TETRA TECH

February 10, 2022

Mr. Gregory Lech
Pennsylvania Fish & Boat Commission
Division of Environmental Services
Resource Extraction Section
595 E Rolling Ridge Dr.
Bellefone, PA 16823

Re: Species Impact Review (SIR) # 55023
Rare, Candidate, Threatened and Endangered Species
PNDI Search No. 741959_1
Chester County: Upper Uwchlan Township

Dear Mr. Lech:

As you are aware, Sunoco Pipeline LP (SPLP) is planning to perform a sediment removal project for a portion of Marsh Creek Reservoir in Upper Uwchlan Township, Chester County, Pennsylvania, specifically an area known as Ranger Cove. As part of the PNDI review process, the state listed threatened northern red-bellied cooter (Pseudemys rubriventris) was noted by the PAFBC as concern for the project as the proposed location and activities have the potential to impact this species and its habitat.

In a December 23, 2021 letter correspondence, the PAFBC responded to the submission of a Biological Assessment dated November 22, 2021 by confirming that the project area includes overwintering habitat for the red-bellied cooter and provided a list of recommendations regarding avoidance and conservation measures. The December 23rd correspondence also indicated that the PNDI clearance for the project would be considered "pending", and that review and approval of a site-specific Clearance Survey and Conservation Plan would be needed to resolve the PNDI.

In response to the PAFBC's December 23rd recommendations, SPLP in partnership with experts in the field of herpetology has prepared a *Northern Red-Bellied Cooter Conservation Plan* (that also includes clearance survey methods) that describe the measures to be taken to avoid and minimize potential impacts to red-bellied cooters and their habitat. The Conservation Plan as attached to this letter provides a brief review of the natural history of the species, identifies potential habitat and types within the project area, and provides descriptions and details of conservation measures to be implemented pre-, during, and post-construction of the project.

SPLP and its team of consultants are committed to avoid and minimize impacts to the northern red-bellied cooter population in Marsh Creek Reservoir during completion of the project. At this time, SPLP requests the PAFBC's review of the attached Conservation Plan designed to achieve that commitment. Please consider its implementation to the fullest extent during the finalization of the

Tetra Tech, Inc.
301 Ellicott Street, Buffalo, NY 14203
Tel 716.849.9419 | tetratech.com

PAFBC's PNDI impact review. If you have questions regarding this correspondence, please do not hesitate to contact me at 716-860-749 or via e-mail at brad.schaeffer@tetratech.com.

Sincerely,

Brad Schaeffer, PMP
Senior Biologist and Project Manager
Tetra Tech, Inc.

Att. Northern Red-bellied Cooter Conservation Plan

cc: J. Allison, PFBC
J. Hohenstein, PADEP SERO
D. Knorr, PADEP SERO
R. Reese, PA DCNR
N. Bryan, Energy Transfer
M. Styles, Energy Transfer
C. Embry, Energy Transfer
A. LeeMasci, Energy Transfer
J. Collins, AECOM

D1670.003
February 10, 2022

NORTHERN RED-BELLIED COOTER CONSERVATION PLAN

MARSH CREEK RESERVOIR RESTORATION PROJECT

UPPER UWCHLAN TOWNSHIP,
CHESTER COUNTY, PENNSYLVANIA

PREPARED FOR:

SUNOCO PIPELINE LP

PREPARED BY:

ETHAN DUBOIS
STAFF BIOLOGIST

BRYON DUBOIS
PRINCIPAL BIOLOGIST

TABLE OF CONTENTS

FIGURES

APPENDICES

1.0 INTRODUCTION

Sunoco Pipeline LP (SPLP) is planning to perform a sediment removal project for a portion of Marsh Creek Reservoir in Upper Uwchlan Township, Chester County, Pennsylvania, specifically an area known as Ranger Cove. As part of the Pennsylvania Natural Diversity Inventory (PNDI) review process, the northern red-bellied cooter (*Pseudemys rubriventris* or red-bellied cooter) was noted by the Pennsylvania Fish and Boat Commission (PAFBC) as concern for the project as the proposed location and activities have the potential to impact this species and its habitat. Although not a federally listed species under the Endangered Species Act (ESA), the red-bellied cooter is listed as a threatened species under the PAFBC Chapter 75 code.

Upon identification of the concern for this species, the PAFBC's September 21, 2021 Site Impact Review (SIR) correspondence requested a habitat assessment be performed so that potential impacts of the project could be further evaluated on the red-bellied cooter. As a result, DuBois prepared a Biological Assessment to determine the potential for impacts to this species. The Biological Assessment submitted on November 22, 2021 provided the PAFBC with additional evaluations, including a habitat assessment and population census, along with proposed conservation measures that would avoid and minimize impacts to the red-bellied cooter.

In a December 23, 2021 letter correspondence, the PAFBC responded to the submission of the Biological Assessment confirming the opinion that the project area includes overwintering habitat for the red-bellied cooter and issued recommendations regarding avoidance and conservation measures (Refer to Appendix A). The December 23 correspondence also indicated that the PNDI clearance for the project would be considered "pending", and that the review and approval by PAFBC of a site-specific Clearance Survey and Conservation Plan would be needed to resolve the PNDI.

In response to the PAFBC December 23rd correspondence, DuBois has prepared this Conservation Plan (that also includes clearance survey methods) that describes the measures to be taken to avoid and minimize potential impacts to red-bellied cooters and their habitat. This Conservation Plan provides a brief review of the natural history of the species, identifies potential habitat and types within the project area, and measures that can be taken to reduce impacts to these areas. Procedures to mitigate for potential impacts will be performed pre-construction, during construction, and post-construction of the project.

This Conservation Plan was prepared by Mr. Bryon DuBois, a recognized qualified herpetologist that has prepared and implemented conservation recommendations on several projects involving potential impacts to the red-bellied cooter.

2.0 PROPOSED PROJECT

2.1 Scope of Work

In coordination with Pennsylvania Department of Environmental Protection (PADEP) and the Pennsylvania Department of Conservation and Natural Resources (DCNR), a 6-inch (depth on average) sediment removal project is proposed at the DCNR-operated Marsh Creek Reservoir located at Marsh Creek State Park, Upper Uwchlan Township, Chester County, Pennsylvania. In particular, a 13.40-acre area identified as Ranger Cove will have a 6-inch-deep layer of sediment removed to maximize the removal of diffusely deposited Horizontal Directional Drill (HDD) fluids that emanated from a small inadvertent return that occurred upstream of the cove in 2020. The hydraulic dredging will be conducted using a small hydraulic dredge/pump (< 8" discharge). In particular, it involves the use of a specially

manufactured vessel equipped with a mechanical auger arm and/or centrifugal pump that is deployed to the substrate bed which suctions sediment. It removes sediment by using an oscillating head to loosen sediment, suctioning sediment and water slurry and subsequently pumping the slurry through a pump head to a discharge line. This dredging activity will be monitored by an environmental inspector assigned to the operation. Additionally, turbidity will be monitored daily upstream and downstream of properly designed and installed best management practices (e.g., impermeable turbidity curtains).

