Indiana Bat Mist-net Survey

Approximately 26.28 Kilometers
Ohio Department of Transportation Portsmouth Bypass
(SCI-823-0.00/6.81, PID 19415)
Scioto County, Ohio
ES Project # 637-3880

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Revised-24 October 2011

STATEMENT OF CERTIFICATION

The analyses, opinions and conclusions in this report are based entirely on EnviroScience's unbiased, professional judgment. EnviroScience's compensation is not in any way contingent on any action or event resulting from this study. Neither EnviroScience nor any EnviroScience employee has any vested interest in the property examined in this study.

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1.0 INTRODUCTION

ASC Group contacted EnviroScience Inc. to assist with issues pertaining to the potential to adversely affect an endangered species in the course of construction of the proposed Ohio Department of Transportation (ODOT) Portsmouth Bypass Corridor (SCI-823-0.00/6.81, PID 19415) project.

The purpose of the project is to connect Ohio State Route 23 directly to Ohio State Route 52 and avoid the downtown portion of the City of Portsmouth. Involved in the construction of the bypass is the clearing of forested areas that the U.S. Fish and Wildlife Service (USFWS) has identified as potential summer roosting and foraging habitat for the Federally Endangered Indiana bat (*Myotis sodalis*). An Indiana bat mist-net survey was conducted in July and August of 2011 in accordance with the protocols and requirements of the USFWS for Indiana Bat presence/ probable absence surveys. A description of the project site, a description of the species of concern, the survey methods used, the results found, and a brief discussion of the survey follow, as well as mapping of the site and net site photographs.

2.0 SITE DESCRIPTION

The Portsmouth Bypass corridor is located in Scioto County and is approximately 16.33 miles (26.28 kilometers) in length. The corridor begins just north of Lucasville and spans east to Minford, then south to Wheelersburg (see Figure 1; Appendix A).

The corridor is currently composed of residential, agricultural, and undeveloped land uses, with undeveloped forested land being the most prevalent. EnviroScience analysis of current aerial mapping, along with field verification, showed that approximately 11.58 miles (18.64 km) of the corridor is forested (see Figure 3; Appendix A).

Vegetative communities found within the corridor vary from areas of open field and agriculture to second-growth and mature forest. Areas that are of concern for potential habitat for the Indiana bat consist of sucessional, second growth, and mature forest. The forested areas on the corridor were composed of mainly deciduous hardwood species including *Acer negundo* (boxelder), *Acer saccharum* (sugar maple), *Acer saccharinum* (silver maple), *Acer rubrum* (red maple), *Platanus occidentalis* (sycamore), *Quercus alba* (white oak), *Prunus serotina* (black cherry), *Ulmus americana* (American elm), *Carya ovata* (shagbark hickory), *Juglans nigra* (black walnut), *Fraxinus americana* (white ash), *Fraxinus pennsylvanica* (green ash), *Liriodendron tulipifera* (tulip tree), and *Robinia pseudoacacia* (black locust).

Topography within the corridor varies from rolling hilltops to stream valley bottoms and elevations range from approximately 1000 AMSL to 500 AMSL. The majority of the corridor is in the Little Scioto-Tygart Watershed (HUC # 05090103), but the far western portion near Lucasville is in the Lower Scioto Watershed (HUC # 05060002). The entire site is in the Allegheny Plateau Physiographic region and the Western Allegheny Plateau Ecoregion.

ODOT requested a review of the ODNR Ohio Biodiversity Database records in order to assess the existence of known or suspected habitat for the Indiana Bat on the site. The ODNR places the corridor within 10 miles of a known or suspected hibernacula (see attached Figure 2; Appendix A). The proposed corridor does not fall within 5 miles of any summer capture records of the Indiana bat.

No caves, mine portals, or other features that could be acting as potential Indiana Bat hibernacula were found within the corridor.

3.0 SPECIES DESCRIPTION

The Indiana Bat is in the genus *Myotis*. Within the range of the Indiana bat (Appendix B: Photos 1-3) two similar appearing bats from this genus are encountered, the Little Brown Bat (*Myotis lucifugus*; Appendix B: Photo 4) and the Northern Long-eared bat (*Myotis septentrionalis*; Appendix B: Photo 5). Size, length, and habitat requirements are similar for these three species. Each of these three species could be encountered foraging in habitats like those found on the Portsmouth Bypass corridor and each could be encountered roosting under exfoliating bark or in tree crevices in such areas. At this time accurate identification between these species can only reliably be made by capturing and direct examination of these bats. For this reason, the USFWS requests mist-net surveys on tree-clearing areas to assure that the Indiana Bat is not present.

The Indiana bat is distinguishable from the other local members of its genus, in that the Northern Long-eared bat has a longer and more pointed tragus in its ear pinna (Appendix B: Photo 5) than the Indiana Bat. The Little Brown bat has some scattered, longer toe hairs, which the Indiana bat lacks (Appendix B: Photo 6). The Indiana bat has a “keeled calcar” along the trailing edge of its interfemoral membrane (Appendix B: Photo 2), which the Little Brown Bat does not have. The pelage color of the Indiana Bat is a dull grayish color instead of the bronze color of the other two bats (Appendix B: Photos 1, 3, 4, and 5).

Also commonly encountered within Ohio are the Hoary Bat (*Lasiurus cinereus*; Appendix B: Photo 6), the Silver-haired bat (*Lasionycteris noctivagans*; Appendix B: Photo 7), the Eastern Red Bat (*Lasiurus borealis*; Appendix B: Photo 8), Big Brown Bat (*Eptesicus fuscus*; Appendix B: Photo 9), the Tri-color Bat (*Pipistrellus subflavus*; Appendix B: Photo 10), the Evening Bat (*Nycticeius humeralis*; Appendix B: Photo 11), Rafinesque's Big-eared Bat (*Corynorhinus rafinesquii*; Appendix B: Photo 12), and the Eastern Small-Footed Bat (*Myotis leibii*; Appendix B: Photo 13). A photograph of a bat captured in a mist-net is also included as Photo 14 in Appendix B. Photographs included in Appendix B are for reference and are not bats actually captured on-site, Photographs of bats actually captured the Portsmouth Bypass corridor are included at the end of Appendix D.

4.0 MATERIALS AND METHODS

According to the USFWS protocol for Indiana Bat mist-net surveys, minimum effort for surveys within linear corridors is one net site (with two net locations, surveyed for two nights) per kilometer of potential habitat. The Portsmouth Bypass corridor was found to

contain 18.64 km of potential habitat and would therefore require 19 net sites to comply with protocol.

Prior to initiation of the survey, EnviroScience biologists performed field reconnaissance and determined the best locations for net site placement. This involved driving and walking the corridor to identify areas that contain good potential travel corridors for the Indiana Bat, such as streams, logging roads, trails, and other corridors with closed canopies that will funnel bats to perpendicularly set nets. Particular attention was given to sites that offered additional habitat features, such as streams or ponds as water sources, wetlands or ephemeral puddles that may produce emerging insects, and live or dead trees that could serve as summer roosts. EnviroScience then composed and submitted a study plan to the USFWS for site specific authorization. The USFWS accepted the plan as written (see Appendix C for Approval).

The bat survey was accomplished by mist netting within the project corridor on the evenings of July 18th through 25th and August 2nd through 14th, 2011. The surveys were conducted by three federally permitted biologists; Gary Libby- Federal Permit # TE156392-1, Michelle Malcosky- Federal Permit # TE08603A-0, and Michael Whitby- Federal Permit # TE02560A-0), along with qualified assistants (Jamie Willaman, Krista Tomasello, Dave Czayka, Tim Ator, and Julia Nawrocki). Each permitted biologist and assistant surveyed only one net site per night.

A total of 38 mist net sets were placed at 38 net locations (19 net sites; 72 net nights). Each mist net set consisted of one to three 38 mm mesh, 75 denier, 2 ply black polyester 2.6 to 7.8 meters (single, double, or triple) high by 2.6 to 18 meters wide from Avinet, Inc., Dryden, New York and were placed so that they completely spanned corridor openings. Nets were stretch between either fixed or telescoping poles with rope and pulley systems to facilitate raising and lowering of the nets.

Net site placement is shown in Appendix A; Figure 3, and details of the survey at each site including date surveyed, number and type of nets used, coordinates of the site, the biologists conducting the survey, start and end times, start and end temperatures, weather conditions, and a brief site description, can be found on Table 1.

Nets were spread each evening at sunset and lowered after over five hours of netting. Nets were checked every 10 minutes for the presence of captured bats. The area was regularly checked with an acoustic bat detector to identify any bats navigating in the survey area and to make sure net placement was optimal.

All captured bats were be identified to species, weighed, measured, assessed for age, sex, and reproductive status, photographed, and released within 30 minutes of capture.

All current USFWS protocols to prevent the spread of White Nose Syndrome (WNS) were strictly observed.

Equipment on hand in anticipation of captured Indiana Bats included ODNR aluminum wing bands, Holohil LB-2 Transmitters (band width 172), a Wildlife Materials TRX 1000S Receiver, and a 3-element Yagi directional folding handheld antenna.

At the end of the survey all materials (nets and poles) were removed from the site.

Table 1. Net Site Summary.

Net Site	Net	Date Surveyed	Set Size	Site Coordinates	Permittee/ Assistant	Start Time	Start Temp. (°F)	End Time	End Temp. (°F)	Weather Notes	Site Description
1	A	7/18/2011	Triple High–2.6m x 6m	-82.99718404W, 38.891956N	Malcosky/Czayka	20:50	84	3:25 AM	75	Precipitation: Mist from 9:54–10:10 pm; Moon: 3 days after full moon; Wind: 1–3mph wind; Cloud Cover: variable (hazy to 100%)	Flight corridor within woods
	B		Triple High–2.6m x 12m								Within wood line across potential travel corridor
1	A	7/19/2011	Triple High–2.6m x 6m	-82.99718404W, 38.891956N	Malcosky/Czayka	21:05	78	2:35 AM	70	Precipitation: none; Moon: 4 days after full moon; Wind: 1–3mph ; Cloud Cover: 25–75%	Flight corridor within woods
	B		Triple High–2.6m x 12m								Within wood line across potential travel corridor
2	A	7/20/2011	Triple High–2.6m x 9m	-82.97291550W, 38.896737N	Malcosky/Czayka	21:00	75	2:05 AM	74	Precipitation: none; Moon: 3 days before last quarter; Wind: 1–3mph; Cloud Cover: 75%	Intersection of ATV trail and small shallow stream
	B		Triple High–2.6m x 9m								Across trail and flyway leading to/away from pond
2	A	7/21/2011	Triple High–2.6m x 9m	-82.97291550W, 38.896737N	Malcosky/Tomasello	21:00	85	3:00 AM	78	Precipitation: none; Moon: 2 days before last quarter; Wind: 1–3mph wind; Cloud Cover: 0%	Intersection of ATV trail and small shallow stream
	B		Triple High–2.6m x 9m								Across trail and flyway leading to/away from pond
3	A	8/10/2011	Double High-2.6m x 18m	-82.95347439W, 38.892884N	Whitby/Nawrocki	20:45	72	2:00 AM	66	Precipitation: none; Moon: 3 days before full moon; Wind: 0–5mph; Cloud Cover: 50%	Across a logging road within woods
	B		Double High–2.6m x 9m								Across a logging road within woods
3	A	8/11/2011	Double High-2.6m x 18m	-82.95347439W, 38.892884N	Whitby/Nawrocki	20:45	72	2:00 AM	64	Precipitation: none; Moon: 2 days before full moon; Wind: 0–5mph; Cloud Cover: 0%	Across a logging road within woods
	B		Double High–2.6m x 9m								Across a logging road within woods
4	A	7/22/2011	Triple High–2.6m x 6m	-82.94905988W, 38.883696N	Malcosky/Tomasello	21:00	77	2:05 AM	72	Precipitation: none; Moon: 1 day before last quarter; Wind: 1–3mph; Cloud Cover: 0–30%	Across a logging road within woods
	B		Double High–2.6m x 6m								Across a logging road within woods
4	A	7/23/2011	Triple High–2.6m x 6m	-82.94905988W, 38.883696N	Malcosky/Tomasello	21:00	78	2:05 AM	75	Precipitation: none; Moon: last quarter; Wind: 1–3mph; Cloud Cover: 0%	Across a logging road within woods
	B		Double High–2.6m x 6m								Across a logging road within woods
5	A	7/24/2011	Triple High–2.6m x 12m	-82.93654426W, 38.870109N	Malcosky/Tomasello	21:00	75	2:30 AM	72	Precipitation: none; Moon: 1 day after last quarter; Wind: 1–3mph; Cloud Cover: 50%	Across intersection of two roads and adjacent to entrenched creek
	B1		Double High–2.6m x 6m								Across a logging road through woods adjacent to entrenched creek
5	A	7/25/2011	Triple High–2.6m x 12m	-82.93654426W, 38.870109N	Malcosky/Tomasello	21:00	82	2:30 AM	74	Precipitation: none; Moon: 2 days after last quarter; Wind: 1–3mph; Cloud Cover: 0-50%	Across intersection of two roads and adjacent to entrenched creek
	B2		Double High–2.6m x 6m								Across a logging road through woods adjacent to entrenched creek
6	A	8/2/2011	Triple High–2.6m x 6m	-82.90875784W, 38.868183N	Malcosky/Tomasello	21:00	82	2:05 AM	75	Precipitation: none; Moon: 3 days after last quarter; Wind: 1–3mph; Cloud Cover: 0%	Across a logging road within woods
	B		Double High–2.6m x 6m								Across a logging road within woods
6	A	8/3/2011	Triple High–2.6m x 6m	-82.90875784W, 38.868183N	Malcosky/Tomasello	20:55	75	2:05	73	Precipitation: none; Moon: 3 days before 1st quarter; Wind: 1–3mph; Cloud Cover: 50%	Across a logging road within woods
	B		Double High–2.6m x 6m								Across a logging road within woods
7	A	8/4/2011	Triple High–2.6m x 12m	-82.89599503W, 38.863968N	Malcosky/Tomasello	21:00	80	2:15	68	Precipitation: none; Moon: 2 days before 1st quarter; Wind: none/calm; Cloud Cover: 0%	Across grassy access drive at narrowing point of trees between fields
	B		2 (Triple High–2.6m x 9m)								Set end to end across grassy access drive between tree row
7	A	8/5/2011	Triple High–2.6m x 12m	-82.89599503W, 38.863968N	Malcosky/Tomasello	21:00	80	2:00	75	Precipitation: gentle drizzle from 11:20 pm to 12:00 am; Moon: 1 day before 1st quarter; Wind: none/calm; Cloud Cover: 100%	Across grassy access drive at narrowing point of trees between fields
	B		2 (Triple High–2.6m x 9m)								Set end to end across grassy access drive between tree row
8	A	8/6/2011	Triple High–2.6m x 6m	-82.88693079W, 38.857525N	Malcosky/Tomasello	20:50	82	2:10	75	Precipitation: none; Moon: 1st quarter; Wind: none/calm; Cloud Cover: 0–75%	Across an opening in woods leading to ATV trails
	B		Triple High–2.6m x 6m								Across ATV trail in woods

Table 1. Net Site Summary.

Net Site	Net	Date Surveyed	Set Size	Site Coordinates	Permittee/ Assistant	Start Time	Start Temp. (°F)	End Time	End Temp. (°F)	Weather Notes	Site Description
8	A	8/7/2011	Triple High–2.6m x 6m	-82.88693079W, 38.857525N	Malcosky/Tomasello	20:50	79	2:05	72	Precipitation: gentle drizzle from 12:35 am to 12:50 am; Moon: 1 day after 1st quarter; Wind: 0–3mph ; Cloud Cover: 50%	Across an opening in woods leading to ATV trails
	B		Triple High–2.6m x 6m								Across ATV trail in woods
9	A	8/8/2011	Triple High–2.6m x 9m	-82.86728733W, 38.848867N	Malcosky/Tomasello	20:50	73	2:05	71	Precipitation: gentle drizzle from 12:20 am to 12:30 am; Moon: 2 days after 1st quarter; Wind: 0–7mph ; Cloud Cover: 50-100%	Across driveway between woods edge and abandoned house
	B		Double High–2.6m x 6m								Clearing within woods travel corridor
	C		Single High–2.6m x 6m								Woods opening along driveway
9	A	8/9/2011	Triple High–2.6m x 9m	-82.86728733W, 38.848867N	Malcosky/Tomasello	21:10	77	2:15	75	Precipitation: gentle drizzle from 12:20 am to 12:30 am; Moon: 3 days after 1st quarter; Wind: 0–5mph ; Cloud Cover: variable 0–100%	Across driveway between woods edge and abandoned house
	B		Double High–2.6m x 6m								Clearing within woods travel corridor
	C		Single High–2.6m x 6m								Woods opening along driveway
10	A	8/12/2011	Double High–2.6m x 6m	-82.85875392W, 38.837084N	Malcosky/Ater	20:50	70	2:00	62	Precipitation: none; Moon: 1 day before full moon; Wind: 1–3mph ; Cloud Cover: 0%	Across grassy road through woods on steep slope
	B		Double High–2.6m x 6m								Across grassy path through woods
10	A	8/14/2011	Double High–2.6m x 6m	-82.85875392W, 38.837084N	Malcosky/Tomasello	20:45	70	2:15	63	Precipitation: none; Moon: 1 day after full moon; Wind: none/calm; Cloud Cover: 0-20%	Across grassy road through woods on steep slope
	B		Double High–2.6m x 6m								Across grassy path through woods
11	A	8/13/2011	Double High–2.6m x 9m	-82.85297203W, 38.828371N	Malcosky/Ater	22:30	73	3:45	60	Precipitation: light rain from 8:30–9:30 PM, dry for remainder of evening; Moon: full moon; Wind: 1–5mph; Cloud Cover: 90-100%	Across Blake Hollow Road, ~30m west of R.R. overpass/tunnel
	B		Triple High–2.6m x 9m								Across opening in woods and parallel to Blake Hollow Road
11	A	8/14/2011	Double High–2.6m x 9m	-82.85297203W, 38.828371N	Libby/Willaman	21:00	68	2:15	61	Precipitation: none; Moon: 1 day after full moon; Wind: none/calm; Cloud Cover: 0-20%	Across Blake Hollow Road, ~30m west of R.R. overpass/tunnel
	B		Double High–2.6m x 6m								Across opening in woods and parallel to Blake Hollow Road
12	A	8/10/2011	Single High–2.6m x 6m	-82.85478723W, 38.821908N	Libby/Tomasello	21:00	71	2:00	60	Precipitation: none; Moon: 3 days before full moon; Wind: 0–5mph; Cloud Cover: 50%	Across gravel road within woods
	B		Double High–2.6m x 6m								Across small pond
	C		Double High–2.6m x 6m								Across gravel road flyway
12	A	8/11/2011	Single High–2.6m x 6m	-82.85478723W, 38.821908N	Libby/Tomasello	21:00	65	2:00	55	Precipitation: none; Moon: 2 days before full moon; Wind: 0–5mph; Cloud Cover: 0%	Across gravel road within woods
	B		Double High–2.6m x 6m								Across small pond
	C		Double High–2.6m x 6m								Across gravel road flyway
13	A1	8/10/2011	Double High–2.6m x 6m	-82.85763338W, 38.816956N	Malcosky/Willaman	21:00	75	2:30	64	Precipitation: none; Moon: 3 days before full moon; Wind: 0–5mph; Cloud Cover: 50%	Across shallow gravel stream/road under complete canopy closure
	B		Double High–2.6m x 6m								Across shallow gravel stream/road at point of tree overhangs
13	A2	8/11/2011	Double High–2.6m x 6m	-82.85763338W, 38.816956N	Malcosky/Willaman	20:45	71	2:15	58	Precipitation: none; Moon: 2 days before full moon; Wind: 0–5mph; Cloud Cover: 0%	Across shallow gravel stream/road under complete canopy closure
	B		Double High–2.6m x 6m								Across shallow gravel stream/road at point of trees overhangs
14	A	8/6/2011	Double High–2.6m x 9m	-82.86196386W, 38.801159N	Whitby/Nawrocki	20:30	82	2:00	72	Precipitation: none; Moon: 1st quarter; Wind: none/calm; Cloud Cover: 0–75%	Across gravel stream with closed canopy
	B		Double High–2.6m x 6m								Across gravel stream with closed canopy
	C		Single High–2.6m x 6m								Across intersection of gravel stream and ATV trail

Table 1. Net Site Summary.

Net Site	Net	Date Surveyed	Set Size	Site Coordinates	Permittee/ Assistant	Start Time	Start Temp. (°F)	End Time	End Temp. (°F)	Weather Notes	Site Description
14	A	8/7/2011	Double High–2.6m x 9m	-82.86196386W, 38.801159N	Whitby/Nawrocki	20:45	78	2:00	68	Precipitation: gentle drizzle from 12:35 am to 12:50 am; Moon: 1 day after 1st quarter; Wind: 0–3mph ; Cloud Cover: 50%	Across gravel stream with closed canopy
	B		Double High–2.6m x 6m								Across gravel stream with closed canopy
	C		Single High–2.6m x 6m								Across intersection of gravel stream and ATV trail
15	A	8/6/2011	Double High–2.6m x 6m	-82.86230691W, 38.800329N	Libby/Willaman	20:45	83	2:00	73	Precipitation: none; Moon: 1st quarter; Wind: none/calm; Cloud Cover: 0–75%	Across closed canopy road
	B		Single High–2.6m x 6m								Across gravel stream with closed canopy
	C		Double High–2.6m x 9m								Across intersection of 2 streams and road
15	A	8/7/2011	Double High–2.6m x 6m	-82.86230691W, 38.800329N	Libby/Willaman	21:00	78	2:00	65	Precipitation: gentle drizzle from 12:35 am to 12:50 am; Moon: 1 day after 1st quarter; Wind: 0–3mph ; Cloud Cover: 50%	Across closed canopy road
	B		Single High–2.6m x 6m								Across gravel stream with closed canopy
	C		Double High–2.6m x 9m								Across intersection of 2 streams and road
16	A	8/8/2011	Double High–2.6m x 5.5m	-82.86533255W, 38.790128N	Whitby/Nawrocki	21:00	76	2:30	70	Precipitation: gentle drizzle from 12:20 am to 12:30 am; Moon: 2 days after 1st quarter; Wind: 0–7mph ; Cloud Cover: 50-100%	Across a logging road within woods
	B		Double High–2.6m x 6m								Across a logging road within woods
	C		Single High–2.6m x 5m								Across a logging road within woods
16	A	8/9/2011	Double High–2.6m x 5.5m	-82.86533255W, 38.790128N	Whitby/Nawrocki	21:00	74	2:30	68	Precipitation: gentle drizzle from 12:20 am to 12:30 am; Moon: 3 days after 1st quarter; Wind: 0–5mph ; Cloud Cover: variable 0–100%	Across a logging road within woods
	B		Double High–2.6m x 6m								Across a logging road within woods
	C		Single High–2.6m x 5m								Across a logging road within woods
17	A	8/8/2011	Double High–2.6m x 18m	-82.87259463W, 38.772265N	Libby/Willaman	21:00	81	2:00	66	Precipitation: gentle drizzle from 12:20 am to 12:30 am; Moon: 2 days after 1st quarter; Wind: 0–7mph ; Cloud Cover: 50-100%	Across the Scioto River
	B		Double High–2.6m x 12m								Across the Scioto River
17	A	8/9/2011	Double High–2.6m x 18m	-82.87259463W, 38.772265N	Libby/Willaman	21:00	79	2:30	64	Precipitation: gentle drizzle from 12:20 am to 12:30 am; Moon: 3 days after 1st quarter; Wind: 0–5mph ; Cloud Cover: variable 0–100%	Across the Scioto River
	B		Double High–2.6m x 12m								Across the Scioto River
18	A	8/4/2011	Double High–2.6m x 6m	-82.87284931W, 38.757229N	Whitby/Nawrocki	20:45	80	2:00	67	Precipitation: none; Moon: 2 days before 1st quarter; Wind: none/calm; Cloud Cover: 0%	Across a logging road within woods
	B		Double High–2.6m x 6m								Across a logging road within woods
	C		Single High–2.6m x 2.6m								Across gravel stream with closed canopy
18	A	8/5/2011	Double High–2.6m x 6m	-82.87284931W, 38.757229N	Whitby/Nawrocki	20:30	80	2:00	65	Precipitation: gentle drizzle from 11:20 pm to 12:00 am; Moon: 1 day before 1st quarter; Wind: none/calm; Cloud Cover: 100%	Across a logging road within woods
	B		Double High–2.6m x 6m								Across a logging road within woods
	C		Single High–2.6m x 2.6m								Across gravel stream with closed canopy
19	A	8/4/2011	Single High–2.6m x18m	-82.87401466W, 38.755406N	Libby/Willaman	21:00	80	2:00	68	Precipitation: none; Moon: 2 days before 1st quarter; Wind: none/calm; Cloud Cover: 0%	Across mitigation pond/wetland
	B		Double High–2.6m x 6m								Across a logging road within woods
19	A	8/5/2011	Single High–2.6m x 18m	-82.87401466W, 38.755406N	Libby/Willaman	20:45	80	2:00	65	Precipitation: gentle drizzle from 11:20 pm to 12:00 am; Moon: 1 day before 1st quarter; Wind: none/calm; Cloud Cover: 100%	Across mitigation pond/wetland
	B		Double High–2.6m x 6m								Across a logging road within woods

5.0 RESULTS

The 38 nights of sampling resulted in the capture of 121 bats representing 6 species. A summary of the capture data is in Table 2 below, and a detailed record of the bat capture data is in Table 3. Field datasheets can be found in Appendix D and photographs of each Net Site are in Appendix E. No Indiana Bats (*Myotis sodalis*) were captured during this survey.

Table 2. Captured Species Summary.

Species	Sites of Capture	Female / Male / Escape	# of Captures
Eptesicus fuscus	1, 2, 3, 5, 6, 15, 16, 17, 18, 19	15 / 20 / 3	38
Lasurius borealis	2, 5, 7, 8, 10, 11, 12, 13, 14, 15, 17, 19	18 / 15 / 3	36
Myotis septentrionalis	2, 3, 5, 11, 12, 13, 14, 15, 16	7 / 24 / 0	31
Myotis lucifugus	12, 13, 17	3 / 4 / 0	7
Perimyotis subflavus	1, 13, 15	1 / 5 / 0	6
Lasurius cinereus	2, 13	1 / 1 / 1	3
Total			**121**

The weather and timeline protocols adhered to those set forth by the USFWS and the conditions of the site specific authorization.

6.0 DISCUSSION

This survey was completed with the appropriate level of effort required by the established guidelines set forth for ODOT projects as well as a project-specific level of effort agreed upon by USFWS and OES. No Indiana bats were captured during this survey. It is presumed that Indiana bats are either not present on the site, or are present in very low numbers. Based on these results, it is reasonable to conclude this project “may affect, but is not likely to adversely affect” the Indiana bat.

The overall capture numbers and diversity of species caught shows bats are using the forested areas. Big Brown bats were found to be the most numerous, while Eastern Red bats were found at the most net sites. Despite the USFWS notification that the Northern Myotis may warrant federal protection, this survey showed that this area has a large population, mainly males.

Several of the survey sites had no captures through the two nights of survey and these sites were monitored with acoustic detectors to see if a change in net placement would result in better results, but it was found that bat activity was extremely low in these areas. Net Site 13 at Dan White Hollow proved to be the most productive site in both capture number and species diversity.

Very few notes of damage to captured bats were made, indicating that for the moment the cave dwelling bats of this area may not be affected by the spread of WNS.

Table 3. Bat Capture Details.

Site	Net #	Date	Time	Species	Sex: M(ale) or F(emale)	Age: A(dult) or J(uvenile)	Reproductive Status: N(on)-R(eproductive), A(ctive), P(regnant), L(actating), or P(ost)-L(actating)	Forearm Length (mm)	Weight (g)	Band Number/Additional Notes
1	B	7/18/2011	22:10	big brown bat (*Eptesicus fuscus*)	M	A	A	44	12	-
1	B	7/18/2011	22:10	big brown bat (*Eptesicus fuscus*)	F	A	P	44	13	-
1	B	7/18/2011	22:10	big brown bat (*Eptesicus fuscus*)	M	A	N/R	44	12	Small hole in left wing
1	B	7/18/2011	22:10	big brown bat (*Eptesicus fuscus*)	F	A	P	47	14	-
1	B	7/19/2011	21:40	big brown bat (*Eptesicus fuscus*)	M	J	N/R	46	14	-
1	B	7/19/2011	22:00	big brown bat (*Eptesicus fuscus*)	M	A	A	47	17.5	-
1	B	7/19/2011	22:00	big brown bat (*Eptesicus fuscus*)	F	A	P	47	19	-
1	B	7/19/2011	22:10	tri-colored bat (*Perimyotis subflavus*)	M	A	N/R	32.5	5.5	-
2	A	7/20/2011	21:50	hoary bat (*Lasurius cinereus*)	-	-	-	-	-	Escaped while lowering net
2	A	7/20/2011	21:50	big brown bat (*Eptesicus fuscus*)	-	-	-	-	-	Escaped while lowering net
2	A	7/20/2011	21:50	big brown bat (*Eptesicus fuscus*)	F	A	P	46	15	-
2	B	7/20/2011	0:50	eastern red bat (*Lasurius borealis*)	M	A	N/R	44	9.5	-
2	A	7/21/2011	21:20	eastern red bat (*Lasurius borealis*)	M	J	N/R	41	9	-
2	A	7/21/2011	21:40	eastern red bat (*Lasurius borealis*)	M	J	N/R	39	8	-
2	A	7/21/2011	22:00	northern myotis (*Myotis septentrionalis*)	F	J	N/R	35	8	-
2	B	7/21/2011	22:30	eastern red bat (*Lasurius borealis*)	F	J	N/R	41	11.5	-
2	B	7/21/2011	0:30	eastern red bat (*Lasurius borealis*)	M	A	A	40	11.5	-
2	A	7/21/2011	1:10	eastern red bat (*Lasurius borealis*)	F	A	A	39	17	-
3	A	8/10/2011	23:00	northern myotis (*Myotis septentrionalis*)	M	A	N/R	36	5.5	Band # ODNR 10827
3	B	8/11/2011	22:00	big brown bat (*Eptesicus fuscus*)	F	A	N/R	48	18	Band # ODNR 22329; wing discoloration
3	B	8/11/2011	22:00	big brown bat (*Eptesicus fuscus*)	M	J	N/R	47	17.25	Band # ODNR 22328
3	A	8/11/2011	23:00	big brown bat (*Eptesicus fuscus*)	M	A	N/R	47	19.25	Band # ODNR 22327
5	A	7/24/2011	21:30	big brown bat (*Eptesicus fuscus*)	M	A	A	42	15.5	-
5	A	7/24/2011	22:30	big brown bat (*Eptesicus fuscus*)	F	A	N/R	46	20	-
5	A	7/24/2011	1:30	northern myotis (*Myotis septentrionalis*)	M	A	A	36	7	-
5	B1	7/25/2011	21:47	eastern red bat (*Lasurius borealis*)	M	-	-	-	-	Escaped from net, not well-tangled
5	B1	7/25/2011	22:10	big brown bat (*Eptesicus fuscus*)	M	A	N/R	48	17.5	-
5	B1	7/25/2011	22:10	big brown bat (*Eptesicus fuscus*)	M	A	N/R	42	15	-
5	B1	7/25/2011	22:18	eastern red bat (*Lasurius borealis*)	M	A	N/R	40	11	-
5	A	7/25/2011	23:50	big brown bat (*Eptesicus fuscus*)	F	A	L	48	19.5	Abnormal growth on right wing (7mm diameter)
5	B1	7/25/2011	0:30	big brown bat (*Eptesicus fuscus*)	M	A	A	44	18	-
5	B1	7/25/2011	0:30	big brown bat (*Eptesicus fuscus*)	F	A	N/R	47	21.5	-
5	B1	7/25/2011	0:30	big brown bat (*Eptesicus fuscus*)	F	A	N/R	48	19.5	-
5	B1	7/25/2011	0:30	eastern red bat (*Lasurius borealis*)	M	-	-	-	-	Escaped from net, not well-tangled
6	A	8/2/2011	0:30	big brown bat (*Eptesicus fuscus*)	M	A	N/R	45	14	-
7	A	8/4/2011	21:45	eastern red bat (*Lasurius borealis*)	F	J	N/R	37	9	-
7	A	8/4/2011	2:15	eastern red bat (*Lasurius borealis*)	F	J	N/R	38	11.5	-
8	A	8/6/2011	21:00	eastern red bat (*Lasurius borealis*)	F	A	N/R	43	12	-
8	A	8/6/2011	21:05	eastern red bat (*Lasurius borealis*)	F	J	N/R	37	8.5	-
8	A	8/6/2011	0:30	eastern red bat (*Lasurius borealis*)	M	J	N/R	39	9.5	-

Table 3. Bat Capture Details.

