Pesi 096.01

A SUMMER MIST NET SURVEY FOR THE ENDANGERED INDIANA BAT ALONG THE PROPOSED PORTSMOUTH BYPASS PROJECT IN SCIOTO COUNTY, OHIO

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1.0 Regulatory Setting

The federal Endangered Species Act (ESA) [16 U.S.C. 1531 *et seq.*] became law in 1973 and provides for the listing, conservation, and recovery of endangered and threatened species of plants and wildlife. Under ESA, the U.S. Fish and Wildlife Service (USFWS) strives to protect and monitor the numbers and populations of listed species. Many states enacted similar laws.

Section 7(a)(2) of the Act states that each federal agency shall insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in destruction or adverse modification of designated critical habitat. Federal actions include (1) expenditure of federal funds for roads, buildings, or other construction projects, and (2) approval of a permit or license, and the activities resulting from such permit or license. This is true regardless of whether involvement is apparent, such as issuance of a federal permit, or less direct, such as federal oversight of a state-operated program.

Section 9 of the Act prohibits the take of listed species. Take is defined by the Act as "*to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect.*" The definition of harm includes adverse habitat modification. Actions of federal agencies that do not result in jeopardy or adverse modification, but that could result in a take, must be addressed under Section 7.

Prior to development of the Portsmouth bypass project, the Ohio Department of Transportation (ODOT) must comply with a variety of requirements for environmental protection, including compliance with ESA. Environmental Solutions & Innovations, Inc. (ESI) was contracted to complete a summer mist netting survey for the endangered Indiana bat (*Myotis sodalis*) within the bypass footprint in Scioto County, Ohio. ESI coordinated timing and methodologies of proposed surveys with USFWS, Ohio Field Office to begin on 6 June 2003 (Appendix A).

ESI completed field efforts under Federal Endangered species permit TE 023664-10 and State of Ohio Division of Wildlife permit 216.

2.0 Project Setting

2.1 Location

The project site is located in Scioto County in southern Ohio (Figure 1). The area lies within the Appalachian Plateau Physiographic Province of south-central Ohio (ODNR, 2003). Specifically, within the Shawnee-Mississippian Plateau. The area is characterized by high relief (400'-800' ASL). The Plateau is highly dissected with course- and fine-grained rock sequences and is considered the most rugged area in Ohio. Remnants of ancient lacustrine clay-filled Teays drainage system are extensive in lowlands but absent in uplands. The geology of the Plateau has developed from Devonian and Mississippian age shales, siltstones, and locally thick sandstones; a Pleistocene age sandy outwash of the Scioto River; Teays age Minford clay, and silt loam and channery colluvium (ODNR, 2003).

The bypass is intended to connect Ohio State Route 23 to Ohio State Route 52. The general footprint of the bypass runs west to east from Lucasville to Minford and then south to Wheelersburg. The footprint covers an area approximately 14.5 miles (23.3 km) long by 1.5 miles (2.4 km) wide. Primary drainage within the footprint comes from the Little Scioto River; Candy Run, Long Run, and Sweet Run creeks also serve as important watersheds for the area.

2.2 Regional Species Occurrence

The federally endangered Indiana bat is known from the region that includes the Portsmouth bypass project area. Winter hibernacula occur in nearby Adams and Brown counties in Ohio, and Carter County, Kentucky. A maternity colony was recorded just east of Scioto County in Lawrence County, Ohio. Both Scioto and Pike counties have summer, nonreproductive Indiana bat records (Figure 2).

N
W E
S

Figure 1. Project Location in Scioto County, Ohio.

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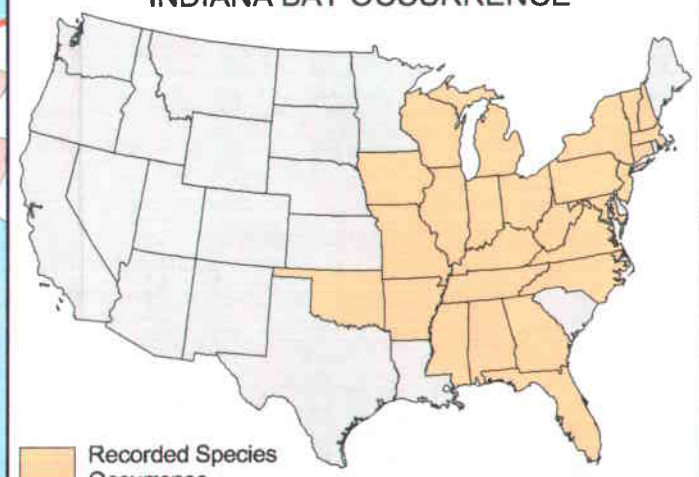
Figure 2. Counties near the project area with hibernacula, summer maternity, and other summer (nonreproductive) records for the Indiana bat (*Myotis sodalis*).

- County with Record of Indiana Bat Hibernacula Occurrence
- County with Record of Indiana Bat Summer Maternity Occurrence
- County with Record of Indiana Bat Other Summer (Nonreproductive) Occurrence
- County with Record of Indiana Bat Hibernacula and Other Summer (Nonreproductive) Occurrences
- State Boundary
- County Boundary

STATES WITH RECORDS OF INDIANA BAT OCCURRENCE



Recorded Species Occurrence

N W E S

Miles
10 0 10 20 30

Sources: USFWS, Indiana Bat Revised Recovery Plan, Agency Draft, 1999.

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OHIO
PENNSYLVANIA
KENTUCKY
WEST VIRGINIA
VIRGINIA
MARYLAND
PORTSMOUTH BYPASS
Van Wert
Putnam
Allen
Hancock
Wyandot
Crawford
Richland
Ashland
Medina
Wayne
Summit
Portage
Stark
Mahoning
Columbiana
Lawrence
Butler
Armstrong
Beaver
Indiana
Mercer
Auglaize
Hardin
Marion
Morrow
Knox
Holmes
Carroll
Jefferson
Hancock
Allegheny
Westmoreland
Shelby
Logan
Union
Delaware
Coshocton
Tuscarawas
Harrison
Brooke
Washington
Darke
Miami
Champaign
Clark
Madison
Franklin
Licking
Muskingum
Guernsey
Belmont
Ohio
Marshall
Greene
Fayette
Somerset
Preble
Montgomery
Greene
Fayette
Pickaway
Fairfield
Perry
Morgan
Noble
Monroe
Wetzel
Monongalia
Garrett
Butler
Warren
Clinton
Ross
Hocking
Athens
Vinton
Washington
Tyler
Pleasants
Ritchie
Doddridge
Harrison
Taylor
Preston
Marion
Hamilton
Clermont
Highland
Pike
Meigs
Wood
Barbour
Tucker
Grant
Kenton
Campbell
Brown
Adams
Scioto
Jackson
Gallia
Wirt
Calhoun
Gilmer
Lewis
Upshur
Randolph
Jackson
Mason
Roane
Braxton
Pendleton
Pendleton
Bracken
Mason
Robertson
Lewis
Greenup
Lawrence
Putnam
Clay
Webster
Grant
Harrison
Fleming
Nicholas
Boyd
Cabell
Kanawha
Nicholas
Pocahontas
Highland
Scott
Bourbon
Carter
Rowan
Bath
Elliott
Lawrence
Wayne
Lincoln
Boone
Augusta
Fayette
Clark
Montgomery
Menifee
Morgan
Powell
Estill
Wolfe
Magoffin
Johnson
Martin
Mingo
Logan
Fayette
Greenbrier
Bath
Alleghany
Rockbridge
Jessamine
Madison
Garrard
Lee
Breathitt
Floyd
Pike
Wyoming
Raleigh
Summers
Monroe
Botetourt

3.0 Ecological Setting

The USFWS listed the Indiana bat as endangered on 11 March 1967. The current total population of Indiana bats is estimated at 350,000 individuals (USFWS, 1999). This is less than half the estimated population of 1960. Long-term, detailed documentation of population changes are lacking in most areas, although Indiana is an exception (Brack et al., 1984; Brack and Dunlap, 1999; Johnson et al., 2001). Summer habitat losses (USFWS, 1999) and winter disturbance (Johnson et al., 1998) are believed to have contributed to the decline.

Indiana bats are "tree bats" in the summer and "cave bats" in winter. A detail life history is provided in the U.S. Fish and Wildlife Service Recovery Plan (1999), Brack (1983), and LaVal and LaVal (1980). Figure 3 provides a chronology of seasonal activities discussed in the following paragraphs.

Federal Register Documents

41 FR 41914; 24 September 1976; Final Critical Habitat, Critical habitat—mammals

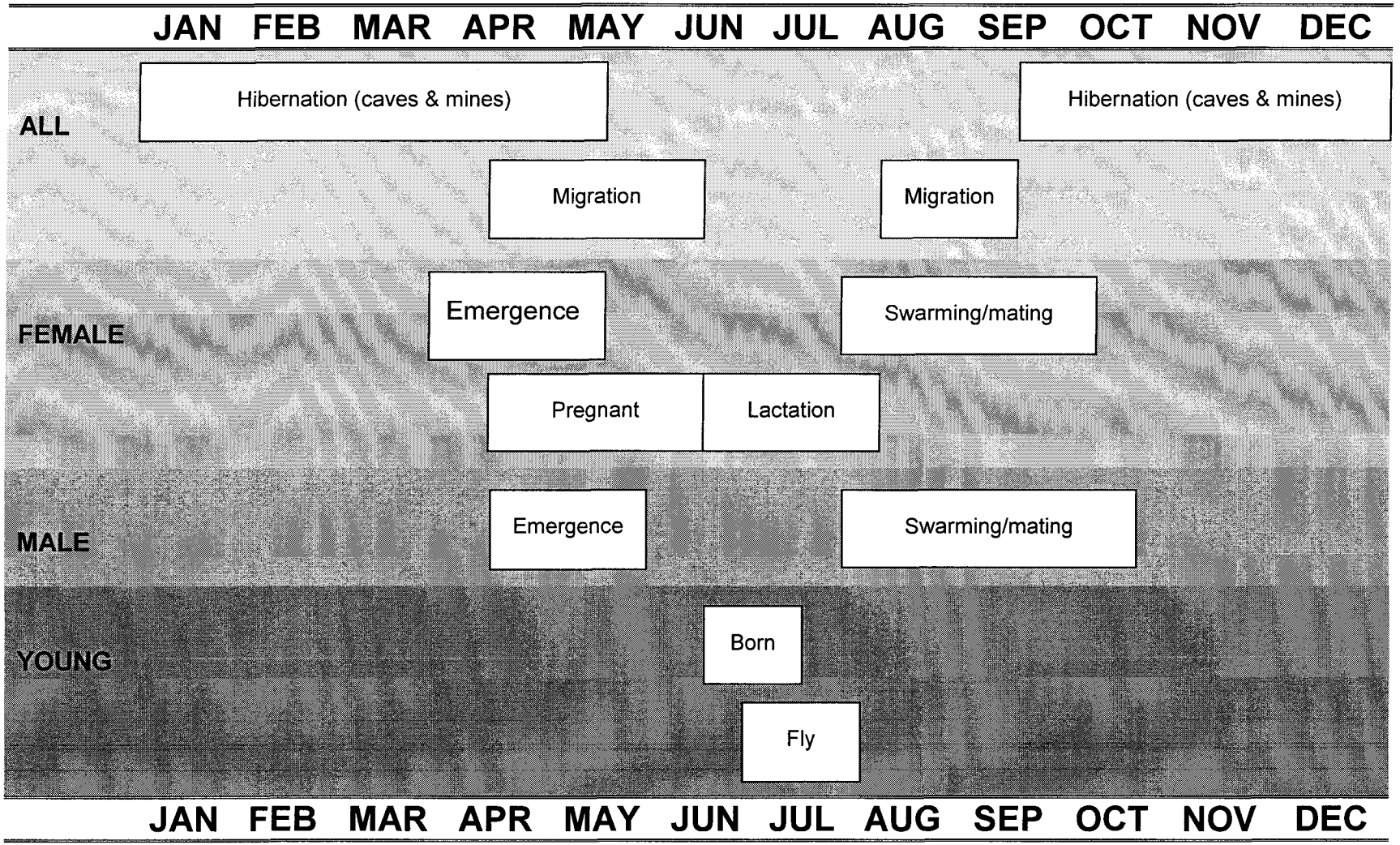
40 FR 58308 58312; 16 December 1975; Proposed Critical Habitat, Critical habitat—mammals

32 FR 4001; 11 March 1967; Final Listing, Endangered

The winter range of the Indiana bat is restricted to regions of well-developed limestone caverns, which serve as hibernacula. Most hibernacula are in caves, but abandoned mines are sometimes used. There are large populations of Indiana bats in only a few caves; most hibernacula contain only a few bats. Large populations of bats hibernate in caves in Indiana, Kentucky, and Missouri (over 82% of the known population). Smaller populations are known from Alabama, Arkansas, Connecticut, Georgia, Illinois, Iowa, Maryland, Massachusetts, Mississippi, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Vermont, Virginia, and West Virginia. Although the winter range is large, the species is restricted to approximately 135 known hibernacula.

Brack (3D/I, 1996) documented a population of nearly 9,300 Indiana bats hibernating in a mine in Preble County, Ohio. The most recent survey (ESI-Brown and Brack 2002) indicated that the number of bats hibernating in the mine has remained stable since first discovered. Spring (ESI-Little et al., 2001) use of coal mines by the Indiana bat in Virginia, and autumn use in Ohio (ESI-Brack and Little, 2001) have recently been documented. This use may be associated with autumn swarming, winter hibernation, spring staging, or seasonal migration, or it may represent use by vagrants.

Figure 3. Seasonal chronology of Indiana bat activities.



Indiana bats hibernate from mid-November to mid-April. Hibernating Indiana bats usually form dense clusters on cave ceilings in portions of the cave where winter temperatures are 39-46°F (4-8°C). Clusters are not sexually segregated.

Hibernation by bats is an adaptation that allows for survival through the winter months when food and water are not available. Mammalian hibernation consists of periods of hibernation interrupted by periodic, spontaneous arousals. Bats frequently move during arousal, and thus are able to change the microenvironment to which they will be exposed during the next period of hibernation. The duration of the period of hibernation between arousals varies by species (Brack, 1979; Brack and Twente, 1985; Twente et al., 1985), and is affected by temperature.

Female Indiana bats leave hibernacula earlier in spring (beginning in mid-April) than do males (peak of departure in early May). This part of spring activity is referred to as staging. Some males remain near hibernacula throughout summer while others migrate to distant areas (Whitaker and Brack, 2001). When female Indiana bats emerge from hibernation, they migrate up to several hundred miles to maternity colonies. Females form nursery colonies under exfoliating bark of dead trees, or living trees such as shagbark hickory *(Carya ovata)* in upland or riparian forests. A single maternity colony typically consists of 25 to 100 adult females. Maternity colonies have been found in many species of trees, indicating that it is tree form, not species that is important for roosts. Some of the species of trees in which roosts have been documented include slippery elm (*Ulmus rubra*), American elm (*U. americana*), cottonwood (*Populus deltoides*), northern red oak (*Quercus rubra*), post oak (*Q. stellata*), white oak (*Q. alba*), shingle oak (*Q. imbricaria*), sassafras (*Sassafras albidum*), sugar maple (*Acer saccharum*), silver maple (*A. saccharinum*), green ash (*Fraxinus pennsylvanica*), and bitternut hickory (*Carya cordiformis*).

Since Indiana bat roosts typically are located in dead or dying trees, they are often ephemeral. Roost trees may be habitable for one to several years, depending on the species and condition of the tree (Callahan et al., 1997). In addition, a single colony of bats moves among roosts within a season. Therefore, numerous suitable roosts may be needed to support a single nursery colony (Foster and Kurta, 1999; Kurta et al., 1993). It is not known how many alternate roosts are required to support a colony within a particular area, but large tracts of mature forest containing large trees increases the probability that suitable roost trees are present. Indiana bats exhibit strong site fidelity to summer roosting and foraging areas, returning to the same area year-after-year.

Reproductive phenology is likely dependent upon seasonal temperatures and the thermal character of the roost (Brack, 1983; Humphrey et al., 1977). Like many other bats, Indiana bats are thermal conformists (Henshaw, 1965), with prenatal, neonatal, and juvenile development heavily temperature dependent (Racey, 1982). Cooler

summer temperatures associated with latitude or altitude likely affect reproductive success and therefore the summer distribution of the species (Brack et al., 2001).