The activity will generate return water that will be treated at an upland sediment dewatering area. The sediment dewatering area will be used to contain, separate, and consolidate the sediment from the dredged slurry. Geotextile tubes will be used to passively release the majority of the water content from the dredged sediments. Once dry (i.e., pass a paint filter test), the dredged sediments will be hauled to an approved off-site disposal area. The treated filtrate will be conveyed and discharged to the reservoir via a 6- to 8-inch diameter discharge line with its terminus placed in the reservoir. An energy dissipater at the discharge point will be used to prevent sediment scouring and suspension. Two turbidity curtains aligned in parallel will be installed along the southwestern boundary of the dredge area and downstream of the discharge point. The discharge action will be authorized by a PADEP Temporary Discharge Permit and the discharge will be monitored for total suspended solids (TSS) and other water quality limits per the PADEP permit.

2.2 Construction Schedule

Construction is expected to occur and be completed in 2022. The in-water dredge work is expected to take about 3-4 weeks to complete and will occur during the red-bellied cooter active season (April 15-October 15) per PAFBC recommendation. The project will commence following the clearance survey performed by DuBois (Refer to Section 5.0).

3.0 PROJECT LOCATION

The project area is located within a portion of Marsh Creek Reservoir in Upper Uwchlan Township, Chester County, Pennsylvania. The reservoir is located within the Marsh Creek State Park with access points from Park and North Reeds Road. It is located on the Downingtown 7.5' USGS Quadrangle (*Refer to Figure 1: Downingtown USGS Quadrangle Map).* The project area encompasses a small portion of the reservoir itself in the northeast corner, in an area known as Ranger Cove. Around the perimeter of the reservoir various trails associated the Marsh Creek State Park can be found. The perimeter of the reservoir is mostly comprised of maintained yards associated with residential homes. The reservoir is surrounded by residential properties and agricultural fields. The reservoir is located within the Brandywine-Christina watershed (HUC 8) and Marsh Creek sub watershed (HUC 12). Refer to *Figure 2: Pennsylvania Roads Map* and *Figure 3: Aerial Map* for the location and depiction of land coverage present on and in the vicinity of the project area, respectively.

4.0 SPECIES DESCRIPTION AND LIFE HISTORY

The northern red-bellied cooter is distributed in the Mid-Atlantic coastal plain from southern New Jersey to North Carolina and westward along the Potomac River to eastern West Virginia. There is a disjunct population in Plymouth County, Massachusetts. In Pennsylvania, the cooter was historically common along the Delaware River and its major tributaries and along the lower Susquehanna River. Habitat destruction and pollution have almost eliminated this species from those areas. The cooter inhabits relatively large deep water bodies including creeks, lakes, ponds, and marshes. The omnivorous cooter occurs in both freshwater and brackish conditions and prefers water bodies with soft, muddy bottoms and an abundance of aquatic vegetation (Davis et al. 1992). This species also depends on abundant basking

sites and spends a great deal of time perched on logs and downed trees (PNHP 2011). The northern red-bellied cooter wanders on land in early spring and fall during the breeding period. It typically lays eggs in a nest dug in soft soil in an open area usually within 100 yards of water. It often nests in tilled or disturbed soil. A clutch of eight to twenty eggs is laid in June to July, hatching ten to fifteen weeks later. The northern red-bellied cooter reaches sexual maturity in five to six years (Davis et al. 1992).

The northern red-bellied cooter is a large aquatic species. This species has an average adult size of approximately 10.5 inches (26.7 cm) and a record length of 16 inches (40.6 cm). The carapace (i.e., top shell) is brown to black with a vertical reddish line occurring on the marginal scutes. Melanism is a common occurrence in this species. The carapace is low, not keeled (except for very young), oval, and slightly wider towards the rear. The red-orange plastron is hingeless and may be marked with large gray blotches that fade with age. The identifying characteristics are the red-orange plastron, reddish markings on the dark carapace, and the cusps flanking the notch at the tip of the upper jaw. Hatchlings differ in coloration. The hatchlings range from brown to olive-brown and have a pattern of yellow lines that divide the carapace into a series of irregular geometric shapes. The plastron has a bold dark midline blotch that is somewhat irregular in shape and extends the entire length of the plastron occasionally possessing lateral projections. Female northern red-bellied cooters are found to be larger than males on average. The male also has a thicker tail than the female (Schwartz and Golden 2002; PNHP 2011).

5.0 BIOLOGICAL ASSESSMENT SUMMARY

DuBois preformed eight (8) visual surveys in September and October of 2021 to determine the use of Ranger Cove by the northern red-bellied cooter. Although these surveys were not performed in the optimal time of year based on the species active season, several conclusions were able to be drawn from them. Following the surveys, calculations performed by DuBois provided estimates of 67-79 northern red-bellied cooters within Ranger Cove (for more information on how these estimates were reached, refer to Appendix A).

DuBois also surveyed Marsh Creek Reservoir to determine how many suitable over-wintering locations are present along with the quality of those observed to determine how critical the project area was for the over-wintering life history traits of the northern red-bellied cooter. Optimal over wintering habitat was observed within Ranger Cove (the project area), which included suitable depths of water, soft substrate, and a flowing channel. Figure 4 provides a demarcation of an area likely to provide suitable overwintering areas for this species. Similarly, the northern most cove of the reservoir (away from the project area) contained conditions comparable to the project area and therefore was determined to also be suitable overwintering habitat. Along with suitable habitat conditions, these cove areas contained the greatest number of turtles in comparison to the rest of the reservoir. The southern portions of the reservoir are more limited in silt deposits and basking area availability. A small area adjacent to Carpenters Cove Lane also contained soft substrate conditions however few turtles were observed there, likely attributed to the lack of basking areas. Based on these findings, the southern areas of Marsh Creek Reservoir contain less than optimal overwintering habitat, although some turtles may use them for seasonal activities. Optimal overwintering habitat was observed in the northern and northeastern reaches of the reservoir, which includes the project area.

The habitat survey also documented approximately 16 basking locations with the majority (13) located along the northwestern shore of Ranger Cove. Figure 4 provides the approximate locations of these. However, the presence and locations of some of these features is ever changing with the fluctuating reservoir levels and presence and availability of downed and semi-submerged logs and other basking areas.

6.0 CONSERVATION MEASURES

PAFBC has reviewed the DuBois' Biological Assessment "Northern Red-bellied Cooter (*Pseudemys rebriventris,* Threatened)" presented in Appendix A and confirmed the opinion that overwintering habitat for the species of concern occurs within the project area. In addition, DuBois presented several conservation measures for consideration by PAFBC that would provide protection to this species and its habitat. The PAFBC concurred with many of those measures and provided a listing of their recommendations going forward within its December 23, 2021 correspondence. The following sections provide how the PAFBC conservation measures will be implemented by SPLP/DuBois.