Site	Net #	Date	Time	Species	Sex: M(ale) or F(emale)	Age: A(dult) or J(uvenile)	Reproductive Status: N(on)-R(eproductive), A(ctive), P(regnant), L(actating), or P(ost)-L(actating)	Forearm Length (mm)	Weight (g)	Band Number/Additional Notes
8	A	8/6/2011	0:30	eastern red bat (*Lasurius borealis*)	M	-	-	-	-	Escaped from net, not well-tangled
8	A	8/7/2011	22:24	eastern red bat (*Lasurius borealis*)	F	J	N/R	43	12	Same size as capture from previous night
8	A	8/7/2011	1:25	eastern red bat (*Lasurius borealis*)	F	-	-	-	-	Escaped from net, not well-tangled
10	A	8/14/2011	2:00	eastern red bat (Lasurius borealis)	F	A	PR	43	15	-
11	A	8/13/2011	23:10	eastern red bat (Lasurius borealis)	M	A	A	40	9.5	-
11	A	8/13/2011	23:55	northern myotis (*Myotis septentrionalis*)	M	A	A	33	6	-
11	A	8/14/2011	22:30	eastern red bat (*Lasurius borealis*)	F	A	N/R	41	10.5	
11	A	8/14/2011	22:30	eastern red bat (*Lasurius borealis*)	M	A	A	39	10.5	
12	A	8/10/2011	21:00	northern myotis (*Myotis septentrionalis*)	M	A	A	35	5.7	Band # ODNR 10847
12	B	8/10/2011	21:30	northern myotis (*Myotis septentrionalis*)	F	A	N/R	36	6.7	Band # ODNR 10848
12	B	8/10/2011	21:30	northern myotis (*Myotis septentrionalis*)	M	A	N/R	35	5.9	Band # ODNR 10849
12	B	8/10/2011	0:00	northern myotis (*Myotis septentrionalis*)	M	A	N/R	34	5.7	Band # ODNR 10850
12	B	8/10/2011	1:00	northern myotis (*Myotis septentrionalis*)	F	A	N/R	36	6.5	Band # ODNR 10831
12	B	8/10/2011	1:40	northern myotis (*Myotis septentrionalis*)	M	A	N/R	35	5.8	Band # ODNR 10832
12	A	8/11/2011	10:20	eastern red bat (*Lasurius borealis*)	M	A	N/R	41	9.6	Band # ODNR 22333
12	B	8/11/2011	11:40	northern myotis (*Myotis septentrionalis*)	M	A	N/R	34	5.3	Band # ODNR 10833
12	C	8/11/2011	11:45	little brown bat (*Myotis lucifugus*)	M	A	N/R	36	6.8	Band # ODNR 10834
13	B	8/10/2011	21:15	eastern red bat (*Lasurius borealis*)	F	J	N/R	39	9	-
13	B	8/10/2011	21:15	eastern red bat (*Lasurius borealis*)	F	-	-	-	-	Escaped from net, not well-tangled
13	B	8/10/2011	21:25	northern myotis (*Myotis septentrionalis*)	M	A	A	33	7	-
13	B	8/10/2011	21:25	eastern red bat (*Lasurius borealis*)	M	A	N/R	39	11	-
13	B	8/10/2011	22:50	northern myotis (*Myotis septentrionalis*)	M	A	A	33	7.5	-
13	B	8/10/2011	23:45	tri-colored bat (*Perimyotis subflavus*)	M	J	N/R	33	9.5	Pin-sized holes in wings
13	B	8/10/2011	0:20	eastern red bat (Lasurius borealis)	F	J	N/R	42	11	-
13	B	8/10/2011	0:20	tri-colored bat (Perimyotis subflavus)	M	A	N/R	36	7	-
13	B	8/10/2011	0:20	big brown bat (*Eptesicus fuscus*)	M	A	A	45	17	-
13	B	8/10/2011	0:20	tri-colored bat (Perimyotis subflavus)	M	J	N/R	33.5	6.5	-
13	B	8/10/2011	0:45	big brown bat (*Eptesicus fuscus*)	M	A	A	45	16.5	-
13	B	8/10/2011	1:20	big brown (Eptesicus fuscus)	M	A	A	44	16.5	-
13	B	8/10/2011	1:35	tri-colored bat (Perimyotis subflavus)	M	J	N/R	32	6	-
13	B	8/10/2011	2:05	eastern red bat (Lasurius borealis)	F	J	N/R	41	12	-
13	B	8/10/2011	2:05	little brown bat (*Myotis lucifugus*)	M	A	A	34	7	-
13	B	8/10/2011	2:10	northern myotis (*Myotis septentrionalis*)	M	A	A	34	6	-
13	A2	8/11/2011	21:40	northern myotis (*Myotis septentrionalis*)	M	A	N/R	34.5	6.5	-
13	B	8/11/2011	21:50	northern myotis (*Myotis septentrionalis*)	F	A	N/R	34.5	6.5	-
13	A2	8/11/2011	22:45	big brown (*Eptesicus fuscus*)	M	A	A	48.5	17	-
13	B	8/11/2011	22:50	hoary bat (*Lasurius cinereus*)	M	A	N/R	59	24.5	-
13	B	8/11/2011	22:50	eastern red bat (*Lasurius borealis*)	F	J	N/R	40	14	-
13	A2	8/11/2011	0:30	big brown bat (*Eptesicus fuscus*)	M	A	A	45	15.5	-
13	A2	8/11/2011	0:30	eastern red bat (*Lasurius borealis*)	-	-	-	-	-	Escaped from net, not well-tangled
13	A2	8/11/2011	1:00	hoary bat (*Lasurius cinereus*)	F	A	A	55	26	-

Table 3. Bat Capture Details.

Site	Net #	Date	Time	Species	Sex: M(ale) or F(emale)	Age: A(dult) or J(uvenile)	Reproductive Status: N(on)-R(eproductive), A(ctive), P(regnant), L(actating), or P(ost)-L(actating)	Forearm Length (mm)	Weight (g)	Band Number/Additional Notes
13	B	8/11/2011	1:00	northern myotis (*Myotis septentrionalis*)	M	J	N/R	33	6.5	-
14	A	8/6/2011	21:03	northern myotis (*Myotis septentrionalis*)	M	A	N/R	33	5.25	
14	C	8/6/2011	21:25	northern myotis (*Myotis septentrionalis*)	M	A	N/R	33	5.75	
14	B	8/6/2011	21:36	northern myotis (*Myotis septentrionalis*)	F	A	N/R	35	6	
14	A	8/6/2011	21:50	northern myotis (*Myotis septentrionalis*)	M	A	N/R	35	5.75	
14	B	8/6/2011	22:40	northern myotis (*Myotis septentrionalis*)	F	A	N/R	35	7	
14	A	8/6/2011	23:00	eastern red bat (*Lasurius borealis*)	M	-	-	-	-	
14	A	8/6/2011	0:55	eastern red bat (*Lasurius borealis*)	M	J	N/R	40	11.25	
14	A	8/6/2011	0:55	northern myotis (*Myotis septentrionalis*)	M	A	N/R	34	5.5	
14	A	8/6/2011	1:35	northern myotis (*Myotis septentrionalis*)	M	A	N/R	35	6	Escaped from net, not well-tangled
14	A	8/7/2011	1:11	northern myotis (*Myotis septentrionalis*)	F	A	N/R	35	6.25	
15	C	8/6/2011	21:32	eastern red bat (*Lasurius borealis*)	F	J	N/R	39	11	
15	C	8/6/2011	21:55	northern myotis (*Myotis septentrionalis*)	M	A	N/R	37	6.5	
15	A	8/6/2011	22:01	tri-colored bat (*Perimyotis subflavus*)	F	J	N/R	36	6	
15	C	8/6/2011	22:53	big brown bat (*Eptesicus fuscus*)	F	J	N/R	46	11.5	
15	C	8/6/2011	0:01	northern myotis (*Myotis septentrionalis*)	M	J	N/R	36	5.5	
15	A	8/7/2011	1:40	northern myotis (*Myotis septentrionalis*)	M	A	N/R	34.5	6.3	Band # ODNR 10841
16	A	8/8/2011	0:15	northern myotis (*Myotis septentrionalis*)	M	J	N/R	33	5	Band # ODNR 10830
16	B	8/8/2011	0:30	northern myotis (*Myotis septentrionalis*)	M	A	N/R	34	5.5	Band # ODNR 10829; Wing discoloration spots
16	B	8/9/2011	23:25	northern myotis (*Myotis septentrionalis*)	M	A	N/R	34	5.5	Band # ODNR 10828
16	B	8/9/2011	23:48	big brown bat (*Eptesicus fuscus*)	F	A	N/R	47	17.25	Band # ODNR 22330
17	A	8/8/2011	21:38	eastern red bat (*Lasurius borealis*)	F	A	N/R	40	16.7	Band # ODNR 22331; Wing discoloration spots
17	B	8/8/2011	21:51	eastern red bat (*Lasurius borealis*)	-	-	-	-	-	Escaped from net, not well-tangled
17	A	8/9/2011	21:10	big brown bat (*Eptesicus fuscus*)	M	A	N/R	44	10.5	Band # ODNR 22332
17	A	8/9/2011	22:49	eastern red bat (*Lasurius borealis*)	-	-	-	-	-	Escaped from net, not well-tangled
17	A	8/9/2011	0:15	little brown bat (*Myotis lucifugus*)	F	A	N/R	36	10.6	Band # ODNR 10842; Bed Bugs on wings
17	A	8/9/2011	0:15	little brown bat (*Myotis lucifugus*)	M	J	N/R	37	7.3	Band # ODNR 10843
17	A	8/9/2011	1:28	little brown bat (*Myotis lucifugus*)	F	A	N/R	37	9.8	Band # ODNR 10844
17	A	8/9/2011	1:30	little brown bat (*Myotis lucifugus*)	M	A	A	36.5	7.8	Band # ODNR 10845
17	A	8/9/2011	2:05	little brown bat (*Myotis lucifugus*)	F	A	N/R	37	7.4	Band # ODNR 10846
18	B	8/5/2011	22:15	big brown bat (*Eptesicus fuscus*)	F	J	N/R	47	18	
18	A	8/5/2011	22:17	big brown bat (*Eptesicus fuscus*)	M	A	A	45	16.5	
19	A	8/4/2011	21:40	big brown bat (*Eptesicus fuscus*)	M	A	A	48.5	13.4	
19	A	8/4/2011	21:40	big brown bat (*Eptesicus fuscus*)	-	-	-	-	-	Escaped from net, not well-tangled
19	A	8/4/2011	22:00	big brown bat (*Eptesicus fuscus*)	M	A	N/R	44	17.2	
19	A	8/4/2011	22:45	big brown bat (*Eptesicus fuscus*)	F	A	N/R	49	21.8	
19	A	8/4/2011	23:15	big brown bat (*Eptesicus fuscus*)	F	A	N/R	48	16.2	
19	A	8/4/2011	23:15	big brown bat (*Eptesicus fuscus*)	F	A	N/R	45	11.7	
19	A	8/5/2011	21:30	big brown bat (*Eptesicus fuscus*)	-	-	-	-	-	Escaped from net, not well-tangled
19	A	8/5/2011	22:45	eastern red bat (*Lasurius borealis*)	F	A	PR	46	17.2	

Appendix A: Figures

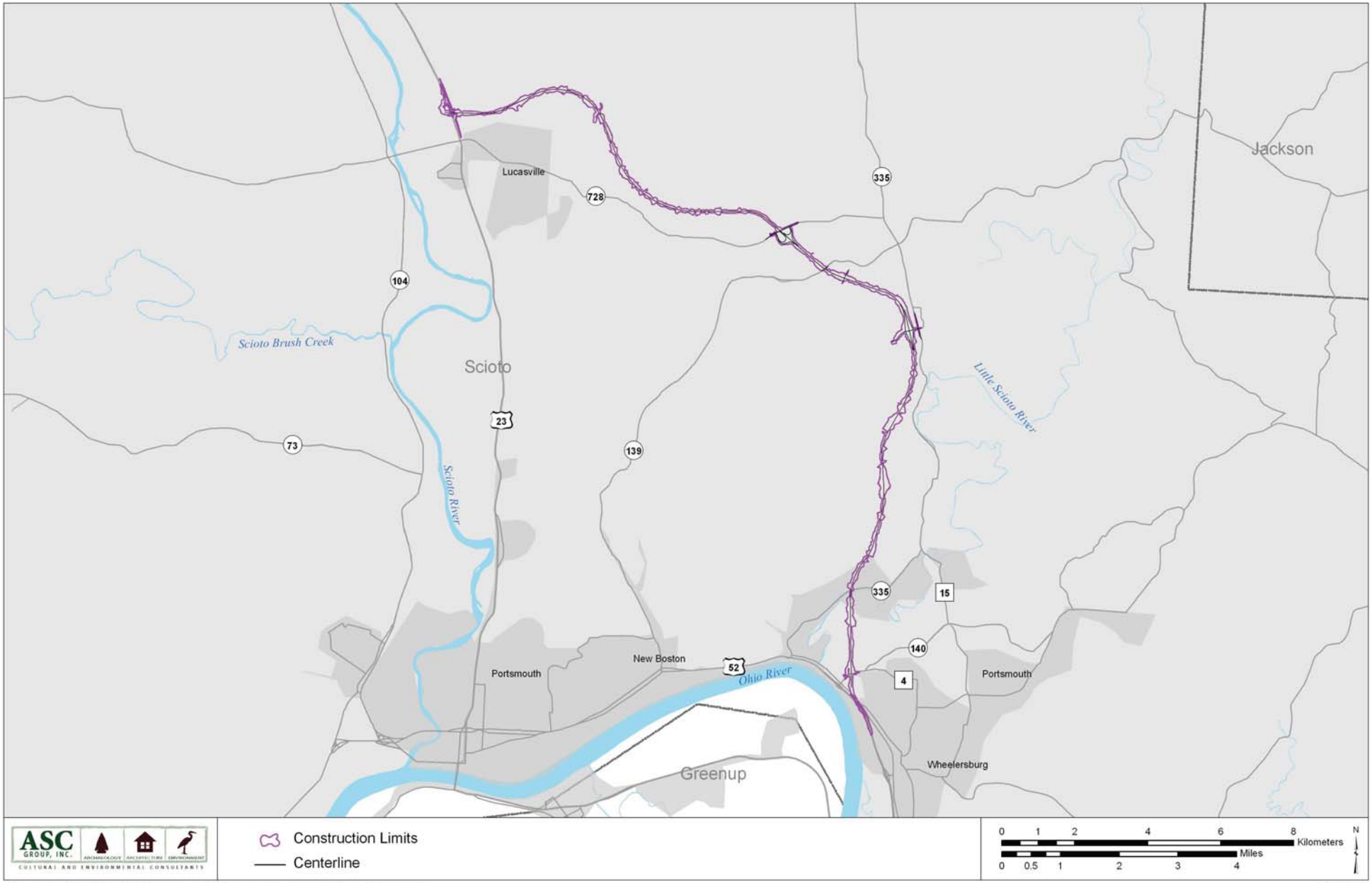

Figure 1. SCI-823-0.00 Portsmouth Bypass-Preferred Alternative location.

Figure 2. Ohio Biodiversity Database Indiana Bat Records Map.

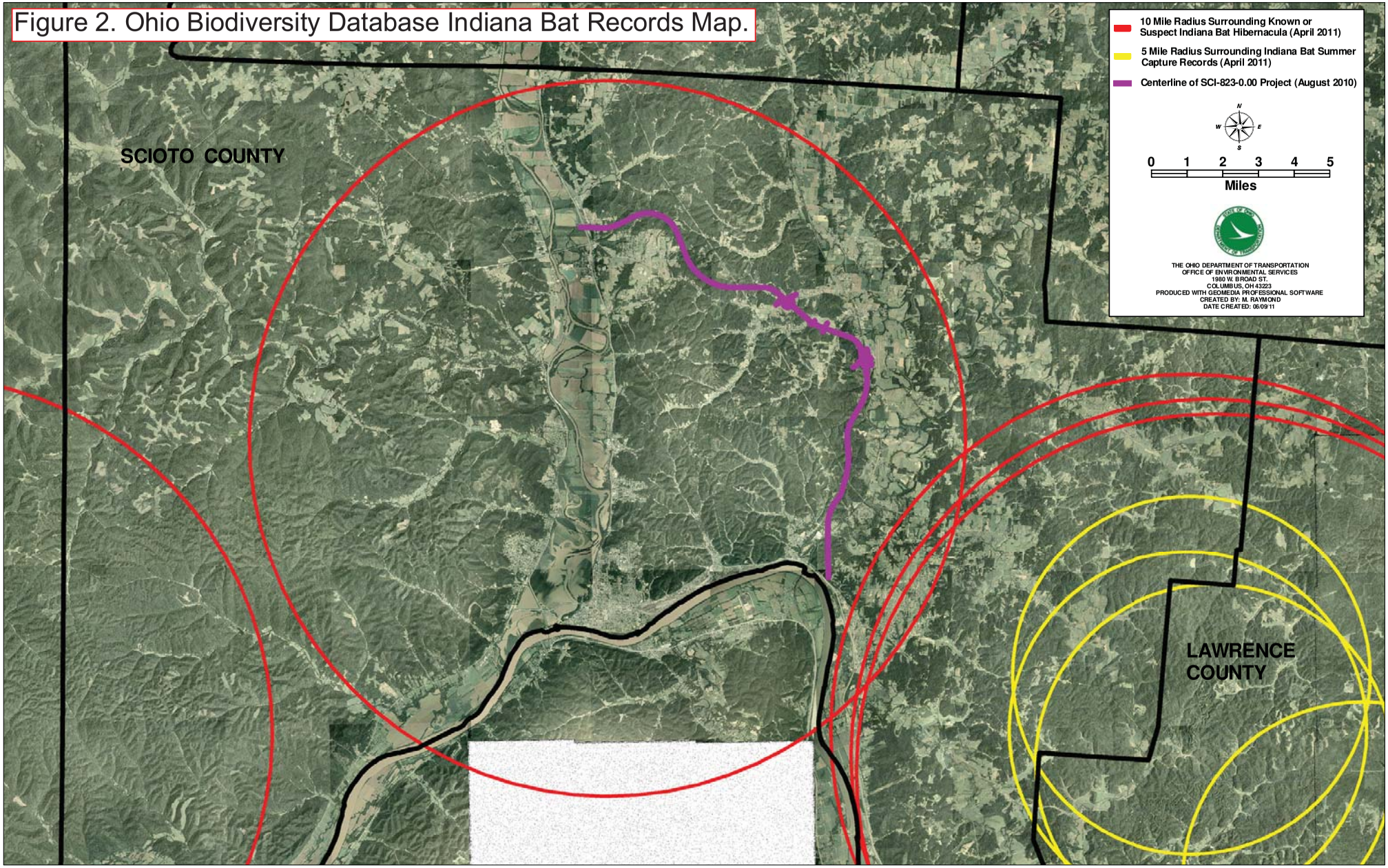

Figure 3.1.
Site Map showing Forested Areas and Net Sites within Construction Limits.
SCI - 823 - 0.00/6.81
Portsmouth Bypass Project (PID 19415).

Net Site
Centerline
Forested Areas
Construction Limits

1,400 700 0 1,400 Feet

400 200 0 400 Meters

Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet

Aerial imagery courtesy of NAIP 2009.

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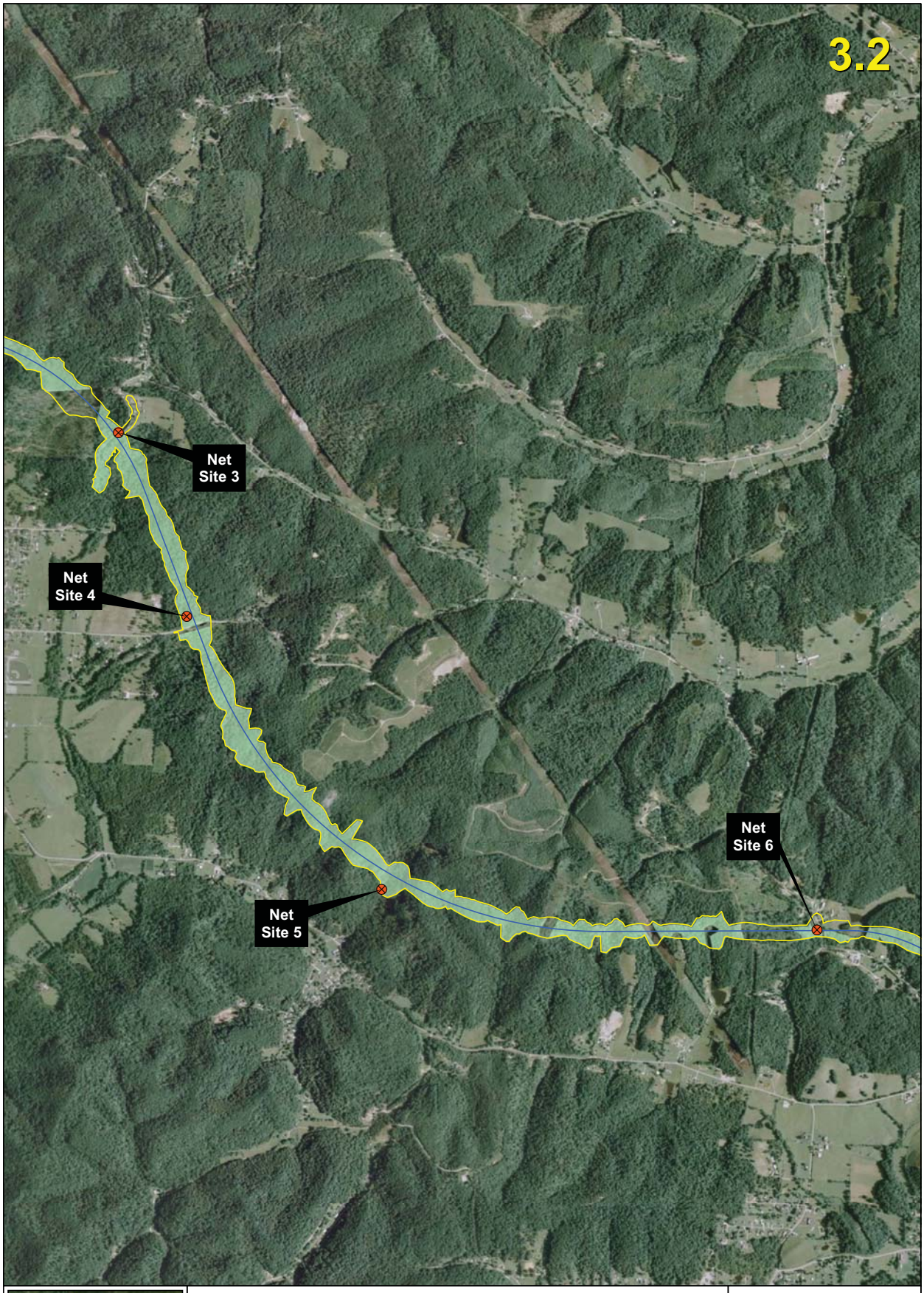

Figure 3.2.
Site Map showing Forested Areas and Net Sites within Construction Limits.
SCI - 823 - 0.00/6.81
Portsmouth Bypass Project (PID 19415).

Net Site
Centerline
Forested Areas
Construction Limits

1,400 700 0 1,400 Feet

400 200 0 400 Meters

Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet

Aerial imagery courtesy of NAIP 2009.

"Excellence in Ecological Monitoring"

ES ENVIRO SCIENCE INCORPORATED

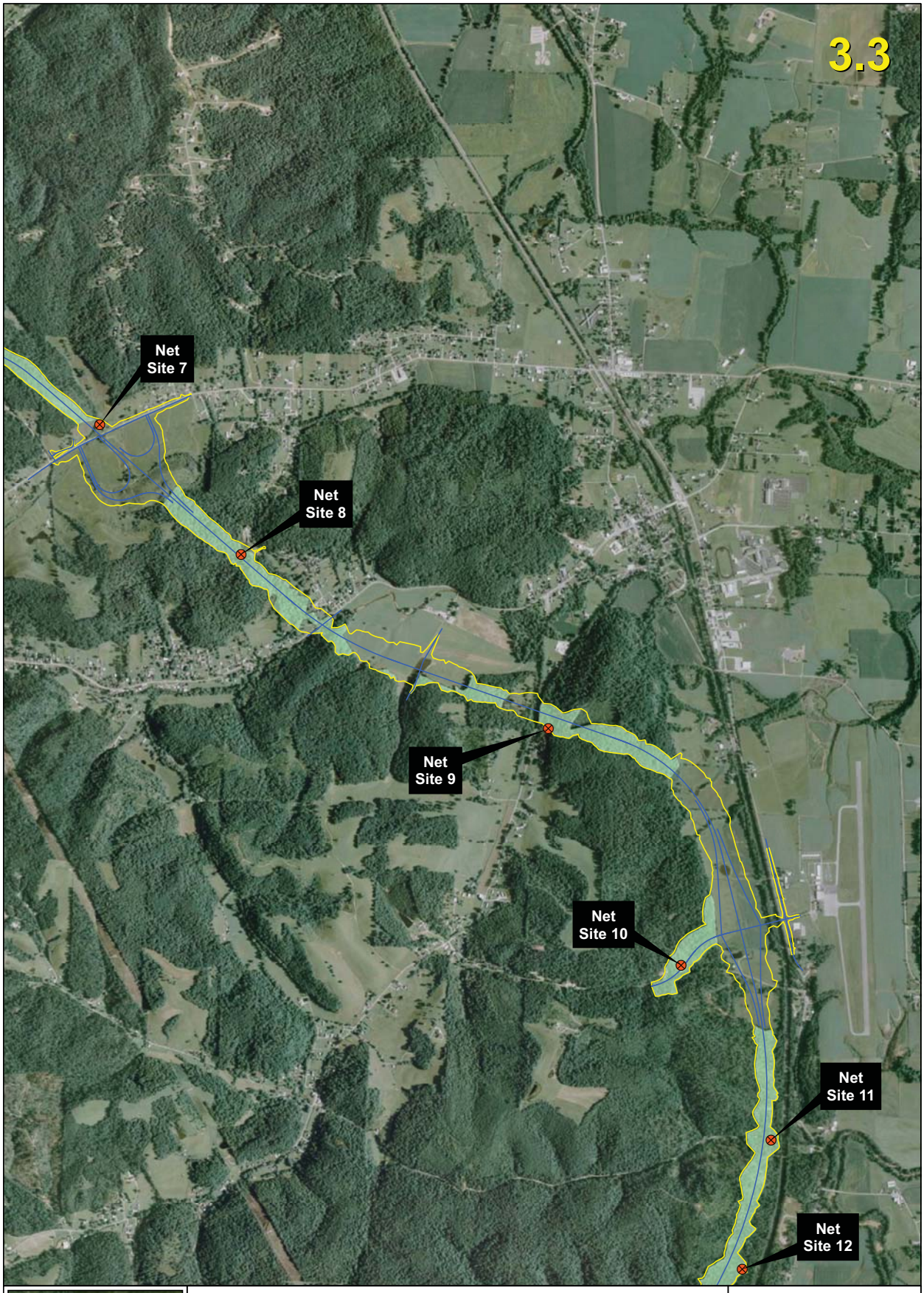

Figure 3.3.
Site Map showing Forested Areas and Net Sites within Construction Limits.
SCI - 823 - 0.00/6.81
Portsmouth Bypass Project (PID 19415).

Net Site
Centerline
Forested Areas
Construction Limits

1,400 700 0 1,400 Feet

400 200 0 400 Meters

Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet

Aerial imagery courtesy of NAIP 2009.

