time, these impacts are not prohibited under the ESA. If the tree clearing occurs prior to the final listing decision, as currently proposed, no further consultation with this office is required, relative to the northern long-eared bat. If the tree clearing does not occur until after a listing decision is made, further consultation with this office will be necessary.

Pursuant to section 7(a)(4) of the ESA, federal action agencies are required to confer with the Service if their proposed action is likely to jeopardize the continued existence of the northern long-eared bat (50 CFR 402.10(a)). Federal action agencies may also voluntarily confer with the Service if the proposed action may affect a proposed species. Nevertheless, species proposed for listing are not afforded protection under the ESA; however as soon as a listing becomes effective, the prohibition against jeopardizing its continued existence and "take" applies regardless of an action's stage of completion. If the federal agency retains any discretionary involvement or control over on-the-ground actions that may affect the species after listing, section 7 applies.

To determine if any other federally endangered, threatened, proposed or candidate species or their habitats exist in your area, please go to the Service's ESA Section 7 Technical Assistance website: http://www.fws.gov/midwest/endangered/section7/s7process/index.html. Here you will find species distribution lists by county, species life history (including habitat requirements), and recommended conservation measures.

If project plans change, if portions of the proposed project were not evaluated, or if additional information on listed or proposed species or their critical habitat becomes available, this finding may be reconsidered and it is our recommendation that you reinitiate coordination with this office. If you have questions, or if we can be of further assistance in this matter, please contact our office at 614-416-8993 or ohio@fws.gov. We recommend that the project be coordinated with the Ohio Department of Natural Resources due to the potential for the project to affect state listed species. Contact John Kessler, Environmental Services Administrator, at (614) 265-6621 or at john.kessler@dnr.state.oh.us.

Sincerely,

Jeromy Applegate

Acting Field Supervisor

cc: Nathan Reardon, ODNR-DOW
Jennifer Norris, ODNR-DOW

Pesi 556

MIST NET SURVEYS
ON AEP'S CONESVILLE FIVE POINTS AML RECLAMATION PROJECT, COSHOCTON COUNTY, OHIO

7 October 2014

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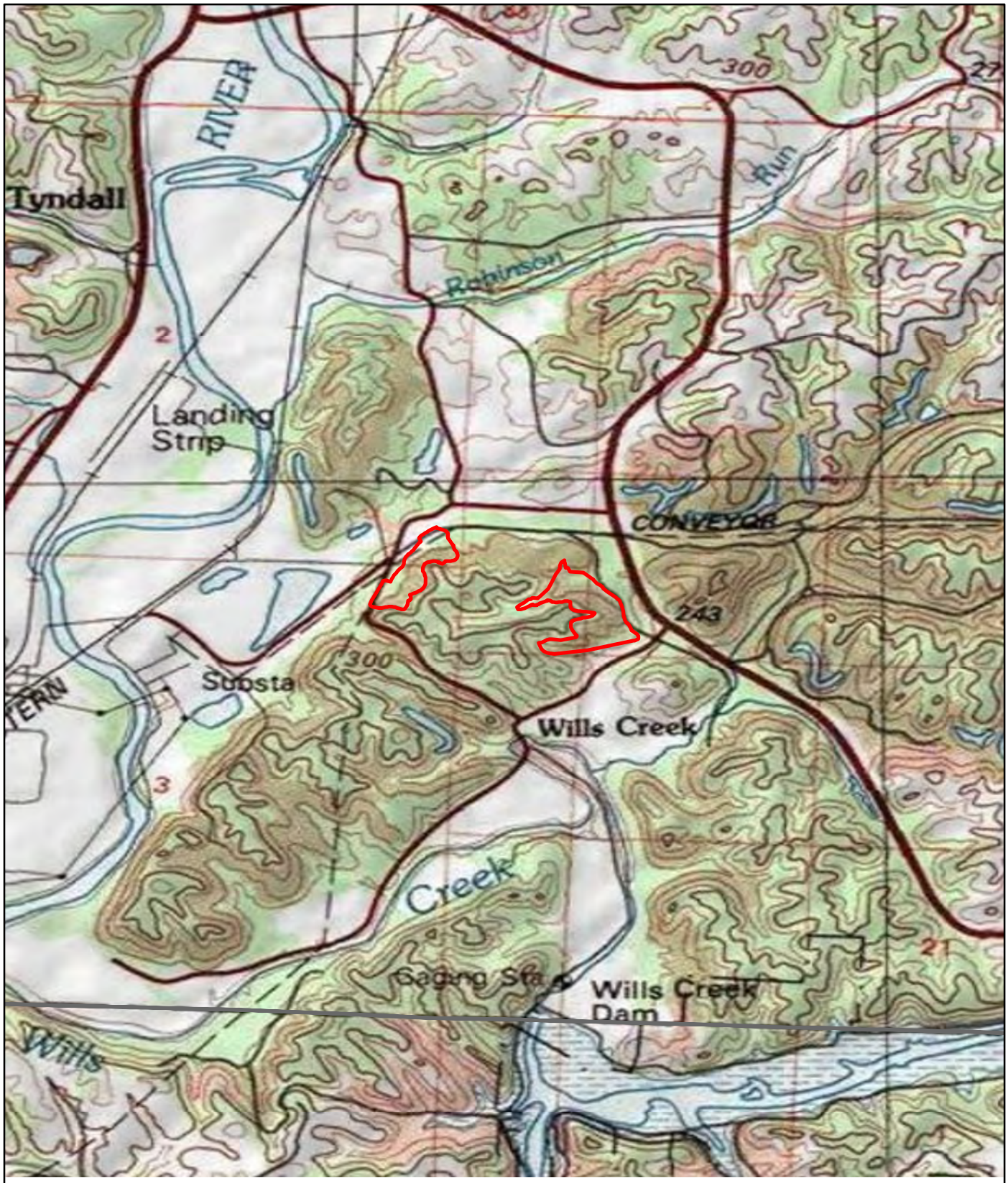
1.0 Introduction

AEP Generation Resources Inc. (AEP) proposes to begin efforts for new phases of the Conesville Five Points AML Reclamation Project (Project) in Coshocton County, Ohio (Figure 1). Project construction limits total 109 acres, divided into the eastern and western portions (referred to as Limits of Disturbance or LOD). AEP intends to use coal combustion residuals (CCRs) from the Conesville Power Plant near Conesville, Ohio to eliminate hazardous highwalls and acid mine drainage leftover from previous mining activity in the area. The goal of the Project is to restore the landscape of the subject Project area to its approximate original contours and reforest the reclaimed areas with vegetation native to the region while utilizing CCRs in a beneficial manner. The application for beneficial reuse of CCRs for the reclamation activities is under review by the Ohio Department of Natural Resources, Division of Mineral Resources Management (ODNR-DMRM). Prior correspondence with state and federal agencies determined endangered bat surveys are recommended before any reclamation efforts occur.

The Project is within the ranges of the federally endangered Indiana bat (*Myotis sodalis)* and the northern long-eared bat (*Myotis septentrionalis),* recently proposed for listing under the Endangered Species Act (ESA). Indiana and northern long-eared bats are "tree bats" in summer and "cave bats" in winter. The use of caves in winter for hibernation also includes spring staging and autumn swarming activities that are typically associated with hibernacula.

AEP contracted Environmental Solutions & Innovations, Inc. (ESI) to conduct mist net surveys and portal searches within the Project area. A presence/ probable absence mist net survey for the Indiana bat was conducted in order to maintain compliance with Section 7(a)(2) of the Endangered Species Act. This document contains the methods used to conduct, and results of the mist net surveys and portal searches.

Studies were carried out under ESI's USFWS Federal Fish and Wildlife Permit (TE02373A-7) and current Ohio Department of Natural Resources (ODNR) Wild Animal Permit: 17-48: Scientific Collection.



Limits of Disturbance (LOD)

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Figure 1. Location of the AEP Conesville Five Points AML Reclamation Project in Coshocton County, Ohio.

Project No. 556

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Base Map: USGS Topographic Map

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ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

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2.0 Ecological Setting

2.1 Indiana Bat (*Myotis sodalis*)

2.1.1 Description

The Indiana bat is a medium-sized bat in the genus *Myotis*. The forearm length has a range of 35 to 41 millimeters (1.4 – 1.6 in). The head and body length range from 41 to 49 millimeters (1.6 – 1.9 in). Its appearance most closely resembles that of congeners little brown bat (*M. lucifugus*) and northern long-eared bat (*M. septentrionalis*). Indiana bats differ from similar *Myotis* species in that they have a distinctly keeled calcar (cartilage that extends from the ankle to support the tail membrane). Other minor differences include smaller and more delicate hind feet, shorter hairs on the feet that do not extend past the toenails, and a pink nose. The fur lacks luster, and the wing and ear membranes have a dull, flat coloration that does not contrast with the fur (USFWS 2007). Fur on the chest and belly is lighter than fur on the back, but is not as strongly contrasting as that of similar *Myotis* species. Overall color is slightly grayer, while the little brown bat and northern bat are browner. The skull has a crest and tends to be smaller, flatter, and narrower than that of the little brown bat (USFWS 2007).

2.1.2 Status

The USFWS listed the Indiana bat as endangered on 11 March 1967. The most current range-wide estimate of the population is 534,239 individuals (USFWS 2013) which represents about 60 percent of the estimated population of 1960. Listing was based on long-term declines of winter populations across the range of the species, although population changes are best documented where the species was most abundant in Kentucky, Missouri, and Indiana (Brack et al. 1984, Johnson et al. 2002, Whitaker et al. 2002, Brack et al. 2003, Sparks et al. 2008), although such information has been acquired in most states since at least the 1990s. It is probable that habitat loss during summer (USFWS 2007) and winter disturbances during hibernation (Johnson et al. 1998) both contributed to the overall decline of the species.

The only official recovery plan for the species was completed on 14 October 1983. A revised draft was released in April 2007. Although widely used as a regulatory document, the 2007 version of the recovery plan has not been officially approved.

Critical habitat was designated on 24 September 1976, and includes 11 caves and 2 abandoned mines in Illinois, Indiana, Kentucky, Missouri, Tennessee, and West Virginia.

2.1.3 Regional Species Occurrence

Capture records of the Indiana bat summer non-reproductive occurrences have been documented in Coshocton County and four surrounding counties in Ohio (Knox, Guernsey, Holmes, and Tuscarawas counties). Additionally, there is evidence of reproduction and maternity colonies from Wayne County, Ohio to the north (ESI 2011) (Figure 2).

2.1.4 Ecology

The Indiana bat is a "tree bat" in summer and a "cave bat" in winter. There are four ecologically distinct components of the annual life cycle: winter hibernation, spring staging and autumn swarming, spring and autumn migration, and the summer season of reproduction. The U.S. Fish & Wildlife Service Recovery Plan (2007) provides a description of the life history. Figure 3 provides an annual chronology of seasonal activities.

2.2 Northern Long-Eared Bat (*Myotis septentrionalis*)

2.2.1 Description

The northern long-eared bat ranges from the northern border of Florida north and west to Saskatchewan and east to Labrador. This bat is common to a variety of forest types ranging from intact to small remnants. Although primarily an eastern species, the northern long-eared bat can be found as far west as Montana, and onto the High Plains.

The northern long-eared bat weighs about 5-8 grams (0.17-0.28 ounce) at maturity and its right forearm measures about 34-38 millimeters (1.3 – 1.5 inches). The wing membrane connects to the foot at the base of the first toe.

The northern long-eared bat is most easily characterized by the long ears (17 mm [0.7 in]), which extend past the muzzle when laid forward, as well as a long and thin tragus (9 mm [0.4 in]) (Whitaker and Mumford 2009). The northern long-eared bats' pelage is typically colored a light to dark brown on the dorsal side and a light brown on the ventral side (Caceres and Barclay 2000, Whitaker and Mumford 2009). Ears and wing membranes are usually a dark brown.

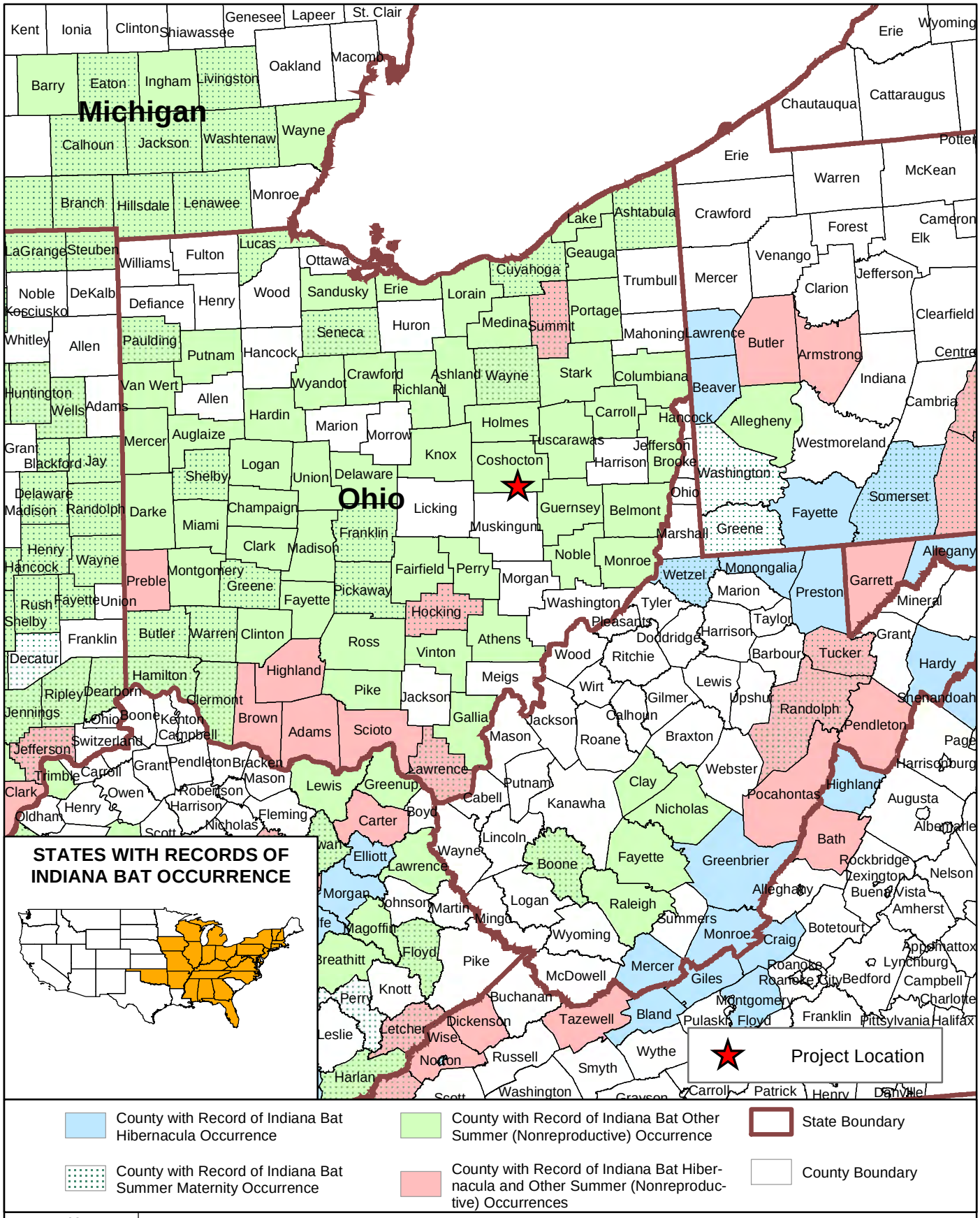

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Figure 2. Counties near the project area with hibernacula, summer maternity, and other summer (nonreproductive) records for the Indiana bat (*Myotis sodalis*).

Project No. 556

Sources: USFWS, Indiana Bat Revised Recovery Plan, Agency Draft, 2007. Updated January 2013

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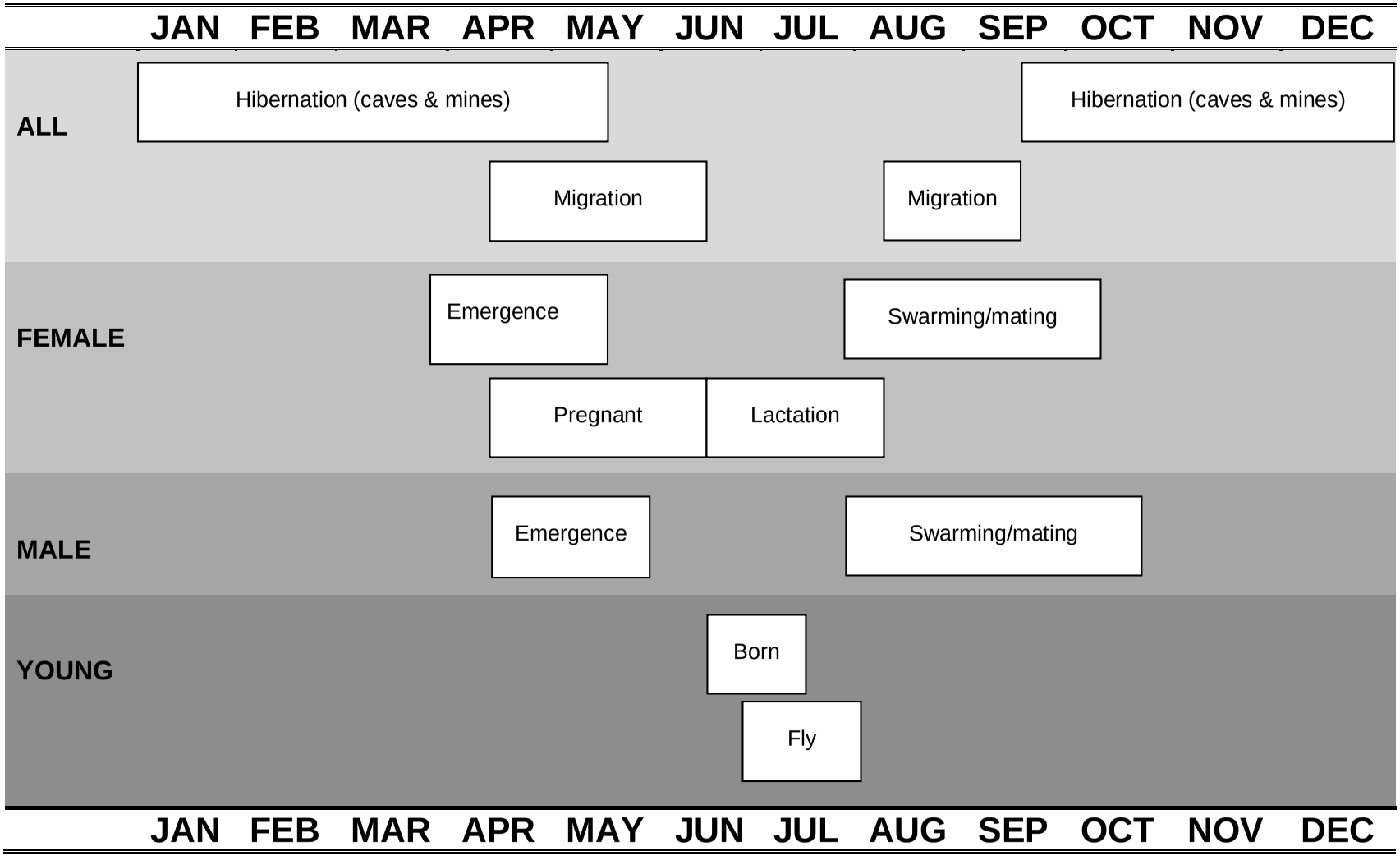


Figure 3. Seasonal chronology of Indiana bat activities.

2.2.2 Status

On 2 October 2013, the northern long-eared bat was proposed for listing by U.S. Fish and Wildlife Service (USFWS) as endangered under the Endangered Species Act (ESA) of 1973. Neither a recovery plan nor an evaluation of critical habitat is currently available.

> Federal Register Documents
>
> 78 FR 61045 61080; 2 October 2013: Proposed Listing: Endangered
> 76 FR 38095 38106; 29 June 2011: Petition to List as Threatened or Endangered

Using high-definition models of hibernacula counts the population decline for the species is 31 percent across New York, Pennsylvania, West Virginia, and Tennessee between 1999 and 2011 (Ingersoll et al. 2013). These data indicate that the decline associated with White-Nose Syndrome (WNS) is not the only conservation issue faced by this species. Hibernacula data from the Northeast indicate the decline is approximately, 93 to 98 percent since 2005 (Turner et al. 2011). Similarly, (Francl et al. 2012) reported a decline of 77 percent in capture rate, as well as indications of reduced reproductive success during the first 2 years of WNS infections in West Virginia.

2.2.3 Regional Species Occurrence

The range of the northern long-eared bat includes Ohio (USFWS 2014). During summer months, it is a common bat species captured during summer mist net surveys in upland woodlands. This bat can be found in many Ohio caves and often selects cracks or crevices during hibernation, but it is never observed in abundance. Although this species is rarely found in abundance during winter bat surveys, it is a common bat species captured at cave and mine entrances before and after winter hibernation. It is believed that these bats hibernate deep into caves and mines where temperatures are warm and stable (Brack et al. 2010). More information is needed on the location of its hibernation sites (Stihler 2013).

2.2.4 Seasonal Ecology

The northern long-eared bat is a "tree bat" in summer and a "cave bat" in winter. During the summer, the species is forest dependent. As with the Indiana bat, there are four ecologically distinct components of the annual life cycle: winter hibernation, spring staging and autumn swarming, spring and autumn migration, and the summer season of reproduction.

2.2.4.1 Winter Roosting Ecology

Northern long-eared bats primarily hibernate in caves and mines (Whitaker and Mumford 2009); however, the species has been known to use other man-made structures including a hydro-electric dam (Kurta and Teramino 1994). They are known to use cracks and crevices in caves and mines, evidenced by the presence of clay and

mud debris found on their fur during cave emergence (Caire et al. 1979, Whitaker and Mumford 2009).

The species selects areas within hibernacula that are relatively stable with a mean temperature of 9.1 Celsius (32 to 48 degrees Fahrenheit) (Brack 2007). Northern long-eared bats prefer high humidity conditions with little to no air flow (van Zyll de Jong 1979), allowing the build-up of water droplets on their fur (Barbour and Davis 1969).

2.2.4.2 Summer Roosting Ecology

The summer range of the northern long-eared bat is large and includes much of the eastern deciduous forestlands from the northern border of Florida north and west to Saskatchewan and east to Labrador (Caceres and Barclay 2000, Whitaker and Mumford 2009). Distribution throughout the range is not uniform, and summer occurrences are more common in the northern and northeastern portions of the species' range than in southern and western (Caceres and Barclay 2000, Amelon and Burhans 2006). Historically, these areas were primarily forested. Through the southern portions of their range, they appear to be less abundant, and are thought of as rare in Alabama, South Carolina, and Georgia (Mumford and Cope 1964, Barbour and Davis 1969, Amelon and Burhans 2006, Whitaker and Mumford 2009, Timpone et al. 2010). Although occasionally captured/recorded in western portions of their range, they are uncommon when records are compared to eastern areas, and may now occupy this area as a result of range expansion following settlement (Sparks et al. 2011).

When female northern long-eared bats emerge from hibernation, they migrate to maternity colonies. The distance traveled from winter hibernacula to summer roosting areas is not known. Maternity colonies are typically found in hollow trees and under bark although they sometimes use bat-houses, buildings, and other anthropogenic structures (Amelon and Burhans 2006) . After parturition, pups usually achieve volancy by 21 days (Kunz 1971, Krochmal and Sparks 2007). As the offspring become volant, average number of bats using a maternity roost declines (Lacki and Schwierjohann 2001, Sparks 2003). During the latter pattern bats from a colony may be spread amongst a greater number of roosts.