6.1 Habitat Protection Buffer

DuBois surveyed Marsh Creek Reservoir to determine areas of suitable overwintering habitat within and outside of the project area. Optimal overwintering habitat was observed and mapped. Conditions included suitable water depths, soft substrate and a flowing channel. Although additional areas included suitable conditions, Ranger Cove contained the greatest number of turtles during DuBois' visual surveys. Based on the basic life history traits of the red-bellied cooter, it was the opinion of DuBois that dredging this area during brumation/overwintering period may result in negative impacts to the species. PAFBC agreed with these findings in their correspondence dated December 23, 2021 and recommended excluding the identified overwintering habitat from the area to be dredged. However, through additional agency coordination it was agreed that the shoreline exclusion buffer would be increased from the already planned 10 feet to 40 feet along approximately 700 feet of the northwestern shoreline. This would protect a portion of the identified hibernation habitat from sediment removal as well as provide additional protection to the basking habitat that occurs along the northwestern shoreline.

6.2 Active Season

As stated above, based on the basic life history traits of the red-bellied cooter, it was the opinion of DuBois that dredging this area during brumation/overwintering period may result in negative impacts to the species. PAFBC agreed with these findings in their correspondence dated December 23, 2021 and recommended moving the construction timeframe to occur outside of the brumation/overwinter period and occur during the Active Season. Based on the PAFBC recommendations provided to SPLP, all in-water work including but not limited to dredging, will occur within the northern red-bellied cooters Active Season (April 15-October 15). A project schedule is provided in Section 7.0.

6.3 Qualified Biologist Oversight

PAFBC recommended a qualified biologist be on site during all in-water work in an area northeast of the turbidity curtain where the majority of the turtles were observed during DuBois' visual surveys (Refer to Figure 4 for a depiction of this location). A Qualified Biologist will provide oversight and will be on-sight during all in-water work that occurs within the area identified as "Herpetologist Oversight Required" on the project plans. The biologist will be held responsible for daily reporting, recording encounters, observations, and concerns related to red-bellied cooter.

6.4 Clearance Survey

PAFBC recommended SPLP/DuBois discuss and develop the methods regarding a clearance survey designed to remove turtles from the project area prior to construction. On January 12, 2022 SPLP/DuBois discussed the clearance survey details during a conference call and the methods are provided below.

If coordination and permitting is completed as expected, an array of hoop and basking traps will be deployed on March 23 and will remain for twenty (20) days. DuBois proposes the use of twelve (12) baited floating hoop traps placed around the perimeter of the project area, specifically around areas where individuals were observed during the initial visual surveys. In addition to the hoop traps, four (4) basking traps will be placed in areas of optimal sunlight where basking may be promoted. During previous projects the use of baited hoop traps have proven to be the most efficient way to capture turtles following brumation. Traps will be checked daily during the survey period by DuBois personal. For a depiction of trap locations refer to Figure 5: Approximate Trap Location Map. Trap locations are subject to change as the survey period progresses to retain the highest amounts of success. With coordination from PAFBC, data will be collected on captured individuals which will include notching prior to release outside the project area.

Pennsylvania state law prohibits the release of non-native invasive turtles into state waters. Red-eared sliders (*Trachemys scripta elegans*) were observed in Ranger Cove and the rest of Marsh Creek Reservoir. This species is known to outcompete native species for resources including food, basking and nesting locations. For a prior project, DuBois has removed red-eared sliders and given live specimens to Ms. Erica Miller, an independent wildlife veterinarian who euthanized these individuals and distributed their remains to be used in workshops for veterinary students and wildlife rehabilitators for the National Wildlife Rehabilitators Association (NWRA). On January 18, 2021 Ms. Miller confirmed her ability to aid with the removal effort.

6.5 Turbidity Curtain

PAFBC recommended the installation of an exclusion barrier to prevent red-bellied cooters from entering the project areas. Installation of two, in parallel, turbidity curtains site along the southwest end of the proposed dredge area is part of the dredge design and will also be used as an exclusion barrier to prevent entry of red-bellied turtles into the project area. At a minimum one of the curtains will be installed before the clearance surveys to facilitate removal and prevent re-entry and will remain in place until the dredging operation is complete. Refer to Figure 4 for a depiction of the location of the turbidity curtain.

PAFBC also recommended the installation of devices over the turbidity curtains to allow turtles to seek refuge outside the project area during the dredge operation. Structures that allow turtles to relocate to other parts of the lake will be installed along and overtop the turbidity curtains. The one-way ramp-like structures will have a blunt face on the opposite side of the project area that eliminates the use of the ramp to re-enter the project area. The specific design will need to be customized to the type of turbidity curtain used, however a minimum of two (2) ramps would be installed per curtain. The PAFBC has agreed that the turbidity curtain and ramp install is in-water work that can be completed during the active season.

6.6 Upland Areas

PAFBC recommended that for upland areas considered to be suitable nesting habitat, SPLP conduct construction prior to the species nesting season (begins May 15) and install an exclusion barrier such as silt fence if turtle movement within the project area is anticipated. DuBois does not believe that any of the upland areas designated to be disturbed for this project has the substrate conducive to nesting.

Regardless, in the vicinity of Ranger Cove SPLP will be installing exclusion fence along the border of the project limits to prevent entry into project areas for the duration of the project. Exclusion fence will be installed at a minimum of 200 feet from the shoreline along the border of the project limits within the upland areas. All incidental observations of nesting areas in the vicinity of the project areas will be documented and monitored.

6.7 Nesting Habitat Construction

The PAFBC recommended creation of nesting habitat as a potential mitigation action following construction. Following DuBois' 2021 surveys, it is believed that nesting locations may be a limiting factor for turtles within Marsh Creek Reservoir. Therefore, SPLP has agreed to the construction of additional nesting habitat within the area of Ranger Cove in an effort to improve conditions within the reservoir. DuBois has aided in the creation of suitable nesting habitat for various turtle species on prior projects. With approval to do so from the DCNR, a single artificial nesting area is proposed to be placed in an area of optimal sunlight (SE facing) along the NW shore of Ranger Cove. The details of the nesting area construction will be provided to the DCNR for approval to install. This work would be performed during the restoration phase of the project.

6.8 Basking Structure Construction

PAFBC recommended installation of artificial basking structures to provide areas of refuge. These structures are proposed to be installed within and outside of the project area to provide additional basking locations while the individuals are displaced as well as replacing structures that may be disrupted within the project area. During visual surveys, DuBois noted the number of basking features outside Ranger Cove may be a limiting factor for turtles within the Marsh Creek Reservoir. The installation of these structures should improve habitat within the reservoir during and following the restoration project. Eight (8) artificial basking structures that will be anchored to either the bottom of the lake or the shoreline are proposed to be placed inside and outside of the project area. A minimum of three (3) basking structures within the project area (inside the turbidity curtain) and a minimum of five (5) outside of the project area (outside of the turbidity curtain) will be installed before the commencement of any dredging activities.