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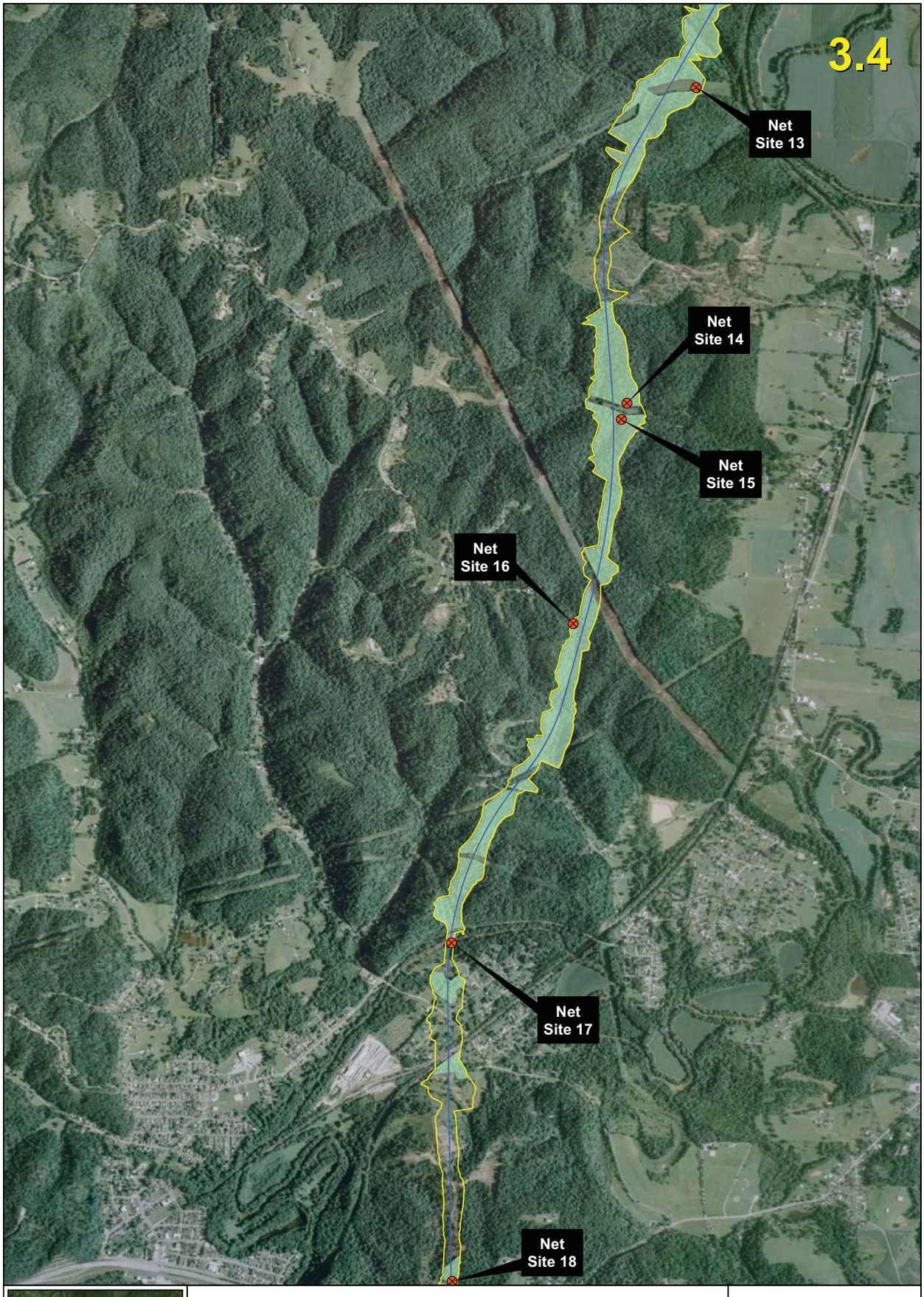

Figure 3.4.
Site Map showing Forested Areas and Net Sites within Construction Limits.
SCI - 823 - 0.00/6.81
Portsmouth Bypass Project (PID 19415).

Net Site
Centerline
Forested Areas
Construction Limits

1,400 700 0 1,400 Feet

400 200 0 400 Meters

Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet

Aerial imagery courtesy of NAIP 2009.

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Figure 3.5.
Site Map showing Forested Areas and Net Sites within Construction Limits.
SCI - 823 - 0.00/6.81
Portsmouth Bypass Project (PID 19415).

Net Site
Centerline
Forested Areas
Construction Limits

1,400 700 0 1,400 Feet

400 200 0 400 Meters

Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet

Aerial imagery courtesy of NAIP 2009.

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Appendix B: Reference Bat Species Photographs

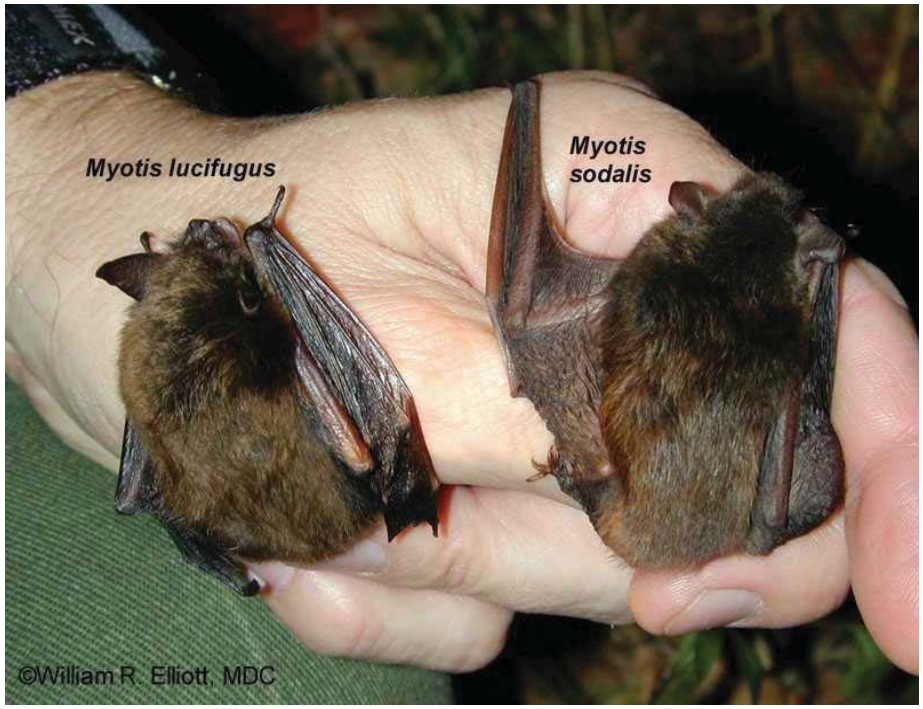

Photo 1: Comparison of Little Brown (*M. lucifugus)* to Indiana Bat (*M. sodalis*).

Photo 2: Keeled calcar and short toe hairs of the Indiana bat.

Photo 3: Indiana Bat showing pink lips, keeled calcar, and dull pelage.

Photo 4: Little Brown bat showing dark lips and bronze pelage.

Photo 5: Northern Long-eared bat (*M. septentrionalis)* showing long ear tragus.

Photo 6: Hoary bat (*Lasiurus cinereus)*.

Photo 7: Silver-haired bat (*Lasionycteris noctivagans)*.

Photo 8: Eastern Red bat (*Lasiurus borealis)*.

Photo 9: Big Brown bat (*Eptesicus fuscus).*

Photo 10: Tri-colored bat (*Pipistrellus subflavus).*

Photo 11: Evening Bat (*Nycticeius humeralis*).

Photo 12: Rafinesque's Big-eared Bat (*Corynorhinus rafinesquii*).

Photo 13: Eastern Small-Footed Bat (*Myotis leibii*).

Photo 14: Bat in Mist-net.

Appendix C:
Site Specific Authorization and Approval

Jamie Willaman

From: Karen_Hallberg@fws.gov
Sent: Monday, July 18, 2011 2:32 PM
To: Jamie Willaman
Cc: garylibby@windstream.net; Angela_Boyer@fws.gov; Mike.Pettegrew@dot.state.oh.us
Subject: Re: Revised Portsmouth Scope
Attachments: pic08723.gif; WNSDecontaminationProtocol_January 25 2011.pdf

Jamie,

Please distribute this email to Michelle Malcosky and Michael Whitby, as I do not have their email addresses.

thanks,
Karen

Dear Mr. Libby, Ms. Malcosky, and Mr. Whitby,

This is in response to your request for an amendment to your Federal Fish and Wildlife Permits (Nos. TE156392-1, TE08603A-0, and TE02560A-0) to conduct a 2011 mist net survey for the Indiana bat (*Myotis sodalis*) at the proposed Portsmouth Bypass (SCI-823-0.00/6.81, PID 19415) project site in Scioto County, Ohio.

This notification serves as written concurrence that Gary Libby, Michelle Malcosky, and Michael Whitby are authorized to proceed with the Indiana bat survey as described in the request. Upon completion of the survey, we request that you submit an electronic copy of the survey results to this office for review. Please include the latitude and longitude coordinates for each survey site in the report. If any Indiana bats are found during the survey, please notify this office within 48 hours.

Due to concerns over White-nose Syndrome, **we are requiring that the White-nose Syndrome Decontamination Protocol be followed for all bat survey work conducted in Ohio.** Please be advised that the current protocol (attached) is subject to revision. Please visit the following link prior to conducting the survey to ensure the most current protocol is being followed.
http://www.fws.gov/midwest/endangered/mammals/BatDisinfectionProtocol.html

(See attached file: WNSDecontaminationProtocol_January 25 2011.pdf)

We request that all Indiana bats be banded utilizing the Ohio Department of Natural Resources, Division of Wildlife (DOW) bands. Please contact Jennifer Norris (DOW) to request bands @ (740) 747-2525, ext. 26.

Please carry a copy of this site specific authorization and your Federal permit while conducting the survey. Please contact me if you have questions, or we may be of further assistance in this matter.

Sincerely,
Karen Hallberg

Karen I. Hallberg
Fish and Wildlife Biologist (Transportation Liaison)

U.S. Fish & Wildlife Service
4625 Morse Road, Suite 104
Columbus, OH 43230
Phone: (614) 416-8993 ext. 23
FAX: (614) 416-8994
Jamie Willaman <jwillaman@enviroscienceinc.com>

Jamie Willaman
<jwillaman@enviroscienceinc.com>

07/18/2011 11:43 AM

To"Karen_Hallberg@fws.gov"
<Karen_Hallberg@fws.gov>

cc

SubjectRevised Portsmouth Scope

Karen,

Attached is the revised scope as we discussed. The main difference is additional permited biologists and the statement that only one net site will be surveyed per permitted biologist per night (Page 3; paragragh 2). Please cal me with any questions and thank you for your assistance.

Sincerely,

Jamie Willaman
EnviroScience Inc.
412-310-2614[attachment "Rev_Portsmouth_Scope.pdf" deleted by Karen Hallberg/R3/FWS/DOI]

INDIANA BAT MIST NET SURVEY
STUDY PROPOSAL

Presented to:

ODOT Office of Environmental Services
1980 West Broad Street-3rd Floor
Columbus, OH 43223

for

SCI-823-0.00/6.81 (PID 19145)
Scioto County, Ohio

Project # 637-3880

Prepared by:

EnviroScience, Inc., 3781 Darrow Road, Stow, Ohio 44224
(800) 940-4025 - 330-688-0111 - FAX: 330-688-5838
enviroscienceinc.com

15 July 2011

Survey Scope

In order to assess the presence of Indiana bats within the Portsmouth Bypass (SCI-823-0.00/6.81, PID 19415) proposed corridor (corridor), EnviroScience (ES) proposes the following study plan for conducting mist net surveys on the areas of the property identified as potential habitat of the federally endangered *Myotis sodalis* (Indiana Bat). EnviroScience strictly adheres to the protocol and requirements of the U.S. Fish and Wildlife Service (USFWS) for such surveys.

Initial Site Research

EnviroScience GIS Analysts attained mapping of the corridor from ODOT and aerial imagery from NAIP 2009 in order to determine the amount of forested area that occurs on the site. In total the proposed corridor is 26.28 kilometers (km) in length. ES found that **18.64 km** (595.04 acres) is currently forested, see attached Figure 1. Areas found to be forested on the aerial imagery were assessed for accuracy in the field.

Additionally, ODOT requested a review of the ODNR Ohio Biodiversity Database records in order to assess the existence of known or suspected habitat for the Indiana Bat on the site. The ODNR places the corridor within 10 miles of a known or suspected hibernacula see attached Figure 2. The proposed corridor does not fall within 5 miles of any summer capture records of the Indiana bat.

Site Reconnaissance

On May 23rd through 27th ES biologists conducted a site visit of the proposed corridor to determine potential mist net sites in accordance with the USFWS protocol for site identification. This involved driving and walking the corridor and identification of areas that contain good potential travel corridors for the Indiana Bat, such as streams, logging roads, trails, and other corridors with closed canopies that will funnel bats to perpendicularly set nets. Particular attention was given to sites that offered additional habitat features, such as streams or ponds as water sources, wetlands or ephemeral puddles that may produce emerging insects, and live or dead trees that could serve as summer roosts. Identified areas were photographed and recorded on GPS. In total ES identified 19 net sites possessing the characteristics stated above. Figure 3, attached, shows the location of each of the identified net sites. Table 1, attached, outlines the details of each net site including coordinate location, the vegetation, key habitat features, and how the site is accessed. Photographs of each identified net site are also attached.

Additionally, at the time of site visit, ES searched for any caves or mine portals that may occur on the corridor, in order to identify any potential winter hibernacula that may be affected by the project. No such areas were identified on available secondary resource mapping or identified in the field.

Survey Protocol

In order to investigate the site for the presence/absence of the endangered Indiana Bat, EnviroScience proposes 19 net sites (with two net locations each, surveyed for two nights each; 76 net nights). The net sites proposed are detailed on attached Figure 3, Table 1, and Site Photographs.

Surveying will be conducted by Gary Libby (Federal Permit # TE156392-1, attached), Michelle Malcosky (Federal Permit # TE08603A-0, attached), Michael Whitby (Federal Permit # TE02560A-0, attached) and assisted by qualified bat ecologists. No more than one net site will be monitored by each permitted biologist each night of the survey.

The survey will be done in July to August of 2011, on nights with temperatures exceeding 50°F, little to no precipitation, low moonlight, and low winds. Each net site will be surveyed for two consecutive nights and will be checked every ten minutes for captured bats during the 5-6 hour survey period.

All current USFWS protocols to prevent the spread of White Nose Syndrome will be strictly observed.

A total of 38 mist net sets will be placed at 38 net locations (19 net sites). Each mist net set will consist of one to three 38 mm mesh, 75 denier, 2 ply black polyester 2.6 to 7.8 meters (4 to 12 shelves) high by 2.6 to 18 meters wide from Avinet, Inc., Dryden, New York and will be placed so that they completely span the corridor openings. All equipment and decontamination materials will be removed from the net sites at the end of each two day survey period.

All captured bats will be identified to species, weighed, measured, assessed for age, sex, and reproductive status, banded with approved arm bands, photographed, and released within 30 minutes of capture. Any captured Indiana bats will be fitted with a radio transmitter, as required by the USFWS, and tracked to a diurnal roost. Tracking of the radio tagged individual will continue for five days or until the radio device falls off or ceases functions. Upon capture of any Indiana Bat ODOT and the USFWS will be notified immediately.

All survey findings will be summarized in a report that will include a final map of the location of each net site, the conditions which exist during each survey night, the methods and staff utilized at the survey, the amount, species, size, condition, capture location, band number, and photographs of captured individuals, and a discussion of the findings.

Please review the above study plan and contact me at your earliest convenience with any questions, comments, or concerns you may have. I can be reached via email at jwillaman@envirosciencinc.com or at (412) 310-2614 or. Thank you for your attention to this matter.

Attachments

Figures
Figure 1. Forested Areas within Corridor Map
Figure 2. ODNR Bat Records Map
Figure 3. Proposed Net Sites

Tables
Table 1. Proposed Net Site Details

Net Site Photographs

Gary Libby, Michelle Malcosky, and Michael Whitby USFWS Federal Permits

Figures

Figure 1.1.
Site Map showing Forested Areas and Net Sites within Construction Limits.
SCI - 823 - 0.00/6.81
Portsmouth Bypass Project (PID 19415).

Centerline
Construction Limits
Forested Areas

1,400 700 0 1,400 Feet

400 200 0 400 Meters

Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet

Aerial imagery courtesy of NAIP 2009.

"Excellence in Ecological Monitoring"

ES ENVIRO SCIENCE INCORPORATED

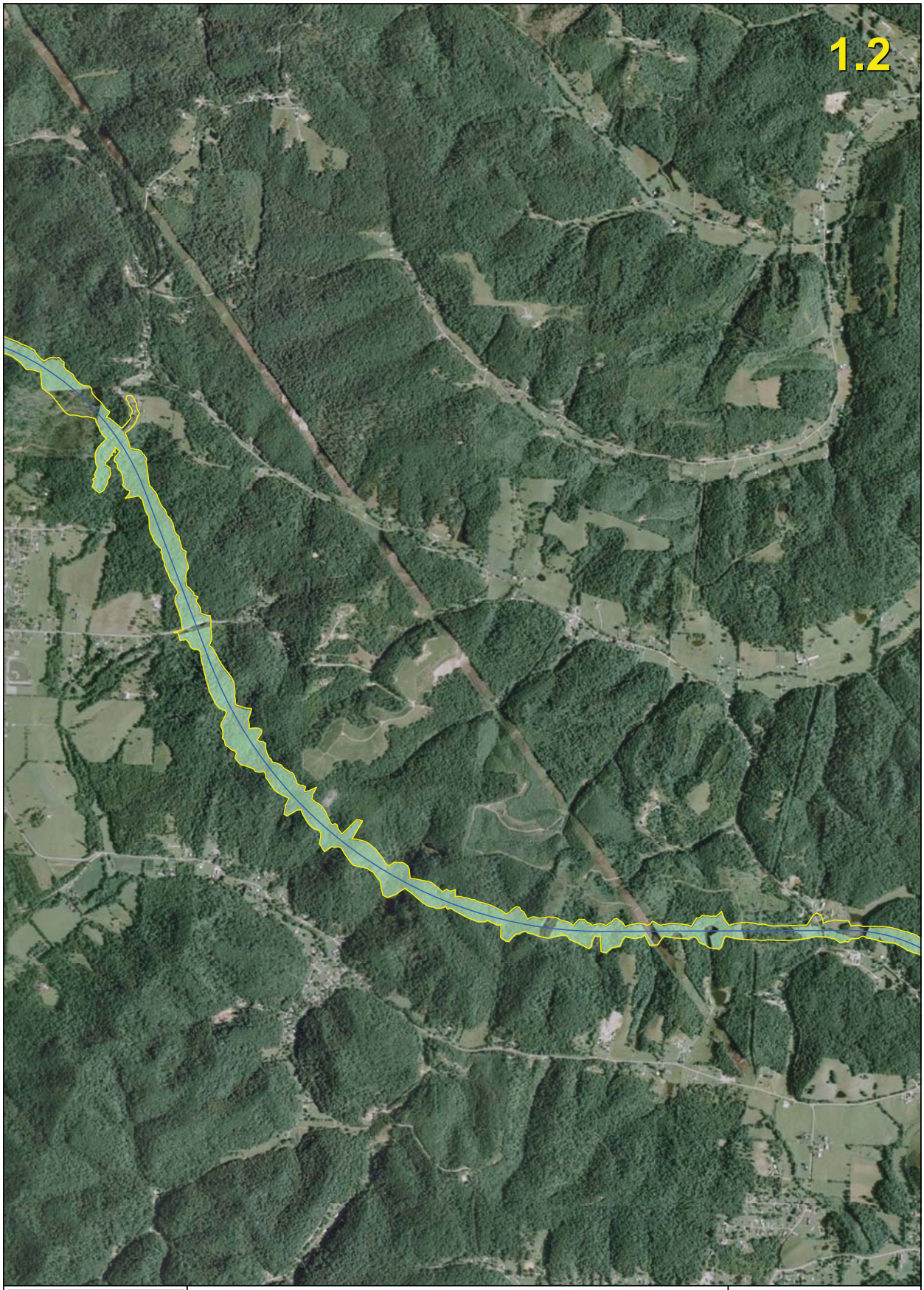

Figure 1.2.
Site Map showing Forested Areas and Net Sites within Construction Limits.
SCI - 823 - 0.00/6.81
Portsmouth Bypass Project (PID 19415).

Centerline
Construction Limits
Forested Areas

1,400 700 0 1,400 Feet

400 200 0 400 Meters

Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet

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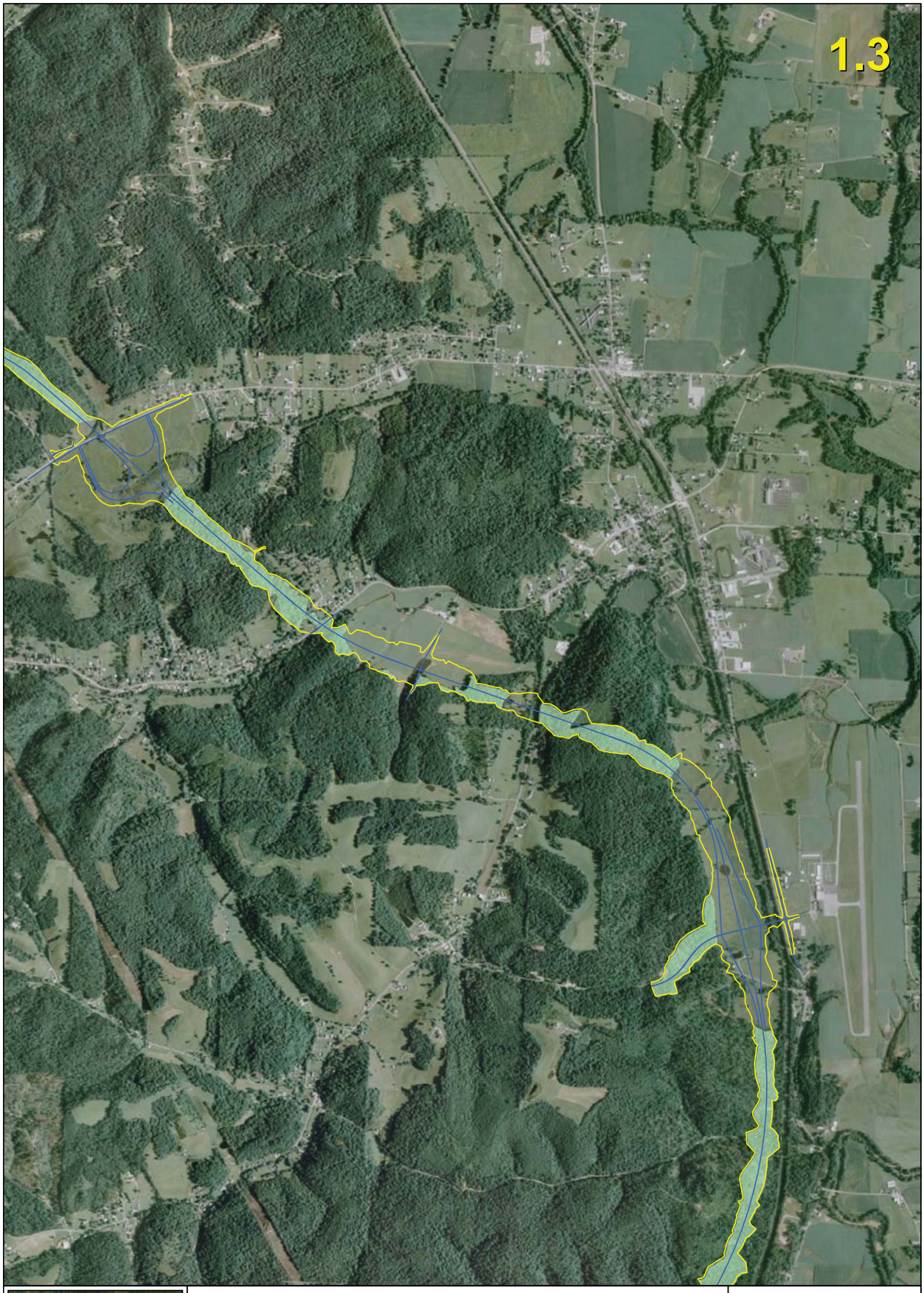

Figure 1.3.
Site Map showing Forested Areas and Net Sites within Construction Limits.
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Centerline
Construction Limits
Forested Areas

1,400 700 0 1,400 Feet

400 200 0 400 Meters

Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet

Aerial imagery courtesy of NAIP 2009.

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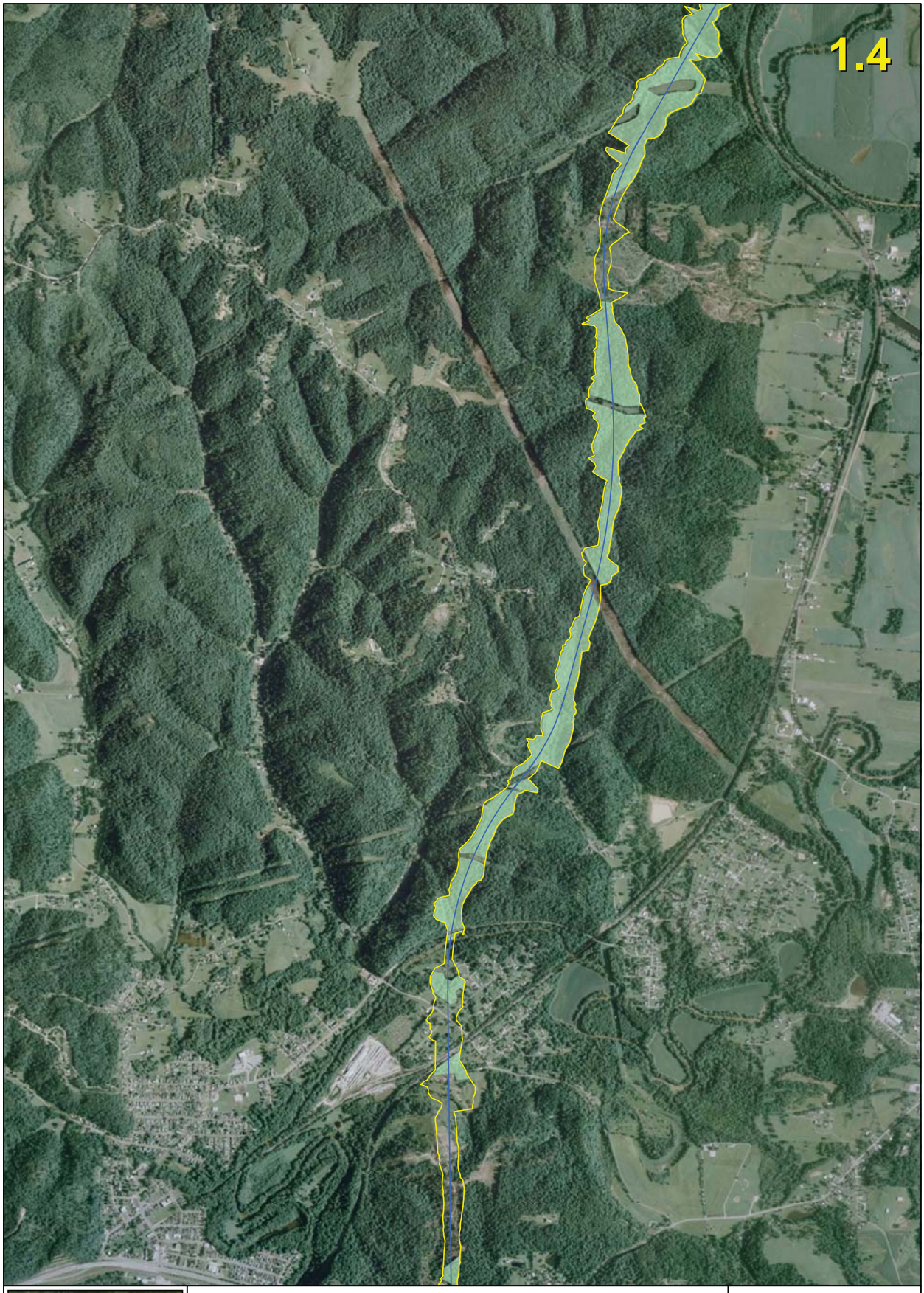

Figure 1.4.
Site Map showing Forested Areas and Net Sites within Construction Limits.
SCI - 823 - 0.00/6.81
Portsmouth Bypass Project (PID 19415).

Centerline
Construction Limits
Forested Areas

1,400 700 0 1,400 Feet

400 200 0 400 Meters

Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet

Aerial imagery courtesy of NAIP 2009.

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Figure 1.5.
Site Map showing Forested Areas and Net Sites within Construction Limits.
SCI - 823 - 0.00/6.81
Portsmouth Bypass Project (PID 19415).

Centerline
Construction Limits
Forested Areas

1,400 700 0 1,400 Feet

400 200 0 400 Meters

Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet

Aerial imagery courtesy of NAIP 2009.

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Figure 2. Ohio Biodiversity Database Indiana Bat Records Map.