A wide variety of deciduous tree species, as well as occasional coniferous species, are used as nursery colonies indicating that it is tree form, not species that is important for roosts (Caceres and Barclay 2000, Carter and Feldhamer 2005). This species regularly uses both live and dead trees (Sasse and Pekins 1996, Foster and Kurta 1999, Carter and Feldhamer 2005). The northern long-eared bat may choose either tree condition, depending on the presence or availability within an area, or possibly due to competition with or predation from other wildlife (Perry and Thill 2007, Perry et al. 2007). Roost trees may be habitable for one to several years, depending on the species and condition of the tree. The species may also use several other structures

as summer roost sites. These can be natural or man-made (e.g. bridges, barns/homes, utility poles rocky cracks or crevices) (Cope et al. 1961, Barbour and Davis 1969, Cope et al. 1991, Sparks and Choate 1995, Caceres and Barclay 2000, Sparks and Choate 2000, Farrell Sparks et al. 2004, Whitaker et al. 2004). Northern long-eared bats make extensive use of bat-houses when these structures are available (Whitaker et al. 2006).

Some males and non-reproductive females remain near their winter hibernacula throughout summer while others migrate varying distances. This may be due to a preference for cooler environments in the absence of pups (Barbour and Davis 1969, Amelon and Burhans 2006). Males can be caught at hibernacula on most nights during summer, although there may be a large turnover of individuals between nights. Structurally, summer roosts used by males are similar to those used by maternity colonies.

3.0 Methods

3.1 Mist Netting

3.1.1 Site Selection

ESI conducted summer mist netting following guidelines contained in the USFWS 2014 *Range-wide Indiana Bat Summer Survey Guidelines*, Indiana Bat Recovery Team 2007 *Indiana Bat Draft Recovery Plan* (First Revision) Draft Survey Protocol, and USFWS 2014 *Northern Long-eared Bat Interim Conference and Planning Guidance* (Table 1).

ESI conducted surveys for **9 net nights** from 7 to 10 July 2014 to provide coverage of the proposed 109-acre Project area.

Site selection is based upon expectation of bat activity, maximizing coverage of the Project area. Mist net site selection also includes consideration of habitat characterization described in current literature, and ESI personnel's experience with the species. Habitat with the following characteristics is preferred: large trees (over 40 centimeters [16 in] diameter at breast height [dbh]) frequently used for maternity roosts, an open canopy (apparently important for warming roost sites), and an open, uncluttered understory used for traveling and foraging.

Table 1. USFWS Indiana and Northern Long-eared Bats Mist Net Survey Guidelines.

2014 NETTING GUIDELINES

Midwest and Ozark-Central Recovery Units (AL, AR, IA, IL, IN, GA, KY, MI, MO, MS, OH, OK, central & western TN, and Lee County, VA)

1. Netting Season: Broadly 15 May to 15 August, but 1 June to 15 August in Ohio.
2. Equipment (Mist Nets): constructed of the finest, lowest visibility mesh commercially available – monofilament or black nylon – with the mesh size approximately 1½ inch (1¼ –1¾) (38 mm).
3. Net Placement: mist nets extend approximately from water or ground level to tree canopy and are bounded by foliage on the sides. Net width and height are adjusted for the fullest coverage of the flight corridor at each site. A "typical" net set consists of three (or more) nets "stacked" on top of one another; width may vary up to 60 feet (20 m).
4. Net Site Spacing:
   - Linear Projects – minimum of 4 net nights per 0.6 mile (1 km); 1 net night = 1 net set deployed for 1 night
   - Non-linear Projects – minimum of 9 net nights per 123 acres (0.5 km)
5. Minimum Level of Effort Per Net Site:
   - At least 2 net locations (sets) per net site, with sets at least 100 feet (30 m) apart
   - At least 2 (calendar) nights of netting per net site
   - Maximum of 3 nights of consecutive netting at any given location; must change net locations or wait at least 2 calendar nights before resuming netting at same location
   - Sample Period: begin at dusk and net for 5 hours (approximately 0200h)
   - Nets are monitored at approximately 10-minute intervals
   - No disturbance near the nets between checks
6. Weather: Negative surveys combined with any of the following conditions throughout all or most of a sampling period are likely to require an additional night of mist-netting:
   - Precipitation (rain and/or heavy fog) lasting >30 minutes or continuing intermittently during the survey period
   - Temperatures <10°C (50°F)
   - Sustained wind >9 mi/hr (4 m/sec) (3 on Beaufort scale)

Source: U.S. Fish and Wildlife Service; 2014

3.1.2 Net Placement

Net placement is based upon canopy cover, presence of a flight corridor, water, and habitat conditions near the site. High nets, based on the system of Garner et al. (1989) and modifications by Brack (2004) were used in accordance with USFWS guidelines. Nets were set to maximize coverage of flight paths used by Indiana bats along suitable corridors. Riparian corridors often provide successful net sites; however, upland corridors (e.g. trails or logging roads) also provide suitable sites (Brown and Brack

2003). The location and orientation of each net is determined in the field (Figure 4). Table 2 provides coordinates for mist net sites.

Table 2. Mist net site GPS coordinates at the AEP's Conesville Five Points AML Reclamation Project in Coshocton County, Ohio.

Site	Net	Latitude	Longitude
East LOD	A	N 40° 11' 29.6"	W 81° 50' 44.3"
	B	N 40° 11' 28.9"	W 81° 50' 46.0"
	C	N 40° 11' 15.9"	W 81° 50' 35.0"
West LOD	D	N 40° 11' 36.9"	W 81° 51' 30.0"
	E	N 40° 11' 38.7"	W 81° 51' 26.4"
	F	N 40° 11' 39.9"	W 81° 51' 23.7"

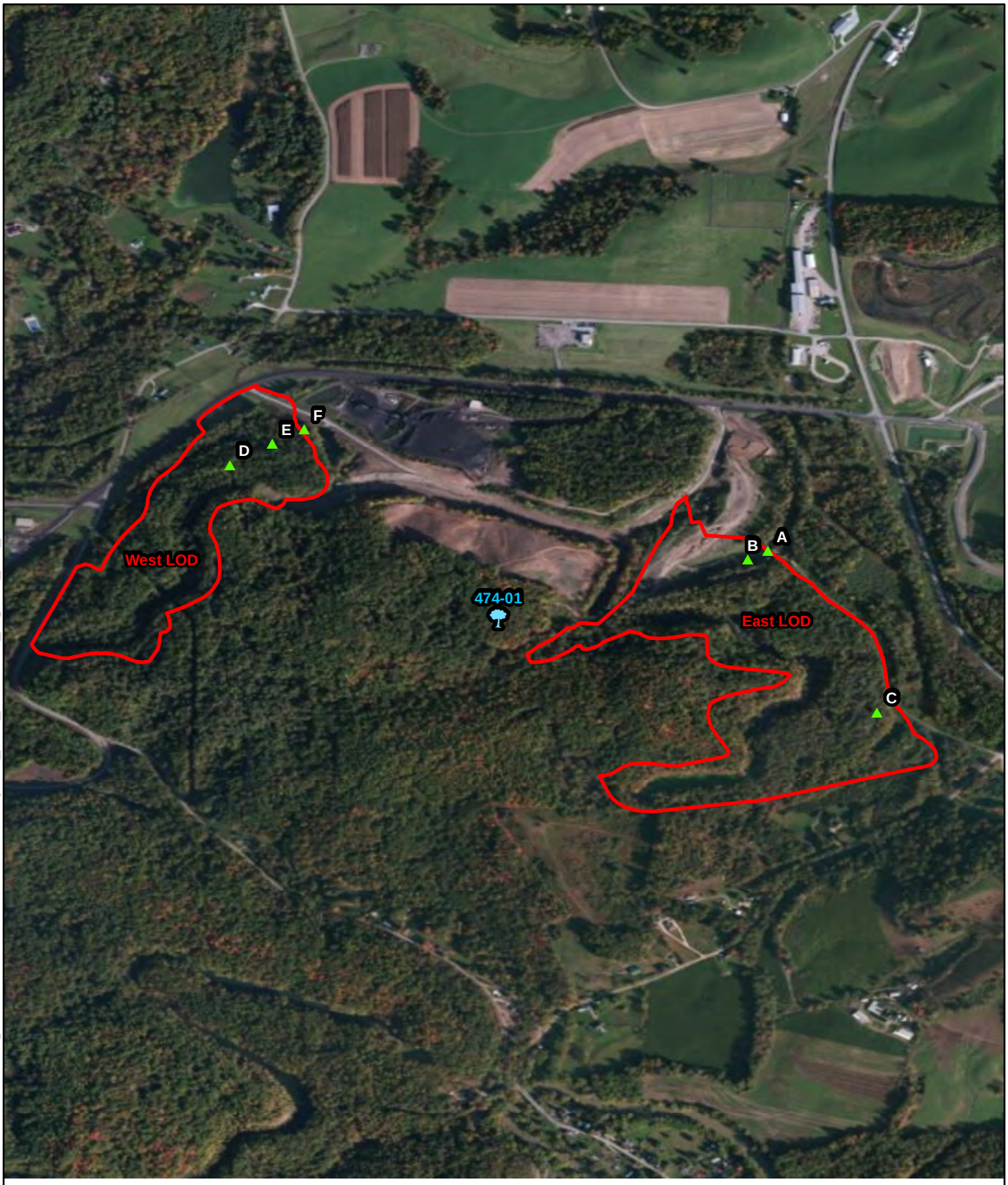
3.1.3 Bat Capture

The netting setup allows bats to be caught live and released unharmed near the point of capture. Bats are identified to species using a combination of morphological characteristics (e.g., ear and tragus, calcar, pelage, size/weight, length of right forearm, and overall appearance of the animal). The species, sex, reproductive condition, age, weight, length of right forearm, and time and location/net site of capture are recorded for all bats captured. Age (adult or juvenile) of bats is determined by examining ephiphyseal-diaphyseal fusion (calcification) of long bones in the wing. Weight is measured to 0.1 gram using a Pesola spring scale. Length of the right forearm of each bat is measured to at least the nearest 1.0 mm using either dial calipers or metric ruler. The reproductive condition of captured bats is classified as descended male (reproductive), non-descended male, non-reproductive female, pregnant female (based on gentle abdominal palpation), lactating female, or post-lactating female.

Bats were not banded. Bat processing and data collection was typically completed within 30 minutes of the time that the bat was removed from the net. Data sheets containing all bat capture data recorded in the field are provided in Appendix A.

3.1.4 White Nose Syndrome

In response to the current WNS issue, ODNR guidelines for WNS decontamination, containment, and avoidance are implemented in conjunction with the latest WNS protocols (currently White-Nose Syndrome Decontamination Protocol and Supporting Decontamination Documentation for Researchers), distributed by USFWS on 25 January 2011. An updated protocol is available from March 2012; however, it does not address summer studies. Wing damage is categorized using the Wing-Damage Index Used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome (Reichard 2008), as applied, tested, and evaluated by ESI on similar projects (Francl et al. 2011).



Net Site Roost Tree Limits of Disturbance (LOD)

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Figure 4. Mist net and roost tree locations on the AEP Conesville Five Points AML Reclamation Project in Coshocton County, Ohio.

Project No. 556

0 287.5 575 Meters

Base Map: Esri

ESI ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

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3.1.5 Habitat Characterization of Mist Net Sites

Habitat characterization at net sites focuses on features indicative of suitability for Indiana bats. A habitat description of each net site is completed (Appendix A). The emphasis of this description is habitat form: size and relative abundance of large trees and snags that potentially serve as roost trees, canopy closure, understory clutter/openness, distance to water, stream or pond characteristics (if a net is placed over them), and flight corridors. Habitat form is emphasized because the Indiana bat roosts in many tree species. Tree species composition is included because it provides insight to edaphic conditions of each site.

Habitat characterization identifies components of canopy and subcanopy layers. Trees that reach into the canopy are canopy trees, regardless of their diameter/size. As defined in the Indiana Bat Habitat Suitability Index Model (3D/Environmental 1995) dominant trees are the large trees in the canopy (over 40 centimeters [16 in] dbh). Current literature seems to suggest that these trees have the greatest likelihood of being used by bat maternity colonies. Many smaller trees are often also found in the canopy, and in some situations, the canopy can be entirely composed of small-diameter trees. ESI's habitat characterization identifies both dominant and subdominant elements of the canopy.

The subcanopy vegetation layer is well defined in classical ecological literature. It is that portion of the forest structure between the ground vegetation [to approximately 0.6 meter (2 ft) and the canopy layers, usually beginning at about 7.6 meters (25 ft)]. Vegetation in the understory may come from:

- Lower branches of overstory trees
- Young overstory trees
- Small trees and shrubs that are confined to the understory

The amount of vegetation in the understory is termed clutter. Many species of bats, including the Indiana bat, tend to avoid areas of high clutter.

Other site-specific parameters pertinent to assessing the quality of the habitat are also recorded, such as distance to water, stream habitat (if present), standing water in an upland site, and travel corridors (or lack thereof). Each net site is documented with a sketch (Appendix A).

3.1.6 Weather and Temperature

Weather conditions are monitored during mist netting to ensure compliance with USFWS mist netting guidelines (Table 1). Conditions recorded include temperature, wind speed, and percent cloud cover. A standard digital thermometer is used to record

temperature, wind speed is determined by use of the Beaufort wind scale, and cloud cover is estimated visually. Appendix A contains completed weather data sheets.

Temperatures in the study area were within acceptable limits based on USFWS guidelines. Survey temperatures ranged from 15.6° to 22.7° Celsius (60.1° – 72.9° F) during the survey period of 7 to 10 July 2014. Rain precluded netting on 7 July.

3.2 Radio-telemetry

3.2.1 Transmitter Attachment

After morphometric data was collected, endangered bats are fitted with 0.25-gram radio-transmitter (Holohil Systems Limited®, Ontario, Canada). Each transmitter has a unique frequency allowing for bats to be tracked individually and independently of one another. Transmitters are activated and tested before attachment to bats. A small interscapular area is trimmed of fur and the transmitter is attached to this area with non-toxic surgical adhesive. The adhesive degrades over time (typically 1 to 4 weeks) and the transmitter falls off the bat. Biologists record the transmitter weight, weight of the bat before and after transmitter attachment, and holding time. Bats are released unharmed near the points of capture. Bat Transmitter Data Sheets, included in Appendix A.

3.2.2 Diurnal Telemetry

To locate roosting bats, ESI tracks radio-telemetry signals using either a ®Wildlife Materials TRX-2000S PLL Synthesized Tracking Receiver, an ®Advanced Telemetry Systems, Inc. Model R2000 Scanning Receiver, or a ®Titley Australis 26k receiver with three-element folding Yagi directional antennas manufactured by either ®Wildlife Materials, Inc. or ®Titley Electronics, PTY LTD.

Beginning the day after bat capture and transmitter attachment, ESI biologists use telemetry to locate each bat's diurnal roost. Roost trees are identified to species and dbh is measured. The approximate height at which the bat is roosting and general condition of the roost tree (dead, live, dying, % bark cover, etc.) is noted. A description of habitat near the roost tree is recorded. Occasionally, Indiana and northern long-eared bats roost in man-made structures. Roosts are flagged or marked in an acceptable manner for ease of future identification. Coordinates of each roost are recorded with a GPS unit. When feasible, distances among roost trees and other notable landscape features are determined. Data sheets used to characterize roost trees and assess associated habitat are provided in Appendix A.

3.2.3 Emergence Counts

Emergence counts are completed to determine the number of bats emerging from each roost. Emergence counts are completed visually by a biologist while he or she is sitting near or under each roost tree. Bats are tallied only if emerging from a roost, not merely

flying in the vicinity. Beginning at sunset, counts lasted approximately 0.5 to 1 hour or until bats finished emerging and/or darkness precludes accurate counting. Emergence counts are performed on each identified roost tree for a minimum of 2 days. Direction of bat emergence (as feasible) and other behavior are noted on the Roost Emergence Data Sheets provided in Appendix A.

3.3 Portal Search

Underground voids may be used by bats for winter hibernation. Voids may be natural or man-made. In this portion of the country, the mining activity most likely to produce underground voids is coal extraction.

Field searches are conducted by teams of two individuals walking a grid pattern with approximately 45.7 meters (150 ft) between searchers. Biologists search not only for holes in hillsides, but also tailing, slag, benches, high-walls, seams, vents, drainage, and areas of auger activity that could indicate the potential presence of open mine portals. Portal search data sheets are provided in Appendix A.

4.0 Results

4.1 Mist Netting

4.1.1 Bat Capture

ESI conducted surveys at two net sites from 7 to 10 July 2014 to provide adequate survey coverage of the Project area. All nets were placed 70 to 80 meters (230 to 262 ft) apart along an access roads or a pond within the project LOD (Figure 4). Nine net nights were completed: 3 nets for 3 nights totaling 9 net nights. Twenty-one bats representing five species were captured including: 7 eastern red (*Lasiurus* borealis), 7 big brown (*Eptesicus* fuscus), 3 hoary (*Lasiurus* cinereus), 1 northern long-eared (*Myotis septentrionalis*), and 1 little brown (*Myotis lucifugus*) bats. One big brown bat and one eastern red bat escaped before processing could be completed. No currently listed endangered bats were captured; however, 1 northern long-eared bat, recently proposed for listing under the ESA, was captured (Table 3, Figure 5). All bats captured were released without harm. Bat capture data from all nights of netting are included in Appendix A.

4.1.2 Occurrence by Sex and Age

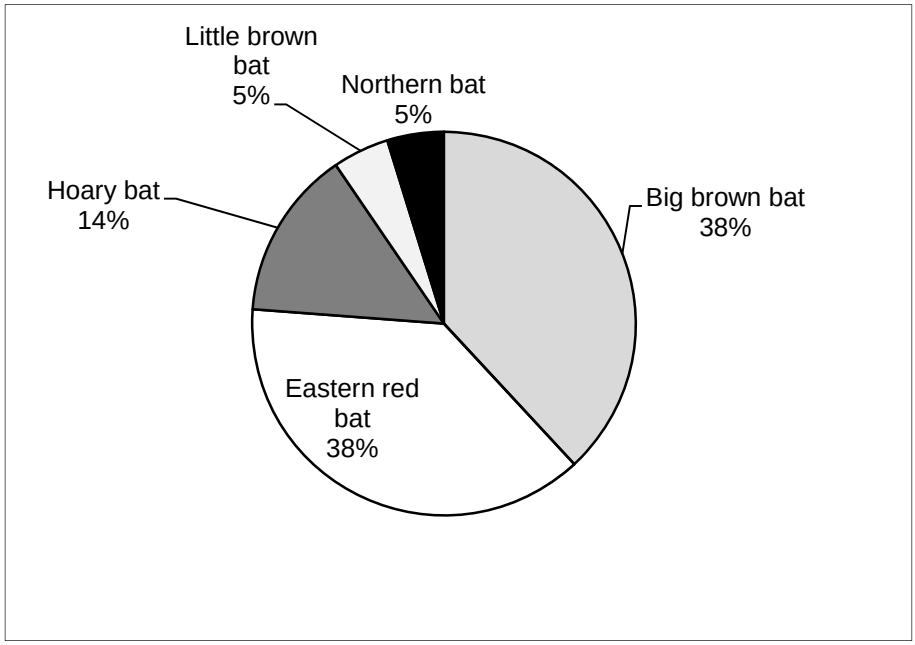
Most bats captured were adults (two juveniles were captured) and there were almost even captures of females and males, females (n = 8, 42.1%) and males (n = 11, 57.9%). Evidence of reproduction was found in four of the five species.

Table 3. Bat capture by sex, reproductive condition, and age at the AEP Conesville Five Points AML Reclamation Project in Coshocton County, Ohio.

Species	Adult Male	Adult Female[1] L	Juvenile Female	Escape[2]	Total
Big brown bat	7			1	8
Eastern red bat	3	3	1	1	8
Northern bat	1				1
Hoary bat		3			3
Little Brown Bat			1		1
Total	11	6	2	2	21

[1] L = Lactating
[2] Escape = Escaped from net before processing was complete

Figure 5. Percent bat capture at the AEP Conesville Five Points AML Reclamation Project in Coshocton County, Ohio.



4.1.3 White Nose Syndrome Scores

Approximately three-quarters of bats captured did not exhibit signs of WNS wing damage (i.e., Wing Index Scores were 0). The remaining 25 percent (*n*=5; big brown bats) of the 19 total bats captured and inspected received Wing Index Scores of 1 (minor damage).

4.1.4 Habitat Characterization of Net Sites

Mist net sites were placed in forested areas, across roads, or near/over ponds within the LOD based upon potential suitability for Indiana bat use. The existing trails provide suitable fly-way for bats, also ponds provide suitable foraging habitat. A habitat characterization of the immediate area surrounding net sites was conducted to gain a generalized view of the available habitat near the Project area (Table 4).

Canopy closure for the eastern LOD is ranked as open at the site whereas the subcanopy is characterized as moderately closed and is composed of saplings, shrubs, and lower branches of canopy trees. Dominant tree species at the site include sugar maple (*Acer saccharum*), American sycamore (*Platanus occidentalis*), and tulip poplar (*Liriodendron tulipifera*). White oak (*Quercus alba*), sweetgum (*Liquidambar styraciflua*), and big tooth aspen (*Populus grandidentata*) are the subdominant canopy tree species. The subcanopy is primarily composed of black locust (*Robinia pseudoacacia*), white ash (*Fraxinus americana*), and common spicebush (*Lindera benzoin*). Canopy and subcanopy closure for the western LOD is ranked as moderately closed and is composed of saplings, shrubs, and lower branches of canopy trees. Dominant tree species at the site include white ash, big tooth aspen, and American sycamore. black cherry (*Prunus serotina*), red maple (*Acer rubrum*) and sugar maple comprise the subdominant canopy tree species. The subcanopy is primarily composed of red maple, black cherry, and black locust.

Unnamed ponds are the closest water sources to the sites, with the east LOD net sites positioned on the pond or next to the pond, and the west LOD net sites approximately 90 meters (295 ft) away from a pond. The approximate elevations of the three nets within the eastern LOD ranged from 253 to 256 meters (830 to 839 ft) above mean sea level, and the western LOD nets ranged from 255 to 270 meters (838 to 887 ft). Appendix A contains Net Site Habitat Description data sheets. Appendix B provides net site photographs.

4.2 Radio-telemetry

One adult male northern long-eared bat was captured (Table 5) and radio tagged. This bat was tracked to a single roost tree between 11 and 17 July 2014.

4.2.1 Bat 474

Bat 474 was a non-reproductive male captured at 0152 h on 10 July 2014 at net E on the western LOD. It was caught in a 9-meter wide by 9-meter high mist net set across a maintained well pad assess road through a wooded lot. Bat 474 was tracked for seven days; however, the tracking efforts were not successful on the 6th and 7th days. Despite efforts to locate the bat, radio signals were no longer received on day 6 and 7. Roost tree data provided herein are the results of 5 successful telemetry survey days.

Table 4. Habitat characteristics of the mist net survey sites at the AEP Conesville Five Points AML Reclamation Project in Coshocton County, Ohio.

Site	Water Source		Tree Species			Canopy Closure	Clutter		Roost Tree		Habitat	Herb.
	Name	Distance (m)	Dominant Canopy	Subdominant Canopy	Subcanopy		Rating	Composition	Potential	Composition	Type	Cover
East LOD	Unnamed Pond	0	*Liriodendron tulipifera, Acer saccharum, Platanus occidentalis*	*Quercus alba, Liquidambar styraciflua, Populus grandidentata*	*Robinia pseudoacacia, Fraxinus americana, Lindera benzoin*	O	M	Saplings, Shrubs, Lower branches of canopy trees	H	Snags	YU, YL, RL, FE, settling pond	D
West LOD	Unnamed Pond	90	*Fraxinus americana, Populus grandidentata, Platanus occidentalis*	*Prunus serotina, Acer rubrum, Acer saccharum*	*Acer rubrum, Prunus serotina, Robinia pseudoacacia*	M	M	Saplings, Shrubs, Lower branches of canopy trees	M	Large trees, Snags	YU, YL, RL, FE, settling pond	D

Tree Species: red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), common spicebush (*Lindera benzoin*), sweetgum (*Liguidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), American sycamore (*Platanus occidentalis*), big tooth aspen (*Populus grandidentata*), black cherry (*Prunus serotina*), white oak (*Quercus alba*), black locust (*Robinia pseudoacacia*)

Canopy/Subcanopy Closure: M = Moderate; O = Open

Roost Potential Rating: M = Moderate; H = High

Habitat Type: YU = Young Upland Forest; FE = Forest Edge; YL = Young Lowland Forest; RL = Recently Logged Forest

Herb (Herbaceous) Cover: D = Dense

The bat was fitted with a 0.25-gram transmitter (172.474 MHz) and released near the capture site at 0225 h. The bat was not banded, was released by hand and flew to the west in the direction of the woodlot. A bat transmitter data sheet is provided in Appendix A, photographs are in Appendix B.