DuBois identified 13 existing basking structures within Ranger Cover during habitat surveys in 2021. These are not expected to be damaged or impacted by the project as they are located along the shoreline and outside of the areas to be dredged. The entire dredge operation will remain 10-feet from the shoreline and further in the area depicted on Figure 4 where the majority of the existing structures in 2021 were identified are located. The Qualified Biologist on-site will inventory existing structures in 2022 prior to project implementation and ensure any structures indirectly damaged or destroyed will be replaced following construction.

In similar projects DuBois has utilized basking structures like those presented in Figure 6. These structures utilize locally cut logs at least 10' long and 10-12" dbh (diameter breast height). These structures are connected to the shore or an anchor by a cable or similar material with a lag or bolt that screw into the log/tree. The PAFBC has agreed that the basking structure installation is in-water work that can be completed during the active season.

7.0 SCHEDULE

Some of the measures discussed above are time-of-year dependent, therefore SPLP provides below a planned schedule as well as a schedule that provides contingencies in the event of a later start date.

Planned Schedule
The planned schedule assumes receipt of all project approvals in time for the in-water dredge work to begin between April 15 and April 30. This allows the clearance surveys to be performed near the last part of March or the first part of April. This time frame is when the turtles are most susceptible to trapping.

- Install Turbidity Curtain(s) – March 22
- Clearance Survey – March 23 – April 11 (20 days)
- Install One-way Ramps – March 23-24
- Install Basking Structures – March 23- April 14
- Dredge Start – April 15 – 30
- Install Nesting Habitat (restoration phase)

Contingency Schedule
The contingency schedule assumes project approvals will not be received in time for the in-water dredge work to begin between April 15 and April 30 and the in-water dredge work would start between May 1 and August 15.

- Install Turbidity Curtain(s)- TBD
- Clearance Survey – 20 days after curtain installation
- Install One-way Ramps – 1-2 days after curtain install
- Install Basking Structures – prior to dredge start
- Dredge Start – after completion of the clearance trapping
- Install Nesting Habitat (restoration phase)

8.0 SUMMARY

SPLP and its team of consultants are committed to avoid and minimize impacts to the northern red-bellied cooter population in Marsh Creek Reservoir during completion of the project. In coordination with PAFBC, DCNR and PADEP, conservation measures have been recommended and outlined within this conservation plan. The following provides a summary of those measures that will be adhered to and will be reiterated on project plans:

- All commitments outlined within the PAFBC approved *Northern Red-bellied Conservation Plan* will be followed and that document must be available on-site.
- All in-water work must be conducted between April 15 and October 15 (installation of the turbidity curtain, one-way ramps, and basking structures are allowed outside of these dates).
- No sediment removal will be conducted within the area identified on project plans as “Habitat Protection Buffer – No Sediment Removal”
- A Qualified Biologist will provide oversight of implementation of the approved Northern Red-bellied Conservation Plan and will be on-sight during all in-water work that occurs within the area identified as “Herpetologist Oversight Required” on the project plans.

- The turbidity curtain(s) will be installed prior to the clearance surveys and remain in place until project completion.
- A minimum of two (2) one-way ramps will be installed along each turbidity curtain before the commencement of any dredging activities.
- A minimum of eight (8) basking structures, with a minimum of three (3) within the project area (inside the turbidity curtain) and a minimum of five (5) outside of the project area (outside of the turbidity curtain) will be installed along the northwest shoreline of Ranger Cove before the commencement of any dredging activities.
- A Qualified Biologist will inventory existing basking structures prior to the commencement of any dredging activities and ensure replacement of any impacted structures following construction.
- A clearance survey will be completed prior to the commencement of any dredging activities, including the trapping and removal of individuals from within the turbidity curtain. Twelve (12) baited hoop traps and four (4) floating basking traps will be deployed for twenty (20) days and checked daily by a Qualified Biologist.
- Exclusion fence will be installed along the project limits a minimum of 200 feet from the shoreline to prevent entry into the upland project areas.
- With DCNR approval, a single nesting habitat area is to be created along the northwest shore of Ranger Cove following construction.
- A brief summary report will be prepared following completion of the project summarizing the results of the clearance survey, Qualified Biologist encounters and observations, and documentation of installation of basking and nesting habitat.

9.0 REFERENCES

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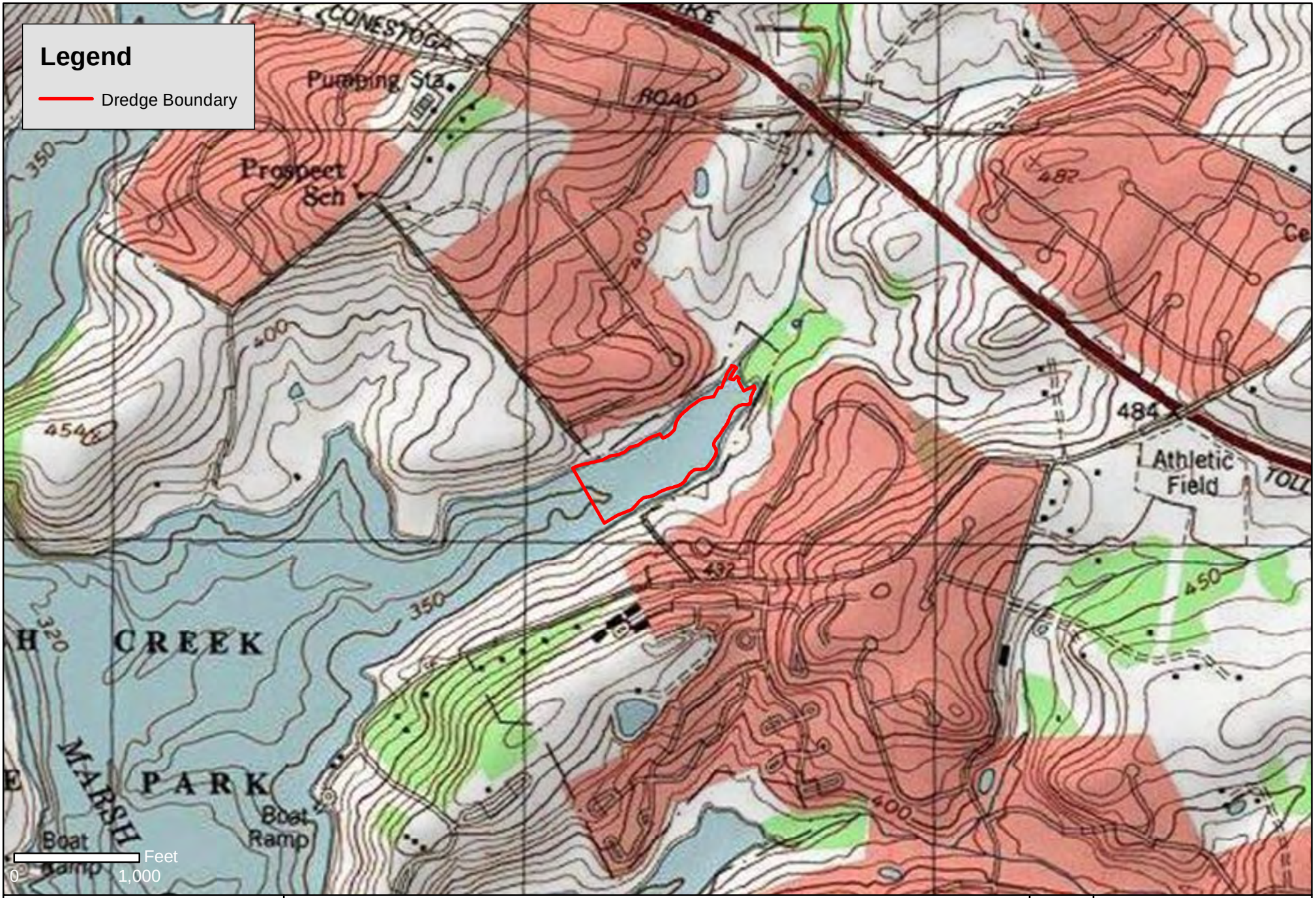
FIGURES



