PHASE 2 BOG TURTLE SURVEY REPORT

Eisenhower Drive Extension Project
Adams and York Counties, Pennsylvania

JMT Project #: 02-0308-012

Submitted to:
PennDOT District 8-0

July 28, 2018

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I. INTRODUCTION

On behalf of the Pennsylvania Department of Transportation (PennDOT) Engineering District 8-0, Johnson, Mirmiran, and Thompson (JMT) conducted a Phase 2 Bog Turtle Survey for the proposed Eisenhower Drive Extension Project in Adams and York Counties, Pennsylvania. The purpose of the Phase 2 Survey was to determine the presence or probable absence of bog turtles (*Glyptemys muhlenbergii*) within wetlands containing potential habitat on or in the vicinity of the proposed project area. A total of approximately 2.06 acres of Designated Survey Areas (DSAs) within two wetlands (WET-2 and WET-8) containing potential bog turtle habitat were included in the survey. Wetlands were initially delineated and assessed for potential bog turtle habitat by JMT's PA Qualified Bog Turtle Surveyor during Phase 1 Bog Turtle Habitat Survey work completed in November and December of 2016 and November of 2017. In a response letter to JMT dated April 20, 2018 (see **Appendix C**), the USFWS concurred with the Phase 1 Survey findings of potential bog turtle habitat and JMT's proposed approach for conducting Phase 2 Surveys, given the potential for direct and/or indirect effects to WET-2 and WET-8.

JMT conducted the Phase 2 Bog Turtle Surveys for the proposed transportation project during May and June of 2018. Survey protocols followed the methodologies outlined in the U.S. Fish and Wildlife Service's (USFWS) *Guidelines for Bog Turtle Surveys* (revised April, 2006).

II. SITE DESCRIPTION

The overall study area for the proposed project is located within Penn Township and Hanover Borough in York County, and McSherrystown Borough and Conewago, Mount Pleasant, and Union Townships in Adams County. The study area occurs within the McSherrystown and Hanover, PA 7.5 Minute USGS Quadrangles (**Figure 1** in **Appendix A**) and is generally bordered by S.R. 116 to the south, Bender and Chapel Roads to the west, and Carlisle Street to the east. The study area occurs within primarily rural portions of Adams County, with dominant surrounding land uses represented by agricultural fields and riparian woodlands. Concentrated areas of development occur in the southern and eastern portions of the study area, and include high-density residential, commercial, and industrial properties. The topography in the study area is generally flat with gentle slopes adjacent to the stream valleys.

The study area lies within the Plum Creek-South Branch Conewago Creek and Headwaters South Branch Conewago Creek HUC-12 subwatersheds, both of which are subbasins of the Susquehanna River drainage basin. Plum Creek (WUS-2) is a perennial stream that flows from south to north within the western portion of the study area, and is designated as a Warm Water Fishery (WWF) and a Migratory Fishery (MF) in Chapter 93 of the *Water Quality Standards*. All unnamed tributaries to Plum Creek within the study area are also considered WWFs and MFs. Direct tributaries to the South Branch Conewago Creek were identified in the southwestern portion of the study area. An unnamed tributary to Slagles Run (WUS-8) is a perennial stream that flows in a northerly direction, forming another primary stream corridor within the eastern portion of the study area. All of these watercourses and their tributaries in the study area are designated as WWFs and MFs in Chapter 93 of the *Water Quality Standards*.

According to the Pennsylvania Fish and Boat Commission (PFBC), no stocked trout streams occur in the vicinity of the study area, and no streams are listed as Approved Trout Waters, Class A wild trout streams, or as streams supporting natural trout reproduction. In addition, no natural trout reproducing streams occur downstream of this portion of the project area.

Wetland delineation and habitat assessment fieldwork for the Eisenhower Drive Extension Project was completed in two periods. The first survey area was investigated in 2016 and consisted of the approximately one-mile long segment of Plum Creek located to the south of Chapel Road and north and east of Centennial Road, with a corridor spanning approximately 1,500 feet across along this length. Additional fieldwork was completed in 2017 within several alternative roadway alignment corridors in the study area. These alternate corridors were approximately 125 feet wide, with wetland surveys extending at least 300 feet from each side of the corridor in order to complete a Phase 1 Bog Turtle Habitat Survey. Fourteen watercourses and 17 palustrine wetlands were identified in the study area during JMT's field investigations. Please see **Figure 2** through **Figure 7** in **Appendix A** for depictions of the study area and locations of wetlands and watercourses.

III. WETLAND DESCRIPTIONS

JMT initially conducted wetland delineation and Phase 1 Bog Turtle Habitat Survey fieldwork for the proposed project in November and December of 2016 and November of 2017. Seventeen palustrine wetlands were identified during the investigation, two of which were determined to consist of potential bog turtle habitat (WET-2 and WET-8). For reference, please see **Appendix D** for the USFWS/PFBC Bog Turtle Habitat Evaluation Field Forms and mapping associated with the delineation and habitat assessment.

The following provides detailed descriptions of the wetland habitats as they were observed by JMT during field visits in 2016 and 2017, and explanations of which habitats were included in the Phase 2 Surveys. Summary habitat information from JMT for these wetlands can be found in **Table 1**. Please see **Figure 8** and **Figure 9** in **Appendix A** for the locations of the wetland Designated Survey Areas (DSAs) for Phase 2 Bog Turtle Surveys. Photographs of the site are included in **Appendix B**.

Wetland 1 (WET-1)

Wetland 1 (WET-1) is an approximately 3.84-acre PFO/PEM wetland located in the southwestern portion of the study area. This wetland occurs to the west of Plum Creek and is bordered by agricultural fields and riparian forests. The narrow PEM portion (0.34 acre) of WET-1 is situated within a vegetated segment of an intermittent stream (WUS-1), which flows north into the larger PFO (3.51 acres) wetland area. No persistent groundwater springs or seeps were observed in WET-1, as surface waters were restricted to flows within the intermittent stream channel at 1 to 5 inches in depth. Mucky soils were limited to a small portion of the PEM wetland area that had silted in within the main channel, and could be probed from 3 to 6 inches in depth. The remainder of the PEM area and the entire forested portion of the wetland featured hard-bottomed soils.

Vegetation in the PEM portion of WET-1 was dominated by reed canarygrass and also included sparse cattails and sedges, while the forested wetland area was dominated by green ash, red maple, ash-leaf maple,

oaks, multiflora rose, skunk cabbage (florets observed at the surface), garlic mustard, and Japanese honeysuckle. Subsurface structural characteristics (e.g., tunnels, root mats) were not observed within the wetland. In addition, both potential nesting and overwintering habitat were highly limited. Due largely to the lack of persistent groundwater sources and limited mucky soil substrates, it was determined that WET-1 does not contain potential bog turtle habitat.

Wetland 2 (WET-2)

Wetland 2 (WET-2) is an approximately 5.06-acre PFO/PEM wetland located in the southwestern portion of the study area. WET-2 is primarily bordered by fallow fields to the west and developed lands to the east and south. This wetland is situated to the east of Plum Creek, and consists of a man-made/altered drainage channel running along the southwestern portion of WET-2, as well as groundwater-fed areas. The main drainage channel emanates from a culvert conveying water from the Hanover Wastewater Treatment Facility to the south of the wetland. Groundwater spring seeps were observed within and immediately adjacent to the PEM portion (0.44 acre) of the wetland, which converges with the drainage channel in the center of the wetland and continues to flow northwest towards Plum Creek. Surface water was observed at a depth of 1 to 3 inches in small depressions and rivulets, and 2 to 6 inches in the main drainage channel. Approximately 35 percent of the PEM and 10 percent of the larger PFO wetland areas featured mucky soils at depths of 3 to 12 inches and 3 to 8 inches, respectively. The majority of WET-2 featured hard-bottomed soil substrates. Outside of the concentrated groundwater-fed/drainage areas, a large portion of WET-2 featured drier forest with scattered, hard-bottomed depressions that seasonally collect surface water (i.e., vernal pools).

Vegetation within WET-2 was dominated by reed canarygrass, silky dogwood, multiflora rose, green ash, ash-leaf maple, goldenrod, and bush honeysuckle. Additional vegetation observed included broad-leaf cattail, shallow sedge, New York ironweed, rice cutgrass, and red maple. Subsurface structural characteristics (e.g., tunnels, root mats) were concentrated within the PEM portion of the wetland and adjacent forested areas with groundwater hydrology components. For these reasons, WET-2 was determined to contain marginal potential bog turtle habitat. A Phase 2 Bog Turtle Survey was recommended for WET-2. Based on the field investigation, JMT recommended inclusion of approximately 1.91 acres of WET-2 in the DSA (**Figure 8** in **Appendix A**).

Wetland 3 (WET-3)

Wetland 3 (WET-3) is an approximately 0.05-acre PEM wetland located in the northwestern portion of the study area. This wetland is bordered primarily by riparian forests, agricultural fields, mowed fields, and developed lands. WET-3 is a low-lying fringe wetland associated with an unnamed tributary to Plum Creek (WUS-3). No persistent groundwater springs or seeps were observed. Surface water was restricted to the vegetated portion of the wetland within the intermittent stream channel at a depth of 1 to 4 inches. Mucky soils were limited to a small portion (5 percent) of the wetland, consisting of shallow mineral soil (3 to 5 inches) atop rocky substrate in the vicinity of the stream channel. The remainder of the wetland upslope from the tributary featured hard-bottomed soils. Vegetation within WET-3 was dominated by reed canarygrass and arrow-leaf tearthumb. Subsurface structural characteristics (e.g., tunnels, root mats) were

highly limited within this small wetland. Due largely to the lack of persistent groundwater sources and limited mucky soil substrates, it was determined that WET-3 does not contain potential bog turtle habitat.

Wetland 4 (WET-4)

Wetland 4 (WET-4) is an approximately 6.44-acre PEM wetland located in the western portion of the study area to the east of Plum Creek. This wetland is bordered by agricultural fields to the north and east, the Plum Creek corridor to the west, and woodlands to the south. The southern portion of WET-4 is contiguous with a forested wetland (WET-6). A hard-bottomed, excavated drainage ditch runs along the western side of WET-4, which has impacted the hydrology within the wetland. No persistent groundwater springs or seeps were observed. The wetland contains shallow drainage patterns that flow north towards an outlet into an intermittent tributary to Plum Creek (WUS-3). Surface water was observed at a depth of 2 to 8 inches within the excavated channel and 1 to 3 inches in small depressions and drainages. No mucky soils were observed; thus, the entire wetland was determined to be hard-bottomed. A fine clay layer was identified within the soil profile beginning at approximately 12 inches, which may contribute to wetland conditions by perching surface waters. Vegetation within WET-4 was dominated by reed canarygrass, and also included goldenrod, giant ragweed, and very sparse sedges and rushes. Subsurface structural characteristics (e.g., tunnels, root mats) were highly limited within this wetland. Although this wetland includes a large area of open-canopy emergent habitat, persistent groundwater springs and seeps and mucky soils were absent in WET-4. For these reasons, it was determined that WET-4 does not contain potential bog turtle habitat.

Wetland 5 (WET-5)

Wetland 5 (WET-5) is an approximately 0.06-acre PEM wetland located in the western portion of the study area. This small wetland lies adjacent to the western side of Plum Creek and is bordered by agricultural fields and riparian forests. One small spring seep discharges out of the base of the slope below the agricultural field to the west; however, this seep is immediately adjacent to Plum Creek, and only at a slightly higher elevation relative to the main stream channel. Surface water at a depth of 2 to 6 inches was observed in the small pool associated with the groundwater seep. Mucky soils were observed at a depth of 3 to 12 inches, and were limited to the groundwater seep area adjacent to the stream (approximately 15 percent of the wetland area). The remainder of the wetland upslope from the seep featured hard-bottomed mineral soils that could not be probed below the surface.

Vegetation within WET-5 was dominated by reed canarygrass, and also included a patch of broad-leaf cattail and halberd-leaf tearthumb within the groundwater seep area. A berm covered with giant ragweed and Japanese hops is located between the drier reed canarygrass-dominated portion of the wetland and Plum Creek. The majority of the wetland lacked subsurface structural features (e.g., tunnels, root mats), although the small groundwater seep area included mucky soil substrates. This small wetland features limited nesting habitat for bog turtles. Although WET-5 does contain one small groundwater seep with mucky soil substrates, this area is situated immediately adjacent to Plum Creek and is heavily influenced by stream flooding. For these reasons, it was determined that WET-5 does not contain potential bog turtle habitat.

Wetland 6 (WET-6)

Wetland 6 (WET-6) is an approximately 8.23-acre bottomland PFO wetland located in the western portion of the study area to the east of Plum Creek. This wetland is bordered by agricultural fields to the east, a residential development to the south, the Plum Creek riparian corridor to the west, and is contiguous with an emergent wetland (WET-4) to the north. One small groundwater spring area was observed in the southern portion of the wetland; however, the remainder of the surface water observed in WET-6 was characterized by scattered vernal pool features in depressional areas. Surface water was observed at a depth of 1 to 2 inches in small depressions and at a depth of 1 to 5 inches in larger vernal pools and drainages. Deep mucky soils were observed at a depth of 3 to 24 inches, but were only observed in the small area associated with the groundwater spring (less than 1 percent of the total wetland area). The upwelling from this spring drains northward along a low-lying channel that is entirely hard-bottomed. The remainder of this wetland featured hard-bottomed soils.

Vegetation within WET-6 was dominated by green ash, ash-leaf maple, oaks, poison ivy, multiflora rose, privet, and skunk cabbage (florets observed at soil surface). Additional species were sparsely scattered within the wetland and included sedges, jewelweed, silky dogwood, red maple, and sphagnum moss. Subsurface structural features (e.g., tunnels, rootmats) were lacking throughout the wetland. Although one small spring with mucky soils was observed, the vast majority of the wetland lacked the hydrology, soils, and vegetation suitable for bog turtles. For these reasons, it was determined that WET-6 does not contain potential bog turtle habitat.

Wetland 7 (WET-7)

Wetland 7 (WET-7) is an approximately 0.35-acre PEM wetland located in the western portion of the study area to the west of Sunday Drive. This wetland is surrounded primarily by agricultural fields, with woodlands occurring further east. WET-7 is a depressional wetland that has formed within a drainage between two agricultural fields and a portion of an unnamed tributary to South Branch Conewago Creek (WUS-7). Surface water was restricted to the main channel at a depth of 1 to 5 inches. Portions of the wetland featured stream baseflow but contained no persistent groundwater springs or seeps. Mucky soils were limited to a small portion (5 percent) of the wetland, consisting of shallow mineral soils 3 to 5 inches in depth. The remainder of the wetland upslope from the tributary featured hard-bottomed soils. Vegetation within WET-7 was dominated by reed canarygrass and false nettle. Additional vegetation observed included sparse cattails, sedges, and rushes. Subsurface structural features (e.g., tunnels, rootmats) that would provide overwintering habitat were lacking throughout the wetland. Although the vegetation criterion was met, the wetland lacked sources of perennial groundwater hydrology and mucky soil substrates were minimal. For these reasons, it was determined that WET-7 does not contain potential bog turtle habitat.

Wetland 8 (WET-8)

Wetland 8 (WET-8) is an approximately 0.15-acre PEM wetland located in the central portion of the study area. This small, spring-fed wetland lies east of Church Street and is bordered by a large, fenced pasture.

This wetland feeds into WUS-3, which continues to the west. A spring upwelling in the eastern portion of the wetland provides the primary hydrology within WET-8. Additional small groundwater springs and seeps converge with the main channel in the center of the wetland and continue west. Surface water was observed at a depth of 1 to 2 inches in small depressions and rivulets, and 2 to 6 inches in the spring upwelling. Mucky soils were observed at a depth of 3 to 20 inches (majority 6 to 8 inches) in approximately 35% of the wetland. The remainder of the wetland featured hard-bottomed soils.

Vegetation within WET-8 was dominated by reed canarygrass and also included watercress and sedges. Although marginal, nesting and overwintering habitat occur within WET-8. Based primarily on the perennial groundwater spring and observed mucky substrates, WET-8 was determined to contain marginal potential bog turtle habitat. A Phase 2 Bog Turtle Survey for WET-8 was recommended, with inclusion of the entire wetland in the DSA (**Figure 9** in **Appendix A**).

Wetland 9 (WET-9)

Wetland 9 (WET-9) is an approximately 0.02-acre PEM wetland located in the north-central portion of the study area adjacent to the riparian corridor of WUS-3. Aside from the riparian woodlands, this small wetland is bordered by agricultural fields. WET-9 lies in a depression adjacent to the large agricultural field to the south and drains into an unnamed tributary to WUS-3 (WUS-3A). Surface water at a depth of 1 to 4 inches was observed within a small seep channel. Mucky soils were observed at a depth of 3 to 8 inches (majority 3 to 5 inches), and were limited to the seep channel adjacent to the stream (approximately 15 percent of the wetland area). The remainder of the wetland featured hard-bottomed mineral soils. Vegetation within WET-9 was dominated by reed canarygrass, Japanese honeysuckle, and blackberry, and also included sparse silky dogwood. The majority of the wetland lacked subsurface structural features (e.g., tunnels, root mats), and little to no suitable nesting habitat was observed. Although WET-9 does contain a small seep, mucky substrates were minimal, and the wetland lacked structural features for overwintering and nesting. For these reasons, it was determined that WET-9 does not contain potential bog turtle habitat.

Wetland 10 (WET-10)

Wetland 10 (WET-10) is an approximately 0.05-acre PEM wetland located in the north-central portion of the study area to the east of WET-9 and adjacent to the riparian corridor of WUS-3. This small wetland is bordered by agricultural fields and the riparian woodland corridor. Surface water at a depth of 1 inch was observed within small depressions. This wetland contained hydrology perched atop a layer of clay-dominated soils. No persistent perennial groundwater springs or seeps were observed. No mucky soils were observed; thus, the entire wetland was determined to be hard-bottomed. Vegetation within WET-10 was dominated by reed canarygrass, and also included silky dogwood and blackberry. Subsurface structural characteristics (e.g., tunnels, root mats) were not observed within the wetland. In addition, both potential nesting and overwintering habitat were highly limited. For these reasons, it was determined that WET-10 does not contain potential bog turtle habitat.

Wetland 11 (WET-11)

Wetland 11 (WET-11) is an approximately 0.03-acre PEM wetland located in the eastern portion of the project area to the east of WUS-8. This wetland is bordered by recreational fields to the east and woodlands to the north, south, and west. WET-11 is a small seep wetland located at the headwaters of a narrow stream (WUS-10) that flows into the adjacent forested uplands and eventually to WUS-8. Surface water at a depth of 1 to 3 inches was observed within the seep channel. Shallow, mucky soils were limited to a small portion (5 percent) of the wetland at 3 to 5 inches in depth and were underlain by hard-bottomed rocky substrate in the vicinity of the seep/stream channel. The remainder of the wetland upslope from the channel featured hard-bottomed soils. Vegetation within the WET-11 sample plot was dominated by reed canarygrass and tussock sedge. Additional species within the wetland included thistle, mountain mint, monkey flower, and New York ironweed. Subsurface structural characteristics (e.g., tunnels, root mats) were highly limited within this wetland and mucky soil substrates were minimal. For these reasons, it was determined that WET-11 does not contain potential bog turtle habitat.

Wetland 12 (WET-12)

Wetland 12 (WET-12) is an approximately 0.18-acre PFO wetland located in the eastern portion of the project area to the east of WUS-8. This wetland is embedded within forested lands to the east of the Clarks building. No persistent perennial groundwater springs or seeps were observed. Surface water was observed at a depth of 1 to 3 inches within small depressions and drainages. No mucky soils were observed; thus, the entire wetland was determined to be hard-bottomed. Vegetation within WET-12 was dominated by Japanese stiltgrass, reed canarygrass, green ash, and black gum. No subsurface structural features (e.g., tunnels, root mats) were observed within this wetland, and overwintering and nesting habitat were lacking. For these reasons, it was determined that WET-12 does not contain potential bog turtle habitat.

Wetland 13 (WET-13)

Wetland 13 (WET-13) is an approximately 0.52-acre PEM wetland located in the eastern portion of the project area to the west of WUS-8 and north of the Clarks building. This wetland is bordered by agricultural fields to the west and south and riparian woodlands to the north and east. WET-13 appeared to be an altered pond basin with surface connection to WUS-8 from a channel flowing north. No persistent perennial groundwater springs or seeps were observed. Surface water was observed at a depth of 1 to 4 inches within the old basin. Shallow, mucky soils were limited to a small portion (1 percent) of the wetland and were only observed at a depth of 3 to 4 inches. The remainder of the wetland featured almost entirely hard-bottomed soils. Vegetation within WET-13 was dominated by reed canarygrass, broad-leaf cattail, and ash-leaf maple, and also included sparse sedges. No subsurface structural features (e.g., tunnels, root mats) were observed within this wetland. Little to no overwintering habitat and no ideal nesting habitat for bog turtles was present. For these reasons, it was determined that WET-13 does not contain potential bog turtle habitat.

Wetland 14 (WET-14)

Wetland 14 (WET-14) is an approximately 0.01-acre PEM wetland located in the eastern portion of the study area to the southwest of the Clarks building at the corner of Kindig Lane and Oxford Avenue. This wetland runs along the toe of the roadway fill slope and is bordered by agricultural fields to the north and east and residential communities to the south and west. No persistent perennial groundwater springs or seeps were observed. Surface water was observed at a depth of 1 to 2 inches from small depressions within the wetland. No mucky soils were observed; thus, the entire wetland was determined to consist of hard-bottomed soils. Vegetation within WET-14 was dominated by broad-leaf cattail and rice cutgrass. No subsurface structural features (e.g., tunnels, root mats) were observed within this wetland. Little to no overwintering habitat and no ideal nesting habitat for bog turtles was present within the wetland. For these reasons, it was determined that WET-14 does not contain potential bog turtle habitat.

Wetland 15 (WET-15)

Wetland 15 (WET-15) is an approximately 0.10-acre PEM wetland located in the eastern portion of the study area to the east of WUS-8, situated between a large agricultural field and a riparian woodland. No persistent perennial groundwater springs or seeps were observed. Surface water was observed at a depth of 1 to 2 inches from small depressions within the wetland. No mucky soils were observed; thus, the entire wetland was determined to consist of hard-bottomed soils. This wetland contained hydrology perched atop a layer of clay-dominated soils beginning at approximately 6 inches from the surface. Vegetation within WET-15 was dominated by reed canarygrass and false nettle, and fringed by ash-leaf maple, silver maple, and green ash. No subsurface structural features (e.g., tunnels, root mats) were observed within this wetland. Little to no overwintering habitat and no ideal nesting habitat for bog turtles was present within the wetland. For these reasons, it was determined that WET-15 does not contain potential bog turtle habitat.

Wetland 16 (WET-16)

Wetland 16 (WET-16) is an approximately 0.05-acre PEM wetland located in the eastern portion of the study area to the east of WUS-8, situated between a large agricultural field and a riparian woodland. No persistent perennial groundwater springs or seeps were observed. Surface water was observed at a depth of 1 to 2 inches from small depressions within the wetland. No mucky soils were observed; thus, the entire wetland was determined to consist of hard-bottomed soils. This wetland contained hydrology perched atop a layer of clay-dominated soils beginning at approximately 4 inches from the surface. Vegetation within WET-16 was dominated by reed canarygrass. No subsurface structural features (e.g., tunnels, root mats) were observed within this wetland. Little to no overwintering habitat and no ideal nesting habitat was present. For these reasons, it was determined that WET-16 does not contain potential bog turtle habitat.

Wetland 17 (WET-17)

Wetland 17 (WET-17) is an approximately 0.87-acre wetland ditch located in the eastern portion of the project area to the north of Radio Road. This wetland is bordered by agricultural fields to the east and west. No

persistent perennial groundwater-fed sources were observed. Surface water was observed at a depth of 0.5 inches in small puddles and depressions within the wetland. No mucky soils were observed; thus, the entire wetland was determined to consist of hard-bottomed soils. Evidence of flooding was observed from bent vegetation resulting from recent stormwater flows. Vegetation within WET-17 was dominated by reed canary grass and also included blue vervain and sparse trees. No subsurface structural features (e.g., tunnels, root mats) were observed within this wetland. Little to no overwintering habitat and no ideal nesting habitat for bog turtles was present within the wetland. For these reasons, it was determined that WET-17 does not contain potential bog turtle habitat.

Table 1: Summary of Bog Turtle Habitat Summary Results for the Eisenhower Drive Extension Project Study Area, Adams and York Counties, Pennsylvania

Wetland ID	Wetland Size (approximate acres)	Wetland Type and Amount (% or acres)	Extent of Mucky Soils (by Wetland Type)	Potential Bog Turtle Habitat?	Designated Survey Area (acres)
WET-1	3.843	PEM – 10% PFO – 90%	PEM – 5% PFO – 0%	No	none
WET-2	**5.057**	**PEM – 10% PFO – 90%**	**PEM – 35% PFO – 10%**	**Yes**	**1.91**
WET-3	0.047	PEM – 100%	PEM – 5%	No	none
WET-4	6.437	PEM – 100%	PEM – 0%	No	none
WET-5	0.060	PEM – 100%	PEM – 15%	No	none
WET-6	8.229	PFO – 100%	PFO – 1%	No	none
WET-7	0.352	PEM – 100%	PEM – 5%	No	none
WET-8	**0.144**	**PEM – 100%**	**PEM- 35%**	**Yes**	**0.15**
WET-9	0.025	PEM – 100%	PEM – 15%	No	none
WET-10	0.050	PEM – 100%	PEM – 0%	No	none
WET-11	0.026	PEM – 100%	PEM – 5%	No	none
WET-12	0.184	PFO – 100%	PFO – 0%	No	none
WET-13	0.524	PEM – 100%	PEM – 1%	No	none
WET-14	0.012	PEM – 100%	PEM – 0%	No	none
WET-15	0.104	PEM – 100%	PEM – 0%	No	none
WET-16	0.051	PEM – 100%	PEM – 0%	No	none
WET-17	0.865	PEM – 100%	PEM – 0%	No	none

IV. SURVEY METHODOLOGY

Prior to conducting the Phase 2 Surveys, JMT obtained the appropriate Type III Scientific Collector's Permit and Chapter 75.4 Special Permit from the PA Fish and Boat Commission (PFBC), granting permission to survey for bog turtles at the project site (**Appendix E**). Surveys were conducted by Craig Patterson Nein (Environmental Scientist, PA Qualified Bog Turtle Surveyor), Jim Morris (Environmental Scientist/Habitat Restoration Specialist), and Coleman Kline (Environmental Scientist) of JMT. Please see **Appendix G** for qualifications of the surveyors.