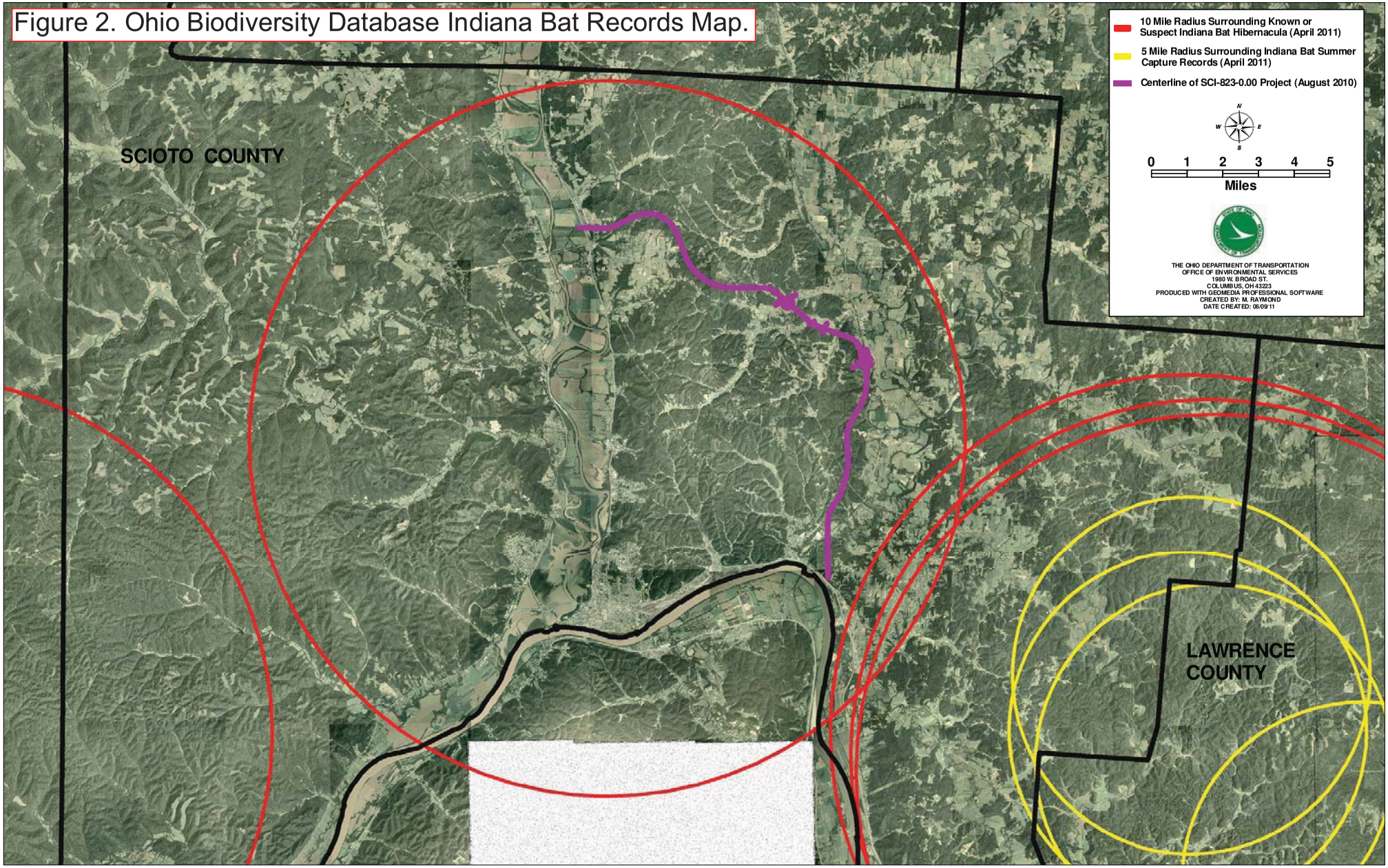

Figure 3.1.
Site Map showing Forested Areas and Net Sites within Construction Limits.
SCI - 823 - 0.00/6.81
Portsmouth Bypass Project (PID 19415).

Net Site
Centerline
Forested Areas
Construction Limits

1,400 700 0 1,400 Feet

400 200 0 400 Meters

Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet

Aerial imagery courtesy of NAIP 2009.

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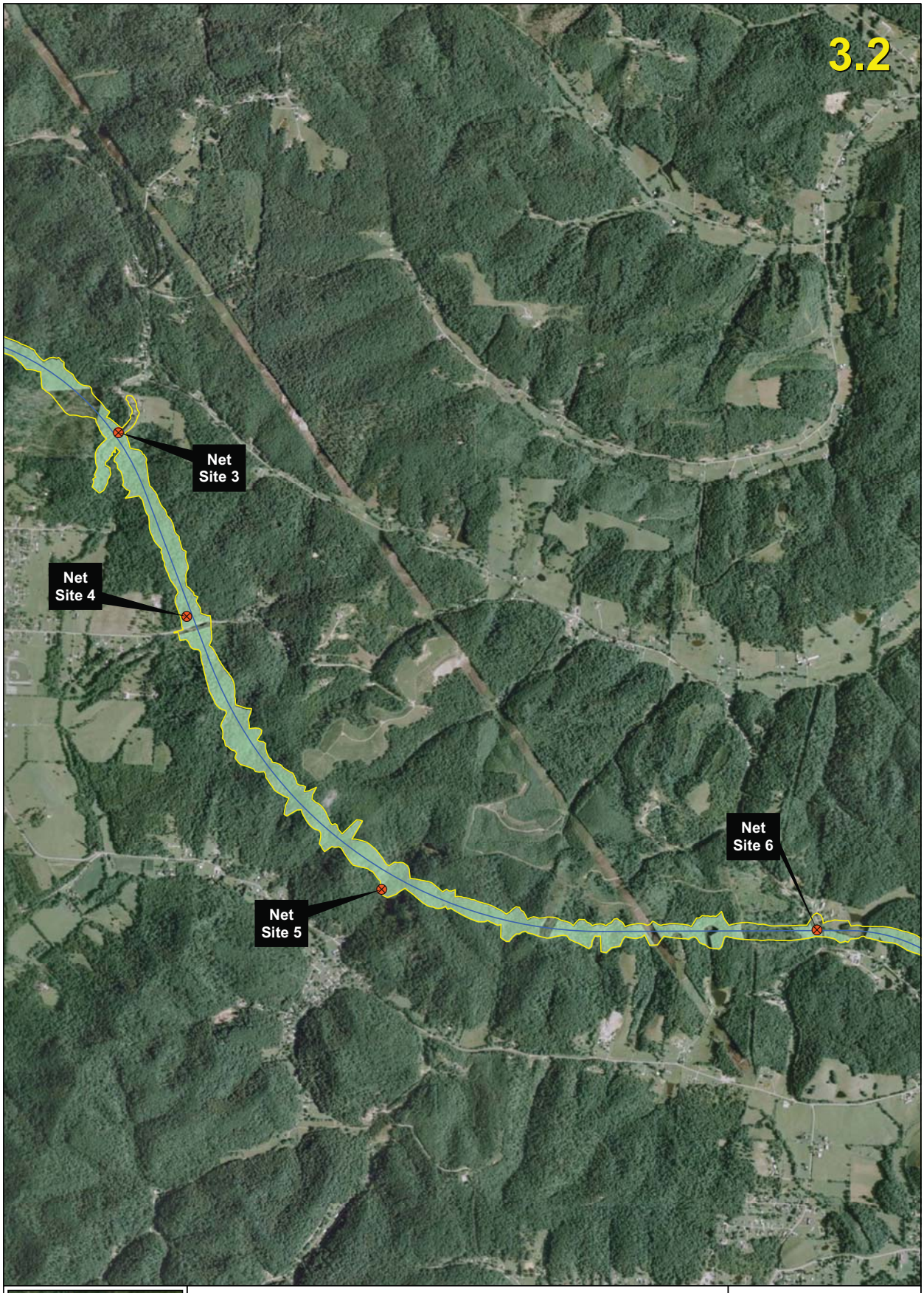

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Net Site
Centerline
Forested Areas
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1,400 700 0 1,400 Feet

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Aerial imagery courtesy of NAIP 2009.

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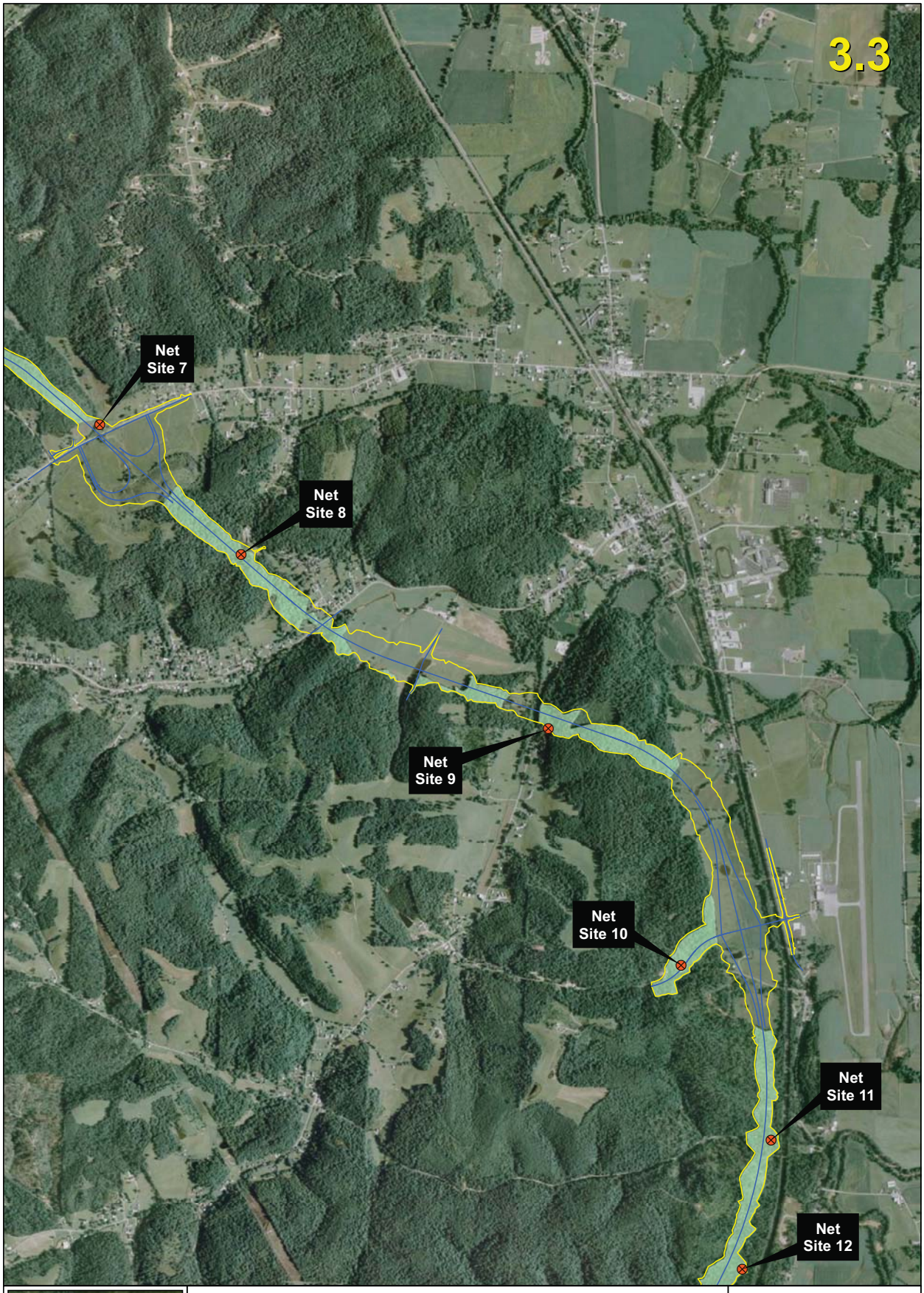

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Centerline
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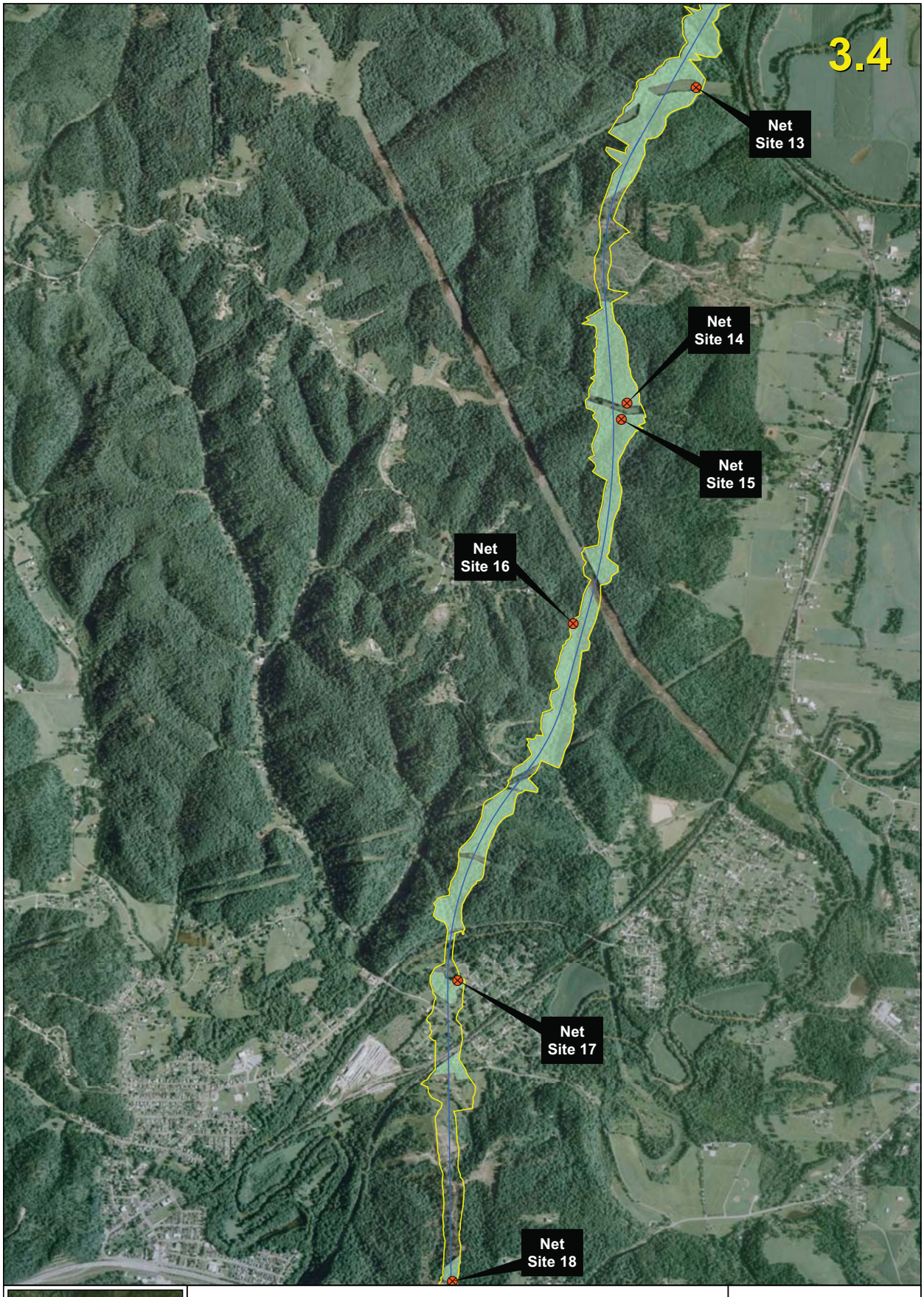

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Net Site
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Portsmouth Bypass Project (PID 19415).

Net Site
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Construction Limits

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Tables

Table 1. Description of Proposed Netting Sites for the ODOT SCI-823-0.00/6.81 (PID 19145), Scioto County, Ohio Indiana Bat Mist Net Survey.

Site #	Location	Picture #	Vegetation	Features	Access
1	-82.99718404W, 38.891956N	1-3	Second growth forest with no understory and thick herbaceous layer; shagbark hickories, black cherry, silver maple.	Closed canopy openings from continuous forest to agricultural field and roadway. Many shagbark hickories in forest area adjacent to openings.	East from Fairgrounds Road
2	-82.97291550W, 38.896737N	4-5	Second growth forest with medial understory, green ash, sugar maple, and white oak.	Closed canopy old road intersects intermittent stream within forest.	Northeast from bend on Kinstler Road
3	-82.95347439W, 38.892884N	6-7	Second growth forest with thick understory; black locust, sugar maple, tuliptree.	Branching old road corridor with partial closed canopy in upland area parallel to roadway leading from forest to agricultural/ residential area.	Northwest parallel to Rose Hill Road
4	-82.94905988W, 38.883696N	8-10	Second growth forest with medial understory, white ash, sugar maple, and shagbark hickory.	Old road corridor with closed canopy leading from forest to roadway with intermittent stream running parallel; shagbark hickories and standing dead adjacent to corridor.	North of Morris Lane
5	-82.93654426W, 38.870109N	11-13	Second growth forest with medial understory, green ash, sugar maple, and black locust. Partially select cut.	Wide timber road corridor with partial clearing and several closed canopy areas; road intersects intermittent stream and has many standing dead.	Timber road extending north from 1249 Lucasville Minford Road
6	-82.90875784W, 38.868183N	14-16	Second growth forest with medial understory, tuliptree, sugar maple, and black locust. Small emergent wetland areas in roadbed.	Old road corridor with closed canopy from forest to abandoned structure with slight guano. Many small wetlands developed in tire ruts, some small open water.	Old road extending southwest from 679 Blues Run Road
7	-82.89599503W, 38.863968N	17-18	Old field with wide second growth forest row surrounding stream to the west and pine stand to the east leading to agricultural field.	Funnel between farm field and old field to stream water source. Closed canopy openings in tree lines.	Small turn-off at 4139 Lucasville Minford Road
8	-82.88693079W, 38.857525N	19-21	Second growth forest with medial understory, sugar maple, white oak, and black locust.	ATV path runs parallel to stream corridor from residential yard into closed canopy forest. Some small wetlands areas adjacent to intermittent stream.	Southwest of driveway at 319 Oliver Road
9	-82.86728733W, 38.848867N	22-24	Second growth forest with sparse understory, white oak, sycamore, and silver maple. Sparse emergent wetland depressions.	Valley closed canopy stream corridor from forest to road. Several small wetlands, a few standing dead, and adjacent to abandoned garage with guano.	North of 6050 Swauger Valley Road
10	-82.85875392W, 38.837084N	25-27	Emergent wetland with second growth forest surrounding; black locust sycamore, sugar maple, and standing dead elm.	Central open wetland with several closed canopy ATV and old road corridors leading to wetland from forest. Several standing dead.	At 850 Shumway Hollow Road, north of roadway
11	-82.85297203W, 38.828371N	28-30	Second growth forest with medial understory; red maple, white oak, sycamore.	Closed canopy abandoned roadway with stream in center and ATV closed canopy paths stemming from it. A few standing dead.	West from SR 335 on Blake Hollow Road, under RR tunnel
12	-82.85478723W, 38.821908N	31-33	Second growth forest with medial understory; sycamore, silver maple, tuliptree, and some standing dead. Open water pond adjacent.	Closed Canopy old road corridor with several standing dead and a pond in the valley adjacent to corridor.	West under RR tunnel at 6117 SR 335

Table 1. Description of Proposed Netting Sites for the ODOT SCI-823-0.00/6.81 (PID 19145), Scioto County, Ohio Indiana Bat Mist Net Survey.

Site #	Location	Picture #	Vegetation	Features	Access
13	-82.85763338W, 38.816956N	34-36	Second growth forest with medial understory extends into a tree row between agricultural fields; silver maple, sycamore, white oak.	Closed canopy old road opens into open fields. In forest road intersects wide intermittent stream corridor. A few standing dead.	Old road under RR tunnel across from 5400 SR 335
14	-82.86196386W, 38.801159N	37-39	Mature forest with thick understory; silver maple, sycamore, box elder, standing dead elm.	Closed canopy intermittent stream corridor with low, wide emergent banks leading through forest to the main stream corridor.	Access road west of 4155 Stewart Ave off Coriell Road
15	-82.86230691W, 38.800329N	40-42	Mature forest with medial understory; silver maple, sycamore, box elder, standing dead elm. Adjacent to agricultural field.	Very wide perennial stream corridor with a closed canopy and several openings/ funnels to and from an agricultural field.	Access road west of 4155 Stewart Ave off Coriell Road
16	-82.86533255W, 38.790128N	43-45	Second growth forest with thick shrub understory; sugar maple, tuliptree, and many standing dead with sun exposure.	ATV path though thick understory woods; mainly closed canopy corridor; abandoned old home structure with faint guano and standing dead.	East of driveway at end of Hunts Point Lane
17	-82.87259463W, 38.772265N	46-48	Second growth forest with sparse understory; seep wetland on slope and intermittent stream.	Forested stream valley adjacent to residential housing, forest has two openings/ funnels in stream corridor. A seep wetland occurs on the slope adjacent to stream.	Southwest of the cul-de-sac at the end of Highland Avenue
18	-82.87284931W, 38.757229N	49-51	Mature deciduous and pine forest with medial understory; sugar maple, white oak, white ash.	Closed canopy old road runs parallel with intermittent stream and eventually intersects. Many puddles in roadway.	North of Poplar Drive
19	-82.87401466W, 38.755406N	52-54	Mature deciduous and pine forest with medial understory; sugar maple, white oak, white pine.	Old road with closed canopy leads to created wetland with open water, then roads continues into forest northwest.	North of Hartladge Drive

Net Site Photographs

Photographs 1 and 2. Net Site 1 showing closed canopy exit from woods to agricultural field and Fairgrounds Road.

Photograph 3. Net Site 1 Shagbark Hickories.

Photograph 4. Net Site 2 closed canopy road corridor crosses stream.

Photograph 5. Net Site 2 stream corridor.

Photograph 6. Net Site 3 upland old road parallel to Rose Hill Road.

Photograph 7. Net Site 3 upland closed canopy to Rose Hill Road.

Photograph 8. Net Site 4 corridor with puddles from Morrison Road.

Photograph 9. Net Site 4 corridor with puddles to Morrison Road.

Photograph 10. Net Site 4 Shagbark Hickories adjacent to corridor.

Photograph 11. Net Site 5 logging road with standing dead in sun.

Photograph 12. Net Site 5 corridor to driveway of Lucasville-Minford Road.

Photograph 13. Net Site 5 logging road intersects stream.

Photograph 14. Net Site 6 corridor to Blue Run Road.

Photograph 15. Net Site 6 corridor from Blue Run Road.

Photograph 16. Net Site 6 small wetlands through corridor.

Photograph 17. Net Site 7 stream corridor.

Photograph 18. Net Site 7 corridor funnel between fields.

Photograph 19. Net Site 8 closed canopy corridor from Oliver Road.

Photograph 20. Net Site 8 closed canopy corridor to Oliver Road.

Photograph 21. Net Site 8 stream within corridor.

Photograph 22. Net Site 9 valley corridor between stream and slope.

Photograph 23. Net Site 9 stream in corridor.

Photograph 24. Net Site 9 old garage adjacent to corridor with guano.

Photographs 25 and 26. Net Site 10 old road and ATV trails to central open wetland off Shumway Hollow Road.

Photograph 27. Net Site 10 Central wetland with standing dead.

Photograph 28. Net Site 11 abandoned Blake Hollow Road corridor.

Photograph 29. Net Site 11 stream corridor next to Blake Hollow Road.

Photograph 30. Net Site 11 ATV trail off Blake Hollow to stream.

Photograph 31. Net Site 12 rail road maintenance road to SR 335.

Photograph 32. Net Site 12 rail road maintenance road from SR 335.

Photograph 33. Net Site 12 pond adjacent to corridor.

Photograph 34. Net Site 13 old road corridor intersects stream.

Photograph 35. Net Site 13 road becomes closed canopy.

Photograph 36. Net Site 13 stream corridor next to road.

Photograph 37. Net Site 14 closed canopy stream and ATV corridor.

Photograph 38. Net Site 14 stream corridor.

Photograph 39. Net Site 14 corridor stream intersects main creek.

Photograph 40. Net Site 15 low wide creek with closed canopy.

Photograph 41. Net Site 15 funnel from field to stream corridor.

Photograph 42. Net Site 15 stream closed canopy corridor.

Photograph 43. Net Site 16 closed canopy ATV trail.

Photograph 44. Net Site 16 standing dead adjacent to corridor.

Photograph 45. Net Site 16 abandoned structure adjacent to corridor.

Photograph 46. Net Site 17 entrance to stream corridor from residential area.

Photograph 47. Net Site 17 entrance to stream corridor.

Photograph 48. Net Site 17 stream corridor.

Photograph 49. Net Site 18 Stream intersects old road corridor.

Photograph 50. Net Site 18 puddles on old road corridor.

Photograph 51. Net Site 18 stream running adjacent to old road corridor.

Photograph 52. Net Site 19 upland corridor leading to wetland.

Photograph 53. Net Site 19 wetland at the end of upland corridor.

Photograph 54. Net Site 19 corridor leading to wetland.

USFWS Federal Permit

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

3-201
(1/97)

FEDERAL FISH AND WILDLIFE PERMIT

2. AUTHORITY-STATUTES
16 USC 1539(a)
16 USC 1533(d)

REGULATIONS
50 CFR 17.22
50 CFR 17.32
50 CFR 17.62 & 17.72
50 CFR 13

1. PERMITTEE

SKYBAX ECOLOGICAL SERVICES, LLC
107 VANWINKLE GROVE
BEREA, KY 40403
U.S.A.

3. NUMBER
TE156392-1 AMENDMENT

4. RENEWABLE
☐ YES
☐ NO

5. MAY COPY
☐ YES
☐ NO

6. EFFECTIVE
08/24/2010

7. EXPIRES
07/31/2012

8. NAME AND TITLE OF PRINCIPAL OFFICER *(If #1 is a business)*
GARY W. LIBBY
PRINCIPAL ECOLOGIST

9. TYPE OF PERMIT
NATIVE ENDANGERED & THREATENED SP. RECOVERY - E & T WILDLIFE; E & T PLANTS

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED
Alabama, Arkansas, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee Indiana, Ohio, Michigan, Minnesota, Illinois, Wisconsin, Iowa, Missouri, Puerto Rico, Virgin Islands Maryland, New Jersy, New York, Pennsylvania, Virginia, West Virginia, Rhode Island

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

C. CONTINUED: TRAINED ASSISTANTS NOT NAMED ON THIS PERMIT MAY WORK ON PERMITTED BAT ACTIVITIES UNDER THE DIRECT AND ON-SITE SUPERVISION OF THE INDIVIDUALS NAMED ABOVE. HOWEVER, TRAINED ASSISTANTS MAY NOT WORK INDEPENDENTLY AT A SITE. TRAINED ASSISTANTS ARE INDIVIDUALS WHO ARE CONSIDERED QUALIFIED BY THE PERMITTED BIOLOGIST(S) TO SELECT SAMPLING SITES, DEPLOY SAMPLING EQUIPMENT AND NETS, AND HANDLE BATS IN THE FIELD AS STATED IN CONDITION F, BELOW.

D. PERMITTEE IS AUTHORIZED TO TAKE (ACOUSTICAL MONITORING, ENTER HIBERNACULA OR MATERNITY ROOST CAVES, SALVAGE DEAD BATS, CAPTURE WITH MIST NETS OR HARP TRAPS, HANDLE, IDENTIFY, COLLECT HAIR SAMPLES, BAND, TRANSMITTER, LIGHT-TAG, WING-PUNCH, AND SELECTIVELY EUTHANIZE FOR WHITE NOSE SYNDROME TESTING) INDIANA BATS (MYOTIS SODALIS), GRAY BATS (MYOTIS GRISESCENS) AND VIRGINIA BIG-EARED BATS (CORYNORHINUS TOWNSENDII VIRGINIANUS) WHILE CONDUCTING PRESENCE/ABSENCE SURVEYS, STUDIES TO DOCUMENT HABITAT USE, AND POPULATION MONITORING, AS CONDITIONED BELOW.

1. FOR ALL ACTIVITIES CONSIDERED WITHIN THIS PERMIT, THE **DISINFECTION PROTOCOL FOR BAT FIELD STUDIES** SHALL BE FOLLOWED. YOU ARE REQUIRED TO USE THE MOST RECENT PROTOCOLS AVAILABLE. YOU SHALL CONTACT THE SERVICE'S OFFICE LISTED IN M., BELOW FOR A COPY OF THE PROTOCOL EACH YEAR AND TO DETERMINE IF ANY SITE SPECIFIC MODIFICATIONS ARE REQUIRED.

☒ ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS
REPORTS WILL BE PROVIDED TO THE U.S. FISH AND WILDLIFE SERVICE OFFICES APPEARING IN CONDITIONS L, M AND N OF THIS PERMIT. REPORTING CONTENT, FORMAT, SUFFICIENCY AND FREQUENCY ARE OUTLINED IN

ISSUED BY
Richard Warren

TITLE
Acting
CHIEF, PLANNING & PERMITTING, ECOLOGICAL SERVICES

DATE
08/24/2010

2. UPON DETERMINATION THAT ENDANGERED BATS ARE PRESENT, THE PERMITEE SHALL NOTIFY THE SERVICE FIELD OFFICE IN THE STATE IN WHICH THE SITE IS LOCATED AND THE CORRESPONDING REGIONAL OFFICE.

3. DEAD BATS MAY BE SALVAGED AND IDENTIFIED (INCLUDING PHOTOGRAPHIC DOCUMENTATION), AND SENT TO THE APPROPRIATE LAB FACILITES FOR THE PURPOSES OF EVALUATING IMPACTS FROM THE CAUSE OF DEATH (WHITE-NOSE SYNDROME, WIND ENERGY OPERATIONS, ETC.). ANY DISCOVERY OF FEDERALLY LISTED SPECIMENS SHALL BE REPORTED, WITHIN 48 HOURS OF DISCOVERY, TO THE USFWS FIELD SUPERVISOR IN THE STATE IN WHICH THE SALVAGE OCCURS. YOUR REPORT MUST BE IN WRITING AND MUST INCLUDE INFORMATION ON THE SPECIES, SEX, LOCATION, DATE, TIME, AND ANY OBSERVATIONS ON THE CONDITION OF THE SPECIMEN. SPECIMENS MUST BE CHILLED AND SURRENDERED TO THE OFFICE IN CONDITION M., BELOW, UNLESS OTHERWISE INSTRUCTED BY THAT OFFICE.

4. BATS MAY BE CAPTURED WITH MIST NETS AND HARP TRAPS. THE MONITORING INTERVAL FOR MIST NETS MAY NOT EXCEED 10 MINUTES. BATS MAY BE CAPTURED WITH HARP TRAPS ONLY WITH WRITTEN CONCURRENCE FROM THE FIELD SUPERVISOR IN THE STATE IN WHICH TRAPPING IS PROPOSED. HARP TRAPS MUST BE CONTINUALLY MONITORED. CAPTURED BATS MAY NOT BE HELD FOR MORE THAN 30 MINUTES, UNLESS INJURED. FOR ESA COMPLIANCE PROJECTS INVOLVING SURVEY WORK FOR THE INDIANA BAT IN KENTUCKY, INDIVIDUALS REFERENCED IN CONDITION C. ABOVE MUST FOLLOW THE INDIANA BAT SURVEY GUIDANCE ISSUED BY THE U.S. FISH AND WILDLIFE SERVICE, KENTUCKY FIELD OFFICE AND KENTUCKY DEPARTMENT OF FISH AND WILDLIFE RESOURCES (ATTACHED). FOR INDIANA BAT SURVEY WORK CONDUCTED IN KENTUCKY, THIS GUIDANCE SUPERCEDES OTHER CONDITIONS LISTED IN THIS PERMIT; THE GUIDANCE MUST BE CURRENT FOR THE YEAR IN WHICH THE SURVEY IS CONDUCTED/REQUIRED.