Table 5. Northern long-eared bat capture and radio-tag information at the AEP Conesville Five Points AML Reclamation Project in Coshocton County, Ohio.

Bat Number	Date Captured (July 2014)	Time	Net	Sex[1]	Age[2]	Reproductive Condition[3]	Weight (g)	RFA (mm)	Transmitter Frequency
474	10	0152	E	M	AD	NR	6.3	35.5	172.474

[1] M = Male
[2] AD = Adult
[3] NR = Non-reproductive

4.3 Roosts

The radio-tagged northern long-eared bat was tracked to the roost daily when the transmitter was operational. The location of the roost tree identified during radio-telemetry studies is shown in Figure 4. One roost tree, a partially dead sugar maple, was identified outside the LOD for this project. The tree exhibited 5 percent exfoliating bark. Canopy closure at the roost was 100 percent (completely closed). The roost tree used by the radio-tagged bat and days the bat was found in the tree were recorded (Table 6). Emergence counts were completed in duplicates (at minimum) at the roost tree (Table 7). A photograph of the roost tree is provided in Appendix B.

4.3.1 Bat 474

Daytime roost searches for bat 474 were conducted from 11 to 17 July 2014; however, due to transmitter malfunction, roost trees were not located after 16 July. Bat 474 used one roost tree over five days of successful tracking (Figure 4). Table 6 shows the chronology of the roost tree used by Bat 474 during the study and Table 7 shows emergence counts for the tree. Bat 474 roosted in the partially dead sugar maple on both nights of emergence counts. The tree was 35.9 centimeters (14.1 in) dbh with 5 percent exfoliating bark, and the bat roosted at approximately 7 meters (23 ft) from the ground.

Table 6. Daily location of the northern long-eared bat in the roost tree for the AEP Conesville Five Points AML Reclamation Project in Coshocton County, Ohio.

Date (July 2014)	Bat 474
10	Captured
11	474-01
12	474-01
13	474-01
14	474-01

Date (July 2014)	Bat 474
15	474-01
16	Transmitter Fouled
17	Transmitter Fouled

Table 7. Emergence counts for northern long-eared bat roost on the Conesville Five Points AML Reclamation Project in Coshocton County, Ohio.

Date (July 2014)	474-01	Total # of Bats in All Roosts
11	1	1
12	1	1

NOTE: Bat 474 was in the roost tree on both dates of the emergence survey

4.4 Emergence Counts

Visual observations of trees at dusk were completed to determine whether bats were leaving the identified roost tree. On each night of emergence count sampling, a biologist observed bat activity at roost tree 474-1. Emergence counts were conducted on 11 and 12 July and a single bat was observed emerging from the roost tree (Table 7)

4.5 Portal Searches

Portal searches were conducted on 13, 17, and 18 July 2014. During the survey, evidence of mining was present in both LODs, though no portals were found. Portal search datasheets are provided in Appendix A.

5.0 Discussion and Conclusion

Mist netting efforts completed for this Project complied with the guidelines contained in the USFWS 2014 *Range-wide Indiana Bat Summer Survey Guidelines*, Indiana Bat Recovery Team 2007 *Indiana Bat Draft Recovery Plan* (First Revision) Draft Survey Protocol, and USFWS 2014 *Northern Long-eared Bat Interim Conference and Planning Guidance* to survey summer habitat for the presence/absence of the federally endangered Indiana bat and proposed listed northern long-eared bat.

Netting provided no evidence that currently listed federally endangered bats use the Project area. Twenty-one bats representing five species were captured and identified over 9 net nights. The majority (76%) of bats captured in the Project area were big brown and eastern red bats (38% respectively), which are common members of the

regional chiropterofauna and are frequently captured by ESI while mist netting in forested areas of eastern Ohio. No currently listed endangered bats were captured.

One northern long-eared bat, recently proposed for listing under the ESA, was captured during survey efforts. A radio transmitter was attached to the northern long-eared bat and one roost tree was identified during telemetry studies. The roost tree was outside the Project area and during two days of emergence surveys, the radio-tagged bat was the only individual seen emerging from the tree.

Portal searches were conducted by ESI. Field pedestrian searches revealed evidence of mining throughout the entirety of the project but no potential portals were located. Due to the lack of Indiana bat captures and lack of suitable hibernating habitat, ESI and AEP request concurrence from USFWS that the proposed Project is not likely to adversely affect Indiana bats. ESI further requests that AEP be allowed to remove trees immediately and during any time of year, for the next two years.

6.0 Literature Cited

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APPENDIX A
COMPLETED DATA SHEETS

2014

Property of: Environmental Solutions & Innovations, Inc.
4525 Este Avenue. Cincinnati, OH 45232 (Phone: 513-451-1777)

ESI

HABITAT ASSESSMENT

Project #: 556 **Date:** 8 July 2014 **State:** OH **County:** Coshocton

Project Name: AEPs reclamation **Site Name/#:** East Polygon **USGS Quad:**

Permitted Biologist: Justin Wilson (full name) Other Field Staff: Les Aron (full name) State Permit #: 17-48

Federal Permit #: TE023734-6

Net/Trap/ Detector	Net/Trap/ Detector #	Latitude	Longitude	Picture #	Waypoint #
Net	A	40 ° 11 ' 29.6 "N	081 ° 50 ' 44.3 "W	Jul09191348	556-Net A
Net	B	40 ° 11 ' 28.9 "N	081 ° 50 ' 46.0 "W	Jul09199 15	556-Net B
Net	C	40 ° 11 ' 15.9 "N	081 ° 50 ' 35.0 "W	Jul09202520	556-Net C
		° ' "N	° ' "W		

Distance to closest water source (meters): Ø Type of water source: pond

Water source name: unknown

ESTIMATED WATER SOURCE CHARACTERISTICS (IF UNDER NETS OR DETECTOR):

Bank Height: / meters Channel Width: / meters Stream Width: / meters

Substratum: ___Bedrock ___Boulder ___Cobble ___Gravel ___Sand ✓ Silt/Clay

Still Water Present (Y/N): Y Average Water Depth: 14 m or (cm) Clarity (H,M,L): M

VEGETATION:

Dominant Canopy Species (> 40 cm/16" dbh)
Liriodendron tulipifera
Acer saccharum
Platanus occidentalis

Estimated dbh range: Lg: 64.7 Sm: 41

Subdominant Canopy Species (< 40 cm/16" dbh)
Quercus alba
Liquidambar styraciflua
Populus grandidentata

Estimated dbh range: Lg: 40 Sm: 22.3

Relative abundance of dominant vs. subdominant (ratio): 1:5

Estimated canopy closure: ___Closed ___Moderate X Open

Roost tree potential consists of: ___Large Trees X Snags ___ Neither

Roost tree potential for the area is: X High ___Moderate ___Low

Roost potential comments: > Snags and < large trees with exfol bark

Subcanopy clutter: ___Closed X Moderate ___Open

Subcanopy comprised largely of: X Lower Branches of Canopy Trees X Saplings X Shrubs

Common Subcanopy Species: Robinia pseudoacacia, Lindera benzoin, Fraxinus americana

Habitat Description: Strip mining area, fragmented upland forest sloping to pond site and emergent wetland.

Check all that apply:

__Mature Upland Forest
X Young Upland Forest
__Mature Lowland Forest
X Young Lowland Forest
X Recently Logged Forest
X Forest Edge
__Woodlot
__Old Field
__Crop/Pasture Land
__Stream/River
__Vernal Pool
__Deepwater Lake/Pond
X Other settling pond

Herbaceous Cover: ___ Sparse ___Moderate X Dense

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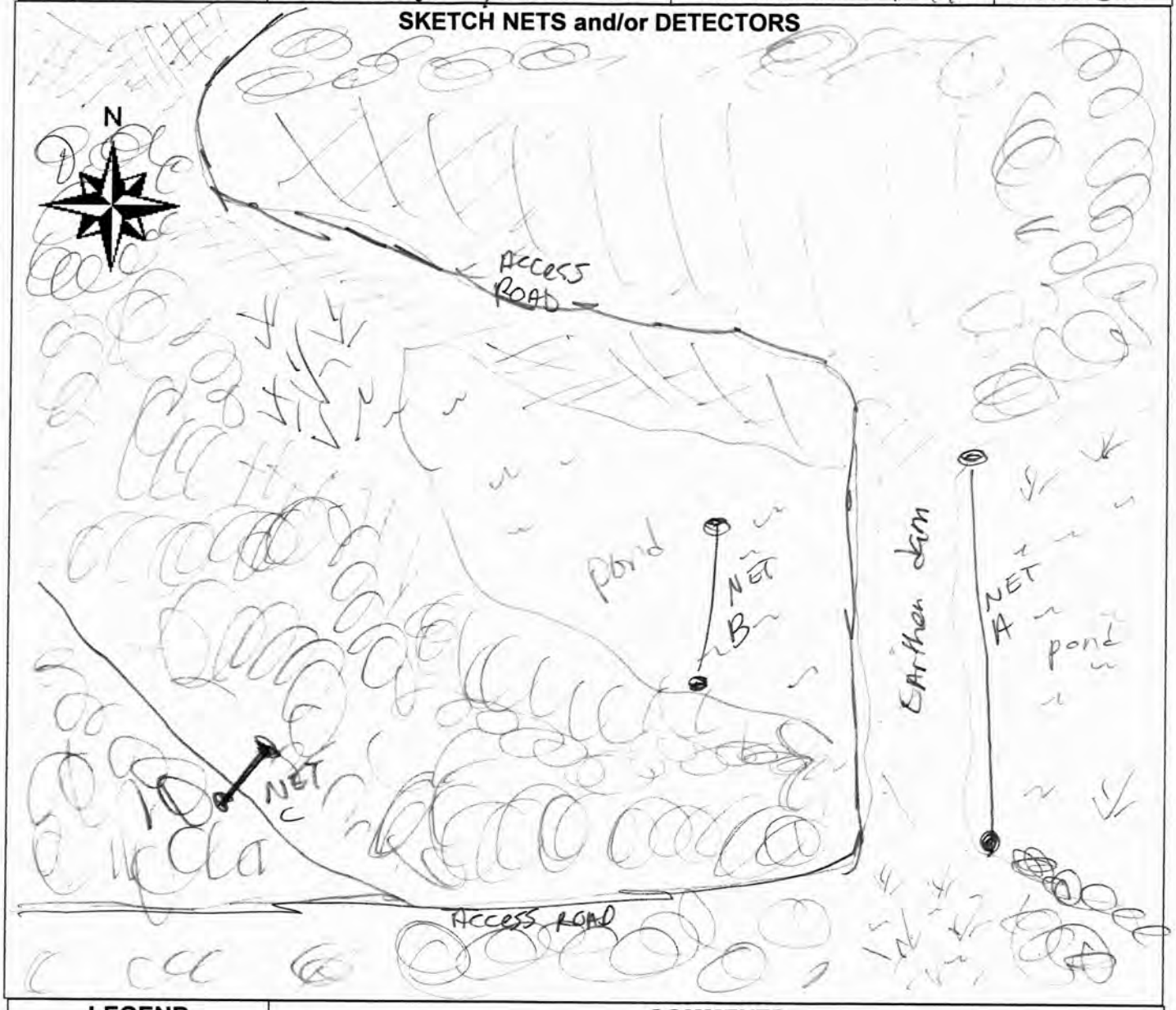
HABITAT ASSESSMENT (continued)

Project #: 556	State/County: OH/Coshocton	Site Name/#: EAST POLYGON	Initials: JW

SKETCH NETS and/or DETECTORS



LEGEND	COMMENTS
Net: ●——●	
Detector: ▭	
Forested area:	
wetland:	
grassy area:	

2014

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4525 Este Avenue, Cincinnati, OH 45232 (Phone: 513-451-1777)

ESI

BAT CAPTURE DATA

Project #: 556 **Date:** 7 July 2014

Project Name: AEP's Reclamation **Site Name/#:** East Polygon

State: OH **County:** Coshocton

GPS Unit #: 0197 **~~Camera~~ IPAD #:** 0130

Permitted Biologist: Justin Wilson (full name) Other Field Staff: Les Aron (full name)

State Permit #: 17-48 Federal Permit #: TE02378A-6

WEATHER DATA

Time (xxxx h)	Temp (°C)	Wind Speed (estimated – see chart)	% Cloud Cover (estimated)	Comments
2030	22.7	4-7	100%	storm
2100	21.9	1-3	100%	lt rain
2130	21.2	4-7	100%	rain/storm
2145	19.7	4-7	100%	storm

RAIN OUT

STORM

Net/Trap/ Detector	Net/Trap/ Detector #	Latitude	Longitude	Length (m)	Height (m)	Time Up (xxxx h)	Time Down (xxxx h)	Picture #	Waypoint #
NET	A	40 ° 11 ' 27.6 "N	081 ° 50 ' 44.3 "W	18	9	2035	2130	Jul09191340	556-Net A
NET	B	40 ° 11 ' 28.9 "N	081 ° 50 ' 46.0 "W	18	9	2040	2135	Jul09191915	556-Net B
NET	C	40 ° 11 ' 15.9 "N	081 ° 50 ' 35.0 "W	9	9	2040	2140	Jul09202520	556-Net C
		° ' "N	° ' "W						

Net Placement/Site Description: Net A stacked over earthen dam between ponds, Net B stacked over pond, Net C stacked over road

Capt #	Net/ Trap	Species	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[1]	Wt (g)	RFA (mm)	Belly (F/M/E)	Wing Index* (0-3)	Comments Picture # /Guano/Hair Sample/Band #
		RAIN OUT									
		NO BAT CAPTURES									

[1] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓ * Refer to table on the back

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BAT CAPTURE DATA

Project #: 556 **Date:** 8 July 2014

Project Name: AEP's reclamation **Site Name/#:** East Polygon

State: OH **County:** Coshocton

GPS Unit #: 0197 **Camera #:** IPAD 0130

Permitted Biologist: Justin Wilson (full name) Other Field Staff: Les Aron (full name)

State Permit #: 17-48 Federal Permit #: TE02373A-6

WEATHER DATA

Time (xxxx h)	Temp (°C)	Wind Speed (estimated – see chart)	% Cloud Cover (estimated)	Comments
2040	21.9	Ø	25%	—
2110	21.7	0	10%	—
2140	19.3	0	0%	—
2210	19.3	0	0%	—
2240	18.7	0	0%	—
2310	18.3	0	0%	—
2340	18.2	0	0%	—
0010	18.0	0	0%	—
0040	17.6	0	0%	—
0110	17.2	0	0%	—
0140	17.2	0	0%	—
0200	17.3	Ø	10%	—

Net/Trap/ Detector	Net/Trap/ Detector #	Latitude	Longitude	Length (m)	Height (m)	Time Up (xxxx h)	Time Down (xxxx h)	Picture #	Waypoint #
Net	A	40° 11' 29.6" N	081° 50' 44.3" W	18	9	2040	0155	Jul09191340	556-Net A
Net	B	40° 11' 28.9" N	081° 50' 46.0" W	18	9	2040	0155	Jul09191915	556-Net B
Net	C	40° 11' 15.9" N	081° 50' 35.0" W	9	9	2040	0155	Jul09202520	556-Net C
		° ' " N	° ' " W						

Net Placement/Site Description: Net A stacked over earthen dam between ponds, Net B stacked over pond, Net C stacked over road

Capt #	Net/ Trap	Species	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[1]	Wt (g)	RFA (mm)	Belly (F/M/E)	Wing Index* (0-3)	Comments Picture # /Guano/Hair Sample/Band #
1	A	Lasiurus borealis	2125	Ad	F	L	13.6	41	E	Ø	—
2	A	Lasiurus borealis	0044	Ad	M	↓	12.1	40	E	Ø	—
3	C	Lasiurus cinereus	0117	Ad	F	L	27	56	M	Ø	—
4	B	Myotis lucifugus	0117	Jv	F	NR	6.6	35	E	Ø	—
5	B	Lasiurus cinereus	0146	Ad	F	L	29.7	57	M	Ø	—

[1] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓ * Refer to table on the back

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BAT CAPTURE DATA

Project #: 556 **Date:** 09 July 2014

Project Name: AEP's Reclamation **Site Name/#:** East Polygon

State: OH **County:** Coshocton

GPS Unit #: 0197 **Camera #:** IPAD 0130

Permitted Biologist: Justin Wilson (full name) Other Field Staff: Les Aron (full name)

State Permit #: 17-48 Federal Permit #: TE02373A-6

WEATHER DATA

Time (xxxx h)	Temp (°C)	Wind Speed (estimated – see chart)	% Cloud Cover (estimated)	Comments
2045	19.2	1-3	45%	—
2115	18.8	1-3	25%	—
2145	18.7	Ø	10%	—
2215	18.0	Ø	30%	—
2245	18.7	1-3	75%	—
2315	17.7	1-3	10%	—
2345	17.2	Ø	Ø%	—
0015	16.4	Ø	Ø%	—
0045	16.2	1-3	Ø%	—
0115	15.8	1-3	Ø%	—
0145	15.9	Ø	Ø%	—
0200	15.6	Ø	Ø%	—

Net/Trap/ Detector	Net/Trap/ Detector #	Latitude	Longitude	Length (m)	Height (m)	Time Up (xxxx h)	Time Down (xxxx h)	Picture #	Waypoint #
Net	A	40 ° 11 ' 29.6 "N	081 ° 50 ' 44.3 "W	18	9	2040	0150	Jul09191340	556-Net A
Net	B	40 ° 11 ' 28.9 "N	081 ° 50 ' 46.0 "W	18	9	2045	0155	Jul09191915	556-Net B
Net	C	40 ° 11 ' 15.9 "N	081 ° 50 ' 35.0 "W	9	9	2045	0200	Jul09202520	556-Net C
		° ' "N	° ' "W						

Net Placement/Site Description: Net A stacked over earthen dam between ponds, Net B stacked over pond, Net C stacked over road

Capt #	Net/ Trap	Species	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[1]	Wt (g)	RFA (mm)	Belly (F/M/E)	Wing Index* (0-3)	Comments Picture # /Guano/Hair Sample/Band #
1	A	Lasiurus borealis	2112	—	—	—	—	—	—	—	Escaped from net
2	A	Eptesicus fuscus	2223	—	—	—	—	—	—	—	Escaped from net
3	B	Lasiurus borealis	2249	Ad	m	↓	12.4	38	E	Ø	—
4	C	Lasiurus borealis	2234	Ad	m	↓	11.0	39	E	Ø	—
5	C	Eptesicus fuscus	2235	Ad	m	↓	17.1	46	F	Ø	—
6	B	Lasiurus cinereus	0042	Ad	F	L	31.5	54	m	Ø	—
7	C	Lasiurus borealis	0021	Ad	F	L	11.7	41	m	Ø	—

[1] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓ * Refer to table on the back

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HABITAT ASSESSMENT

Project #: 556 **Date:** 10 July 2014 **State:** OH **County:** Coshocton

Project Name: AEP's Reclamation **Site Name/#:** West Polygon **USGS Quad:**

Permitted Biologist: Justin Wilson (full name) Other Field Staff: Les Aron (full name) State Permit #: 17-48

Federal Permit #: TE023734-6

Net/Trap/ Detector	Net/Trap/ Detector #	Latitude	Longitude	Picture #	Waypoint #
Net	D	40° 11' 36.9" N	081° 51' 30.0" W	Jul10193539	556-Net D
Net	E	40° 11' 38.7" N	081° 51' 26.4" W	Jul10201216	556-Net E
Net	F	40° 11' 39.9" N	081° 51' 23.7" W	Jul10202821	556-Net F
		° ' " N	° ' " W		

Distance to closest water source (meters): 90 m Type of water source: Pond

Water source name: unknown

ESTIMATED WATER SOURCE CHARACTERISTICS (IF UNDER NETS OR DETECTOR):

Bank Height: _____meters Channel Width: _____meters Stream Width: _____meters

Substratum: ___Bedrock ___Boulder ___Cobble ___Gravel ___Sand ___Silt/Clay

Still Water Present (Y/N): _____ Average Water Depth: ____m or cm Clarity (H,M,L):____

VEGETATION:

Dominant Canopy Species (> 40 cm/16" dbh)
Fraxinus americana
Populus grandidentata
Platanus occidentalis

Subdominant Canopy Species (< 40 cm/16" dbh)
Prunus serotina
Acer rubrum
Acer saccharum

Estimated dbh range: Lg: 46.1 Sm: 41

Estimated dbh range: Lg: 40 Sm: 21

Relative abundance of dominant vs. subdominant (ratio): 1:3

Estimated canopy closure: ___Closed X Moderate ___Open

Roost tree potential consists of: X Large Trees X Snags ___ Neither

Roost tree potential for the area is: ___High X Moderate ___Low

Roost potential comments: < Snags, < large trees minimal exfol. bark or crevices

Subcanopy clutter: ___Closed X Moderate ___Open

Subcanopy comprised largely of: X Lower Branches of Canopy Trees X Saplings X Shrubs

Common Subcanopy Species: Acer rubrum, Robinia pseudoacacia, Prunus serotina

Habitat Description: Strip mine area, fragmented upland forest sloping to lowland area, pond adjacent to access road where nets are stacked

Check all that apply:

__Mature Upland Forest X Recently Logged Forest __Crop/Pasture Land X Other Settling pond
X Young Upland Forest X Forest Edge __Stream/River
__Mature Lowland Forest __Woodlot __Vernal Pool
X Young Lowland Forest __Old Field __Deepwater Lake/Pond

Herbaceous Cover: ___ Sparse ___Moderate X Dense

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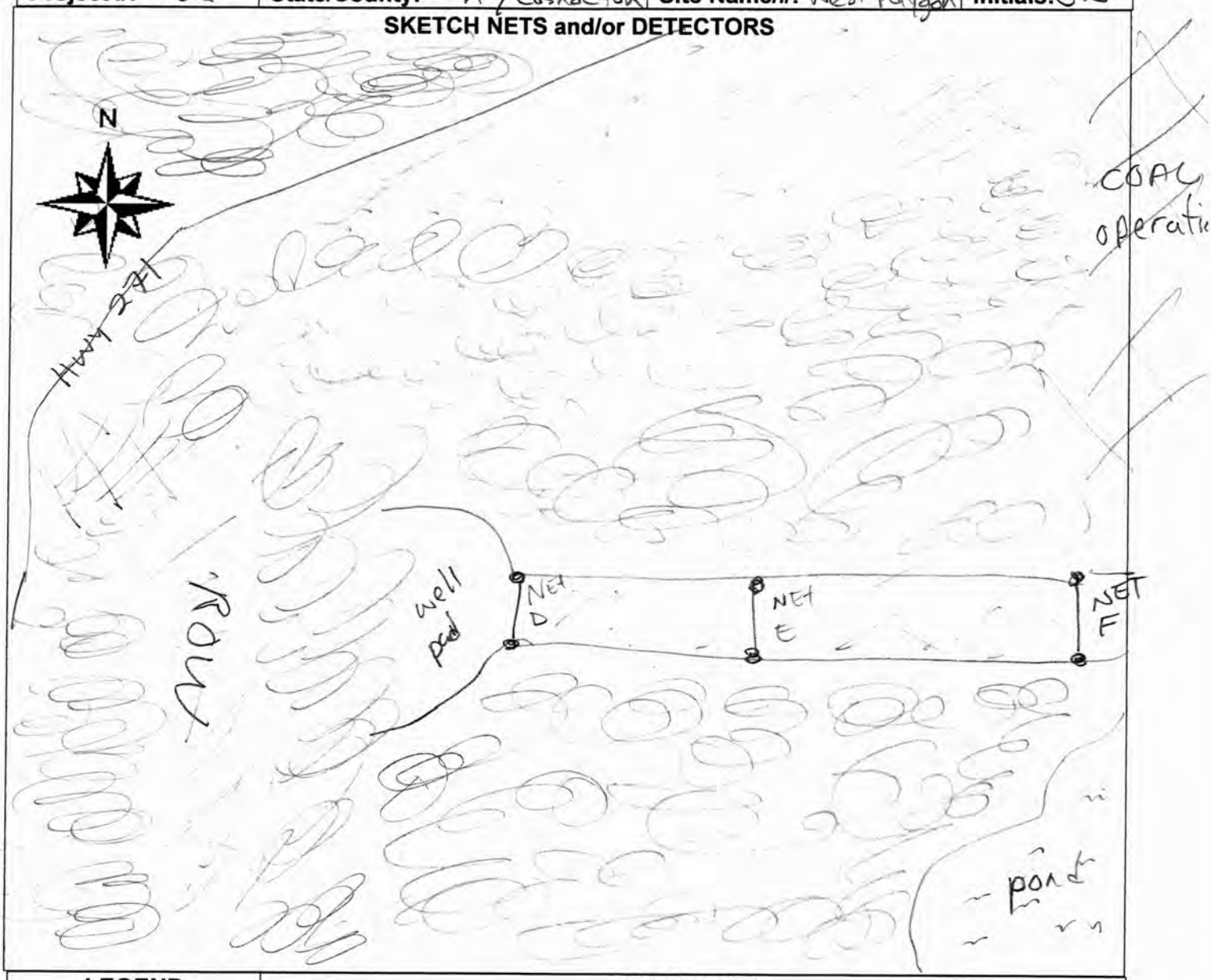
HABITAT ASSESSMENT (continued)