The Phase 2 Bog Turtle Surveys were conducted in accordance with the USFWS *Guidelines for Bog Turtle Surveys* (revised April, 2006). Four surveys were completed during the Phase 2 survey-window of April 15 to June 15 in each wetland. The specific survey dates were May 1, May 10, May 22, and June 7, 2018. Surveys were conducted during suitable weather conditions according to USFWS guidelines.

The Phase 2 surveys focused on wetlands that were determined to be potentially suitable and contained the required soils, hydrology, and vegetation criteria for bog turtles. These areas are known as Designated Survey Areas (DSAs) and can include entire wetlands or suitable portions of wetlands. For the proposed project, Phase 2 surveys were performed in a portion of WET-2 (approximately 1.91 acres) and the entirety of WET-8 (approximately 0.15 acres).

The Phase 2 surveys were conducted using a combination of visual encounter survey and hand capture (i.e., muddling/probing) techniques. Surveys within each DSA began with a semi-rapid walkthrough in order to search for basking turtles or those moving on the surface. These walkthroughs were conducted in transects and involved a visual survey of the ground surface and existing vegetation. When no turtles were found during walkthroughs, more intensive searches were completed. Wooden probing sticks were used to move thick vegetation and to probe for turtles in water and muck. Surveyors also searched for bog turtles by hand through feeling around in water and muck, underneath vegetation, or within tunnels and other subsurface features. Hand capture surveys were initially focused on the most suitable portions of habitat for the bog turtle, but were also conducted in the remainder of the DSA if no turtles were found.

Surveys within WET-2 were focused primarily on the 1.91-acre DSA for the purpose of quantifying survey effort; however, investigators also searched the non-DSA portions of the wetland to look for basking or dispersing individuals, as well as any small mucky pockets that could meet bog turtle habitat criteria.

V. PHASE 2 SURVEY RESULTS

JMT staff surveyed for the presence or probable absence of bog turtles during four site visits to the proposed Eisenhower Drive Extension Project site in May and June of 2018. The survey dates were May 1, 10, and 22, and June 7, 2018. Phase 2 Surveys were conducted during suitable weather conditions according to USFWS guidelines (see **Table 2**). A total of 58.15 person-hours were spent surveying for bog turtles at the property, including 49.25 person-hours in WET-2 and 8.90 person-hours in WET-8. A detailed summary of

the Phase 2 Survey efforts can be viewed in **Table 3**. No bog turtles or their signs (e.g., tracks or egg shells) were observed within or in the vicinity of the survey areas during any of the site visits.

Although no bog turtles were found during the surveys, a population of spotted turtles was observed in WET-2. Seven individual spotted turtles were captured throughout the survey period, including four adult females, two adult males, and one juvenile. Three of the individuals were found dead (two females and one male). The cause of the mortality could not be confirmed for the spotted turtles; however, the potential for a disease outbreak resulting from a pathogen such as *Ranavirus* was of concern to the surveyors. Based on the condition of the dead turtles when found, they were unable to be collected for laboratory analysis.

The following reptile and amphibian species were observed in or within the vicinity of the wetlands during the surveys:

WET-2:

- Northern green frog (*Lithobates clamitans melanota*) – numerous seen and heard calling
- American bullfrog (*Lithobates catesbeianus*) – several heard calling
- American toad (*Anaxyrus americanus*) – numerous seen
- Northern two-lined salamander (*Eurycea bislineata*) – 1 adult
- Northern water snake (*Nerodia s. sipedon*) – 2 adults
- Eastern garter snake (*Thamnophis s. sirtalis*) – 1 adult (dead)
- common snapping turtle (*Chelydra serpentina*) – 2 adults
- Eastern painted turtle (*Chrysemys p. picta*) – 1 hatchling
- spotted turtle (*Clemmys guttata*) – 4 females (2 live, 2 dead), 2 males (1 live, 1 dead), 1 juvenile

WET-8:

- common snapping turtle (*Chelydra serpentina*) – 1 adult
- unidentified snake – escaped before it could be identified

Table 2: Summary of Weather Conditions during Phase 2 Bog Turtle Surveys at the proposed Eisenhower Drive Extension Project Area, Adams and York Counties, Pennsylvania

			Weather Conditions			
Date	**Wetland**	**Time**	**Air Temp (°F)**	**Winds (mph)**	**Cloud Cover**	**Precipitation**
5/1/18	WET-2	Start: 1050	73.0	0 - 3	clear	none
		End: 1510	84.0	0 - 3	clear	none
	WET-8	Start: 0940	64.0	0 - 3	clear	none
		End: 1020	68.2	0 - 3	clear	none
5/10/18	WET-2	Start: 0830	64.8	3 - 8	overcast	none
		End: 1230	77.0	0 - 8	partly cloudy	light rain (1045 – 1110 only)
	WET-8	Start: 1315	77.9	3 - 8	overcast	none
		End: 1355	76.5	3 - 8	overcast	none
5/22/18	WET-2	Start: 1040	66.7	0 - 3	overcast	light rain 1040 - 1200
		End: 1455	70.7	0 - 3	overcast	none
	WET-8	Start: 0920	66.7	0 - 8	overcast	light rain 0920 - 0930
		End: 1013	66.7	0 - 3	overcast	none
6/7/18	WET-2	Start: 1020	78.3	0 - 3	partly cloudy	none
		End: 1500	73.9	0 - 3	partly cloudy	none
	WET-8	Start: 0910	64.0	0 - 3	partly cloudy	none
		End: 0955	69.4	0 - 3	partly cloudy	none

Table 3: Phase 2 Bog Turtle Survey Results for the proposed Eisenhower Drive Extension Project Area, Adams and York Counties, Pennsylvania

Date	**Designated Survey Area (DSA)**	**Time (Start – End)**	**Person-Hours Surveyed (3 surveyors)**	**Size of DSA (acres)**	**Person-Hours per acre DSA**	**No. Bog Turtles Found**
5/1/2018	WET-2	1050 - 1510	12.0	1.91	6.28	0
5/10/2018	WET-2	0830 - 1230	12.0	1.91	6.28	0
5/22/2018	WET-2	1040 - 1455	12.25	1.91	6.41	0
6/7/2018	WET-2	1020 - 1500	13.0	1.91	6.81	0
5/1/2018	WET-8	0940 - 1020	2.0	0.15	13.3	0
5/10/2018	WET-8	1315 - 1355	2.0	0.15	13.3	0
5/22/2018	WET-8	0920 - 1013	2.65	0.15	17.67	0
6/7/2018	WET-8	0910 - 0955	2.25	0.15	15.0	0

VI. PROJECT DESCRIPTION

PennDOT Engineering District 8-0 has proposed the extension of Eisenhower Drive in Adams and York Counties to facilitate safe and efficient intermodal travel within the project study area to meet both current and future transportation needs, and to provide a functional and modern roadway that maximizes current design criteria and promotes multi-modal transportation alternatives. PennDOT seeks to extend Eisenhower Drive, which is located in the northern portion of Hanover, further west and ultimately south in order to tie into Hanover Road (PA-116), thereby avoiding the densely populated areas of Hanover and McSherrystown. Multiple alternative alignments are currently being studied, with a final alignment yet to be determined.

VIII. CONCLUSIONS

On behalf of PennDOT Engineering District 8-0, JMT has completed a Phase 2 Bog Turtle Survey for the proposed Eisenhower Drive Extension Project in Adams and York Counties, Pennsylvania. Phase 2 surveys were conducted within two wetlands containing potential bog turtle habitat (WET-2 and WET-8). Surveys were conducted during four site visits between May and June 2018, with protocols following USFWS guidelines (USFWS 2006). A total of 58.15 person-hours were spent surveying for bog turtles within the potential habitats, which satisfied the minimum requirements for survey effort within the Designated Survey Areas. No bog turtles or their signs (e.g., tracks or egg shells) were observed within or in the vicinity of the survey areas during any of the site visits.

Although we cannot definitively confirm their absence from these surveys, it is highly probable that bog turtles do not occur in wetlands within the vicinity of the proposed project. The two wetlands with potential habitat were searched extensively for bog turtles following USFWS guidelines. In addition, a PNDI Receipt obtained for the proposed project did not identify any known conflicts with the bog turtle. For these reasons, it is the opinion of JMT that the proposed Eisenhower Drive Extension Project will have **'No Effect'** on the bog turtle.

VIII. REFERENCES

The following list of sources includes those cited in this report as well as references that may provide additional information on the bog turtle.

Behler, J. L., and F. W. King. 1979. The Audubon Society Field Guide to North American Reptiles and Amphibians. Alfred A. Knopf, New York. 744 pp.

Carter, S. L., C. A. Haas, and J. C. Mitchell. 2000. Movements and activity of Bog Turtles (*Clemmys muhlenbergii* in Southwestern Virginia. Journal of Herpetology 34 (1): 75-80.

Chase, J. D., K. R. Dixon, J. E. Gates, D. Jacobs, and G. J. Taylor. 1989. Habitat characteristics, population size, and home range of the Bog Turtle, *Clemmys muhlenbergii*, in Maryland. Journal of Herpetology 23(4): 356-362.

Conant, R. 1975. A Field Guide of Reptiles and Amphibians of Eastern and Central North America, second edition. Houghton Mifflin Company, Boston. 429 pp.

Ernst, C. H., J. E. Lovich, and R. W. Barbour. 1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington, 578 pp.

Lee, D. S, and A. W. Norden. 1996. The distribution, ecology, and conservation needs of Bog Turtles, with special emphasis on Maryland. The Maryland Naturalist 40(1-4): 7-46.

Somers, A. B., J. Mansfield-Jones, and J. Braswell. 2007. In stream, streamside, and under stream bank movements of a Bog Turtle, *Glyptemys muhlenbergii*. Chelonian Conservation and Biology 6(2): 286-288.

U.S. Fish and Wildlife Service. 1997. Final rule to list the northern population of the bog turtle as threatened and the southern population as threatened due to similarity of appearance. Federal Register November 4, 1997. Vol.62, No. 213.

U.S. Fish and Wildlife Service. May 2001. Bog Turtle (*Clemmys muhlenbergii*) Northern Population Recovery Plan.

U.S. Fish and Wildlife Service April, 2006. Guidelines for Bog Turtle Surveys (Revised).

U.S. Army Corps of Engineers, Baltimore District. 2008a. Revision to the Pennsylvania State Programmatic General Permit (PASPGP-3) Bog Turtle Habitat Clearance Process. Special Public Notice #08-22. April 22, 2008.

U.S. Army Corps of Engineers, Baltimore District. 2008b. Revision to the Pennsylvania State Programmatic General Permit (PASPGP-3) Bog Turtle Habitat Clearance Process and Nationwide Permit Regional Condition. Special Public Notice #08-69. October 20, 2008.

Appendix A
Figures

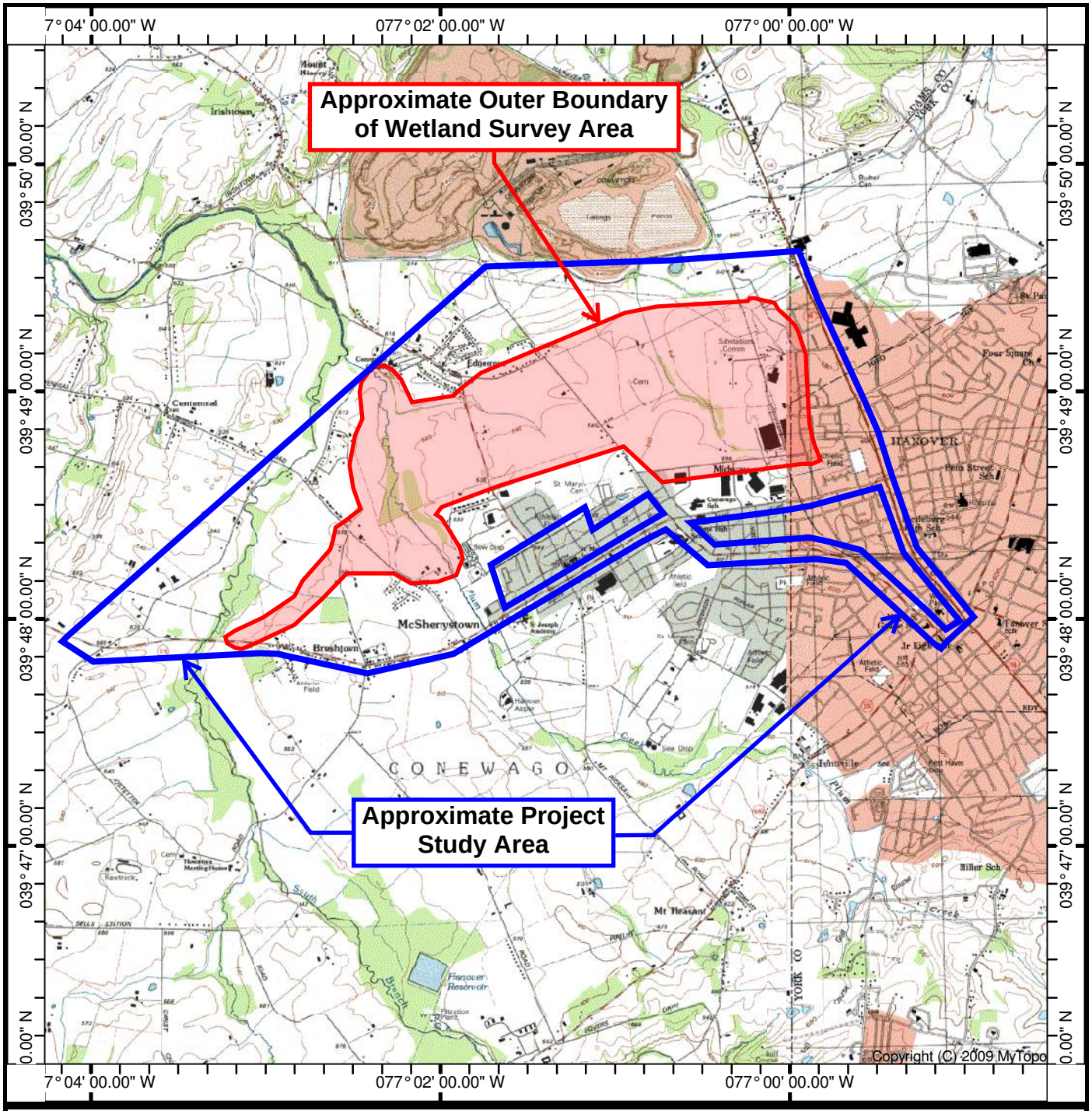

Figure 1: Project Location Map

Eisenhower Drive Project
York & Adams Counties, PA

JOHNSON, MIRMIRAN & THOMPSON
Engineering A Brighter Future®

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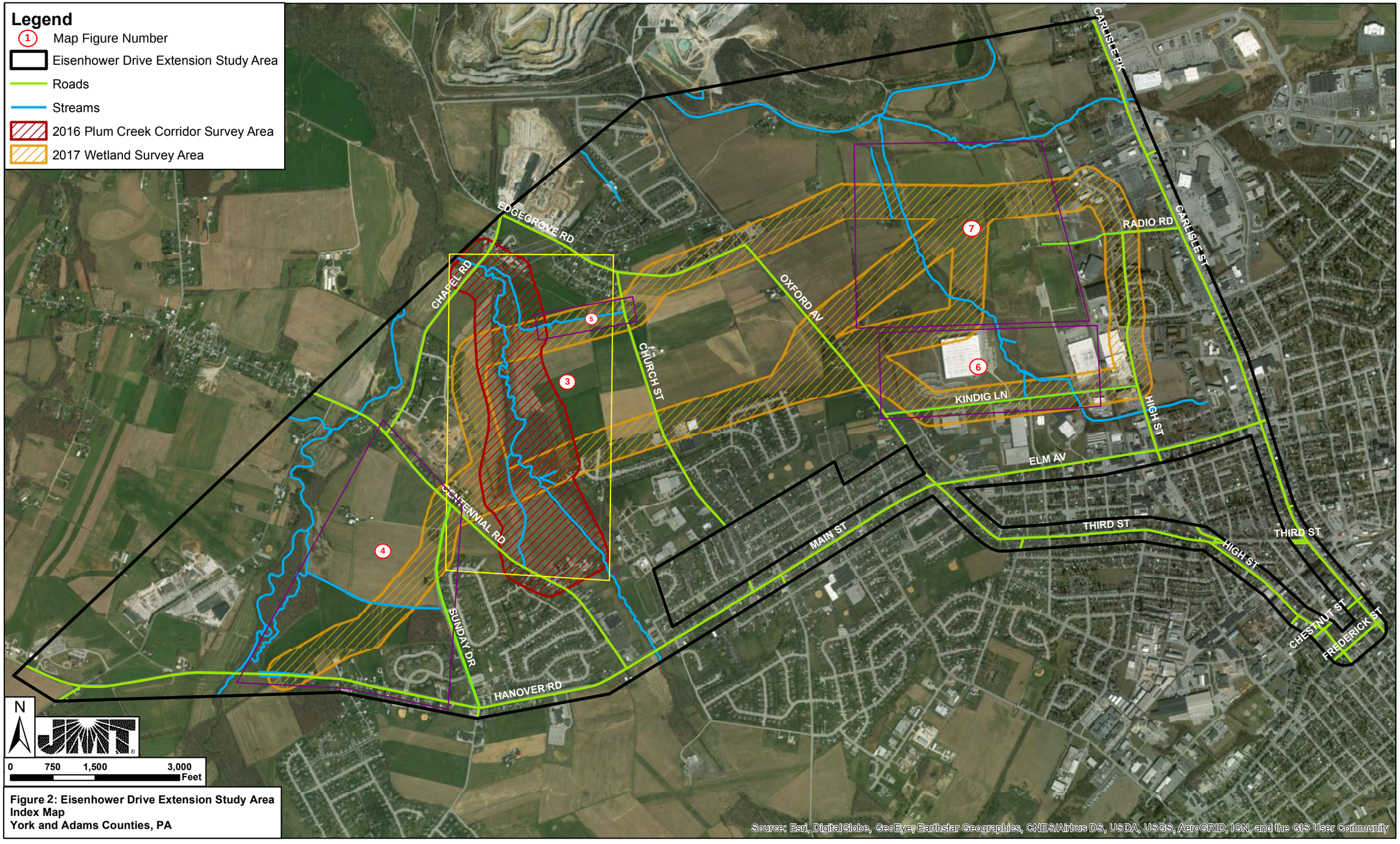


Figure 2: Eisenhower Drive Extension Study Area
Index Map
York and Adams Counties, PA

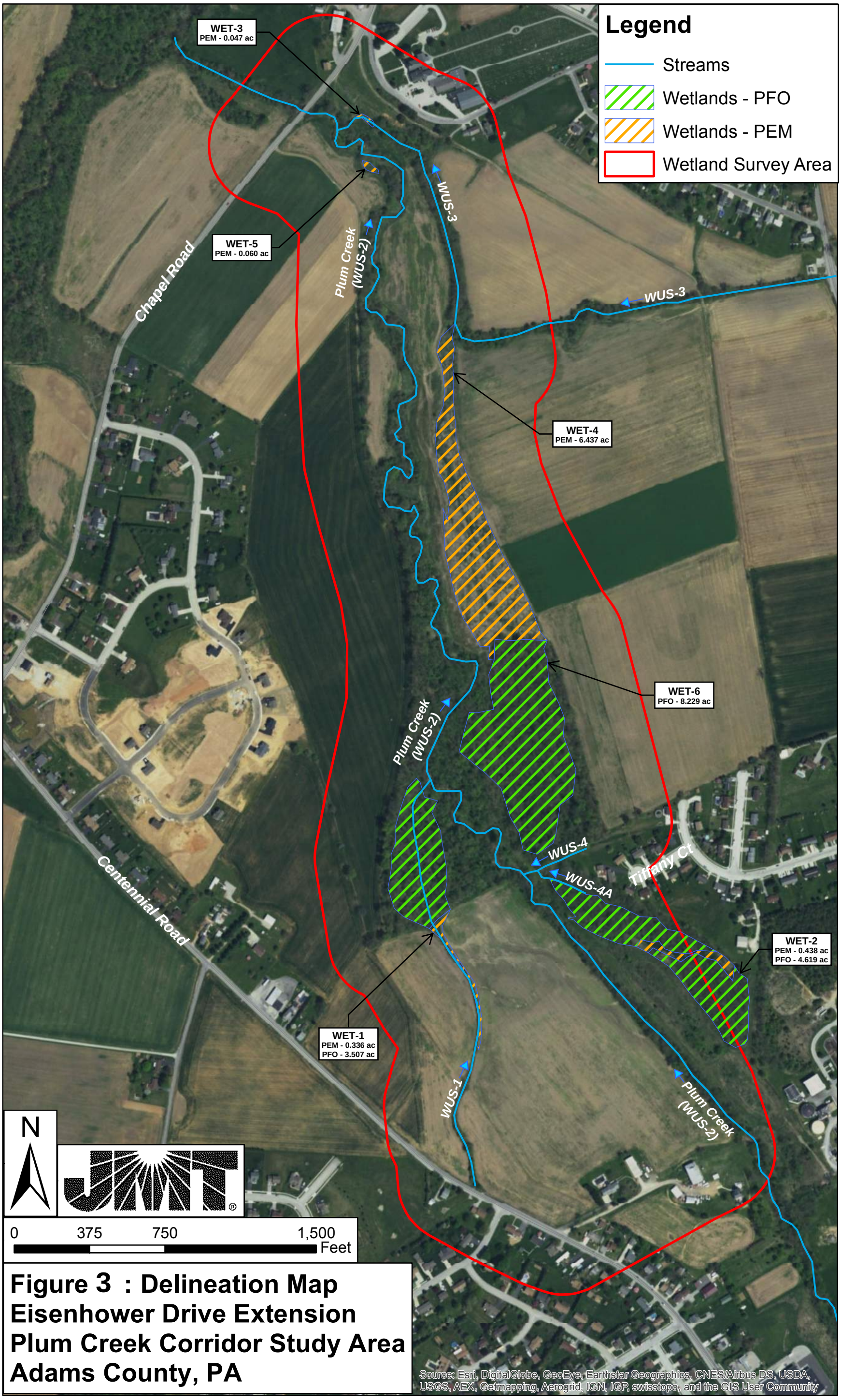


Figure 3 : Delineation Map
Eisenhower Drive Extension
Plum Creek Corridor Study Area
Adams County, PA

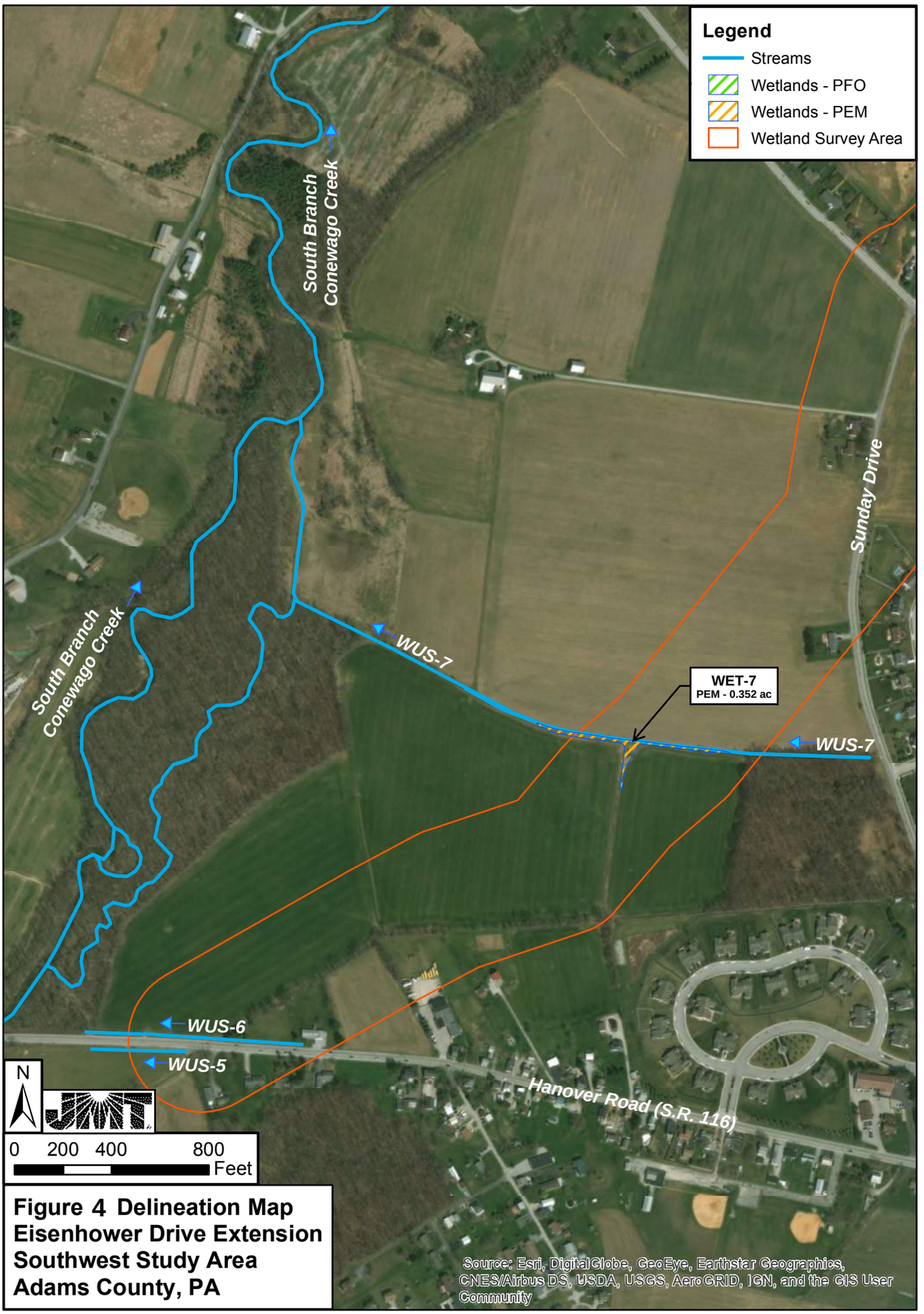


Figure 4 Delineation Map
Eisenhower Drive Extension
Southwest Study Area
Adams County, PA