5. PERMITTEES MAY CARRY OUT NON-INTRUSIVE MEASUREMENTS ON CAPTURED BATS.

6. UNIQUELY NUMBERED, MODERN, LIPPED, CORRECTLY SIZED ALUMINUM BAT BANDS SHALL BE USED. SPLIT-RING, PLASTIC BANDS SHALL BE AVOIDED.

7. PRIOR TO CONDUCTING ACTIVITIES IN NORTH CAROLINA, LOUISIANA, ARKANSAS AND TENNESSEE (FOR TENNESSEE-ONLY WHEN ENTRY OF CAVES IS ANTICIPATED), WRITTEN APPROVAL SHALL BE RECEIVED FROM THE PERMIT COORDINATOR LISTED IN CONDITION N1., BELOW:

8. PRIOR TO CONDUCTING ACTIVITIES IN IOWA, MISSOURI, ILLINOIS, INDIANA, WISCONSIN, MICHIGAN, AND OHIO, WRITTEN APPROVAL SHALL BE RECEIVED FROM THE PERMIT COORDINATOR LISTED IN CONDITION N2., BELOW:

9. PRIOR TO CONDUCTING ACTIVITIES IN WEST VIRGINIA, MASSACHUSETTS, VERMONT, RHODE ISLAND, NEW HAMPSHIRE, AND VIRGINIA, WRITTEN APPROVAL SHALL BE RECEIVED FROM THE PERMITS COORDINATOR LISTED IN CONDITION N3., BELOW.

10. PRIOR TO CONDUCTING ACTIVITIES IN OKLAHOMA, WRITTEN APPROVAL SHALL BE RECEIVED FROM THE PERMITS COORDINATOR LISTED IN CONDITION N4., BELOW.

11. PRIOR TO CONDUCTING ACTIVITIES IN KANSAS, WRITTEN APPROVAL SHALL BE RECEIVED FROM THE PERMITS COORDINATOR LISTED IN CONDITION N5., BELOW.

12. COPIES OF ALL REQUEST AND APPROVAL LETTERS, WITH THE PERMIT NUMBER INCLUDED, SHALL BE FORWARDED TO THE PERMITS COORDINATOR LISTED IN CONDITION L., BELOW.

13. RADIO TRANSMITTERS (TOTAL PACKAGE WEIGHT NOT TO EXCEED 7.5 PERCENT (5 PERCENT RECOMMENDED) OF BODY WEIGHT OR 0.45 GRAM, WHICHEVER IS LESS) MAY BE ATTACHED TO BATS DURING THE SPRING, SUMMER, AND FALL ROOSTING PERIODS BY NONTOXIC SKIN BOND ADHESIVE. BATS CARRYING TRANSMITTERS SHOULD BE MONITORED DAILY FOR AT LEAST FIVE DAYS, OR UNTIL THE TRANSMITTER FALLS OFF, WHICHEVER OCCURS FIRST. RADIO TRANSMITTERS SHALL NOT BE PLACED ON NEWLY VOLANT JUVENILES WITHOUT PRIOR APPROVAL OF THE APPROPRIATE FIELD OFFICE.

14. SURVEYS OF GRAY BAT AND/OR VIRGINIA BIG-EARED BAT MATERNITY ROOSTS AND THEIR OTHER KNOWN SUMMER ROOST SITES SHALL BE CONDUCTED BY OBSERVING THE BATS WITH NIGHT VISION EQUIPMENT AND INFRARED LIGHT SOURCE AS THEY EMERGE FROM THEIR CAVES AND MINE ROOSTS. AT

SITES THAT ARE NOT CURRENTLY KNOWN TO SUPPORT THESE SPECIES THE ACCEPTED METHOD TO DETERMINE IF THEY ARE PRESENT IS TO CAREFULLY AND SLOWLY ENTER THE POTENTIAL ROOST SITE AND VISUALLY CHECK FOR EVIDENCE OF THE PRESENCE OF BATS, SUCH AS SIGNIFICANT QUANTITIES OF GUANO, A STRONG SMELL OF GUANO OR THE AUDIBLE SOUNDS PRODUCED BY BATS ROOSTING AT THE SITE. ONCE ANY OF THE INDICATORS ARE OBSERVED, SURVEY TEAM MEMBERS SHALL EXIT THE ROOST SITE AND MAKE FURTHER OBSERVATIONS FROM OUTSIDE THE ENTRANCE TO THE ROOST. ALL FURTHER OBSERVATIONS (WITH AQUOSTICS AND/OR NIGHT VISION EQUIPMENT AND A SUPPLEMENTAL INFRARED LIGHT SOURCE) SHALL BE MADE FROM THE CAVE OR MINE ENTRANCE DURING THE EVENING EMERGENCE. FOR CAVE ENTRY ACTIVITIES, WRITTEN APPROVAL IS REQUIRED FROM THE U.S. FISH AND WILDLIFE SERVICE FIELD SUPERVISOR FOR THE STATE IN WHICH THE ACTIVITIES ARE PROPOSED.

15. AT SOME SITES, ESPECIALLY ABANDONED MINES, IT IS NOT ADVISABLE TO ENTER A POTENTIAL ROOST BECAUSE OF THE PHYSICAL HAZARDS PRESENT IN THE SITE. ACOUSTICAL MONITORING, MIST NETS, OR HARP TRAPS MAY BE USED OUTSIDE THE ENTRANCE OF THESE SITES TO DETERMINE THE IDENTITY, SEX AND REPRODUCTIVE CONDITION OF BATS USING THE SITE. NETS AND HARP TRAPS SHALL BE CHECKED REGULARLY AND THE MONITORING INTERVAL FOR MIST NETS MAY NOT EXCEED 10 MINUTES. CAPTURED BATS SHALL NOT BE HELD FOR MORE THAN 30 MINUTES, UNLESS INJURED. DATA SHALL BE RECORDED FOR ALL BATS REMOVED FROM THE NET AND/OR TRAP. THESE DATA SHALL INCLUDE SPECIES, SEX, REPRODUCTIVE CONDITION, AND PHYSICAL MEASUREMENTS SUCH AS FOREARM LENGTH, FOOT LENGTH, PRESENCE/ABSENCE OF A KEEL ON THE CALCAR, ETC. BATS MAY BE PHOTOGRAPHED BEFORE RELEASE TO DOCUMENT THEIR PRESENCE AT THE ROOST SITE.

16. IF IT IS DETERMINED TO BE NECESSARY TO DOCUMENT REPRODUCTIVE LEVELS WITHIN A GRAY BAT OR VIRGINIA BIG-EARED BAT MATERNITY ROOST THE ROOST MAY BE ENTERED AFTER THE EVENING EMERGENCE OF ADULTS HAS BEEN COMPLETED. ENTRY SHALL BE LIMITED TO SMALLEST NUMBER OF PEOPLE THAT CAN SAFELY ACCOMPLISH THE SURVEY AND ALL SURVEY TEAM MEMBERS WILL EXIT THE ROOST SITE PRIOR TO THE RETURN OF ADULTS TO THE ROOST. THIS ACTIVITY REQUIRES WRITTEN APPROVAL FROM THE U.S. FISH AND WILDLIFE SERVICE FIELD SUPERVISOR FOR THE STATE IN WHICH ACTIVITIES ARE PROPOSED.

17. SURVEYS CONDUCTED DURING THE WINTER HIBERNATION SEASON SHALL FOLLOW THE GUIDELINES ESTABLISHED IN THE RECOVERY PLANS FOR THESE SPECIES. BATS MAY BE HANDLED DURING WINTER SURVEYS IN ORDER TO COLLECT BAND INFORMATION AND CONFIRM THE IDENTIFICATION OF LISTED SPECIES. DETAILED PHOTOGRAPHS MAY BE TAKEN TO DOCUMENT THE PRESENCE OF LISTED SPECIES. ONLY ONE TRIP TO THE HIBERNATION AREA OF EACH CAVE OR ABANDONED MINE IS AUTHORIZED DURING THE HIBERNATION SEASON. INDIANA BAT, GRAY BAT, AND VIRGINIA BIG-EARED BAT HIBERNATION SITES SHALL ONLY BE SURVEYED ONCE EVERY TWO YEARS. THIS ACTIVITY REQUIRES WRITTEN APPROVAL FROM THE U.S. FISH AND WILDLIFE SERVICE FIELD SUPERVISOR FOR THE STATE IN WHICH ACTIVITIES ARE PROPOSED.

18. WHEN CONDUCTING INDIANA BAT SURVEYS, THE CURRENT MINIMUM SURVEY GUIDANCE CONTAINED IN THE 2007 DRAFT INDIANA BAT RECOVERY PLAN SHALL BE FOLLOWED; HOWEVER, THE PERMITTEE MUST ADHERE TO ANY ADDITIONAL, SPECIFIC GUIDANCE DEVELOPED FOR THE STATE IN WHICH THEIR PROJECT IS LOCATED. DEVIATION FROM THESE GUIDELINES IS NOT AUTHORIZED VIA THIS PERMIT AUTHORIZATION. HOWEVER, IT IS ENCOURAGED THAT ECHOLOCATION DETECTION EQUIPMENT BE USED TO SUPPLEMENT THE INFORMATION GAINED DURING MIST NET SURVEYS. AT THIS TIME ECHOLOCATION DETECTION CAN NOT BE USED TO POSITIVELY IDENTIFY ALL SPECIES OF BATS THAT MAY BE ENCOUNTERED DURING SUMMER SURVEYS AND THEREFORE IT CAN NOT BE USED TO POSITIVELY ESTABLISH PRESENCE WITHIN THE SURVEY AREA. NO TRAPPING ACTIVITIES SHALL OCCUR WITHIN 20 METERS OF AN INDIANA BAT MATERNITY ROOST SITE, UNLESS PERMITTEE RECEIVES WRITTEN APPROVAL FROM THE U.S. FISH AND WILDLIFE SERVICE FIELD SUPERVISOR FOR THE STATE IN WHICH ACTIVITIES ARE PROPOSED.

19. FECAL MATERIAL MAY BE COLLECTED AFTER A BAT IS CAPTURED BY PLACING IT IN A CLOTH BAG FOR A SHORT TIME (NOT TO EXCEED 30 MINUTES) BEFORE IT IS CAREFULLY EXAMINED AND KEY PHYSICAL CHARACTERS DOCUMENTED. FECAL MATERIAL CAN THEN BE REMOVED FROM THE BAG OR COLLECTED OFF THE FUR OF THE BAT.

20. LIGHT TAGS MAY BE ATTACHED TO THE DORSAL FUR OF A BAT WITH A NONTOXIC ADHESIVE THAT WILL QUICKLY DEGRADE AND LOOSE ITS ADHESIVE QUALITIES. THE SMALLEST AND LIGHTEST CYALUME CAPSULES THAT WILL MEET THE PROJECT OBJECTIVES SHALL BE USED.

21. WING PUNCHES MAY BE TAKEN IN SPRING/SUMMER BY PUNCHING A HOLE IN THE WING MEMBRANE, AVOIDING BONES AND MAJOR BLOOD VESSELS. A SEPARATE BIOPSY TOOL MUST BE USED FOR EACH INDIVIDUAL LISTED BAT.

22. UNDER THE FOLLOWING SPECIFIC CONDITIONS RELATED TO WHITE-NOSE SYNDROME, LISTED BATS MAY BE EUTHANIZED: (A) THE SITE OF COLLECTION HAS NOT BEEN PREVIOUSLY DEMONSTRATED TO CONTAIN WNS-INFECTION OR WNS-INFECTED BATS (LISTED AND/OR NON-LISTED), (B) NO OTHER NON-LISTED BATS ARE PRESENT THAT ALSO SHOW SYMPTOMS OF WNS, AND (C) NO OTHER METHOD OF WNS SAMPLE COLLECTION IS POSSIBLE. IN ADDITION, ONLY ONE LISTED BAT OF ANY SPECIES WILL BE COLLECTED AT A SINGLE ROOST SITE AND ONLY IF CRITERIA (A), (B), AND (C) ARE MET AND THOSE CIRCUMSTANCES DOCUMENTED BY THE PERMITTEE IN WRITING TO THE SERVICE.

    WHEN MORE THAN ONE LISTED BAT SPECIES IS PRESENT WITHIN A SITE AND SHOWING SYMPTOMS OF WNS, THE FOLLOWING ORDER SHOULD BE USED IN SELECTING WHICH INDIVIDUAL TO SELECTIVELY EUTHANIZE FOR WNS TESTING: GRAY BAT BEFORE INDIANA BAT BEFORE VIRGINIA BIG-EARED BAT BEFORE OZARK BIG-EARED BAT.

23. THE ATTACHED LETTER OF INSTRUCTION, BAT CAVE ADVISORY, AND DISINFECTION PROTOCOL - AND ANY SUBSEQUENT VERSIONS OF THESE ATTACHMENTS SHALL BE FOLLOWED.

E. NO BAT INJURY OR MORTALITY IS ANTICIPATED AS A RESULT OF THE IMPLEMENTATION OF THE AUTHORIZED ACTIVITIES, EXCEPT AS EXPLICITILY STATED IN CONDITION D22 ABOVE . IF ANY INJURY OR MORTALITY DOES OCCUR, THE PERMITTEE SHALL IMMEDIATELY NOTIFY THE APPROPRIATE U.S. FISH AND WILDLIFE SERVICE OFFICES NOTED IN CONDITION M., BELOW. NOTIFICATION SHALL ALSO BE MADE WITHIN 24 HOURS TO THE REGIONAL PERMITS BIOLOGIST, AT THE ADDRESS AND TELEPHONE NUMBER NOTED IN CONDITION L., BELOW. BASED ON DISCUSSIONS WITH THESE OFFICES, A DECISION WILL BE MADE AS TO WHETHER ANY OF THE AUTHORIZED ACTIVITIES CAN CONTINUE. DECISIONS WILL ALSO BE MADE CONCERNING THE DISPOSITION OF ANY DEAD OR INJURED BATS. THE PERMITTEE SHALL PROVIDE A WRITTEN STATEMENT TO THE U.S. FISH AND WILDLIFE SERVICE OFFICES NOTED IN CONDITIONS L. AND M., BELOW, WHICH DOCUMENTS THE CAUSE OF THE INJURY/MORTALITY, AND IDENTIFIES THE REMEDIAL MEASURES EMPLOYED BY THE PERMITTEE TO ELIMINATE FUTURE MORTALITY/INJURY EVENTS. THE FINAL DECISION ON REMEDIAL MEASURES RESTS WITH THE U.S. FISH AND WILDLIFE SERVICE.

F. THIS PERMIT IS NON-TRANSFERABLE, BUT OTHER QUALIFIED PERSONNEL MAY ASSIST IN THE AUTHORIZED ACTIVITIES, SUBJECT TO THE REQUIREMENTS OF §13.25. WHEN ANY SUCH ASSISTANCE IS TO BE PROVIDED, THOSE DESIGNATIONS ARE TO BE MADE BY LETTER FROM THE PERMITTEE TO EACH AGENT. THE LETTER(S) MUST IDENTIFY THE SCOPE AND DURATION OF THE ASSISTANCE TO THE PERMITTEE. COPIES OF SUCH LETTERS WILL BE PROVIDED IMMEDIATELY TO THE U.S. FISH AND WILDLIFE SERVICE'S REPORTING ADDRESSES LISTED IN CONDITIONS L, M. AND N., BELOW, AS APPROPRIATE. THE PERMITTEE MUST BE PRESENT ON SITE AT ALL TIMES WHILE ACTIVITIES AUTHORIZED UNDER THIS PERMIT ARE BEING CARRIED OUT.

G. PERMITTEE MUST CARRY A COPY OF THIS PERMIT AT ALL TIMES WHEN CONDUCTING THE AUTHORIZED ACTIVITIES. SHIPMENTS OF COLLECTED BIOLOGICAL MATERIALS SHOULD ALSO BE ACCOMPANIED BY A COPY OF THIS PERMIT. NOTE THAT THIS PERMIT IS LIMITED TO THE ABOVE ACTIVITIES AND IDENTIFIED SPECIES.

H. ISSUANCE OF THIS PERMIT DOES NOT CONSTITUTE PERMISSION TO CONDUCT THESE ACTIVITIES ON NATIONAL WILDLIFE REFUGES OR ANY OTHER PUBLIC OR PRIVATE LANDS; SUCH PERMISSION MUST BE OBTAINED SEPARATELY FROM THE APPROPRIATE LANDOWNER OR LAND MANAGER BEFORE BEGINNING THESE AUTHORIZED ACTIVITIES. THIS PERMIT, NEITHER DIRECTLYOR BY IMPLICATION, GRANTS THE RIGHT OF TRESPASS.

I. ACCEPTANCE OF THIS PERMIT SERVES AS EVIDENCE THAT THE PERMITTEE AND ITS AUTHORIZED AGENTS UNDERSTAND AND AGREE TO ABIDE BY THE TERMS OF THIS PERMIT AND ALL SECTIONS OF TITLE 50 CODE OF FEDERAL REGULATIONS, PARTS 13 AND 17, PERTINENT TO ISSUED PERMITS. SECTION 11 OF THE ENDANGERED SPECIES ACT OF 1973, AS AMENDED, PROVIDES FOR CIVIL AND CRIMINAL PENALTIES FOR FAILURE TO COMPLY WITH PERMIT CONDITIONS.

J. UPON LOCATING A DEAD, INJURED, OR SICK BAT, OR ANY OTHER THREATENED OR ENDANGERED SPECIES, UNDER CIRCUMSTANCES NOT ADDRESSED IN THIS AUTHORIZATION, INITIAL NOTIFICATION MUST BE MADE IMMEDIATELY TO THE U.S. FISH AND WILDLIFE SERVICE FIELD OFFICE IDENTIFIED IN CONDITION M., BELOW. NOTIFICATION SHOULD ALSO BE MADE BY THE NEXT WORK DAY TO THE U.S. FISH AND WILDLIFE SERVICE OFFICE IDENTIFIED IN CONDITION L., BELOW. CARE SHOULD BE TAKEN IN HANDLING SICK, INJURED, OR DEAD

SPECIMENS TO ENSURE EFFECTIVE TREATMENT OR TO PRESERVE BIOLOGICAL MATERIALS FOR LATER ANALYSIS. IN CONJUNCTION WITH THE CARE OF SICK OR INJURED ENDANGERED OR THREATENED SPECIES, AND THE PRESERVATION OF BIOLOGICAL MATERIALS FROM A DEAD ANIMAL, THE FINDER SHOULD TAKE RESPONSIBLE STEPS TO ENSURE THAT THE SITE IS NOT UNNECESSARILY DISTURBED.

K. AN ANNUAL REPORT SUMMARIZING AUTHORIZED ACTIVITIES MUST BE SUBMITTED BY DECEMBER 31 OF EACH YEAR THIS PERMIT IS VALID. EACH REPORT SHOULD INCLUDE, AT A MINIMUM, THE FOLLOWING INFORMATION:

1. TOTAL NUMBER OF SURVEYS CONDUCTED AND LOCATIONS OF THE TRAPPING AND SURVEY SITES. LOCATIONS SHALL BE NOTED USING FIGURES, MAPS, AND BY REFERENCING THE NAD83 COORDINATE SYSTEM (E.G., DEGREES, MINUTES, SECONDS).

2. A DESCRIPTION OF SAMPLING METHODS, INCLUDING A DESCRIPTION OF AREA SAMPLED AND NOTES ON BIOTIC AND ABIOTIC FEATURES THAT MIGHT INFLUENCE SAMPLE COMPOSITION.

3. A SPECIES LIST FROM EACH COLLECTION SITE, INCLUDING SPECIES ABUNDANCE AND RICHNESS, CONDITION, AGE, AND SEX OF CAPTURED BATS.

4. THE RESULTS OF THE SURVEYS AND RESEARCH, WITH DISCUSSIONS AND INTERPRETATIONS OF THE DATA IN CONTEXT TO RECOVERY OF THE SPECIES.

5. INFORMATION ON INJURIES AND/OR MORTALITIES AND DISPOSITION OF SPECIMENS.

6. LOCATION AND CHARACTERISTICS OF ROOST TREES AND BAT COLONIES.

7. COPIES OF ALL PUBLISHED PAPERS AND REPORTS.

L. FOR PURPOSES OF MONITORING COMPLIANCE AND ADMINISTRATION OF THE TERMS AND CONDITIONS OF THIS PERMIT, THE CONTACT OFFICE OF THE U.S. FISH AND WILDLIFE SERVICE IS:

U.S. FISH AND WILDLIFE SERVICE
ATTN: PERMIT COORDINATOR
1875 CENTURY BOULEVARD, SUITE 200
ATLANTA, GEORGIA 30345-3301
TELEPHONE: 904/731-3191
FACSIMILE: 904/731-3045

M. COPIES OF ANNUAL REPORTS SHALL ALSO BE SENT TO THE FOLLOWING:

FIELD SUPERVISOR
U.S. FISH AND WILDLIFE SERVICE
J.C. WATTS FEDERAL BUILDING
330 WEST BROADWAY STREET ROOM 265
FRANKFORT, KENTUCKY 40601
TELEPHONE: 502/695-0468
FACSIMILE: 502/695-1024

N. CONTACT INFORMATION FOR U.S. FISH AND WILDLIFE SERVICE STATE FIELD OFFICES AND REGIONS REQUIRING PRIOR APPROVAL;

1. FIELD SUPERVISOR
U.S. FISH AND WILDLIFE SERVICE
551-F PYLON DRIVE
P.O. BOX 33726
RALEIGH, NORTH CAROLINA 27363
TELEPHONE: 919/856-4520

FIELD SUPERVISOR
U.S. FISH AND WILDLIFE SERVICE
160 ZILLICOA STREET
ASHEVILLE, NORTH CAROLINA 28801
TELEPHONE: 828/258-3939

FIELD SUPERVISOR
U.S. FISH AND WILDLIFE SERVICE
646 CAJUNDOME BOULEVARD
SUITE 400
LAFAYETTE, LOUISIANA 70506
TELEHONE: 337/291-3124

FIELD SUPERVISOR
U.S. FISH AND WILDLIFE SERVICE
446 NEAL STREET
COOKEVILLE, TENNESSEE 38501
TELEPHONE: 931/528-6481

FIELD SUPERVISOR
U.S. FISH AND WILDLIFE SERVICE
110 SOUTH AMITY ROAD
SUITE 300
CONWAY, ARKANSAS 72032
TELEPHONE: 501/513-4470

2. U.S. FISH AND WILDLIFE SERVICE
DIVISION OF ENDANGERED SPECIES
1 FEDERAL DRIVE
FORT SNELLING, MINNESOTA 55111-4056
TELEPHONE: 612/713-5343
FACSIMILE: 612/713-5292

3. U.S. FISH AND WILDLIFE SERVICE
DIVISION OF ENDANGERED SPECIES
300 WESTGATE CENTER DRIVE
HADLEY, MASSACHUSETTS 01035-9589
TELEPHONE: 413/253-8627

4. U.S. FISH AND WILDLIFE SERVICE
OKLAHOMA ECOLOGICAL SERVICES FIELD OFFICE
9014 E. 21ST STREET
TULSA, OKLAHOMA 74129
TELEPHONE: 918/581-7458

5. U.S. FISH AND WILDLIFE SERVICE
KANSAS ECOLOGICAL SERVICES FIELD OFFICE
2609 ANDERSON AVENUE
MANHATTAN, KANSAS 66502
TELEPHONE: 785/539-3474

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

3-201
(1/97)

FEDERAL FISH AND WILDLIFE PERMIT

2. AUTHORITY-STATUTES
16 USC 1539(a)

REGULATIONS
50 CFR 17.22

50 CFR 13

1. PERMITTEE

MICHELLE MALCOSKY
266 ATTERBURY BLVD
HUDSON, OH 44236
U.S.A.

3. NUMBER
TE08603A-0

4. RENEWABLE
YES
NO

5. MAY COPY
YES
NO

6. EFFECTIVE
06/11/2010

7. EXPIRES
12/31/2011

8. NAME AND TITLE OF PRINCIPAL OFFICER *(If #1 is a business)*

9. TYPE OF PERMIT
NATIVE ENDANGERED SP. RECOVERY - E WILDLIFE

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED
ON LANDS SPECIFIED WITHIN THE ATTACHED SPECIAL TERMS AND CONDITIONS

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

C.1. VALID FOR USE ONLY BY MICHELLE MALCOSKY.

D. ACCEPTANCE OF THIS PERMIT SERVES AS EVIDENCE THAT THE PERMITTEE AND ITS AUTHORIZED AGENTS UNDERSTAND AND AGREE TO ABIDE BY THE TERMS OF THIS PERMIT AND ALL SECTIONS OF TITLE 50 CODE OF FEDERAL REGULATIONS, PARTS 13 AND 17, PERTINENT TO ISSUED PERMITS. SECTION 11 OF THE ENDANGERED SPECIES ACT OF 1973, AS AMENDED, PROVIDES FOR CIVIL AND CRIMINAL PENALTIES FOR FAILURE TO COMPLY WITH PERMIT CONDITIONS.

E. Permittee is authorized to take (capture and release, band, and radio-track) Indiana bats (*Myotis sodalis*) for scientific research aimed at recovery of the species.

F. Activities are authorized at the following locations:

F.1. Locations within Region 3 of the USFWS: Illinois, Indiana, Michigan and Ohio, upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.

F.2. Locations within Region 4 of the USFWS: Kentucky, upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.

F.3. Locations within Region 5 of the USFWS: Pennsylvania and West Virginia, upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.

[ ] ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS
ANNUAL REPORT DUE: 01/31

ISSUED BY

TITLE
CHIEF - ENDANGERED SPECIES

DATE
06/11/2010

G. Permittee shall notify the USFWS Field Supervisor for the state in which activities are proposed to occur at least 15 days prior to conducting any activities. Contact information is Condition M., below. Your request must be in writing and must indicate:

G.1. Location of proposed activities, including project site, county, and state.

G.2. A description of the activities (i.e., surveys, radio-telemetry studies, etc.).

G.3. Dates when the project is proposed to take place.

G.4. Evidence that Permittee has received any required contracts to complete the activities.

G.5. You may proceed with activities only upon receipt of written concurrence from the applicable USFWS Field Supervisor. *Your concurrence letter must be carried with this permit to authorize site-specific activities.*

H. The attached "Indiana Bat Mist-Netting Guidelines" shall be followed. Permittee shall also adhere to the following conditions involving capture and handling of bats:

H.1. Bats may be captured with mist nets. The monitoring interval for mist nets may not exceed 15 minutes. Captured bats should be held for a maximum of 30 minutes, unless injured. In extenuating circumstances, bats shall be held for no longer than 45 minutes.

H.2. Permittee may carry out non-intrusive measurements on captured bats. Celluloid split-ring or lipped metal bands having unique identifier may be applied to the forearms of captured bats prior to release.

H.3. Holohil Systems, or similar radio transmitters may be attached during the summer roosting period using nontoxic skin bond adhesive (such as colostomy glue). It is recommended that the total weight of the package (transmitter and adhesive) not exceed 5% of the bat's body weight. The lightest transmitters capable of accomplishing the required task should be used, especially with pregnant females and newly volant juveniles. Under no circumstances shall the total weight of the package exceed 0.8 grams or 10% of the bat's weight, whichever is less. Bats carrying transmitters must be monitored daily for at least three days, or until the transmitter falls off, whichever occurs first.

H.4. No trapping activities shall occur within 20 meters of a known Indiana bat maternity roost site, either natural or artificial roosts, unless Permittee receives prior written approval from the U.S. Fish and Wildlife Service Field Supervisor for the state in which the activities are proposed to occur.

H.5. Equipment used to capture and handle bats shall be cleaned and decontaminated according to the attached "Disinfection Protocol for Bat Field Studies." In addition, you are required to use the most recent handling protocols available by checking the protocols posted on the USFWS Midwest Region website at: http://www.fws.gov/midwest/Endangered/mammals/BatDisinfectionProtocol.html. You must visit the web site at least once every six weeks to determine whether new information has been learned regarding appropriate equipment handling to halt the spread of White Nose Syndrome in the bat community.

I. Upon determination that endangered bats are present at previously undocumented sites, Permittee shall notify the following offices within 48 hours: the U.S. Fish and Wildlife Service Region 3 Office (Condition L.), and the U.S. Fish and Wildlife Service Field Office within the geographic location of study areas (Condition M.).

J. Accidental mortality may not exceed two specimens. In the event that this number is met, all activities must cease. Any bat mortality or serious injury must be reported within 5 calendar days to the applicable office listed in condition M. and to the nearest U.S. Fish and Wildlife Service Law Enforcement Office (Attachment 2 or on the web at http://www.fws.gov/offices/directory). Dead or moribund bats may be retained for further study only with the written permission of the U.S. Fish and Wildlife Service. Any bats that are not authorized for retention are to be chilled and promptly transferred to the U.S. Fish and Wildlife Service for potential necropsy and/or contaminants analysis (Condition L.4.).

K. Reports are due on January 31 following each year this permit is in effect. At a minimum, your report shall include:

K.1. The date, time, locations (using UTM, latitude-longitude, section descriptors, or accurately plotted on USGS maps), age, sex, weight of all bats encountered.

K.2. Locations surveyed where no bats were encountered.

K.3. Band numbers of all bats banded.

K.4. Information on any injuries and/or mortalities and disposition of specimens.

K.5. Location and characteristics of roost trees and bat colonies.

K.6. Copies of any separate reports and/or publications resulting from work conducted under the authority of this permit.

K.7. A completed INDIANA BAT SURVEY AND BANDING DATA form.

K.8. Copies of all site specific authorization letters required under Condition G.

L. Copies of your reports shall be sent to the offices listed below. When possible, electronic copies shall be submitted in lieu of hard copies in MS Word, Portable Document Format, Rich Text Format, or other file format that is compatible with the receiving office.