Project #: 556	State/County: OH / Coshocton	Site Name/#: West Polygon	Initials: JW

SKETCH NETS and/or DETECTORS



LEGEND

Net: ●——●

Detector: ▭◁

Forested area :

Grassy area : \|\|\|

COMMENTS

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BAT CAPTURE DATA

Project #: 556
Date: 10 July 2014
Project Name: AEP's Reclamation
Site Name/#: West Polygon
State: OH
County: Coshocton
GPS Unit #: 0197
Camera #: IPAD 0130
Permitted Biologist: Justin Wilson (full name)
Other Field Staff: Les Aron (full name)
State Permit #: 17-48
Federal Permit #: TE 0373A 6

WEATHER DATA

Time (xxxx h)	Temp (°C)	Wind Speed (estimated – see chart)	% Cloud Cover (estimated)	Comments
2040	21.6	Ø	Ø%	—
2110	20.9	Ø	Ø%	—
2140	20.2	Ø	Ø%	—
2210	20.1	1-3	Ø%	—
2240	19.5	1-3	Ø%	—
2310	19.2	4-7	Ø%	—
2340	18.7	1-3	Ø%	—
0010	18.4	1-3	25%	—
0040	18.1	Ø	45%	—
0110	17.7	1-3	30%	—
0140	18.1	1-3	25%	—
0200	17.9	1-3	25%	—

Net/Trap/ Detector	Net/Trap/ Detector #	Latitude	Longitude	Length (m)	Height (m)	Time Up (xxxx h)	Time Down (xxxx h)	Picture #	Waypoint #
Net	D	40 ° 11 ' 36.9 "N	081 ° 51 ' 30.0 "W	12	9	2045	0150	JUL10193539	556-Net D
Net	E	40 ° 11 ' 38.7 "N	081 ° 51 ' 26.4 "W	9	9	2045	0200	JUL10201216	556-Net E
Net	F	40 ° 11 ' 39.9 "N	081 ° 51 ' 23.7 "W	9	9	2050	0200	JUL10202321	556-Net F
		° ' "N	° ' "W						

Net Placement/Site Description: Nets placed in access road to well site, Minimal canopy.

Capt #	Net/ Trap	Species	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[1]	Wt (g)	RFA (mm)	Belly (F/M/E)	Wing Index* (0-3)	Comments Picture # /Guano/Hair Sample/Band #
1	E	Eptesicus fuscus	2204	Ad	m	↓	16.6	44	E	1	—
2	D	Eptesicus fuscus	2228	Ad	m	↓	18.7	48	F	1	—
3	E	Eptesicus fuscus	2244	Ad	M	↓	17.9	47.5	M	1	—
4	D	Eptesicus fuscus	2306	Ad	m	↓	17.3	45	F	1	—
5	D	Lasiurus borealis	2347	JV	F	NR	7.6	39	E	Ø	—
6	D	Eptesicus fuscus	2359	Ad	M	↓	15.2	46	E	1	—
7	D	Eptesicus fuscus	2358	Ad	m	↓	18	48	F	Ø	—
8	E	Myotis septentrionalis	0152	Ad	m	↑	6.3	35.5	F	Ø	Freq 172-474

[1] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓ * Refer to table on the back

Jul 11 22339
Jul 11 22404
Jul 11 22419

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BAT TRANSMITTER DATA

Project #: 556 **Date:** 10 July 2014 **Site Name/#:** west polygon Net E

Project Name: AEP's Reclamation **Camera #:** ESI 0130

State: OH **County:** Coshocton **Picture #:** Jul 11 22339, Jul 11 22404, Jul 11 22419

Bat Species: Myotis septentrionalis **Capture Time:** 0152

Permitted Biologist: Justin Wilson (full name) Other Field Staff: Les Aron (full name)

State Permit #: 17-48 Federal Permit #: TE023731A-6

Age Ad or Jv	Sex M or F	Reproductive Condition F=(NR/PG/L/PL; M=↑/↓	Wt (g)	RFA (mm)
Ad	M	↑	6.3	35.5

Transmitter weight = .25 grams Frequency number: 172-474

Transmitter + bat total weight = 6.55 grams Band/color number: NA

FINAL CHECK:

1) Transmitter attachment (Y/N): Y
2) Signal receiving (frequency): Y
3) Band attachment (Y/N): NA
4) Condition of animal: docile
5) Description of release: bat-474 in good condition, aspect of flight westerly

RELEASE TIME: 0225 **TOTAL HOLD TIME:** 33 **minutes**

RELEASE LOCATION: NET E

COMMENTS:

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MOBILE TELEMETRY DATA

Project #: 556 **Date:** 11 July 2014 **State:** OH **County:** Coshocton

Project Name: AEP's reclamation **GPS Unit #:** 0197

Permitted Biologist: Justin Wilson (full name) Other Field Staff: Les Aron (full name) State Permit #: 17-48

Federal Permit #: TE 02373A6

Frequency	Sex	Age	Repro. Condition	Capture Site	Capture Date	Day of Search (1st, 2nd, 3rd, etc.)
172-474	M	Ad	↑	West polygon net E	10 July 2014	1st

Start Time: 1100 Ending Mileage: 136123

End Time: 1545 Starting Mileage: 136121

Total Effort (hours): ____ Total Mileage: 3 miles

Antennas: ___Yagi ___Directional ✓ Both

NOTE: Record coordinates as often as possible (at intersections and when you stop).

Location (road or river name, etc.)	Latitude	Longitude	Comments (Bat frequency – if detected)
Access road/capture site	40° 11' 39.9"	081° 51' 23.2"	No signal detected - high static
Access road / well pad	40° 11' 36.9"	081° 51' 27.9"	No signal
Access Road	40° 11' 36.3"	081° 51' 15.1"	faint signal

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MOBILE TELEMETRY DATA

Project #: 556 **Date:** 12 July **State:** OH **County:** Coshocton

Project Name: AEP Reclamation **GPS Unit #:** 0197

Permitted Biologist: Justin Nelson (full name) Other Field Staff: Les Aron (full name) State Permit #: 17-48

Federal Permit #: TE 023731A-6

Frequency	Sex	Age	Repro. Condition	Capture Site	Capture Date	Day of Search (1st, 2nd, 3rd, etc.)
172-474	m	Ad	↑	West Polygon Net E	10 July 2014	2nd

Start Time:_____ Ending Mileage:_____

End Time:_____ Starting Mileage:_____

Total Effort (hours):_____ Total Mileage:_____

Antennas: ___Yagi ___Directional X Both

NOTE: Record coordinates as often as possible (at intersections and when you stop).

Location (road or river name, etc.)	Latitude	Longitude	Comments (Bat frequency – if detected)
474-01 Roost tree	40°11'23.9"	081°51'7.2"	signal detected

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MOBILE TELEMETRY DATA

Project #: 556 **Date:** 13 July **State:** OH **County:** Coshocton

Project Name: AEP Reclamation **GPS Unit #:** 0197

Permitted Biologist: Justin Wilson (full name) Other Field Staff: Les Aron (full name) State Permit #: 17-48

Federal Permit #: TE02373A-6

Frequency	Sex	Age	Repro. Condition	Capture Site	Capture Date	Day of Search (1st, 2nd, 3rd, etc.)
172.474	M	Ad	↑	West Polygon Net E	10 July 2014	3rd

Start Time:_____ Ending Mileage:_____

End Time:_____ Starting Mileage:_____

Total Effort (hours):_____ Total Mileage:_____

Antennas: ___Yagi ___Directional X Both

NOTE: Record coordinates as often as possible (at intersections and when you stop).

Location (road or river name, etc.)	Latitude	Longitude	Comments (Bat frequency – if detected)
474-01 Roosttree	40° 11' 23.94"	081° 51' 7.2"	signal detected

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MOBILE TELEMETRY DATA

Project #: 556 **Date:** 14 July 2014 **Biologists:** Justin Wilson / Les Aron

Project Name: AEP Reclamation **State:** OH **County:** Cashocton

GPS Unit #: 0197

state permit #: 17-48
Fed permit #: TE02373A-6

Frequency	Sex	Age	Repro. Condition	Capture Site	Capture Date	Day of Search (1st, 2nd, 3rd, etc.)
172.474	m	Ad	↑	West Polygon Net E	10 July 2014	4th

Start Time:_____ Ending Mileage:_____

End Time:_____ Starting Mileage:_____

Total Effort (hours):_____ Total Mileage:_____

Antennas: ___Yagi ___Directional X Both

NOTE: Record coordinates as often as possible (at intersections and when you stop).

Location (road or river name, etc.)	Latitude	Longitude	Comments (Bat frequency – if detected)
474-01 Roost tree	40°11'23.9"	081°51'7.2"	signal detected

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MOBILE TELEMETRY DATA

Project #: 556 **Date:** 15 July 2014 **Biologists:** Justin Wilson / Les Aron

Project Name: AEP Reclamation **State:** OH **County:** Guernsey

GPS Unit #: 0197

State permit #: 17-48
Fed permit #: TE02373A-6

Frequency	Sex	Age	Repro. Condition	Capture Site	Capture Date	Day of Search (1st, 2nd, 3rd, etc.)
172-474	M	Ad	↑	West Polygon Net E	10 July 2014	5th

Start Time:_____ Ending Mileage:_____

End Time:_____ Starting Mileage:_____

Total Effort (hours):_____ Total Mileage:_____

Antennas: ___Yagi ___Directional X Both

NOTE: Record coordinates as often as possible (at intersections and when you stop).

Location (road or river name, etc.)	Latitude	Longitude	Comments (Bat frequency – if detected)
474-01 Roost tree	40°11'23.9"	081°51'7.2"	signal detected

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MOBILE TELEMETRY DATA

Project #: 556 **Date:** 16 July 2014 **State:** OH **County:** Coshocton

Project Name: AEP Reclamation **GPS Unit #:** 0197

Permitted Biologist: Justin Wilson (full name) Other Field Staff: Les Aron (full name) State Permit #: 17-48

Federal Permit #: TE 023731A-6

Frequency	Sex	Age	Repro. Condition	Capture Site	Capture Date	Day of Search (1st, 2nd, 3rd, etc.)
172.474	M	Ad	↑	West Polygon/Net E	10 July 2014	6th

Start Time: 1410 Ending Mileage: 136918

End Time: 1800 Starting Mileage: 136901

Total Effort (hours): ____ Total Mileage: 17

Antennas: ___Yagi ___Directional X Both

NOTE: Record coordinates as often as possible (at intersections and when you stop).

Location (road or river name, etc.)	Latitude	Longitude	Comments (Bat frequency – if detected)
Access Rd / RT 474-01	40° 11' 26.8"	081° 51' 06.8"	No signal
Access Rd	40° 11' 21.0"	081° 51' 05.9"	NO signal
Access Rd	40° 11' 35.1"	081° 51' 15.3"	No signal
Access Rd / well site	40° 11' 36.5"	081° 51' 31.3"	No signal
Haul Rd	40° 11' 35.6"	081° 51' 40.7"	No signal
Hwy 271	40° 11' 18.6"	081° 51' 48.7"	No signal
Access Rd	40° 11' 11.3"	081° 51' 25.8"	NO signal
Access Rd	40° 11' 19.3"	081° 51' 33.3"	No signal
Access Rd / well site	40° 11' 25.7"	081° 51' 25.8	NO signal
Access Rd	40° 11' 11.1"	081° 51' 19.1"	No signal
Access Rd	40° 11' 14.9"	081° 51' 06.8"	No signal
Access Rd / well site	40° 11' 17.9"	081° 50' 53.7"	No signal
Hwy 271	40° 11' 55.1"	081° 51' 11.4"	No signal
CR 274	40° 10' 40.4"	081° 51' 02.0"	No signal
CR 429	40° 10' 53.9"	081° 50' 52.4"	No signal
CR 429	40° 11' 11.6"	081° 50' 24.4"	No signal
Access Road	40° 11' 17.2"	081° 50' 34.0"	No signal
Access Road / well site	40° 11' 14.9"	081° 50' 43.2"	NO signal
Access Road	40° 11' 09.7"	081° 50' 45.2"	No signal
Access Road / well site	40° 11' 08.8"	081° 50' 51.1"	No signal
Access Road	40° 11' 29.4"	081° 50' 43.1"	No signal
Access Road	40° 11' 25.8"	081° 50' 56.2"	No signal
Access Road	40° 11' 36.5"	081° 50' 47.1"	NO signal

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MOBILE TELEMETRY DATA (continued)

Project #: 556 **Date:** 16 July 2014 **State :** OH **County:** Coshocton **Initials:** JW

Location (road or river name, etc.)	Latitude	Longitude	Comments (Bat frequency – if detected)
Reclamation Site East of 83	40° 11' 36.9"	081' 50' 13.3"	NO signal

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MOBILE TELEMETRY DATA

Project #: 556 **Date:** 17 July 2014 **State:** OH **County:** Coshocton

Project Name: AEP Reclamation **GPS Unit #:** 0197

Permitted Biologist: Justin Wilson (full name) Other Field Staff: Les Aron (full name) State Permit #: 17-48

Federal Permit #: TE023773A-6

Frequency	Sex	Age	Repro. Condition	Capture Site	Capture Date	Day of Search (1st, 2nd, 3rd, etc.)
172.474	M	Ad	↑	West Polygon NE+E	10 July 2014	7th

Start Time: 1230 Ending Mileage: 136966

End Time: 1636 Starting Mileage: 136951

Total Effort (hours): 4hr 6min Total Mileage: 15 miles

Antennas: X Yagi ___Directional ___Both

NOTE: Record coordinates as often as possible (at intersections and when you stop).

Location (road or river name, etc.)	Latitude	Longitude	Comments (Bat frequency – if detected)
Hwy 83	40° 11' 10.2"	081° 50' 11.6"	No signal
Hwy 271	40° 12' 6.3"	081° 51' 22.1"	No signal
CR 279	40° 12' 13.7"	081° 52' 36.6	No signal
Hwy 16	40° 11' 52.4"	081° 53' 30.4"	No signal
Access Rd	40° 11' 27.2"	081° 51' 05.0"	No signal
Access rd / well site	40° 11' 36.2"	081° 51' 31.2"	No signal
Hwy 273	40° 11' 31.8"	081° 51' 41.9"	No signal
Access Rd / well site	40° 11' 17.1"	081° 50' 53.3"	No signal
Access Rd	40° 11' 10.0"	081° 51' 20.3"	No signal
Access Rd	40° 11' 23.1"	081° 51' 31.9"	No signal
Access Rd / well site	40° 11' 25.7"	081° 51' 26.1"	No signal
Access rd / Dedam site	40° 11' 36.6"	081° 50' 12.9"	No signal

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ROOST TREE DATA

Project #: 556 **Date:** 11 July 2014 **Biologists:** Justin Wilson/Les Arson

Project Name: AEP Reclamation **State:** OH **County:** Coshocton

GPS Unit #: 6197 **Waypoint:** 474-01 **Camera #:** IPAD 0130 **Picture #:** JUL 11 204746

Latitude: 40° 11' 23.9"N **Longitude:** 081° 51' 07.2"W JUL 11 204805

Bat Species: MYSE **Sex(M/F):** M **Age(Ad/Jv):** Ad **Repro.:** ↑

Capture Date: 10 July 2014 **Capture Site:** West polygon NET E

Frequency: 172-474 **Roost Name/#:** 474-01

ROOST TREE DATA

Roost tree species: Acer saccharum dbh: 35.9 cm

Estimated height from ground to roost: 7m (meters) Tree height 22 m (meters)

Exfoliating bark (%): 5% Distance from capture site: .5 m or km (circle one)

Tree health: __Live __Dead X Partial

Observed roost potential: X Exfoliating Bark __Cracks/crevasses __Hollow __Unknown

Bat vocalizations: __Yes X No

Guano on ground/foliage: __Yes X No

Is guano fresh (if present)?: __Yes __No

Guano volume (if present): ~

DESCRIPTION OF SURROUNDING HABITAT

Dominant Canopy Species (> 40 cm/16" dbh)
- Acer saccharum
- Quercus alba
- Populus grandidentata

Estimated dbh range (cm): Lg: 64.8 Sm: 41

Subdominant Canopy Species (< 40 cm/16" dbh)
- Acer saccharum
- Quercus alba
- Populus grandidentata

Estimated dbh range (cm): Lg: 40 Sm: 22.2

Estimated canopy closure at roost: 100 %

Slope: __Steep X Moderate __Slight __None Slope aspect: South

Subcanopy Clutter: __Closed __Moderate X Open

Distance to nearest water source: .45 m or km (circle one)

Distance to nearest flight corridor: 45 meters

Habitat Description: Upland forest on south facing slope adjacent to field edge (45 m)

Check all that apply:

X Mature Upland Forest	__Recently Logged Forest	__Crop/Pasture Land	__Shrub/scrub Swamp
X Young Upland Forest	__Pine Plantation	__Stream/River	__Vernal Pool
__Mature Lowland Forest	__Woodlot/ForestEdge	__Emergent Wetland	__Deepwater Lake/Pond
__Young Lowland Forest	__Old Field	__Forested Swamp	__Other _____

Comments:

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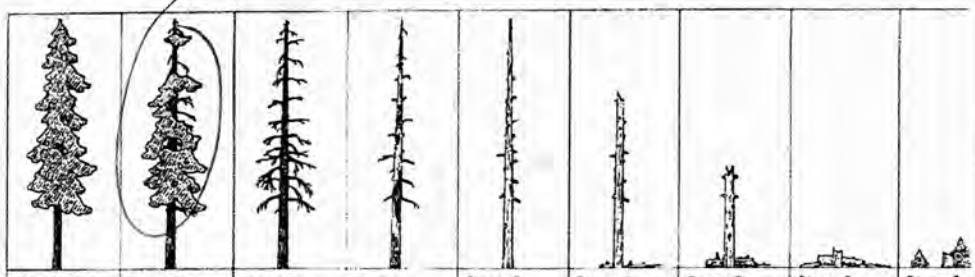
ROOST TREE DATA (continued)

State/County: OH / Coshocton **Project Name/#:** AEP Reclamation 556 **Date:** 11 July 2014
Frequency: 172-474 **Roost Name/#:** 474-01 **Initials:** LA

Sketch: Roost Tree Habitat

Comments: Upland forest sub canopy moderate to more open. Two flight corridors within 45 meters. Tree is live but has two dead lower limbs.

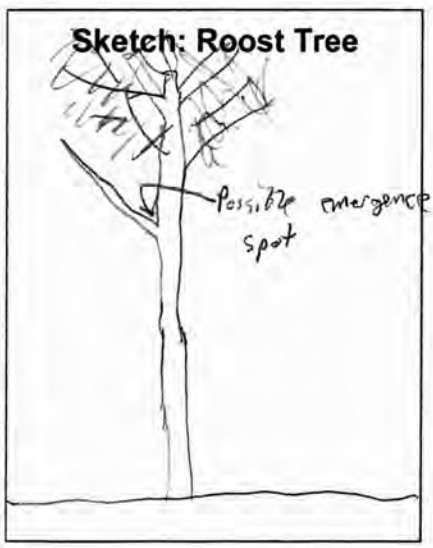
Stages of Decay:



Stage 1 Live	Stage 2 Declining	Stage 3 Dead	Stage 4 Loose bark	Stage 5 Clean	Stage 6 Broken	Stage 7 Decomposed	Stage 8 Down material	Stage 9 Stump

Figure 38

Sketch: Roost Tree



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ROOST TREE EMERGENCE DATA

Project #: 556 **Date:** 11 July 2014 **Biologists:** Justin Wilson / Les Aron

Project Name: AEP Reclamation **State:** OH **County:** Coshocton

GPS Unit #: 0197 **Waypoint:** 474-01

Latitude: 40 ° 11 ' 23.9 "N **Longitude:** 081 ° 51 ' 07.2 "W

Roost Name/#: 474-01

Radio-tagged bat present in tree: Yes ✓ **No**____

Complete the following information only if a radio-tagged bat is present in the roost

Bat species: MYSE **Sex(M/F):** M **Age(Ad/Jv):** Ad **Repro.:** ↑

Capture date: 10 July 2014 **Capture site:** West polygon net E **Frequency:** 172-474

NOTE: Tallies of bat exits should be made at 2-minute intervals. Use the back lighting of the setting sun to help distinguish bats as silhouettes against the sky as they exit the roost. Please ensure that you are close enough to the roost to observe all exiting bats, but not close enough to influence emergence (do not stand directly beneath the roost and do not make unnecessary noise and/or conversation, and minimize use of lights).

Arrival time: 2020 **Departure time:** 2124 **Total Bats:** 1

Emergence Time	Number of Bats	Emergence Aspect
2106	1	Southwest
2108	0	
2110	0	
2112	0	
2114	0	
2116	0	
2118	0	
2120	0	
2122	0	
2124	0	

Describe emergence: Did bats emerge simultaneously, fly off in the same direction, loiter, circle, disperse, etc. What time did the transmittered bat(s) emerge? What direction did the transmittered bat fly?

Transmittered bat flew at 2106 in an southwest, no loitering

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ROOST TREE EMERGENCE DATA

Project #: 556 **Date:** 12 July 2014 **Biologists:** Justin Wilson

Project Name: AEP Reclamation **State:** OH **County:** Coshocton

GPS Unit #: 8197 **Waypoint:** 474-01

Latitude: 40 ° 11 ' 23.9 "N **Longitude:** 081 ° 51 ' 07.2 "W

Roost Name/#: 474-01

Radio-tagged bat present in tree: Yes X **No** ____

Complete the following information only if a radio-tagged bat is present in the roost

Bat species: MYSE **Sex(M/F):** M **Age(Ad/Jv):** Ad **Repro.:** ↑

Capture date: 10 July 2014 **Capture site:** West Polygon Net E **Frequency:** 172.474

NOTE: Tallies of bat exits should be made at 2-minute intervals. Use the back lighting of the setting sun to help distinguish bats as silhouettes against the sky as they exit the roost. Please ensure that you are close enough to the roost to observe all exiting bats, but not close enough to influence emergence (do not stand directly beneath the roost and do not make unnecessary noise and/or conversation, and minimize use of lights).