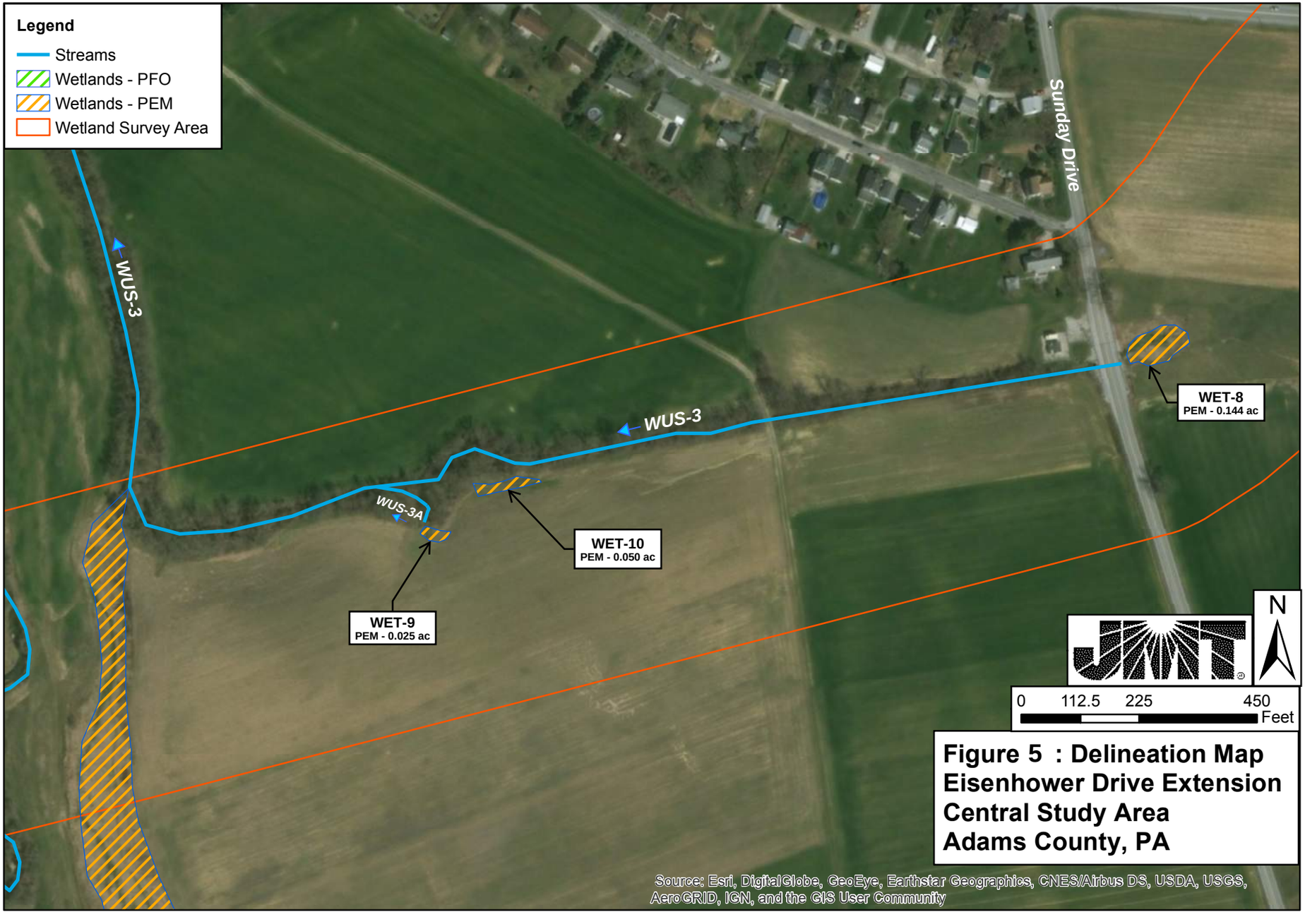


Figure 5 : Delineation Map
Eisenhower Drive Extension
Central Study Area
Adams County, PA

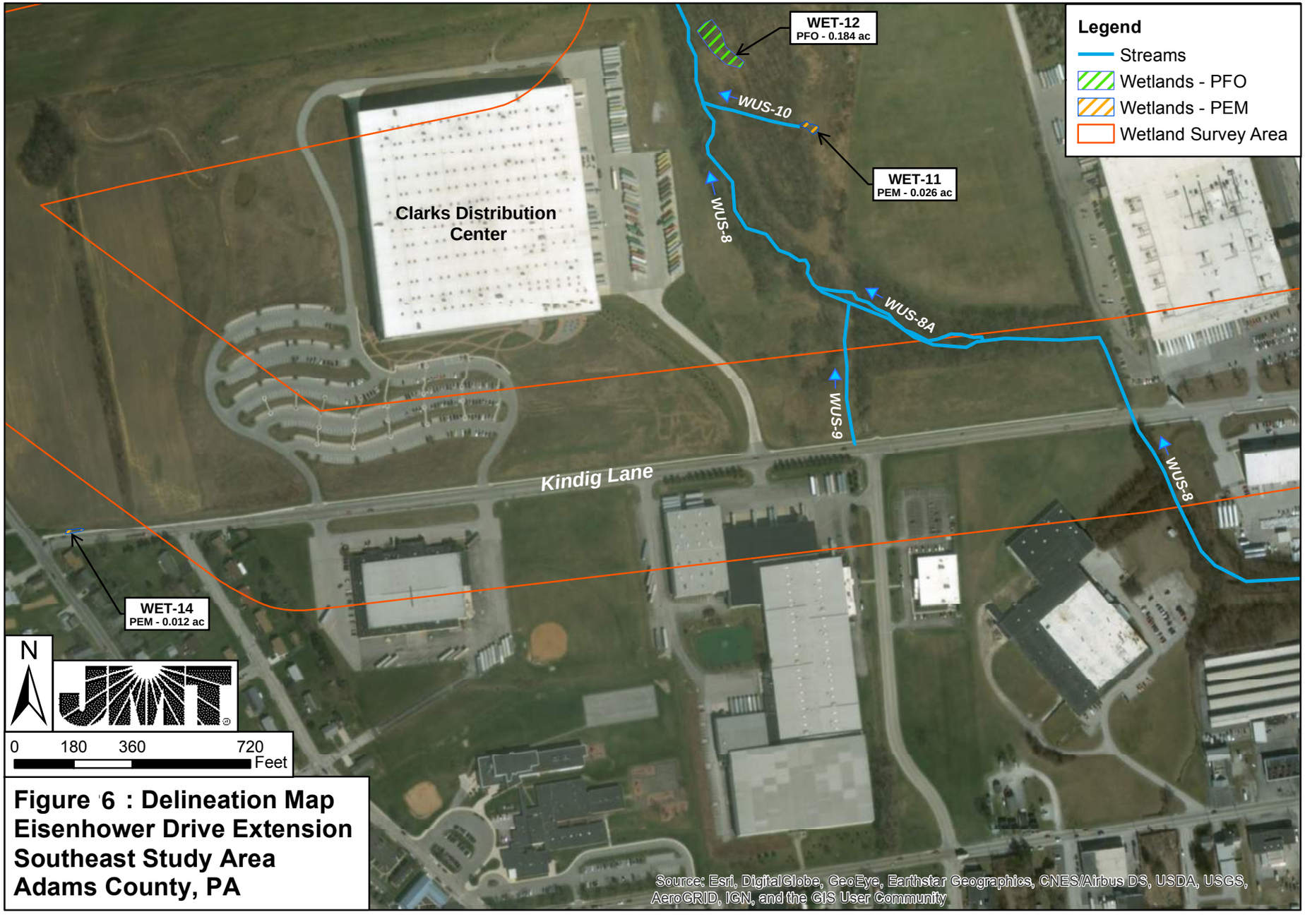


Figure 6 : Delineation Map
Eisenhower Drive Extension
Southeast Study Area
Adams County, PA

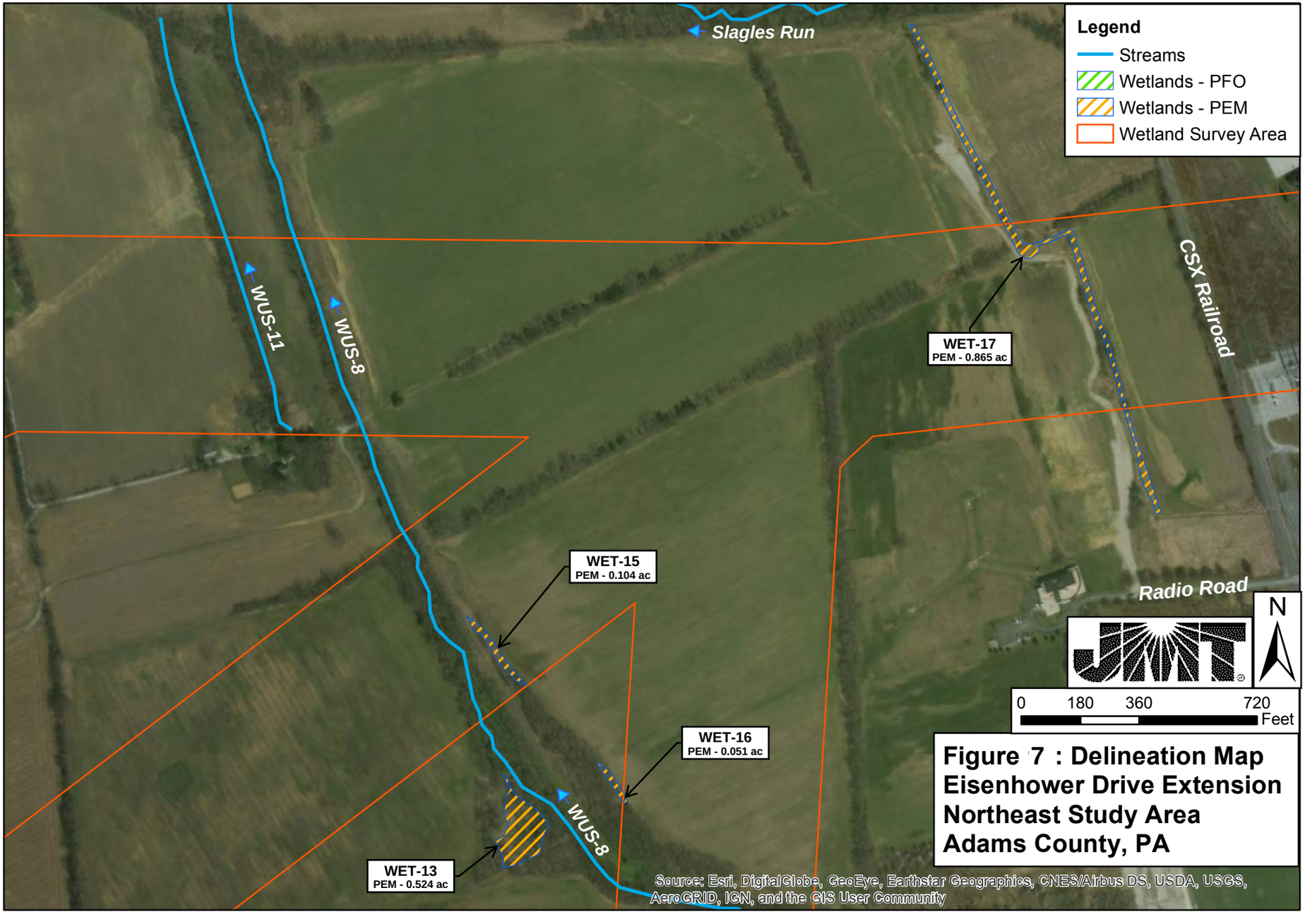


Figure 7 : Delineation Map
Eisenhower Drive Extension
Northeast Study Area
Adams County, PA

Figure 8: Bog Turtle Designated Survey Area Map

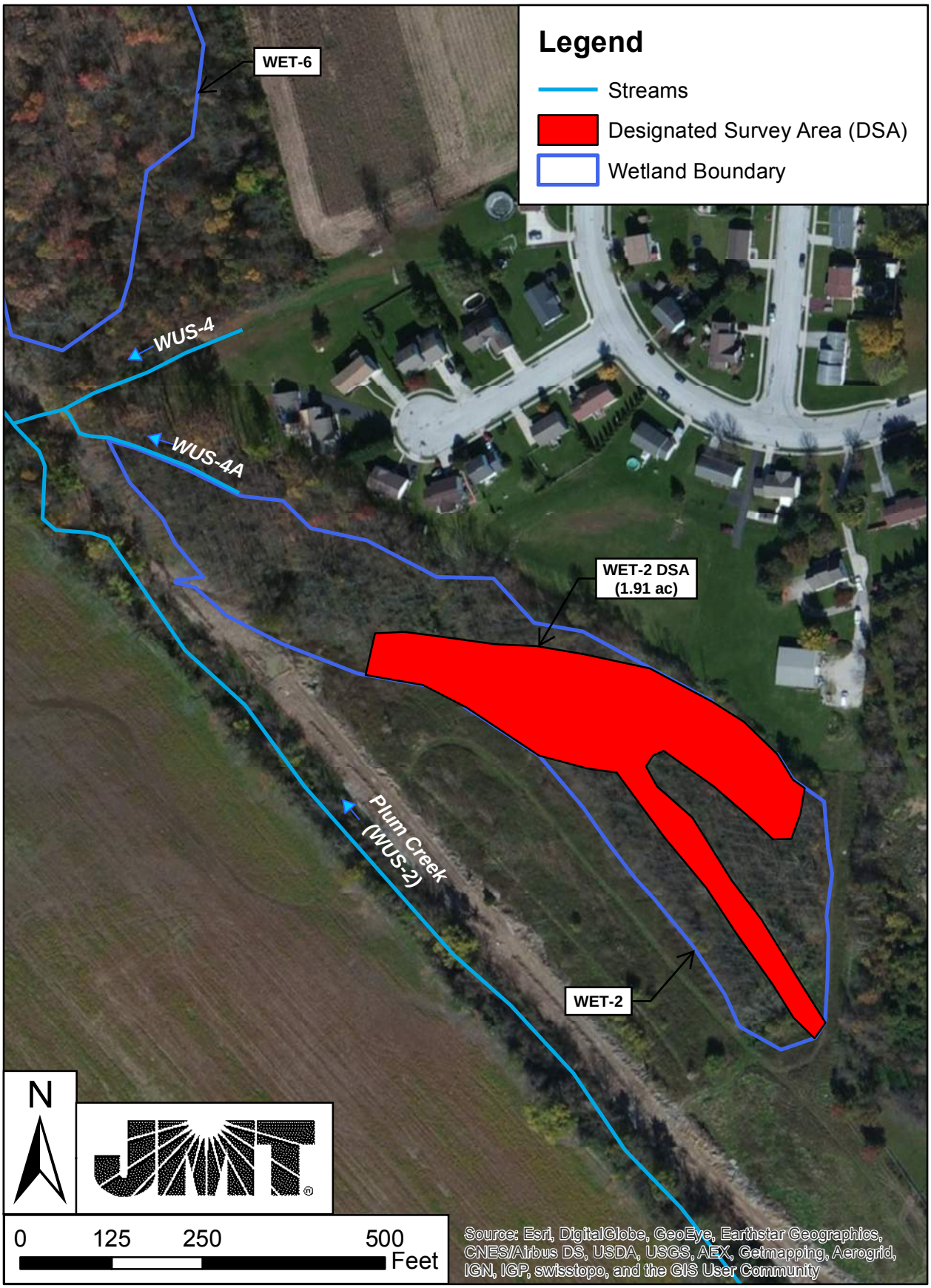
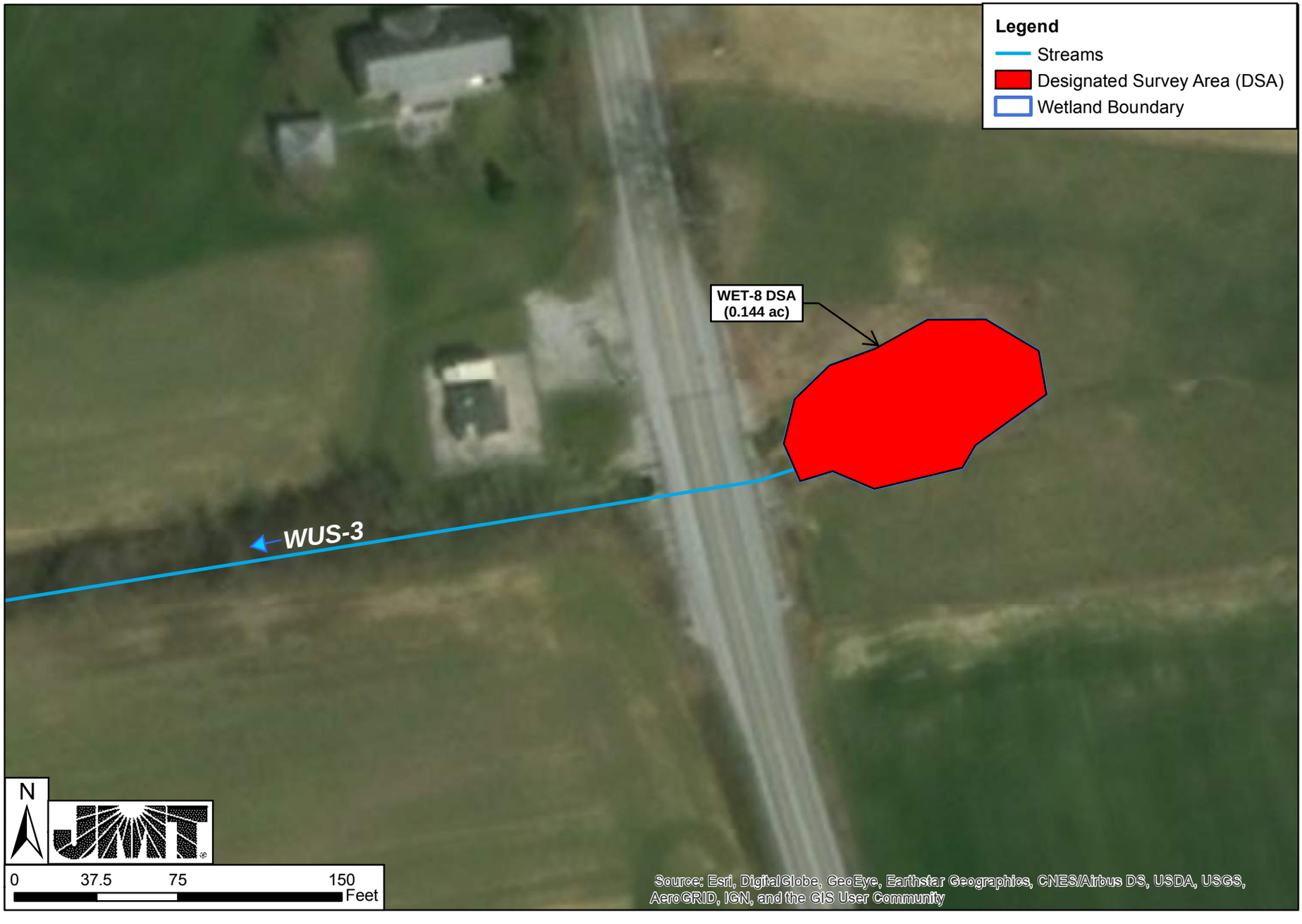


Figure 9: Bog Turtle Designated Survey Area Map



Appendix B
Site Photographs

Photo 1: Looking southeast towards a portion of the WET-2 DSA where the man-made/altered channel converges with the remainder of the DSA. Photo taken May 1, 2018.

Photo 2: Looking towards a dead spotted turtle found in the northern portion of the WET-2 DSA. Photo taken May 1, 2018.

Photo 3: Looking towards a common snapping turtle submerged in the main channel in WET-2. Photo taken May 1, 2018.

Photo 4: Looking towards a dead Eastern garter snake found on the western side of the WET-2 DSA. Photo taken May 1, 2018.

Photo 5: Looking towards an adult female spotted turtle found in the main channel in WET-2 at the western end of the DSA. Photo taken May 10, 2018.

Photo 6: Looking towards a dead male spotted turtle found at the base of a black walnut tree on the northern side of WET-2. Photo taken May 10, 2018.

Photo 7: Looking towards a juvenile spotted turtle observed underneath a log in the southeastern end of WET-2. Photo taken May 22, 2018.

Photo 8: Looking towards a dead adult female spotted turtle observed in the man-made/altered channel portion of the WET-2 DSA. Photo taken May 22, 2018.

Photo 9: Looking towards an adult male spotted turtle found basking within the northeastern portion of the WET-2 DSA. Photo taken June 7, 2018.

Photo 10: Looking towards a subadult female spotted turtle found basking within the northeastern portion of the WET-2 DSA. Photo taken June 7, 2018.

Photo 11: Looking towards an adult female spotted turtle (recapture from 5/10/18) basking next to the main wetland channel at the western end of the WET-2 DSA. Photo taken June 7, 2018.

Photo 12: Looking southeast from Church Street towards WET-8. Photo taken May 1, 2018.

Photo 13: Looking east towards WET-8 during the semi-rapid walkthrough portion of the Phase 2 Bog Turtle Survey. Photo taken May 1, 2018.

Photo 14: Looking towards an adult common snapping turtle found basking within the WET-8 DSA. Photo taken May 10, 2018.

Appendix C
Agency Coordination and
PNDI Environmental Review Receipt

1. PROJECT INFORMATION

Project Name: **Eisenhower Drive Extended**
Date of Review: **3/18/2018 11:40:34 PM**
Project Category: **Transportation, Roads, New construction/ New alignment**
Project Area: **3,635.72 acres**
County(s): **Adams; York**
Township/Municipality(s): **CONEWAGO; HANOVER; MCSHERRYSTOWN; MOUNT PLEASANT; OXFORD; PENN; UNION**
ZIP Code: **17331; 17340; 17344**
Quadrangle Name(s): **HANOVER; MC SHERRYSTOWN**
Watersheds HUC 8: **Lower Susquehanna**
Watersheds HUC 12: **Headwaters South Branch Conewago Creek; Plum Creek-South Branch Conewago Creek**
Decimal Degrees: **39.811941, -77.023242**
Degrees Minutes Seconds: **39° 48' 42.9874" N, 77° 1' 23.6710" W**

This is a draft receipt for information only. It has not been submitted to jurisdictional agencies for review.

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 must comply with the bog turtle habitat screening requirements of the PASPGP.