L.1. Pete Fasbender
U.S. Fish and Wildlife Service
Ecological Services
1 Federal Drive
Fort Snelling, Minnesota 55111-4056
(612/713-5343; fax 612/713-5292)
permitsR3ES@fws.gov

L.2. Cam Shaw
U.S. Fish and Wildlife Service
Attn: Permit Coordinator (AES/TE/P)
1875 Century Boulevard, Suite 200
Atlanta, Georgia 30345-3301
(904/731-3191; fax 404/679-7081)
permitsR4ES@fws.gov

L.3. Alex Hoar
U.S. Fish and Wildlife Service
Endangered Species Division
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589
(413/253-8631; fax 413/253-8482)
permitsR5ES@fws.gov

L.4. Lori Pruitt
Endangered Species Coordinator for Indiana
U.S. Fish and Wildlife Service
Ecological Services Field Office
620 S. Walker Street
Bloomington, Indiana 47403-2121
(812/334-4261 x1211; fax 812/334-4273)

M. Additionally, based on geographic area, reports and publications shall be submitted to the following:

M.1. For studies conducted in Illinois:

M.1.a. Jody Millar
Endangered Species Coordinator for Illinois/Iowa
U.S. Fish and Wildlife Service
Ecological Services Field Office
1511 47th Ave.
Moline, Illinois 61265
(309/757-5800, x202; fax 309/757-5807)

M.1.b. Joe Kath
Endangered Species Coordinator
Illinois Department of Natural Resources
Division of Natural Heritage
One Natural Resource Way
Springfield, Illinois 62702-1271
(217/785-8764; fax 217/785-2438)

M.2. For studies conducted in Indiana:

Katie Gremillion-Smith
Endangered Species Coordinator
Indiana Department of Natural Resources
Division of Fish and Wildlife
Room W273, 402 W. Washington St.
Indianapolis, Indiana 46204-2267
(317/232-8160; fax 317/232-8150)

M.3. For studies conducted in Michigan:

M.3.a. Jack Dingledine
Endangered Species Coordinator for Michigan
U.S. Fish and Wildlife Service
2651 Coolidge Road
East Lansing, Michigan 48823
(517/351-6320; fax 517/351-1443)

M.3.b. Christopher Hoving
Michigan Department of Natural Resources
Wildlife Division
5th Floor, Stevens T. Mason Bldg.
P.O. Box 30028
Lansing, Michigan 48909
(517/373-1263; fax 517/373-6705)

M.4. For studies conducted in Ohio:

M.4.a. Angela Boyer
Endangered Species Coordinator for Ohio
U.S. Fish and Wildlife Service
Ohio Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614/416-8993, x22; fax 614/416-8994)

M.4.b. Carolyn Caldwell
Endangered Species Coordinator
Ohio Department of Natural Resources
Division of Wildlife
2045 Morse Road
Building G
Columbus, Ohio 43229-6693
(614-265-6329)

M.5. For studies conducted in Kentucky:

Frankfort Field Office
Lee Andrews, Field Supervisor
J C Watts Federal Bldg., Rm 265
330 West Broadway
Frankfort, KY 40601-8670
(502) 695-0468

M.6. For studies conducted in Pennsylvania:

Pennsylvania Field Office
Clint Riley, Field Supervisor
315 So. Allen Street, Suite 322
State College, PA 16801-4850
(814) 234-4090

M.7. For studies conducted in West Virginia:

West Virginia Field Office
Deborah Carter, Field Supervisor
Route 250 South, Elkins Shopping Plaza
694 Beverly Pike
Elkins, WV 26241
(304) 636-6586

cc: FWS/Regions 4 and 5 (Attn: Regional Permits Coordinator)
FWS/ESFOs: IN, IL, MI, OH (Attn: Endangered Species Coordinator)
DNR/DOCs: IN, IL, MI, OH, (Attn: Endangered Species Coordinator)

END

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

3-201
(1/97)

FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

TIMOTHY C CARTER
dba BALL STATE UNIVERSITY
DEPARTMENT OF BIOLOGY
CL 121
BALL STATE UNIVERSITY
MUNCIE, IN 47306-0440

2. AUTHORITY-STATUTES
16 USC 1539(a)

REGULATIONS
50 CFR 17.22

50 CFR 13

3. NUMBER
TE02560A-0

4. RENEWABLE	5. MAY COPY
☒ YES ☐ NO	☒ YES ☐ NO

6. EFFECTIVE	7. EXPIRES
05/15/2010	12/31/2011

8. NAME AND TITLE OF PRINCIPAL OFFICER *(If #1 is a business)*

9. TYPE OF PERMIT
NATIVE ENDANGERED SP. RECOVERY - E WILDLIFE

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED
ON LANDS SPECIFIED WITHIN THE ATTACHED SPECIAL TERMS AND CONDITIONS

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

C.1. ALSO VALID FOR MICHAEL WHITBY. TRAINED ASSISTANTS MAY WORK ON PERMITTED ACTIVITIES UNDER THE DIRECT AND ON-SITE SUPERVISION OF TIM CARTER OR MICHAEL WHITBY.

D. ACCEPTANCE OF THIS PERMIT SERVES AS EVIDENCE THAT THE PERMITTEE AND ITS AUTHORIZED AGENTS UNDERSTAND AND AGREE TO ABIDE BY THE TERMS OF THIS PERMIT AND ALL SECTIONS OF TITLE 50 CODE OF FEDERAL REGULATIONS, PARTS 13 AND 17, PERTINENT TO ISSUED PERMITS. SECTION 11 OF THE ENDANGERED SPECIES ACT OF 1973, AS AMENDED, PROVIDES FOR CIVIL AND CRIMINAL PENALTIES FOR FAILURE TO COMPLY WITH PERMIT CONDITIONS.

E. Permittee is authorized to take (capture, handle, radio-tag, and release) Indiana bats (*Myotis sodalis*) and gray bats (*Myotis grisescens*), for scientific research aimed at recovery of the species: presence/absence surveys, studies to document habitat use, population monitoring, and to evaluate potential impacts.

F. Activities are authorized at the following locations:

F.1. Throughout southern Illinois in conjunction with roosting ecology study on the Shawnee National Forest (U.S. Forest Service Agreement No. 08-PA-11090800-023) upon receipt of written concurrence from Field Supervisor, as outlined in Condition G.

☒ ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS
ANNUAL REPORT DUE: 01/31

ISSUED BY	TITLE	DATE
	CHIEF - ENDANGERED SPECIES	05/12/2010

F.2. Other locations within Georgia, Illinois, Indiana, Iowa, Michigan, Missouri, Ohio, and Wisconsin upon receipt of written concurrence from Field Supervisor, as outlined in Condition G.

G. For locations specified in Condition F., Permittee shall notify the Service Field Supervisor for the state in which activities are proposed to occur at least 15 days prior to conducting any activities. Your notification must be in writing and must indicate:

G.1. Location of proposed activities, including project site, county, and state

G.2. A detailed description of the activities (i.e., surveys, radio-telemetry studies, etc.)

G.3. Dates when the project is proposed to take place

G.4. Evidence that permittee has received any required contracts to complete the activities

G.5. This permit is not valid without a concurrence letter from the U.S. Fish and Wildlife Service authorizing the site-specific survey or research activities. You may only proceed with activities upon receipt of written concurrence from the Field Supervisor for the state in which activities are proposed. *Your concurrence letter must be carried with this permit to authorize locations not named in this permit.*

H. Permittee shall adhere to the following conditions involving capture and handling of bats:

H.1. Bats may be captured with mist nets. The attached "Indiana Bat Mist-Netting Guidelines" shall be followed. The monitoring interval for mist nets may not exceed 15 minutes. Captured bats should be held for a maximum of 30 minutes, unless injured. In extenuating circumstances, bats shall be held for no longer than 45 minutes.

H.2. Bats may only be captured with harp traps with written concurrence from the Field Supervisor in the state in which trapping is proposed. Harp traps must be continually monitored. Captured bats may be held for a maximum of 30 minutes, unless injured. In extenuating circumstances, bats shall be held for no longer than 45 minutes.

H.3. Permittee may carry out non-intrusive measurements on captured bats. Celluloid split-ring or lipped metal bands having unique identifier may be applied to the forearms of captured bats prior to release.

H.4. Holohil Systems, or similar radio transmitters may be attached during the summer roosting period using nontoxic skin bond adhesive (such as colostomy glue). It is recommended that the total weight of the package (transmitter and adhesive) not exceed 5% of the bat's body weight. The lightest transmitters capable of accomplishing the required task should be used, especially with pregnant females and newly volant juveniles. Under no circumstances shall the total weight of the package exceed 0.8 grams or 10% of the bat's weight, whichever is less. Bats carrying transmitters must be monitored daily for at least three days, or until the transmitter falls off, whichever occurs first.

H.5. No trapping activities shall occur within 20 meters of a known Indiana bat roost site, either natural or artificial roosts, unless authorized in writing by the Field Supervisor for the state in which activities are proposed to occur. When so authorized, trapping activities at roost trees shall be limited to those roosts where exit counts from the previous night contained no more than 25 bats. Nets shall be lowered after 20 bats of any species are captured. Trapping shall occur at each roost tree no more than once every 10 days and bats may be captured at night roosts under bridges no more than one time per week per site.

H.6. Wing punch tissue samples and guano samples may be collected from each Indiana bat captured. A new, sterile punch must be used for each Federally-listed bat sampled. Boards or any other equipment used to collect samples must be sterilized in accordance with disinfection protocols cited in Condition H.9.

H.7. Hibernacula surveys may be conducted with concurrence of the Field Supervisor, as outlined in Condition G. Suitable hibernation sites may be quietly searched by the Permittee and no more than 3 assistants at one time. Where safety conditions allow, individuals entering hibernacula are recommended to utilize night vision goggles or red-filtered light and to remain in the cave/mine no more than 90 minutes to complete the work.

H.8. Light tags may not be affixed to bats.

H.9. Equipment used to capture and handle bats shall be cleaned and decontaminated according to the attached "Disinfection Protocol for Bat Field Studies." In addition, you are required to use the most recent handling protocols available by checking the protocols posted on the USFWS Midwest Region website at: http://www.fws.gov/midwest/Endangered/mammals/BatDisinfectionProtocol.html. You must visit the web site at

least once every six weeks to determine whether new information has been learned regarding appropriate equipment handling to halt the spread of White Nose Syndrome in the bat community.

I. The following conditions apply to activities involving marking with passive integrated transponder (PIT) tags:

I.1. PIT tagging authorization will be determined through coordinated efforts between Permittee and the Service. Permittee may only proceed with PIT tagging activities upon receipt of written concurrence from the Service Office in Condition G.

I.2. PIT tagging activities shall be restricted to one maternal roost colony located on Camp Atterbury, Indiana. No more than 20% of the colony may be trapped and marked with PIT tags.

J. Upon determination that endangered bats are present at previously undocumented sites, permittee shall notify the U.S. Fish and Wildlife Service Region 3 Office (Condition M.1.) and the U.S. Fish and Wildlife Service Field Office within the geographic location of study areas (contact information in Condition M.) within 48 hours.

K. Accidental mortality may not exceed two specimens. In the event that this number is met, all activities must cease. Any bat mortality or serious injury must be reported within 5 calendar days to the applicable office listed in Condition M. and to the nearest U.S. Fish and Wildlife Service Law Enforcement Office (Attachment 1.). Dead or moribund bats may be retained for further study only with the written permission of the U.S. Fish and Wildlife Service, Ft. Snelling Regional Office. Any bats that are not authorized for retention are to be chilled and promptly transferred to the U.S. Fish and Wildlife Service for potential necropsy and/or contaminants analysis.

L. Reports are due on January 31 following each year this permit is in effect. At a minimum, your report shall include:

L.1. The date, time, locations (using UTM, latitude-longitude, section descriptors, or accurately plotted on USGS maps), age, sex, weight of all bats encountered.

L.2. Locations surveyed where no bats were encountered.

L.3. Band numbers of all bats banded.

L.4. Information on any injuries and/or mortalities and disposition of specimens.

L.5. Location and characteristics of roost trees and bat colonies.

L.6. Copies of any separate reports and/or publications resulting from work conducted under the authority of this permit.

L.7. A completed INDIANA BAT SURVEY AND BANDING DATA form (attached).

L.8. Copies of all site-specific authorization letters required under Condition G.

M. Copies of your reports shall be sent to the offices listed below. When possible, electronic copies shall be submitted in lieu of hard copies in MS Word, Rich Text Format, Portable Document Format or other file format that is compatible with the receiving office.

M.1. Pete Fasbender
Regional Recovery Permits Coordinator
U.S. Fish and Wildlife Service
Ecological Services
1 Federal Drive
Fort Snelling, Minnesota 55111-4056
(612/713-5343; fax 612/713-5292)
email: permitsR3ES@fws.gov

M.2. Cam Shaw
U.S. Fish and Wildlife Service
Attn: Permit Coordinator (AES/TE/P)
1875 Century Boulevard, Suite 200
Atlanta, Georgia 30345-3301
(904/731-3191; fax 404/679-7081)
permitsR4ES@fws.gov

Appendix D: Net Site Photographs

Photo 1. Site 1; Net A.

Photo 2. Site 1; Net B.

Photo 3. Site 2; Net A.

Photo 4. Site 2; Net B.

Photo 5. Site 3; Net A.

Photo 6. Site 3; Net B.

Photo 7. Site 4; Net A.

Photo 8. Site 4; Net B.

Photo 9. Site 5; Net A.

Photo 10. Site 5; Net B1.

Photo 11. Site 5; Net B2.

Photo 12. Site 6; Net A.

Photo 13. Site 7; Net A.

Photo 14. Site 7; Net B.

Photo 15. Site 8; Net A.

Photo 16. Site 8; Net B.

Photo 17. Site 9; Net A.

Photo 18. Site 9; Net B.

Photo 19. Site 9; Net C.

Photo 20. Site 10; Net A.

Photo 21. Site 10; Net B.

Photo 22. Site 11; Net A.

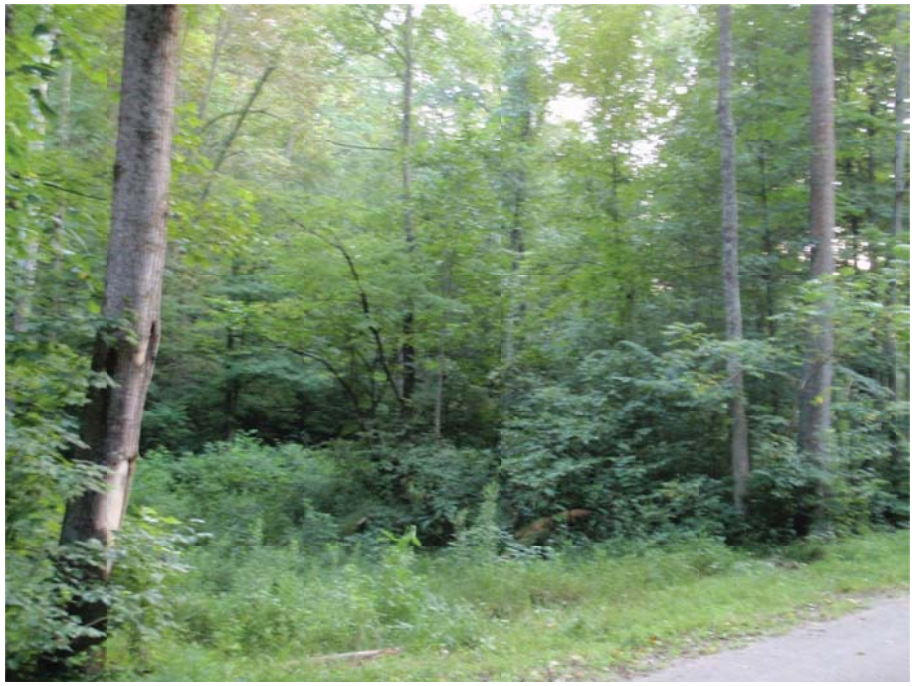


Photo 23. Site 11; Net B.

Photo 24. Site 12; Net A.

Photo 25. Site 12; Net B.

Photo 26. Site 12; Net C.

Photo 27. Site 13; Net A1.

Photo 28. Site 13; Net A2.

Photo 29. Site 13; Net B.

Photo 30. Site 14; Net A.

Photo 31. Site 14; Net B.

Photo 32. Site 14; Net C.

Photo 33. Site 15; Net A.

Photo 34. Site 15; Net B.

Photo 35. Site 15; Net C.

Photo 36. Site 16; Net A.

Photo 37. Site 16; Net B.

Photo 38. Site 16; Net C.

Photo 39. Site 17; Net A and B.

Photo 40. Site 18; Net A.

Photo 41. Site 18; Net B.

Photo 42. Site 18; Net C.

Photo 43. Site 19; Net A.

Photo 44. Site 19; Net B.

Photo 45. Big Brown Bat captured on the Portsmouth Bypass corridor.

Photo 46. Tri-Color Bat captured on the Portsmouth Bypass corridor.

Photo 47. Eastern Red Bat captured on the Portsmouth Bypass corridor.

Photo 48. Northern Long-eared Bat captured on the Portsmouth Bypass corridor.

Photo 49. Hoary Bat captured on the Portsmouth Bypass corridor.

Photo 50. Little Brown Bat captured on the Portsmouth Bypass corridor.

Appendix E: Field Datasheets

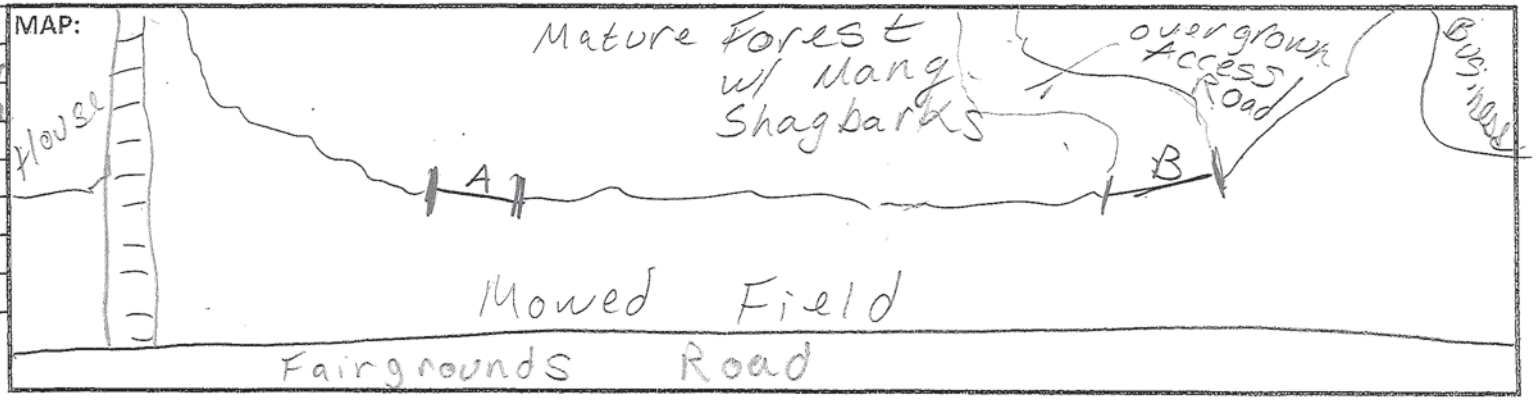
Date: 7-18-11 Project/Area: Portsmouth Bypass Site Name/County: #1, Scioto UTMs (E/W/N): -82.997184 / 38.891956

Location: Woodlot east of Fairgrounds Road Weather (wind/moon/precip): wind 1-3mph; Moon - 3day postfull, Mist 16m

Start/End Time: 8:50/3:25 Start/End Temp: 84 / 75 Personnel: Michelle Malcosky, Dave Czaykа

Net	# High	Length	Feature
A	3	6	Corridor
B	3	12	Wooding
C			
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	10:10	EPFU	M-A	A	12	44	0	—	B	—	—	—	
2	10:10	EPFU	F-P	A	13	44	0	—	B	—	—	—	
3	10:10	EPFU	M-N/R	A	12	44	P	—	B	—	—	—	Small hole Lt Wing
4	10:50	EPFU	F-P	A	14	47	0	—	B	—	—	—	
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 7-19-11 Project/Area: Portsmouth Bypass Site Name/County: #1, Scioto UTMs (E/N): -82.997184 / 38.891956
Location: Woodlot East of Fairgrounds Road Weather (wind/moon/precip): W=1-3mph, M=4+Full, P=None
Start/End Time: 9:05/2:35 Start/End Temp: 78 / 70 Personnel: M. Malcosky, D. Czayka

Net	# High	Length	Feature
A	3	6m	corridor
B	3	12m	Woodline
C			
D			
E			
F			
G			

MAP:

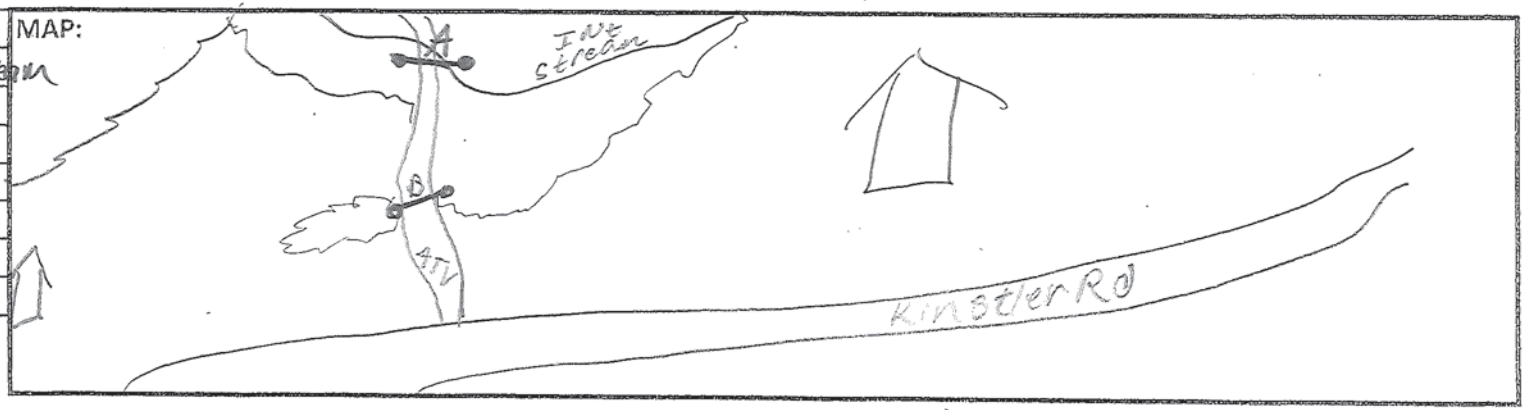
	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	9:40	EPFU	M-N	J	14	46	0	—	B	—	—	—	
2	10:00	EPFU	M-A	A	17.5	47	0	—	B	—	—	—	
3	10:00	EPFU	F-P	A	19	47	0	—	B	—	—	—	
4	10:10	PESU	M-N	A	5.5	32.5	0	—	B	—	—	—	
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 7-20-11 Project/Area: Portsmouth Bypass Site Name/County: #2, Scioto UTMs (E/N): -82.972915, 38.896737
Location: Woods north of Kinstler Rd. Weather (wind/moon/precip): W=1-3mph, M=3; 1st quarter; P=none
Start/End Time: 9:00 / 1:05 Start/End Temp: 75 / 74 Personnel: M. Malcosky, D. Czayak

Net	# High	Length	Feature
A	3	9m	Trail/stream
B	3	9m	Trail
C			
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / ~~Height~~	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	9:50	LACI	—	—	—	—	—	—	A	—	—	—	Escape
2	9:50	EPFU	—	—	—	—	—	—	A	—	—	—	Escape
3	9:50	EPFU	F-P	A	15	46	0	—	A	—	—	—	
4	12:50	LABO	M-N	A	9.5	44	0	—	B	—	—	—	
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 7-21-11 Project/Area: Portsmouth Bypass Site Name/County: #2, Scioto UTMs (E/N): -82.972915 / 38.896737
Location: woods north of Kinstler rd. Weather (wind/moon/precip): W=1-3mph, M=-2; Last quarter, P=none
Start/End Time: 9:00 / 3:00pm Start/End Temp: 85 / 78 Personnel: M. Malcosky, K. Tomasello

Net	# High	Length	Feature
A	3	9 m	Trail / stream
B	3	9 m	Trail
C			
D			
E			
F			
G			

MAP:

See Day 1

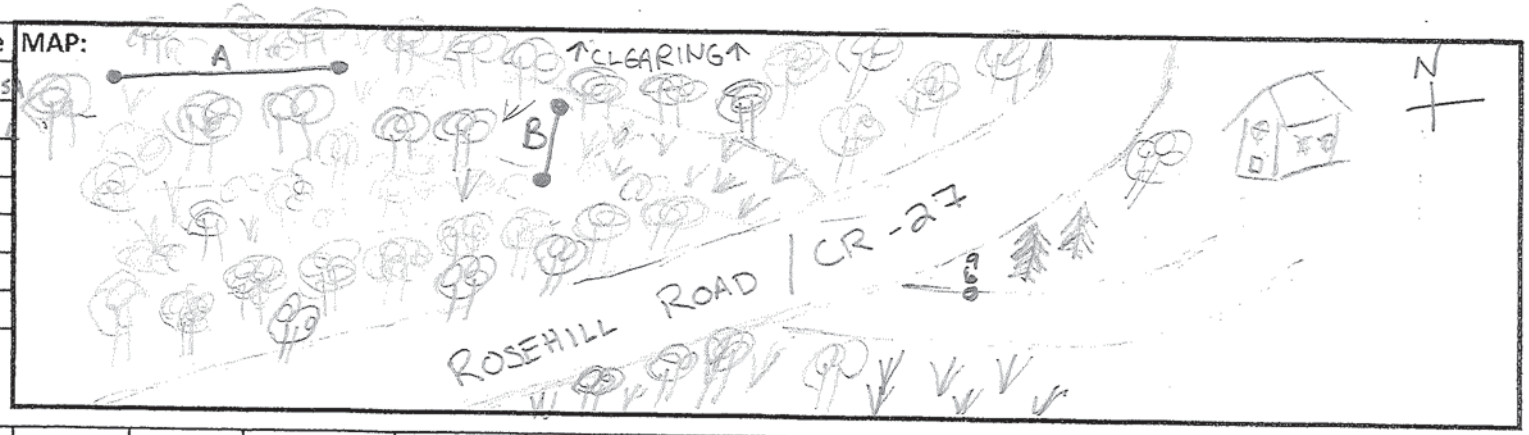
	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	9:20pm	LABO	M-N/R	J	9	41	0	—	A	—	—	—	
2	9:40pm	LABO	M-N/R	J	8	39	0	—	A	—	—	—	
3	10:00pm	MYSE	F-N/R	J	8	35	0	—	A	—	—	—	
4	10:30	LABO	F-N/R	J	11.5	41	0	—	B	—	—	—	
5	12:30	LABO	M-A	A	11.5	40	0	—	B	—	—	—	
6	1:10am	LABO	F-A	A	17	39	0	—	A	—	—	—	
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 8/10/2011 Project/Area: Portsmouth Bypass Site Name/County: #3 Site UTMs (E/N): 17S 0330487 / 4306696
Location: Clearing & old Road off Rosehill Rd Weather (wind/moon/precip): 1-3 / FULL / NONE
Start/End Time: 20:45 / 0200 Start/End Temp: 72° / 66° Personnel: MICHAEL WHITBY & JULIA NAWROCKI

Net	# High	Length	Feature
A	2	18 m	FOREST ED GE-ISH
B	2	9m	OLD ATV TRAIL
C			
D			
E			
F			
G			

MAP:



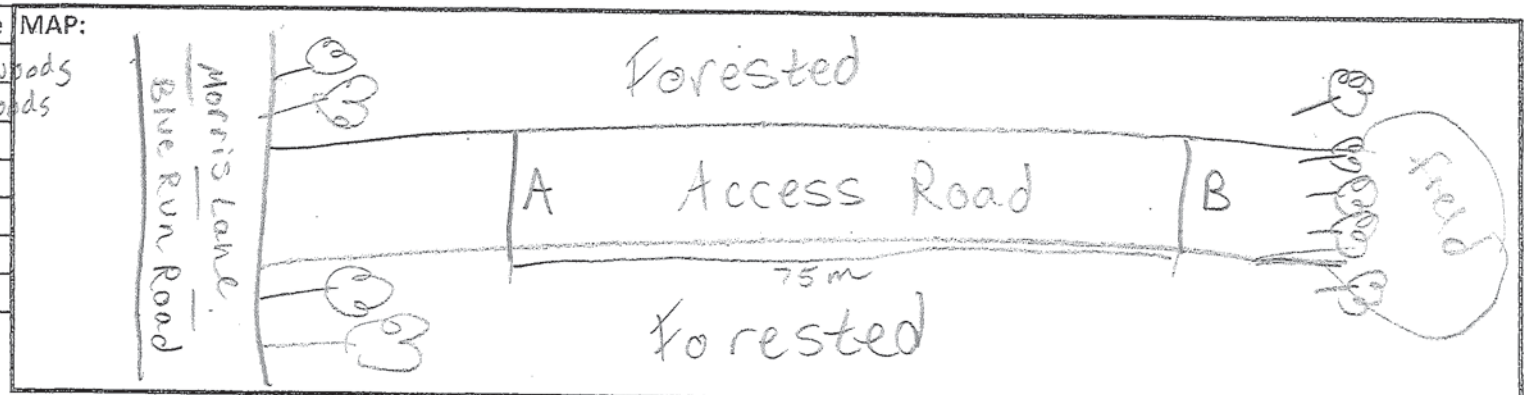
	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.) ODNR	Net / Height (tier)	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	2300	MYSF	M/NR	A	5.5	36	0	10827	A/5				Day 1
2													
3													
4													
5	8/11/2011			Start	Temp	72°	End	64°					
6					Time	2045		0200					
7													
8	22:00	EPFU	F/NR	A	18	48	1	22329	B/4				Day 2
9	22:00	EPFU	M/NR	JV	17.25	47	0	22328	B/5				
10	2300	EPFU	M/NR	A	19.25	47	0	22327	A/4				
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 7-22-11 Project/Area: Portsmouth Bypass Site Name/County: #4, Scioto UTMs (E/N): -82.941959 / 38.883696
Location: woods north of Morris Lane - blue run road Weather (wind/moon/precip): W = 1-3mph, M = 1 day before last quarter, fmore
Start/End Time: 9:00 / 2:05 am Start/End Temp: 77 / 72 Personnel: M. Malcosky, K. Tomasello