Arrival time: 2014 **Departure time:** 2117 **Total Bats:** 1

Emergence Time	Number of Bats	Emergence Aspect
2057	1	NW

Describe emergence: Did bats emerge simultaneously, fly off in the same direction, loiter, circle, disperse, etc. What time did the transmittered bat(s) emerge? What direction did the transmittered bat fly?

Bat emerged high in canopy aspect was NW, loitered to the west of tree, close proximity to flight corridor

ESI

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PORTAL SEARCH DATA SHEET

State Permit #: 17-48
Fed Permit #: TE02373A-6

Project #: 556 **Task #:** ___ **Date:** 13 July 2014 **Project Name:** AEP Reclamation (western polygon) **Page** 1 **of** 1

Biologist(s): Justin Wilson, Les Arch **GPS Unit:** 0197 **Camera :** IPHO 0130 **County:** Coshocton

Feature/ Segment ID	Start Time	End Time	Evidence of Mining?	Portal(s) Present?	Portal ID(s) if present *	GPS Coordinates/Waypoints Start Wpt	Start Lat/Long	End Wpt	End Lat/Long	Photos	Comments
											Re-survey in winter due to heavy veg
556-01 556-02	1514	1543	Y	N	—	556-01	N 40°11'39.3" W 81°51'24.0"	556-02	N 40°11'36.5" W 81°51'30.0"	→	JUL 13 151533, JUL 13 152101 JUL 13 152106
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		

* Refer to Mine Portal Description data sheets

ESI

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PORTAL SEARCH DATA SHEET

State Permit #: 1748
Fed Permit #: TE02373A-G

Project #: 556 **Task #:** ___ **Date:** 17 July 2014 **Project Name:** AEP Reclamation (western polygon) **Page** 1 **of** 1

Biologist(s): Justin Wilson, Les Aron **GPS Unit:** 0197 **Camera :** IPAD 0130 **County:** Coshocton

Feature/ Segment ID	Start Time	End Time	Evidence of Mining?	Portal(s) Present?	Portal ID(s) if present *	GPS Coordinates/Waypoints Start Wpt	Start Lat/Long	End Wpt	End Lat/Long	Photos	Comments JUL17144446
556-03 / 556-04	1344	1447	Y	N	—	556-03	N 40°11'41.3" W 81°51'24.1"	556-04	N 40°11'30.1" W 81°51'40.0	→	JUL17135749, JUL17135854, JUL17140610, JUL17140759, JUL17144124
556-05 556-06	1414	1515	Y	N	—	556-05	N 40°11'38.6" W 81°51'22.5"	556-06	N W	→	JUL17142505, JUL17142447 JUL17141549, JUL17141544, JUL17151114
556-07 / 556-08	1520	1601	Y	N	—	556-07	N 40°11'23.9" W 81°51'34.6"	556-08	N 40°11'22.4" W 81°51'46.2"	→	JUL17151250, JUL17151641, JUL17155001 JUL17155011, JUL17155431
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		

* Refer to Mine Portal Description data sheets

ESI

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PORTAL SEARCH DATA SHEET

State permit #: 17-48
Fed Permit #: TE02373A-6

Project #: 556 **Task #:** ___ **Date:** 18 July 2014 **Project Name:** AEP's Reclamation (East Polygon) **Page** 1 **of** 1

Biologist(s): Justin Wilson / Les Arm **GPS Unit:** 0197 **Camera :** 0130 **County:** Coshocton

Feature/ Segment ID	Start Time	End Time	Evidence of Mining?	Portal(s) Present?	Portal ID(s) if present *	GPS Coordinates/Waypoints Start Wpt	Start Lat/Long	End Wpt	End Lat/Long	Photos	Comments
556-09/ 556-10	1354	1415	Y	N	—	556-09	N 40°11'30.8" W 81°50'48.5"	556-10	N 40°11'20.8" W 81°51'04.8"	→	JUL 1814 0153, JUL 1814 1031
556-11/ 556-12	1419	1512	Y	N	—	556-11	N 40°11'25.8" W 81°50'53.6"	556-12	N 40°11'08.1" W 81°50'53.8"	→	Areas should be looked at when veg. is less dense (I.E. late autumn, early winter)
							N W		N W	→	Jul 18 14 2333, Jul 18 14 3417, Jul 18 14 3425, Jul 18 14 4258
							N W		N W	→	Jul 18 14 5000, Jul 18 14 59 46
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		
							N W		N W		

* Refer to Mine Portal Description data sheets

APPENDIX B
PHOTOGRAPHS

East LOD – Net A

East LOD – Net B

East LOD – Net C

West LOD – Net D

West LOD – Net E

West LOD – Net F

Bat 474: Northern Long-eared bat *(Myotis septentrionalis)*

Roost 474-01: *Acer saccharum*

Phase I Cultural Resources Management Survey Report

Phase I Cultural Resource Management Survey for the Approximately 145 ha (358 ac) Five Points High Wall Reclamation Expansion Project in Franklin Township, Coshocton County, Ohio

Ryan Weller

May 8, 2013

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Phase I Cultural Resource Management Survey for the Approximately 145 ha (358 ac) Five Points High Wall Reclamation Expansion Project in Franklin Township, Coshocton County, Ohio

By

Ryan Weller

Submitted By:

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Lead Agency:

US Army Corps of Engineers, Huntington

Ryan Weller, P.I.

May 8, 2013

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W-1155

i. Abstract

In May of 2013, Weller & Associates, Inc. conducted a Phase I Cultural Resource Management Survey for the Approximately 145 ha (358 ac) Five Points High Wall Reclamation Expansion Project in Franklin Township, Coshocton County, Ohio. The lead federal agency for this undertaking is the U.S. Army Corps of Engineers, Huntington due to likely involvement with wetland permitting. These investigations were deemed necessary to identify any sites or properties that might be directly or indirectly affected by the planned reclamation-related activities and to evaluate them for the National Register of Historic Places (NRHP). The work involved a literature review and field investigations. These investigations identified one previously unrecorded archaeological site; 33CS727.

The project area is located to the north of the small community of Wills Creek in south central Coshocton County. This is an area that has been highly industrialized for coal mining, minerals, and activities associated with the Conesville power plant. This is a rural area with landscapes and activities associated with boating/recreation, farming, and industry. The former use of the project area is not too divergent from that of its surrounding industrial landscape; however, it has been omitted from any recent disturbances. In the early part of the twentieth century, underground coal mining was taking place in association with the Barnes Coal & Mining Company /Conesville Mines (CN-100). All but the southern part of this project area has been extensively altered by this previous mining activity; this is apparent on aerial images as well as topographic maps. As recent as the 1980s, a conveyor system had extended through the northwestern part of the project and similar mining-related constructions and activities are prevalent in the immediate vicinity. The field investigations focused on identifying intact landscapes, any mining-related facilities older than 50 years, and the conditions. There are no buildings or structures identified within this project area.

The literature review for this project identified few archaeological/architectural sites near this project area. There were two archaeological sites and three architectural sites identified in the surrounding landscape and within the study radius. The Muskingum River Navigation Historic District is located at the northeastern fringe of the study radius and is not within or near the current area of investigations. The literature identified few sites or surveys within the study radius and nothing that is within the project. Inspection and review of coal mining records indicated that there were mine adits and openings in this area associated with early twentieth century mining. However, the field investigations were unable to locate any of the former adits or openings.

These investigations involved subsurface testing methods and intensive visual inspection. The undertaking will not directly involve any standing buildings that are older than 50 years. There was one archaeological site, 33CS727, identified within the project area. This site is not considered to be significant and it is not regarded as being eligible for inclusion onto the NRHP. An appropriate finding of ‘no historic properties affected’ is considered for the project area and a finding of no adverse effects is

considered to be appropriate for the surrounding setting. No further work is deemed necessary for this project.

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Introduction

In May of 2013, Weller & Associates, Inc. (Weller) conducted a Phase I cultural resource management (CRM) survey for the 145 ha (348 ac) Five Points High Wall Reclamation Expansion in Franklin Township, Coshocton County, Ohio (Figures 1-3). The work was completed for the American Electric Power (AEP). These investigations were necessary to identify any sites or properties and to evaluate them for the National Register of Historic Places (NRHP) pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 [36 CFR 800]). The lead agency for this undertaking is the US Army Corps of Engineers, Huntington (ACOE) pursuant to probable wetland permitting. This report summarizes the results of the fieldwork and literature review and the report format and design is similar to that established in *Archaeology Guidelines* (Ohio Historic Preservation Office [OHPO] 1994).

The project area is located in south central Coshocton County and in a landscape that has been greatly manipulated. Though it initially appears natural, it is evident that coal mining and activities associated with the Conesville power plant have altered this setting. Previous mining activity is noted within the project area; which is partially the purpose of the proposed work. The project is high wall reclamation and acid mine drainage abatement by beneficially reusing coal combustion by-products. The purpose of the Phase I and other environmental studies is to identify potential resources and permit the site as appropriate. The high wall reclamation plan would be approved through ODNR and impacts to waters would be permitted through the ACOE and /or OEPA depending on the jurisdictional determination. It is expected than an ACOE permit will be necessary for this project, which is the purpose of these Phase I investigations.

Chad Porter conducted the literature review in April of 2013. Ryan Weller served as the Principal Investigator and project manager. The field crew included Chad Porter, Justin Zink, Todd Hawes, Seth Cooper, and Ryan Weller. The report preparation was by Ryan, with Chad completing the figures.

Environmental Setting

Climate

Coshocton County, like all of Ohio, has a continental climate, with hot and humid summers and cold winters. About 99 cm (39 in) of precipitation fall annually on the county with the average monthly precipitation about 8 cm (3.3 in). February is the driest month, while July tends to be the wettest month for this County [United States Department of Agriculture, Soil Conservation Service (USDA, SCS) 2002].

Physiography, Relief and Drainage

Coshocton County is located within the Allegheny Plateaus physiographic region of Ohio and, more specifically, the project is located on the Muskingum-Pittsburgh Plateau. This region is characterized by "moderately high to high relief dissected plateau having broad major valleys that contain outwash terraces, and tributaries with lacustrine terraces; remnants of ancient Teays-age drainage system uncommon; elevations from 650

ft to 1,400 ft" (Brockman 1998; Pavey et al. 1993). The southern and eastern part of the project area is drained by an unnamed tributary of Wills Creek. The northern and western parts are drained by an unnamed tributary that empties directly into the Muskingum River. These are all part of the Muskingum River watershed.

Geology

The project is situated in the Muskingum-Pittsburgh Pittsburgh Plateau. The underlying bedrock is from the Pennsylvanian- and Mississippian-era sedimentary rocks. The geology of the project consists of shales, coals, and sandstones (Brockman 1998). The underlying bedrock, specific to this project, included a coal layer associated with the Kittaning member.

Soils

The project is located in the Bethesda-Coshocton-Westmoreland association. These soils are generally located in upland, unglaciated areas with narrow ridge tops and steep side slopes (USDA, SCS 2002). There are numerous specific soils identified within the project (Table 1). The lower-lying areas appear to have soils associated with glacial activity (i.e., Glenford and Watertown series); however, these are also the likely locations of mining-related disturbances. Much of the project area contains soils that are either steeply sloped or severely disturbed. Most of the disturbance is associated with previous and multiple episodes of coal mining.

Table 1. Soils in the Project Area.

Soil Symbol	Soil Name	% Slope	Location
BhF	Bethesda channery loam	25-70	Mine spoil
BrF	Brownsville channery silt loam	35-70	Mine spoil
Ds	Dumps, mine	8-15	Mine spoil
GdC2	Germano sandy loam	6-15	Ridge tops
GhC	Gilpin silt loam	6-15	Ridge tops, Hillsides
GnB, GnC	Glenford silt loam	2-6, 6-15	Glacial terraces
MnC	Mentor silt loam	6-15	Upland Terraces
Or	Orrville silt loam	--	Upland floodplains
RgD	Rigley sandy loam	15-25	Hillsides
Ug	Udorthents, loamy	--	Disturbed areas
WaB, WaC	Watertown sandy loam	2-6, 6-15	Glacial terraces
WhD, WhE	Westmoreland silt loam	15-25, 25-35	Hillsides

Flora

There is or at least was great floral diversity in Ohio. This diversity is relative to the soils and the terrain that generally includes the till plain, lake plain, terminal glacial margins, and unglaciated plateau (Forsyth 1970). Three major glacial advances, including the Kansan, Illinoisan, and Wisconsinan, have affected the landscape of Ohio. The effects of the Wisconsin glaciation are most pronounced and have affected more than half of the state (Pavey et al. 1999).

The least diverse part of Ohio extends in a belt from the northeast below the lake-affected areas through most of western Ohio (Gordon 1966). These areas are part of the late Wisconsin ground moraine and lateral end moraines. It is positioned between the lake plains region and the terminal glacial moraines. This area included broad forested areas of beech maple forests interspersed with mixed oak forests in elevated terrain or where relief is greater (Forsyth 1970; Gordon 1966). Prairie environments such as those in Wyandot and Marion County areas would contain islands of forests, but were mostly expansive open terrain dominated by grasses.

The northwestern Ohio terrain is nearly flat because of ancient glacial lakes and glaciation, which affected the flora. However, the vegetation was more diverse than the till plain to the south and east because of the variety of factors that contributed to its terrain. Forests within the Black Swamp were generally comprised of elm/ash stands; however, dissected areas along drainages and drier, elevated areas from beach deposits would contain mixed forests of oak and hickory (Gordon 1966; 1969). There was little upland floral diversity in the lake plains (Black Swamp region) except for the occasional patches of oak and hickory. Floral variety was most evident in narrow sleeves along larger stream valleys where there is relief.

The most biological diversity in Ohio is contained within the Allegheny Plateau, which encompasses the southeastern two-thirds of the state (Sheaffer and Rose 1998). Because this area is higher and has drier conditions, it is dominated by mixed oak forests. Some locations within the central part of this area contain beech and mixed mesophytic forests. There are large patches of oak and sugar maple forests to the south of the terminal moraine from Richland to Mahoning County (Gordon 1966).

Southwestern Ohio from about Cincinnati to Bellefontaine east to the Scioto River historically contained a very diverse floral landscape. This is an area where moraines from three glacial episodes are prevalent (Pavey et al. 1999). Forests in this area include elm-ash swamp, beech, oak-sugar maple, mixed mesophytic, prairie grasslands, mixed oak, and bottomland hardwoods (Core 1966; Gordon 1966; 1969). These forests types are intermingled with prairies being limited to the northern limits of this area mostly in Clark and Madison Counties.

Generally, beech forests are the most common variety through Ohio and could be found in all regions. Oak and hickory forests dominated the southeastern Ohio terrain and were found with patchy frequency across most of northern Ohio. Areas that were formerly open prairies and grasslands are in glacial areas, but are still patchy. These are in the west central part of the state. Oak and sugar maple forests occur predominantly along the glacial terminal moraine. Elm-ash swamp forests are prevalent in glaciated areas including the northern and western parts of Ohio (Gordon 1966; Pavey et al. 1999).

The project area and south central Coshocton County are generally within what is considered to be a mixed oak and mixed mesophytic forest area (Gordon 1966).

Fauna

The upland forest zone offered a diversity of mammals to the prehistoric diet. This food source consisted of white-tailed deer, black bear, Eastern cottontail rabbit, opossum, a variety of squirrels, as well as other less economically important mammals. Several avian species were a part of the upland prehistoric diet as well (i.e. wild turkey, quail, ruffed grouse, passenger pigeon, etc.). The lowland zone offered significant species as well. Raccoon, beaver, and muskrat were a few of the mammals, while wood duck and wild goose were the economically important birds. Fishes and shellfish were also an integral part of the prehistoric diet. Ohio muskellunge, yellow perch, white crappie, long nose gar, channel catfish, pike, and sturgeon were several of the fish, whereas, the Ohio naiad mollusc, butterfly's shell, long solid, common bullhead, knob rockshell, and cod shell were the major varieties of shellfish. Reptiles and amphibians, such as several varieties of snakes, frogs, and turtles, were also part of the prehistoric diet (Trautman 1981; Lafferty 1979; Mahr 1949).

Cultural Setting

The first inhabitants of Ohio were probably unable to enter this land until the ice sheets of the Wisconsin glacier melted around 14,000 B.C. Paleoindian sites are considered rare due to the age of the sites and the effects of land altering activities such as erosion. Such sites were mostly used temporarily and thus lack the accumulation of human occupational deposits that would have been created by frequent visitation. Paleoindian artifact assemblages are characteristic of transient hunter-gatherer foraging activity and subsistence patterns. In Ohio, major Paleoindian sites have been documented along large river systems and near flint outcrops in the Unglaciated Plateau (Cunningham 1973). Otherwise, Paleoindian sites in the glaciated portions of Ohio are encountered infrequently and are usually represented by isolated finds or open air scatters.

The Paleoindian period is characterized by tool kits and gear utilized in hunting Late Pleistocene megafauna and other herding animals including but not limited to short-faced bear, barren ground caribou, flat-headed peccary, bison, mastodon, and giant beaver (Bamforth 1988; Brose 1994; McDonald 1994). Groups have been depicted as being mobile and nomadic (Tankersley 1989); artifacts include projectile points, multi-purpose unifacial tools, burins, gravers, and spokeshaves (Tankersley 1994). The most diagnostic artifacts associated with this period are fluted points that exhibit a groove or channel positioned at the base to facilitate hafting. The projectiles dating from the late Paleoindian period generally lack this trait; however, the lance form of the blade is retained and is often distinctive from the following Early Archaic period (Justice 1987).

Lepper (1986) has gathered information about this time period in the region. In the central Muskingum River basin there is a dense concentration of sites centered on discrete outcrops of Upper Mercer chert and a few of these sites are exceptionally large suggesting periodic reoccupation. There are indications that the Paleoindians were unusually selective regarding the quality of their raw material, but the evidence for a lithic determined settlement system can be derived from principles of hunter-gatherer settlement systems as outlined by Binford (1978).

The Archaic period has been broken down into three sub-categories, including the Early, Middle, and Late Archaic. During the Early Archaic period (ca. 10,000-8000 B.P.), the environment was becoming increasingly arid as indicated by the canopy (Shane 1987). This period of dryness allowed for the exploitation of areas that were previously inaccessible or undesirable. The Early Archaic period does not diverge greatly from the Paleoindian regarding the type of settlement. Societies still appear to be largely mobile with reliance on herding animals (Bamforth 1988). For these reasons, Early Archaic artifacts can be encountered in nearly all settings throughout Ohio. Tool diversity increased at this time including hafted knives that are often re-sharpened by the process of beveling the utilized blade edge and intense basal grinding (Justice 1987). There is a basic transition from lance-shaped points to those with blades that are triangular. Notching becomes a common hafting trait. Another characteristic trait occurring almost exclusively in the Early and Middle Archaic periods is basal bifurcation and large blade serrations. Tool forms begin to vary more and may be a reflection of differential resource exploitation. Finished tools from this period can include bifacial knives, points, drills/perforators, utilized flakes, and scrapers.

The Middle Archaic period (8000-6000 B.P.) is poorly known or understood in archaeological contexts within Ohio. Some (e.g., Justice 1987) regard small bifurcate points as being indicative of this period. Ground stone artifacts become more prevalent at this time. Other hafted bifaces exhibit large side notches with squared bases, but this same trait can extend back to the Paleoindian period. The climate at this time is much like that of the modern era. Middle Archaic period subsistence tended to be associated with small patch foraging that involved a consistent need for mobility with a shift towards stream valleys (Stafford 1994). Sites encountered from this time period throughout most of Ohio tend to be lithic scatters or isolated finds. The initial appearance of regional traits may be apparent at this time.

The Late Archaic period in Ohio (ca 6000-3000 B.P.) diverges from the previous periods in many ways. Preferred locations within a regional setting appear to have been repeatedly occupied. The more intensive and repeated occupations often resulted in the creation of greater social and material culture complexity. The environment at this time is warmer and drier. Most elevated landforms in northeastern Ohio have yielded Archaic artifacts (Prufer and Long 1986:7), and the same can be stated for the remainder of Ohio.

Various artifacts are diagnostic of the Late Archaic period. Often, burial goods provide evidence that there was some long-distance movement of materials, while lithic materials used in utilitarian assemblages are often from a local chert outcrop. There is increased variation in projectile point styles that may reflect regionalism. Slate was often used in the production of ornamental artifacts. Ground and polished stone artifacts reached a high level of development. This is evident in such artifacts as grooved axes, celts, bannerstones, and other slate artifacts.

A local proliferation of the Late Archaic is regarded as the Gilbert Phase. The Gilbert Site is located on the east side of the Muskingum River and on the floodplain. This site has yielded features that have been dated from the Late Archaic period. The Gilbert point type, a form similar to Brewerton styles, was defined from deposits from

this site (Carskadden 1963) and has been identified with some frequency throughout the county. This is situated to the south of the project and in a similar geological location.

It is during the Terminal Archaic period (ca 3500-2500 B.P.) that extensive and deep burials are encountered. Cultural regionalism within Ohio is evident in the presence of Crab Orchard (southwest), Glacial Kame (northern), and Meadowood (central to Northeastern). Pottery makes its first appearance during the Terminal Late Archaic.

Previous studies of Early Woodland "Adena" and Middle Woodland "Hopewell" settlement patterns in the lower Scioto Valley (Shane 1971), Hocking Valley (Black 1979), and southern Ohio in general (Fischer 1974) suggest the following: early Adena sites were located in diverse topographic settings due to seasonal movement from one primary resource zone to another. These settings included not only river bottoms, but also hilltops and small stream valleys. A shift is seen in late Adena toward greater use of river bottoms and Hopewell sites tended to be located primarily in the bottoms of major rivers. The shift from uplands to bottomlands is thought to be a result of a shift from a generalized subsistence toward an increased dependence on a variety of bottomland resources (Carskadden and Morton 1997a; Ford 1979; Smith 1987; Wymer 1987).

Evidence from Muskingum County, where 209 sq km of hinterland have been surveyed, indicated that during all three periods (early Adena, late Adena, and Hopewell), the bottoms of the Muskingum and Licking Rivers were exploited to a much greater degree than the hinterland (Carskadden and Morton 1997a). The density of river bottom sites is 5.9 times greater than the average hinterland density for early Adena sites, more than 4.8 times for late Adena, and 6.3 times for Hopewell when looking at workshops and short term sites. Early and late Adena sites have their greatest density along the Muskingum River, whereas the greatest density of Hopewell sites can be found along the Licking River. The dispersed nature of Adena habitation sites (hamlets) has long been recognized. Webb, for example, has observed that "individual house groups perhaps were several hundred feet apart, each group a small unit in itself, yet scores of such house groups might have been within an area of a few square miles" (Webb 1942:363).

The pattern mentioned above by Webb is apparent for the late Adena sites near Dresden and at other locations along the Muskingum River and seems to hold true for early Adena in the area. At Philo, six late Adena hamlets have been located in the river bottoms below a single ridge top burial mound. The local Hopewell settlements take on the same dispersed pattern as seen in earlier Adena. There appears to be a propensity for repeatedly selecting the exact same location, or nearly so, throughout Adena and Hopewell. Of the early Adena river bottom habitation sites, 52 percent were re-occupied in late Adena (or were continuously occupied into late Adena). A total of 34 percent of all late Adena sites in the river bottoms were occupied in Hopewell (about 50 percent long term and 50 percent short term). Twenty percent of the river bottom sites were occupied during all three periods. The site selection continuity seems to represent continuity in subsistence strategies (Carskadden and Morton 1997a).

Adena hamlets in Carskadden and Morton's (1997a) survey are more ephemeral than Hopewell hamlets; there is less in the way of diagnostic artifacts, debitage and

pottery. Late Adena hamlets covered areas averaging 0.28 to 0.32 ha with scattered postholes, usually in no identifiable pattern, in the immediate vicinity of a cluster of cooking/thermal features. Although some possible storage pits and a midden were identified at one site, Duncan Falls, there is no real indication that these sites were occupied for great lengths of time (Carskadden and Morton 1997a). What is lacking in the Muskingum River Valley are large (2.0 ha) late Adena sites that are known to occur along the Hocking River by the first century A.D. There also seems to be a lack of late Adena concentrations of mounds and earthworks in the Muskingum River Valley. Radiocarbon dates suggest that very late Adena in the central Muskingum Valley was contemporaneous with very late Adena in the Hocking Valley (post A.D. 1) and yet what was going on in the Hocking Valley was very different from what was going on in the central Muskingum Valley (Carskadden and Morton 1997a).