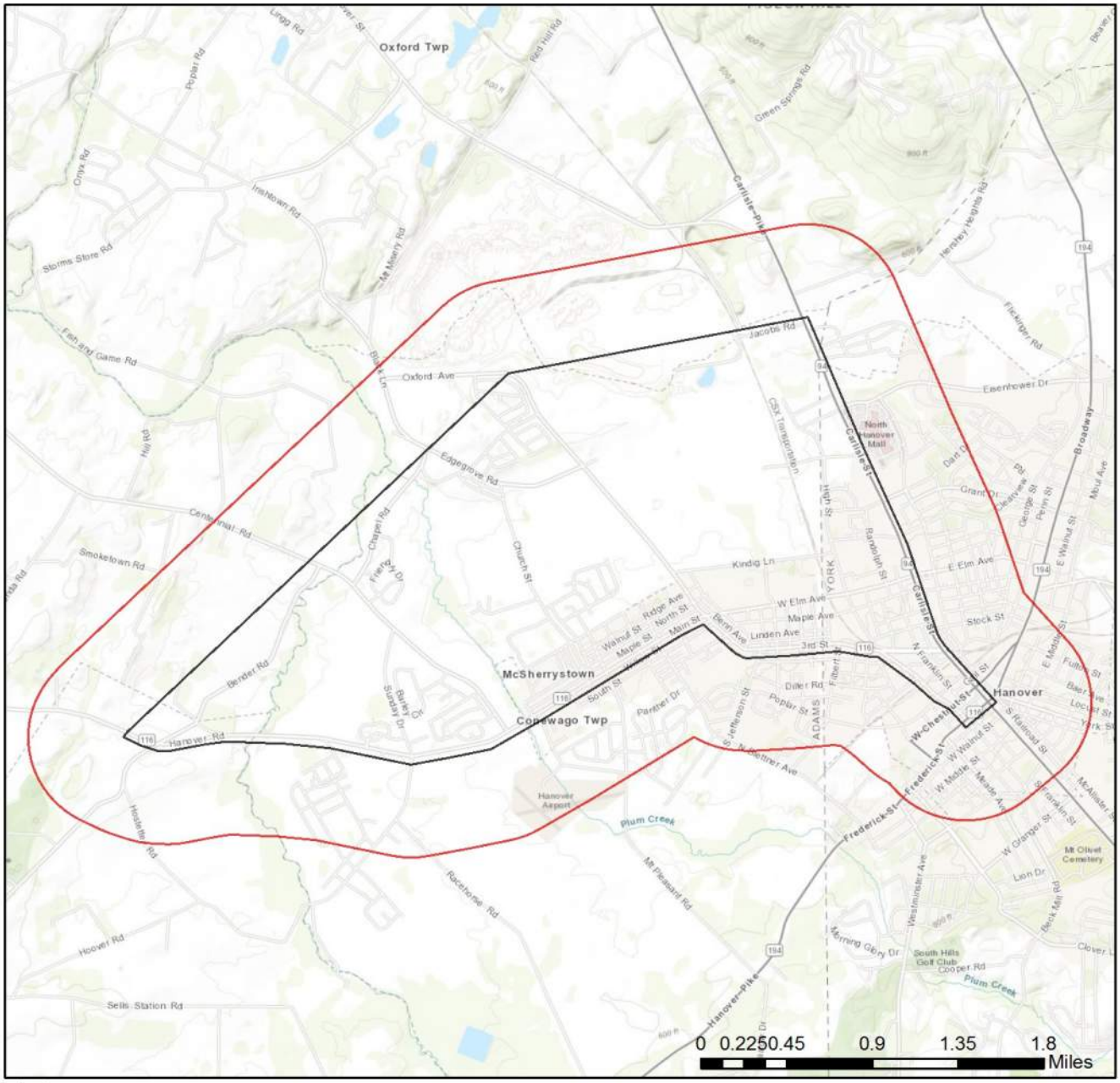
Eisenhower Drive Extended

Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Eisenhower Drive Extended



Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,

RESPONSE TO QUESTION(S) ASKED

Q1: Will the entire project area (including any discharge), plus a 300 feet buffer around the project area, all occur in or on an existing building, parking lot, driveway, road, road shoulder, street, runway, paved area, railroad bed, maintained (periodically mown) lawn, crop agriculture field or maintained orchard?
Your answer is: No

Q2: The proposed project is in the range of the Indiana bat. Describe how the project will affect bat habitat (forests, woodlots and trees) and indicate what measures will be taken in consideration of this. Round acreages up to the nearest acre (e.g., 0.2 acres = 1 acre).
Your answer is: The project will affect 1 to 39 acres of forests, woodlots and trees.

Q3: Is tree removal, tree cutting or forest clearing of 40 acres or more necessary to implement all aspects of this project?
Your answer is: No

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission
RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources
RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

DCNR Species: (Note: The Pennsylvania Conservation Explorer tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below. After desktop review, if a botanical survey is required by DCNR, we recommend the DCNR Botanical Survey Protocols, available here: https://conservationexplorer.dcnr.pa.gov/content/survey-protocols)

Scientific Name	Common Name	Current Status	Proposed Status	Survey Window
Quercus shumardii	Shumard's Oak	Endangered	Endangered	Fruits September - October

PA Fish and Boat Commission
RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service
RESPONSE:

No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
** Sensitive Species - Species identified by the jurisdictional agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, upload* or email* the following information to the agency(s). Instructions for uploading project materials can be found here. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies. Alternatively, applicants may email or mail their project materials (see AGENCY CONTACT INFORMATION).
***Note:** U.S.Fish and Wildlife Service requires applicants to mail project materials to the USFWS PA field office (see AGENCY CONTACT INFORMATION). USFWS will not accept project materials submitted electronically (by upload or email).

Check-list of Minimum Materials to be submitted:
____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
____A map with the project boundary and/or a basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
In addition to the materials listed above, USFWS REQUIRES the following
____**SIGNED** copy of a Final Project Environmental Review Receipt

The inclusion of the following information may expedite the review process.
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
110 Radnor Road, Suite 101
State College, Pennsylvania 16801-4850

April 20, 2018

Craig Patterson Nein
JMT
220 St. Charles Way, Suite 200
York, PA 17402

RE: USFWS Project #2017-0474
PNDI Receipt #602909

Dear Mr. Nein:

Thank you for your letter of March 27, 2018, which provided the U.S. Fish and Wildlife Service (Service) with information regarding the proposed Eisenhower Drive Extension Project located in Penn Township and Hanover Borough, York County; and, McSherrystown Borough, Conewago, Mount Pleasant, and Union Townships, Adams County, Pennsylvania. The Pennsylvania Department of Transportation (PennDOT) proposes to construct a western extension of Eisenhower Drive to improve traffic safety, mobility, and management. The project area is within the range of the bog turtle (*Clemmys muhlenbergii*), a species that is federally listed as threatened. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq*.) to ensure the protection of endangered and threatened species.

Bog turtles usually occur in small, discrete populations occupying suitable wetland habitat dispersed along a watershed. The species inhabits shallow, spring-fed fens, sphagnum bogs, swamps, marshy meadows, and pastures characterized by soft, muddy bottoms; clear, cool, slow-flowing water, often forming a network of rivulets; high humidity; and an open canopy.

To determine the potential effects of the proposed project on bog turtles and their habitat, you, a recognized qualified bog turtle surveyor (QBTS), conducted a Phase 1 bog turtle habitat assessment on November 17, 18; December 7, 8, 21, and 27, 2016; November 8, 9, 13, and 14, 2017. According to the report 17 wetlands and 14 watercourses extend to within 300 feet of the proposed limit of disturbance. Following the methods described under "*Bog Turtle Habitat Survey*" (Phase 1 survey) of the *Guidelines for Bog Turtle Surveys* (revised April 2006), you determined that the wetlands referred to as "WET-2" and "WET-8" have the combination of soils, vegetation, and hydrology typical of habitat occupied by bog turtles. Additionally, you determined that some of these watercourses may also serve as a travel corridor for bog turtles (hydrologically connected to potential bog turtle habitat).

Based on a review of the information supplied to this office, and a field evaluation on April 18, 2018, the Service has agrees that "WET-2" and "WET-8" contain the combination of habitat characteristics typical of areas occupied by bog turtles. Due to the potential for direct or indirect adverse effects to these two wetland you have proposed conducting a more detailed and thorough survey, as described under Phase 2 of the *Guidelines for Bog Turtle Surveys*.

"WET-2" is about 5.06 acres of marginal bog turtle habitat. You found that about 35 percent of the emergent habitat and 10 percent of the forested wetland habitat contains mucky soils, while the majority of wetland (55 percent) features hard-bottomed substrates and drier depressions, and did not satisfy any of the criteria for suitable bog turtle habitat. Consequently, you propose including about 1.91 acres of "WET-2" in the Designated Survey Area (DSA) for the proposed Phase 2 survey. Additionally, as discussed in the field, you agreed to complete a cursory evaluation for mucky pockets that might meet bog turtle habitat criteria give the area outside the DSA, but still within "WET-2". If found, the Phase 2 survey will be expanded to include these areas as well. Based on our observations during the field evaluation of April 18, 2018, we concur with your findings and your proposed approach for the Phase 2 bog turtle surveys of "WET-2."

You propose including the entire "WET-8" (about 0.15 acres) in the DSA for Phase 2 surveys. Based on our observations during the field evaluation of April 18, 2018, we concur with your findings and your proposed approach for the Phase 2 bog turtle surveys of "WET-8."

The Phase 2 survey should be conducted by a QBTS with bog turtle field survey experience (see the following link: https://www.fws.gov/northeast/pafo/pdf/BT%20Surveyors%209-1-17.pdf). Submit survey results to the Service for review and concurrence. This information and appropriate supporting information (*e.g.*, bog turtle survey results, project plans documenting no encroachment into wetlands) will be necessary before the Service can concur that no federally listed species will be adversely affected by the project. If project activities might adversely affect bog turtles, please contact the Service for additional coordination.

This response relates only to endangered and threatened species under our jurisdiction based on an office review of the proposed project's location. No field inspection of the project area has been conducted by this office. Consequently, this letter is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities.

To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.

Please contact Jennifer Kagel of my staff at 814-234-4090 if you have any questions or require further assistance regarding this matter.

Sincerely,

Robert M. Anderson
Acting, Field Office Supervisor

cc:
PFBC – Savage

Appendix D
Bog Turtle Habitat Evaluation Field Forms

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway Construction

Applicant/Landowner Name: Penn DOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Twp

PNDI # PNDI-602909 Potential conflict with USFWS species? • •Y •X•N

ACTION AREA[2]

Action area size: ≈ 205.33ac Does the Phase 1 survey include all wetlands in the action area? •X•Y • •N[3]

WETLAND ID: WET-1 PHOTOS TAKEN: •X•Yes • •No WETLAND SIZE: 3.843 acres

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

• •< 0.1 acre • •0.1-0.5 acre • •>0.5 to <1 acre • •1-2 acres •X•2-4 acres • •5+ acres • •10+ acres

WETLAND LOCATION: Lat 39.807684° N Long -77.038041° W

(approximate center of wetland) GPS Datum (check one): • •NAD 27 •X•NAD 83 • •WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 12/27/2016 Time In: 10:00 AM Time Out: 2:30 PM

Last precipitation: • •< 24 hours •X•1-7 days • •> 1 week • •unknown Drought conditions? • •Y •X•N • •Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

•X•none of it – the entire wetland is within the property boundaries (skip next 2 questions)

• •some of it – _____ acres or _____ % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

• •none of it • •all of it • •part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

• •all of it • •part of it (at least _____ acres) • •none of it

Are there any wetlands located off-site and close enough to be affected by this project? • •Y • •N •X•Unknown

If yes, *could* they be potential bog turtle habitat? • •Y • •N •X•Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Agricultural fields, forested riparian corridors, residential properties

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: •X•PEM ≈ 10 • •PSS ____ •X•PFO ≈ 90 • •POW ____

•X•Y • •N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe Ditching / alteration of stream between Ag Fields in PEM portion

•X•Y • •N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe Maintenance of Ag. Fields adjacent to wetland ditch/watercourse in PEM portion.

PEM Wetland drainage between large agricultural fields continues into larger forested portion of wetland as a stream that drains into Plum Creek.

Surface water / observed hydrology limited to drainage channel / stream that bisects wetland

Project Name Eisenhower Drive Extension Project *Wetland* WET-1 *(con't)*

Hydrology

- •Y ☒N Springs or seeps •visible or •likely ? Watercress present? •Yes ☒No
- •Y ☒N Spring houses in or adjacent to wetland? saturated soils restricted to drainage channel
- ☒Y •N Saturated soils present? If yes, year-round? •Likely ☒Unlikely •Unknown
- ☒Y •N Water visible on surface? Check all that apply: •small puddles/depressions (__" deep) •rivulets (__" deep) •larger pools/ponds (__" deep) drainage channel/stream only → 1-5"
- •Y ☒N Evidence of flooding? If yes, describe indicators______

Soils Mapping Unit (optional): Pa = Penlaw silt loam

Field observations confirm mapped type? •YES ☒NO •Unknown

Soils – PEM Portion of Wetland			
Mucky[4]? ☒YES •NO	How much of it (PEM) is mucky? ☒<10% •10-29% •30-49% •50-70% •>70% 5%	Mucky soils range in depth from: 3 to 6"	Most of the mucky part(s) of the wetland can be probed[5]: ☒3-5" •6-8" •9-11" •≥12"
Non-mucky[6]? ☒YES •NO	How much of it (PEM) is non-mucky? •<10% •10-29% •30-49% •50-70% ☒>70% 95%	Mucky soils highly limited, restricted to small portion of drainage channel	

Soils – PSS and PFO Portions of Wetland			
Mucky[4]? •YES ☒NO	How much of it is mucky? ☒<10% •10-29% •30-49% •50-70% •>70% 0%	Mucky soils range in depth from: ___ to ___"	Most of the mucky part(s) of the wetland can be probed[5]: •3-5" •6-8" •9-11" •≥12"

Potential nesting/overwintering habitat highly limited

Wetland Vegetation (characterize the wetland as a whole) Little to no subsurface structural characteristics observed

Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

sparse ☒sedges •rushes (☒skunk cabbage) ☒cattail •sweet flag ☒jewelweed •sphagnum moss •sensitive fern •rice cutgrass •tearthumb (☒reed canary grass) •*Phragmites* •purple loosestrife •alder ☒dogwood (☒red maple) •willow •poison sumac (☒multiflora rose) •______

Additional dominant species: Green ash, oaks, box elder, Japanese honeysuckle, garlic mustard

Herptiles

Were any bog turtles observed? •YES[7] ☒NO If yes, how many? ____

Other herptiles •observed • •previously observed: none observed

Additional Comments/Observations: (use additional sheets if necessary)

Large PFO portion w/ small PEM wetland consisting of drainage channel area between Ag Fields.

INVESTIGATOR'S OPINION

- •YES ☒NO •UNSURE The hydrology criterion[8] for bog turtle habitat is met.
- •YES ☒NO •UNSURE The soils criterion[8] for bog turtle habitat is met.
- •YES ☒NO •UNSURE The vegetation criterion[8] for bog turtle habitat is met.
- •YES ☒NO •UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Hern — Investigator's Name (print)
[signature] — Investigator's Signature
12/27/2016 — Date

Contact info: chern@rmt.com, 717-241-6252

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway Construction

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Twp

PNDI # PNDI- 602909 Potential conflict with USFWS species? • •Y •X N

ACTION AREA[2]

Action area size: ≈ 205.33ac **Does the Phase 1 survey include all wetlands in the action area?** X Y • •N[3]

WETLAND ID: WET-Z **PHOTOS TAKEN:** X Yes • •No **WETLAND SIZE:** 5.057 acres

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

• •< 0.1 acre • •0.1-0.5 acre • •>0.5 to <1 acre • •1-2 acres • •2-4 acres X 5+ acres • •10+ acres

WETLAND LOCATION: Lat 39.806975 °N Long -77.033685 °W

(approximate center of wetland) GPS Datum (check one): • •NAD 27 X NAD 83 • •WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 11/18/2016 Time In: 9:00 AM Time Out: 2:00 PM

Last precipitation: • •< 24 hours X 1-7 days • •> 1 week • •unknown Drought conditions? • •Y • •N X Unknown

Dry, recent, little rains

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

X none of it – the entire wetland is within the property boundaries (skip next 2 questions)

• •some of it – _____ acres or _____ % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

• •none of it • •all of it • •part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

• •all of it • •part of it (at least _____ acres) • •none of it

Are there any wetlands located off-site and close enough to be affected by this project? • •Y • •N X Unknown

If yes, *could* they be potential bog turtle habitat? • •Y • •N X Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Forested floodplains, agricultural fields, high-density residential properties, industrial (sub-station)

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: X PEM ≈ 10 • •PSS ____ X PFO ≈ 90 • •POW ____

X Y • •N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

Drainage from adjacent developed properties, excavated/altered ditch

X Y • •N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

limited mowing of pathways within/adjacent to wetland

- Wetland consists of concentrated wet areas and large portions of primarily dry areas.
- Drainage channel and groundwater-fed wetland areas drain towards Plum Creek to the northwest of wetland.

Project Name Eisenhower Drive Extension Project *Wetland* WET-2 (con't)

Hydrology

X Y • N Springs or seeps • X visible or • likely? Watercress present? • Yes X No
• Y X N Spring houses in or adjacent to wetland?
X Y • N Saturated soils present? If yes, year-round? X Likely • Unlikely • Unknown
X Y • N Water visible on surface? Check all that apply: X small puddles/depressions (1-2" deep)
X rivulets (1-3" deep) • larger ~~pools/ponds~~ (2-6" deep) → main channel
• Y X N Evidence of flooding? If yes, describe indicators _____

very dry period, but groundwater-fed portions of wetland maintained saturated soils

Soils Mapping Unit (optional): Dy = Dunning silty clay loam
Field observations confirm mapped type? X YES • NO • Unknown

Soils – PEM Portion of Wetland			
Mucky[4]?	How much of it (PEM) is mucky?	Mucky soils range in depth from:	Most of the mucky part(s) of the wetland can be probed[5]:
X YES • NO	• <10% • 10-29% • X 30-49% • 50-70% • >70% 35%	3 to 12"	• 3-5" • 6-8" • 9-11" • ≥12" (3-8")
Non-mucky[6]?	How much of it (PEM) is non-mucky?	Mucky soils observed in portions of main channel as well as groundwater-fed PEM/PFO areas.	
X YES • NO	• <10% • 10-29% • 30-49% X 50-70% • >70% 65%		

Soils – PSS and PFO Portions of Wetland			
Mucky[4]?	How much of it is mucky?	Mucky soils range in depth from:	Most of the mucky part(s) of the wetland can be probed[5]:
X YES • NO	• <10% X 10-29% • 30-49% • 50-70% • >70% 10%	3 to 8"	• 3-5" • 6-8" • 9-11" • ≥12"

Wetland Vegetation (characterize the wetland as a whole) moderate diversity of vegetative/subsurface structure in suitable habitat areas
Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage). sparse sphagnum

X sedges X rushes • skunk cabbage X cattail • sweet flag • jewelweed • sphagnum moss
• sensitive fern X rice cutgrass • tearthumb X reed canary grass • *Phragmites* • purple loosestrife
• alder X dogwood X red maple • willow • poison sumac X multiflora rose • • _____
Additional dominant species: Green ash, box elder, new york ironweed, bush honeysuckle, blue vervain, goldenrod

Herptiles
Were any bog turtles observed? • YES[7] X NO If yes, how many? _____
Other herptiles • observed • previously observed: none observed

Additional Comments/Observations: (use additional sheets if necessary)
Marginal potential habitat → a portion of the wetland contains groundwater-fed hydrology and suitable soils.

INVESTIGATOR'S OPINION

X YES • NO • UNSURE The hydrology criterion[8] for bog turtle habitat is met.
X YES • NO • UNSURE The soils criterion[8] for bog turtle habitat is met.
X YES • NO • UNSURE The vegetation criterion[8] for bog turtle habitat is met.
X YES • NO • UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Petterson Hern — Investigator's Name (print)
Craig Petterson Hern — Investigator's Signature
11/18/2016 — Date

Contact info: chern@jmt.com, 717-741-6252

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway Construction

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Twp

PNDI # PNDI- 602909 Potential conflict with USFWS species? • •Y •X N

ACTION AREA[2]

Action area size: ± 205.33 Does the Phase 1 survey include all wetlands in the action area? •X Y • •N[3]

WETLAND ID: WET-3 PHOTOS TAKEN: •X Yes • •No WETLAND SIZE: 0.047 acres

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

•X < 0.1 acre • •0.1-0.5 acre • •>0.5 to <1 acre • •1-2 acres • •2-4 acres • •5+ acres • •10+ acres

WETLAND LOCATION: Lat 39.818223°N Long -77.038954°W

(approximate center of wetland) GPS Datum (check one): • •NAD 27 •X NAD 83 • •WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 11/18/2016 Time In: 2:15 PM Time Out: 2:45 PM

Last precipitation: • < 24 hours •X 1-7 days • •> 1 week • •unknown Drought conditions? • Y • •N •X Unknown

Dry period overall

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

•X none of it – the entire wetland is within the property boundaries (skip next 2 questions)

• •some of it – _____ acres or _____ % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

• •none of it • •all of it • •part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

• •all of it • •part of it (at least _____ acres) • •none of it

Are there any wetlands located off-site and close enough to be affected by this project? • Y • •N •X Unknown

If yes, *could* they be potential bog turtle habitat? • Y • •N •X Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Ag Fields, Woodlands, Municipal (church),

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: •X PEM 100 • •PSS _____ • •PFO _____ • •POW _____

• •Y •X N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

_____

• •Y •X N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

Potential mowing upslope of the wetland

- All observed surface water observed within vegetated wetland portion of watercourse, with primarily rocky substrate

Project Name Eisenhower Drive Extension Project *Wetland* WET-3 *(con't)*

Hydrology

- • Y [X] N — Springs or seeps • visible or • likely ? Watercress present? • Yes [X] No
- • Y [X] N — Spring houses in or adjacent to wetland?
- [X] Y • N — Saturated soils present? If yes, year-round? [X] Likely • Unlikely • Unknown (Saturated soils restricted to within stream channel portion of wetland)
- [X] Y • N — Water visible on surface? Check all that apply: • small puddles/depressions (___" deep) • rivulets (___" deep) • larger pools/ponds (___" deep) within channel ≈ 1-4 inches
- [X] Y • N — Evidence of flooding? If yes, describe indicators drainage pattern, matted vegetation

Soils Mapping Unit (optional): Dy = Dunning silty clay loam
Field observations confirm mapped type? [X] YES • NO • Unknown

Soils – PEM Portion of Wetland			
Mucky[4]? [X] YES • NO	How much of it (PEM) is mucky? [X] <10% • 10-29% • 30-49% • 50-70% • >70% — 5%	Mucky soils range in depth from: 3 to 5 "	Most of the mucky part(s) of the wetland can be probed[5]: [X] 3-5" • 6-8" • 9-11" • ≥12"
Non-mucky[6]? [X] YES • NO	How much of it (PEM) is non-mucky? • <10% • 10-29% • 30-49% • 50-70% [X] >70% — 95%	- 'mucky' soils shallow, highly limited, restricted to within vegetated wetland portion of watercourse	

N/A

Soils – PSS and PFO Portions of Wetland			
Mucky[4]? • YES • NO	How much of it is mucky? • <10% • 10-29% • 30-49% • 50-70% • >70%	Mucky soils range in depth from: ___ to ___ "	Most of the mucky part(s) of the wetland can be probed[5]: • 3-5" • 6-8" • 9-11" • ≥12"

- Subsurface structural characteristics highly limited,

Wetland Vegetation (characterize the wetland as a whole)
Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

- • sedges [X] rushes (sparse) • skunk cabbage • cattail • sweet flag • jewelweed • sphagnum moss
- • sensitive fern • rice cutgrass ([X] tearthumb) ([X] reed canary grass) • *Phragmites* • purple loosestrife
- • alder • dogwood • red maple • willow • poison sumac • multiflora rose • ___________

Additional dominant species: ___________

Herptiles
Were any bog turtles observed? • YES[7] [X] NO If yes, how many? ______
Other herptiles • observed • previously observed: none observed

Additional Comments/Observations: (use additional sheets if necessary)
Small fringe wetland associated with Tributary to Plum Creek, lack of persistent groundwater sources / mucky soils

INVESTIGATOR'S OPINION

- • YES [X] NO • UNSURE — The hydrology criterion[8] for bog turtle habitat is met.
- • YES [X] NO • UNSURE — The soils criterion[8] for bog turtle habitat is met.
- • YES [X] NO • UNSURE — The vegetation criterion[8] for bog turtle habitat is met.
- • YES [X] NO • UNSURE — This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Hern — Investigator's Name (print)
[signature] — Investigator's Signature
11/18/2016 — Date

Contact info: cnern@jmt.com, 717-741-6252

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway Construction

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Twp

PNDI # PNDI- 602909 Potential conflict with USFWS species? • Y • N

ACTION AREA[2]

Action area size: ± 205.33ac Does the Phase 1 survey include all wetlands in the action area? • Y • N[3]

WETLAND ID: WET-4 **PHOTOS TAKEN:** • Yes • No **WETLAND SIZE:** 6.437 acres

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

• < 0.1 acre • 0.1-0.5 acre • >0.5 to <1 acre • 1-2 acres • 2-4 acres • 5+ acres • 10+ acres

WETLAND LOCATION: Lat 39.812605°N Long -77.037180°W

(approximate center of wetland) GPS Datum (check one): • NAD 27 • NAD 83 • WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 12/7/2016 Time In: 10:00 AM Time Out: 2:00 PM

Last precipitation: • < 24 hours • 1-7 days • > 1 week • unknown Drought conditions? • Y • N • Unknown

relatively dry prior to recent rains

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

• none of it – the entire wetland is within the property boundaries (skip next 2 questions)

• some of it – _____ acres or _____ % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

• none of it • all of it • part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

• all of it • part of it (at least _____ acres) • none of it

Are there any wetlands located off-site and close enough to be affected by this project? • Y • N • Unknown

If yes, *could* they be potential bog turtle habitat? • Y • N • Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Ag. Fields, Woodlands, riparian floodplains

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: • PEM 100 • PSS ____ • PFO ____ • POW ____

• Y • N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

excavated ditch alongside western boundary of wetland

• Y • N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

Mowing / maintenance of Ag Field adjacent to wetland

No persistent springs/seeps - hydrology perched atop fine clay layer

Project Name Eisenhower Drive Extension Project *Wetland* WET-4 *(con't)*

Hydrology

- ·Y ·X N Springs or seeps · ·visible or · ·likely? Watercress present? · ·Yes X ·No
- ·Y ·X N Spring houses in or adjacent to wetland?
- X Y · ·N Saturated soils present? If yes, year-round? · ·Likely X ·Unlikely · ·Unknown
- X Y · ·N Water visible on surface? Check all that apply: X ·small puddles/depressions (1-3" deep)
  · ·rivulets (___" deep) X ·larger pools/ponds (___" deep) -> excavated drainage ditch, 2-8 inches
- ·Y ·X N Evidence of flooding? If yes, describe indicators ___

Soils Mapping Unit (optional): Dy - Dunning silty clay loam
Field observations confirm mapped type? X ·YES · ·NO · ·Unknown

Soils – PEM Portion of Wetland			
Mucky[4]*?* · ·YES X ·NO	How much of it (PEM) is **mucky**? X ·<10% · ·10-29% · ·30-49% · ·50-70% · ·>70% 0 %	**Mucky** soils range in depth from: ___ to ___"	Most of the **mucky** part(s) of the wetland can be probed[5]: · ·3-5" · ·6-8" · ·9-11" · ·≥12"
Non-mucky[6]*?* X ·YES · ·NO	How much of it (PEM) is **non-mucky**? · ·<10% · ·10-29% · ·30-49% · ·50-70% X ·>70% 100 %	- No mucky soils observed - Excavated ditch and small puddles in wetland are all hard-bottomed substrates	

Soils – PSS and PFO Portions of Wetland			
N/A *Mucky*[4]*?* · ·YES · ·NO	How much of it is **mucky**? · ·<10% · ·10-29% · ·30-49% · ·50-70% · ·>70%	**Mucky** soils range in depth from: ___ to ___"	Most of the **mucky** part(s) of the wetland can be probed[5]: · ·3-5" · ·6-8" · ·9-11" · ·≥12"

Wetland Vegetation (characterize the wetland as a whole)

- No subsurface structural characteristics observed.

Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

very sparse
X ·sedges X ·rushes · ·skunk cabbage · ·cattail · ·sweet flag · ·jewelweed · ·sphagnum moss
· ·sensitive fern · ·rice cutgrass · ·tearthumb (X ·reed canary grass) · ·*Phragmites* · ·purple loosestrife
· ·alder · ·dogwood · ·red maple · ·willow · ·poison sumac X ·multiflora rose · · ___
Additional dominant species: goldenrods, Grant Ragweed, sparse shrubs

Herptiles

Were any bog turtles observed? · ·YES[7] X ·NO If yes, how many? ___
Other herptiles · ·observed · ·previously observed: none observed

Additional Comments/Observations: (use additional sheets if necessary)
Large emergent wetland heavily impacted by past/current agricultural use. No persistent groundwater-fed hydrology/mucky soils observed.

INVESTIGATOR'S OPINION

- · ·YES · X ·NO · ·UNSURE The hydrology criterion[8] for bog turtle habitat is met.
- · ·YES · X ·NO · ·UNSURE The soils criterion[8] for bog turtle habitat is met.
- X ·YES · ·NO · ·UNSURE The vegetation criterion[8] for bog turtle habitat is met.
- · ·YES · X ·NO · ·UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Nem — Craig Patterson Nem — 12/7/2016
Investigator's Name (print) — Investigator's Signature — Date

Contact info: cnern@jmt.com, 717-741-6252

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway Construction

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Twp

PNDI # PNDI- 602909 Potential conflict with USFWS species? • •Y •X N

ACTION AREA[2]

Action area size: 205.33ac **Does the Phase 1 survey include all wetlands in the action area?** X Y • •N[3]

WETLAND ID: WET-5 **PHOTOS TAKEN:** X Yes • •No **WETLAND SIZE:** 0.060 acres

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

X < 0.1 acre • •0.1-0.5 acre • •>0.5 to <1 acre • •1-2 acres • •2-4 acres • •5+ acres • •10+ acres

WETLAND LOCATION: Lat 39.817554°N Long −77.038882°W

(approximate center of wetland) GPS Datum (check one): • •NAD 27 X NAD 83 • •WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 12/07/2016 Time In: 9:00 AM Time Out: 9:50 AM

Last precipitation: • < 24 hours X 1-7 days • > 1 week • •unknown Drought conditions? • Y X N • •Unknown

Note: dry prior to recent rains

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

X none of it – the entire wetland is within the property boundaries (skip next 2 questions)

• •some of it – _____ acres or _____ % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

• •none of it • •all of it • •part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

• •all of it • •part of it (at least _____ acres) • •none of it

Are there any wetlands located off-site and close enough to be affected by this project? • Y • •N X Unknown

If yes, *could* they be potential bog turtle habitat? • Y • •N X Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Ag Fields, woodlands, riparian corridor, church

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: X PEM 100 • •PSS ____ • •PFO ____ • •POW ____

X Y • •N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

Depression adjacent to Ag. Field and Plum Creek, Access Road for Ag. Fields

X Y • •N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

Mowing / Maintenance of Ag. Field adjacent to wetland

Project Name Eisenhower Drive Extension Project *Wetland* WET-5 (con't)

Hydrology

- X Y • N — Springs or seeps • visible or X likely? Watercress present? • Yes X No (small depressional seep immediately adjacent to Plum Creek)
- • Y X N — Spring houses in or adjacent to wetland?
- X Y • N — Saturated soils present? If yes, year-round? X Likely • Unlikely • Unknown
- X Y • N — Water visible on surface? Check all that apply: • small puddles/depressions (___" deep)
  - • rivulets (___" deep) X larger pools/ponds (2-6' deep)
- X Y • N — Evidence of flooding? If yes, describe indicators: low-lying depressional area immediately adjacent to Plum Creek

Soils Mapping Unit (optional): Dy = Dunning silty clay loam
Field observations confirm mapped type? • YES • NO • Unknown

Soils – PEM Portion of Wetland			
Mucky[4]?	How much of it (PEM) is mucky?	Mucky soils range in depth from:	Most of the mucky part(s) of the wetland can be probed[5]:
X YES • NO	• <10% X 10-29% • 30-49% • 50-70% • >70% 15%	3 to 12"	• 3-5" X 6-8" • 9-11" • ≥12"
Non-mucky[6]?	How much of it (PEM) is non-mucky?	- 85% hard-bottomed Mucky soil area restricted to small seep right adjacent to stream, consisted of 'mucky' mineral soils,	
X YES • NO	• <10% • 10-29% • 30-49% • 50-70% X >70% 85%		

Soils – PSS and PFO Portions of Wetland			
Mucky[4]?	How much of it is mucky?	Mucky soils range in depth from:	Most of the mucky part(s) of the wetland can be probed[5]:
N/A • YES • NO	• <10% • 10-29% • 30-49% • 50-70% • >70%	____ to ____"	• 3-5" • 6-8" • 9-11" • ≥12"

Wetland Vegetation (characterize the wetland as a whole) - Little to no vegetative diversity and subsurface structure observed,
Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

- • sedges • rushes • skunk cabbage X cattail • sweet flag • jewelweed • sphagnum moss
- • sensitive fern • rice cutgrass X tearthumb X reed canary grass • *Phragmites* • purple loosestrife
- • alder • dogwood • red maple • willow • poison sumac • multiflora rose • ____

Additional dominant species: ____

- Little to no nesting habitat, no tunnels observed

Herptiles

Were any bog turtles observed? • YES[7] • NO If yes, how many? ____
Other herptiles • observed • previously observed: ____

Additional Comments/Observations: (use additional sheets if necessary)
Small wetland impacted by flooding from Plum Creek, small seep provides small area of mucky mineral soils, but highly unstable due to flooding from Plum Creek.

INVESTIGATOR'S OPINION

- X YES • NO • UNSURE — The hydrology criterion[8] for bog turtle habitat is met. - one small seep, but flooding from stream prevalent.
- X YES • NO • UNSURE — The soils criterion[8] for bog turtle habitat is met. - marginal soils and veg.
- X YES • NO • UNSURE — The vegetation criterion[8] for bog turtle habitat is met.
- • YES X NO • UNSURE — This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Hern — Investigator's Name (print)
Craig Patterson Hern — Investigator's Signature
12/07/2016 — Date

Contact info: chern@jmt.com, 717-741-6252

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway ~~Extens~~ Construction

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Twp

PNDI # PNDI- 602909 Potential conflict with USFWS species? • •Y •X N

ACTION AREA[2]

Action area size: 205.33 ac Does the Phase 1 survey include all wetlands in the action area? X Y • •N[3]

WETLAND ID: WET-6 PHOTOS TAKEN: X Yes • •No WETLAND SIZE: 8.229 acres

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

• < 0.1 acre • •0.1-0.5 acre • •>0.5 to <1 acre • •1-2 acres • •2-4 acres X 5+ acres • •10+ acres

WETLAND LOCATION: Lat 39.809643°N Long -77.036118°W

(approximate center of wetland) GPS Datum (check one): • •NAD 27 X NAD 83 • •WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 12/21/2016 Time In: 8:30 AM Time Out: 1:00 PM

Last precipitation: • < 24 hours X 1-7 days • •> 1 week • •unknown Drought conditions? • Y X N • •Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

X none of it – the entire wetland is within the property boundaries (skip next 2 questions)

• •some of it – _____ acres or _____ % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

• •none of it • •all of it • •part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

• •all of it • •part of it (at least _____ acres) • •none of it

Are there any wetlands located off-site and close enough to be affected by this project? • Y • •N X Unknown

If yes, *could* they be potential bog turtle habitat? • Y • •N X Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Ag. Fields, Woodlands, Residental properties

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: • •PEM ____ • •PSS ____ X PFO 100 • •POW ____

X Y ~~X~~ N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

Potential disturbance from residental developments to the south of wetland

• •Y X N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

- This wetland is contiguous with WET-4 to the north

Majority of wetland soils are hardbottomed, and some seasonal hydrology may perch above fine clay layer. Surface water observed in depressions within wetland largely hardbottomed, more vernal pool in nature.

Project Name Eisenhower Drive Extension Project *Wetland* WET-6 (con't)

Hydrology — One small spring within wetland

- X Y • N — Springs or seeps • X visible or • likely? Watercress present? • Yes X No
- • Y X N — Spring houses in or adjacent to wetland?
- X Y • N — Saturated soils present? If yes, year-round? X Likely • Unlikely • Unknown — highly limited, restricted to one spring/seep
- X Y • N — Water visible on surface? Check all that apply: • X small puddles/depressions (1-2" deep)
  - • rivulets (___" deep) X larger pools/ponds (1-5' deep)
- • Y X N — Evidence of flooding? If yes, describe indicators ___

Soils Mapping Unit (optional): Dy = Dunning silty clay loam
Field observations confirm mapped type? X YES • NO • Unknown

Soils – PEM Portion of Wetland			
Mucky[4]? • YES • NO	How much of it (PEM) is mucky? • <10% • 10-29% • 30-49% • 50-70% • >70%	Mucky soils range in depth from: ___ to ___"	Most of the mucky part(s) of the wetland can be probed[5]: • 3-5" • 6-8" • 9-11" • ≥12"
Non-mucky[6]? • YES • NO	How much of it (PEM) is non-mucky? • <10% • 10-29% • 30-49% • 50-70% • >70%	Mucky soil which drains depressional area	restricted to one small spring, north within hard-bottomed

N/A

Soils – PSS and PFO Portions of Wetland			
Mucky[4]? • YES • NO	How much of it is mucky? X <10% • 10-29% • 30-49% • 50-70% • >70% – 1%	Mucky soils range in depth from: 3 to 24"	Most of the mucky part(s) of the wetland can be probed[5]: • 3-5" • 6-8" • 9-11" • ≥12"

– 99% non-mucky

3 – 12" - variable

Wetland Vegetation (characterize the wetland as a whole)

Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

very sparse — flares observed — sparse

X sedges • rushes X skunk cabbage • cattail • sweet flag X jewelweed X sphagnum moss
• sensitive fern • rice cutgrass • tearthumb • reed canary grass • *Phragmites* • purple loosestrife
• alder X dogwood (silky) X red maple • willow • poison sumac X multiflora rose • • ___
Additional dominant species: Green ash, white oaks, box elder, parsnip, privet

Herptiles

Were any bog turtles observed? • YES[7] X NO If yes, how many? ___
Other herptiles • observed • previously observed: none observed

Additional Comments/Observations: (use additional sheets if necessary)

Large forested wetland contiguous w/ PEM wetland (WET-4) to the north. One small spring observed, but lack of persistent groundwater and mucky soils throughout majority of wetland.

INVESTIGATOR'S OPINION

- • YES X NO • UNSURE — The hydrology criterion[8] for bog turtle habitat is met. – one small spring observed.
- • YES X NO • UNSURE — The soils criterion[8] for bog turtle habitat is met. – lack of mucky soils throughout vast majority of wetland.
- • YES X NO • UNSURE — The vegetation criterion[8] for bog turtle habitat is met.
- • YES X NO • UNSURE — This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Nern — Craig Patterson Nern — 12/21/2016
Investigator's Name (print) — Investigator's Signature — Date

Contact info: cnern@jmt.com, 717-741-6252

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway / Roadway Improvements

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Township

PNDI # PNDI - 602909 Potential conflict with USFWS species? ☐ Y ☒ N

ACTION AREA[2]

Action area size: ~593 acres **Does the Phase 1 survey include all wetlands in the action area?** ☒ Y ☐ N[3]

WETLAND ID: WET-7 **PHOTOS TAKEN:** ☒ Yes ☐ No **WETLAND SIZE:** 0.352 **acres**

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

☐ < 0.1 acre ☒ 0.1-0.5 acre ☐ >0.5 to <1 acre ☐ 1-2 acres ☐ 2-4 acres ☐ 5+ acres ☐ 10+ acres

WETLAND LOCATION: Lat 39.801750°N Long -77.046041°W

(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 11/8/2017 Time In: 1200 Time Out: 1230

Last precipitation: ☒ < 24 hours ☐ 1-7 days ☐ > 1 week ☐ unknown Drought conditions? ☐ Y ☒ N ☐ Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

☐ none of it – the entire wetland is within the property boundaries (skip next 2 questions)

☒ some of it – _____ acres or 100 % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

☐ none of it ☒ all of it ☐ part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

☐ all of it ☐ part of it (at least _____ acres) ☒ none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐ Y ☒ N ☐ Unknown

If yes, *could* they be potential bog turtle habitat? ☐ Y ☐ N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Agricultural fields, woodlands

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒ PEM 100 ☐ PSS _____ ☐ PFO _____ ☐ POW _____

☒ Y ☐ N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

Ditching / stream alteration between Ag. fields

☒ Y ☐ N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

Agricultural activity almost immediately adjacent to wetland

Corn fields along south, soybean field to north

Wetland - silted into stream channel, no perennial groundwater spring/seeps, fed by stream baseflow & Ag. runoff

Project Name Eisenhower Drive Extension Project ***Wetland*** WET-7 (con't)

Hydrology

☐Y ☒N Springs or seeps ☐visible or ☐likely? Watercress present? ☐Yes ☒No

☐Y ☒N Spring houses in or adjacent to wetland? - within stream channel

☒Y ☐N Saturated soils present? If yes, year-round? ☒Likely ☐Unlikely ☐Unknown

☒Y ☐N Water visible on surface? Check all that apply: ☐small puddles/depressions (___" deep)

☐rivulets (___" deep) ☒larger ~~pools/ponds~~ channel (1-5" deep)

☐Y ☒N Evidence of flooding? If yes, describe indicators_____

Soils Mapping Unit (optional): Penlaw silt loam - Pa

Field observations confirm mapped type? ☒YES ☐NO ☐Unknown

Soils – PEM Portion of Wetland			
Mucky[4]? ☒YES ☐NO	How much of it (PEM) is **mucky**? ☒<10% 5% ☐10-29% ☐30-49% ☐50-70% ☐>70%	**Mucky** soils range in depth from: 3 to 5"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☒3-5" ☐6-8" ☐9-11" ☐≥12"
Non-mucky[6]? ☒YES ☐NO	How much of it (PEM) is **non-mucky**? ☐<10% ☐10-29% ☐30-49% ☐50-70% ☒>70% 95%		

Soils – PSS and PFO Portions of Wetland			
N/A *Mucky*[4]? ☐YES ☐NO	How much of it is **mucky**? ☐<10% ☐10-29% ☐30-49% ☐50-70% ☐>70%	**Mucky** soils range in depth from: ____ to ____"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐3-5" ☐6-8" ☐9-11" ☐≥12"

Wetland Vegetation (characterize the wetland as a whole)

Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

- little to no overwintering habitat
- subsurface structure no tunnels

very sparse

☒sedges ☒rushes ☐skunk cabbage ☒cattail ☐sweet flag ☐jewelweed ☐sphagnum moss

☐sensitive fern ☐rice cutgrass ☐tearthumb ☒reed canary grass ☐*Phragmites* ☐purple loosestrife

☐alder ☐dogwood ☐red maple ☐willow ☐poison sumac ☐multiflora rose ☐_____

Additional dominant species: false nettle

- no ideal nesting habitat

Herptiles

Were any bog turtles observed? ☐YES[7] ☒NO If yes, how many? _____

Other herptiles ☐observed ☐previously observed: none

Additional Comments/Observations: (use additional sheets if necessary)

PEM wetland within stream/depressional channel between large Ag. fields. Features stream baseflow, but no spring/seeps in adjacent area.

INVESTIGATOR'S OPINION

☐YES ☒NO ☐UNSURE The hydrology criterion[8] for bog turtle habitat is met.

☐YES ☒NO ☐UNSURE The soils criterion[8] for bog turtle habitat is met.

☒YES ☐NO ☐UNSURE The vegetation criterion[8] for bog turtle habitat is met.

☐YES ☐NO ☐UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Nem — Investigator's Name (print)

Craig Patterson Nem — Investigator's Signature

11/8/2017 — Date

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway / Road Improvements

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Township

PNDI # PNDI-602909 Potential conflict with USFWS species? ☐ Y ☒ N

ACTION AREA[2]

Action area size: ~593 acres **Does the Phase 1 survey include all wetlands in the action area?** ☒ Y ☐ N[3]

WETLAND ID: WET-8 **PHOTOS TAKEN:** ☒ Yes ☐ No **WETLAND SIZE:** 0.144 **acres**

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

☐ < 0.1 acre ☒ 0.1-0.5 acre ☐ >0.5 to <1 acre ☐ 1-2 acres ☐ 2-4 acres ☐ 5+ acres ☐ 10+ acres

WETLAND LOCATION: Lat 39.816101° N Long -77.030420° W

(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 11/8/2017 Time In: 1500 Time Out: 1530

Last precipitation: ☒ < 24 hours ☐ 1-7 days ☐ > 1 week ☐ unknown Drought conditions? ☐ Y ☒ N ☐ Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

☐ none of it – the entire wetland is within the property boundaries (skip next 2 questions)

☒ some of it – _____ acres or ~100 % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

☐ none of it ☒ all of it ☐ part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

☒ all of it ☐ part of it (at least _____ acres) ☐ none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐ Y ☒ N ☐ Unknown

If yes, *could* they be potential bog turtle habitat? ☐ Y ☐ N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Pasture lands, Ag. fields, residential properties

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒ PEM 100 ☐ PSS _____ ☐ PFO _____ ☐ POW _____

☒ Y ☐ N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

road to west of wetland, which continues as stream to west

☒ Y ☐ N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

Pasture surrounding wetland

Project Name Eisenhower Drive Extension Project *Wetland* WET-S *(con't)*

Hydrology

X Y ☐ N Springs or seeps X visible or ☐ likely ? Watercress present? X Yes ☐ No
☐ Y X N Spring houses in or adjacent to wetland?
X Y ☐ N Saturated soils present? If yes, year-round? X Likely ☐ Unlikely ☐ Unknown
X Y ☐ N Water visible on surface? Check all that apply: X small puddles/depressions (1-2' deep)
☐ rivulets (___" deep) X larger pools/ponds (2-6" deep) - springhead upwelling
☐ Y X N Evidence of flooding? If yes, describe indicators ___

Soils Mapping Unit (optional): Dunning silty clay loam - Dy
Field observations confirm mapped type? X YES ☐ NO ☐ Unknown

Soils – PEM Portion of Wetland			
Mucky[4]*?* X YES ☐ NO	How much of it (PEM) is **mucky**? ☐ <10% ☐ 10-29% X 30-49% 35% ☐ 50-70% ☐ >70%	**Mucky** soils range in depth from: 3 to 20"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐ 3-5" X 6-8" ☐ 9-11" ☐ ≥12"
Non-mucky[6]*?* X YES ☐ NO	How much of it (PEM) is **non-mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% X 50-70% 65% ☐ >70%		

Soils – PSS and PFO Portions of Wetland			
Mucky[4]*?* ☐ YES ☐ NO	How much of it is **mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70%	**Mucky** soils range in depth from: ___ to ___"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐ 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"

Wetland Vegetation (characterize the wetland as a whole)
Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

X sedges ☐ rushes ☐ skunk cabbage ☐ cattail ☐ sweet flag ☐ jewelweed ☐ sphagnum moss
☐ sensitive fern ☐ rice cutgrass ☐ tearthumb X reed canary grass ☐ *Phragmites* ☐ purple loosestrife
☐ alder ☐ dogwood ☐ red maple ☐ willow ☐ poison sumac ☐ multiflora rose ☐ ___
Additional dominant species: Xanthium at fringes, watercress

Herptiles
Were any bog turtles observed? ☐ YES[7] X NO If yes, how many? ___
Other herptiles ☐ observed ☐ previously observed: none

Additional Comments/Observations: (use additional sheets if necessary)
Spring-fed emergent wetland east of Church Road, feeds into WUS-3, which continues to the west

INVESTIGATOR'S OPINION

X YES ☐ NO ☐ UNSURE The hydrology criterion[8] for bog turtle habitat is met.
X YES ☐ NO ☐ UNSURE The soils criterion[8] for bog turtle habitat is met.
X YES ☐ NO ☐ UNSURE The vegetation criterion[8] for bog turtle habitat is met.
X YES ☐ NO ☐ UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Herr — Craig Patterson Herr — 11/8/2017
Investigator's Name (print) — Investigator's Signature — Date

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway / Road Improvements

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Township

PNDI # PNDI-602909 Potential conflict with USFWS species? ☐ Y ☒ N

ACTION AREA[2]

Action area size: ~593 acres **Does the Phase 1 survey include all wetlands in the action area?** ☒ Y ☐ N[3]

WETLAND ID: WET-9 **PHOTOS TAKEN:** ☒ Yes ☐ No **WETLAND SIZE:** 0.025 **acres**

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

☐ < 0.1 acre ☐ 0.1-0.5 acre ☐ >0.5 to <1 acre ☐ 1-2 acres ☐ 2-4 acres ☐ 5+ acres ☐ 10+ acres

WETLAND LOCATION: Lat 39.815139° N Long -77.035275° W

(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 11/8/2017 Time In: 1545 Time Out: 1615

Last precipitation: ☒ < 24 hours ☐ 1-7 days ☐ > 1 week ☐ unknown Drought conditions? ☐ Y ☒ N ☐ Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

☐ none of it – the entire wetland is within the property boundaries (skip next 2 questions)

☒ some of it – _____ acres or 100 % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

☐ none of it ☒ all of it ☐ part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

☐ all of it ☐ part of it (at least _____ acres) ☒ none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐ Y ☒ N ☐ Unknown

If yes, *could* they be potential bog turtle habitat? ☐ Y ☐ N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Ag. Fields, riparian stream corridor

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒ PEM 100 ☐ PSS _____ ☐ PFO _____ ☐ POW _____

☒ Y ☐ N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

Ag. Fields adjacent to wetland

☒ Y ☐ N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

Ag. Fields adjacent to wetland

Project Name Eisenhower Drive Ext. Project *Wetland* WET-9 *(con't)*

Hydrology

X Y ☐ N Springs or seeps ☐ visible or ☐ likely ? Watercress present? ☐ Yes X No
☐ Y X N Spring houses in or adjacent to wetland? - only in seep channel
X Y ☐ N Saturated soils present? If yes, year-round? X Likely ☐ Unlikely ☐ Unknown
X Y ☐ N Water visible on surface? Check all that apply: ☐ small puddles/depressions (___" deep)
from seep channel X rivulets (1-4" deep) ☐ larger pools/ponds (___" deep)
☐ Y X N Evidence of flooding? If yes, describe indicators ___

Soils Mapping Unit (optional): Dunning silty clay loam - Dy
Field observations confirm mapped type? X YES ☐ NO ☐ Unknown

Soils – PEM Portion of Wetland			
Mucky[4]*?* X YES ☐ NO	How much of it (PEM) is **mucky**? ☐ <10% X 10-29% ☐ 30-49% ☐ 50-70% ☐ >70% 15%	**Mucky** soils range in depth from: 3 to 8"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: X 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"
Non-mucky[6]*?* X YES ☐ NO	How much of it (PEM) is **non-mucky**? ☐ <10% X 10-29% ☐ 30-49% ☐ 50-70% ☐ >70% 85%	- Limited mucky soil - wetland drains into small hardbottomed trib to WUS-3	

Soils – PSS and PFO Portions of Wetland			
N/A *Mucky*[4]*?* ☐ YES ☐ NO	How much of it is **mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70%	**Mucky** soils range in depth from: ___ to ___"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐ 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"

Wetland Vegetation (characterize the wetland as a whole)
Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage). Little to no nesting habitat. Little to no subsurface structure

☐ sedges ☐ rushes ☐ skunk cabbage ☐ cattail ☐ sweet flag ☐ jewelweed ☐ sphagnum moss
☐ sensitive fern ☐ rice cutgrass ☐ tearthumb X reed canary grass ☐ *Phragmites* ☐ purple loosestrife
☐ alder X dogwood ☐ red maple ☐ willow ☐ poison sumac ☐ multiflora rose ☐ ___
Additional dominant species: Jap. honeysuckle, Rubus sticky dogwood

Herptiles
Were any bog turtles observed? ☐ YES[7] X NO If yes, how many? ___
Other herptiles ☐ observed ☐ previously observed: none

Additional Comments/Observations: (use additional sheets if necessary)
- Small wetland in depression adjacent to Ag. field, drains into trib to WUS-3

INVESTIGATOR'S OPINION

marginal X YES ☐ NO ☐ UNSURE The hydrology criterion[8] for bog turtle habitat is met.
☐ YES X NO ☐ UNSURE The soils criterion[8] for bog turtle habitat is met.
marginal X YES ☐ NO ☐ UNSURE The vegetation criterion[8] for bog turtle habitat is met.
☐ YES X NO ☐ UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Mern — Investigator's Name (print)
Craig Patterson Mern — Investigator's Signature
11/8/2017 — Date

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway / Road Improvements

Applicant/Landowner Name: Penn DOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Township

PNDI # PHOI - 602909 Potential conflict with USFWS species? ☐ Y ☒ N

ACTION AREA[2]

Action area size: ~593 acres **Does the Phase 1 survey include all wetlands in the action area?** ☒ Y ☐ N[3]

WETLAND ID: WET-1A **PHOTOS TAKEN:** ☒ Yes ☐ No **WETLAND SIZE:** 0.050 **acres**

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

☒ 0.1 acre ☐ 0.1-0.5 acre ☐ >0.5 to <1 acre ☐ 1-2 acres ☐ 2-4 acres ☐ 5+ acres ☐ 10+ acres

WETLAND LOCATION: Lat 39.815393° N Long -77.034802° W

(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 11/9/2017 Time In: 0920 Time Out: 0950

Last precipitation: ☒ < 24 hours ☐ 1-7 days ☐ > 1 week ☐ unknown Drought conditions? ☐ Y ☒ N ☐ Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

☐ none of it – the entire wetland is within the property boundaries (skip next 2 questions)

☒ some of it – _____ acres or 100 % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

☐ none of it ☒ all of it ☐ part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

☐ all of it ☐ part of it (at least _____ acres) ☒ none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐ Y ☒ N ☐ Unknown

If yes, *could* they be potential bog turtle habitat? ☐ Y ☐ N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Ag. Fields, riparian woodlands

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒ PEM 100 ☐ PSS _____ ☐ PFO _____ ☐ POW _____

☒ Y ☐ N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

Ag. fields adjacent to wetland

☒ Y ☐ N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

Ag. activities (clearing/planting) adjacent to wetland

- emergent wetland adjacent to riparian corridor, branches from adjacent canopy overhanging

WET-

Project Name Eisenhower Drive Ext. Project *Wetland* 19 *(con't)*

Hydrology

☐Y ☒N Springs or seeps ☐visible or ☐likely ? Watercress present? ☐Yes ☒No

☐Y ☒N Spring houses in or adjacent to wetland?