Net	# High	Length	Feature
A	3	6m	road/woods
B	2	6m	road/woods
C			
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1													No captures
2													
3													
4													
5													
6													
7													
8													
9													
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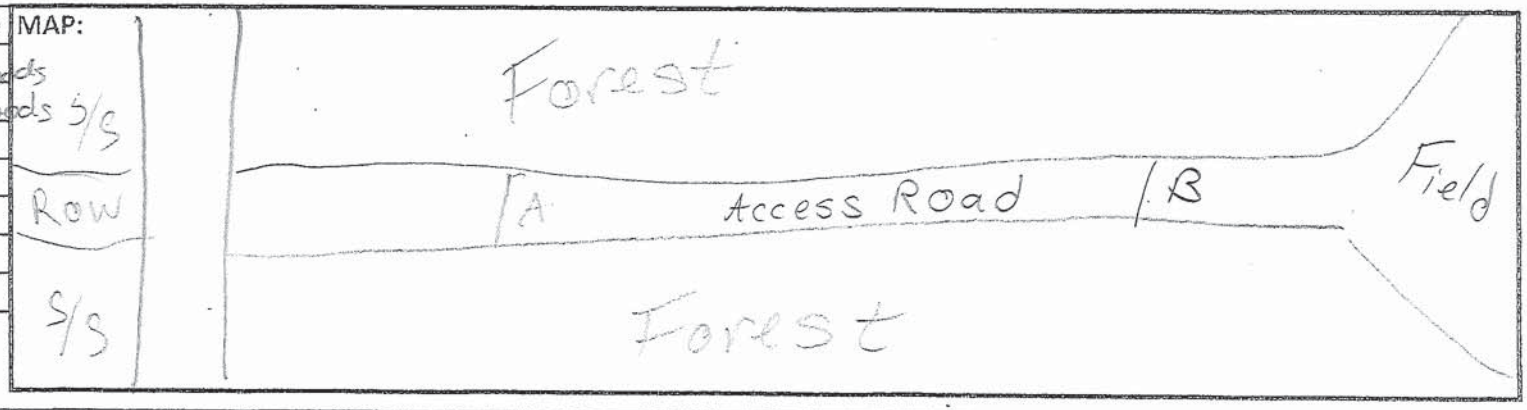
18													

condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 7-23-11 Project/Area: Portsmouth Bypass Site Name/County: #4, Scioto UTMs (E/N): 82949059 / 38.883696
Location: woods north of morris lane - Blue Run road Weather (wind/moon/precip): W= 1-3 mph, M= last quarter, P= none
Start/End Time: 9:09 2:05 am Start/End Temp: 76 / 75 Personnel: M. Malcosky, K. Tomasello

Net	# High	Length	Feature
A	3	6	road/woods
B	2	6	road/woods
C			
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1													no captures
2													
3													
4													
5													
6													
7													
8													
9													
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15													
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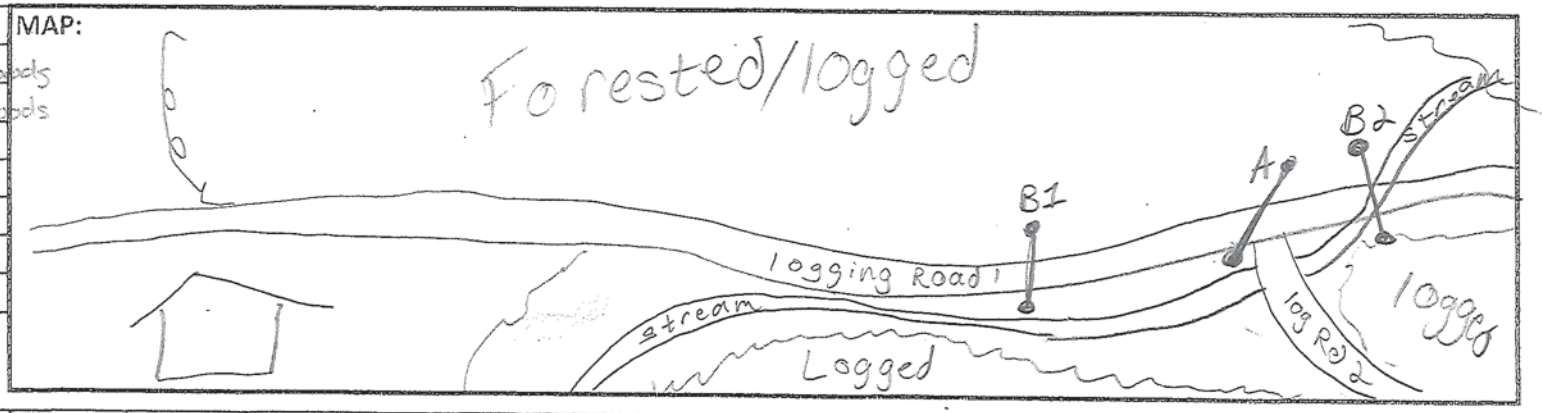
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 7-24-11 Project/Area: Portsmouth Bypass Site Name/County: #5, Scioto UTMs (E/N): -82.936544 / 38.870109
Location: Across road adjacent to entrenched creek Weather (wind/moon/precip): W=1-3mph, M=+1 last quarter, P=none
Start/End Time: 9:00/2:30am Start/End Temp: 75 / 72 Personnel: M. Malcosky, K. Tomasello

Net	# High	Length	Feature
A	3	12	road/woods
B	2	6	road/woods
C			
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	9:30	EPFU	M-A	A	15.5	42	0	—	A	—	—	—	
2	10:30	EPFU	F-NR	A	20	46	0	—	A	—	—	—	
3	1:30	MYSE	M-A	A	7	36	0	—	A	—	—	—	
4													
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6													
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14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 7-25-11 Project/Area: Portsmouth Bypass Site Name/County: #5, Scioto UTMs (E/N): -82.936544 / 38.870109
Location: Across road adjacent to entrenched creek Weather (wind/moon/precip): W=1-3mph, M=±2 days last quarter, P=none
Start/End Time: 9:00/ 2:30 am Start/End Temp: 82 / 74 Personnel: M. Malecky, K. Tamsellos

Net	# High	Length	Feature
A	3	12	Road/woods
B	2	6	Road/woods
C			
D			
E			
F			
G			

MAP:

See Day 1.

	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	9:47	LABO	M	—	—	—	—	—	B1	—	—	—	Escaped
2	10:10	EPFU	M-N/R	A	17.5	48	0	—	B1	—	—	—	
3	10:10	EPFU	M-N/R	A	15	42	0	—	B1	—	—	—	
4	10:18	LABO	M-N/R	A	11	40	0	—	B1	—	—	—	
5	11:50	EPFU	F-L	A	19.5	44	0	—	A	—	—	—	Abnormal growth on right wing (Tumor) Diameter (7mm)
6	12:30	EPFU	M-A	A	18	44	0	—	B1	—	—	—	
7	12:30	EPFU	F-N/R	A	21.5	47	0	—	B1	—	—	—	
8	12:30	EPFU	F-N/R	A	19.5	44	0	—	B1	—	—	—	
9	2:30	LABO	M	—	—	—	—	—	—	—	—	—	Escaped
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

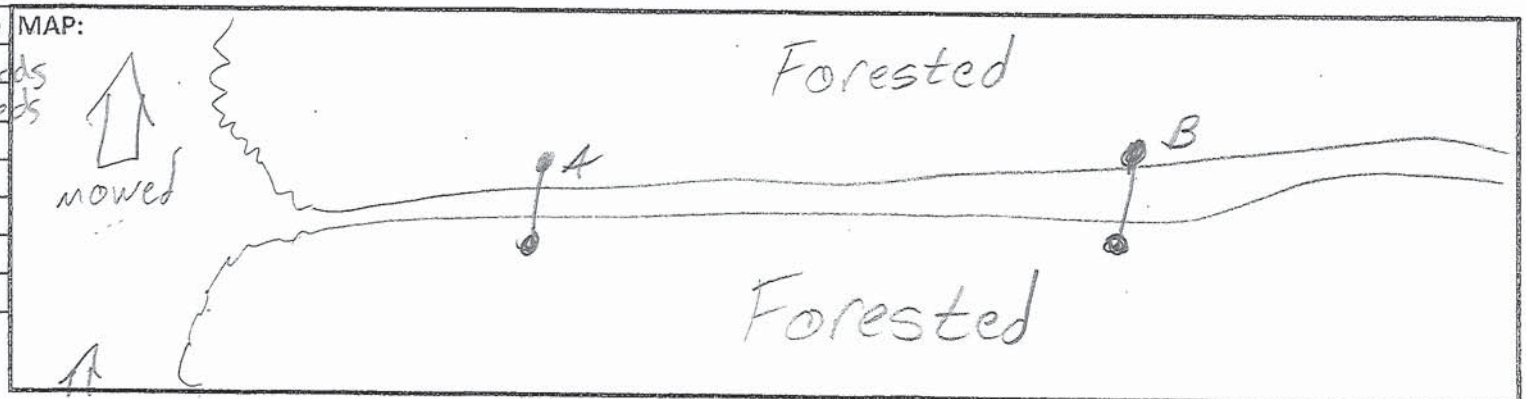
Date: 08-02-11 Project/Area: Portsmouth Bypass Site Name/County: #6, Scioto UTMs (E/N): -82.908757 / 38.868183

Location: Across logging road within woods Weather (wind/moon/precip): W=1-3mph, M=~3days last quarter, P=none

Start/End Time: 9:00 / 2:05 am Start/End Temp: 82 / 75 Personnel: M. Malcosky, K. Tomastello

Net	# High	Length	Feature
A	3	6	hardwoods
B	2	6	hardwoods
C			
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	12:30	EPFU	M-N/R	A	14	45	—	—	A	—	—	—	
2													
3													
4													
5													
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18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 08-03-11 Project/Area: Portsmouth Bypass Site Name/County: #6 ; Scioto UTMs (E/N): -82.908757 / 38.868183

Location: Across logging road within woods Weather (wind/moon/precip): W= 1-3mph, M= -3days first quarter, P= none

Start/End Time: 8:55 / 2:05 Start/End Temp: 75 / 73 Personnel: M. Malcosky, K. Tomasella

Net	# High	Length	Feature
A	3	6	road/woods
B	2	6	road/woods
C			
D			
E			
F			
G			

MAP:

See day 1

	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1													No captures
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

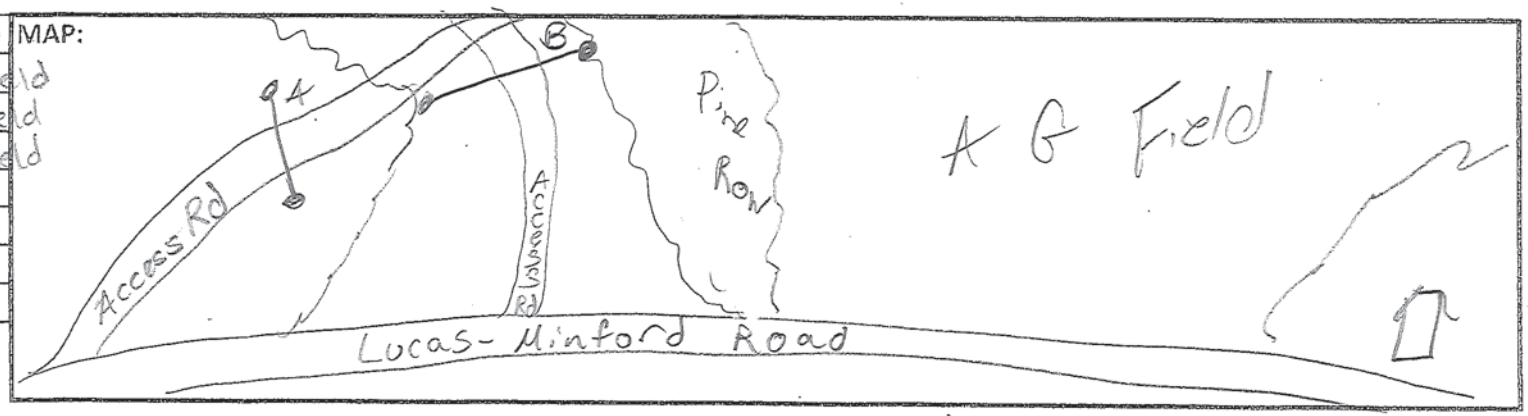
Date: 08-04-11 Project/Area: Portsmouth Bypass Site Name/County: #7, Scioto UTMs (E/N): -82.895995 / 38.8139 68

Location: Across across drive between fields and tree row Weather (wind/moon/precip): W-none, M=-2days first quarter, P=none

Start/End Time: 9:00 / 2:15 Start/End Temp: 80 / 68 Personnel: M Malcosky, K. Tamarello

Net	# High	Length	Feature
A	3	12	road/field
B	3	9	road/field
C	3	9	road/field
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	9:45	LABO	F-N/R	J	9	37	—	—	A	—	—	—	
2	2:15am	LABO	F-N/R	J	11.5	38	—	—	A	—	—	—	
3													
4													
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6													
7													
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9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 08-05-11 Project/Area: Portsmouth Bypass Site Name/County: #7, Scioto UTMs (E/N): -82.895995 / 38.863968

Location: Across access drive between fields and tree row Weather (wind/moon/precip): W=none, M=-1 day first quarter, P-gentle drizzle 11:20-12am cloudy

Start/End Time: 9:00 / 2:00 am Start/End Temp: 80 / 75 Personnel: M. Malcosky, K. Tomasello

Net	# High	Length	Feature
A	3	12	road/field
B	3	9	road/field
C	3	9	road/field
D			
E			
F			
G			

MAP:

See day 1

	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

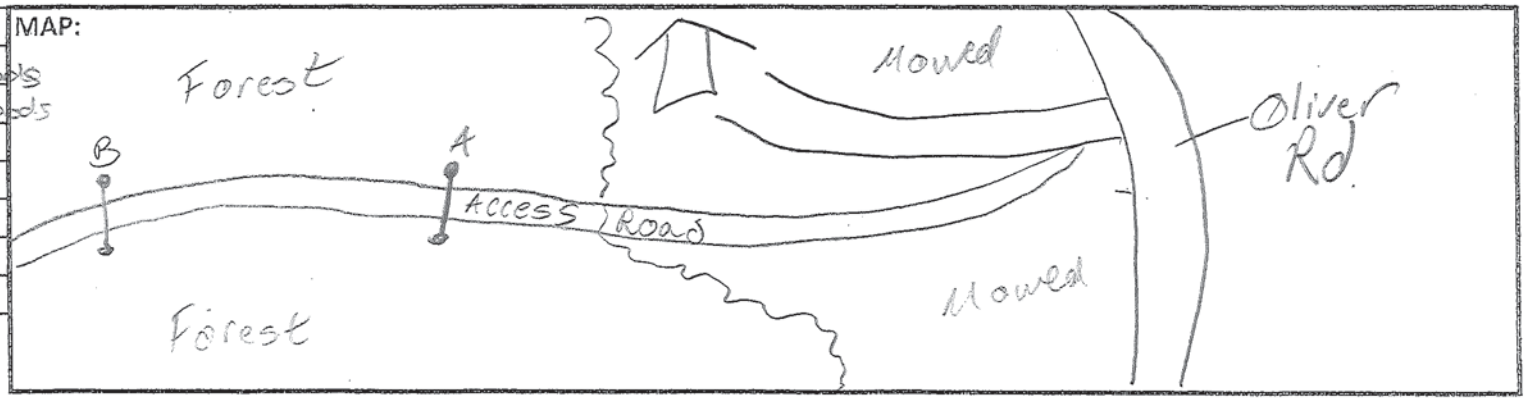
Date: 08-06-11 Project/Area: Portsmouth Bypass Site Name/County: #8, Scioto UTMs (E/N): -82.886930 / 38.857525

Location: Across ATV trails in woods Weather (wind/moon/precip): W=none, M= first quarter, P= none

Start/End Time: 9:50 / 2:10am Start/End Temp: 82 / 75 Personnel: M Malcosky, K Tomasello

Net	# High	Length	Feature
A	3	6	trail/woods
B	3	6	trail/woods
C			
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	9:00	LABO	F-NR	A	12	43	—	—	A	—	—	—	
2	9:05	LABO	F-NR	J	8.5	37	—	—	A	—	—	—	
3	12:30am	LABO	M-NR	J	9.5	39	—	—	A	—	—	—	
4	12:30am	LABO	M	—	—	—	—	—	A	—	—	—	escaped
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 08-07-11 Project/Area: Portsmouth Bypass Site Name/County: H8, Scioto UTMs (E/N): -82.886930 / 38.857525

Location: Across ATV trails in woods Weather (wind/moon/precip): W=0-3mph, M=1st first quarter, P=gentle drizzle from 12:35am to 12:50am

Start/End Time: 8:50 / 2:05 am Start/End Temp: 79 / 72 Personnel: M Malcosky, K. Tinsley

Net	# High	Length	Feature
A	3	6	trail/woods
B	3	6	trail/woods
C			
D			
E			
F			
G			

MAP:

See Day 1.

	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	10:24	LABO	F-N/R	J	12	43	—	—	A	—	—	—	Same size as capture from
2	1:25	LABO	F	—	—	—	—	—	A	—	—	—	escaped Previous night
3													
4													
5													
6													
7													
8													
9													
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11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

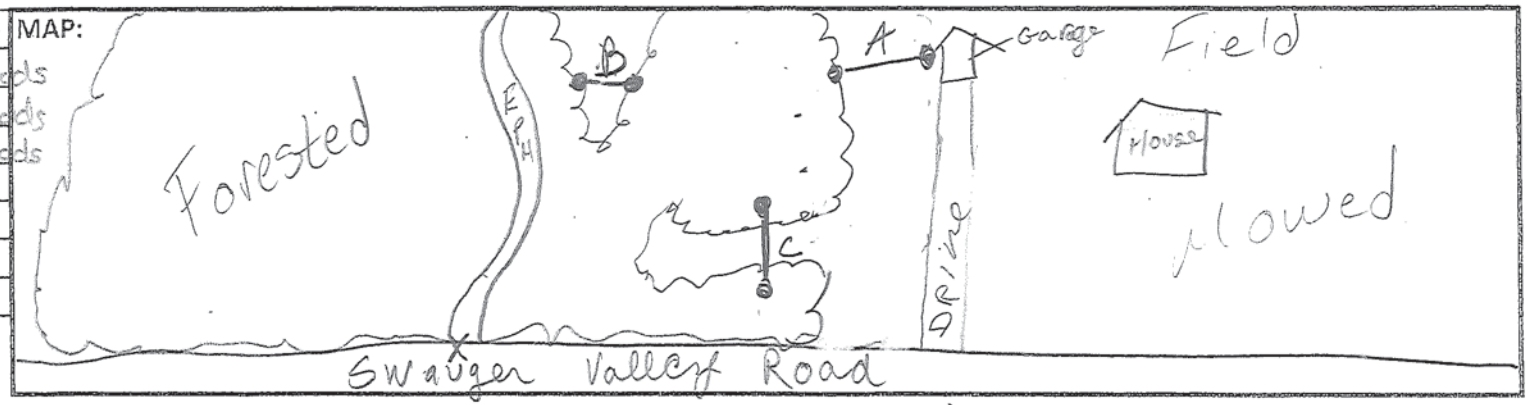
Date: 08-08-11 Project/Area: Portsmouth Bypass Site Name/County: #9, Scioto UTMs (E/N): -82.867287 / 38.848867

Location: Across driveway, clearing within woods Weather (wind/moon/precip): W=0-7mph, M=+2 first quarter, P=gentle drizzle from 12:00am to 12:30am

Start/End Time: 8:50 / 2:05 Start/End Temp: 73 / 71 Personnel: M. Malosky, K. Tomasello

Net	# High	Length	Feature
A	3	9	road/woods
B	2	6	road/woods
C	1	6	road/woods
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1													No captures
2													
3													
4													
5													
6													
7													
8													
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11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 08-09-11 Project/Area: Portsmouth Bypass Site Name/County: #9, Scioto UTMs (E/N): 382867287 / 38848867

Location: Across driveway, clearing within woods Weather (wind/moon/precip): W=0-5mph, M=+3 first quarter, P=gentle drizzle from 12:20am-12:30am

Start/End Time: 9:10 / 2:15 Start/End Temp: 77 / 75 Personnel: M. Malcosky, K. Tomastello

Net	# High	Length	Feature
A	3	9	road/woods
B	2	6	road/woods
C	1	6	road/woods
D			
E			
F			
G			

MAP:

See day 1.

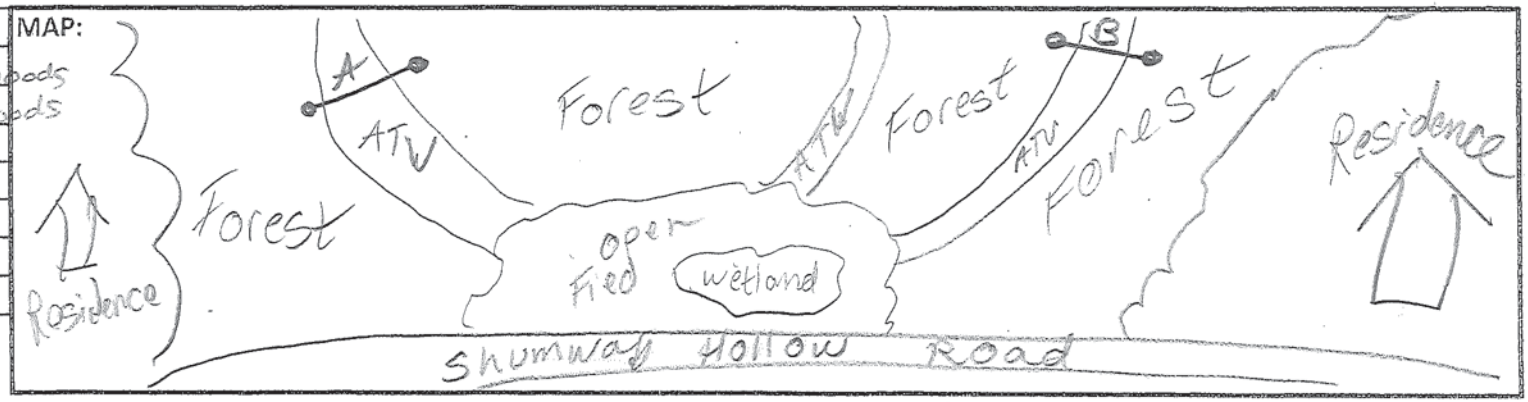
	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1													no captures
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 08-12-11 Project/Area: Portsmouth Bypass Site Name/County: #10, Scioto UTMs (E/N): -82.88853 / 38.83708 4
Location: Across road through woods Weather (wind/moon/precip): W= 1-3mph, M=-1full, P= none
Start/End Time: 8:50/2100 am Start/End Temp: 70 / 62 Personnel: M. Malcosky, T. Ater

Net	# High	Length	Feature
A	2	6	road/woods
B	2	6	road/woods
C			
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1													no captures
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 08-14-11 Project/Area: Portsmouth Bypass Site Name/County: #10, Scioto UTMs (E/N): -82.858753 / 38.837084

Location: Across road through woods Weather (wind/moon/precip): W=none, M=1/4 full, P=none

Start/End Time: ~~8:45~~/2:15 Start/End Temp: 70 / 63 Personnel: M. Malcos Ky, K. Tomasello

Net	# High	Length	Feature
A	2	6	road/woods
B	2	6	road/woods
C			
D			
E			
F			
G			

MAP:

See day 1.

	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	2:00pm	LABO	F-PR	A	15	43	—	—	A	—	—	—	
2													
3													
4													
5													
6													
7													
8													
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11													
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14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 08-13-11 Project/Area: Portsmouth Bypass Site Name/County: #11, Scioto UTMs (E/N): -82.852972 / 38.828371

Location: Across road and opening in woods Weather (wind/moon/precip): W=1-5mph, M=full, P=light rain 5:30-9:30pm

Start/End Time: 10:30/3:45 am Start/End Temp: 73 / 60 Personnel: M. Malcosky, T. Ater

Net	# High	Length	Feature
A	2	9	road/tunnel
B	3	9	road/woods
C			
D			
E			
F			
G			

MAP:

See day 2.

	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	11:10	LABO	M-A	A	9.5	40	—	—	A	—	—	—	
2	11:55	MYSE	M-A	A	6	33	—	—	A	—	—	—	
3													
4													
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16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

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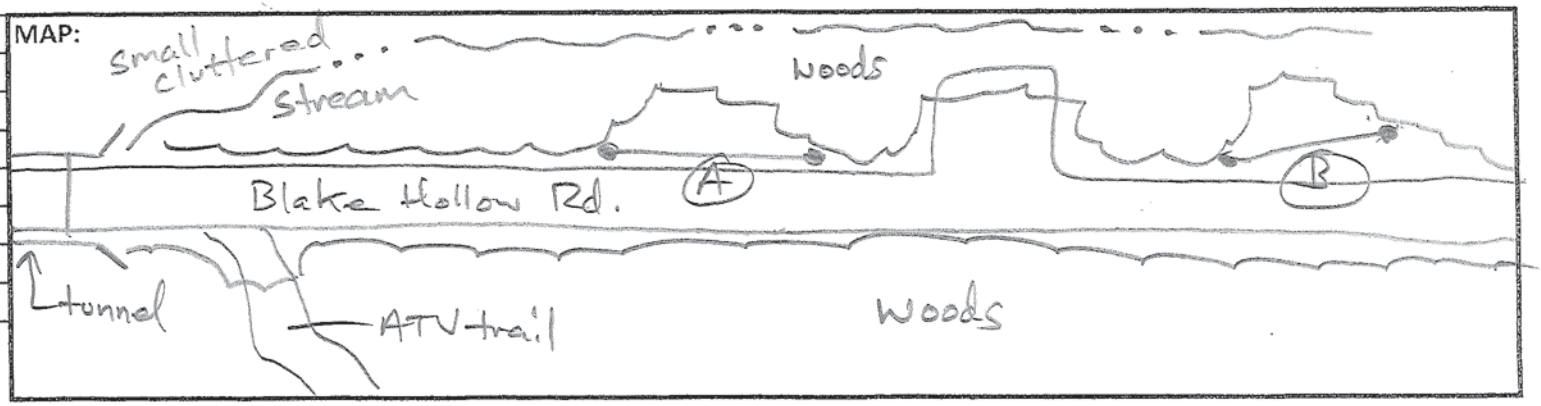
Date: 6/14/11 Project/Area: Portsmouth Site Name/County: #11 / Scioto UTMs (E/N): 0339068 / 4299384

Location: Blake Hollow Weather (wind/moon/precip): calm + clear

Start/End Time: 2100 / ____ Start/End Temp: 68° / 61° Personnel: G. Libby, J. Willaman

Net	# High	Length	Feature
A	2x	9m	gap
B	2x	6m	gap
C			
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	2130	LABO	F/N	A	10.7	41	0	DNB	A/T4	—	—	—	
2	2130	LABO	M/Scr	A	10.4	39	0	DNB	A/T6	—	—	—	
3													
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16													
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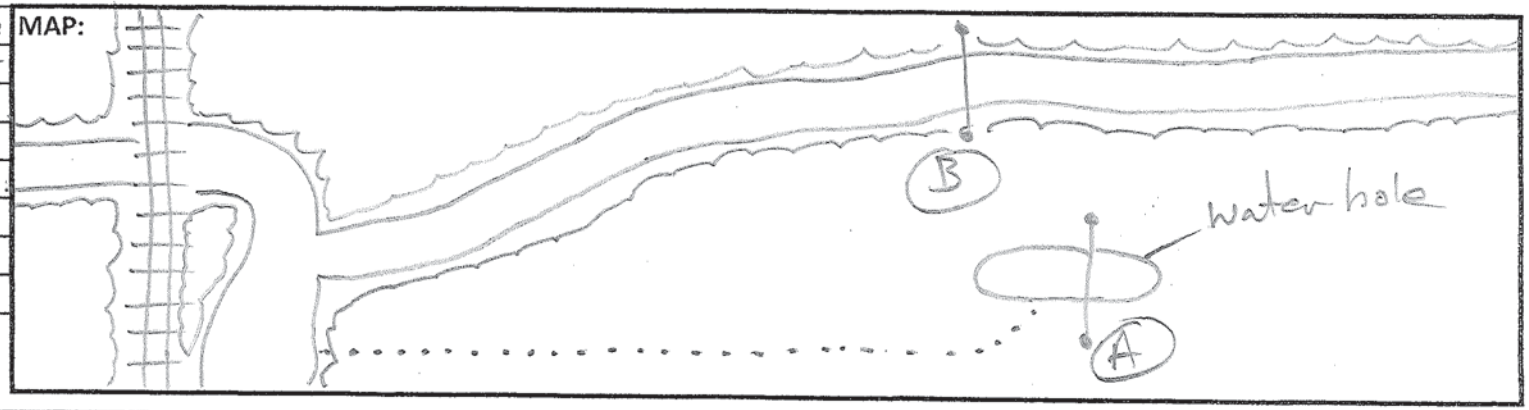
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 8/10/11 Project/Area: Portsmouth, OH Site Name/County: #12 / Scioto UTMs (17S E/N): 0339052 / 4298657
Location: W under RR tunnel @ 6117' SR 335 Weather (wind/moon/precip): calm / partly cloudy
Start/End Time: 2100 / 0200 Start/End Temp: 71°F / 60°F Personnel: G. Libby + K. Tomasello

Net	# High	Length	Feature
A	1x	6M	water
B	2x	2.6M	road
C			
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	alum. Band (Type/No.) ODNR	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	2100	MYSE	M/Scr	A	5.7	35	0	10847	A/T2	—	—	—	
2	2130	MYSE	F/N	A	6.7	36	0	10848	B/T3	—	—	—	
3	2130	MYSE	M/N	A	5.9	35	0	10849	B/T4	—	—	—	
4	000	MYSE	M/N	A	5.7	34	0	10850	B/T3	—	—	—	
5	100	MYSE	F/N	A	6.5	36	0	10831	B/T2	—	—	—	
6	140	MYSE	M/N	A	5.8	35	0	10832	B/T3	—	—	—	
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

175

Date: 8/11/11 Project/Area: Portsmouth, OH Site Name/County: #12 / Scioto Co. UTMs (E/N): 0339052 / 4298657

Location: W under RR tunnel @ 6117 SR 335 Weather (wind/moon/precip): cool + clear