Although Flint Ridge flint appears to have played a role in the Hopewellian trade network, it became an important source for flint during late Adena, at least locally in the Muskingum River Valley. Over 84 percent of the late Adena (Robbins Phase) projectile points found throughout the Carskadden and Morton (1997a) survey were made from Flint Ridge flint. This contrasts with only 22 percent use of Flint Ridge in early Adena and 74 percent in Hopewell (Carskadden and Morton 1997a).

It seems that most of the ridge top and small stream valley hinterland habitation sites (Adena and Hopewell) in the Muskingum River Valley have characteristics of typical bottomland hamlets, which occur in clusters, just like those in the bottoms. Again it seems that Hopewell sites seem to occur in the general vicinity, if not exact, on the same site as a late Adena hamlet or hamlet clusters. This continuity continues all the way back into the early Adena, 65 percent of early Adena hinterland habitation sites also date to or have late Adena components, and 25 percent of the hinterland late Adena habitation sites also had either “long term” or “short term” Hopewell components. About 23 percent of all of these hinterland sites were occupied at some point during all three periods (Carskadden and Morton 1997a).

Carskadden and Morton (1997a) argue that the hinterland sites represent continuously occupied Adena-Hopewell occupations. They also suggest that towards the end of the early Adena there was a “settling in” period for local populations. Most of the groups had established themselves in the river bottoms; however a few groups established themselves in the hinterlands and then remained there into Hopewell. There seems to be no evidence of late Adena populations from the hinterlands moving to the river valleys (Carskadden and Morton 1997a).

Middle Woodland “Hopewell”

Dispersed clusters or isolated river bottom sites of little more than an acre in extent characterize middle Woodland “Hopewell” along the central Muskingum Valley proper. Often associated with these sites are single river terrace burial mounds and in a couple cases, groups of two to four low burial mounds located on terraces or hilltops overlooking the open sites (discussed later).

Review of the *Bibliography of Muskingum County Archaeology 1795-1995* (Carskadden and Morton 1997b) indicates the location of numerous resources in Muskingum County. Many obscure resources are located in this bibliography. The Trinway Earthwork, sometimes called the Dresden Circle (33MU573) is depicted on a late nineteenth century county history (Everhart 1882). In 1805, a diary/journal reference indicated the presence of the earthworks describing it as a "circular brest-works and redoubts, rising one above the other" and located "on a side hill at Wakkatomaka." This reference is reported from a secondhand account and may refer to other earthworks other than the Trinway Earthwork (Carskadden and Morton 1997b).

According to current conventional wisdom, Adena and Hopewell are simply stages in a continuous developmental sequence, and there are sites that span the transitional period between what would be called late Adena and classic Hopewell. These sites produced projectile points that appear intermediate between the late Adena Robbins type and the later Hopewellian corner notched forms, as well as plain surfaced pottery with characteristics of Adena Plain and McGraw Plain/Murphy Plain. What is suggested is that the corrected date of 77 A.D. from the Cox B site, associated with plain, cordmarked, as well as rocker stamped pottery, probably comes closer to dating the beginning of the Hopewellian component of the Cox site cluster, and the beginning of cordmarked pottery in central Muskingum Valley, meaning the beginning of Hopewell (Carskadden and Morton 1997a).

In spite of Squier and Davis' remark about the lack of rudimentary Hopewellian earthworks, at least three are possible in the Muskingum Valley above Marietta. Two of these (the Dresden Circle and the Lichtenau Circle) are located in the 3.2 km wide bottoms of the Upper Muskingum between Dresden and Coshocton, and the third is located in a narrower portion of the valley at Gilbert, about midway between Dresden and Zanesville. The earthwork just above Dresden, situated near the Hopewellian Cox sites, was a circle about 174 m in diameter; surrounded an area of a little less than 2.4 ha. The Lichtenau earthwork, located about four kilometers below (south) Coshocton, consisted of a circle of about the same size (Carskadden and Morton 1997a). Late Adena as well as Hopewellian habitation sites can be found in the immediate vicinity of both of these circles. Carskadden and Morton (1997a) report that the Dresden and Lichtenau earthworks were constructed by the early Hopewell.

Hopewell settlements are generally characterized as clusters of dispersed sedentary farmsteads or hamlets occurring in the general vicinity of earthwork complexes (Carskadden and Morton 1997a; Pacheco 1988; Smith 1987). Similar, if not identical patterns of Hopewell settlement can be seen along the lower Licking and in the central and upper Muskingum Valley, where a number of clusters of up to six households or hamlets, have been located. Isolated single Hopewell hamlets occur rarely where there is a limited area exposed by plowing according to Carskadden and Morton (1997a). Yet, only at Dresden and possibly Gilbert (and Lichtenau in Coshocton County) are these hamlet clusters associated with an earthwork. However, Cox B and Cox C are the only Hopewell hamlets along the Muskingum that have been tested.

These Hopewell habitation sites (open-air) are further divided into two types, which are designated as long term and/or short term habitations. The long term sites are

characteristic of farming hamlets as outlined by Pacheco (1988) and consist of hundreds of bladelets, dozens of projectile points, and an abundance of debitage, whereas, the short term sites are differentiated by two or three bladelets, one or two projectile points, and a very small amount of debitage. Pottery sherds and pit features are normally, but not always, characteristic of long term sites, whereas single pit features are reminiscent of short term habitation (Carskadden and Morton 1997a). Pacheco (1992) went on further to designate these sites as small artifact clusters. According to Pacheco (1992) these sites/clusters average .14 ha in size and have artifact densities of less than .2 per sq m, whereas, the hamlets (long term) average .45 ha and have artifact densities greater than .2 per sq m. These small artifact cluster sites as defined by Pacheco (1992) represent short duration specialized camps or activity areas (Carskadden and Morton 1997a; Pacheco 1992).

Over half (56 percent) of the "short term" sites/specialized camps/activity areas found in Carskadden and Morton's (1997a) survey occur in the bottoms of the Muskingum and Licking Rivers, more often than not in the vicinity of the hamlet clusters. The remaining 43 percent of the sites occur in the hinterlands, mostly in the valleys of stream valleys (Carskadden and Morton 1997a).

There is a third type of Hopewellian site identified, and this is the so-called ridge top workshop. These workshops are located in close proximity to flint quarries (could be up to six km away), have an abundance of debitage (particularly bladelet cores, and various blanks in different stages of reduction). These sites for the most part lack pit features. An example of this site type is located near Flint Ridge State Park at the Dodson Village. Numerous amounts of debitage were recovered yet an excavation in 1932 revealed only two cooking features and a small amount of animal bone and potsherds. A reanalysis of this site and artifacts concluded that this site "represents very short term occupations over a long period of time by comparatively small groups of people intent upon procuring Flint Ridge Flint" (Murphy and Morton 1984:24).

On the other hand excavation at the Murphy sites has produced just as much if not more lithic debitage as the workshops (Dancey 1991; Pacheco 1992). The Murphy sites suggest that the abundance of such debitage does not preclude a site from being a hamlet. A large amount of debitage may be the result of long duration of occupation. Sites such as those as the Murphy sites are described by Pacheco as "intense occupation by a substantial permanent population." There are ridge top Hopewell sites located in the Muskingum Valley that are distant from flint outcrops that appear to fit the definition of hamlets (Carskadden and Morton 1997a).

The early Late Woodland is assumed by Carskadden and Morton (1997a) to be a continuation of the Middle Woodland culture, yet lacking the Hopewellian interaction sphere of goods and elaborate mortuary practices. This stage is represented in the central Muskingum River Valley by a number of open sites along the river including an excavated component at the Philo II site, several rockshelters in the hinterland and possibly a hinterland circular earthen enclosure. Diagnostic artifacts of this time frame include Chesser Notched points and plain rimmed, grit tempered Peters Cordmarked pottery. The angular shoulders, which distinguish Newtown-like pottery, are not found at central Muskingum River Valley sites. Limestone tempering, the characteristic of

Watson Cordmarked pottery is present in a minority of sherds. All of the sherds recovered from the early Late Woodland features at Philo II are cordmarked, but nothing that could be interpreted as Peters Plain has been found. Pottery lips appear flattened and un-notched. The only radiocarbon date is from Philo II, A.D. 850 (Morton 1977). The timeframe for the early Late Woodland probably dates between 600-850 A.D. (Morton 1984).

Morton (1984) refers to the middle Late Woodland as "Intrusive Mound-like." This is a hard cultural manifestation to identify in the central Muskingum River Valley. No burials have been identified in this region as Intrusive Mound-like, however; artifacts associated with this timeframe have been identified in the region. Artifacts associated with the middle Late Woodland are Jack's Reef, Raccoon Notched/Side Notched, and Levanna triangular points. Sites yielding Jack's Reef projectile points are believed to represent the early period of the middle Late Woodland while the Raccoon Notched points indicate a later period within the middle Late Woodland (Morton 1984). Morton (1984) defines the timeframe for this period is most likely between A.D. 850-1100. The pottery during this timeframe is the Cole Cordmarked (?) and the Peters Cordmarked.

An "Intrusive Mound-like" site near Dresden along the Muskingum River yielded exclusively Jack's Reef Corner Notched points and Peters Cordmarked pottery from a refuse pit. The Peters Cordmarked ceramics are predominant in the early Late Woodland and characterized by a thickened or collared rim with two slight but noticeable raised rim areas with notches along the slip. It seems to Morton (1984) that this vessel is the morphological "missing link" between the plain-rimmed Peters Cordmarked and the later collared and castellated Cole-style ware.

In regards to settlement and subsistence patterns little can be inferred until further investigations within the Muskingum River Valley have been carried out. What can be said is that settlements are represented by low terrace or floodplain "hot spots," sites of generally smaller extent and thinner density than the early Late Woodland sites. Jack's Reef and Raccoon Notched points have been identified in rockshelters, but these are considerably less numerous than Chesser Notched points in such contexts (Morton 1984).

Sites belonging to the late Late Woodland or the "Cole/Baldwin-like" phase include two-rock shelters and two excavated open sites: the Locust Site along the Licking River and a site at Copeland Island along the Muskingum River. Tentative dates suggest 1100-1150 A.D. as the beginning of this phase in the central Muskingum areas, although the earliest radiocarbon dates obtained indicate A.D. 1190 from Copeland Island. These sites have yielded Levanna-like triangular points, yet Raccoon Notched points are found on these sites and believed to fall within the early phase of the late Late Woodland (Morton 1984).

The pottery is similar to that of the Baldwin phase pottery and radiocarbon dated to A. D. 1230. Similarities can also be seen in central Ohio, such as the Cole, Decco, and Ufferman sites. What all the pottery of the Muskingum River Valley has in common is a high proportion of cordmarking, grit tempering, and collared and castellated rims with flange/lugs. What seems to be absent or rare are punctuates, strap handles, incised designs, and shell tempering-in short all of the pottery diagnostic of Fort Ancient. A few

sherds in the Muskingum Valley have incising of the parallel oblique kind on the neck of the vessel or in one vessel on the collar (Morton 1984).

Intra-site patterning of the late Late Woodland sites consists of a sparse "linear scatter" or diffuse series of "hot spots" along the floodplain, very much like the patterning of earlier sites. What this seems to suggest is periodic reoccupation over an extended span of time rather than intensive occupation over a relatively short span of time. The Fort Ancient style circular nucleated village layout seen in the later Philo Phase or in the Baum Phase of the Scioto Valley seems to be lacking at these late Late Woodland sites. Present at these sites are deep refuse/storage pits, often containing bone and shell refuse. This suggests some degree of intensity of the occupation at these sites (Morton 1984).

Late Prehistoric

The early Late Prehistoric or the Philo Phase is characterized by nucleated, circular, central plaza-type villages occupied year-round, large scale river bottom maize agriculture, smooth shell tempered Philo Punctate pottery, rich and diversified bone and antler industries, and ossuary-style mass burials (Carskadden and Morton 1977). Projectile points of this time period are the Madison point and the Fort Ancient style points. Radiocarbon dates suggest a beginning of this phase in the Muskingum Valley from A.D. 1230 to A.D. 1320. Radiocarbon dates have suggested something interesting concerning the Cole/Baldwin-like phase. It seems that the Cole/Baldwin-like phase persisted as much as a generation after the appearance of the Philo phases, at least in certain portions of the Muskingum Valley (e.g. Locust Site, Eddy Paul Rockshelter). Several Cole Cordmarked vessels have been recovered from the Philo phase Richards site (A.D. 1260 to A.D. 1290) [Morton 1984].

The late Late Prehistoric or the Riker Phase manifests itself in the form of Wellsburg Simple Stamped and Tuttle Hill Notched pottery. One site, in Muskingum County near Dresden, has a radiocarbon date A.D. 1350 (30 years after the latest Philo phase), and may represent the earliest influx of Riker phase traits into the central Muskingum area, possibly from northeast Ohio. The only other manifestation of this phase in the Muskingum Valley is from a mound to the West of Zanesville, which yielded Tuttle Hill Notched ceramics (Morton 1984).

Protohistoric to Settlement

By the mid-1600s, French explorers traveled through the Ohio country as trappers, traders, and missionaries. They kept journals about their encounters and details of their travels. These journals are often the only resource historians have regarding the early occupants of seventeenth century Ohio. The earliest village encountered by the explorers in 1652 was a Tionontati village located along the banks of Lake Erie and the Maumee River. Around 1670, it is known that three Shawnee villages were located along the confluence of the Ohio River and. the Little Miami River. Because of the Iroquois Wars, which continued from 1641-1701, explorers did not spend much time in the Ohio region, and little else is known about the natives of Ohio during the 1600s. Although the Native American tribes of Ohio may have been affected by the outcome of the Iroquois

Wars, no battles occurred in Ohio (Tanner 1987).

French explorers traveled extensively through the Ohio region from 1720-1761. During these expeditions, the locations of many Native American villages were documented. In 1751, a Delaware village known as Maguck existed near present-day Chillicothe. In 1758, a Shawnee town known as 'Lower Shawnee 2' existed at the same location. The French also documented the locations of trading posts and forts, which were typically established along the banks of Lake Erie or the Ohio River (Tanner 1987).

While the French were establishing a claim to the Ohio country, many Native Americans were also entering new claims to the region. The Shawnee were being forced out of Pennsylvania because of English settlement along the eastern coast. The Shawnee created a new headquarters at Shawnee Town, which was located at the mouth of the Scioto River. This headquarters served as a way to pull together many of the tribes which had been dispersed because of the Iroquois Wars (Tanner 1987).

Warfare was bound to break out as the British also began to stake claims in the Ohio region by the mid-1700s. The French and Indian War (1754-1760) affected many Ohio Native Americans; however, no battles were recorded in Ohio (Tanner 1987). Although the French and Indian War ended in 1760, the Native Americans continued to fight against the British explorers. In 1764, Colonel Henry Bouquet led a British troop from Fort Pitt, Pennsylvania to near Zanesville, Ohio.

In 1763, the Seven Years' War fought between France and Britain, also known as the French and Indian War ended with The Treaty of Paris. In this Peace of Paris, the French ceded their claims in the entire Ohio region to the British. When the American Revolution ended with the Second Treaty of Paris in 1783, the Americans gained the entire Ohio region from the British; however, they designated Ohio as Indian Territory. Native Americans were not to move south of the Ohio River but Americans were encouraged to head west into the newly acquired land to occupy and govern it (Tanner 1987).

By 1783, Native Americans had established fairly distinct boundaries throughout Ohio. The Shawnee tribes generally occupied southwest Ohio, while the Delaware tribes stayed in the eastern half of the state. Wyandot tribes were located in north-central Ohio, and Ottawa tribes were restricted to northeast Ohio. There was also a small band of Mingo tribes in eastern Ohio along the Ohio River, and there was a band of Mississauga tribes in northeastern Ohio along Lake Erie. The Shawnee people had several villages within Ross County along the Scioto River (Tanner 1987). Although warfare between tribes continued, it was not as intense as it had been in previous years. Conflicts were contained because boundaries and provisions had been created by earlier treaties.

In 1795, the Treaty of Greenville was signed as a result of the American forces defeat of the Native American forces at the Battle of Fallen Timbers. This allocated the northern portion of Ohio to the Native Americans, while the southern portion was opened for Euro-American settlement. Although most of the battles which led up to this treaty did not occur in Ohio, the outcome resulted in dramatic fluctuations in the Ohio region. The Greenville Treaty line was established, confining all Ohio Native Americans to

northern Ohio, west of the Tuscarawas River (Tanner 1987).

Ohio Native Americans were again involved with the Americans and the British in the War of 1812. Unlike the previous wars, many battles were fought in the Ohio country during the War of 1812. By 1815, peace treaties began to be established between the Americans, British, and Native Americans. The Native Americans lost more and more of their territory in Ohio. By 1830, the Shawnee, Ottawa, Wyandot, and Seneca were the only tribes remaining in Ohio. These tribes were contained on reservations in northwest Ohio. By the middle 1800s, the last of the Ohio Native Americans signed treaties and were removed from the Ohio region.

Coshocton County History

Coshocton County was first organized on April 1, 1811. It is a rugged countryside that is centered on the confluence of the Walhonding River, Tuscarawas River, and Muskingum River. The terrain and environment is diverse as the uplands are comprised of unglaciated landforms and the valleys were carved as a byproduct of glacial activity. The county derives its name from Native American words meaning Black Bear. Originally, it included a large part of Holmes County and was part of the United States military Land District granting land to participants in the Revolutionary War (Hill 1881; Bahmer 1909). In the 1830s to 1840s many new immigrants from New York, western Pennsylvania, eastern Ohio, Germany, and Ireland settled in the county (Bahmer 1909; Hunt 1876). Various Native American groups were in the area just prior to the settlement period including the Delaware and Shawnee Tribes (Hunt 1876; Bahmer 1909).

Early Ohio history involves aspects of Coshocton County. Christopher Gist, Croghan, various Native American chiefs (i.e., Captain Pipe and Netawatwees), Colonel James Smith, Henry Bouquet, and Charles Williams to name a few were all part of the early history of this area. Mr. Williams arrived at the Forks around 1799 where he established a tavern called ‘King Charley’s” (Hill 1881; Bahmer 1909; Lewis 1928; Howe 1880), which served a dual function as the first courthouse. During the early surveys of the area surrounding the tavern, the budding community was called “Tuscarawas” (Bahmer 1909:58).

Bouquet’s expedition into the area with a small army of 1500 men occurred in the mid 1760s. His travels and camp locations were chronicled at the time and he is responsible for freeing many captives of the Native Americans as well as taking captives himself. His activity assisted in squelching the Native American hostilities at that time. His focus was on the towns that were established at the Forks (Hunt 1876). His mission was to cease the raiding and murders that were occurring at the hands of the Native Americans in this area and extending into Pennsylvania. He met with little resistance as his forces were viewed as being too large to overtake.

Near the center of the county is the City of Coshocton, a community that was formed early on as it is at the forks of major streams. It was always a hub of activity dating to the prehistoric period. Historic Native American villages were established in the river valleys including one at present day Coshocton. The river valleys and the abundance of readily available chert made this county very attractive to the Native

Americans. There are numerous earthworks, villages, chert quarries, and artifacts throughout the county dating from the Paleoindian period to the Contact Period. Early Native American trails traverse the county and were used by the early settlers and military expeditions (Lewis 1928). It seems that all roads and activities centered on the City of Coshocton and it remains the largest community in the county.

The dominant economy of the county in the first half of the nineteenth century was agriculture. Corn, wheat, barley, sorghum, tobacco, and livestock were major products. Early grist and sawmills were built along the local creeks and streams in the 1810s. In 1812, road construction began in the county, mainly along old Indian trails. In the 1810s and 1820s roads/trails and the rivers and creeks in the county were used to transport agricultural goods for export. The Ohio Canal was a crucial part of the development of the county as it allowed for the farmers in the region to participate in the capitalism of the eastern markets. This was occurring soon after the initial waves of settlers around 1830. It spurned the growth of many communities as well as the price of grains such as wheat. Wheat nearly tripled in value and the farmers were able to profit from their endeavors. Small towns with gristmills and warehouses sprang up next to the canal in the 1830s and 1840s. Roscoe was one of the towns that became an important stop with a granary, mills, hotels, and a distillery (Bahmer 1909; Hunt 1876). This also allowed businesses such as coal mining to take off (Lewis 1928).

The effectiveness of the canals was superseded by the development of railroads as a more efficient, quicker, and less costly means of transportation. In 1852-53 the first railroad, the Steubenville and Indiana, was built in the county. Several other lines were built after 1874. The development of the canal and railroads stimulated the growth of Coshocton, which is both the county seat and economic center of the county. Coshocton was laid out in 1802. In the mid-1860s the town had several iron foundries, a paper mill, a brewery, and a planing mill. In 1870, a cigar factory was established. Other industries in the county that developed in the nineteenth century included coal mining and oil wells. In 1834, the first coal mining activities were reported in the county. Early mining was small and mainly done for family use; however, this changed with the appearance of the railroads. Larger mining operations began in the late nineteenth and early twentieth century. Oil wells reached peak production between 1857 and 1860 (Bahmer 1909; Hunt 1876).

Coal mining started early on in the county dating from Morriss Burt's activity in 1834 (Lewis 1928). This product was shipped as canal cargo and later on the railroads and is accessible from nearly all townships in the county. The coal was so abundant that the county had produced over 400,000 tons by 1910. New coal mines still sprout up around the county today and some of the large enterprises of the 1960s (i.e., Peabody and Arrowhead mines) have visually altered the formerly natural landscape.

Modern Coshocton County largely remains rural and much of its business endeavors are focused on mineral extraction (mostly coal) and agriculture. The City of Coshocton remains the hub of the population and political activity for the county. This town and a few others in the area have seen some expansion with the advent of such enterprises as industrial parks, Walmart, and even a defunct ethanol plant. Other businesses of mention include Kraft Foods and the Novelty Advertising Company.

Franklin Township History

Franklin Township was formed in 1814 with it being split into two halves. The eastern part is contained in Congress land and the western part is Military land. The terrain in the township is diverse. It includes dissected, unglaciated uplands and valleys that were formed from glacial outwash. It is primarily drained by the Muskingum River and Wills Creek. This diversity offered rich mineral deposits and large fertile bottom land soils that would form the backbone of the economy; coal mining and farming. The economy was maintained first through the Ohio Canal that passes through the western part, then the railroads, followed by paved roads (Bahmer 1909; Hill 1881).

Early settlers in the area were immigrating from New Orleans and associated with the French. German settlers made up the majority of the population. The French were Catholics that were oriented initially with St. Nicholas in Zanesville. They were the most populace in the eastern, hilly part of the township during the middle of the nineteenth century (Hill 1881). Early settlers of the township included Major William Robinson, whose namesakes owned property into the twentieth century. Robinson was originally from Virginia and had been a captive of Chief Logan during Dunmore's War (Hill 1881; Bahmer 1909). He was one of the first landowners of the area occupying land in the early nineteenth century along with Michael Miller circa 1801. Other early surnames include Tanner, Taylor, Jackson, Johnson, Powelson, Wilcox, and Shoemaker. Lewis Rodruck occupied land on the Robinson tract starting in 1809 and purchased land in the southern part of the township (Hill 1881; Hunt 1876).

The township includes several small communities including Conesville, which is one of the larger communities in the township. The village was named after Beebe S. Cone who instituted much of the business and activities of the area during the middle of the nineteenth century. He was the postmaster and started a distillery that employed most of the town. However, once the distillery burnt down (twice) he left for Iowa. The populace would not take on the appearance of a village again until the late nineteenth century with the replacement of the 1830 schoolhouse (circa 1893) (CCHS 1985).