☒Y ☐N Saturated soils present? If yes, year-round? ☐Likely ☒Unlikely ☐Unknown — saturated soil restricted to upper 3 inches due to clay soil layer

☒Y ☐N Water visible on surface? Check all that apply: ☒small puddles/depressions (1" deep)

☐rivulets (___" deep) ☐larger pools/ponds (___" deep)

☐Y ☒N Evidence of flooding? If yes, describe indicators_____

Soils Mapping Unit (optional): Dunning silty clay loam - Dy

Field observations confirm mapped type? ☒YES ☐NO ☐Unknown

Soils – PEM Portion of Wetland			
Mucky[4]? ☐YES ☒NO	How much of it (PEM) is **mucky**? ☒<10% ☐10-29% ☐30-49% ☐50-70% ☒>70% 0%	**Mucky** soils range in depth from: ____ to ____"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐3-5" ☐6-8" ☐9-11" ☐≥12"
Non-mucky[6]? ☒YES ☐NO	How much of it (PEM) is **non-mucky**? ☐<10% ☐10-29% ☐30-49% ☐50-70% ☒>70% 100%		

Soils – PSS and PFO Portions of Wetland			
Mucky[4]? ☐YES ☐NO	How much of it is **mucky**? ☐<10% ☐10-29% ☐30-49% ☐50-70% ☐>70%	**Mucky** soils range in depth from: ____ to ____"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐3-5" ☐6-8" ☐9-11" ☐≥12"

N/A

Wetland Vegetation (characterize the wetland as a whole)

Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

☐sedges ☐rushes ☐skunk cabbage ☐cattail ☐sweet flag ☐jewelweed ☐sphagnum moss

☐sensitive fern ☐rice cutgrass ☐tearthumb ☒reed canary grass ☐*Phragmites* ☐purple loosestrife

☐alder ☒dogwood ☐red maple ☐willow ☐poison sumac ☐multiflora rose ☐_____

Additional dominant species: Rubus on fringes

Herptiles

Were any bog turtles observed? ☐YES[7] ☒NO If yes, how many? _____

Other herptiles ☐observed ☐previously observed: none

Additional Comments/Observations: (use additional sheets if necessary)

Marginal emergent wetland adjacent to riparian corridor and Ag. field. No perennial groundwater sources present.

INVESTIGATOR'S OPINION

☐YES ☒NO ☐UNSURE The hydrology criterion[8] for bog turtle habitat is met.

☐YES ☒NO ☐UNSURE The soils criterion[8] for bog turtle habitat is met.

☐YES ☒NO ☐UNSURE The vegetation criterion[8] for bog turtle habitat is met.

☐YES ☒NO ☐UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Hern — Investigator's Name (print)

Craig Patterson Hern — Investigator's Signature

11/9/2017 — Date

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhauer Drive Extension Project

Project type: New roadway / Roadway Improvements

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Township

PNDI # PNDI-602909 Potential conflict with USFWS species? ☐Y ☒N

ACTION AREA[2]

Action area size: ~593 acres **Does the Phase 1 survey include all wetlands in the action area?** ☒Y ☐N[3]

WETLAND ID: WET-11 **PHOTOS TAKEN:** ☒Yes ☐No **WETLAND SIZE:** 0.026 **acres**

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

☒< 0.1 acre ☐0.1-0.5 acre ☐>0.5 to <1 acre ☐1-2 acres ☐2-4 acres ☐5+ acres ☐10+ acres

WETLAND LOCATION: Lat 39.814317°N Long -77.005817°W

(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 11/13/17 Time In: 1130 Time Out: 1145

Last precipitation: ☒< 24 hours ☐1-7 days ☐> 1 week ☐unknown Drought conditions? ☐Y ☒N ☐Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

☐none of it – the entire wetland is within the property boundaries (skip next 2 questions)

☒some of it – _____ acres or 100 % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

☐none of it ☒all of it ☐part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

☐all of it ☐part of it (at least _____ acres) ☒none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐Y ☒N ☐ Unknown

If yes, *could* they be potential bog turtle habitat? ☐Y ☐N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Woodlands, fallow fields, recreational sports fields

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒PEM 100 ☐PSS _____ ☐PFO _____ ☐POW _____

☒Y ☐N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

Adjacent disturbance / development of recreational fields to east

☐Y ☒N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

_____

Project Name Eisenhower Drive Ext. Project *Wetland* WET-11 *(con't)*

Hydrology shallow seep feeds intermittent stream; some further down in stream as well

X Y ☐ N Springs or seeps: X visible or ☐ likely? Watercress present? X Yes ☐ No
☐ Y X N Spring houses in or adjacent to wetland? in seep channel
X Y ☐ N Saturated soils present? If yes, year-round? X Likely ☐ Unlikely ☐ Unknown
X Y ☐ N Water visible on surface? Check all that apply: ☐ small puddles/depressions (___" deep)
☐ rivulets (___" deep) ☐ ~~larger pools/ponds~~ (0-3 deep) seep channel
☐ Y X N Evidence of flooding? If yes, describe indicators: _____

Soils Mapping Unit (optional): Dunning silty clay loam - Dy
Field observations confirm mapped type? ☐ YES ☐ NO ☐ Unknown
Clay soils observed below 4-6 in.

Soils – PEM Portion of Wetland			
Mucky[4]? X YES ☐ NO	How much of it (PEM) is **mucky**? X <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70% 5%	**Mucky** soils range in depth from: 3 to 5"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: X 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"
Non-mucky[6]? X YES ☐ NO	How much of it (PEM) is **non-mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% X >70% 95%	- minimal, shallow mucky soil w/in seep/stream channel - hard bottomed beneath with rocky substrate	

Soils – PSS and PFO Portions of Wetland			
N/A *Mucky*[4]? ☐ YES ☐ NO	How much of it is **mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70%	**Mucky** soils range in depth from: ___ to ___"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐ 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"

Wetland Vegetation (characterize the wetland as a whole)
Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage). - little to no subsurface structure outside of seep channel

tussock sedge
X sedges ☐ rushes ☐ skunk cabbage ☐ cattail ☐ sweet flag ☐ jewelweed ☐ sphagnum moss
☐ sensitive fern ☐ rice cutgrass ☐ tearthumb X reed canary grass ☐ *Phragmites* ☐ purple loosestrife
☐ alder ☐ dogwood ☐ red maple ☐ willow ☐ poison sumac ☐ multiflora rose ☐ _____
Additional dominant species: Mountain mint, NY Ironweed, Monkey Flower

Herptiles
Were any bog turtles observed? ☐ YES[7] X NO If yes, how many? _____
Other herptiles ☐ observed ☐ previously observed: none

Additional Comments/Observations: (use additional sheets if necessary)
Small seep wetland at headwater of narrow stream that flows in forested uplands.

INVESTIGATOR'S OPINION
marginal X YES ☐ NO ☐ UNSURE The hydrology criterion[8] for bog turtle habitat is met.
☐ YES X NO ☐ UNSURE The soils criterion[8] for bog turtle habitat is met.
X YES ☐ NO ☐ UNSURE The vegetation criterion[8] for bog turtle habitat is met.
☐ YES X NO ☐ UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Heyn — Investigator's Name (print)
Craig Patterson Heyn — Investigator's Signature
11/13/2017 — Date

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway / Road Improvements

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Township

PNDI # PNDI - 602909 Potential conflict with USFWS species? ☐ Y ☒ N

ACTION AREA[2]

Action area size: ~593 acres **Does the Phase 1 survey include all wetlands in the action area?** ☒ Y ☐ N[3]

WETLAND ID: WET-12 **PHOTOS TAKEN:** ☒ Yes ☐ No **WETLAND SIZE:** 0.184 **acres**

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

☐ < 0.1 acre ☒ 0.1-0.5 acre ☐ >0.5 to <1 acre ☐ 1-2 acres ☐ 2-4 acres ☐ 5+ acres ☐ 10+ acres

WETLAND LOCATION: Lat 39.815059° N Long -77.006769° W

(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 11/13/17 Time In: 1330 Time Out: 1400

Last precipitation: ☒ < 24 hours ☐ 1-7 days ☐ > 1 week ☐ unknown Drought conditions? ☐ Y ☒ N ☐ Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

☐ none of it – the entire wetland is within the property boundaries (skip next 2 questions)

☒ some of it – _____ acres or 100 % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

☐ none of it ☒ all of it ☐ part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

☐ all of it ☐ part of it (at least _____ acres) ☒ none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐ Y ☒ N ☐ Unknown

If yes, *could* they be potential bog turtle habitat? ☐ Y ☐ N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Woodlands, commercial properties, fallow fields

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☐ PEM _____ ☐ PSS _____ ☒ PFO 100 ☐ POW _____

☒ Y ☐ N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

Potential impacts from sewerline ROW

☒ Y ☐ N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

Sewerline ROW clearing

Project Name Essenhaves Drive Ext. Project *Wetland* WET-12 *(con't)*

Hydrology

- Wetland driven by seasonal water table and surface runoff

☐Y ☒N Springs or seeps ☐visible or ☐likely? Watercress present? ☐Yes ☒No
☐Y ☒N Spring houses in or adjacent to wetland?
☒Y ☐N Saturated soils present? If yes, year-round? ☐Likely ☒Unlikely ☐Unknown
☒Y ☐N Water visible on surface? Check all that apply: ☒small puddles/depressions (1-3" deep)
☐rivulets (___" deep) ☐larger pools/ponds (___" deep)
☐Y ☒N Evidence of flooding? If yes, describe indicators ___

saturated soils below surface from seasonally high water table

Soils Mapping Unit (optional): Dunning silty clay loam - Dy
Field observations confirm mapped type? ☒YES ☐NO ☐Unknown

Soils – PEM Portion of Wetland			
Mucky[4]? ☐YES ☐NO	How much of it (PEM) is **mucky**? ☐<10% ☐10-29% ☐30-49% ☐50-70% ☐>70%	**Mucky** soils range in depth from: ___ to ___"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐3-5" ☐6-8" ☐9-11" ☐≥12"
N/A *Non-mucky*[6]? ☐YES ☐NO	How much of it (PEM) is **non-mucky**? ☐<10% ☐10-29% ☐30-49% ☐50-70% ☐>70%		

Soils – PSS and PFO Portions of Wetland			
Mucky[4]? ☐YES ☒NO	How much of it is **mucky**? ☒<10% ☐10-29% ☐30-49% ☐50-70% ☐>70% 0%	**Mucky** soils range in depth from: ___ to ___"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐3-5" ☐6-8" ☐9-11" ☐≥12"

no mucky soils, all hard-bottomed

Wetland Vegetation (characterize the wetland as a whole)
Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

No subsurface structural features observed

Sarques
☒sedges ☐rushes ☐skunk cabbage ☐cattail ☐sweet flag ☐jewelweed ☐sphagnum moss
☐sensitive fern ☐rice cutgrass ☐tearthumb ☒reed canary grass ☐*Phragmites* ☐purple loosestrife
☐alder ☐dogwood ☐red maple ☐willow ☐poison sumac ☒multiflora rose ☐___
Additional dominant species: Japanese stiltgrass, green ash, blackgum

Herptiles
Were any bog turtles observed? ☐YES[7] ☒NO If yes, how many? ___
Other herptiles ☐observed ☐previously observed: none

Additional Comments/Observations: (use additional sheets if necessary)
- Marginal wetland in woodlands, no perennial springs or seeps, no mucky soils

INVESTIGATOR'S OPINION

☐YES ☒NO ☐UNSURE The hydrology criterion[8] for bog turtle habitat is met.
☐YES ☒NO ☐UNSURE The soils criterion[8] for bog turtle habitat is met.
☒YES ☐NO ☐UNSURE The vegetation criterion[8] for bog turtle habitat is met.
☐YES ☐NO ☐UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Hern — Investigator's Name (print)
Craig Patterson Hern — Investigator's Signature
11/13/2017 — Date

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway / Roadway Improvements

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Township

PNDI # PHDI - 602909 Potential conflict with USFWS species? ☐ Y ☒ N

ACTION AREA[2]

Action area size: ~593 acres **Does the Phase 1 survey include all wetlands in the action area?** ☒ Y ☐ N[3]

WETLAND ID: WET-13 **PHOTOS TAKEN:** ☒ Yes ☐ No **WETLAND SIZE:** 0.524 **acres**

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

☐ < 0.1 acre ☐ 0.1-0.5 acre ☐ >0.5 to <1 acre ☐ 1-2 acres ☐ 2-4 acres ☐ 5+ acres ☐ 10+ acres

WETLAND LOCATION: Lat 39.817023°N Long -77.011222°W

(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 11/13/17 Time In: 1515 Time Out: 1615

Last precipitation: ☒ < 24 hours ☐ 1-7 days ☐ > 1 week ☐ unknown Drought conditions? ☐ Y ☒ N ☐ Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

☐ none of it – the entire wetland is within the property boundaries (skip next 2 questions)

☒ some of it – _____ acres or 100 % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

☐ none of it ☒ all of it ☐ part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

☐ all of it ☐ part of it (at least _____ acres) ☒ none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐ Y ☒ N ☐ Unknown

If yes, *could* they be potential bog turtle habitat? ☐ Y ☐ N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Ag. Fields, Commercial development, riparian woodlands

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒ PEM 100 ☐ PSS _____ ☐ PFO _____ ☐ POW _____

☒ Y ☐ N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

Site appears to be old pond that has silted in.

☐ Y ☒ N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

_____

Project Name Eisenhower Drive Ext. Project *Wetland* WET-13 *(con't)*

Hydrology no perennial groundwater springs/seeps observed

- ☐Y ☒N Springs or seeps ☐visible or ☐likely? Watercress present? ☐Yes ☒No
- ☐Y ☒N Spring houses in or adjacent to wetland?
- ☒Y ☐N Saturated soils present? If yes, year-round? ☐Likely ☒Unlikely ☐Unknown
- ☒Y ☐N Water visible on surface? Check all that apply: ☒small puddles/depressions (0-4" deep) ☐rivulets (___" deep) ☐larger pools/ponds (___" deep) old pond holding surface water
- ☐Y ☒N Evidence of flooding? If yes, describe indicators

Soils Mapping Unit (optional): Dunning silty clay loam - Dy
Field observations confirm mapped type? ☒YES ☐NO ☐Unknown

Soils – PEM Portion of Wetland			
Mucky[4]? ☒YES ☐NO	How much of it (PEM) is **mucky**? ☒<10% ☐10-29% ☐30-49% ☐50-70% ☐>70% 1%	**Mucky** soils range in depth from: 3 to 4"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☒~~3-5~~ 3-4" ☐6-8" ☐9-11" ☐≥12"
Non-mucky[6]? ☒YES ☐NO	How much of it (PEM) is **non-mucky**? ☐<10% ☐10-29% ☐30-49% ☐50-70% ☒>70% 99%	- Almost entirely hard bottomed	

Soils – PSS and PFO Portions of Wetland			
Mucky[4]? ☐YES ☐NO	How much of it is **mucky**? ☐<10% ☐10-29% ☐30-49% ☐50-70% ☐>70%	**Mucky** soils range in depth from: ___ to ___"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐3-5" ☐6-8" ☐9-11" ☐≥12"

Wetland Vegetation (characterize the wetland as a whole)
Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

sparse
☒sedges ☐rushes ☐skunk cabbage ☒cattail ☐sweet flag ☐jewelweed ☐sphagnum moss
☐sensitive fern ☐rice cutgrass ☐tearthumb ☒reed canary grass ☐*Phragmites* ☐purple loosestrife
☐alder ☐dogwood ☐red maple ☐willow ☐poison sumac ☐multiflora rose ☐___
Additional dominant species: Box elder on fringes

Herptiles
Were any bog turtles observed? ☐YES[7] ☒NO If yes, how many? ___
Other herptiles ☐observed ☐previously observed: none

Additional Comments/Observations: (use additional sheets if necessary)
PEM wetland west of WUS-8, north of Clarks Building. Appears to be an old pond with surface connection to WUS-8 from channel flowing north.

INVESTIGATOR'S OPINION
- ☐YES ☒NO ☐UNSURE The hydrology criterion[8] for bog turtle habitat is met.
- ☐YES ☒NO ☐UNSURE The soils criterion[8] for bog turtle habitat is met.
- ☒YES ☐NO ☐UNSURE The vegetation criterion[8] for bog turtle habitat is met.
- ☐YES ☒NO ☐UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Hern — Craig Patterson Hern — 11/13/2017
Investigator's Name (print) — Investigator's Signature — Date

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway / Roadway Improvements

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Township

PNDI # PNDI-602909 Potential conflict with USFWS species? ☐ Y ☒ N

ACTION AREA[2]

Action area size: ~593 acres **Does the Phase 1 survey include all wetlands in the action area?** ☒ Y ☐ N[3]

WETLAND ID: WET-14 **PHOTOS TAKEN:** ☒ Yes ☐ No **WETLAND SIZE:** 0.012 **acres**

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

☒ < 0.1 acre ☐ 0.1-0.5 acre ☐ >0.5 to <1 acre ☐ 1-2 acres ☐ 2-4 acres ☐ 5+ acres ☐ 10+ acres

WETLAND LOCATION: Lat 39.810993°N Long -77.013862°W
(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 11/14/17 Time In: 0945 Time Out: 1015

Last precipitation: ☐ < 24 hours ☒ 1-7 days ☐ > 1 week ☐ unknown Drought conditions? ☐ Y ☒ N ☐ Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

☐ none of it – the entire wetland is within the property boundaries (skip next 2 questions)

☒ some of it – _____ acres or 100 % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

☐ none of it ☒ all of it ☐ part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

☒ all of it ☐ part of it (at least _____ acres) ☐ none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐ Y ☒ N ☐ Unknown

If yes, *could* they be potential bog turtle habitat? ☐ Y ☐ N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Ag. fields, fallow fields, residential properties

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒ PEM 100 ☐ PSS _____ ☐ PFO _____ ☐ POW _____

☒ Y ☐ N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

Adjacent to roadway fill slope

☒ Y ☐ N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

Adjacent to Ag. field, mowed/cleared for Ag. up to edge

Project Name Eisenhower Drive Ext. Project *Wetland* WET-14 *(con't)*

Hydrology

☐Y ☒N Springs or seeps ☐visible or ☐likely ? Watercress present? ☐Yes ☒No
☐Y ☒N Spring houses in or adjacent to wetland? saturated soils below surface from high water table
☒Y ☐N Saturated soils present? If yes, year-round? ☐Likely ☒Unlikely ☐Unknown
☒Y ☐N Water visible on surface? Check all that apply: ☒small puddles/depressions (1-2" deep)
☐rivulets (___" deep) ☐larger pools/ponds (___" deep)
☐Y ☒N Evidence of flooding? If yes, describe indicators ___

Soils Mapping Unit (optional): Conestoga silt loam - CnA
Field observations confirm mapped type? ☒YES ☐NO ☐Unknown

Soils – PEM Portion of Wetland			
Mucky[4]? ☐YES ☒NO	How much of it (PEM) is **mucky**? ☒<10% ☐10-29% ☐30-49% ☐50-70% ☐>70% 0%	**Mucky** soils range in depth from: ___ to ___"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐3-5" ☐6-8" ☐9-11" ☐≥12"
Non-mucky[6]? ☒YES ☐NO	How much of it (PEM) is **non-mucky**? ☐<10% ☐10-29% ☐30-49% ☐50-70% ☒>70% 100%		

Soils – PSS and PFO Portions of Wetland			
Mucky[4]? ☐YES ☐NO	How much of it is **mucky**? ☐<10% ☐10-29% ☐30-49% ☐50-70% ☐>70%	**Mucky** soils range in depth from: ___ to ___"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐3-5" ☐6-8" ☐9-11" ☐≥12"

Wetland Vegetation (characterize the wetland as a whole)
Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

☐sedges ☐rushes ☐skunk cabbage ☒cattail ☐sweet flag ☐jewelweed ☐sphagnum moss
☐sensitive fern ☒rice cutgrass ☐tearthumb ☐reed canary grass ☐*Phragmites* ☐purple loosestrife
☐alder ☐dogwood ☐red maple ☐willow ☐poison sumac ☐multiflora rose ☐___
Additional dominant species: ___

Herptiles
Were any bog turtles observed? ☐YES[7] ☒NO If yes, how many? ___
Other herptiles ☐observed ☐previously observed: none

Additional Comments/Observations: (use additional sheets if necessary)
Small wetland adjacent to Kindig Lane fill slope, no perennial groundwater sources

INVESTIGATOR'S OPINION

☐YES ☒NO ☐UNSURE The hydrology criterion[8] for bog turtle habitat is met.
☐YES ☒NO ☐UNSURE The soils criterion[8] for bog turtle habitat is met.
☐YES ☒NO ☐UNSURE The vegetation criterion[8] for bog turtle habitat is met.
☐YES ☒NO ☐UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Hein Craig Patterson Hein 11/14/2017
Investigator's Name (print) Investigator's Signature Date

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway / Roadway Improvements

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Township

PNDI # PNDI - 602909 Potential conflict with USFWS species? ☐ Y ☒ N

ACTION AREA[2]

Action area size: ~593 acres **Does the Phase 1 survey include all wetlands in the action area?** ☒ **Y** ☐ **N[3]**

WETLAND ID: WET-15 **PHOTOS TAKEN:** ☒ **Yes** ☐ **No** **WETLAND SIZE:** 0.104 **acres**

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

☐ < 0.1 acre ☒ 0.1-0.5 acre ☐ >0.5 to <1 acre ☐ 1-2 acres ☐ 2-4 acres ☐ 5+ acres ☐ 10+ acres

WETLAND LOCATION: Lat 39.818632° N Long -77.011498° W

(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 11/14/2017 Time In: 1130 Time Out: 1200

Last precipitation: ☐ < 24 hours ☒ 1-7 days ☐ > 1 week ☐ unknown Drought conditions? ☐ Y ☒ N ☐ Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

☐ none of it – the entire wetland is within the property boundaries (skip next 2 questions)

☒ some of it – _____ acres or 100 % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

☐ none of it ☒ all of it ☐ part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

☐ all of it ☐ part of it (at least _____ acres) ☒ none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐ Y ☒ N ☐ Unknown

If yes, *could* they be potential bog turtle habitat? ☐ Y ☐ N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Ag. fields, riparian woodlands

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒ PEM 100 ☐ PSS _____ ☐ PFO _____ ☐ POW _____

☒ Y ☐ N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

compaction from past/current agricultural activities

☒ Y ☐ N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

mowing adjacent to and across small path of wetland

Project Name Eisenhower Drive Ext. Project *Wetland* WET-15 *(con't)*

Hydrology

☐ Y ☒ N Springs or seeps ☐ visible or ☐ likely ? Watercress present? ☐ Yes ☒ No

☐ Y ☒ N Spring houses in or adjacent to wetland?

only at surface, shallow → ☒ Y ☐ N Saturated soils present? If yes, year-round? ☐ Likely ☒ Unlikely ☐ Unknown

☒ Y ☐ N Water visible on surface? Check all that apply: ☒ small puddles/depressions (1-2" deep)

☐ rivulets (___" deep) ☐ larger pools/ponds (___" deep)

☐ Y ☒ N Evidence of flooding? If yes, describe indicators_____

Soils Mapping Unit (optional): Dunning silty clay loam - Dy

Field observations confirm mapped type? ☒ YES ☐ NO ☐ Unknown

Soils – PEM Portion of Wetland			
Mucky[4]*?* ☐ YES ☒ NO	How much of it (PEM) is **mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70% 0%	**Mucky** soils range in depth from: ____ to ____"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐ 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"
Non-mucky[6]*?* ☒ YES ☐ NO	How much of it (PEM) is **non-mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☒ >70% 100%	Soils entirely	hard bottomed

Soils – PSS and PFO Portions of Wetland			
N/A *Mucky*[4]*?* ☐ YES ☐ NO	How much of it is **mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70%	**Mucky** soils range in depth from: ____ to ____"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐ 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"

Wetland Vegetation (characterize the wetland as a whole)

Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage). no subsurface structural features observed

sparse ☒ sedges ☐ rushes ☐ skunk cabbage ☐ cattail ☐ sweet flag ☐ jewelweed ☐ sphagnum moss

☐ sensitive fern ☐ rice cutgrass ☐ tearthumb ☒ reed canary grass ☐ *Phragmites* ☐ purple loosestrife

☐ alder ☐ dogwood ☐ red maple ☐ willow ☐ poison sumac ☐ multiflora rose ☐_____

Additional dominant species: false nettle, fringed by box elder, silver maple, green ash

Herptiles

Were any bog turtles observed? ☐ YES[7] ☒ NO If yes, how many? _____

Other herptiles ☐ observed ☐ previously observed: none

Additional Comments/Observations: (use additional sheets if necessary)

PEM wetland adjacent to Ag. field and riparian woodlands east of WUS-8. No perennial groundwater hydrology observed.