Downingtown USGS Quadrangle Map

Marsh Creek Lake Restoration Project
Upper Uwchlan Township, Chester County,PA

DuBois & ASSOCIATES

NORTH

Figure 1

Job No.: D1670.003	
Scale: 1 in = 1,000 ft	
Date: 2/8/2022	
Drawn By: AG	

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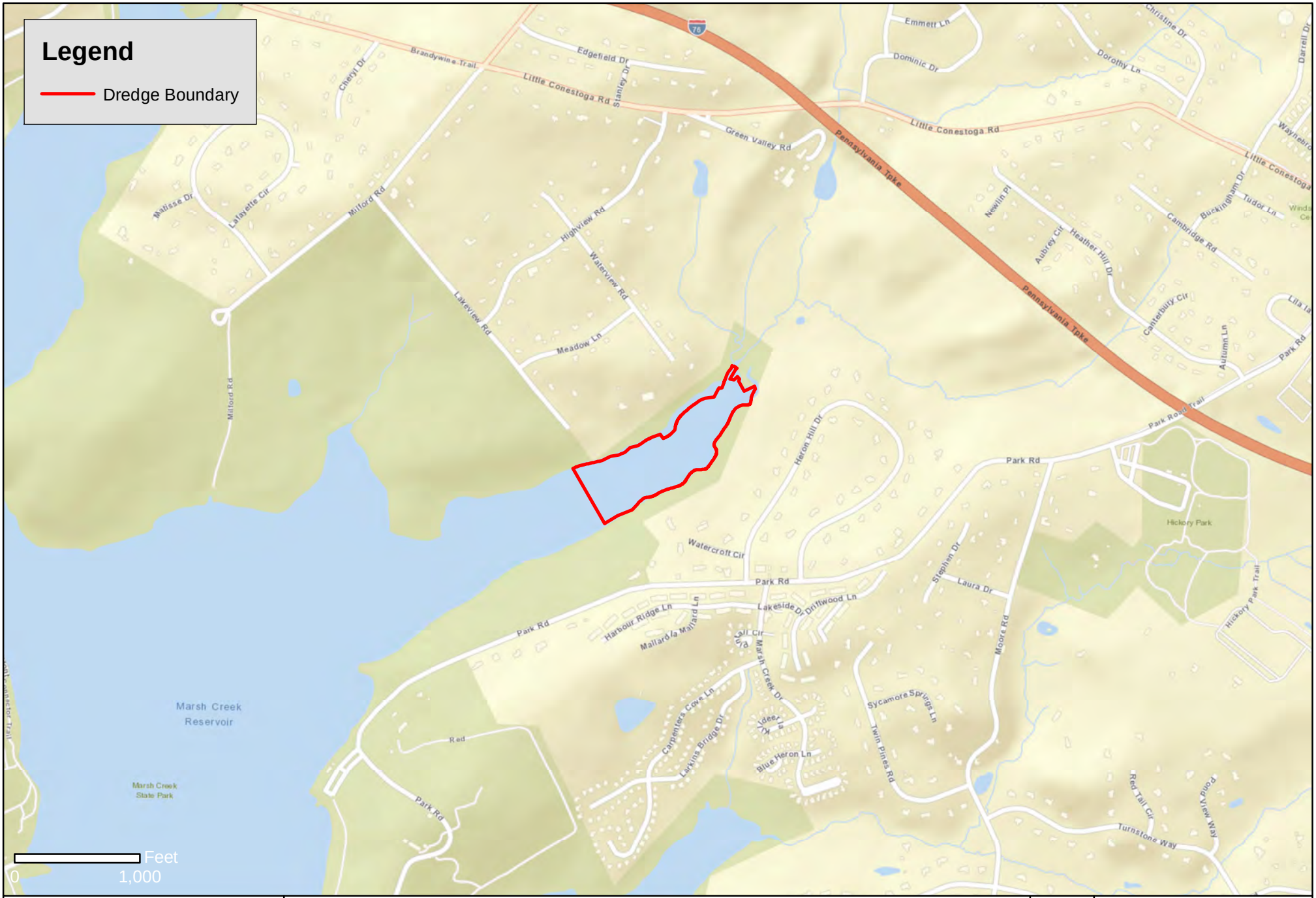
This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.



Pennsylvania Road Map

Marsh Creek Lake Restoration Project
Upper Uwchlan Township, Chester County,PA

NORTH

Figure 2

Job No.: D1670.003
Scale: 1 in = 1,000 ft
Date: 2/8/2022
Drawn By: AG

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DuBois & ASSOCIATES

Aerial Map

Marsh Creek Lake Restoration Project
Upper Uwchlan Township, Chester County,PA

NORTH

Figure 3

Job No.: D1670.003
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Date: 2/8/2022
Drawn By: AG