Start/End Time: 2100 / 200 Start/End Temp: 65° / 55° Personnel: G. Libby + K. Tomasello

Net	# High	Length	Feature
A			
B			
C			
D			
E			
F			
G			

MAP:

See sketch from 8/10/11

plus additional 2x 6M on rd below RR tracks

(flying squirrel + 1 MYLU)

	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	alum. Band (Type/No.) ODNR	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	2220	LABO	M/N	A	9.6	41	0	22333	A/T2	—	—	—	
2	2340	MYSE	M/N	A	5.3	34	0	10833	B/T4	—	—	—	
3	2345	MYLU	M/N	A	6.8	36	0	10834	C/T6	—	—	—	
4													
5													
6													
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11													
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14													
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17													
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^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

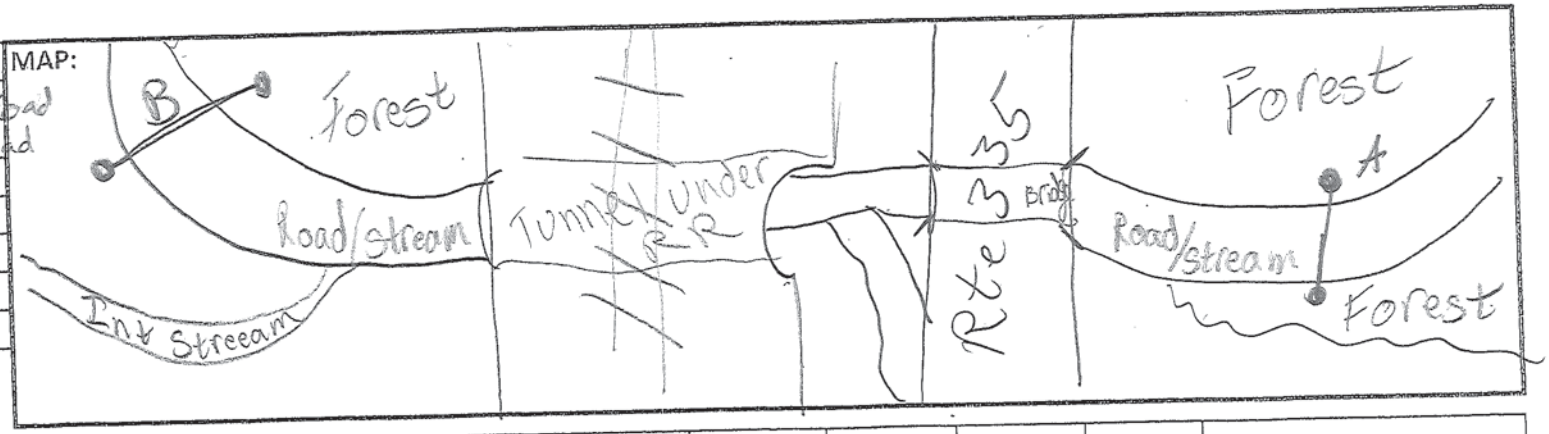
Date: 08-10-11 Project/Area: Portsmouth Bypass Site Name/County: #13, Scioto UTMs (E/N): 82857633 / 38816956

Location: Across shallow gravel stream/road under canopy Weather (wind/moon/precip): W=0-5mph, M=-3 full, P=none

Start/End Time: 9:00/2:30 Start/End Temp: 75 / 64 Personnel: M. Malcosky, J. Williamson

Net	# High	Length	Feature
A	2	6	Stream/road
B	2	6	Stream/road
C			
D			
E			
F			
G			

MAP:



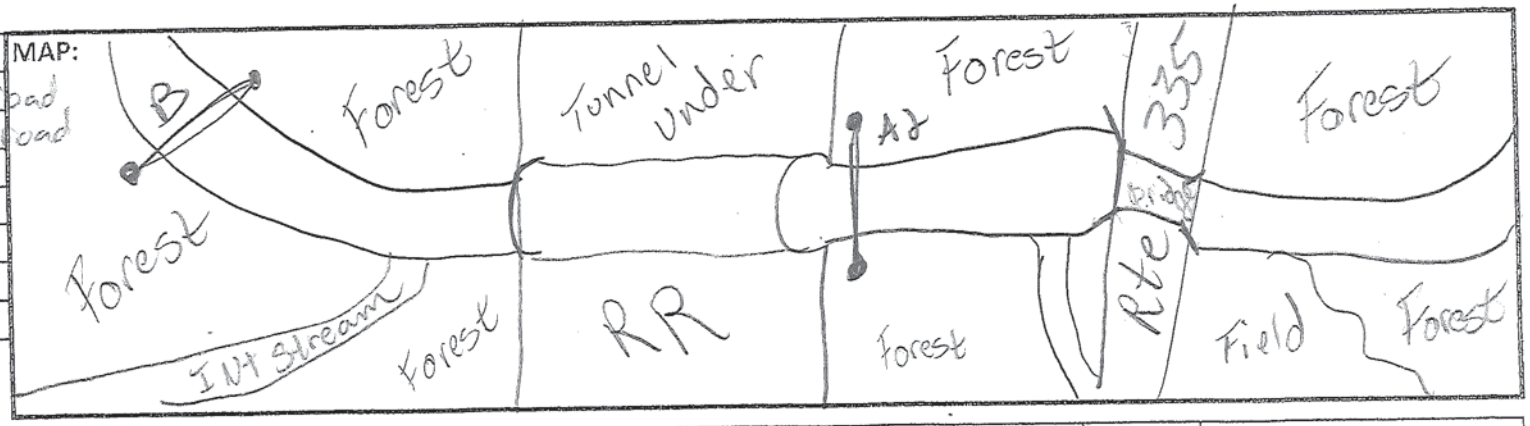
	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	9:15	LABO	F-NR	J	9	39	—	—	B	—	—	—	
2	9:15	LABO	F-	—	—	—	—	—	B	—	—	—	escaped
3	9:25	MYSE	M-A	A	7	33	—	—	B	—	—	—	
4	9:25	LABO	M-NR	A	11	39	—	—	B	—	—	—	
5	10:50	MYSE	M-A	A	7.5	33	—	—	B	—	—	—	
6	11:45	PESU	M-NR	J	9.5	33	2	—	B	—	—	—	Pin-sized holes
7	12:20	LABO	F-NR	J	11	42	—	—	B	—	—	—	
8	12:20	PESU	M-NR	A	7	36	—	—	B	—	—	—	
9	12:20	EPFU	M-A	A	17	45	—	—	B	—	—	—	
10	12:20	PESU	M-NR	J	6.5	33.5	—	—	B	—	—	—	
11	12:45	EPFU	M-A	A	16.5	45	—	—	B	—	—	—	
12	1:20	EPFU	M-A	A	16.5	44	—	—	B	—	—	—	
13	1:35	PESU	M-NR	J	6	32	—	—	B	—	—	—	
14	2:05	LABO	F-NR	J	12	41	—	—	B	—	—	—	
15	2:05	MYLU	M-A	A	7	34	—	—	B	—	—	—	
16	2:10	MYSE	M-A	A	6	34	—	—	B	—	—	—	
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 08-11-11 Project/Area: Portsmouth Bypass Site Name/County: #13 Scioto UTMs (E/N): 332557233 / 38.816958
Location: Across shallow gravel stream/road under canopy Weather (wind/moon/precip): W=0-5mph, M=2 full, P= none
Start/End Time: 9:45/2:15 Start/End Temp: 71 / 54 Personnel: M. Malosky, J. Willaman

Net	# High	Length	Feature
A	2	6	Stream/road
B	2	6	stream/road
C			
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	9:40	MYSE	M	A	6.5	34.5	—	—	A2	—	—	—	
2	9:50	MYSE	F	A	6.5	34.5	—	—	B	—	—	—	
3	10:45	EPFU	M	A	17	48.5	—	—	A2	—	—	—	
4	10:55	LACI	M	A	24.5	59	—	—	B	—	—	—	
5	10:50	LABO	F	J	14	40	—	—	B	—	—	—	
6	12:30	EPFU	M	A	15.5	45	—	—	A2	—	—	—	
7	12:30	LABO	-	—	—	—	—	—	A2	—	—	—	escaped
8	1:00	LACI	F	A	26	55	—	—	A2	—	—	—	
9	1:00	MYSE	M	J	6.5	33	—	—	B				
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 8/6/2011 Project/Area: Portsmouth Bypass Site Name/County: #14 Site UTMs (E/N): 17S0338327/ 4296298
Location: Stewart Ave, off Coriell Rd Weather (wind/moon/precip): 0 mph / Half Moon / None
Start/End Time: 2030/0200 Start/End Temp: 82° / 72° Personnel: Michael Whitby, J. Nawrocki

Net	# High	Length	Feature
A	2	9m	DRY STREAM
B	2	6m	DRY STREAM
C	1	5m	ATV TRAIL/ROAD
D			
E			
F			
G			

MAP:

	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height (tier)	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	21:03	MYSE	M/NR	A	5.25	33	0		A/1				
2	21:25	MYSE	M/NR	A	5.75	33	0		C/3				
3	21:36	MYSE	F/NR	A	6.0	35	0		B/3				
4	21:50	MYSE	M/NR	A	5.75	35	0		A/2				
5	22:40	MYSE	F/NR	A	7.0	35	0		B/2				
6	23:00	LABO	M						A/5				ESCAPED
7	00:55	LABO	M/NR	J	11.25	40	0		A/2				
8	00:55	MYSE	M/NR	A	5.5	34	0		A/1				
9	01:35	MYSE	M/NR	A	6.0	35	0		A/2				
10													
11	8-07	START			20:45	78°							
12												wind	1-3 mph (light breeze)
13	01:11	MYSE	F/NR	A	6.25	35	0		A/4			Precip	T-storm BY and after netting but no rain during
14													
15													
16												Moon	Half
17			END		02:00	68°							
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

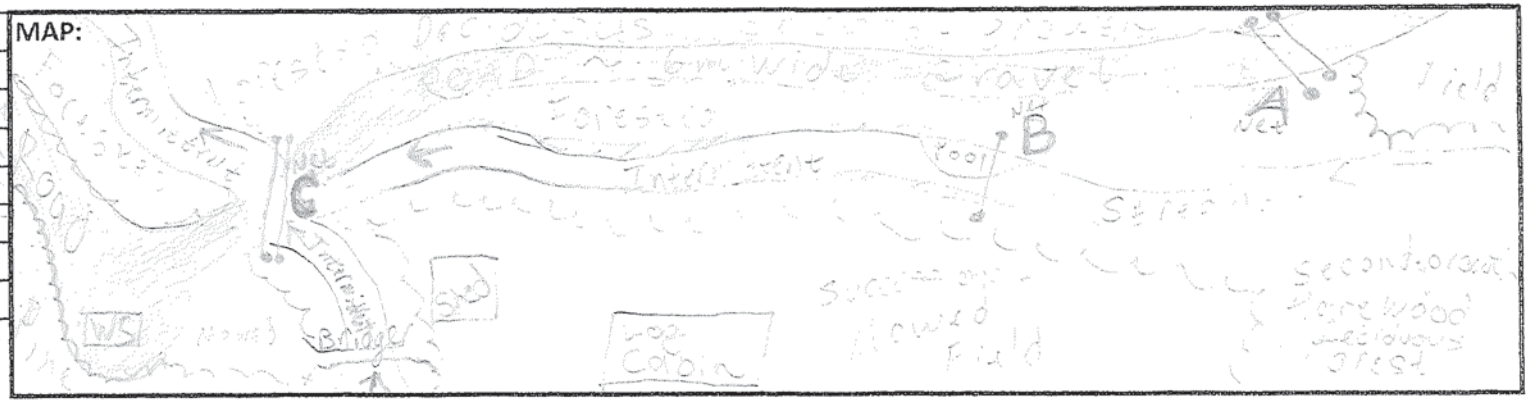
Date: 8-6-11 Project/Area: Portsmouth Bypass Site Name/County: Site 15 / Scioto UTMs (NAD83): -82.8623069 / 38.800329

Location: Stewart Ave. off Cor. Rd. Portsmouth Weather (wind/moon/precip): Partly Cloudy, Very Humid No Wind, ½ moon

Start/End Time: 8:45 / 2:00 pm Start/End Temp: 83°F / 73°F Personnel: J. Williamson & C. Libby

Net	# High	Length	Feature
A	2	6	Road
B	1	6	Stream
C	2	9	Stream
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	9:32	LABO	F-NR	J	11	39	0	—	C-T6	—	—	—	
2	9:55	MYSE	M-NR	A	6.5	37	0	—	C-T3	—	—	—	
3	10:01	PESU	F-NR	J	6	36	0	—	A-T2	—	—	—	
4	10:53	EPFU	F-NR	J	11.5	46	0	—	C-T4	—	—	—	
5	12:01	MYSE	M-NR	J	5.5	36	0	—	C-T3	—	—	—	
6													
7													
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11													
12													
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14													
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16													
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^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 8/7/11 Project/Area: Portsmouth OH Site Name/County: #15/Scioto Co. UTMs (E/N): -82.8623069 / 38.800329
Location: W of 4155/ Stewart Ave off Coriell Rd. Weather (wind/moon/precip): damp/calm
Start/End Time: 2100/0200 Start/End Temp: ~75°/~65° Personnel: G. Libby / J. Willaman

Net	# High	Length	Feature
A			
B			
C			
D			
E			
F			
G			

MAP:

See sketch from 8/6/11

	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	140	MYSE	M-NR	A	6.3	34.5	0	ODNR10R41	A/T3	—	—	—	guano
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

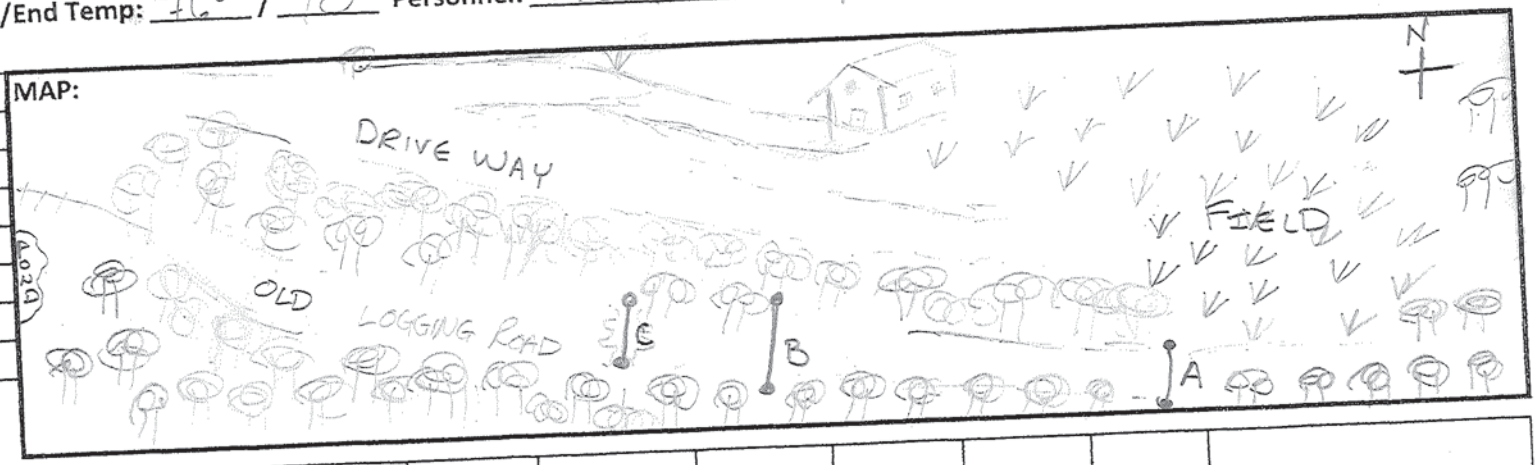
Date: 8/8/2011 Project/Area: Portsmouth Bypass Site Name/County: #16 UTMs (E/N): 5033720 / 4295305

Location: Hunts Point Lane Weather (wind/moon/precip): 1-3 / half moon / none - 2 temporary rain periods

Start/End Time: 2100/0232 Start/End Temp: 76° / 70 Personnel: Michael Whitby, J. N

Net	# High	Length	Feature
A	2	5.5m	logging road
B	2	6m	logging road
C	1	5m	road cut
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.) ODNR	Net / Height (tier)	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	0015	MYSE	M/NR	J	5.0	33	0	DNR 10830	A/8				left wing edge damage discoloration in membrane close to body
2	0030	MYSE	M/NR	A	5.5	34	1	ODNR 10829	B/5				
3													
4													
5	Day 2											MOON	3/4
6	8-09		START:		21:30	END:	02:30					WIND	-light (1-3
7			TEMP	74°F			6830					Precip	None
8													
9	2325	MYSE	M/NR	A	5.5	34	0	10828	B/3				
10	7340	EPFU	F/NR	A	17.25	47	0	22330	B/4				
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

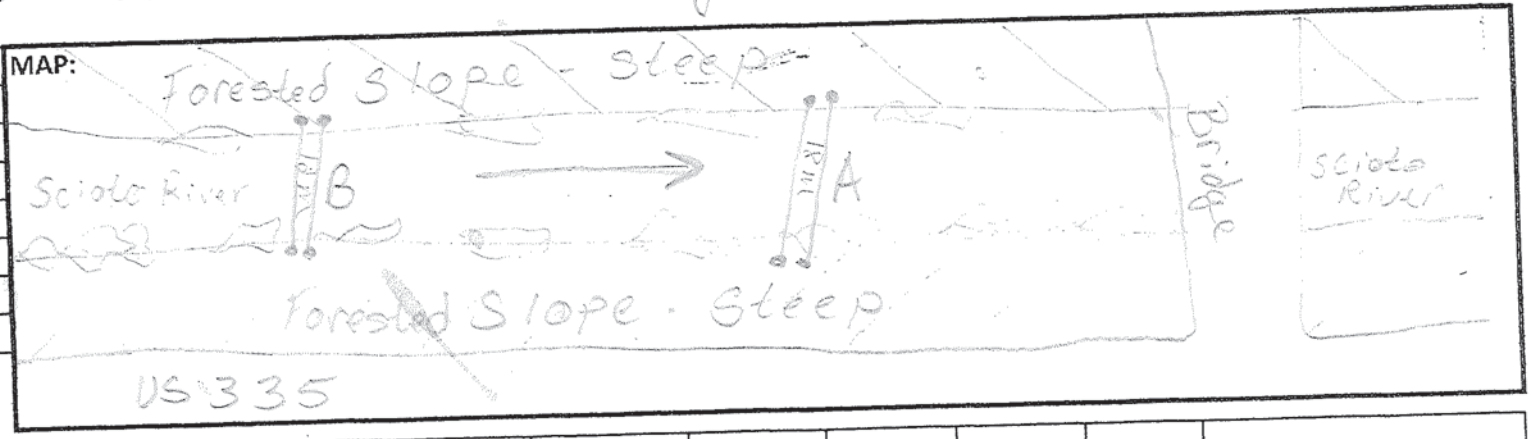
Date: 8-8-11 Project/Area: Portsmouth Site Name/County: #17 Scioto Co. (@ parking spot) UTMs (E/N): 38.77277 / 82.87666

Location: Scioto River Weather (wind/moon/precip): Humid, overcast

Start/End Time: 9pm / 2am Start/End Temp: 71°F / 66° Personnel: G. Libby / J. Williams

Net	# High	Length	Feature
A	2	18m	River
B	2	12m	River
C			
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	9:38pm	LABO	F-NR	A	16.7	40	1	ODNR22331	A-T3	—	—	—	
2	9:57pm	LABO	—	—	—	—	—	—	B-T5	—	—	—	Escaped
3													
4													
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14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

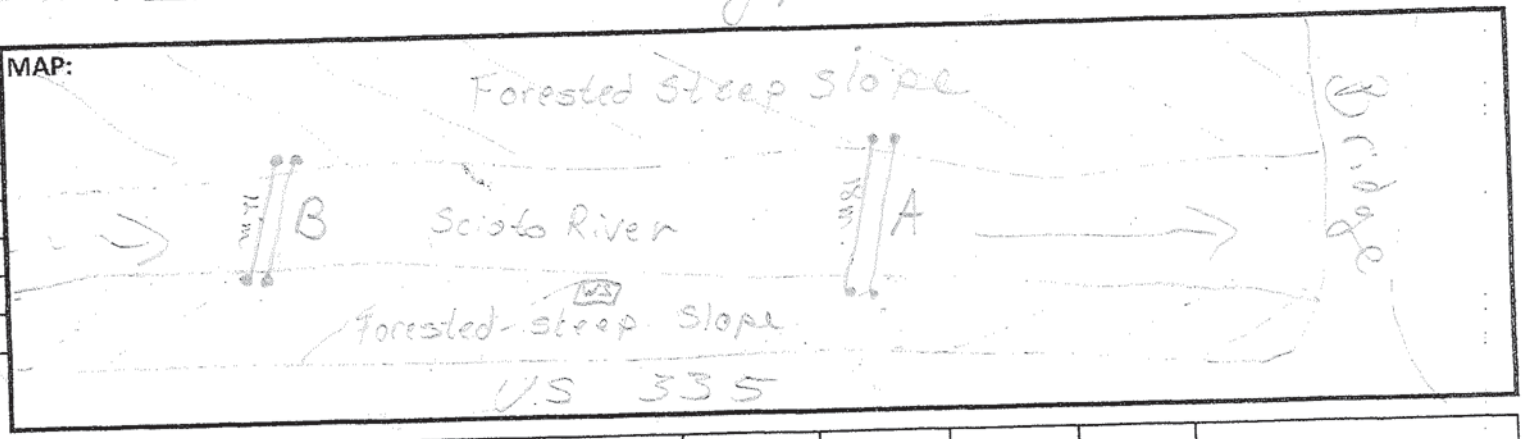
Date: 8-9-11 Project/Area: Portsmouth Bypass Site Name/County: #17/Scioto R. UTMs (E/N): 38.77277 / 82.87666 @ parking spot

Location: Scioto River Weather (wind/moon/precip): Clear

Start/End Time: 9pm / 2:30 am Start/End Temp: 79°F / 64° Personnel: G. Libby / J. Williams

Net	# High	Length	Feature
A	3	18m	River
B	2	12m	River
C			
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	9:10pm	EPFU	M-NR	A	10.5	44	0-P	ODNR 22330	A-T5	—	—	—	2 bedbugs on rt wing
2	10:49pm	LABO	—	—	—	—	—	—	A-T8	—	—	—	Escape ✓
3	12:15am	MYLU	F-NR	A	10.6	36	0	ODNR 109013	A-T3	—	—	—	Caught in Rain
4	12:15am	MYLU	M-NR	J	7.3	37	0	ODNR 109015	A-T4	—	—	—	Caught in Rain
5	1:28am	MYLU	F-NR	A	9.8	37	0	ODNR 109014	A-T3	—	—	—	
6	1:30	MYLU	M-NR	A	7.8	36.5	0	ODNR 109015	A-T7	—	—	—	
7	2:05am	MYLU	F-NR	A	7.4	37	0	ODNR 109216	A-T4	—	—	—	
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

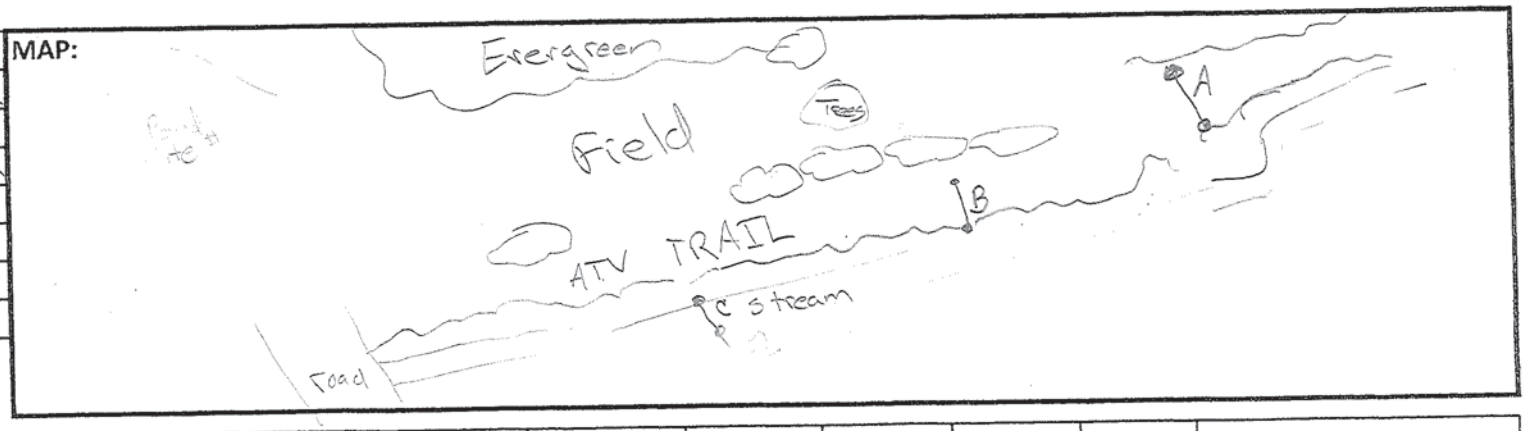
Date: 08-04-2011 Project/Area: Portsmouth, OH Site Name/County: 18 S, ~~to~~ UTMs (E/N): -82.87284971 38.755486

Location: North of Popular Dr. Weather (wind/moon/precip): 0 wind, No moon, No Precip

Start/End Time: 2045/0200 Start/End Temp: 80°F / 67°F Personnel: Michael Whitby, Julia Nawrocki

Net	# High	Length	Feature
A	2	6	ATV TRAIL
B	2	6	ATV TRAIL
C	1	2.6	Stream
D			
E			
F			
G			

MAP:



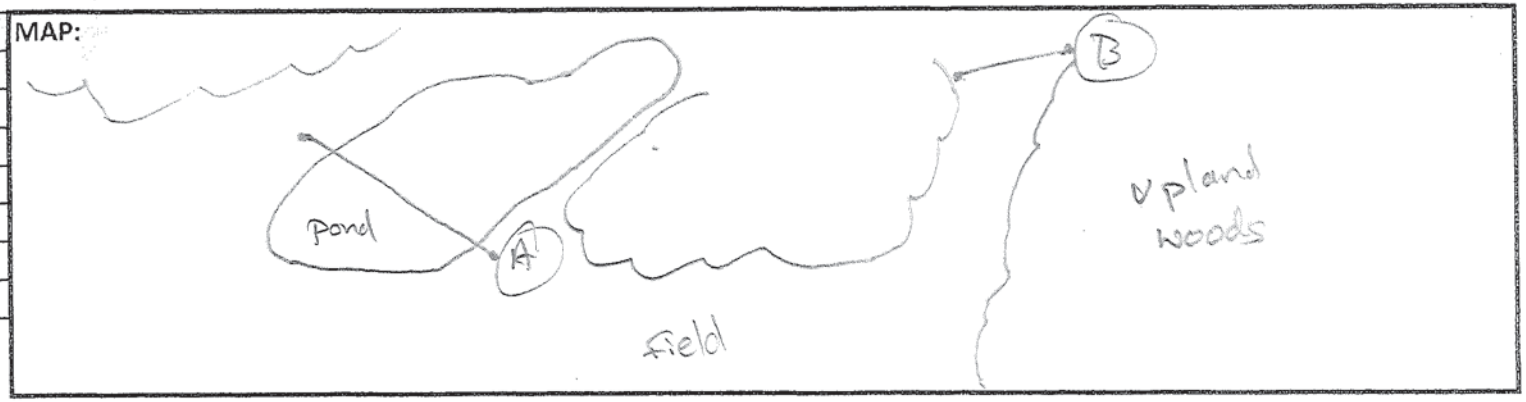
	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1		NO	CAPTURES										
2													
3													
4													
5													
6													
7													
8													
9													
10	NIGHT 2					8-05-2011							
11		start	20:30		END								
12	22:15	EPFU	F/NR	JV	18	47	0		B 4 tier				
13	22:17	EPFU	M/A	SCF	16.5	45	0		A 2 tier				
14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 8/4/11 Project/Area: Portsmouth OH Site Name/County: #19 / Scioto Co. UTMs (E/N): 82.87402 / 38.75541
Location: N of Hartladge Drive Weather (wind/moon/precip): warm / calm
Start/End Time: 2100 / 0200 Start/End Temp: 80°F / 68°F Personnel: G. Libby / J. Willaman

Net	# High	Length	Feature
A	x1	18 M	pond
B	x2	5M	road
C			
D			
E			
F			
G			

MAP:



	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	2140	EPFU	M/S	A	13.4	48.5	0	DNB	A/T2	N	N	—	
2	2140	EPFU	U	U	U	U	U	DNB	A/T2	N	N	—	escaped
3	2200	EPFU	M/N	A	17.2	44	0	DNB	A/T2	N	N	—	
4	2245	EPFU	F/N	A	21.8	49	0	DNB	A/T2	N	N	—	
5	2315	EPFU	F/N	A	16.2	48	0	DNB	A/T1	N	N	—	
6	2315	LABO	F/N	A	11.7	45	0	DNB	A/T2	N	N	—	
7													
8													
9													
10													
11													
12													
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14													
15													
16													
17													
18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage

Date: 8/5/11 Project/Area: Portsmouth OH Site Name/County: #19/Scioto Co. UTMs (E/N): 82.87402 / 38.75541
Location: N of Hartladge Drive Weather (wind/moon/precip): calm / clear
Start/End Time: 2045/0200 Start/End Temp: ~80° / ~65°F Personnel: G. Libby + J. Willaman

Net	# High	Length	Feature
A			
B			
C			
D			
E			
F			
G			

MAP:

See sketch from 8/4/11

	Time	Species	Sex / Reprod. Condn.	Age	Mass (g)	Forearm (mm)	Wing Condn.^	Band (Type/No.)	Net / Height	DNA Punch #	Hair Sample #	Trans. Freq.	Comments
1	2130	EPFU	U	U	U	U	U	DNB	A/T5	—	—	—	escaped
2	2245	EPFU	F/PL	A	17.2	46	0	DNB	A/T2	—	—	—	
3													
4													
5													
6													
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18													

^WING condn damage: 0=none; 1=less than 50% pigment loss; 2=greater than 50% scarring/splotching, holes <5mm; 3=holes ≥5mm, necrotic tissue, membrane loss; P=physical impact damage