There are several small communities in the area including Wills Creek (formerly Frew's Mill) and Coalport. Coalport was originally named 'Franklin Station', whose residents were mostly employed with the company of that namesake. The community of Tyndal was formed from another community regarded as Franklin Station. It is likely that it was named for Joseph Tingle, landowner/storeowner/postmaster of the village (Hill 1881; Hunt 1876; Bahmer 1909).

Unlike many other locations throughout Ohio and the region, Franklin Township did not experience the boon of early industry. The only tavern was on the Marquand farm and was operated by John Wamsley. This would have been situated on the west side of the river. There were distilleries in the area and mills were necessary to process agricultural products. The Parker brothers constructed Frew's Mill around 1815. This was the start of a small community with blacksmith shops, and various other businesses setting up shop (Hill 1881).

The first schoolhouse was located between Tyndal and Conesville. Israel Baker taught at the school in the first decade of the nineteenth century (Bahmer 1909:62; Hill 1881). There were six school districts in the township as of 1876.

The earliest church to be formalized in the township was affiliated with the Methodist Epicopals. This was started in 1812 on the Robinson property at what was called Bethany Church. The first church as erected in 1870 to the northeast of Wills Creek. Several other Methodist organizations sprang up during the nineteenth century and usually held services at residences or other facilities. The German Lutheran church was erected in 1839 and in Section 21. This was a log structure, while many of the services associated with this religion were in houses (Hill 1881; Bahmer 1909).

Coal mining became a large aspect of the industry and economics of the area along with farming and stock raising. Corporate coal mining became the industry after the Civil War. Early mining was conducted by the Highland Coal Company up to about the 1860s; the Columbus Coal and Mining Company was enterprising prior to 1900 (Hill 1881; Bahmer 1909). The early coal that was mined was exported via canal boats until 1854 when the railroads took over. This early mining involved subterranean systems, in which this method has largely gone to the wayside in favor of strip mining.

The mining activity in this region also took place within the current project area. John Knoff was an early settler that occupied a residence in the vicinity. His surname, likely his son, is noted as having a residence within the project area in the late nineteenth century (Lake 1872). Knoff was one of the first to start extracting coal from the area circa 1820; an enterprise that continues into the modern era.

The Columbus and Southern Ohio electric plant began in 1956 and it remains as one of the steadfast industries. It is supported by the local coal mining industry. Farming prospers in the valley areas as it always has. Other mineral resources of interest include oil and iron. The township is not densely populated and retains its rural atmosphere.

Research Design

The purpose of a Phase I survey is to locate and identify cultural resources that will be affected by the planned development. This includes archaeological deposits as well as architectural properties that are older than 50 years. Once these resources are identified and sampled, they are evaluated for their eligibility or potential eligibility to the NRHP. These investigations are directed to answer or address the following questions:

1) Did the literature review reveal anything that suggests the project area had been previously surveyed, and what is the relationship of previously recorded properties to the project area?
2) Are cultural resources likely to be encountered in the project area?
3) Will the planned undertaking affect any archaeological or architectural properties?
4) Will any NRHP eligible sites or properties be affected by the planned development?

Archaeological Field Methods

The survey conducted within the project used three methods of sampling and testing to identify and evaluate cultural resources. These included shovel test unit excavation, shovel probe excavation, and visual inspection.

Shovel test unit excavation. Shovel test units were placed at 15-m intervals. Shovel test units measure 50 cm on a side and are excavated to 5 cm below the topsoil/subsoil interface. Individual shovel test units were documented regarding their depth, content and color (Munsell). Wherever sites are encountered, Munsell color readings are taken per shovel test unit. All of the undisturbed soil matrices from shovel test units are screened using .6 cm hardware mesh. When sites are encountered, additional shovel test units will be excavated at 7.5 m intervals extending on grid and in the two cardinal directions within the corridor from the positive locations.

Shovel probe excavation. Shovel probes were excavated during these investigations to document the extent of the disturbance associated with modern construction activities. These probes were excavated similarly to shovel test units. They had the same dimensions of 50 cm on a side, but were not screened. They were excavated at 15-m intervals and to a depth of 15-20 cm or deep enough to establish lack of soil integrity.

Visual inspection. Locations where cultural resources were not expected, such as mined and disturbed areas or low/wet areas were walked over and visually inspected. Efforts were intensified to verify the existence/absence of mining or residential remains. This method was used to verify the absence or likelihood of any cultural resources being located in these areas. This method was also utilized to document the general terrain and the surrounding area.

The application of the resulting field survey methods was documented in field notes, field maps, and project plan maps.

Prehistoric Artifact Analysis

An artifact inventory was accomplished upon completion of the fieldwork. This involved identifying the functional attributes of individual artifacts, as well as the artifact cluster(s) or site assemblage collectively. The prehistoric artifact types and material were identified during the inventory process. The lithic artifact categories are modeled after Flenniken and Garrison (1975) and include the following:

Utilized Flake/Uniface. This artifact is a tool form that typically evidences use-wear on one face. The tool is made or derived from a flake and has edge attrition. These tool types generally function as knives, scrapers, and/or graving utensils.

Identification of the material type of individual artifacts is based on several attributes, including color, inclusions, and luster. Several resources were used to aid in the inventory of the material types, including Converse (1994), DeRegnaucourt and Georgiady (1998), and Stout and Schoenlaub (1945). Chert outcrops have been identified in the immediate and surrounding terrain to this project corridor.

Curation

A single artifact was recovered during these investigations. The landowner was sent a letter to determine the disposition of this artifact. It had not been received by the time this document had been completed. Notes and maps affiliated with this project will be maintained at Weller & Associates, Inc. files.

Literature Review

The literature review study area is defined as a 1 mile radius from the center of the project. In conducting the literature review, the following resources were consulted at OHPO and the State Library of Ohio:

1) *Archeological Atlas of Ohio* (Mills 1914);
2) OHPO United States Geological Survey (USGS) 7.5' series topographic maps;
3) Ohio Archaeological Inventory (OAI) files;
4) Ohio Historic Inventory (OHI) files;
5) National Register of Historic Places (NRHP) files;
6) OHPO CRM/contract archaeology files; and
7) OHPO consensus determination of eligibility files;
8) ODNR mining resource maps; and
9) Coshocton County atlases, histories, historic USGS 15'series topographic map(s), and current USGS 7.5' series topographic map(s).

A review of the *Atlas* (Mills 1914) was conducted. There were no resources situated within or adjacent the project.

The OHPO topographic maps did not indicate any previously recorded archaeological sites in the project area, but there are two sites indicated within the study radius. This includes 33CS422 and 33CS581, which both date from the prehistoric period and with unassigned temporal components.

The Ohio Historic Inventory (OHI) files did not indicate any previously recorded OHIs within the project or its study radius. There are three cemeteries noted within this inspected radius. This includes the Ann Royers Chapel-Royers Chapel (#2229), Bethany-Robinson (#2230), and the Franklin Methodist Protestant Church-Franklin (#2234). The Bethany-Robinson Cemetery is located near the southwestern corner of the project area; however, it is clearly positioned outside of the subject area.

A review of the NRHP files indicates that the Muskingum River Navigation Historic District (basically the Muskingum River) is located within the study radius. This riparian corridor will not be involved in this project.

A review of the CRM surveys was conducted for this project. There have been three professional surveys (Reigel 1993; LePelley 2004; Biehl and Keener 2001). The latter two were investigations completed for small project areas, cell towers. Reigel's (1993) investigation was completed for a two-mile long pipeline associated with the Columbus Southern Power Company.

Cartographic and Mining Related Documents

Cartographic/atlas resources were reviewed for the project. The *Atlas of Coshocton County, Ohio* (Lake 1872) indicated that there are several landowners involved in this project (Figure 4). In the late nineteenth century the landowners include: J & W Renolds (with house), I. Shambough (house near project area), Dan Hankins, Moses Wilkins, J. Collet (with house), J. Knoff (with house), and S. Robinson (with house). There is a Methodist Episcopal Church and cemetery noted near the southwestern corner of the project area (Figure 4).

Coal mining activity became prevalent in the early part of the twentieth century within the project area. In 1910, the Barnes Coal & Mining Company /Conesville Mines (CN-100) owned at least the mineral rights and most of the land associated with the project area (Bock 1910; Figures 5-8). At this time there was a spur associated with the Wheeling & Lake Erie Railroad extending into the western part of the area. This was to facilitate the extraction of the coal from this mine tract. This early mining was abandoned in 1926; however, more recent longwall mining took place sometime between 1962 and 1985. A conveyor system was located in the area dating from the 1980s and extended through the northwestern part of the tract and to the Conesville plant facilities.

The USGS *1908 Conesville, Ohio Quadrangle 15 Minute Series (Topographic)* map indicates a road extending through the eastern part, as two isolated residences, and a series of five residential buildings along the western side. Inspection of the Barnes Coal & Mining Company /Conesville Mines (CN-100) blueprint verifies that these structures were associated with miners for the area (Figures 5-7). Drift entries and air shafts, along with the underground mining corridors, were recorded by the Ohio Department of Natural Resources, Division of Mining Reclamation. According to the USGS *1962 (P.R. 1985) Wills Creek, Ohio Quadrangle 7.5 Minute Series (Topographic)* map there are no buildings or structures within the project area (Figure 2). This resource further indicates a conveyor through the northwestern part, a cemetery to the south, and various mining-related disturbances surrounding the uplands.

Evaluation of Research Questions 1 and 2

There were two questions presented in the research design that will be addressed at this point. These are:

1) Did the literature review reveal anything that suggests the project had been previously surveyed and what is the relationship of previously recorded properties to the project?
2) Are cultural resources likely to be identified in the project?

There were few previously recorded sites located in the vicinity of this project. Inspection of mining-related resources and cartographic maps were more telling about some of the cultural activities that had occurred. Mining clearly dominates this landscape, especially the project area and its vicinity. Things that need to be accounted for are intact and older coal mining related activities as well as possible residences. This area has not been the focus of many previous CRM surveys; two of the three that were identified are associated with cell towers.

Fieldwork Results

The field investigations for this project were conducted on May 1-3, 2013 (Figures 9-29). The weather and conditions were a non-factor in the completion of the field investigations. Access to the project was initially more problematic until an earthen truck path was located along the northern part of the area. There are two basic aspects to this project: 1) the lower-lying terrain that outlines all but the southern part and; 2) the central, upland part that sits above the previous and severely disturbed mining landscape. Pedestrian inspection was an important part of these investigations as much of the terrain has been altered or completely disturbed. This visual inspection was combined with subsurface methods of sampling to identify/test for cultural materials. These investigations identified one previously unrecorded archaeological site, 33CS727. There are no buildings or structures present in this project area.

Pedestrian/visual inspection was conducted in the eastern and western parts of the project area that basically account for previously mined landscape. According to the modern topographic maps, mining blueprints, and histories these locations have been the focus of extractive coal mining operations. The ODNR indicated that there were drift mine entries and air shafts located in this area in association with mine CN-100. The inspected blueprints indicated that the early twentieth century mining consisted of extensive underground activity along with worker's housing. This housing was noted on the blueprints as well as the circa 1908 15-minute topographic map. Additional and more modern mining activity to this area further exploited the coal prior to 1962 and sometime from 1962-1985. The fieldwork split the project area into three areas; the western, eastern, and central parts.

The Western Part

Visual inspection of the area between the existing mining highwall and CR 271 was conducted (Figures 9-12). This inspection was intensive and involved the excavation of shovel probes to verify the nature of the setting and lack of intact topsoil deposits. There were 8 shovel probes excavated in this area. The testing identified severely mottled loam and sandy loam (10YR 2/2) over mottled, similarly textured subsoil. There were no intact soils identified in this area. These probes were placed in the suspected vicinity of the former buildings that may have been associated with workers of the former early twentieth century mining. There was no evidence of these facilities identified. Instead, the testing and visual inspection verified the modern to semi-modern mining landscape. This consisted of irregular and unnatural terrain comprised of spoil and exfoliated bedrock. The former 1980s conveyor belt corridor was obvious as it cut

through the project obliquely from the southwest to the northeast. Inspection for any mine openings or related facilities was conducted, but there was nothing identified. The presence of any intact materials from this part of the project area is highly improbable. This precludes the identification of any residences, structures, or buildings that might have been noted in this area according to cartographic resources.

The Eastern Part

Inspection of the eastern part of the project area, from the highwalls to the SR 83 right-of-way, was conducted (Figures 9 and 16-18). The field investigations for this part of the project were limited to visual inspection. There were no intact landforms identified and the terrain is highly irregular and unnatural. The primary agent of disturbance is associated with previous mining activity and the construction of a road. This road is apparent on the 1908 15-minute topographic map, but is no longer a through-road. It is an abandoned segment that mimics the orientation of the highwalls and is comprised of earth and gravel. Visual inspection and inspection of aerial/topographic maps secured that this terrain was disturbed.

The Central Part

Subsurface testing and visual inspection were conducted in the central and majority of the project area (Figures 9 and 19-26). The field investigations conducted in this part of the project was two-fold. Intensive inspection of the central part of the project was conducted to attempt to locate any former residences as well as suitable landforms to test. The J. Knoff residence (circa 1872 and 1908) was noted in the central part and near the headwaters of the ephemeral stream that flows eastward through this area. Pedestrian transects were spaced at 15 m intervals through this area, but failed to locate any historic period materials or foundation remains. A brief interview with AEP further reiterated the absence of any such related materials (personal communication, Jon Magalski, May 6th, 2013).

There were 120 shovel test units and 32 shovel probes excavated in this area. The testing identified shallow topsoil deposits that were always less than 30 cm. The average depth was at 22 cm below ground surface, at which point the subsoil was reached. The interface between the topsoil and subsoil was abrupt, but wavy to gradual. The topsoil was brown (10YR 3/3) and the subsoil was dark yellowish brown (10YR 4/6) (Figure 26). There was little variation to the soil hues.

The testing was conducted on ridge top situations including saddles, toe ridges, and promontories. However, the testing had its limitations. Steep slope (>15 percent) was prevalent in much of this upland setting. This is just part of the natural, unglaciated terrain but some areas had erosion and slope that was exacerbated by the abutting coal mining activity; this includes the ancillary activities such as soil borings, lumbering, and ponding. Generally, the ridge tops were the most testable aspect of the project area. However, this is also the best location for interior access roads for other purposes. A bulldozed pathway traversed the ridge tops and effectively disturbed locations that would have been investigated. Where possible, shovel testing was conducted next to these graded pathways. It was apparent from the age of the trees that this entire area had been

timbered maybe 50 years ago; this area is dominated by semi-mature deciduous forestation. The timbering process degrades the nature of the topsoil and often eliminates it from shallower locations. Testing was precluded altogether from some landforms where it was visually apparent that intact topsoil was lacking.

The location of the Bethany-Robinson Cemetery was verified to the south of the project area. The associated Methodist Episcopal Church that was indicated abutting the cemetery is no longer extant. Its former location appears to have been graded and filled relative to previous coal mining access that would have stemmed into the project area. The proposed work will avoid the cemetery and there is over 15 m between it and the southern boundary of the project area. The cemetery is clearly fenced and limited to a bench-like landform that does not extend into the project (Figures 2, 27, and 28).

The nature of the terrain and disturbances were major factors for the archaeological investigations of this area. The testing and visual inspection identified one prehistoric site, 33CS727; this was identified during visual inspection. The following is a description of this archaeological resource.

33CS727

This site is an isolated prehistoric artifact that was identified during visual inspection within a sloping wooded setting (Figure 9 and 29). The artifact was recovered from exposed soil from an uprooted tree root ball. This artifact was identified on the southern slope of an upland intermittent valley and immediately above what appeared to be a spring. This ephemeral stream flows eastward into an unnamed tributary of Wills Creek; which is part of the Muskingum River watershed. By definition, an isolated artifact has a site size that is 1 sq m.

The artifact that is associated with site is a utilized flake of Upper Mercer chert. Utilized flakes functioned as expedient cutting tools and are often associated with generalized hunting-foraging behavior. This artifact is not diagnostic of any specific prehistoric temporal period.

This site was evaluated for its eligibility for the NRHP. This site lacks integrity (Little et al. 2000:39-43; U.S. Department of the Interior, National Park Service [USDI, NPS] 1997:44-45) and the ability to yield further and important information regarding prehistory. The site has a functionally and numerically limited artifact assemblage that was identified in a sloping context. This site is not considered to be eligible for inclusion into the NRHP, and further work at this site is not deemed necessary.

Evaluations of Research Questions 3 & 4

There were two questions presented in the research design that will be addressed at this point. These are:

3) Will the planned undertaking affect any archaeological or architectural properties?
4) Will any NRHP eligible sites or properties be affected by the project?

The testing for this project area did not identify any significant cultural remains and much of the area is disturbed. The only site that was identified was an isolated prehistoric period artifact. The proposed work will not impact or affect any known cultural resources that would be considered significant.

APE Definition and NRHP Determination

The APE is a term that must be applied on an individual project basis. The nature of the project or undertaking is considered in determining the APE. This may include areas that are off the property or outside of the actual project's boundaries to account for possible visual impacts. When construction is limited to underground or ground level activity, the APE may be contained within the footprint of the project. The APE for this project is limited because the types of development are not vertical. The work is a reclamation project that is taking place within an area that has been coal mined repeatedly. Filling in the low-lying areas within the subject area will have limited visual appreciation from the surrounding area. The area is very rural with few residences or buildings in the vicinity.

These investigations identified one archaeological site within the project area. This site is a single prehistoric artifact and not deemed significant. Inspection of the surrounding terrain was conducted. The project area is bracketed by roads including CR 271 to the west, SR 83 to the east, and an access road to the north. The Oxford Mining Company, Inc. has a facility that is within the cutout on the north side of the plant. The areas to the north, west, and east are either highly industrialized or associated with former mining. The southern boundary of this tract does not appear to be the target of this undertaking. The Bethany-Robinson Cemetery is located to the south and it will not be impacted; its northern limits are about akin with the southern limits of this project and they are separated by a disturbed ravine. Residences located to the south were photographed and none appear to be historically significant nor will they be directly impacted by the planned activity. There is a wide arboreal buffer between these buildings and the project area. The eastern and western aspects of the parcel have been seriously disturbed by at least three previous mining episodes.

These investigations did not identify any significant cultural deposits and a finding of no historic properties affected is deemed appropriate.

Recommendations

In May of 2013, Weller & Associates, Inc. completed a Phase I cultural resource management (CRM) survey for the 145 ha (348 ac) Five Points High Wall Reclamation Expansion in Franklin Township, Coshocton County, Ohio. These investigations involved subsurface testing and visual inspection, and resulted in the identification of one previously unrecorded site (i.e., 33CS727). This site is not considered to be eligible for the National Register of Historic Places as it does not meet the minimum criteria. Sizeable aspects of this are have been disturbed or manipulated. It is Weller's opinion that this undertaking will not adversely affect any historic properties. If the agency is in

agreement with these findings, then a recommendation of no further work is considered and “no historic properties affected” is appropriate.

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Figures

Figure 1. Political map of Ohio showing the approximate location of the project.

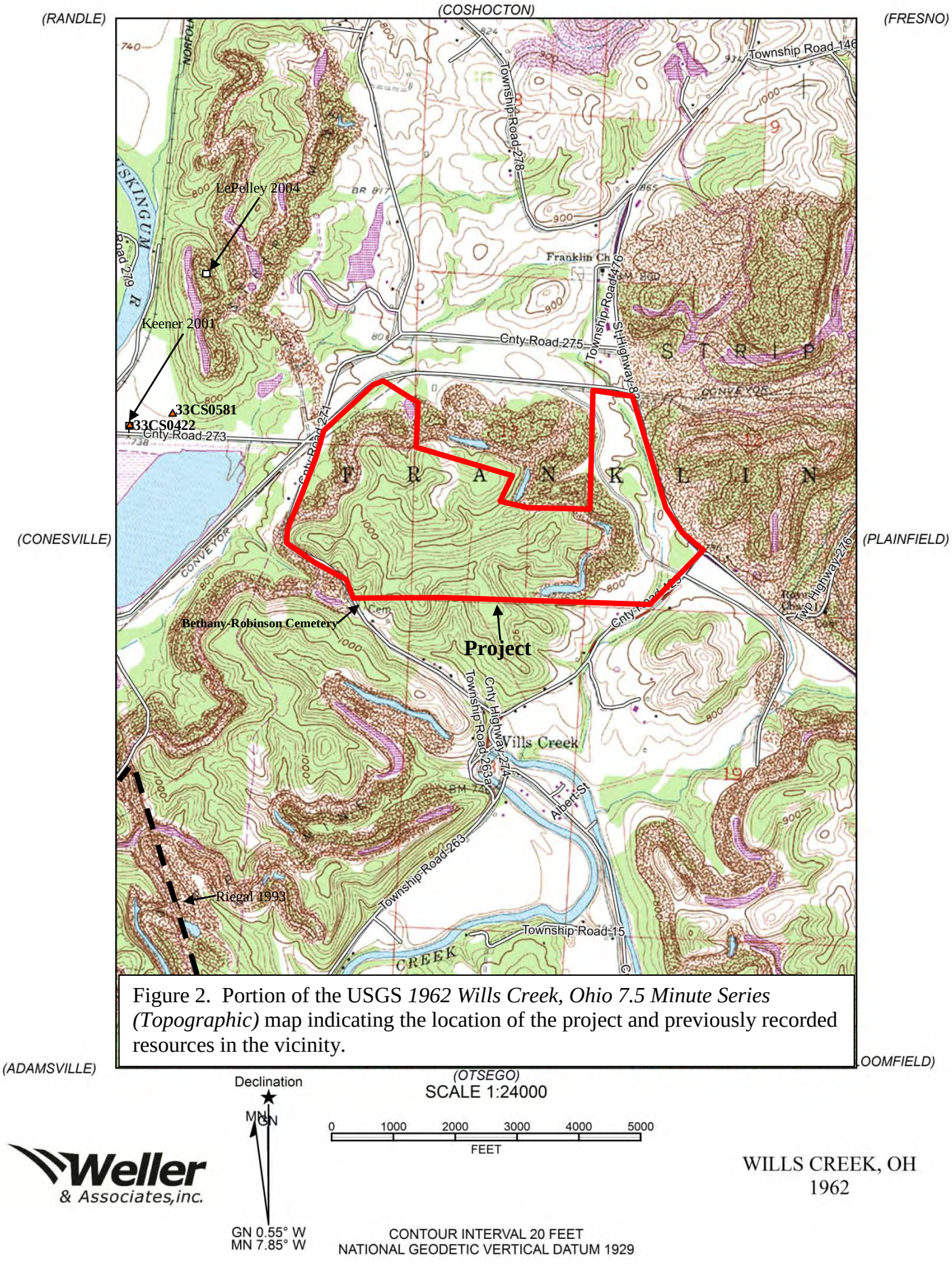


Figure 2. Portion of the USGS *1962 Wills Creek, Ohio 7.5 Minute Series (Topographic)* map indicating the location of the project and previously recorded resources in the vicinity.