INVESTIGATOR'S OPINION

☐ YES ☒ NO ☐ UNSURE The hydrology criterion[8] for bog turtle habitat is met.

☐ YES ☒ NO ☐ UNSURE The soils criterion[8] for bog turtle habitat is met.

☒ YES ☐ NO ☐ UNSURE The vegetation criterion[8] for bog turtle habitat is met.

☐ YES ☒ NO ☐ UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Herm — Craig Patterson Herm — 11/14/2017

Investigator's Name (print) Investigator's Signature Date

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway / Roadway Improvements

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Township

PNDI # PNDI - 602909 Potential conflict with USFWS species? ☐ Y ☒ N

ACTION AREA[2]

Action area size: ~593 acres **Does the Phase 1 survey include all wetlands in the action area?** ☒ **Y** ☐ **N[3]**

WETLAND ID: WET-16 **PHOTOS TAKEN:** ☒ **Yes** ☐ **No** **WETLAND SIZE:** 0.051 **acres**

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

☒ < 0.1 acre ☐ 0.1-0.5 acre ☐ >0.5 to <1 acre ☐ 1-2 acres ☐ 2-4 acres ☐ 5+ acres ☐ 10+ acres

WETLAND LOCATION: Lat 39.817505° N Long -77.010216° W

(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 11/14/2017 Time In: 1245 Time Out: 1315

Last precipitation: ☐ < 24 hours ☒ 1-7 days ☐ > 1 week ☐ unknown Drought conditions? ☐ Y ☒ N ☐ Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

☐ none of it – the entire wetland is within the property boundaries (skip next 2 questions)

☒ some of it – _____ acres or 100 % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

☐ none of it ☒ all of it ☐ part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

☐ all of it ☐ part of it (at least _____ acres) ☒ none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐ Y ☒ N ☐ Unknown

If yes, *could* they be potential bog turtle habitat? ☐ Y ☐ N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Ag. fields, riparian woodlands

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒ PEM 100 ☐ PSS _____ ☐ PFO _____ ☐ POW _____

☒ Y ☐ N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

compaction from past/current agricultural activities

☒ Y ☐ N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

mowing adjacent to wetland

Project Name Eisenhower Drive Ext. Project *Wetland* WET-16 *(con't)*

Hydrology

☐ Y ☒ N Springs or seeps ☐ visible or ☐ likely ? Watercress present? ☐ Yes ☒ No

☐ Y ☒ N Spring houses in or adjacent to wetland?

only at surface shallow ☒ Y ☐ N Saturated soils present? If yes, year-round? ☐ Likely ☒ Unlikely ☐ Unknown

☒ Y ☐ N Water visible on surface? Check all that apply: ☒ small puddles/depressions (1-2" deep)

☐ rivulets (___" deep) ☐ larger pools/ponds (___" deep)

☐ Y ☒ N Evidence of flooding? If yes, describe indicators_____

Soils Mapping Unit (optional): Dunarng silty clay loam - Dy

Field observations confirm mapped type? ☒ YES ☐ NO ☐ Unknown

Soils – PEM Portion of Wetland			
Mucky[4]*?* ☐ YES ☒ NO	How much of it (PEM) is **mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70% 0%	**Mucky** soils range in depth from: ____ to ____"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐ 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"
Non-mucky[6]*?* ☒ YES ☐ NO	How much of it (PEM) is **non-mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☒ >70% 100%	entirely hardbottomed.	

Soils – PSS and PFO Portions of Wetland			
N/A *Mucky*[4]*?* ☐ YES ☐ NO	How much of it is **mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70%	**Mucky** soils range in depth from: ____ to ____"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐ 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"

Wetland Vegetation (characterize the wetland as a whole)

Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

no subsurface structural features observed

☐ sedges ☐ rushes ☐ skunk cabbage ☐ cattail ☐ sweet flag ☐ jewelweed ☐ sphagnum moss

☐ sensitive fern ☐ rice cutgrass ☐ tearthumb ☒ (reed canary grass) ☐ *Phragmites* ☐ purple loosestrife

☐ alder ☐ dogwood ☐ red maple ☐ willow ☐ poison sumac ☐ multiflora rose ☐_____

Additional dominant species: Silver maples along fringes

Herptiles

Were any bog turtles observed? ☐ YES[7] ☒ NO If yes, how many? _____

Other herptiles ☐ observed ☐ previously observed: none

Additional Comments/Observations: (use additional sheets if necessary)

PEM wetland adjacent to Ag. field and riparian woodlands east of WCS-8. No perennial groundwater hydrology observed.

INVESTIGATOR'S OPINION

☐ YES ☒ NO ☐ UNSURE The hydrology criterion[8] for bog turtle habitat is met.

☐ YES ☒ NO ☐ UNSURE The soils criterion[8] for bog turtle habitat is met.

☒ YES ☐ NO ☐ UNSURE The vegetation criterion[8] for bog turtle habitat is met.

☐ YES ☒ NO ☐ UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Hero — Investigator's Name (print)

Craig Patterson Hero — Investigator's Signature

11/14/2017 — Date

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: Eisenhower Drive Extension Project

Project type: New Roadway / Roadway Improvements

Applicant/Landowner Name: PennDOT 8-0

County: Adams Quad: McSherrystown Township/Municipality: Conewago Township

PNDI # PNDI - 602909 Potential conflict with USFWS species? ☐ Y ☒ N

ACTION AREA[2]

Action area size: ~593 acres **Does the Phase 1 survey include all wetlands in the action area?** ☒ Y ☐ N[3]

WETLAND ID: WET-17 **PHOTOS TAKEN:** ☒ Yes ☐ No **WETLAND SIZE:** 0.865 **acres**

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

☐ < 0.1 acre ☐ 0.1-0.5 acre ☒ >0.5 to <1 acre ☐ 1-2 acres ☐ 2-4 acres ☐ 5+ acres ☐ 10+ acres

WETLAND LOCATION: Lat 39.821773°N Long -77.005057°W

(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 11/14/2017 Time In: 1500 Time Out: 1600

Last precipitation: ☐ < 24 hours ☒ 1-7 days ☐ > 1 week ☐ unknown Drought conditions? ☐ Y ☒ N ☐ Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

☐ none of it – the entire wetland is within the property boundaries (skip next 2 questions)

☒ some of it – _____ acres or 100 % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

☐ none of it ☒ all of it ☐ part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

☐ all of it ☐ part of it (at least _____ acres) ☒ none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐ Y ☒ N ☐ Unknown

If yes, *could* they be potential bog turtle habitat? ☐ Y ☐ N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Ag. fields, commercial properties, railroad

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒ PEM 100 ☐ PSS _____ ☐ PFO _____ ☐ POW _____

☒ Y ☐ N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

Wetland formed in existing ditch

☐ Y ☒ N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

_____

Wetland consists of a drainage ditch that conveys stormwater north to Slagle Run

Project Name Eisenhower Drive Ext. Project *Wetland* WET-17 *(con't)*

Hydrology no perennial springs or seeps

- ☐ Y ☒ N Springs or seeps ☐ visible or ☐ likely ? Watercress present? ☐ Yes ☐ No
- ☐ Y ☒ N Spring houses in or adjacent to wetland?
- ☐ Y ☒ N Saturated soils present? If yes, year-round? ☐ Likely ☐ Unlikely ☐ Unknown
- ☒ Y ☐ N Water visible on surface? Check all that apply: ☒ small puddles/depressions (0.5" deep)
  ☐ rivulets (___" deep) ☐ larger pools/ponds (___" deep)
- ☒ Y ☐ N Evidence of flooding? If yes, describe indicators bent veg. from stormwater flows

hydrology driven by surface water/ stormwater collection in depressional channel

Soils Mapping Unit (optional): Dunning silty clay loam (Dy)
Field observations confirm mapped type? ☒ YES ☐ NO ☐ Unknown

Soils – PEM Portion of Wetland			
Mucky[4]? ☐ YES ☒ NO	How much of it (PEM) is **mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70% 0%	**Mucky** soils range in depth from: ___ to ___"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐ 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"
Non-mucky[6]? ☒ YES ☐ NO	How much of it (PEM) is **non-mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70% 100%	entirely no mucky soils	hard-bottomed,

Soils – PSS and PFO Portions of Wetland			
N/A *Mucky*[4]? ☐ YES ☐ NO	How much of it is **mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70%	**Mucky** soils range in depth from: ___ to ___"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐ 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"

Wetland Vegetation (characterize the wetland as a whole) no subsurface structural characteristics observed.
Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

☐ sedges ☐ rushes ☐ skunk cabbage ☐ cattail ☐ sweet flag ☐ jewelweed ☐ sphagnum moss
☐ sensitive fern ☐ rice cutgrass ☐ tearthumb ☒ reed canary grass ☐ *Phragmites* ☐ purple loosestrife
☐ alder ☐ dogwood ☐ red maple ☐ willow ☐ poison sumac ☐ multiflora rose ☐ ___
Additional dominant species: Blue vervain, sparse black cherry in ditch

Herptiles
Were any bog turtles observed? ☐ YES[7] ☒ NO If yes, how many? ___
Other herptiles ☐ observed ☐ previously observed: none

Additional Comments/Observations: (use additional sheets if necessary)
Wetland ditch that conveys stormwater, no persistent groundwater-fed hydrology or mucky soils

INVESTIGATOR'S OPINION

- ☐ YES ☒ NO ☐ UNSURE The hydrology criterion[8] for bog turtle habitat is met.
- ☐ YES ☒ NO ☐ UNSURE The soils criterion[8] for bog turtle habitat is met.
- marginal ☒ YES ☐ NO ☐ UNSURE The vegetation criterion[8] for bog turtle habitat is met.
- ☐ YES ☒ NO ☐ UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Craig Patterson Nem — Investigator's Name (print)
Craig Patterson Nem — Investigator's Signature
11/14/2017 — Date

Appendix E
PFBC Scientific Collectors Permit and Chapter 75.4 Endangered Species Permit

COMMONWEALTH OF PENNSYLVANIA

PENNSYLVANIA FISH AND BOAT COMMISSION
Bureau of Fisheries - Environmental Services Division - Natural Diversity Section
595 E. Rolling Ridge Drive
Bellefonte, PA 16823

Permit Issue Date:April 25, 2018 | Permit Print Date:April 30, 2018 |

THIS IS TO CERTIFY THAT ACTING UNDER THE PROVISIONS OF THE FISH AND BOAT CODE, ACT 1980-175 AMENDED:

Name and Town of Permit Owner	Age	Height	Weight	Eyes	Hair	PA Fishing License #
CRAIG NEIN, JMT-ENVIRONMENTAL SCIENTIST YORK, PA	36	5ft. 10In.	150	Blue	Brown	019-161-272

APPROVED ASSISTANTS TO THE ABOVE PERMIT OWNER:

Name and Town	Age	Height	Weight	Eyes	Hair	PA Fishing License #
COLEMAN KLINE, NEW OXFORD, PA	23	5ft. 11In.	0	Brown	Brown	016-633-190
James Morris, Glen Rock, PA	37	6ft. 1In.	0	Blue	Blonde	066-401-126

AND ASSISTANTS LISTED, ARE HEREBY AUTHORIZED TO COLLECT FISH OR OTHER AQUATIC LIFE FOR SCIENTIFIC PURPOSES AND IS LIMITED TO THOSE ACTIVITIES AS DESCRIBED IN RESPONSE TO THE APPLICATION PROJECT DETAILS SECTION. THIS PERMIT IS VALID FOR COLLECTION PROJECTS: (SEE ATTACHED SHEET)

UNLESS OTHERWISE PERMITTED, ALL SPECIES MUST BE RELEASED UNHARMED AT SITE OF CAPTURE. A SCIENTIFIC COLLECTOR'S PERMIT DOES NOT GRANT THE PERSONS THE AUTHORITY TO TRESPASS ON PRIVATE PROPERTY.

THIS PERMIT IS GOOD FOR THE CALENDAR YEAR **2018** OR DATE SPECIFIED IN PERMIT CONDITIONS, WHICHEVER COMES FIRST.

THE OWNER OF THIS PERMIT AND LISTED ASSISTANTS MUST BE THE HOLDERS OF A RESIDENT OR NONRESIDENT FISHING LICENSE WHICH MUST BE CARRIED WITH THEM AT ALL TIMES, ALONG WITH THIS PERMIT, OR A COPY THEREOF. PROPER NOTIFICATION MUST BE GIVEN TO THE REGIONAL LAW ENFORCEMENT OFFICE COVERING THE COUNTY IN WHICH COLLECTIONS ARE BEING CONDUCTED. OFFICES ARE OPEN MONDAY THRU FRIDAY BETWEEN 8:00AM AND 4:00PM

IN WITNESS THEREOF, I HAVE HEREUNTO SET MY HAND AND AFFIXED THE OFFICAL SEAL OF THE COMMISSION THE DAY AND DATE FIRST ABOVE WRITTEN

PENNSYLVANIA FISH & BOAT COMMISSION

Christopher A. Wilson

EXECUTIVE DIRECTOR OR DESIGNEE

Permit Conditions/Comments From PFBC Natural Diversity Section Staff

ANY THREATENED OR ENDANGERED SPECIES, AS LISTED IN 58 PA CODE CHAPTERS 73 AND 75, CAPTURED BY THE PERMITTEE OR ANY ASSISTANT SHALL BE IMMEDIATELY RETURNED TO THE ENVIRONMENT FROM WHICH IT WAS COLLECTED. PERSONS COLLECTING FISH, REPTILES, OR AMPHIBIANS ON STATE GAME LANDS MUST NOTIFY THE APPROPRIATE PENNSYLVANIA GAME COMMISSION (WWW.PGC.STATE.PA.US) REGIONAL OFFICE BY PHONE AT LEAST 24 HOURS PRIOR TO COMMENCING THOSE ACTIVITIES. ANY OTHER AREA MUST BE APPROVED BY THE PENNSYLVANIA FISH AND BOAT COMMISSION.

Special Comments:

Authorized Collection Projects:

PROJECT NAME:	Arnott Fen Wetland Restoration Project
PROJECT COLLECTION JUSTIFICATION:	Other (give details in project details box)
SAMPLE SIZE APPROVED:	Zero Collected; Capture and Release All
PROJECT DETAILS:	JMT has been contracted by the National Park Service to provide wetland restoration services at the Arnott Fen site, which is located within the Delaware Water Gap National Recreation Area. The project includes wetland restoration design to be used as mitigation for impacts from construction of the new Susquehanna to Roseland Electric Transmission Line constructed through the Delaware Water Gap. The project will restore habitat for rare, threatened, and critically endangered species, and includes cultural resource investigations; wetland, forest, and benthic studies; permitting; modeling; and NEPA evaluations. The National Park Service proposes to remove an old road bed that bisects the fen, thereby restoring hydrologic and biologic connectivity. The Arnott Fen site is known to support a population of bog turtles; therefore, Phase 2-style bog turtle surveys and/or monitoring will be conducted throughout the life of the project whenever necessary to ensure that bog turtles are not harmed or impacted during any site investigations or restoration activities. APPROVED FOR BOG TURTLE SURVEYS FOR ARNOTT FEN WETLAND RESTORATION PROJECT, DEWA, MIDDLE SMITHFIELD TWP, MONROE CO
TAXONS COLLECTED:	Reptiles
CRITTER DISPOSITION:	Capture, Process, Live Release
PROJECT COUNTIES:	MONROE
PROJECT WATERS:	

PROJECT NAME:	Maple Spring Farms Subdivision Project - Warner and Workinger Roads
PROJECT COLLECTION JUSTIFICATION:	Other (give details in project details box)
SAMPLE SIZE APPROVED:	Zero Collected; Capture and Release All
PROJECT DETAILS:	The Maple Spring Farms Partnership (MSFP) contracted JMT in 2017 to provide Wetland Delineation and Phase 1 Bog Turtle Habitat Assessment Services for a proposed subdivision project along Warner and Workinger Roads in Chanceford Township, York County, PA. The project area included three existing parcels, totaling approximately 226 acres. There is a known bog turtle site within the project area, and bog turtles were already found during field work for the 2017 project. Through coordination with MSFP, JMT's Qualified Bog Turtle Surveyor may conduct sporadic Phase 2-style bog turtle surveys on the property in 2018. No formalized Phase 2 or Phase 3 surveys are planned at this time. The coordinates provided represent the approximate center of the overall project area. APPROVED FOR BOG TURTLE SURVEYS (INCLUDING TRAPPING) AT MAPLE FARM SUBDIVISION PROJECT, CAPTURE, MARK, MEASURE, PHOTODOCUMENT AND RELEASE. ALL NEW RECORDS ARE TO BE REPORTED USING THE PFBC SCP ONLINE SYSTEM WITHIN 48 HOURS OF DISCOVERY
TAXONS COLLECTED:	Reptiles

CRITTER DISPOSITION:	Capture, Process, Live Release
PROJECT COUNTIES:	YORK
PROJECT WATERS:	West Branch Toms Run

PROJECT NAME:	SR 2003-01B (Kemmertown Road) over Cherry Creek Bridge Replacement
PROJECT COLLECTION JUSTIFICATION:	Other (give details in project details box)
SAMPLE SIZE APPROVED:	Zero Collected; Capture and Release All
PROJECT DETAILS:	ennDOT District 5-0 has proposed the replacement of the bridge carrying S.R. 2003-01B (Kemmertown Road) over Cherry Creek in Hamilton Township, Monroe County, PA. The construction work is scheduled to run from Fall 2017 through spring 2018. Because known bog turtle wetlands occur adjacent to the structure, Qualified Bog Turtle Surveyors will be required to monitor project construction, including installment of exclusionary barriers. Ben Berra of Skelly & Loy, Inc. is the Project Manager in charge of Bog Turtle Construction Monitoring for this project. JMT's Qualfied Bog Turtle Surveyor will assist SKelly & Loy with bog turtle monitoring as needed. Any bog turtles found will be processed and marked, and then released into wetland habitat away from the work area, following coordination with PFBC and USFWS. APPROVED FOR BOG TURTLE CONSTRUCTION MONITORING SURVEYS FOR THE SR 2003-01B (Kemmertown Road) over Cherry Creek Bridge Replacement PROJECT, HABILTON TWP, MONROE COUNTY. CAPTURE, MARK, MEASURE, PHOTODOCUMENT AND RELEASE IN APPROPRIATE HABITAT AFTER PROCESSING. ALL NEW RECORDS ARE TO BE REPORTED USING THE PFBC SCP ONLINE SYSTEM WITHIN 48 HOURS OF DISCOVERY
TAXONS COLLECTED:	Reptiles
CRITTER DISPOSITION:	Capture, Process, Live Release
PROJECT COUNTIES:	MONROE
PROJECT WATERS:	Cherry Creek

PROJECT NAME:	Eisenhower Drive Extension Project
PROJECT COLLECTION JUSTIFICATION:	Other (give details in project details box)
SAMPLE SIZE APPROVED:	Zero Collected; Capture and Release All
PROJECT DETAILS:	PennDOT District 8-0 has proposed the Eisenhower Drive Extension Project in York and Adams Counties. The overall study area for the proposed project is located within Penn Township and Hanover Borough in York County, and McSherrystown Borough and Conewago, Mount Pleasant, and Union Townships in Adams County. The study area is generally bordered by S.R. 116 to the south, Bender and Chapel Roads to the west, and Carlisle Street to the east. JMT completed a Phase 1 Bog Turtle Assessment for the study area and identified 2 wetlands with potential bog turtle habitat (WET-2 and WET-8). Both wetlands are located in Conewago Township of Adams County. WET-2 is located east of Plum Creek and southwest of Tiffany Court (39.807153 N, -77.034159 W). WET-8 is located just east of Church Street (39.816112 N, -77.030425 W). A formalized Phase 2 Bog Turtle Survey has been proposed to be conducted within these two wetlands. Turtles would be captured by hand, processed, and released at the point of capture. APPROVED FOR BOG TURTLE SURVEYS AT EISENHOWER DRIVE EXTENSION PROJECT, CONEWAGO TWP, ADAMS CO
TAXONS COLLECTED:	Reptiles
CRITTER DISPOSITION:	Capture, Process, Live Release
PROJECT COUNTIES:	ADAMS
PROJECT WATERS:	Plum Creek, Unt To South Branch Codorus Creek (shaeffer hollow

PROJECT NAME:	Valley Road Bog Turtle Surveys
PROJECT COLLECTION JUSTIFICATION:	Other (give details in project details box)
SAMPLE SIZE APPROVED:	Zero Collected; Capture and Release All

PROJECT DETAILS:	Potential bog turtle habitat has been identified by Craig Patterson Nein to the north of Valley Road and west of Glen Valley Road in Shrewsbury Township, York County (39.804110 N, -76.700539 W), which is right near the home of Mr. Nein. Although no formal Phase 2 Bog Turtle Survey is proposed, permission from the associated landowners has been obtained to conduct Phase 2-style bog turtle surveys in the wetland. There is no associated project/disturbance planned in or in the vicinity of the wetlands in the area, and the surveys are only proposed for the purposes of gathering data. APPROVED FOR BOG TURTLE SURVEYS FOR VALLEY ROAD PROJECT, SHREWSBURY TWP, YORK COUNTY
TAXONS COLLECTED:	Reptiles
CRITTER DISPOSITION:	Capture, Process, Live Release
PROJECT COUNTIES:	YORK
PROJECT WATERS:	

THIS PERMIT IS GOOD FOR THE CALENDAR YEAR **2018** OR DATE SPECIFIED IN PERMIT CONDITIONS, WHICHEVER COMES FIRST

NETS LARGER THAN 4 FEET SQUARE OR 4 FEET IN DIAMETER LISTED ON THIS PERMIT HAVE BEEN APPROVED FOR USE BY THE PERMIT HOLDER. THE REQUIREMENT FOR ADDITIONAL NETTING PERMITS FOR ANY OF THE BELOW LISTED NETS EXCEEDING MAXIMUM SIZE HAS BEEN WAIVED

THIS IS TO CERTIFY THAT ACTING UNDER THE PROVISIONS OF CHAPTER 29 OF THE FISH AND BOAT CODE, ACT 1980-175 AMENDED, 30 PA C.S.§ 2902, THE OWNER OF THIS PERMIT IS HEREBY AUTHORIZED TO POSSESS THE FOLLOWING NET/NETS/ELECTROFISHING GEAR. ALL NETS SET WITHIN A COLLECTION DAY MUST BE TENDED DAILY.

Permit Authorized Gears Listed By User Project Name

Project Name	Gear Type	Qty:	Gear Details
Arnott Fen Wetland Restoration Project			
	VES (visual encounter surveys)	0	Surveys will include visual encounter surveys and hand capture techniques (Phase 2 Bog Turtle Surveys)
Eisenhower Drive Extension Project			
	Hand Capture (Search-And-Sieze)	0	
	VES (visual encounter surveys)	0	
Maple Spring Farms Subdivision Project - Warner and Workinger Roads			
	VES (visual encounter surveys)	0	
	Hand Capture (Search-And-Sieze)	0	
SR 2003-01B (Kemmertown Road) over Cherry Creek Bridge Replacement			
	VES (visual encounter surveys)	0	
	Hand Capture (Search-And-Sieze)	0	
Valley Road Bog Turtle Surveys			
	Hand Capture (Search-And-Sieze)	0	
	VES (visual encounter surveys)	0	

Pennsylvania Fish & Boat Commission

Natural Diversity Section
595 E. Rolling Ridge Drive
Bellefonte, PA 16823-9620
(814) 359-5237 Fax: (814) 359-5175

April 30, 2018

CRAIG P NEIN
JMT
220 SAINT CHARLES WAY,
YORK, PA 17402

RE: Chapter 75.4 Special Permit for Collection of Threatened and Endangered Species
Scientific Collectors' Permits No. 2018-03-0100 Type 3

Dear CRAIG P NEIN:

THIS IS TO CERTIFY THAT, pursuant to PA 58 Code §75.4,

CRAIG P NEIN

and approved Scientific Collectors' Permit (SCP) assistants, are hereby granted written permission to search for, trap, measure, and mark threatened and endangered species under Pennsylvania Fish and Boat Commission jurisdiction in exception of the prohibition of possession. Specifically, this permit grants permission for CRAIG P NEIN to survey for the following species:

Common Name	***Scientific Name***
Bog Turtle	*Glyptemys muhlenbergii*

Upon capture, these specimens will be measured, marked, photo-documented, and immediately released to the point of capture and reported to the Commission within 48 hours via the Scientific Collectors' Permit online reporting system. This Special Permit **DOES NOT AUTHORIZE** any individual to kill or take from the wild endangered or threatened species. However, this permit authorizes valid Scientific Collector Permit holders (Types I, II and III) and their approved SCP assistants to engage in scientific collecting for endangered or threatened species at the locations approved on their 2018 Scientific Collectors' Permit. **Any endangered or threatened species captured during these permitted activities shall be released as authorized by the conditions outlined in your Scientific Collector's permit.** Deceased specimens, in whole or parts, shall be reported immediately to the Pennsylvania Fish & Boat Commission to determine disposition. This permit, unless sooner revoked, is effective immediately and expires with the 2018 Scientific Collectors' Permit.