Females are pregnant when they arrive at maternity roosts. Fecundity of the species is low with females producing only one young per year. Parturition typically occurs between late June and early July. Lactating females have been caught from 11 June to 29 July in Indiana, from 26 June to 22 July in Iowa, and between 11 June and 6 July in Missouri (Brack, 1983; Clark et al., 1987; Humphrey et al., 1977; LaVal and LaVal, 1980). Juveniles become volant between early July and early August.

Indiana bats may travel several miles to forage. Instances where individuals from maternity colonies traveled 2.5 miles in Illinois (Gardner et al., 1991), and summer males traveling 3.1 miles in Missouri (LaVal and LaVal, 1980) have been documented. Brack (1983) observed foraging light-tagged bats within 2 miles of caves used during the autumn swarming period.

Indiana bats forage in upland and floodplain forest (Brack, 1983; Humphrey et al., 1977; LaVal et al., 1977; LaVal and LaVal, 1980; Gardner et al., 1991). Foraging activity is concentrated around the foliage of tree crowns, and although the bats may forage in other areas, it is quantitatively and qualitatively less important (Brack, 1983). Indiana bats often use stream corridors and other linear woodland openings as flight corridors from roosts to foraging areas.

Brack and LaVal (1985) referred to the Indiana bat as a selective opportunist that often eats similar types of prey when readily available. However, components of the diet do vary by habitat, geographic location, season, and sex or age of the bat (Kurta and Whitaker, 1998; Brack and LaVal, 1985; Brack, 1983; Belwood, 1979). In Missouri, Brack and LaVal (1985) noted that terrestrial-based insects, e.g., moths (Order Lepidoptera) and beetles (Coleoptera), were most often eaten, logically as a result of treetop foraging. The proportion of aquatic insects eaten [e.g., flies (Diptera), caddisflies (Trichoptera), and stoneflies (Plecoptera)] was small and influenced by the lunar cycle.

Indiana bats begin to arrive at hibernacula in August (Figure 3) and engage in a behavior referred to as swarming (Cope and Humphrey, 1977). Early during autumn swarming, bats visit hibernacula at night but may day-roost in woodlands. As the season progresses, more bats roost in hibernacula caves. Males become active first in mid-August. Females begin arriving in late August. By September, numbers of swarming females peak, although the male may be more common since males frequent the swarming site more than females. By late September, many females are hibernating; males remain active until mid-October or later, apparently in an effort to breed late-arriving females. Swarming chronology likely is influenced by temperature and precipitation.

Swarming is an important part of the Indiana bat's life cycle and is when most copulation occurs (Hall, 1962). However, Richter et al. (1993) postulated that males lacking sufficient fat to survive winter hibernation may remain active, seeking opportunities to mate well into the winter in a final effort to reproduce before they die. Females store sperm through winter hibernation, and fertilization is delayed until spring (Wimsatt, 1944). It is not known whether juvenile females mate their first autumn. Limited mating may occur in spring (Hall, 1962).

4.0 Methods

4.1 Site Selection

Survey sites were selected to provide broad coverage of the project area, focusing on areas that provided larger trees and riparian corridors suitable for travel and forage. Sites were selected using topographic maps, aerial photographs, and reconnaissance survey information on potential Indiana bat habitat collected by CH2MHill biologists.

4.2 Mist Netting

Efforts to survey for endangered bats are difficult to standardize because of the large amount of variability that exists in a field situation. However, a number of practices used for summer surveys for Indiana bats have provided structure for implementation of netting guidelines provided by the U.S. Fish and Wildlife Service (1999) in the most recent (Agency Draft) revision of the Indiana Bat Recovery Plan. At the 10 net sites surveyed, those guidelines (Table 1) were employed for this survey.

Ten mist net sites were selected and operated for two nights each from 9 June to 25 June 2003. Each site consisted of two net sets run for two nights, for a total of four net nights per site. Net placement was based upon canopy cover, presence of a flight corridor, water, and conditions near the site. Nets were set to maximize coverage of flight paths used by Indiana bats along suitable corridors. Site selection was based upon an expectation of greatest bat activity and an effort to provide survey coverage of the permit area. Nets are often placed over streams, which are used as travel corridors and sometimes for foraging. In upland areas, road ruts or other areas of standing water frequently produce high capture rates. The location and specific orientation of each net was determined in the field.

Mist net sites were also selected based upon habitat characterizations described for the Indiana bat in current literature and extensive experience of ESI personnel capturing this species. General habitat types selected included the following characteristics:

- Large trees (>16 inches dbh) for maternity roosts
- An open canopy, apparently important for warming roost sites
- An open, uncluttered understory, used for travel and forage

To insure compliance with weather conditions outlined in the Table 2, temperature, percent cloud cover, wind, and rainfall were monitored and recorded hourly while mist netting.

Table 1. Standard netting guidelines.

1. Netting Season: 15 May to 15 August, when Indiana bats occupy summer habitat.
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:
   - Streams – one net site per 0.5 mile (1 km)
   - Land Tracts – two net sites per 250 acres (1 square km)
5. Minimum Level of Effort Per Net Site:
   - Two net locations (sets) per net site, with locations (sets) at least 100 feet (30 m) apart
   - Two (calendar) nights of netting
   - At least three net–nights (1 net–night = 1 net set deployed for 1 night); typically, two net sets are deployed at one site for two nights, resulting in four net-nights
   - Sample Period: begin at dusk and net for 5 hours (approximately 0200h)
   - Nets are monitored at approximately 20-minute intervals
   - No disturbances near the nets between checks
6. Weather Conditions: net only if the following weather conditions are met:
   - No precipitation
   - Temperature $\geq$ 10°C (50°F)
   - No strong winds
7. Moonlight: avoid net sets with direct exposure to a moon ½ -full or greater – typically by utilizing forest canopy cover

Source: U.S. Fish and Wildlife Service, 1999

4.3 Bat Capture

The netting setup allows bats to be caught live and released unharmed near the point of capture. Bats were 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 were 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 was measured to 0.1 grams using a Pesola spring scale. Length of the right forearm of each bat was measured to the nearest 1.0 mm using either dial calipers or metric ruler. The reproductive condition of captured bats was classified as non-descended male, 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 the bat was removed from the net. All data were recorded on data sheets (Appendix B).

The species diversity in the project area was examined using the species diversity index used was MacArthur's (l972): Species Diversity Index = $I/\sum P_i^2$, where P_i is the proportion of bats belonging to species i. This index has an advantage over other commonly used idiocies in that it provides an estimate of the number of equally represented species. Chi-square analysis was completed to compare the catch of males and females.

4.4 Habitat Characterization of Net Sites

Habitat assessment at net sites focused on features indicative of suitability for Indiana bats. A habitat description of each net location was completed (Appendix B). The emphasis of this description was 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 net was placed over them), and flight corridors. Habitat form was emphasized because the Indiana bat roosts in many species of trees. Tree species composition was 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 (> 16" dbh) that have the greatest likelihood of being used by maternity colonies of Indiana bats. 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 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 2 feet (0.6 m) and the canopy layers, usually beginning at about 25 feet (7.6 m).

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 were 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 was documented with a sketch.

5.0 Results

5.1 Weather and Temperature

In general, precipitation, humidity, and cloud cover were higher than normal for the Portsmouth area during the survey period (Weather Underground, 2003), but weather parameters were within netting guidelines. Days were usually overcast, humid, and rainy. Rain was frequent in late afternoon, but tapered off in the early evening prior to netting. Evening skies sometimes remained overcast and fog set in during the night. Over the entire project time period nighttime lows ranged from 53 to 68°F, high temperatures ranged from 64 to 82°F. The spread of temperatures between high and low ranged from 2 to 17 degrees. Appendix B contains completed Weather Data Sheets.

Start/End Dates (2002)	High Temp. °F	Low Temp. °F
9 June	65	56
25 June	76	67

5.2 Mist Netting and Site Selection

Ten net sites were surveyed for a total of 40 net nights. Four net sites selected based on topographic maps and related information were relocated during field efforts. Two sites (#2 and #7) were relocated due to poor habitat and/or lack of potential net sites. Two additional sites (#8 and #9) were moved due to water level of the Little Scioto River and current strength. Landowner permission was obtained for all sites. Sites were renumbered to match their geographical sequence from Lucasville to Wheelersburg (Figure 4).

5.3 Bat Captures

No endangered bats were captured.

A total of 53 bats of seven species were caught (Table 2). All bats were adults. All males were non-descended. Thirty two percent of captured bats were big brown bats (*Eptesicus fuscus*). Eastern pipistrelles (*Pipistrellus subflavus*) and northern bats (*Myotis septentrionalis*) were the next most common bats captured at 28 and 15 percent, respectively. Species diversity was relatively high with a Diversity Index value of 6.02. Twenty-nine reproductive females were captured versus 22 adult males, which is not significantly different than random ($\bar{x}$ = 0.9608; P = 0.3270).

Figure 4. Summer 2003 Indiana bat survey sites for Portsmouth bypass project, Scioto County, Ohio.

Project No. 096 Task 01	Base Map: USGS 30 x 60 Minute Series (1:100,000) Topographic Map - Ironton, OH-KY-WV (enlarged)	ESI ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

Table 2. Bat captures from 9 June to 25 June 2003 for the Portsmouth bypass project, Scioto County, Ohio.

Species	Male	Female					
		P*	L*	PL*	NR*	Escape*	Total
Eptesicus fuscus	2	9	5			1	**17**
Pipistrellus subflavus	8	7					**15**
Myotis septentrionalis	7	1					**8**
Myotis lucifugus	2		1				**3**
Lasiurus borealis		4	1			1	**6**
Lasiurus cinereus			1				**1**
Lasionycteris noctivagans	3						**3**
Total	**22**	**21**	**8**	**0**	**0**	**2**	**53**

* P=pregnant; L=lactating; PL=Post lactating; NR=non-reproductive; Escape=escaped from net before processing could be completed

Two bats escaped before sex and morphometric data were collected, although they were identified to species.

5.4 Habitat Assessment

Approximately half of the project area is forested. The remaining area is inundated with suburban development and agricultural operations. All net sites were over streams in close proximity to developed areas and/or agricultural operations. Most sites (80%) had low roost site potential due to lack of canopy structure and/or canopy storm damage (90% of sites) and cluttered understories (90% of sites). Appendix B contains completed Net Site Habitat Description Data Sheets and photographs of each net site.

6.0 Discussion and Conclusions

Netting efforts provided no evidence that endangered Indiana bats use the project area during summer months. The species complement and number of bats captured in the project area was typical for the geographic location and type of habitat. Bryan and Kiser (1996) caught 11 bats of three species over 3 nights of netting north of the Portsmouth bypass project site in Pike County. All three species [Big brown bats (*Eptesicus fuscus)*, eastern red bats (*Lasiurus borealis*), and eastern pipistrelles (*Pipistrellus subflavus*)] are commonly found in open/edge, developed areas, and do not form maternity colonies in large trees as does the Indiana bat (*Myotis sodalis*). Although diversity appeared higher for this project, most additional species caught in the project area also readilly use open/edge, developed areas, and do not form maternity colonies in trees. The little brown bat (*Myotis lucifugus*) and northern bat (*Myotis septentrionalis*) were the only two species caught during this netting effort that form maternity colonies in trees and utilize habitat similar to that of the Indiana bat although little brown bats often use man-made structures. Of these 2 species, 9 males and 2 females were captured, which is significantly different than random ($\bar{x}$ = 4.4545; P = 0.0348). A low female capture rate may indicate poor quality habitat.

Habitat for the Indiana bat within the project area at sites netted was of relatively low value. Ecological impacts from natural and man-made disturbances were clearly evident throughout the project area. An ice storm during the previous season destroyed much of the forest canopy in many areas. The storm also felled many snags that could have served as potential roost sites. Due to storm damage and the early successional stage of most forested areas, understory clutter was usually high and unfavorable for bat activity.

Streams in the project area were heavily impacted by land use in surrounding areas. All showed signs of erosion. Some streams had been dredged. Cattle often had access to streams, leading to high sediment loads. ATV trails along and through streams also increased sediment loads and erosion. Many streams had only narrow bands (sometimes a single row) of small- to medium-sized trees buffering them from agricultural fields and or maintained areas (e.g., roads, lawns, parking areas). Some had no buffer. Cursory examination of flora and fauna components of the stream ecosystem revealed apparent low diversity and density.

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Appendix A

USFWS Ohio field office acknowledgement and approval of study plan

ESI

Environmental Solutions & Innovations, Inc.

Jeffrey H. Schwierjohann, Scientist
781 Neeb Road
Cincinnati, OH 45233
Phone: (513) 451-1777; Fax: (513) 451-3321
E-mail: jschwierjohann@EnvironmentalSI.com

Pesi096

6 June 2003

Mrs. Mary Knapp
Endangered Species Field Supervisor for Ohio
U.S. Fish and Wildlife Service
Ecological Services Field Office
6950-H American Parkway
Reynoldsburg, Ohio 43068-4132

Re: Netting for the Indiana Bat along the Proposed Portsmouth Bypass, Scioto County, Ohio

Dear Mrs. Knapp:

Environmental Solutions & Innovations, Inc. (ESI) has been selected to complete netting for the Indiana bat for the above referenced project and is seeking written concurrence of these activities from the Region 3 Field Office. Project information follows:

Activity: Net 10 sites to help ascertain presence/absence of the Indiana bat in the project area

Location: ODOT's Proposed Portsmouth Bypass, Scioto County, Ohio

Federal Permit holder: Environmental Solutions and Innovations, Inc.

Federal Permit No: TEO23664-10 (pdf copy attached)

Methods: Netting as identified in the Permit

Personnel: Identified on the permit

ESI would very much appreciate your helping us expedite this process. We have just received notice to proceed and would like to begin work next Monday, 9 June 2003, weather permitting. If you could sign below or if we could get verbal agreement, as we have done on past projects, we could begin these studies as planned.

Thank you for your assistance.

Sincerely,

Jeffrey H. Schwierjohann, Scientist
Environmental Solutions and Innovations, Inc.

781 Neeb Road, Cincinnati, OH 45233 (513) 451-1777
409 Highway 317, PO Box 205, Neon KY 41840 (606) 855-9949

ESI

Jeff Schwierjohann

From: Megan_Sullivan@fws.gov
Sent: Friday, June 06, 2003 1:39 PM
To: jschwierjohann@environmentalsi.com
Cc: Mary_M_Knapp@fws.gov; Angela_Boyer@fws.gov
Subject: Indiana bat survey

Mr. Schwierjohann,

This is in response to your proposal to conduct mist netting surveys for the Federally endangered Indiana bat in Ohio. These surveys will be completed to determine the presence or absence of the Indiana bat along the Ohio Department of Transportation's proposed Portsmouth Bypass, located in Scioto County, Ohio. Environmental Solutions and Innovations, Inc. proposes to net 10 sites according to the methods identified in Federal Permit No. TEO23664-10. Work is scheduled to begin on Monday, June 9, 2003.

The Service has no objection to the proposed survey. The survey should be completed as described above. Upon completion of the survey, we request that you submit a copy of the survey report results to this office for review.

If you have any questions or need additional information, please feel free to contact me.

Sincerely,
Megan Seymour
Wildlife Biologist
U.S. Fish and Wildlife Service
6950 Americana Pkwy.
Suite H
Reynoldsburg, OH 43068
(614) 469-6923 ext. 16
(614) 469-6919 fax

Appendix B

Completed project data sheets with site photographs

Property of: Environmental Solutions & Innovations, Inc.
781 Neeb Road. Cincinnati, OH 45233 (Phone: 513-451-1777)

NET SITE HABITAT DESCRIPTION

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 10 JUNE 2003 **Biologist:** SCHWIEDJOHANN ; HOFFMAN
State: OH **County:** Scioto **Forest:** — **Tract:** —
GPS: Latitude: N 38 · 53 · 08.0 " Longitude: W 82 · 59 · 26.3 "
Site Name/#: 16 **Waypoint Name:** _____
Quad.: _____ **Range:** ____ **Township:** ____ **Sec.:** ____ **¼ Sec.:** _____
Distance to water: 10 YARDS – See NET SITE DESCRIPTION 1a (9 JUNE) for STREAM & HABITAT Desc.