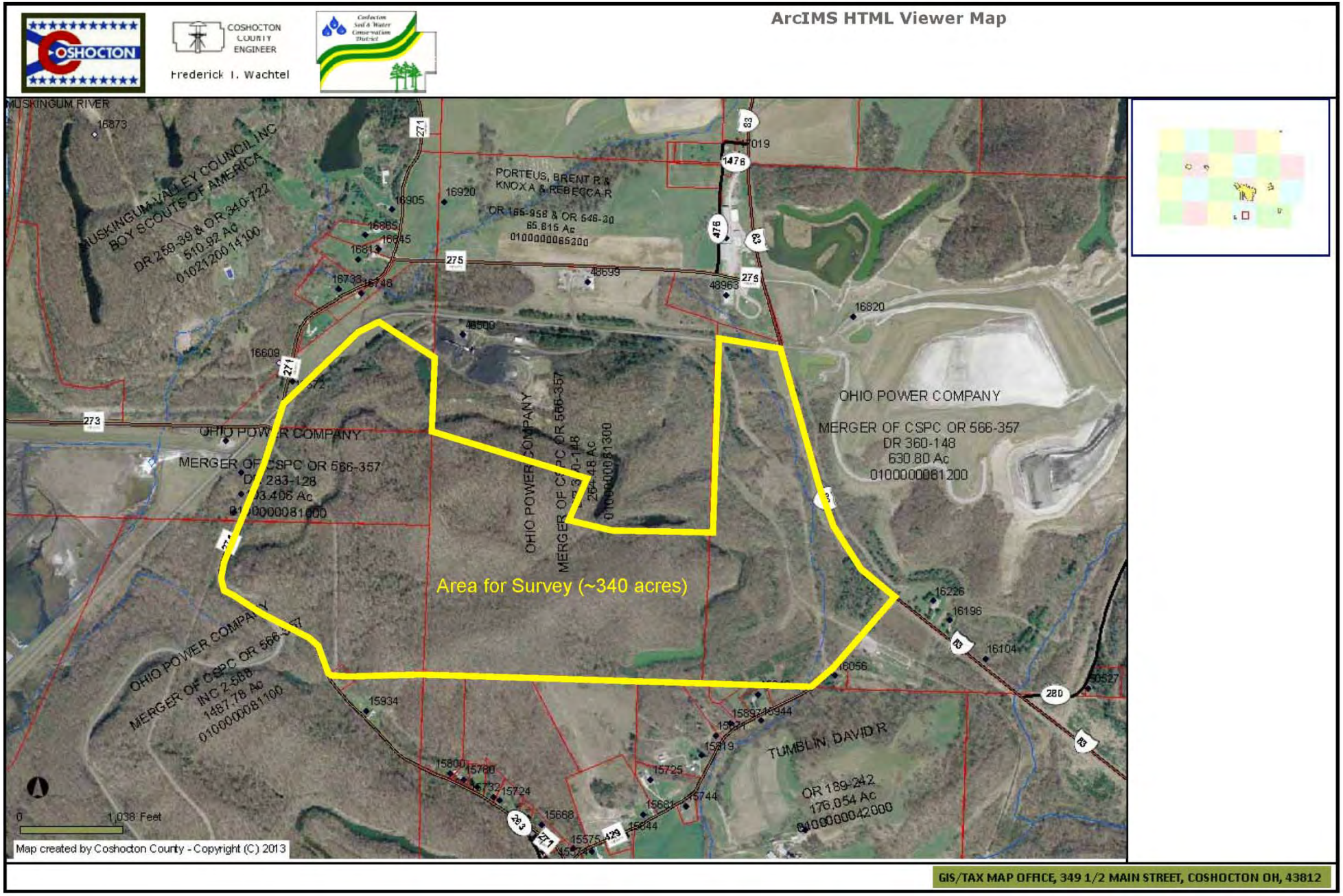


Figure 3. Aerial view of the project.

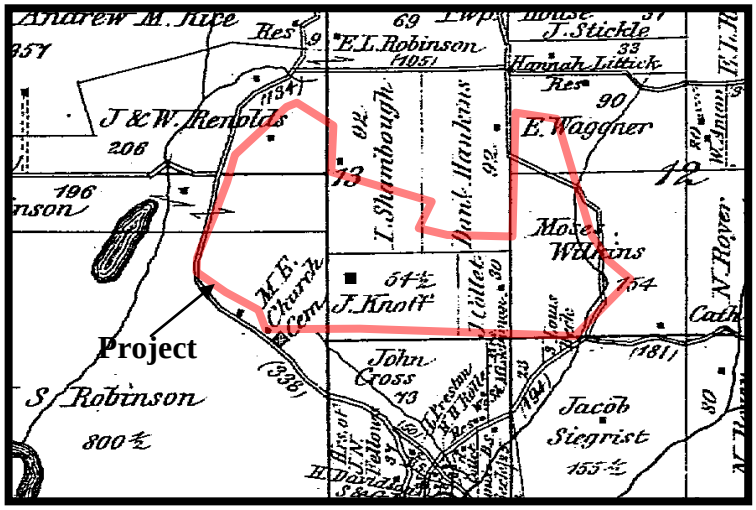


Figure 4. Portion of the *Atlas of Coshocton County, Ohio* (Lake 1872) indicating the approximate location of the project.

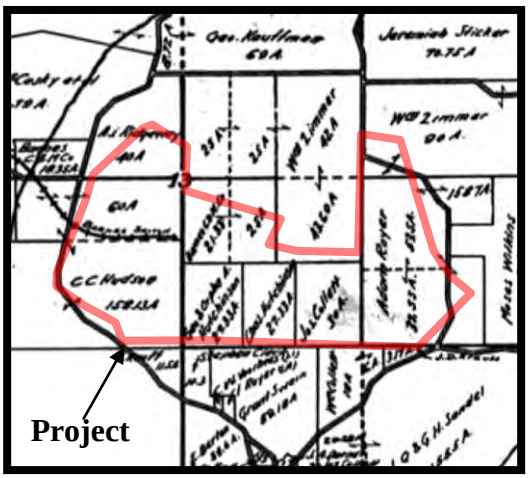


Figure 5. Portion of the *Atlas of Coshocton County, Ohio* (Bock 1910) indicating the approximate location of the project.

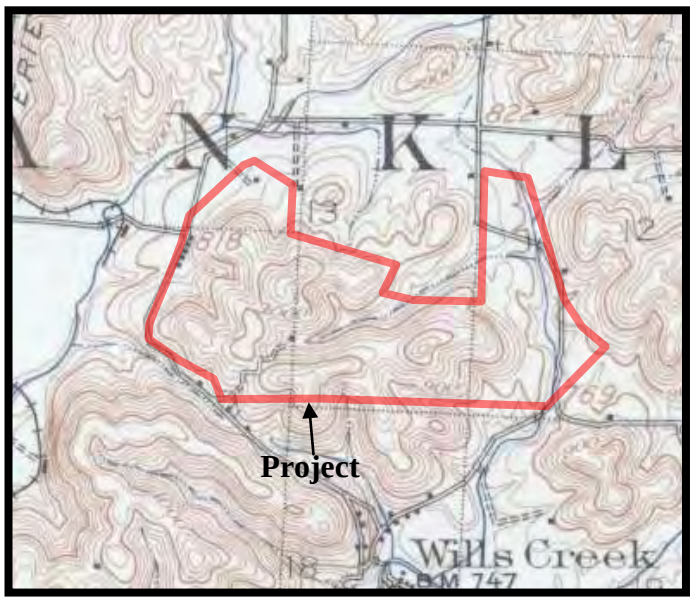


Figure 6. Portion of the *USGS 1908 Conesville, Ohio 15 Minute Series (Topographic)* map indicating the approximate location of the project.

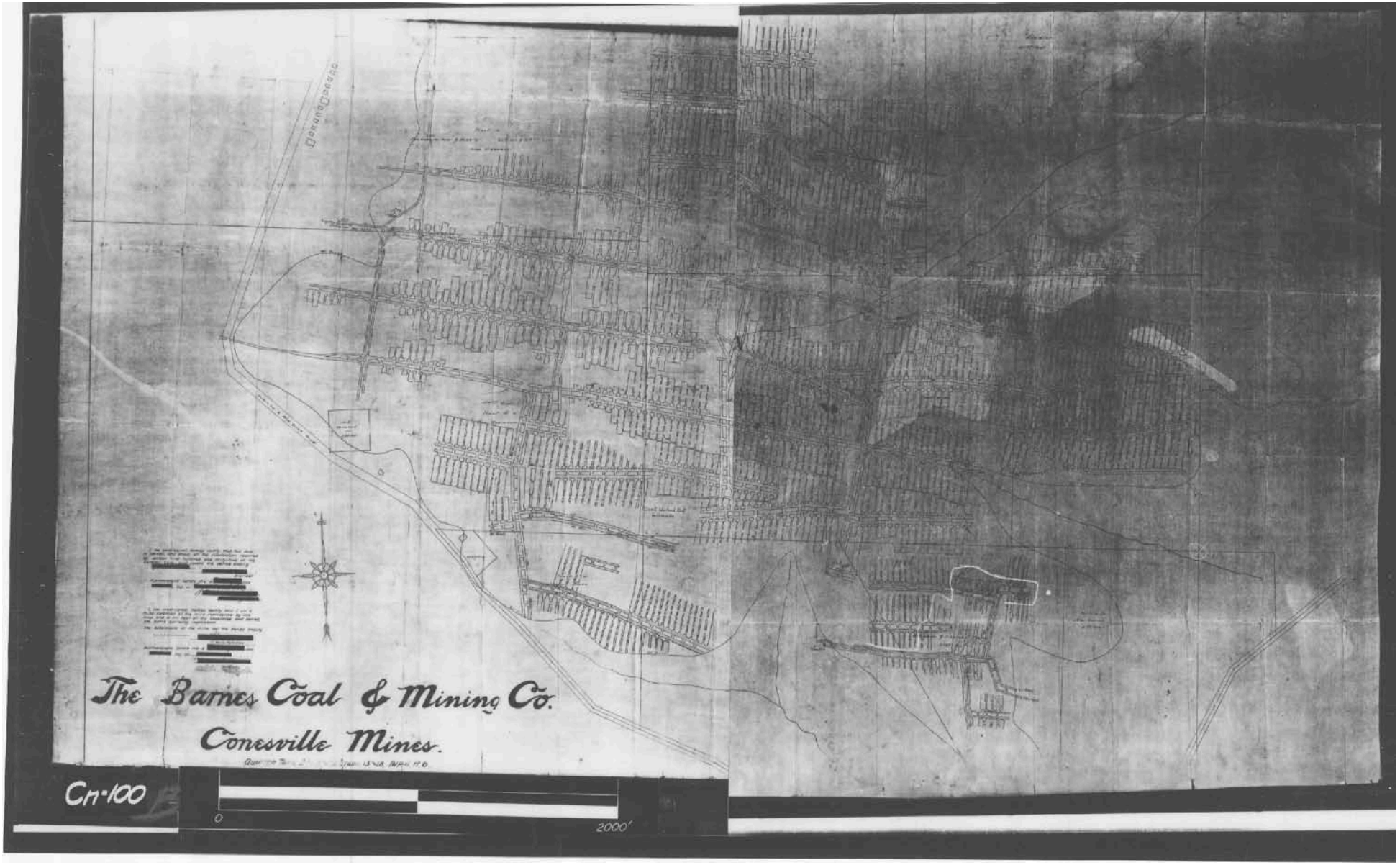


Figure 7. Map of the abandoned underground mine within a portion of the project.

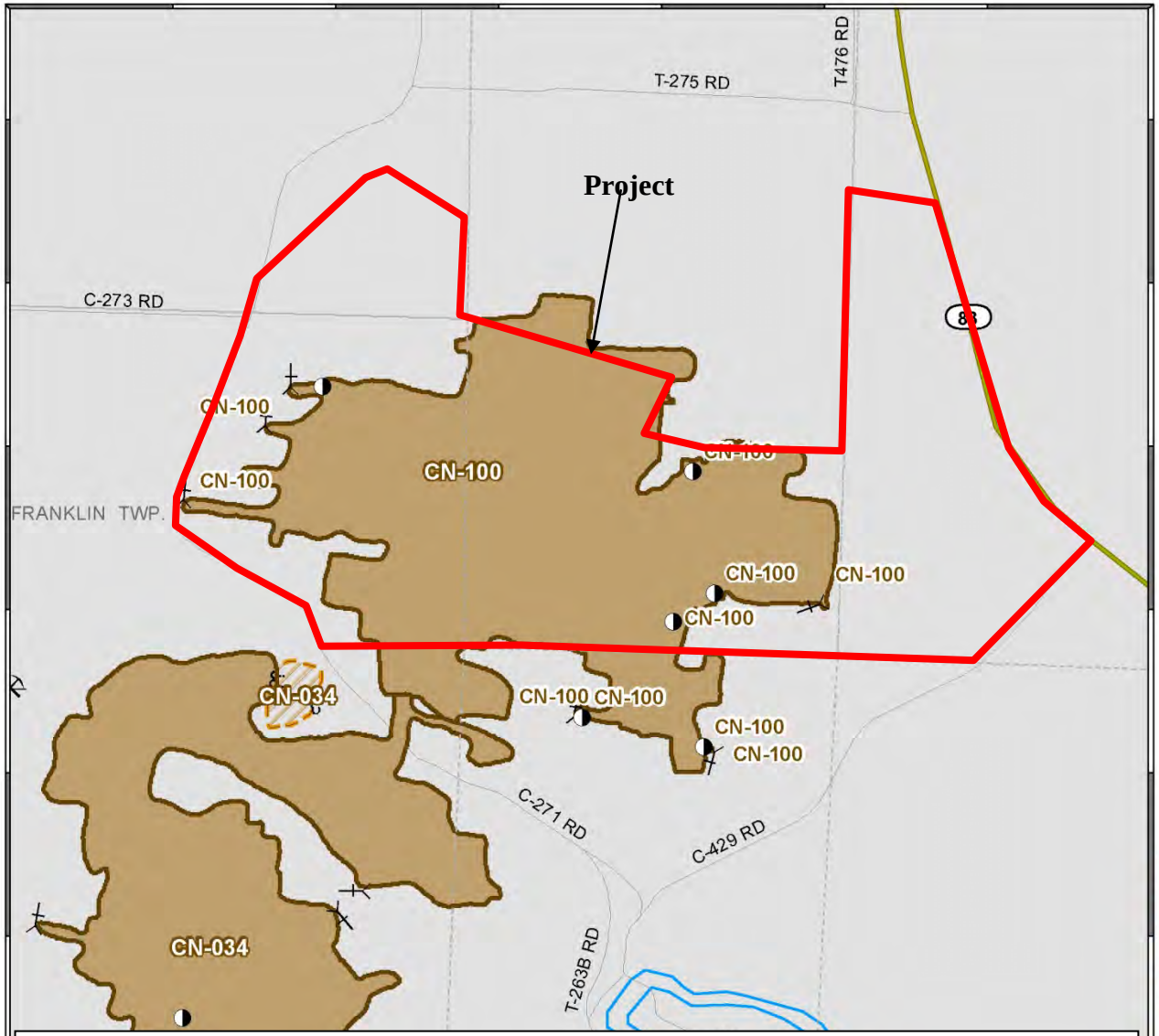
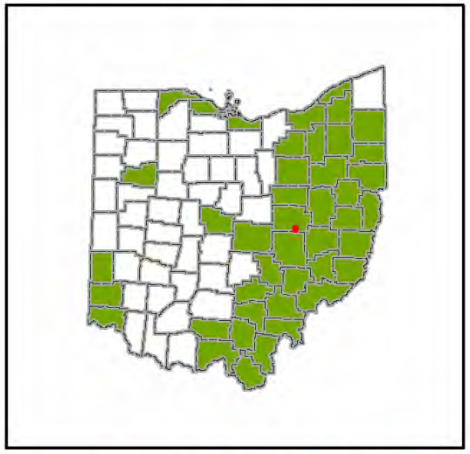


Figure 8. ODNR Abandoned Mines of Ohio map indicating the location of the project.

ABANDONED MINES OF OHIO

INDEX MAP



Map provided by the Ohio Geological Survey
http://www.dnr.state.oh.us/geosurvey

Legend

- Air Shaft
- Drift Entry
- Vertical Mine Shaft
- Inclined Mine Shaft
- Mine Points - Unassociated
- Underground Mines - outline
- Affected
- Permitted
- Underground Mines - Extent Partially Unknown
- Underground Mines

0 0.05 0.1 0.2 0.3 0.4 Miles

0 0.05 0.1 0.2 0.3 0.4 Kilometers

DISCLAIMER
This product of the Ohio Department of Natural Resources, Division of Geological Survey is intended to provide general information only and should not be used for any other purposes. It is not intended for resale or to replace site-specific investigations. These data were complied by the Ohio Division of Geological Survey, which reserves the publication rights to this material. If these data are used in the compilation of other data sets or maps for distribution or publication, this source must be referenced.

Figure 9. Topographic fieldwork map indicating conditions, results of testing, and photo orientations.

Scale
0 ft. 400 ft.
Contour Interval is 20 ft.
Note: Shovel test units and probes are not to scale.

N

Visually Inspected Disturbed Areas
Intense Pedestrian Survey Area
Datum Locations
Negative Shovel Test Unit
Disturbed Shovel Probe
Photo Orientations

Figure 10. View of the typical conditions within the previously mined western portion of the project.

Figure 11. View of the landscape in the vicinity of the previously located mining buildings along County Road 271.

Figure 12. View of the conditions in the vicinity of the former location of a mining conveyor.

Figure 13. View of the typical mining landscape around the northern portion of the project.

Figure 14. View of the northeastern portion of the project along State Highway 83.

Figure 15. View of the disturbed conditions within the northeastern portion of the project along a mining access road at State Highway 83.

Figure 16. View of some of the visually inspected disturbed area within the eastern portion of the project.

Figure 17. View of the disturbed conditions within the southeastern portion of the project.

Figure 18. Another view of the disturbed conditions within the southeastern portion of the project.

Figure 19. View of the typical intact shovel tested areas within the project, this being the datum 1 area.

Figure 20. View of a portion of the shovel tested datum 2 area.

Figure 21. View of the typical conditions within the shovel tested portions of the project in the vicinity of the datum 3 and 4 areas.

Figure 22. View of some of the typical disturbed conditions encountered along some of the ridge tops within the project.

Figure 23. Typical sloped conditions from within the project.

Figure 24. View of some of the conditions within the intense pedestrian survey area.

Figure 25. Typical disturbed shovel probe from within the project.

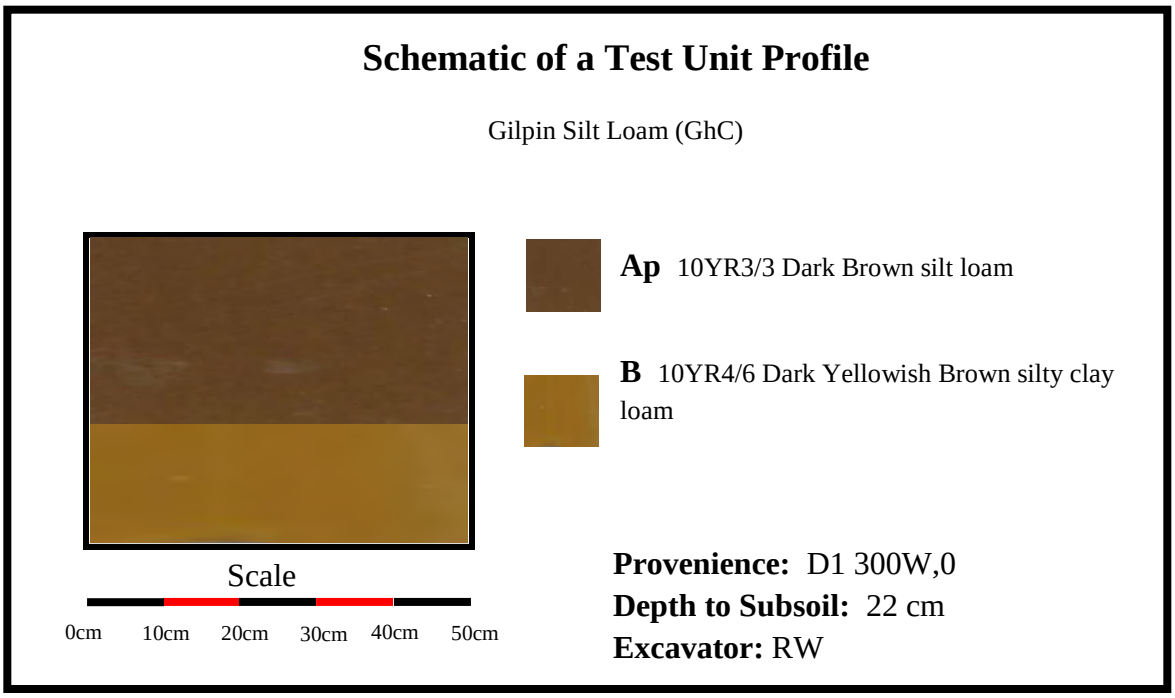


Figure 26. A typical shovel test unit excavated within the project.

Figure 27. View of the Bethany-Robinson Cemetery situated adjacent to the southwestern portion of the project.

Figure 28. View facing northwest from the cemetery.

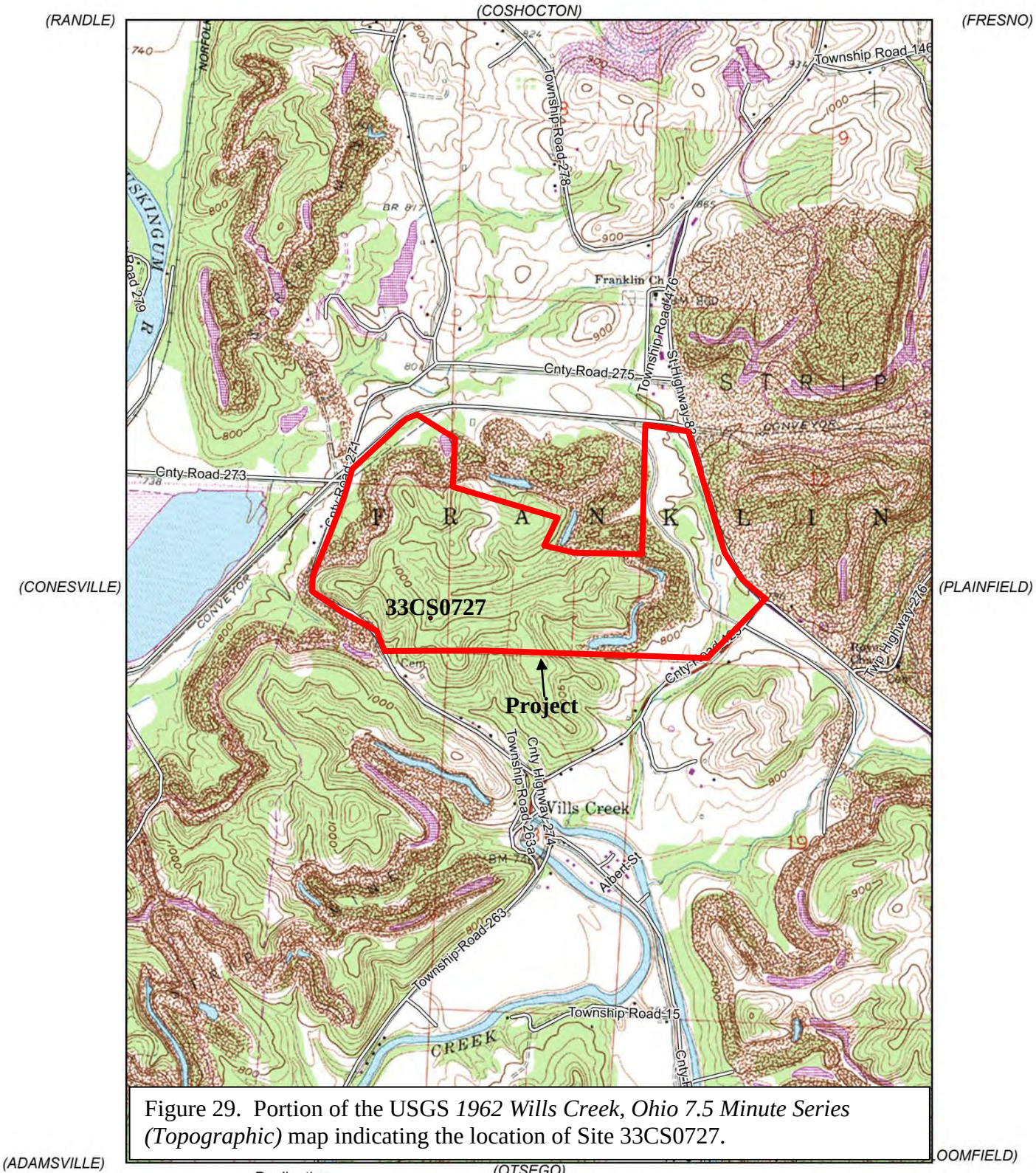


Figure 29. Portion of the USGS *1962 Wills Creek, Ohio 7.5 Minute Series (Topographic)* map indicating the location of Site 33CS0727.