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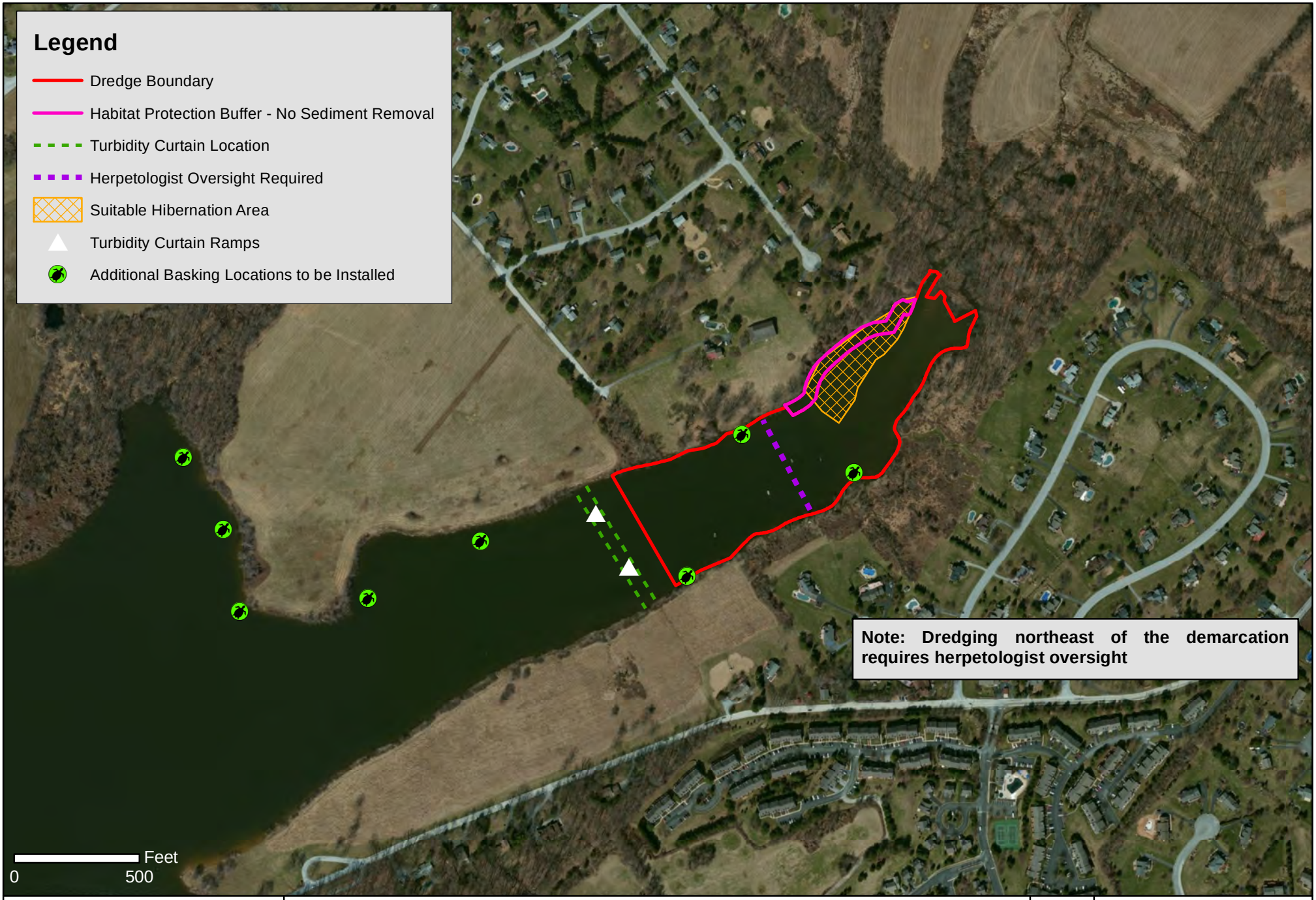


DuBois & ASSOCIATES

Conservation Map

Marsh Creek Reservoir Restoration Project
Upper Uwchlan Township, Chester County,PA

NORTH

Figure 4

Job No.: D1670.003
Scale: 1 in = 500 ft
Date: 2/9/2022
Drawn By: ED

Document Path: S:\JOBS NUMBERS\D1670.003\Conservation Plan\Conservation Map.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.

DuBois & ASSOCIATES

Approximate Trap Location Map

Marsh Creek Reservoir Restoration Project
Upper Uwchlan Township, Chester County,PA

NORTH

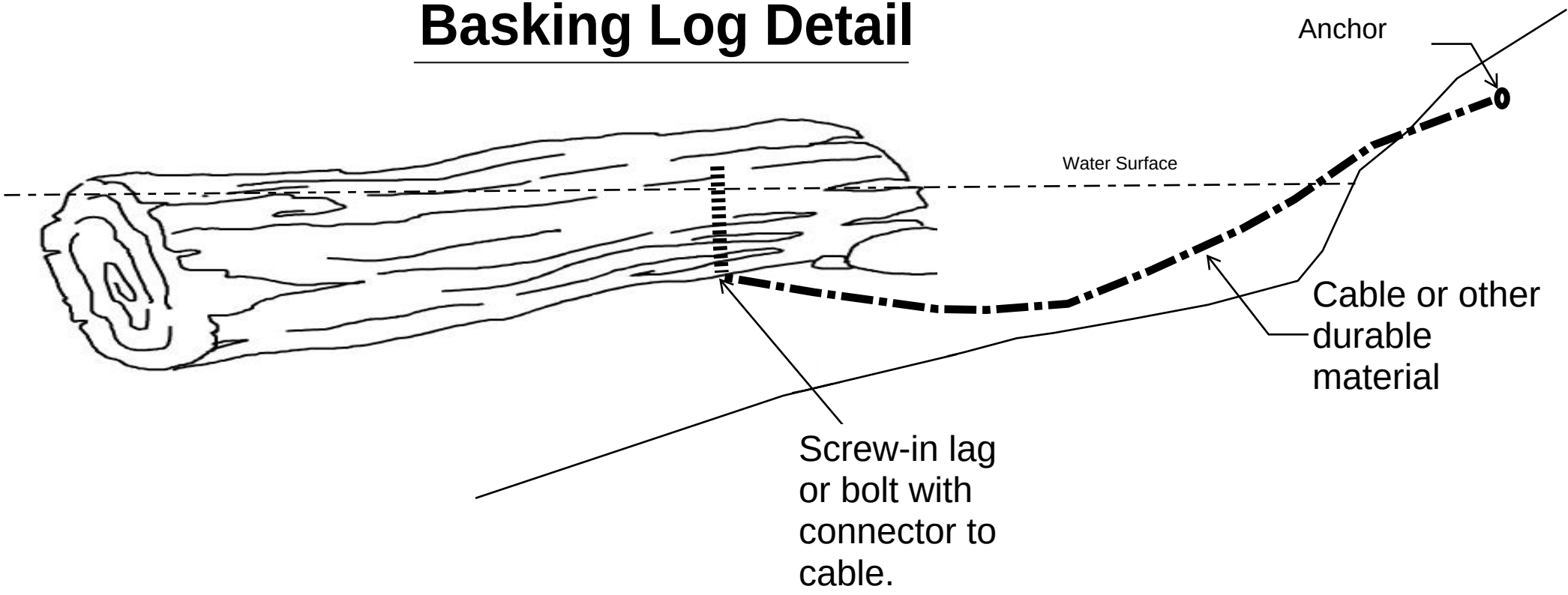
Figure 5

Job No.: D1670.003	
Scale: 1 in = 350 ft	
Date: 2/9/2022	
Drawn By: ED	

Document Path: S:\JOBS NUMBERS\D1670.003\Trap Location map.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.