[redacted]

Bank Height: _____ Channel Width: _____ Stream Width: _____
Substratum: ☐ Sand ☐ Gravel ☐ Cobble ☐ Bedrock ☐ Silt/mud other _____
Average Water Depth: _____ Clarity: ☐ High ☐ Moderate ☐ Low

[redacted]

Estimated Canopy Closure: ☐ Closed ☐ Moderate ☐ Open
Dominant Overstory Species (>38cm/15"): Estimated DBH range: Lg: ___ dbh Sm ___ dbh
1. _____
2. _____
3. _____
Roost Tree Potential consists of: ☐ Large Trees ☐ Snags ☐ Both
Roost Tree Potential for the Area is: ☐ High ☐ Moderate ☐ Low
Subdominant Overstory Species (<38cm/15"):
1. _____ 2. _____ 3. _____
Relative Abundance of Dominant vs. Subdominant: _____
Description of Overstory Habitat Form:
_____
Subcanopy Clutter: ☐ Closed ☐ Moderate ☐ Open
Is Subcanopy Vegetation Lay Comprised Largely of: ☐ Lower Branches of Canopy Trees?
☐ Saplings ☐ Shrubs
Dominant Understory Species: 1.
2.
3.
Description of Habitat Form:
_____
~~Herbaceous Cover~~:
Wildlife Spp: Woodthrush, LA. Waterthrush, Towhee, A. Robin, Green Frog, Veery.

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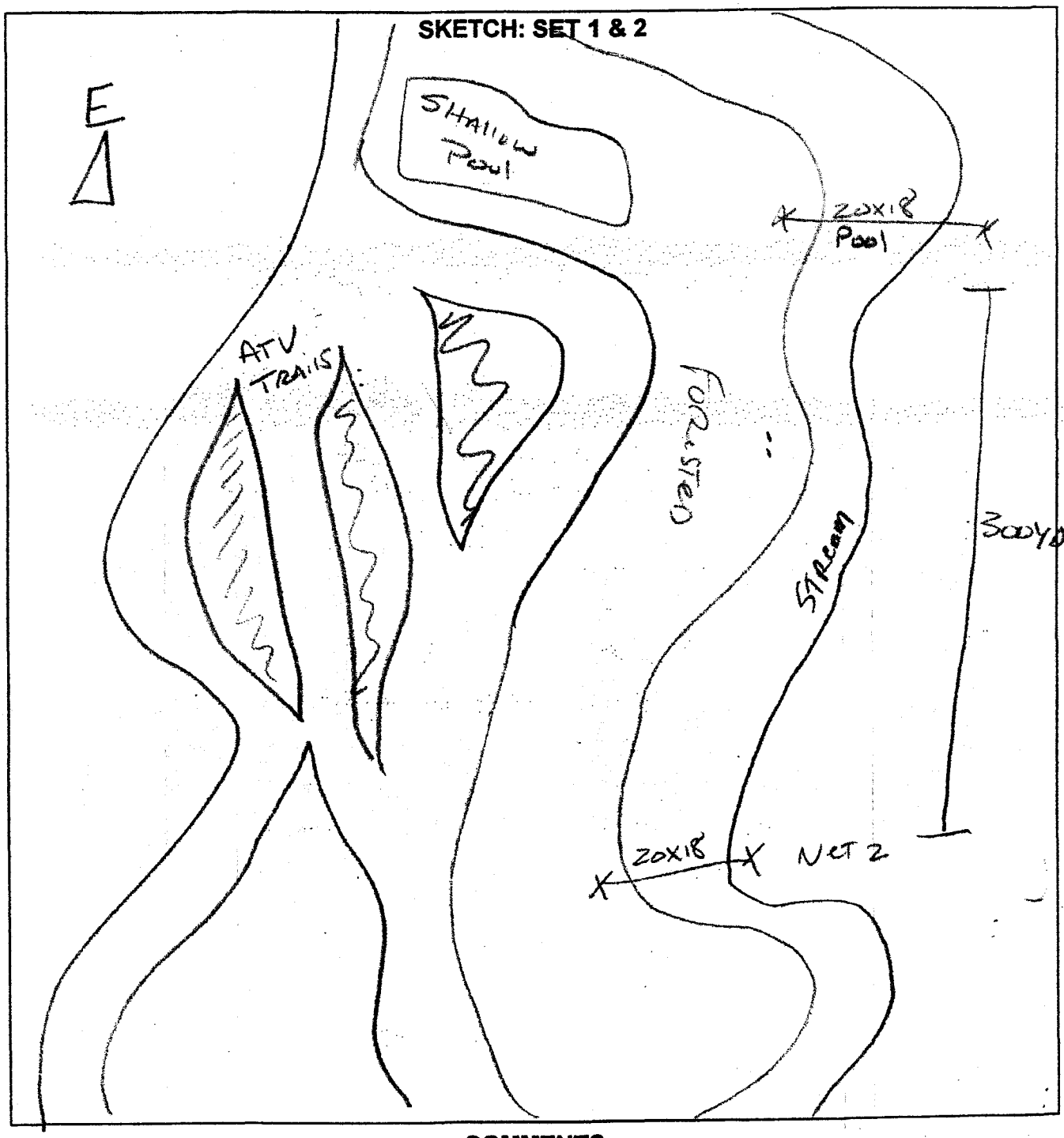
NET SITE HABITAT DESCRIPTION (Continued)

State: OH County: Scioto Project Name and #: ODOT CH2Mhill/ Pesi 096

Site Name/#: #1A Waypoint Name: ~~~~

SKETCH: SET 1 & 2



COMMENTS

WOOD LOT is APPROXIMATELY 700-1000 YARDS WIDE (N to S)
MANY HEAVILY USED ATV TRAILS RUN E TO W.

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 9 June 2003 **Biologists:** Schwierjohann; Hoffman **Camera #** 4

State: OH **County:** Scioto **Forest:** ✓ **Tract:** ✓ **Site Name/#:** #19

GPS: Latitude: N 38 · 53 · 06.9 " Longitude: W 82 · 59 · 13.9 " **Waypoint Name:** ✓

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	1	Mono / Old Nylon / New Nylon	18	20	2030	0200
	2	Mono / Old Nylon / New Nylon	18	20	2030	0200
		Mono / Old Nylon / New Nylon				

Site Description/Comments: #1 Pic #: 100-0817 #2: 100-0816

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Feces #	NET ~~Picture #~~ LOCATION & ~~Description~~
1	E. Fuscus	2355	✓	✓	✓	✓	✓	✓	—	1; Top center
	L7 BAT escaped From NET									

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 9 June 2003 **Biologist:** Schweitzer, Hartman
State: OH **County:** Scioto **Forest:** / **Tract:** /
GPS: Latitude: N 38° 53' 06.9" Longitude: W 82° 59' 13.9"
Site Name/#: #1a **Waypoint Name:** /

Comments: Fairly Humid Day. High & Lower 80's. Clear Skies, Slight Breeze, Waning Gibbous Moon, Quite Bright

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2030	69	0	-	<5%	Very Humid
2100	67	0	-	"	"
2200	62	0	-	0	Humidity DROPPED DRAMATICALLY
2300	60	0	-	0	CAN NOW See Bright
0000	59	0	-	0	
0100	59	0	-	0	
0130	58	0	-	0	
0200	57	0	-	0	

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 10 June 2003 **Biologists:** Schwierjohann; Houtman **Camera #** 4

State: OH **County:** Scioto **Forest:** / **Tract:** / **Site Name/#:** 16

GPS: Latitude: N 38 · 53 · 08.0 " Longitude: W 82 · 59 · 26.3 " **Waypoint Name:**

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	1	Mono / Old Nylon / New Nylon	18	20	2030	0200
	2	Mono / Old Nylon / New Nylon	18	20	2030	0200
		Mono / Old Nylon / New Nylon				

Site Description/Comments: #1 Pic # - 100-0819 ; #2 · 100-0818

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Feces #	~~Picture #~~ LOCATION & ~~Description~~
	M. Septentrionalis	2150	AD	F	P	9	34.4	/	/	NET 1 Right center →

BOTH NIGHTS (9 & 10 June) NO BAT ACTIVITY OBSERVED IN WOODLOT OVER FIELD OR NEAR LIGHTS... NONE!

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 10 June 2003 **Biologist:** Schuierjohann, Hoffman
State: OH **County:** Scioto **Forest:** — **Tract:** —
GPS: Latitude: N 38° 53' 080" Longitude: W 82° 59' 26.3"
Site Name/#: 16 **Waypoint Name:** _____
Comments: Less Humid than 9 June; Partly cloudy; Highs in upper 70's

Mesa Phase Material

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2030	71°	0	—	30%	"
2100	71°	0	—	30%	
2200	66°	0	—	10%	Dew Glicking
2300	65	0	—	65%	Haze settled in
0000	65	4	N→S	100%	Lightning in far distance
0100	65	1	"	100%	" "
0130	64	1	"	100%	
0200	64	0	—	100%	

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NET SITE HABITAT DESCRIPTION

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 9 June 2003 **Biologist:** Schwierjohann; Hoffman
State: OH **County:** Scioto **Forest:** — **Tract:** —
GPS: Latitude: N 38 · 53 · 06.9 " Longitude: W 82 · 59 · 13.9 "
Site Name/#: #1a **Waypoint Name:** —
Quad.: _____ **Range:** ____ **Township:** ____ **Sec.:** ____ **¼ Sec.:** _____
Distance to water: OVER STREAM

Bank Height: 2'-6' Channel Width: 10'-30' Stream Width: 5'-20'
Substratum: ☐ Sand ☐ Gravel ☒ Cobble ☐ Bedrock ☒ Silt/mud other _____
Average Water Depth: 2" – 2' Clarity: ☐ High ☒ Moderate ☐ Low

Estimated Canopy Closure: ☐ Closed ☒ Moderate ☐ Open
Dominant Overstory Species (>38cm/15"): Estimated DBH range: Lg: 30 cm dbh Sm 10 cm dbh
1. Sycamore (Platanus occidentalis)
2. Red maple (Acer Rubrum)
3. A. Beech (Fagus grandifolia)

Roost Tree Potential consists of: ☒ Large Trees ☐ Snags ☐ Both
Roost Tree Potential for the Area is: ☐ High ☐ Moderate ☒ Low
Subdominant Overstory Species (<38cm/15"):
1. Box Elder (Acer Negundo) 2. Mockernut Hickory (C. Tomentosa) 3. Tulip Poplar (L. Tulipifera)
Relative Abundance of Dominant vs. Subdominant: 3:1
Description of Overstory Habitat Form:
Moderately closed canopy, Relatively uncluttered; uneven aged stand
Subcanopy Clutter: ☐ Closed ☒ Moderate ☐ Open
Is Subcanopy Vegetation Layer Comprised Largely of: ☐ Lower Branches of Canopy Trees? ☒ Saplings ☒ Shrubs
Dominant Understory Species: 1. Paw Paw (Asimina Triloba)
2. Box elder (Acer Negundo)
3.
Description of Habitat Form:

Herbaceous Cover: Rose, Jack-in-pulpit, Honeysuckle, Mayapple

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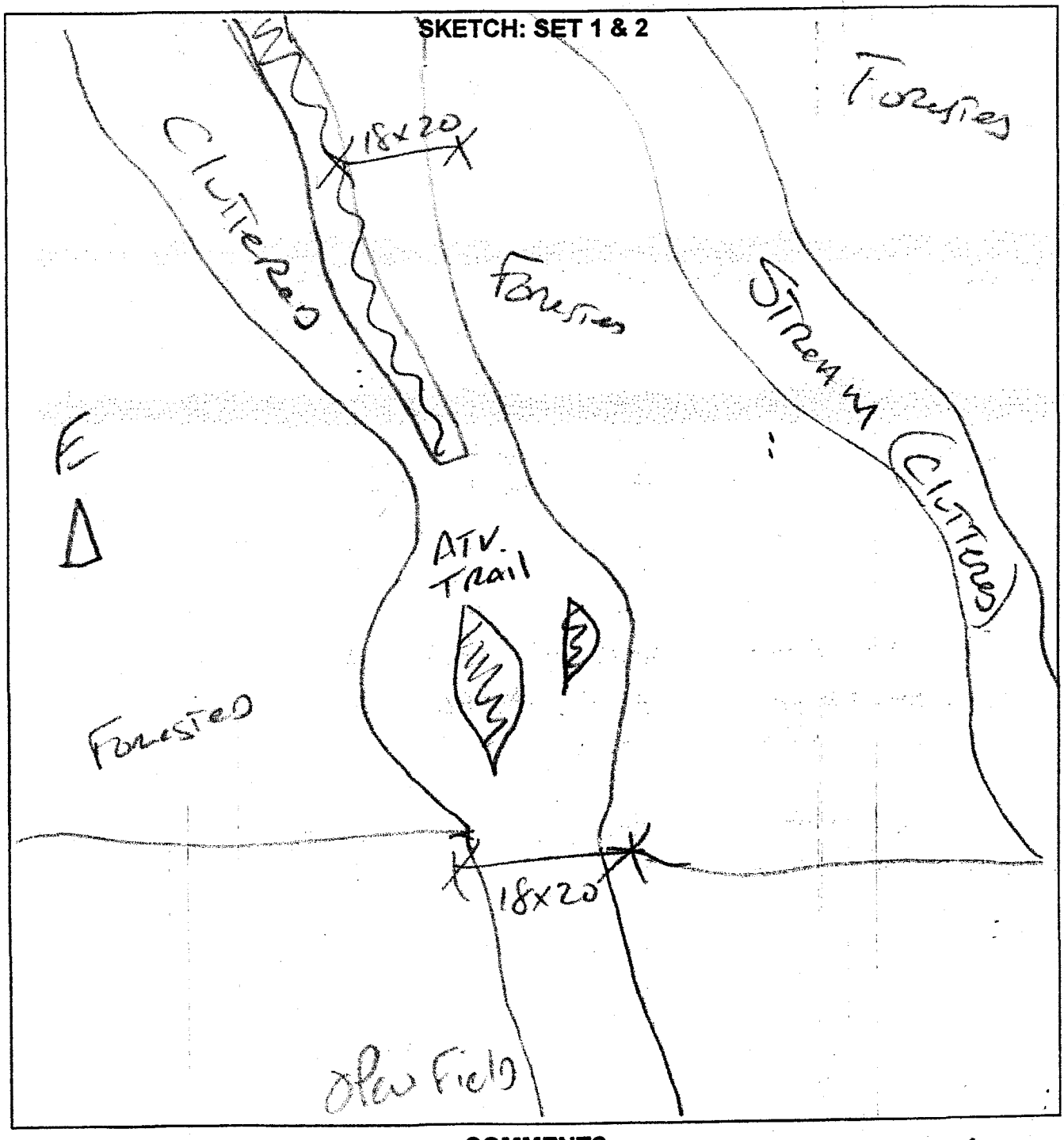
NET SITE HABITAT DESCRIPTION (Continued)

State: OH County: Scioto Project Name and #: ODOT CH2Mhill/ Pesi 096

Site Name/#: 16 Waypoint Name: _____

SKETCH: SET 1 & 2



COMMENTS

NO WAY TO COVER ALL CORRIDORS; WATER NOT A LIMITING FACTOR; SINCE ONLY 1 BAT CAPTURED OVER STREAM ON 9 JUNE I DECIDED TO TRY ATV TRAILS

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 9 JUNE 2003 **Biologists:** M. Gilley & J. Duffey **Camera #** 4 - Jeff took Photos

State: OH **County:** Scioto **Forest:** — **Tract:** — **Site Name/#:** ODOT # 32 of site

GPS: Latitude: N 38 · 52 · 04.1 " Longitude: W 82 · 56 · 24.6 " **Waypoint Name:** 065

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	1	Mono / Old Nylon / New Nylon	18'	20'	20:45	1:45
	2	Mono / Old Nylon / New Nylon	18'	20'	21:00	1:50
		Mono / Old Nylon / New Nylon				

Site Description/Comments: Pictures Net #1 – Jeff
Net #2 –

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Feces #	Picture # & Description
1	L. noctivagans	22:45	Ad	M	NR ↑	10.0	43.0	E	—	—
2	L. borealis	24:30	Ad	F	Preg	13.5	42.0	M	—	—

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 10 JUNE 2003 **Biologists:** M. Gilley & J. Duffey **Camera #** 4 Jeff

State: OH **County:** Scioto **Forest:** ——— **Tract:** ——— **Site Name/#:** ODOT #3 2

GPS: Latitude: N 38° 52' 04.1" Longitude: W 82° 56' 24.6" **Waypoint Name:** 065

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	1	Mono / Old Nylon / New Nylon	18'	20'	20:50	1:50
	2	Mono / Old Nylon / New Nylon	18'	20'	21:00	2:10
		Mono / Old Nylon / New Nylon				