FOR THE PENNSYLVANIA FISH AND BOAT COMMISSION

Christopher A. Urban, Chief
Natural Diversity Section

Appendix F
Phase 2 Bog Turtle Survey Data Forms

Transcriber initials:____
QC initials:____

BOG TURTLE POPULATION MONITORING:
TURTLE SURVEY FORM

Northeast regional bog turtle working group, last updated on 12/07/2015

A. Site Information, Date and Time, and Surveyors (*optional fields)

Adams County PA

1. ***Monitoring Site ID***: WET-2 ***Site Name****: Eisenhower Drive Ext ***Town/County****: Conewago Township
2. ***Core Habitat Area (ac)***: 1.91 ***Survey Area (ac)***: 1.91 (or Township)
3. ***Survey Date***: 5/1/18 ***Required Survey Time****[1]: 11.46 person hours * Note: total wetland size ≈ 5.05 ac. - DSA for official Phase 2 survey effort ≈ 1.91 ac.
4. ***Site Visit Number (1, 2, or 3)*** _____
5. ***Lead Surveyor(s)***: Craig Patterson MEM
   Assistant Surveyor(s): Jim Marrs, Coleman Kline

[1]to determine the appropriate amount of search time based on the number of surveys and size of the survey area refer to the chart on the last page of the instructions document.

B. Environmental Factors and Number of Surveyors

6. ***Start Conditions***:
   Start Time: 1050
   Rain *(circle one)*: (n) l i h
   Air Temp *(shade)*: 22.8 °C (°F or C)
   Wind Rank *(see chart →)*: 2
   Cloud Cover *(circle one)*: (c) p o
   Num of Surveyors: 3

7. ***End Conditions***:
   End Time: 1510
   Rain *(circle one)*: (n) l i h
   Air Temp (shade): 28.9 °C (°F or C)
   Wind Rank *(see chart →)*: 2
   Cloud Cover *(circle one)*: (c) p o
   Num of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

C. Survey Results

8. ***Stopped Searching***[2] ***(min)***: 60
9. ***Effort Hrs***: 6.28 person hours/acre (person hours[3]/area)

10. ***Other Turtle Species Observed:***
- Snapping Turtle (1 live adult)
- Spotted Turtle (dead adult fem.)

11. ***Herpetofauna Species Observed:*** *(4 letter abbreviation)*
- Northern green frogs
- 1 dead Eastern garter snake

[2]Num of person minutes not actively searching
[3]Num surveyors x num of hours

12. ***# Live Bog Turtles Captured During the Survey Time:*** 0
    Num Live Males:_____
    Num Live Females:_____
    Num Live Juveniles:_____
13. ***# Live Bog Turtles Captured After the Survey Time:*** 0
14. ***# Dead Bog Turtles:*** 0
15. ***# Undetermined gender/est. age***_____
16. ***Signs of Bog Turtles (y/n)***:_____
    Describe:_____

17. ***Comments:***
- Searches conducted outside DSA in small suitable pockets, and visual sweeps for basking individuals also performed in wetland areas outside the DSA.

Lunch Break: 1320-1340

Transcriber initials:____
QC initials:____

BOG TURTLE POPULATION MONITORING:
TURTLE SURVEY FORM

Northeast regional bog turtle working group, last updated on 12/07/2015

A. Site Information, Date and Time, and Surveyors (*optional fields)

Adams County PA

1. ***Monitoring Site ID***: WET-2 ***Site Name****: Eisenhower Drive Ext ***Town/County****: Conewago Township (or Township)
2. ***Core Habitat Area (ac)***: 1.91 ***Survey Area (ac)*** (if different): 1.91
3. ***Survey Date***: 5/10/18 ***Required Survey Time****[1]: 11.46 person hours
   Note: total wetland size = 5.057 acres DSA for official Phase 2 Survey Effort = 1.91 acres
4. ***Site Visit Number (1, 2, or 3)*** 2
5. ***Lead Surveyor(s)***: Craig Pattersan Nem
   Assistant Surveyor(s): Jim Morris, Coleman Kline

[1]to determine the appropriate amount of search time based on the number of surveys and size of the survey area refer to the chart on the last page of the instructions document.

B. Environmental Factors and Number of Surveyors

6. ***Start Conditions***:
   Start Time *(military)*: 0830
   Rain *(circle one)*: (n) l i h
   Air Temp *(shade)*: 18.2°C (C or °F)
   Wind Rank *(see chart →)*: 3
   Cloud Cover *(circle one)*: c p (o)
   Num of Surveyors: 3

7. ***End Conditions***:
   End Time *(military)*: 1230
   Rain *(circle one)*: (n) l i h
   Air Temp (shade): 25.0°C (C or °F)
   Wind Rank *(see chart →)*: 2-3
   Cloud Cover *(circle one)*: c (p) o
   Num of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

C. Survey Results

8. ***Stopped Searching***[2] *(min.)*: 0
9. ***Effort Hrs***: 6.28 person hours/acre (person hours[3]/area)

10. ***Other Turtle Species Observed:***
    Spotted Turtle (1 live, 1 dead)

11. ***Herpetofauna Species Observed:*** *(4 letter abbreviation)*
    - Spotted Turtle
    - Northern Green Frog
    - Northern two-lined salamander

[2]Num of person minutes not actively searching
[3]Num surveyors x num of hours

12. ***# Live Bog Turtles Captured During the Survey Time:*** 0
    Num Live Males:_____
    Num Live Females:_____
    Num Live Juveniles:_____

13. ***# Live Bog Turtles Captured After the Survey Time:*** 0

14. ***# Dead Bog Turtles:*** 0

15. ***# Undetermined gender/est. age*** N/A

16. ***Signs of Bog Turtles (y/n):*** no
    Describe:_____

17. ***Comments:***
    Searches also conducted outside DSA in small suitable pockets and visual sweeps for basking individuals performed outside DSA.

    Note: light rain from 1045-1110.

Transcriber initials:____
QC initials:____

Form 3 of 4

BOG TURTLE POPULATION MONITORING:
TURTLE SURVEY FORM

Northeast regional bog turtle working group, last updated on 12/07/2015

A. Site Information, Date and Time, and Surveyors (*optional fields)

Adams County PA

1. ***Monitoring Site ID***: WET-2 ***Site Name****: Eisenhower Drive Ext ***Town/County****: Conewago Township (or Township)
2. ***Core Habitat Area (ac)***: 1.91 ***Survey Area (ac)***: 1.91
3. ***Survey Date***: 5/22/18 ***Required Survey Time****[1]: 11.46 person hours
4. ***Site Visit Number (1, 2, or 3)*** 3
5. ***Lead Surveyor(s)***: Craig Patterson Mern
   Assistant Surveyor(s): Jim Morris Coleman Kline

Note: Total wetland size is 5.057 acres; DSA for off-site Phase 2 survey is 1.91 acres

[1]to determine the appropriate amount of search time based on the number of surveys and size of the survey area refer to the chart on the last page of the instructions document.

B. Environmental Factors and Number of Surveyors

6. ***Start Conditions***:
   Start Time: 1040
   Rain *(circle one)*: n (l) i h
   Air Temp *(shade)*: 19.3°C (°F or C)
   Wind Rank *(see chart →)*: 2
   Cloud Cover *(circle one)*: c p (o)
   Num of Surveyors: 3

7. ***End Conditions***:
   End Time: 1455
   Rain *(circle one)*: (n) l i h
   Air Temp (shade): 21.5°C (°F or C)
   Wind Rank *(see chart →)*: 2
   Cloud Cover *(circle one)*: c p (o)
   Num of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

C. Survey Results

8. ***Stopped Searching[2] (min)***: 30
9. ***Effort Hrs***: 6.41 person hours/acre (person hours[3]/area)
10. ***Other Turtle Species Observed***: Spotted Turtle (1 live, 1 dead) Snapping Turtle
11. ***Herpetofauna Species Observed:*** *(4 letter abbreviation)*: Spotted turtles, snapping turtle, Am. toad, green frogs, bullfrog, northern water snakes (2)

[2]Num of person minutes not actively searching
[3]Num surveyors x num of hours

12. ***# Live Bog Turtles Captured During the Survey Time***: 0
    Num Live Males:____
    Num Live Females:____
    Num Live Juveniles:____
13. ***# Live Bog Turtles Captured After the Survey Time***: 0
14. ***# Dead Bog Turtles***: 0
15. ***# Undetermined gender/est. age*** N/A
16. ***Signs of Bog Turtles (y/n)***: no
    Describe:____

17. ***Comments:***
- Light rain during survey from 1040 to 1200, then stopped for remainder of survey
- Dead adult female Spotted Turtle found in main ditch below treatment plant. Turtle appeared intact, no obvious signs of predation.

Transcriber initials:____
QC initials:____

Form 4 of 4

BOG TURTLE POPULATION MONITORING:
TURTLE SURVEY FORM

Northeast regional bog turtle working group, last updated on 12/07/2015

A. Site Information, Date and Time, and Surveyors (*optional fields)

Adams County PA

1. *Monitoring Site ID*: WET-2 *Site Name**: Eisenhower Drive Ext *Town/County**: Conewago Township (or Township)
2. *Core Habitat Area (ac)*: 1.91 *Survey Area (ac)* (if different): 1.91
3. *Survey Date*: 6/7/18 *Required Survey Time**[1]: 11.46 person hours
4. *Site Visit Number* ~~*(1, 2, or 3)*~~ 4 Note: total wetland size = 5.057 acres, DSA for official Phase 2 Survey Effort = 1.91 acres
5. *Lead Surveyor(s)*: Craig Patterson Hern
   Assistant Surveyor(s): Jim Mavris, Coleman Kline

[1]to determine the appropriate amount of search time based on the number of surveys and size of the survey area refer to the chart on the last page of the instructions document.

B. Environmental Factors and Number of Surveyors

6. ***Start Conditions***:
   Start Time *(military)*: 1020
   Rain *(circle one)*: (n) l i h
   Air Temp *(shade)*: 25.7°C (C or °F)
   Wind Rank *(see chart →)*: 2
   Cloud Cover *(circle one)*: c (p) o
   Num of Surveyors: 3

7. ***End Conditions***:
   End Time *(military)*: 1500
   Rain *(circle one)*: (n) l i h
   Air Temp (shade): 23.3°C (C or °F)
   Wind Rank *(see chart →)*: 2
   Cloud Cover *(circle one)*: c (p) o
   Num of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

C. Survey Results

8. ***Stopped Searching***[2] *(min.)*: 60
9. ***Effort Hrs***: 6.81 person hours/acre
   (person hours[3]/area)

10. ***Other Turtle Species Observed:***
    Eastern Painted Turtle (hatchling)
    3 Spotted Turtles
11. ***Herpetofauna Species Observed:***
    (4 letter abbreviation)
    - Spotted Turtle
    - Eastern Painted Turtle
    - Northern Green Frog

[2]Num of person minutes not actively searching
[3]Num surveyors x num of hours

12. ***# Live Bog Turtles Captured During the Survey Time:*** 0
    Num Live Males:
    Num Live Females:
    Num Live Juveniles:
13. ***# Live Bog Turtles Captured After the Survey Time:*** 0
14. ***# Dead Bog Turtles:*** 0
15. ***# Undetermined gender/est. age***
16. ***Signs of Bog Turtles (y/n)***: no
    Describe:

17. ***Comments:***
    *Searches also conducted outside DSA in small suitable pockets, and visual sweeps for basking individuals performed outside DSA
    * 1 spotted turtle egg observed in area of wetland where two spotted turtles observed basking during today's survey

Transcriber initials:____
QC initials:____

Form 1 of 4

BOG TURTLE POPULATION MONITORING:
TURTLE SURVEY FORM

Northeast regional bog turtle working group, last updated on 12/07/2015

A. Site Information, Date and Time, and Surveyors (*optional fields)

Adams County, PA

1. ***Monitoring Site ID***: WET-8 ***Site Name****: Eisenhower Drive Extension ***Town/County****: Conewago Township (or Township)
2. ***Core Habitat Area (ac)***: 0.15 ***Survey Area (ac)*** (if different): 0.15
3. ***Survey Date***: 5/1/18 ***Required Survey Time****[1]: 0.9 person hours
4. ***Site Visit Number (1, 2, or 3)*** 1
5. ***Lead Surveyor(s)***: Craig Pattersan Hein
   Assistant Surveyor(s): Jim Morris, Coleman Kline

[1]to determine the appropriate amount of search time based on the number of surveys and size of the survey area refer to the chart on the last page of the instructions document.

B. Environmental Factors and Number of Surveyors

6. ***Start Conditions***:
   Start Time *(military)*: 0940
   Rain *(circle one)*: (n) l i h
   Air Temp *(shade)*: 17.8°C (C or °F)
   Wind Rank *(see chart →)*: 2
   Cloud Cover *(circle one)*: (c) p o
   Num of Surveyors: 3

7. ***End Conditions***:
   End Time *(military)*: 1020
   Rain *(circle one)*: (n) l i h
   Air Temp (shade): 20.1°C (C or °F)
   Wind Rank *(see chart →)*: 2
   Cloud Cover *(circle one)*: (c) p o
   Num of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy.

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

C. Survey Results

8. ***Stopped Searching***[2] *(min.)*: 0
9. ***Effort Hrs***: 13.3 person hours/acre (person hours[3]/area)

10. ***Other Turtle Species Observed:***
    none

11. ***Herpetofauna Species Observed:*** *(4 letter abbreviation)*
    none

12. ***# Live Bog Turtles Captured During the Survey Time:*** 0
    Num Live Males:_____
    Num Live Females:_____
    Num Live Juveniles:_____

13. ***# Live Bog Turtles Captured After the Survey Time:*** 0
14. ***# Dead Bog Turtles:*** 0
15. ***# Undetermined gender/est. age***_____
16. ***Signs of Bog Turtles (y/n)***: no
    Describe:_____

17. ***Comments:***
- Deep groundwater spring upwelling/seep in center of wetland
- perennial groundwater hydrology
- Minor algae observed

[2]Num of person minutes not actively searching
[3]Num surveyors x num of hours

Transcriber initials:____
QC initials:____

Form 2 of 4

BOG TURTLE POPULATION MONITORING:
TURTLE SURVEY FORM

Northeast regional bog turtle working group, last updated on 12/07/2015

A. Site Information, Date and Time, and Surveyors (*optional fields)

Adams County PA

1. ***Monitoring Site ID***: WET-8 ***Site Name****: Eisenhower Drive Ext ***Town/County****: Conewago Township (or Township)
2. ***Core Habitat Area (ac)***: 0.15 ***Survey Area (ac)***: 0.15
3. ***Survey Date***: 5/10/18 ***Required Survey Time****[1]: 0.9 person hours
4. ***Site Visit Number (1, 2, or 3)*** 2
5. ***Lead Surveyor(s)***: Craig Patterson Mem
   Assistant Surveyor(s): Jim Morris, Coleman Kline

[1]to determine the appropriate amount of search time based on the number of surveys and size of the survey area refer to the chart on the last page of the instructions document.

B. Environmental Factors and Number of Surveyors

6. ***Start Conditions***:
   Start Time: 1315
   Rain *(circle one)*: (n) l i h
   Air Temp *(shade)*: 25.5°C (°F or C)
   Wind Rank *(see chart →)*: 3
   Cloud Cover *(circle one)*: c p (o)
   Num of Surveyors: 3

7. ***End Conditions***:
   End Time: 1355
   Rain *(circle one)*: (n) l i h
   Air Temp (shade): 24.7°C (°F or C)
   Wind Rank *(see chart →)*: 3
   Cloud Cover *(circle one)*: c p (o)
   Num of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

C. Survey Results

8. ***Stopped Searching[2] (min)***: 0
9. ***Effort Hrs***: 13.3 person hours/acre (person hours[3]/area)
10. ***Other Turtle Species Observed:*** Common snapping turtle
11. ***Herpetofauna Species Observed:*** *(4 letter abbreviation)* Snapping Turtle

[2]Num of person minutes not actively searching
[3]Num surveyors x num of hours

12. ***# Live Bog Turtles Captured During the Survey Time***: 0
    Num Live Males:____
    Num Live Females:____
    Num Live Juveniles:____
13. ***# Live Bog Turtles Captured After the Survey Time***: 0
14. ***# Dead Bog Turtles***: 0
15. ***# Undetermined gender/est. age*** N/A
16. ***Signs of Bog Turtles (y/n)***: no
    Describe:____

17. ***Comments:***
- Snapping Turtle observed on surface w/in wetland.

Transcriber initials:____
QC initials:____

BOG TURTLE POPULATION MONITORING:
TURTLE SURVEY FORM

Northeast regional bog turtle working group, last updated on 12/07/2015

A. Site Information, Date and Time, and Surveyors (*optional fields)

Adams County, PA

1. ***Monitoring Site ID***: WET-8 ***Site Name****: Eisenhower Drive Ext. ***Town/County****: Conewago Township (or Township)
2. ***Core Habitat Area (ac)***: 0.15 ***Survey Area (ac)***: 0.15
3. ***Survey Date***: 5/22/18 ***Required Survey Time****[1]: 0.9 person hours
4. ***Site Visit Number (1, 2, or 3)*** 3
5. ***Lead Surveyor(s)***: Craig Patterson Hern
   Assistant Surveyor(s): Jim Morris, Coleman Kline

[1]to determine the appropriate amount of search time based on the number of surveys and size of the survey area refer to the chart on the last page of the instructions document.

B. Environmental Factors and Number of Surveyors

6. ***Start Conditions***:
   Start Time: 0920
   Rain *(circle one)*: n (l) i h
   Air Temp *(shade)*: 19.3°C (°F or C)
   Wind Rank *(see chart →)*: 2-3
   Cloud Cover *(circle one)*: c p (o)
   Num of Surveyors: 3

7. ***End Conditions***:
   End Time: 1013
   Rain *(circle one)*: (n) l i h
   Air Temp (shade): 19.3°C (°F or C)
   Wind Rank *(see chart →)*: 2
   Cloud Cover *(circle one)*: c p (o)
   Num of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

C. Survey Results

8. ***Stopped Searching***[2] ***(min)***: 0
9. ***Effort Hrs***: 17.67 person hours / acre
   (person hours[3]/area)

10. ***Other Turtle Species Observed:***
    none

11. ***Herpetofauna Species Observed:***
    (4 letter abbreviation)
    unid. snake (escaped from assistant before ID could be confirmed)

[2]Num of person minutes not actively searching
[3]Num surveyors x num of hours

12. ***# Live Bog Turtles Captured During the Survey Time:*** 0
    Num Live Males:____
    Num Live Females:____
    Num Live Juveniles:____

13. ***# Live Bog Turtles Captured After the Survey Time:*** 0
14. ***# Dead Bog Turtles:*** 0
15. ***# Undetermined gender/est. age*** N/A
16. ***Signs of Bog Turtles (y/n)***: no
    Describe:____

17. ***Comments:***
    - Light rain from 0920-0930

Transcriber initials:____
QC initials:____

Form 4 of 4

BOG TURTLE POPULATION MONITORING:
TURTLE SURVEY FORM

Northeast regional bog turtle working group, last updated on 12/07/2015

A. Site Information, Date and Time, and Surveyors (*optional fields)

Adams County, PA

1. ***Monitoring Site ID***: WET-8 ***Site Name****: Eisenhower Drive Ext ***Town/County****: Conewago Township (or Township)
2. ***Core Habitat Area (ac):*** 0.15 ***Survey Area (ac)*** (if different): 0.15
3. ***Survey Date***: 6/7/18 ***Required Survey Time****[1]: 0.9 person hours
4. ***Site Visit Number*** ~~***(1, 2, or 3)***~~ 4
5. ***Lead Surveyor(s)***: Craig Patterson Hem
   Assistant Surveyor(s): Jim Morris, Coleman Kline

[1]to determine the appropriate amount of search time based on the number of surveys and size of the survey area refer to the chart on the last page of the instructions document.

B. Environmental Factors and Number of Surveyors

6. ***Start Conditions***:
   Start Time *(military)*: 0910
   Rain *(circle one)*: (n) l i h
   Air Temp *(shade)*: 17.8°C (C or °F)
   Wind Rank *(see chart →)*: 2
   Cloud Cover *(circle one)*: c (p) o
   Num of Surveyors: 3

7. ***End Conditions***:
   End Time *(military)*: 0955
   Rain *(circle one)*: (n) l i h
   Air Temp (shade): 20.8°C (C or °F)
   Wind Rank *(see chart →)*: 2
   Cloud Cover *(circle one)*: c (p) o
   Num of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

C. Survey Results

8. ***Stopped Searching***[2] *(min.)*: 0
9. ***Effort Hrs***: 15.0 person hours/acre (person hours[3]/area)

10. ***Other Turtle Species Observed:***
    none

11. ***Herpetofauna Species Observed:*** *(4 letter abbreviation)*
    none

12. ***# Live Bog Turtles Captured During the Survey Time:*** 0
    Num Live Males:____
    Num Live Females:____
    Num Live Juveniles:____

13. ***# Live Bog Turtles Captured After the Survey Time:*** 0

14. ***# Dead Bog Turtles:*** 0

15. ***# Undetermined gender/est. age***____

16. ***Signs of Bog Turtles (y/n):*** no
    Describe:____

17. ***Comments:***

[2]Num of person minutes not actively searching
[3]Num surveyors x num of hours

Appendix G
Professional Qualifications

QUALIFICATIONS

Craig Patterson Nein – Mr. Nein has a bachelor's degree in Environmental Science from the University of Mary Washington and a master's degree in Biology from Towson University. He has over 8 years of experience in the natural resources field. Prior to joining JMT, Mr. Nein worked for the U.S. Fish and Wildlife Service (USFWS) and the Maryland Department of Natural Resources (MD DNR) where he focused on the conservation and management of threatened and endangered reptiles and amphibians. Specifically, Mr. Nein has extensive experience conducting a variety of work with the federally threatened bog turtle, including habitat monitoring and restoration, Phase 2 (visual) surveys, radio-telemetry studies, and trapping studies. During his time at USFWS, Mr. Nein conducted a bog turtle site prioritization project in order to prioritize management, conservation, and survey efforts at all known bog turtle sites in Maryland. He is recognized as a Qualified Bog Turtle Surveyor in the states of Pennsylvania and Maryland. Mr. Nein has completed a 40 hour Wetland Delineation Training based on the U.S. Army Corps of Engineers' methodology and has also been trained to perform Phase 1 Bog Turtle Habitat Assessments.

James Morris, P.E. – Mr. Morris is a habitat restoration specialist in JMT's Water Resources group. He has designed and constructed multiple projects in Southern York County, including one major stream restoration in the Pierceville Run watershed and multiple restorations on the East, West and South Branches of the Codorus Creek in support of restoration efforts by Watershed Alliance of York and the Izaak Walton League. In addition to this design work, he has conducted or assisted with Phase I bog turtle screenings for at least 10 stream restoration projects in York County as part of the permitting of those projects, as well as conducted phase I screenings at wetland functions and values assessments at multiple sites in Pennsylvania and New Jersey at Delaware Water Gap National Recreation Area adjacent to or within known bog turtle wetlands. He has conducted habitat assessment for red bellied turtles within the East Branch Codorus watershed in association with projects near or adjacent to Lake Redman, and assessment of wood turtle habitats adjacent to known sites within the South Branch Codorus watershed. In addition to this work, he assists in the conduction of timed meander searches as part of T&E species assessment and restoration, and conducts physical habitat assessments for herpetofauna, macroinvertebrates, and fish associated with restoration projects. Mr. Morris has experience capturing bog turtles at known sites and has received training in conducting Phase 2 Bog Turtle Surveys.

QUALIFICATIONS

Coleman Kline – Mr. Kline has a bachelor's degree in Environmental Studies from Franklin and Marshall College. He has one year of experience in the natural resources field focusing on stream restoration, wetland delineation, and habitat assessment efforts. Mr. Kline has experience conducting macroinvertebrate sampling during his time in the south pacific, as well as various wetland delineation and bog turtle habitat assessment projects in the mid-Atlantic region. Notable projects include wetland delineation along 70+ miles of the Pennsylvania Turnpike, assisting with Phase I bog turtle surveys for the Centerville Rd Interchange Project in Lancaster County, Pennsylvania, as well as conducting fish and reptile recovery at the I-270 Watkins Mill Interchange and Stream Restoration Project in Montgomery County, Maryland. Mr. Kline was field-trained in Phase 2 bog turtle survey techniques by Craig Patterson Nein (PA/MD Qualified Bog Turtle Surveyor).