Basking Log Detail



APPENDIX A

BIOLOGICAL ASSESSMENT

D1670.003
November 22, 2021

NORTHERN RED-BELLIED COOTER
(*Pseudemys rubriventris*)
BIOLOGICAL ASSESSMENT

MARSH CREEK RESERVOIR RESTORATION PROJECT

UPPER UWCHLAN TOWNSHIP,
CHESTER COUNTY, PENNSYLVANIA

PREPARED FOR:

SUNOCO PIPELINE LP

PREPARED BY:

ETHAN DUBOIS
STAFF BIOLOGIST

BRYON DUBOIS
PRINCIPAL BIOLOGIST

TABLE OF CONTENTS

FIGURES

APPENDICES

1.0 INTRODUCTION

On behalf of Sunoco Pipeline LP (SPLP), DuBois & Associates, L.L.C. (DuBois) was contracted to census a population of northern red-bellied cooter (*Pseudemys rubriventris*) within a portion of Marsh Creek Reservoir in Upper Uwchlan Township, Chester County, Pennsylvania. SPLP is planning to perform a sediment removal project from a portion of Marsh Creek Reservoir, specifically an area known as Ranger Cove. The Pennsylvania Fish and Boat Commission (PAFBC), in a September 21, 2021 response to a Pennsylvania Natural Diversity Inventory (PNDI) further project review request, indicted that the Marsh Creek Reservoir contains known occurrences of this state listed threatened species. The PAFBC also indicated that the dredging of Marsh Creek Reservoir would cause impacts to this species and requested additional evaluations to confirm whether the project site contains overwintering habitat and to determine the potential for adverse impacts to this species. This report provides the results of additional evaluations, including a habitat assessment and population census, along with proposed conservation measures that are proposed to minimize impacts to the northern red-bellied cooter.

This Biological Assessment was prepared by Mr. Bryon DuBois, a recognized qualified herpetologist that has surveyed and provided conservation recommendations on several projects involving potential impacts to the northern red-bellied cooter.

2.0 PROPOSED PROJECT

2.1 Scope of Work

In coordination with Pennsylvania Department of Environmental Protection (PADEP) and the Department of Conservation and Natural Resources (DCNR), a 6-inch (depth on average) sediment removal project is proposed at the DCNR-operated Marsh Creek Reservoir located at Marsh Creek State Park, Chester County, Pennsylvania. In particular, a 14.7-acre area identified as Ranger Cove will have a 6-inch-deep layer of sediment removed to maximize the removal of diffusely deposited Horizontal Directional Drill (HDD) fluids that emanated from a small spill upstream of the cove in 2020. The hydraulic dredging will be conducted using a small hydraulic dredge/pump (< 8" discharge). In particular, it involves the use of a specially manufactured vessel equipped with a mechanical auger arm and/or centrifugal pump that is deployed to the substrate bed which suctions sediment. It removes sediment by using an oscillating head to loosen sediment, suctioning sediment and water slurry and subsequently pumping the slurry through a pump head to a discharge line. This dredging activity will be constantly monitored at the point of dredging by an environmental inspector assigned to the operation. Additionally, turbidity will be monitored daily upstream and downstream of properly designed and installed best management practices (e.g., impermeable turbidity curtains).

The activity will generate return water that will be treated at an upland sediment dewatering area. The sediment dewatering area will be used to contain, separate, and consolidate the sediment from the dredged slurry. Geotextile tubes will be used to passively release the majority of the water content from the dredged sediments. Once dry (i.e., pass a paint filter test), the dredged sediments will be hauled to an approved off-site disposal area. The treated filtrate will be conveyed and discharged to the reservoir via a 6- to 8-inch diameter discharge line with its terminus placed in the reservoir. An energy dissipater at the discharge point will be used to prevent sediment scouring and suspension. The discharge action will be authorized by a PADEP Temporary Discharge Permit. The discharge will be monitored for total suspended solids (TSS) and other water quality limits per the PADEP permit.

2.2 Construction Schedule

The final exact timeframe for implementation of the construction activities will be dependent on weather and PADEP and DCNR approvals, however, construction is expected to occur and be completed in 2022. The in-water dredge work is expected to take about 3-4 weeks to complete.

3.0 PROJECT LOCATION

The project area is located within a portion of Marsh Creek Reservoir in Upper Uwchlan Township, Chester County, Pennsylvania. The reservoir is located within the Marsh Creek State Park with access points from Park and North Reeds Road. It is located on the Downingtown 7.5' USGS Quadrangle (*Refer to Figure 1: Downingtown USGS Quadrangle Map).* The project area encompasses a small portion of the reservoir itself in the northeast corner, in an area known as Ranger Cove. Around the perimeter of the reservoir various trails associated the Marsh Creek State Park can be found. The perimeter of the reservoir is mostly comprised of maintained yards associated with residential homes. The reservoir is surrounded by residential properties and agricultural fields. The reservoir is located within the Brandywine-Christina watershed (HUC 8) and Marsh Creek sub watershed (HUC 12). Refer to *Figure 2: Pennsylvania Roads Map* and *Figure 3: Aerial Map* for the location and depiction of land coverage present on and in the vicinity of the project area, respectively.

4.0 SITE ECOLOGICAL CHARACTERISTICS

An inventory of existing ecological conditions among the project area has been prepared through a combination of Geographic Information Systems (GIS) desktop analysis and direct field observation. Refer to *Appendix B: Project Area Photographs* for a photographic depiction of the project area and vicinity.

4.1 Vegetation Communities

The reservoir's vegetational communities can be broken up into two distinct classifications. The upper north reaches and shallows of the reservoir contained the largest abundance of aquatic vegetation. In this lacustrine environment the upper reaches are more silted from typical stream discharges. Subsequently, the shallower depths found in this area are also what supports most of the native and nonnative aquatic vegetation. This portion of Ranger Cove consists of roughly 15 acres of the entire reservoir. In the inner portion of the reservoir the water depths are deeper and therefore aquatic vegetation was only observed along the fringe of the shoreline. Dominant vegetation located along the cove and shallower areas of the reservoir includes pond lilies (family *Nymphaeaceae*), water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), duckweed (*Lemna* spp.), milfoil (*Myriophyllum* spp.), algae, pond weed (family *Potamogetonaceae*), bulrush (*Schoenoplectus* spp.) and common reed (*Phragmites australis*). Areas of vegetation found along the edge and upland perimeter of the reservoir include skunk cabbage (*Symplocarpus foetidus*), soft rush (*Juncus effusus*), dogwood spp. (*Cornus spp.*), tree of heaven (*Ailanthus altissima*), red maple (*Acer rubrum*), oak species (*Quercus spp.*), and beech (*Fagus spp.*) along with various sedges and rushes on or within 5-10' of the shoreline.