Site Description/Comments:

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Feces #	Picture # & Description
	NO BATS									

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 9 JUNE 2003 **Biologist:** M. Gilley & J. Duffey
State: OH **County:** Scioto **Forest:** ——— **Tract:** ———
GPS: Latitude: N 38 ° 52 ' 04.1 " Longitude: W 82 ° 56 ' 24.6 "
Site Name/#: ODOT #32 **Waypoint Name:** 065

Comments:

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
21:00	65°F	1-3mph	SE - NW	5%	———
22:00	61°	3-5mph	SE to NW	35%	———
23:00	60°	3-5mph	SE to NW	10%	———
24:00	58°	0	———	0%	———
01:00	57°	1-3 mph	SE to NW	0%	———
02:00	56°	1-3mph	SE to NW	0%	———

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 10 JUNE 2003 **Biologists:** M. Gilley & J. Duffey **Camera #** 4 Jeff

State: OH **County:** Scioto **Forest:** _____ **Tract:** _____ **Site Name/#:** ODOT #3 2

GPS: Latitude: N 38° 52' 04.1" Longitude: W 82° 56' 24.6" **Waypoint Name:** 065

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	1	Mono / Old Nylon / New Nylon	18'	20'	20:50	1:50
	2	Mono / Old Nylon / New Nylon	18'	20'	21:00	2:10
		Mono / Old Nylon / New Nylon				

Site Description/Comments: _____

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Feces #	Picture # & Description
	NO BATS									

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 10 JUNE 2003 **Biologist:** M. Gilley & J. Duffey
State: OH **County:** Scioto **Forest:** _____ **Tract:** _____
GPS: Latitude: N 38° 52' 04.1" Longitude: W 82° 56' 24.6"
Site Name/#: ODOT # 32 **Waypoint Name:** 065

Comments:

Weather Phase Criteria

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
21:00	68°F	0 mph	—	99%	"
22:00	66°	0	—	90%	—
23:00	64°	1-3 mph	E to W	90%	—
24:00	64°	8-12 mph	SE ~~to~~ NW	90%	lightning flashes & thunder in distance
1:00	68°	1-3 mph	N to S	100%	Front moving in
2:00	68°	1-3 mph	SE to NW	100%	light rain started 01:40

Camera #4 - Jeff took

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NET SITE HABITAT DESCRIPTION

Project No.: Pesi 096 **Project Name:** ODOT SR2 MHill

Date: 10 JUNE 2003 **Biologist:** M. Gilley & J. Duffey

State: OH **County:** Scioto **Forest:** ——— **Tract:** ———

GPS: Latitude: N 38 ° 52 ' 04.1 " **Longitude:** W 82 ° 56 ' 24.6 "

Site Name/#: #3 2 **Waypoint Name:** 065

Quad.: _____ **Range:** ____ **Township:** ____ **Sec.:** ____ **¼ Sec.:** ____

Distance to water: Not Over Stream

ESTIMATED STREAM CHARACTERISTICS

Bank Height: 2.5 ft. **Channel Width:** 22 ft. **Stream Width:** 5-10 ft.

Substratum: ☐ Sand ☐ Gravel ☒ Cobble ☐ Bedrock ☐ Silt/mud other _____

Average Water Depth: 6in. **Clarity:** ☒ High ☐ Moderate ☐ Low

VEGETATION

Estimated Canopy Closure: ☐ Closed ☒ Moderate ☐ Open

Dominant Overstory Species (>38cm/15"): Estimated DBH range: Lg: 45dbh **Sm** 38 dbh

1. P. occidentalis
2. Juglans nigra
3. ———

only 2 dominant over story trees

Roost Tree Potential consists of: ☐ Large Trees ☒ Snags ☐ Both → 2 Hollow sycamores

Roost Tree Potential for the Area is: ☐ High ☐ Moderate ☒ Low

Subdominant Overstory Species (<38cm/15"):

1. Acer negundo 2. Fraxinus pennsylvanica 3. Platanus occidentalis

Relative Abundance of Dominant vs. Subdominant: 10% D : 90% Sub

Description of Overstory Habitat Form:
2 single rows of deciduous trees bordering each side of Stream

Subcanopy Clutter: ☐ Closed ☐ Moderate ☒ Open

Is Subcanopy Vegetation Lay Comprised Largely of: ☐ Lower Branches of Canopy Trees? ☒ Saplings ☐ Shrubs

Dominant Understory Species:
1. Acer negundo shoots
2. Platanus occidentalis shoots
3. Vitis spp.

Description of Habitat Form:
Small Stream channel bordered by trees & mowed lawns – Very open & maintained by residents

Herbaceous Cover: Spearmint
Grasses
Virginia creeper on trees

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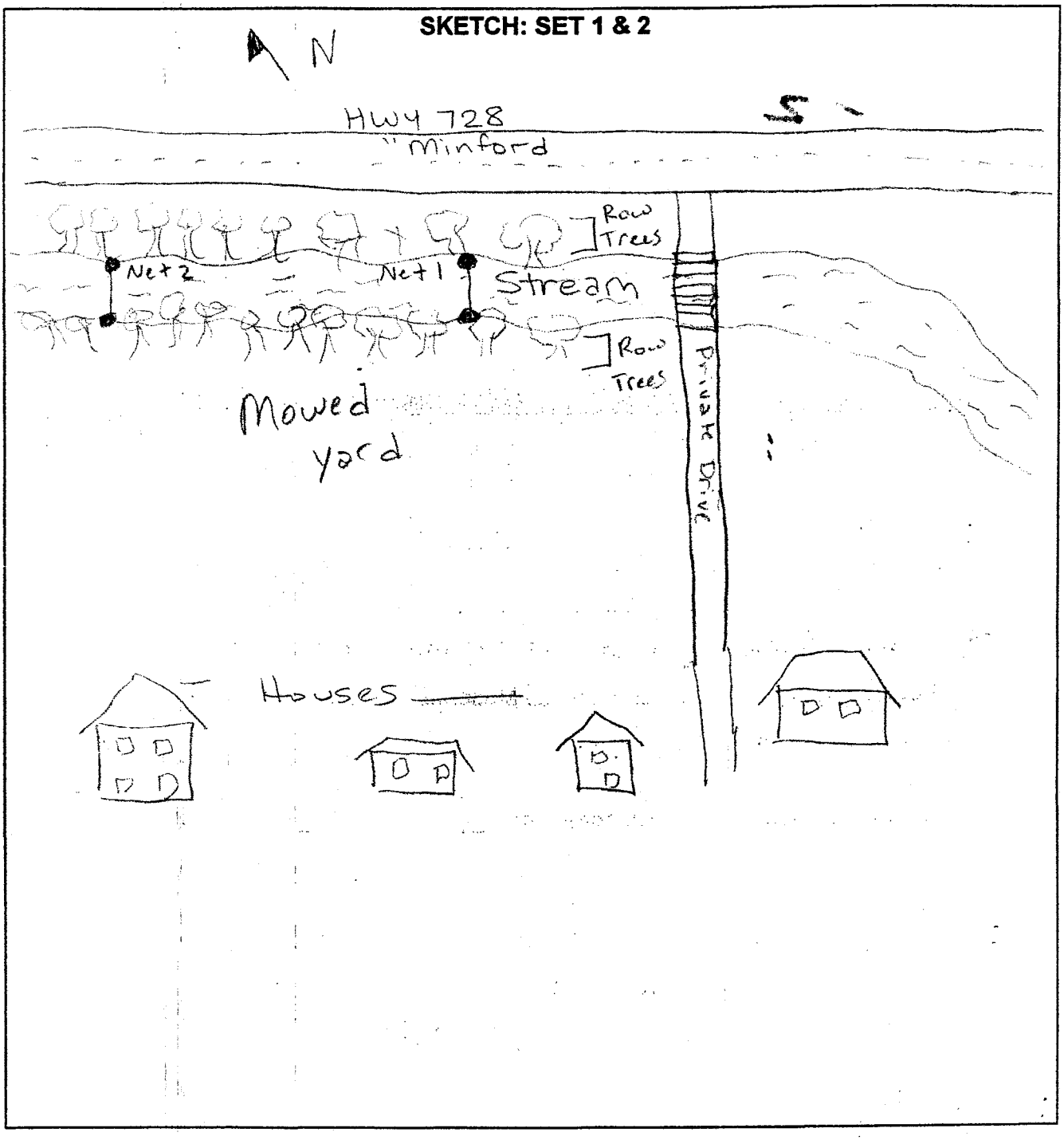
NET SITE HABITAT DESCRIPTION (Continued)

State: OH **County:** Scioto **Project Name and #:** ODOT CH2Mhill/ Pesi 096

Site Name/#: ODOT #32 **Waypoint Name:** 065

SKETCH: SET 1 & 2



COMMENTS

Small stream. Flowing water. Area very open with few trees. Mostly maintained yards of residents

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 06/12/2003 **Biologists:** MG, BW **Camera #** 1

State: OH **County:** Scioto **Forest:** — **Tract:** — **Site Name/#:** DPDT #43

GPS: Latitude: N 38° 51' 20.6" Longitude: W 82° 54' 35.2" **Waypoint Name:** D66

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	1	Mono / Old Nylon / New Nylon	18'	20'	8:30	1:50
	2	Mono / Old Nylon / New Nylon	18'	20'	8:45	2:00
		Mono / Old Nylon / New Nylon				

Site Description/Comments:

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Feces #	Picture # & Description
1	P. Subflavus	21:15	Ad	F	PG	8	35.00	M	NA	NA NET #1
2	P. Subflavus	21:37	Ad	F	PG	8	33.70	F	NA	NA NET #1
3	P. subflavus	22:20	Ad	M	↑	5.5	34.45	E	NA	NA Net #1
4	M. Lucifugus	23:40	Ad	M	↑	7	36.70	M	NA	NA Net #1

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 06/12/2003 **Biologist:** MG, BW
State: OH **County:** Scioto **Forest:** — **Tract:** —
GPS: Latitude: N 38° 51' 20.6" Longitude: W 82° 54' 35.2"
Site Name/#: ODOT 4 3 **Waypoint Name:** 066
Comments:

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
21:00	70°F	0 mph	—	90%	—
22:00	69°F	0 mph	—	90%	—
23:00	68°F	0 mph	—	80%	—
24:00	66°F	0 mph	—	60%	Fog
01:00	65°F	0 mph	—	25%	Dense Fog
02:00	65°F	0 mph	—	90%	Dense Fog

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 06/13/2003 **Biologists:** MG, BW **Camera #** 1

State: OH **County:** Scioto **Forest:** — **Tract:** — **Site Name/#:** ODOT #3

GPS: Latitude: N 38° 51' 20.6" Longitude: W 82° 54' 35.2" **Waypoint Name:** 066

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	1	Mono / Old Nylon / New Nylon	18'	20'	8:30	2:00
	2	Mono / Old Nylon / New Nylon	18'	20'	8:45	2:15
		Mono / Old Nylon / New Nylon				

Site Description/Comments: Pictures Camera #1 : Net #1-100-702
Net #2-100-704

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Feces #	Picture # & Description
1	P. subflavus	22:20	Ad	M	↑	5.0	33.0	F	—	—
2	L. borealis	23:20	Ad	F	PG	14.0	39.60	E	—	—
3	L. borealis	24:00	Ad	F	PG	19	44.25	F	—	—
4.	L. borealis	24:00	Ad	F	DG	escaped			—	—
5.	L. noctivagans	24:00	Ad	M	↑	10.0	41.05	M	—	—

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 06/13/2003 **Biologist:** MG, RW
State: OH **County:** Scioto **Forest:** — **Tract:** —
GPS: Latitude: N 38° 51' 20.6" Longitude: W 82° 54' 35.2"
Site Name/#: ODOT 43 **Waypoint Name:** 066

Comments:

Water Chemistry

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2100	70°	1-3mph	—	0%	—
2200	66°	1-3mph	—	10%	—
23:00	64°	—	—	75%	—
24:00	66°	—	—	98%	—
1:00	64°	—	—	80%	FOG
2:00	65°	—	—	80%	—

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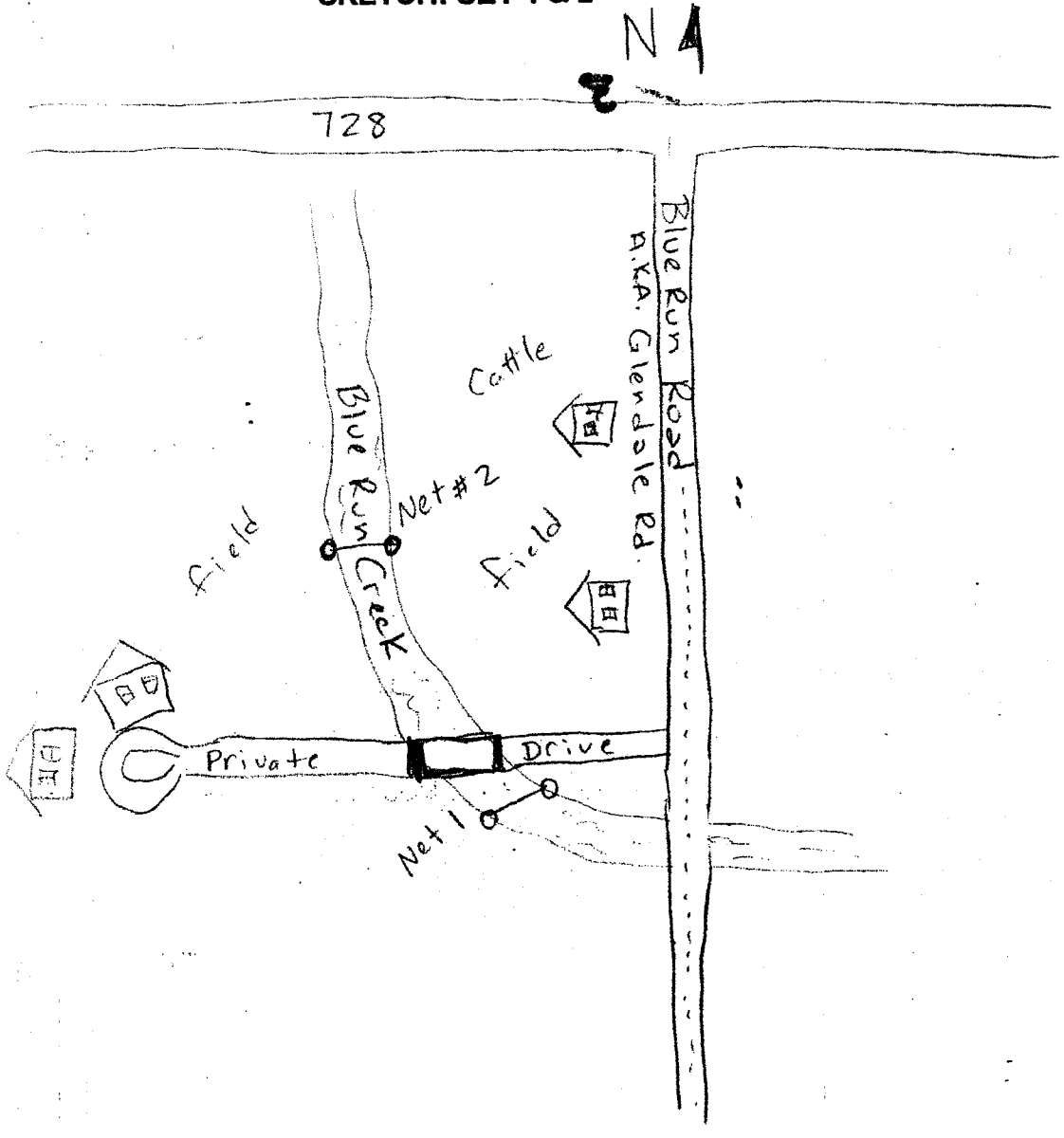
NET SITE HABITAT DESCRIPTION (Continued)

State: OH **County:** Scioto **Project Name and #:** ODOT CH2Mhill/ Pesi 096

Site Name/#: ODOT #3 **Waypoint Name:** 0066

SKETCH: SET 1 & 2



COMMENTS

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 06/14/2003 **Biologists:** MG, BC **Camera #** 1

State: OH **County:** Scioto **Forest:** — **Tract:** — **Site Name/#:** ODOT #4

GPS: Latitude: N 38° 51' 15.9" Longitude: W 82° 52' 54.0" **Waypoint Name:** 067

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	1	Mono / Old Nylon / New Nylon	42	20	2040	02:20
	2	Mono / Old Nylon / New Nylon	30	20	2130	02:35
		Mono / Old Nylon / New Nylon				

Site Description/Comments: Pictures: Net #1 - 100.708
Net #2 - 100-709

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓)	Wt (g)	RFA (mm)	Belly: F, M, E	Feces #	Picture # & Description
1	E. fucus	2200	Ad	F	PG	24	48.00	M	—	— Net# 1
2	M. Septentrionalis	2200	Ad.	M	↑	6.5	35.65	M	—	— Net# 1
3	P. Subflavus	2300	Ad	M	↑	6	34.00	F	—	— Net# 1
4	E. fucus	2240	Ad	F	PG	22	49.55	M	—	— Net# 1
5	E. fuscus	23:05	Ad	F	PG	21.5	45.00	F	—	— Net # 2
6	P. Subflavus	23:40	Ad	F	PG	8	33.80	F	—	— Net# 1
7	P. subflavus	24:00	Ad	F	PG	9	34.05	F	—	— Net # 2
8	L. Borealis	24:20	Ad	F	L	13	40.40	F	—	— Net# 1
9	E. fuscus	01:40	Ad	F	PG	23	49.00	F	—	— Net # 1

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 06/14/2003 **Biologist:** MG, BC
State: OH **County:** Scioto **Forest:** — **Tract:** —
GPS: Latitude: N 38° 51' 15.0" Longitude: W 82° 52' 54.0"
Site Name/#: ODOT #54 **Waypoint Name:** 067

Comments:

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2100	70°	1-3	S to N	100%	—
2200	70°	1-3	S to N	100%	—
2300	68°	1-3	S to N	100%	—
24:00	66°	1-3	S to N	100%	—
01:00	66°	1-3	S to N	100%	—
02:00	66°	1-3	S to N	100%	Light rain started 01:10. Stopped 01:30

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 06/15/2003 **Biologists:** MG, BW **Camera #** 1

State: OH **County:** Scioto **Forest:** — **Tract:** — **Site Name/#:** ODOT #4

GPS: Latitude: N 38° 51' 15.0" Longitude: W 82° 52' 54.0" **Waypoint Name:** 067

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	~~1~~	~~Mono~~ / Old Nylon / New Nylon	42'	20'	8:00	01:45
	2	Mono / Old Nylon / ~~New Nylon~~	30'	20'	8:30	02:15
		Mono / Old Nylon / New Nylon				

Site Description/Comments:

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Feces #	Picture # & Description
1	E. fuscus	2370	Ad	M	↑	18	45.00	F	—	— Net #2
2	E. fuscus	2400	Ad.	F	PG	21.5	48.50	F	—	— Net #1
3	E. fuscus	2400	Ad	M	↑	18	45.80	F	—	— Net #2
4	P. subflavus	2420	Ad	M	↑	5.5	33.10	F	—	— Net #2
5	E. fuscus	2420	Ad	F	L	20.	47.25	F	—	— Net #2
6	E. fuscus	2420	Ad	F	L	18.5	45.50	F	—	— Net #2
7	E. fuscus	0100	Ad	F	PG	20.5	46.40	F	—	old Bat Net #2
8	E. fuscus	0120	Ad	F	PG	24.0	49.80	F	—	Net #1
9	E. fuscus	0130	Ad	F	PG	—	—	F	—	Net #1

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 06/15/2003 **Biologist:** MG, SW
State: OH **County:** Scioto **Forest:** — **Tract:** —
GPS: Latitude: N 38° 51' 15.0" Longitude: W 82° 52' 54.0"
Site Name/#: ODOT #54 **Waypoint Name:** 067

Comments:

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2100	77°	3-5	S → N	100%	—
2200	70°	1-3	S → N	100%	light rain started 9:30 stops at 10:40
2300	70°	0	—	100%	fog sets in
2400	69°	0	—	100%	—
0100	68°	0	—	60%	—
0200	68°	1-3	S to N	100%	FOG!

Camera #1 → Net 1 – 100-708
→ Net 2 – 100-709

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NET SITE HABITAT DESCRIPTION

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 15 JUNE 2003 **Biologist:** MG & RW
State: OH **County:** Scioto **Forest:** ——— **Tract:** ———
GPS: Latitude: N 38° 51' 15.0" Longitude: W 82° 52' 54.0"
Site Name/#: ODOT #54 **Waypoint Name:** 067
Quad.: _____ **Range:** ____ **Township:** ____ **Sec.:** ____ **¼ Sec.:** ____

Distance to water:

Bank Height: 10ft Channel Width: 45 ft. Stream Width: 35-40ft

Substratum: ☐ Sand ☐ Gravel ☐ Cobble ☒ Bedrock ☐ Silt/mud other _____

Average Water Depth: 17in. Clarity: ☐ High ☒ Moderate ☐ Low

Estimated Canopy Closure: ☒ Closed ☐ Moderate ☐ Open
Dominant Overstory Species (>38cm/15"): Estimated DBH range: Lg: 60 dbh Sm 38 dbh

1. Platanus occidentalis
2. Acer saccharum
3. Liriodendron tulipifera

Roost Tree Potential consists of: ☒ Large Trees ☒ Snags ☐ Both

Roost Tree Potential for the Area is: ☒ High ☐ Moderate ☐ Low

Subdominant Overstory Species (<38cm/15"):

1. Acer saccharum 2. Betula nigra 3. P. occidentalis

Relative Abundance of Dominant vs. Subdominant: 50:50

Description of Overstory Habitat Form:
Mature hardwood forest w/ many large trees & open underneath

Subcanopy Clutter: ☐ Closed ☐ Moderate ☒ Open

Is Subcanopy Vegetation Lay Comprised Largely of: ☒ Lower Branches of Canopy Trees?
☐ Saplings ☐ Shrubs

Dominant Understory Species: 1. Carpinus caroliniana
2. Acer saccharum
3. Prunus serotina

* Good roosting & foraging potential

Description of Habitat Form:
Creek with flowing water, high banks & open understory

Herbaceous Cover: along banks: May Apple, Viola spp., Solidago spp. Grasses

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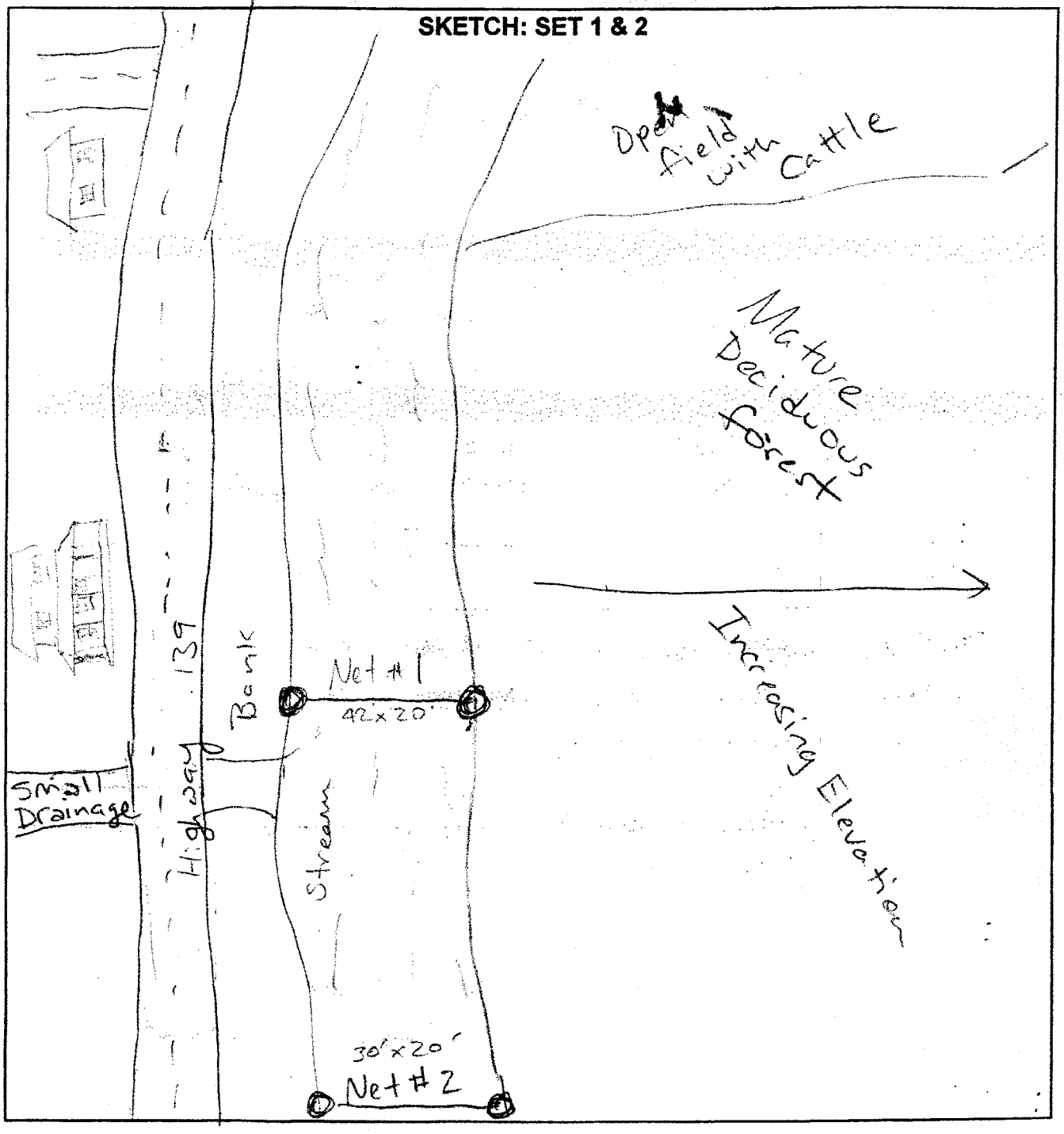
NET SITE HABITAT DESCRIPTION (Continued)

State: OH **County:** Scioto **Project Name and #:** ODOT CH2Mhill/ Pesi 096

Site Name/#: ODOT #54 **Waypoint Name:** 007

SKETCH: SET 1 & 2



COMMENTS

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 20 June 2003 **Biologists:** Schwierjohann/Hartman **Camera #** 4

State: OH **County:** Scioto **Forest:** XXXXXXXXXX **Tract:** XXXXXXXXX **Site Name/#:** #5

GPS: Latitude: N 38° 51' 14.6" Longitude: W 82° 51' 52.6" **Waypoint Name:**

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	A	Mono / ~~Old Nylon~~ / New Nylon	42	30	830	0200
	B	Mono / Old Nylon / ~~New Nylon~~	20	20	830	0200
		Mono / Old Nylon / New Nylon				

Site Description/Comments:

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Net #	Location in net
					NO BATS					

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 20 June 2003 **Biologist:** Schmierjohann / Hoffman
State: OH **County:** Scioto **Forest:** XXXXXXXX **Tract:** XXXXXXX
GPS: Latitude: N 38° 51' 14.6" Longitude: W 82° 51' 52.7"
Site Name/#: #85 **Waypoint Name:** XXXX

Comments: BAST NIGHT YET

Moon Phase (Quarter)

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2100	64	1-3	E-W	40%	Bo
2200	63	1-3		0	
2300	60	1-3		0	
0000	56	1-3		0	
0100	55	3		0	
0200	53	3		0	

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 18 June 2003 **Biologists:** Schuerger, Hoffman **Camera #** 4

State: OH **County:** Scioto **Forest:** XXXXXXXXXX **Tract:** XXXXXXXXX **Site Name/#:** 85

GPS: Latitude: N 38 · 51 · 14.0 " Longitude: W 82 · 51 · 51.7 " **Waypoint Name:**

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	A	Mono / Old Nylon / ~~New Nylon~~	18	20	2045	0200
	B	Mono / ~~Old Nylon~~ / New Nylon	42	20	2045	0200
		Mono / Old Nylon / New Nylon				

Site Description/Comments:

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Net #	Location in net
1	P. SUBFLAVUS	2130	AD	F	P	8	33.0	M	A	Lower Right Quadrant

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 18 June 2003 **Biologist:** Schuckman; Hoffman
State: OH **County:** Scioto **Forest:** XXXXXXXX **Tract:** XXXXXXX
GPS: Latitude: N 38° 51' 14.0" Longitude: W 82° 51' 51.7"
Site Name/#: 55 **Waypoint Name:** _____

Comments:

Moon Phase (Quarter):

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2100	72	1-3	S-N	80	
2200	70	1-3	"	80	
2300	70	1-3	"	80	
0000	69	1-3	"	"	
0100	69	1-3	"	100	
0200	68	1-3	"	100	

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NET SITE HABITAT DESCRIPTION

Project No.: Pesi 096 **Project Name:** ODOT CH2M Hill
Date: 20 June 2003 **Biologist:** Schwierjohann / Hootman
State: OH **County:** Scioto **Forest:** XXXXXXXX **Tract:** XXXXXXXXXX
GPS: Latitude: N 38° 51' 14.6" Longitude: W 82° 51' 52.7"
Site Name/#: #5 **Waypoint Name:**
Quad.: **Range:** **Township:** **Sec.:** **¼ Sec.:**
Distance to water:

ESTIMATED STREAM CHARACTERISTICS

Bank Height: 4-8' Channel Width: 30-40' Stream Width: 35'
Substratum: Sand (Gravel) Cobble ~~Bedrock~~ (Silt/mud) other
Average Water Depth: 1'-2' Clarity: High (Moderate) Low

VEGETATION

Estimated Canopy Closure: Closed Moderate (Open)
Dominant Overstory Species (>38cm/15"): Estimated DBH range: Lg: 17" dbh Sm 15" dbh
1. Platinus occidentalis
2. Acer saccharum
3. Liriodendron tulipifera
Roost Tree Potential consists of: Large Trees Snags (Both)
Roost Tree Potential for the Area is: High ~~Moderate~~ (Low)
Subdominant Overstory Species (<38cm/15"):
1. Acer saccharum 2. Fagus grandifolia 3. Acer negundo
Relative Abundance of Dominant vs. Subdominant: 1:2
Description of Overstory Habitat Form:
Creek - mostly open w/ a few low branches jutting out into corridor/road - moderately closed
Subcanopy Clutter: Closed (Moderate) Open
Is Subcanopy Vegetation Lay Comprised Largely of: Lower Branches of Canopy Trees?
(Saplings) (Shrubs)
Dominant Understory Species: 1. Lindera benzoin
2. Asimina triloba Ironwood
3. Fagus grand. folia
Description of Habitat Form:
Intermixed sap/shrub w/ herbatious cover
Herbaceous Cover: Nettle spp. New York/xmas fern, mayapple, trillium spp. SNAKEROOT

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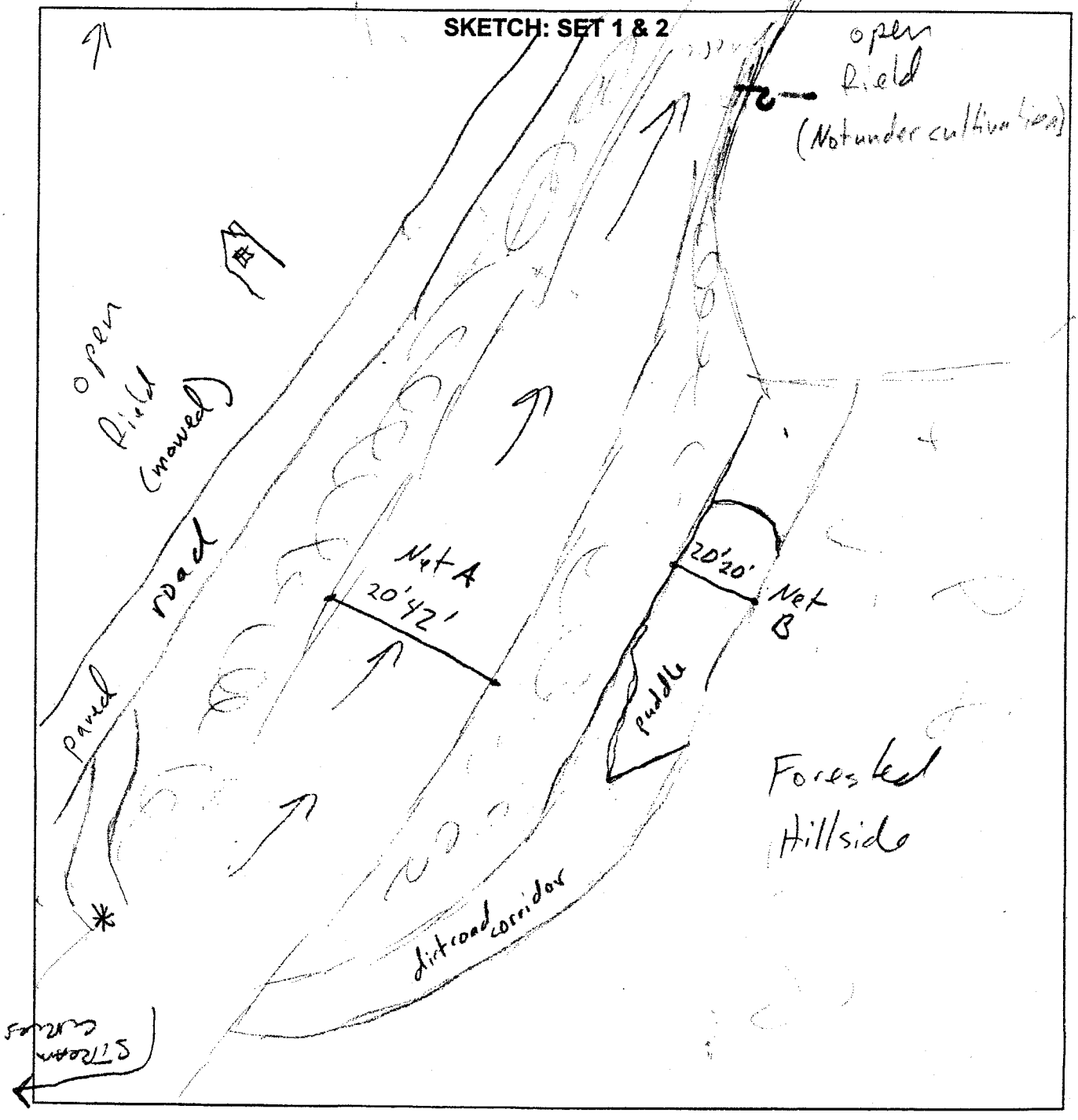
NET SITE HABITAT DESCRIPTION (Continued)

State: OH **County:** Scioto **Project Name and #:** ODOT CH2Mhill/ Pesi 096

Site Name/#: #5 **Waypoint Name:**

SKETCH: SET 1 & 2



COMMENTS

* Anabat

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New "Moved" site

BAT CAPTURE DATA

Bennett Road off N 335

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 18 JUNE 2003 **Biologists:** MGilley & J. Duffey **Camera #** ~~[redacted]~~

State: OH **County:** Scioto **Forest:** — **Tract:** — **Site Name/#:** ODOT #76 New site

GPS: Latitude: N 38 · 51 · 01.8 " Longitude: W 82 · 51 · 05.2 " **Waypoint Name:** 069

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	1	Mono / Old Nylon / New Nylon	30'	20'	20:40	0200
	2	Mono / Old Nylon / New Nylon	30'	20'	21:00	0200
		Mono / Old Nylon / New Nylon				

Site Description/Comments:

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Feces #	Picture # & Description
1	P. subflavus	2200	JV	M	↑	4.75	31.65	E	—	— Net # 2
2	E. fuscus	2240	AD	F	P	22.0	48.10	F	—	— Net # 1
3	M. septentrionalis	2320	AD	M	↑	7.50	35.20	F	—	— Net # 1
4	M. lucifugus	2355	AD	M	↑	8.00	36.10	M	—	— Net # 1

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 18 JUNE 2003 **Biologist:** MGillespie J. DeMay
State: OH **County:** Scioto **Forest:** ——— **Tract:** ———
GPS: Latitude: N 38° 51' 01.8" Longitude: W 82° 51' 05.2"
Site Name/#: ODOT #6 **Waypoint Name:** 069

Comments:

Mostly Clear

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2100	72°	0	———	50%	———
2200	70°	0	———	75%	———
2300	69°	0	———	75%	———
2400	70°	0	———	75%	———
0100	69°	0	———	75%	———
0200	68°	0	———	75%	———

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 21 June 2003 **Biologists:** Schwierjohann / Hutchman **Camera #** 4

State: OH **County:** Scioto **Forest:** XXXXXXXXXX **Tract:** XXXXXXXXX **Site Name/#:** #6

GPS: Latitude: N 38° 51' 018" Longitude: W 82° 51' 05.2" **Waypoint Name:**

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	A	Mono / Old Nylon / New Nylon	30	20	8:45	0200
	B	Mono / Old Nylon / New Nylon	42	30	845	0200
		Mono / Old Nylon / New Nylon				

Site Description/Comments:

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Net #	Location in net
	P. SUBFLAVUS	2110	A	M	↑	4	37.2	E	A	TOP CENTER
	P. SUBFLAVUS	2235	A	F	P	9.5	32.0	F	B	MIDDLE LEFT
	P. SUBFLAVUS	2235	A	F	P	10.5	34.1	F	B	" "
	P. SUBFLAVUS	2338	A	M	↑	5.5	31.8	F	A	MIDDLE BOTTOM

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 2/June 03 2003 **Biologist:** Schwierjohann ; Hoffman
State: OH **County:** Scioto **Forest:** XXXXXXXX **Tract:** XXXXXXX
GPS: Latitude: N 38° 51' 01.8" Longitude: W 82° 51' 05.2"
Site Name/#: #76 **Waypoint Name:**

Comments:

Moon Phase (Quarter)

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2100	68	—	—	80%	
2200	66	—	—	30%	
2300	62	1-3	N-S	0	
0000	60	1-3	N-S	0	
0100	59	1-3	N-S	40%	
0200	57	+	—	0	

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NET SITE HABITAT DESCRIPTION

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill

Date: 21 June 2003 **Biologist:** Schuerholz, Hartman

State: OH **County:** Scioto **Forest:** XXXXXXXX **Tract:** XXXXXXXXXX

GPS: Latitude: N 38 ° 51 ' 01.8 " Longitude: W 82 ° 51 ' 05 2 "

Site Name/#: #76 **Waypoint Name:**

Quad.: **Range:** **Township:** **Sec.:** **¼ Sec.:**

Distance to water: 0

ESTIMATED STREAM HABITAT FEATURES

Bank Height: 5'-10' Channel Width: 20'-40' Stream Width: 20'-40'

Substratum: Sand Gravel Cobble (Bedrock) Silt/mud other

Average Water Depth: 1'-2' Clarity: High (Moderate) Low

VEGETATION

Estimated Canopy Closure: Closed Moderate (Open)

Dominant Overstory Species (>38cm/15"): Estimated DBH range: Lg: 15 cm dbh Sm 5 cm dbh

1. Box Elder (Acer negundo)
2. Elm (Ulmus Americana)
3. Maple (Acer saccharum)

Roost Tree Potential consists of: Large Trees (Snags) Both

Roost Tree Potential for the Area is: High Moderate (Low)

Subdominant Overstory Species (<38cm/15"):

1. Box Elder 2. Elm 3. Maple

Relative Abundance of Dominant vs. Subdominant: 1:1

Description of Overstory Habitat Form:

Single Row Along Stream Side

Subcanopy Clutter: (Closed) Moderate Open

Is Subcanopy Vegetation Lay Comprised Largely of: (Lower Branches of Canopy Trees?) Saplings Shrubs

Dominant Understory Species: 1. 2. 3. None

Description of Habitat Form:

Herbaceous Cover:

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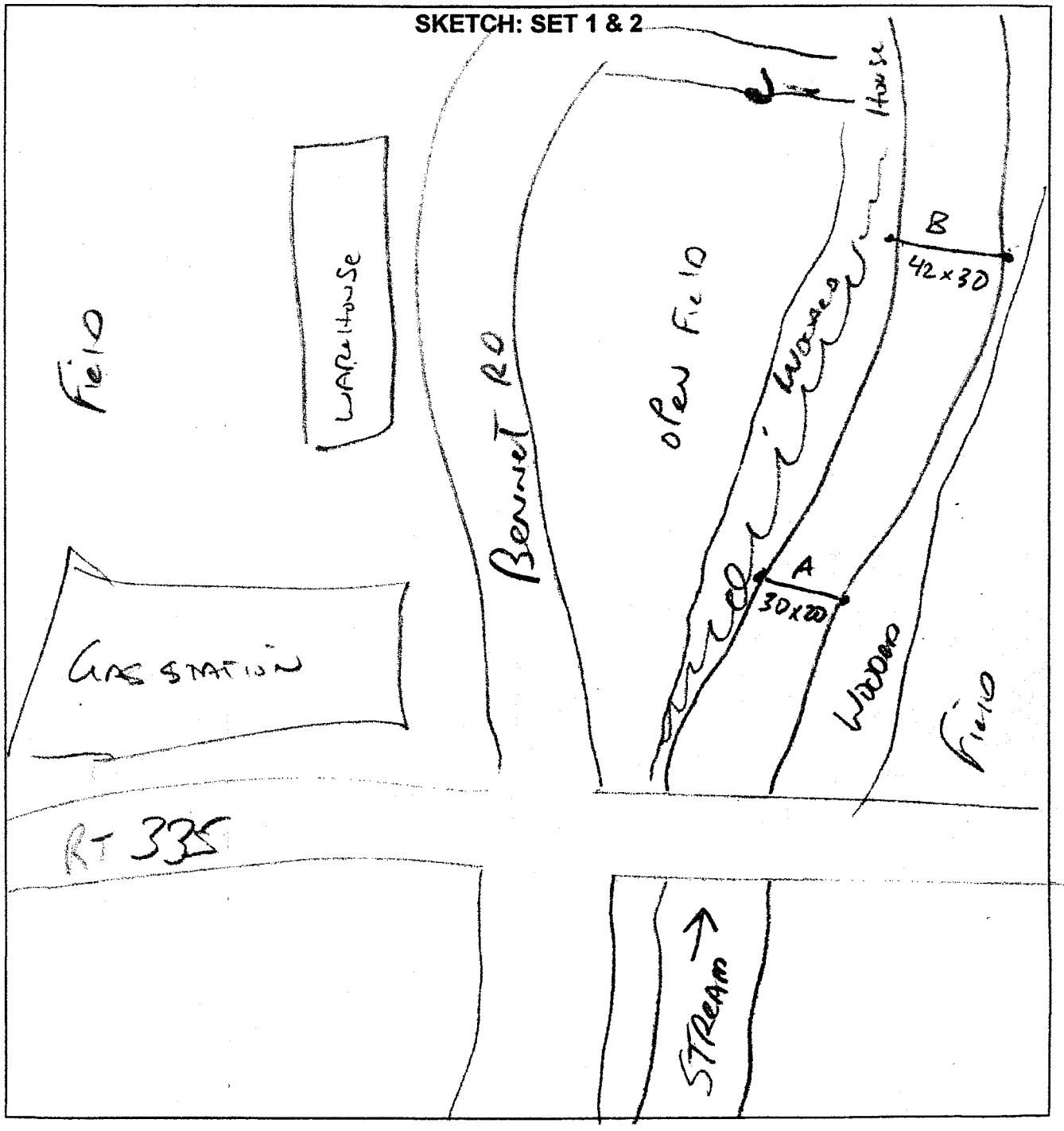
NET SITE HABITAT DESCRIPTION (Continued)

State: OH County: Scioto Project Name and #: ODOT CH2Mhill/ Pesi 096

Site Name/#: X6 Waypoint Name: _____

SKETCH: SET 1 & 2



COMMENTS

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 17 June 2003 **Biologists:** Schwierjohann/Hoffman **Camera #** 4

State: OH **County:** Scioto **Forest:** XXXXXXXXXX **Tract:** XXXXXXXXX **Site Name/#:** Scioto Cty #6,7

GPS: Latitude: N 38° 48' 58.8" Longitude: W 82° 51' 17.4" **Waypoint Name:**

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	A	Mono / Old Nylon / New Nylon	20	20	20:30	0200
	B	Mono / Old Nylon / New Nylon	20	20	20:30	0200
		Mono / Old Nylon / New Nylon				

Site Description/Comments: American toad Bufo americanus, white tail deer (short) Whipoorwill

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Net #	Location in net
	M. Septentrionalis	21:15	AD	M	↑	6.5	38.4	E	6A	middle left: into Tunnel
	Escape	21:20								Middle center into tunnel

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 17 June 2003 **Biologist:** Schwierjohann Hootman
State: OH **County:** Scioto **Forest:** XXXXXXXX **Tract:** XXXXXXX
GPS: Latitude: N 38° 48' 58.8" Longitude: W 82° 51' 17.9"
Site Name/#: Scioto Cty 67 **Waypoint Name:** _____
Comments: Rain * I hour Prior To netting. Clears out To Partly cloudy. Less Humid Than last night. High in mid 70's

Moon Phase (Quarter)

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2030	72	1-3	W-E	100	
2100	67	1-3	W to E	100	
2130	66	1-3	W to E	100	Fog set in
2200	65	1-3	W to E	70	
2230	64	1-3	W to E	50	
2300	64	1-3	W to E	30	
2330	64	1-3	"	10	
0000	63	1-3	"	75	
0030	64	1-3	"	100	
0100	64	1-3	"	100	
0130	64	1-3	"	100	
0200	62	1-3	"	100	

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 16 June 2003 **Biologists:** Schwierjohann ; Hostman **Camera #** 4

State: OH **County:** Scioto **Forest:** / **Tract:** / **Site Name/#:** #67

GPS: Latitude: N 38.48.590" Longitude: W 82.51.179" **Waypoint Name:** /

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	6a	Mono / Old Nylon / New Nylon	18	20	2045	0200
	6b	Mono / Old Nylon / New Nylon	18	20	2045	0200
		Mono / Old Nylon / New Nylon				

Site Description/Comments: Wood Thrush, Towee, * Whip-or-will*, Phoebe

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	~~Picture #~~ NCI Feces #	~~Picture # & Description~~
1	M. Septentrionalis	2130	Ad	M	↑	6.0	34.9	E	6A	Middle Right into Tunnel
2	M. Septentrionalis	2131	Ad	M	↑	6.0	35.4	E	6b	Middle Right away
3	E. fuscus	22:05	Ad	F	L	24.0	48.5	F	6b	mid/lower Center Away
4	Lasionycteris noctivagans	23:20	Ad	M	↑	11.5	41.2	F	6A	mid/upper OUT of Tunnel
5	M. Septentrionalis	00:45	Ad	M	↑	7.5	34.6	E	6b	Middle Towards

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 16 June 2003 **Biologist:** Schwendeman, Hootman
State: OH **County:** Scioto **Forest:** — **Tract:** —
GPS: Latitude: N 38 · 48 · 59.0 " Longitude: W 82 · 51 · 17.9 "
Site Name/#: 67 **Waypoint Name:** —

Comments: Overcast; mod. humid; rain for abt 1 hour before we opened nets

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2100	70	0	—	100%	overcast
2200	68	2	E-W	100%	"
2300	67	0	—	100%	"
0000	66	0	—	100%	"
0100	65	0	—	100%	"
0200	66	0	—	100%	"

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NET SITE HABITAT DESCRIPTION

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill

Date: 17 June 03 2003 **Biologist:** Schwierjohann Hoetman

State: OH **County:** Scioto **Forest:** XXXXXXXX **Tract:** XXXXXXXXXX

GPS: Latitude: N 38° 48' 58.18" Longitude: W 82° 51' 17.4"

Site Name/#: 67 **Waypoint Name:** _____

Quad.: _____ **Range:** ____ **Township:** ____ **Sec.:** ____ **¼ Sec.:** ____

Distance to water: 50 ft over water, a road that has been recently dredged

ESTIMATE OF STREAM CHARACTERISTICS

Bank Height: 6-10' Channel Width: 15' Stream Width: 12-13'

Substratum: Sand (Gravel) Cobble Bedrock (Silt/mud) other _____

Average Water Depth: 1-2" Clarity: (High) Moderate Low

VEGETATION

Estimated Canopy Closure: Closed Moderate (Open)

Dominant Overstory Species (>38cm/15"): Estimated DBH range: Lg: 15" dbh Sm ____ dbh

1. Platanus occidentalis sycamore
2. Liriodendron tulipifera tulip poplar
3. Acer saccharum s. maple

Roost Tree Potential consists of: (Large Trees) Snags Both

Roost Tree Potential for the Area is: High Moderate (Low)

Subdominant Overstory Species (<38cm/15"):

1. Fagus grandifolia Beech 2. Ulmus americana A. Elm 3. Robinia pseudoacacia Black locust

Relative Abundance of Dominant vs. Subdominant: 1:2 Amelanchier serviceberry spp.

Description of Overstory Habitat Form:

patchy open areas + closed areas

Subcanopy Clutter: (Closed) Moderate Open

Is Subcanopy Vegetation Lay Comprised Largely of: Lower Branches of Canopy Trees?

(Saplings) Shrubs

Dominant Understory Species: 1. Fagus grandifolia
2. Acer saccharum
3.

Description of Habitat Form:

Open uneven aged stand, highly disturbed, damage due to ice storm

Herbaceous Cover: None

Rubus spp.
Vitis spp.

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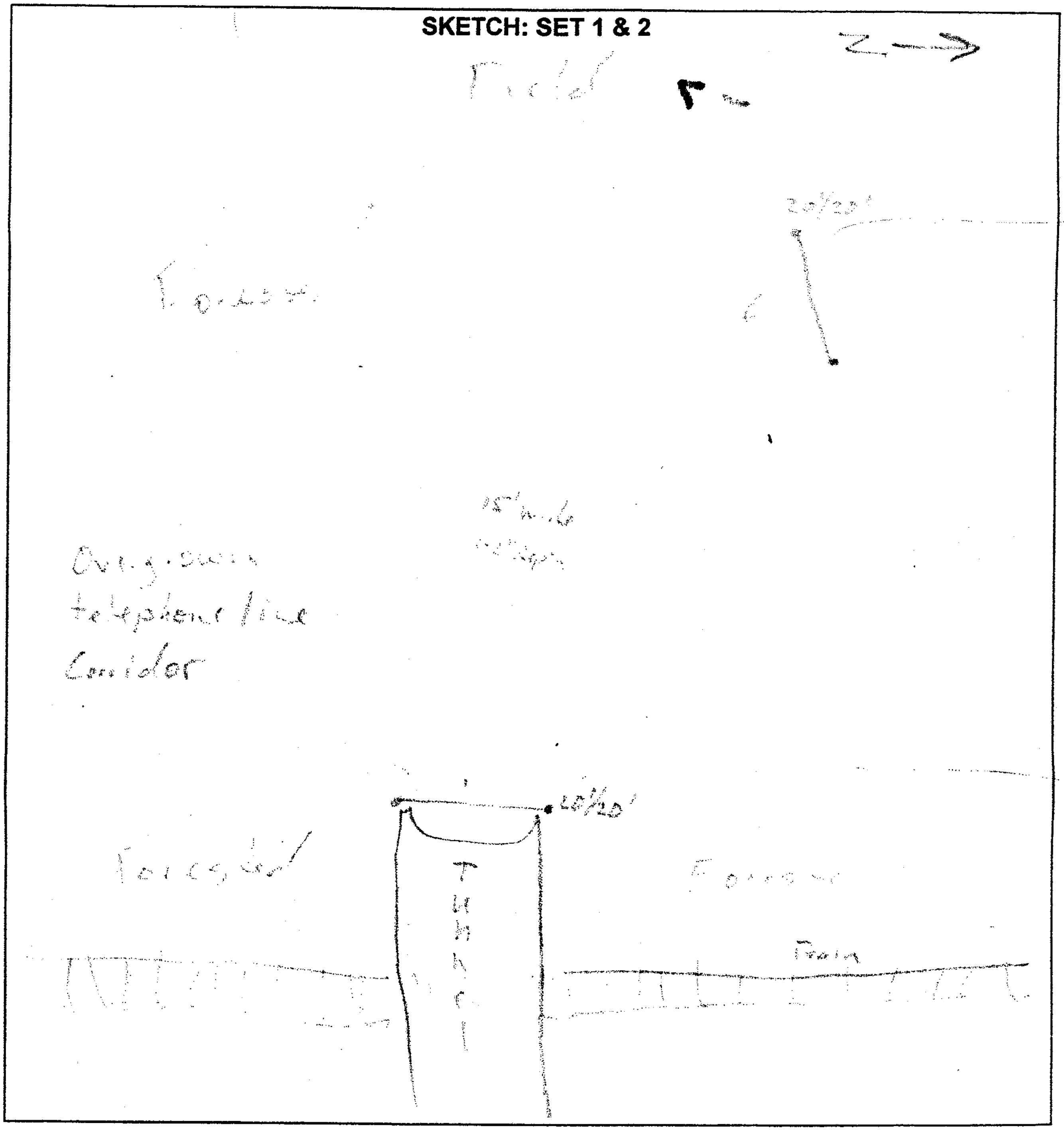
NET SITE HABITAT DESCRIPTION (Continued)

State: OH **County:** Scioto **Project Name and #:** ODOT CH2Mhill/ Pesi 096

Site Name/#: #7 **Waypoint Name:** ______

SKETCH: SET 1 & 2



COMMENTS

State 335 Runs parallel to train tracks just to the east, + just east of that is the Little Scioto River

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 24 JUNE 2003 **Biologists:** SCHWIERJOHANN, HOOTMAN **Camera #** 4

State: OH **County:** Scioto **Forest:** XXXXXXXXXX **Tract:** XXXXXXXXX **Site Name/#:** 7 (FARM) 8

GPS: Latitude: N 38° 47' 13.7" Longitude: W 82° 50' 40.7" **Waypoint Name:**

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	A	Mono / Old Nylon / New Nylon	18	20	2030	0200
	B	Mono / Old Nylon / New Nylon	18	20	2030	0200
		Mono / Old Nylon / New Nylon				

Site Description/Comments: Barred owl, Green Frog, pileated woodpecker, Red tail Hawk, American toad

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Net #	Location in net
	Hoary (L. cinereus)	0033	Ad	F	L	26	56.3	E	A	* Bottom center
	24 JUNE 03									
	L. cinereus	2333	AD	F	L	19.6	41.5	F	B	Top center

* coming out of wood lot

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 24 June 2003 **Biologist:** Schwierjohann, Hoetman
State: OH **County:** Scioto **Forest:** XXXXXXXX **Tract:** XXXXXXX
GPS: Latitude: N 38° 47' 13.7" Longitude: W 82° 50' 40.7"
Site Name/#: F (Farm) 8 **Waypoint Name:** _____
Comments: Humid Day near 90°

Moon Phase/Quarter:

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2030	82	1-3	W-E	0	Humid Hazy
2100	76	—	—	0	"
2200	75	—	—	0	"
2300	72	1-3	W-E	0	"
0000	70	1-3	W-E	0	"
0100	67	1-3	W-E	0	Heavy Forest
0200	65	—	—	0	
					"

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 25 JUNE 2003 **Biologists:** Schwierjohann; Hoffman **Camera #** 4

State: OH **County:** Scioto **Forest:** XXXXXXXXXX **Tract:** XXXXXXXXX **Site Name/#:** 28

GPS: Latitude: N 38° 47' 13.7" Longitude: W 82° 50' 40.7" **Waypoint Name:**

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	A	Mono / Old Nylon / New Nylon	18	20	2030	0200
	B	Mono / Old Nylon / New Nylon	18	20	2030	0200
		Mono / Old Nylon / New Nylon				

Site Description/Comments:

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Net #	Location in net
	E. Fuscus	2333	AD	F	L	9.6	46.5	F	B	Top Center

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 25 June 2003 **Biologist:** Schueler, Shaw, Hartman
State: OH **County:** Scioto **Forest:** XXXXXXXX **Tract:** XXXXXXX
GPS: Latitude: N 38 · 47 · 13.7" Longitude: W 82 · 50 · 40.7"
Site Name/#: #98 **Waypoint Name:**

Comments:

Moon Phase / Quarter:

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2100	76	1-3	W-E	0	Humid & Hazy
2200	73	1-3	W-E	↓	↓
2300	72	1-3	W-E		
0000	71	1-3	W-E		
0100	68	—			
0200	67	—			

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NET SITE HABITAT DESCRIPTION

Project No.: Pesi 096 **Project Name:** ODOT CR 3 Hill
Date: 25 June 2003 **Biologist:** Schwierjohann Hootman

State: OH **County:** Scioto **Forest:** XXXXXXXX **Tract:** XXXXXXXXXX
GPS: Latitude: N 38°47'20.5" Longitude: W 82°50'29.2"
Site Name/#: #7 8 **Waypoint Name:** _____

Quad.: _____ **Range:** ____ **Township:** ____ **Sec.:** ____ **¼ Sec.:** _____

Distance to water:

ESTIMATED STREAM/HABITAT CHARACTERISTICS

Bank Height: 15' - 3' Channel Width: 20' Stream Width: 15'

Substratum: Sand Gravel Cobble (Bedrock) (Silt/mud) other _____

Average Water Depth: 3" Clarity: High Moderate (Low)

VEGETATION

Estimated Canopy Closure: Closed (Moderate) Open
Dominant Overstory Species (>38cm/15"): Estimated DBH range: Lg: 20 dbh Sm 15" dbh

1. Fagus grandifolia Beech
2. Platanus occidentalis - sycamore
3. Q Rubra Red Oak

Roost Tree Potential consists of: Large Trees Snags (Both)

Roost Tree Potential for the Area is: High (Moderate) (Low)

Subdominant Overstory Species (<38cm/15"):
1. Fagus grandifolia 2. Carya tomentosa 3. Acer saccharinum

Relative Abundance of Dominant vs. Subdominant: 1:3

Description of Overstory Habitat Form:
Broken overstory

Subcanopy Clutter: Closed (Moderate) Open

Is Subcanopy Vegetation Lay Comprised Largely of: Lower Branches of Canopy Trees?

(Saplings) (Shrubs)

Dominant Understory Species:
1. Acer saccharum s. maple
2. F. grandifolia Beech
3. Carpinus caroliniana

Description of Habitat Form: Open understory w patches of thick m. Rose where canopy is open

Herbaceous Cover: Virginia creeper ground cover w/ New York fern, mayapple, [illegible] Rose

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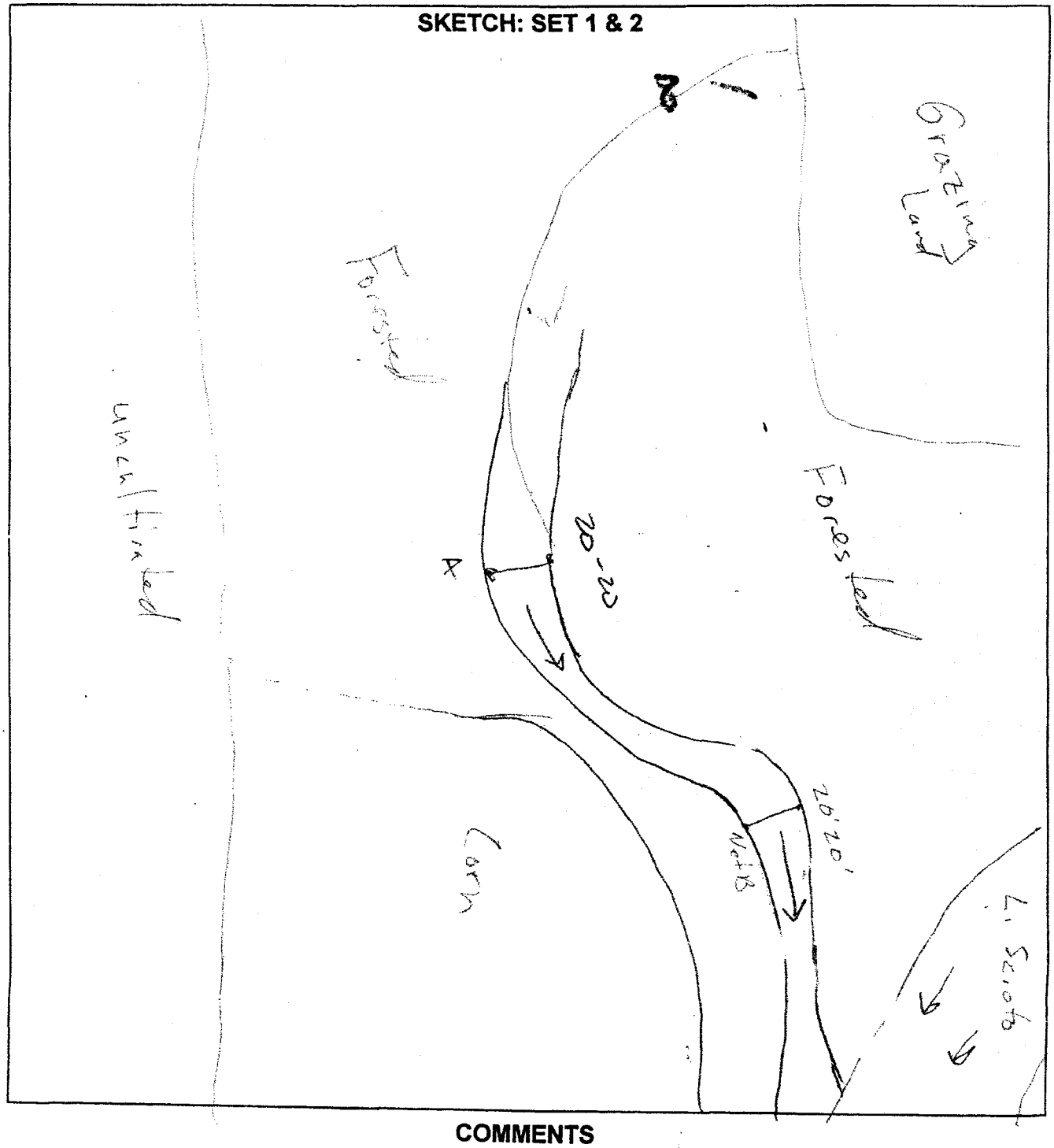
NET SITE HABITAT DESCRIPTION (Continued)

State: OH County: Scioto Project Name and #: ODOT CH2Mhill/ Pesi 096

Site Name/#: #78 Waypoint Name: _____

SKETCH: SET 1 & 2



COMMENTS

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 16 JUNE 2003 **Biologists:** MGilley & JDuffy **Camera #** 1

State: OH **County:** Scioto **Forest:** — **Tract:** — **Site Name/#:** ODOT #~~10~~ 9

GPS: Latitude: N 38 · 45 · 53.0 " Longitude: W 82 · 50 · 19.8 " **Waypoint Name:** 008

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	1	Mono / Old Nylon / ~~New Nylon~~	30	20	20:30	0200
	2	Mono / Old Nylon / ~~New Nylon~~	18	20	20:50	0210
		Mono / Old Nylon / New Nylon				

Site Description/Comments:

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Feces #	Picture # & Description
1	E. fuscus	2140	Ad	F	L	18.5	47.70	E	—	— Net # 1
2	M. septentrionalis	2320	Ad	M	↑	6.0	33.85	M	—	— Net # 1
3	P. subflavus	00135	Ad	M	↑	5.75	33.00	M	—	— Net #1

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 16 June 2003 **Biologist:** MGillen & JDuffey
State: OH **County:** Scioto **Forest:** — **Tract:** —
GPS: Latitude: N 38° 45' 53.0" Longitude: W 82° 50' 19.0"
Site Name/#: ODOT #~~10~~ 9 **Waypoint Name:** 068

Comments:

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2100	70°	3-5 mph	N to S	100%	"
2200	70°	0 mph	—	100%	—
2300	70°	1-3 mph	N to S	100%	—
2400	70°	0	—	100%	—
0100	68°	0	—	100%	—
0200	68°	0	—	100%	—

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 17 JUNE 2003 **Biologists:** MG & JD **Camera #** 1

State: OH **County:** Scioto **Forest:** — **Tract:** — **Site Name/#:** ODOT #~~10~~ 9

GPS: Latitude: N 38° 45' 53.0" Longitude: W 82° 50' 19.0" **Waypoint Name:** 068

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	1	Mono / Old Nylon / New Nylon	30'	20'	2030	0200
	2	Mono / Old Nylon / New Nylon	18'	20'	2045	0215
		Mono / Old Nylon / New Nylon				

Site Description/Comments: Pictures: Net #1 - 100.711
Net #2 - 100.710

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Feces #	Picture # & Description
1	M. lucifugus	0200	Ad	F	L	8.5	36.85	F	—	— Net #1

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 17 JUNE 2003 **Biologist:** M Gilley & J. Duffey
State: OH **County:** Scioto **Forest:** _____ **Tract:** _____
GPS: Latitude: N 38° 45' 53.0" Longitude: W 82° 50' 19.0"
Site Name/#: ODOT #09 **Waypoint Name:** 008

Comments: Stream up ~ 1½ - 2ft. Strong current.

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2100	68°	0	—	90%	—
2200	68°	0	—	25%	—
2300	66°	0	—	25%	—
2400	66°	0	—	25%	—
0100	66°	0	—	100%	—
0200	66°	0	—	100%	—

Camera #1 [Net 1 - 100-711
Net 2 - 100-710

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NET SITE HABITAT DESCRIPTION

Camera #1
Net 1 - 100-711
Net 2 - 100-710

Project No.: Pesi 096 **Project Name:** ODOT CH2M Hill
Date: 17 JUNE 2003 **Biologist:** MG & JD
State: OH **County:** Scioto **Forest:** — **Tract:** —
GPS: Latitude: N 38° 45' 53.0" **Longitude:** W 82° 50' 19.0"
Site Name/#: ODOT #09 **Waypoint Name:** 068
Quad.: _____ **Range:** ____ **Township:** ____ **Sec.:** ____ **¼ Sec.:** ____
Distance to water: over H2O

Bank Height: 15ft Channel Width: 30ft Stream Width: 20ft
Substratum: ☐ Sand ☐ Gravel ☒ Cobble ☐ Bedrock ☐ Silt/mud other _____
Average Water Depth: 12in Clarity: ☒ High ☐ Moderate ☐ Low

Estimated Canopy Closure: ☐ Closed ☒ Moderate ☐ Open
Dominant Overstory Species (>38cm/15"): Estimated DBH range: Lg: 70 dbh Sm 38 dbh
1. P. occidentalis
2. L. tulipifera
3. Q. alba

Roost Tree Potential consists of: ☐ Large Trees ☐ Snags ☐ Both
Roost Tree Potential for the Area is: ☐ High ☐ Moderate ☐ Low

Subdominant Overstory Species (<38cm/15"):
1. Aesculus glabra 2. Acer saccharinum 3. Betula nigra
Relative Abundance of Dominant vs. Subdominant: 15% D: 85% S
Description of Overstory Habitat Form:
Few large hardwoods, Mostly young trees with dense vegetation underneath

Subcanopy Clutter: ☒ Closed ☐ Moderate ☐ Open
on banks
Is Subcanopy Vegetation Lay Comprised Largely of: ☐ Lower Branches of Canopy Trees?
☒ Saplings ☐ Shrubs

Dominant Understory Species: 1. Carpinus caroliniana
2. Aesculus glabra
3. Unknown —

Description of Habitat Form: Stream flowing
Early successional woods with alot of undergrowth.

Herbaceous Cover: Jewel weed, , multiflora rose

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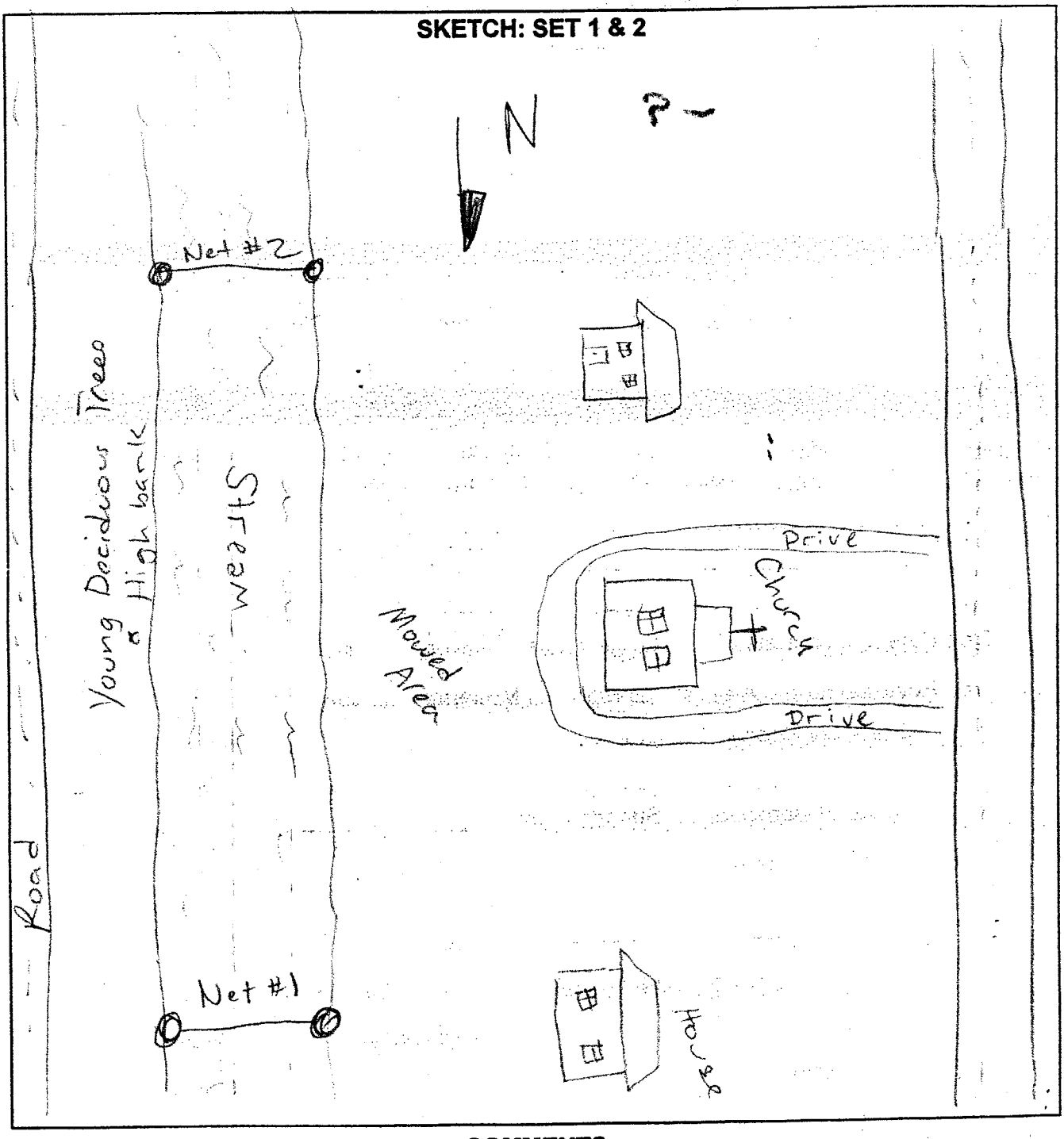
NET SITE HABITAT DESCRIPTION (Continued)

State: OH **County:** Scioto **Project Name and #:** ODOT CH2Mhill/ Pesi 096

Site Name/#: ODOT #9 **Waypoint Name:** 068

SKETCH: SET 1 & 2



COMMENTS

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 22 June 2003 **Biologists:** Schwierjohann; Hoffman **Camera #** 4

State: OH **County:** Scioto **Forest:** XXXXXXXXXX **Tract:** XXXXXXXXX **Site Name/#:** ~~9~~ 10

GPS: Latitude: N 38° 43' 49.3" Longitude: W 82° 57' 30.9" **Waypoint Name:**

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	A	Mono / Old Nylon / New Nylon	18	20	2030	0120
	B	Mono / Old Nylon / New Nylon	18	20	2030	0220
		Mono / Old Nylon / New Nylon				

Site Description/Comments: Observed B. le Browns (E. Fuscus) Foraging near Houses @ 2115

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Net #	Location in net

NO BATS

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 22 June 2003 **Biologist:** Schwierjohann
State: OH **County:** Scioto **Forest:** XXXXXXXX **Tract:** XXXXXXX
GPS: Latitude: N 38°43'49.3" Longitude: W 82°51'30.9"
Site Name/#: 9 10 **Waypoint Name:**
Comments: Observed Big Brown foraging near Hayes @ 2115

Moon Phase (Quarter):

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2100	74	–	–	10%	
2200	70	–	–	10%	
2300	68	–	–	0	
0000	65	–	–	0	
0100	62	–	–	0	
0200	60	–	–	0	

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BAT CAPTURE DATA

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill Page 1 of 1

Date: 23 June 2003 **Biologists:** Schwierjohann, Hoffman **Camera #** 4

State: OH **County:** Scioto **Forest:** XXXXXXXXXXX **Tract:** XXXXXXXXX **Site Name/#:** 910

GPS: Latitude: N ___ ___ ° ___ ___ ' ___ ___ ___ " Longitude: W ___ ___ ° ___ ___ ' ___ ___ ___ " **Waypoint Name:** _____

Trap #	Net #	Net type	Length	Height	Time Up	Time Down
	a	Mono / Old Nylon / New Nylon	18	20	2030	0200
	b	Mono / Old Nylon / New Nylon	9	10	2030	0200
		Mono / Old Nylon / New Nylon				

Site Description/Comments: _____

Capt #	Species	Time (2400)	Age Ad or Jv	Sex M or F	Reprod F=(NR/PG/L /PL; M=↑/↓	Wt (g)	RFA (mm)	Belly: F, M, E	Net #	Location in net
	L. Borealis	2250	AO		ESCAPED				A	Lower center

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WEATHER DATA SHEET

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill
Date: 23 June 2003 **Biologist:** Sabrina Taylor, Heather

State: OH **County:** Scioto **Forest:** XXXXXXXX **Tract:** XXXXXXX

GPS: Latitude: N ___ ° ___ ' ___ " Longitude: W ___ ° ___ ' ___ "

Site Name/#: 910 **Waypoint Name:** ___

Comments: ___

Moon Phase (Quarter): ___

Time (2400 h)	Temp (°C/F)	Wind Speed (estimated – see chart)	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	Comments
2100	76	—	—	0	
2200	72	—	—	0	
2300	68	—	—	0	
0000	67	—	—	0	
0100	67	—	—	0	
0200	67	—	—	0	

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NET SITE HABITAT DESCRIPTION

Project No.: Pesi 096 **Project Name:** ODOT CH2MHill

Date: 22 June 2003 **Biologist:** Schwab, Hoot Man

State: OH **County:** Scioto **Forest:** XXXXXXXX **Tract:** XXXXXXXXX

GPS: Latitude: N 38° 43' 49.3" Longitude: W 82° 51' 30.9"

Site Name/#: 9720 **Waypoint Name:** CAMERA #4

Quad.: _____ **Range:** _____ **Township:** _____ **Sec.:** _____ **¼ Sec.:** _____

Distance to water: 0 Picture #'s: A) 100-0714 B) 100-0718 / 100-0715

ESTIMATED STREAM CHARACTERISTICS

Bank Height: 1'-5' Channel Width: 10'-20' Stream Width: 1'-20'

Substratum: Sand (Gravel) Cobble Bedrock (Silt/mud) other _____

Average Water Depth: 1'-3' Clarity: High (Moderate) Low

VEGETATION

Estimated Canopy Closure: Closed Moderate (Open)

Dominant Overstory Species (>38cm/15"): Estimated DBH range: Lg: 30 cm dbh Sm 5 cm dbh

1. Sycamore (Platinus occidentalis)
2. Box Elder (Acer Negundo)
3. Black Walnut (Juglans nigra)

Roost Tree Potential consists of: (Large Trees) Snags Both

Roost Tree Potential for the Area is: High Moderate (Low)

Subdominant Overstory Species (<38cm/15"):

1. Box Elder 2. Elm (Ulmus Americana) 3. _____

Relative Abundance of Dominant vs. Subdominant: 1:1

Description of Overstory Habitat Form:

Narrow band of woods along stream edge. Canopy open, patchy

Subcanopy Clutter: (Closed) Moderate Open

Is Subcanopy Vegetation Lay Comprised Largely of: (Lower Branches of Canopy Trees?) (Saplings) Shrubs

Dominant Understory Species: 1.
2. Same as above
3.

Description of Habitat Form:

very cluttered, Poor corridor

Herbaceous Cover:

Poison Ivy, Solomons SP, Jewelweed, Grass IV4, Viola SPP,

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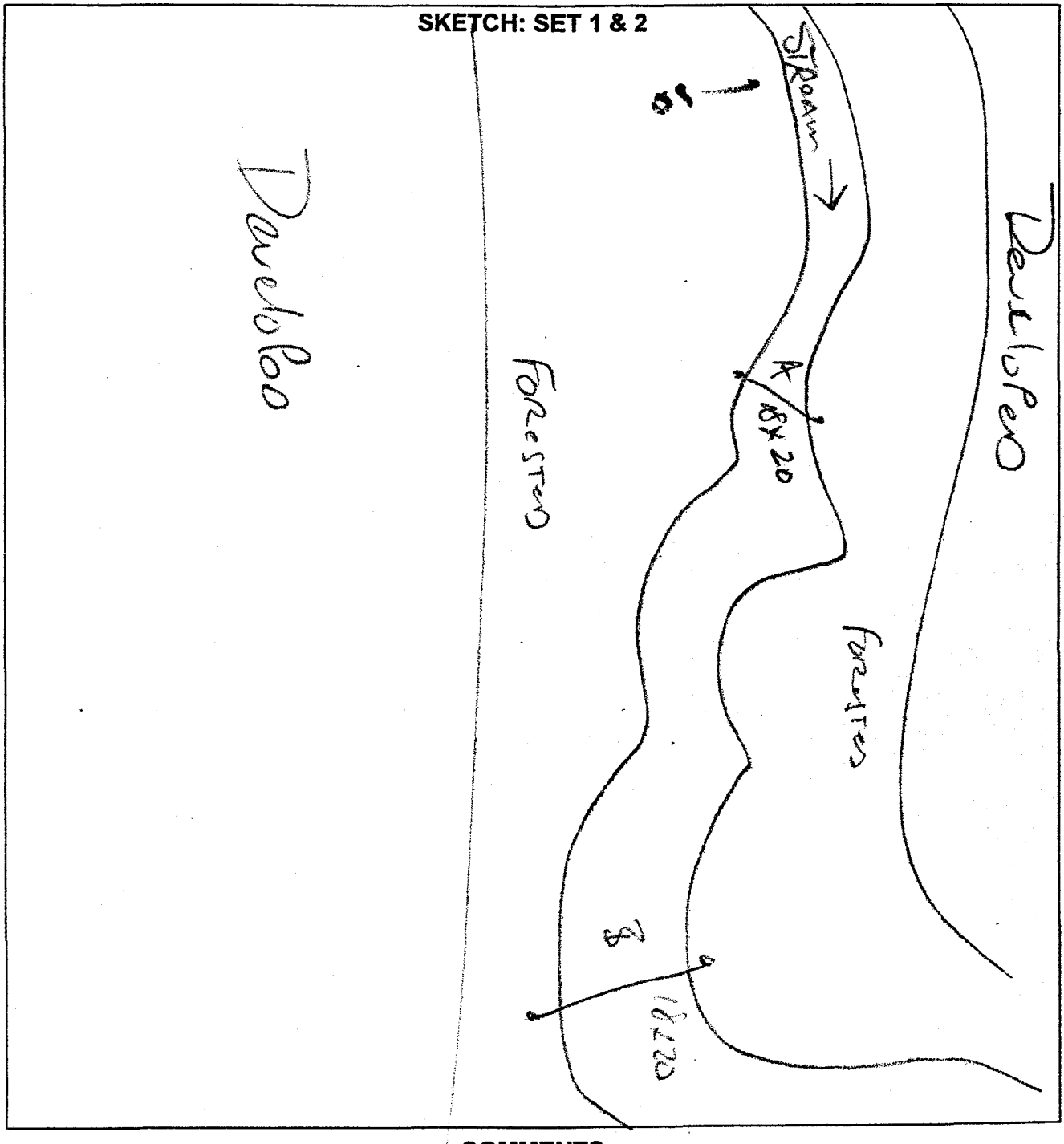
NET SITE HABITAT DESCRIPTION (Continued)

State: OH County: Scioto Project Name and #: ODOT CH2Mhill/ Pesi 096

Site Name/#: 9 10 Waypoint Name: _____

SKETCH: SET 1 & 2



COMMENTS

Net Sites 1b1 and 1b2

Net Sites 2a and 2b

Net Sites 3a and 3b

Net Sites 4a and 4b

Net Sites 5a and 5b

Net Sites 7a and 7b

Net Sites 8a and 8b

Net Sites 9a and 9b

Net Sites 10a and 10b