4.2 Hydrology & Freshwater Wetlands

The U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) identifies the following wetland and deepwater habitats present from the project area (Cowardin et al. 1979):

Table 1: Wetland and Deepwater Habitat Classification of Project Area

Code	System	Subsystem	Class	Subclass	Water Regime	Special Modifier
L1UBHh	Lacustrine (L)	Limnetic (1)	Unconsolidated Bottom (UB)		Permanently Flooded (H)	Diked/Impounded (h)
PEM5E	Palustrine (P)		Emergent (EM)	*Phragmites australis* (5)	Seasonally Flooded/Saturated (E)	

The field investigation identified one waterway, Tributary 00333 to Marsh Creek, that flows into Ranger Cove. Other streams also flow in and out of Marsh Creek Reservoir, including Black Horse Creek and several other tributaries to Marsh Creek. Areas to the north of the Black Horse Creek confluence also appeared favorable for northern red-bellied cooters.

4.3 Soils

According to the Chester County Soil Survey, originated by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), the project area is underlain by three (3) soil map units: Water; Codorus silt loam (Co); Gladstone gravelly loam, 3 to 8 percent slopes (GdB).

The field investigation confirmed silt loam soil types up to and within the existing reservoir bed. Silt was observed throughout the cove, however, was deepest along the upper extremities on the northern bank, which was the area where the majority of the turtles were observed basking throughout the DuBois survey window. Along this side, depths of 1.5-2’ of silt was measured within 3-5’ of water. Along the main channel, very little silt was observed likely due to the constant flow of moving water. Along the southern shore, small pockets of shallow silt were observed in various places but not considered deep enough to function as suitable overwintering locations. These areas contained 4-8” of silt in many locations.

5.0 SPECIES DESCRIPTION AND LIFE HISTORY

The northern red-bellied cooter is distributed in the Mid-Atlantic coastal plain from southern New Jersey to North Carolina and westward along the Potomac River to eastern West Virginia. There is a disjunct population in Plymouth County, Massachusetts. In Pennsylvania, the cooter was historically common along the Delaware River and its major tributaries and along the lower Susquehanna River. Habitat destruction and pollution have almost eliminated this species from those areas. The cooter inhabits relatively large deep water bodies including creeks, lakes, ponds, and marshes. The omnivorous cooter occurs in both freshwater and brackish conditions and prefers water bodies with soft, muddy bottoms and an abundance of aquatic vegetation (Davis et al. 1992). This species also depends on abundant basking sites and spends a great deal of time perched on logs and downed trees (PNHP 2011). The northern red-bellied cooter wanders on land in early spring and fall during the breeding period. It typically lays eggs in a nest dug in soft soil in an open area usually within 100 yards of water. It often nests in tilled or disturbed soil. A clutch of eight to twenty eggs is laid in June to July, hatching ten to fifteen weeks later. The northern red-bellied cooter reaches sexual maturity in five to six years (Davis et al. 1992).

The northern red-bellied cooter is a large aquatic species. This species has an average adult size of approximately 10.5 inches (26.7 cm) and a record length of 16 inches (40.6 cm). The carapace (i.e., top shell) is brown to black with a vertical reddish line occurring on the marginal scutes. Melanism is a common occurrence in this species. The carapace is low, not keeled (except for very young), oval, and

slightly wider towards the rear. The red-orange plastron is hingeless and may be marked with large gray blotches that fade with age. The identifying characteristics are the red-orange plastron, reddish markings on the dark carapace, and the cusps flanking the notch at the tip of the upper jaw. Hatchlings differ in coloration. The hatchlings range from brown to olive-brown and have a pattern of yellow lines that divide the carapace into a series of irregular geometric shapes. The plastron has a bold dark midline blotch that is somewhat irregular in shape and extends the entire length of the plastron occasionally possessing lateral projections. Female northern red-bellied cooters are found to be larger than males on average. The male also has a thicker tail than the female (Schwartz and Golden 2002; PNHP 2011).

6.0 METHODS

To estimate the population size of northern red-bellied cooters, DuBois conducted visual observation surveys throughout project area on eight (8) dates in September and October 2021. This survey included the visual identification and count of live individuals, suitable habitats, and core-use habitat areas. Visual surveys were performed mid-day between 1000-1800 hours during days without rain or strong winds, when turtles are more likely to be basking. Biologists initially stationed themselves at opportunistic locations along the reservoir's edge, in concealed locations where turtle observations could be made without disturbing basking activity. However, surveys completed from the kayak were determined to be more advantageous. Where possible, voucher photographs of basking turtles were taken (Appendix B). In-water surveys via kayak were utilized each survey to analyze/record core-basking area as well as silt depths in these areas. During three (3) surveys, the entire reservoir was surveyed to help determine population size throughout different reaches of the reservoir. This data has been used to give insight on the proportion of the population in Ranger Cove relative to the entire reservoir.

7.0 RESULTS

DuBois conducted visual surveys throughout the project area on eight (8) dates in September and October, 2021. Optimal weather conditions were experienced during the first six survey dates; however, two of our latter surveys were not considered optimal due to previous cold nights and low humidity. This survey included the observation and identification of individual cooters and an evaluation of suitable nesting habitat surrounding the reservoir. Table 2 below summarizes the survey results.

Table 2: Results of the Northern Red-bellied Cooter Visual Survey at Ranger Cove on Marsh Creek Reservoir (September & October, 2021)

Common Name	Scientific Name	9/21/21	9/24/21	9/28/21	9/30/21	10/3/21	10/6/21	10/7/21	10/13/21	Average	Total
Northern Red-bellied Cooter	*Pseudemys rubriventris*	28	40	30	21	16	6	3	22	20.75	166
Red-eared Slider	*Trachemys scripta elegans*	21	31	25	10	12	7	3	18	15.88	127
Eastern Painted Turtle	*Chrysemys scripta*	34	35	20	13	15	3	7	15	17.75	142
Snapping Turtle	*Chelydra serpentina*	2	0	0	0	1	0	1	0	0.5	4
Unidentifiable Individuals		5	0	0	0	3	2	0	0	1.25	10
Total											452
	Survey Date with Unfavorable Weather Conditions										

Table 3: Results of Northern Red-bellied Cooter Visual Survey not at Ranger Cover on Marsh Creek Reservoir (September & October, 2021)

Common Name	Scientific Name	9/30/21	10/7/21	10/13/21	Total
Northern Red-bellied Cooter	*Pseudemys rubriventris*	54	20	40	114
Red-eared Slider	*Trachemys scripta elegans*	33	10	33	76
Eastern Painted Turtle	*Chrysemys scripta*	42	16	47	136
Snapping Turtle	*Chelydra serpentina*	1	1	0	2
Unidentified Turtles		2	0	0	2
Total					

During the visual basking surveys northern red-bellied cooters, eastern red eared sliders (*Trachemys scripta elegans*), eastern painted turtles (*Chrysemys picta*), as well as common snapping turtles (*Chelydra serpentina*) were observed basking upon substrate at the surface of the reservoir. Red-eared sliders are considered a non-native and invasive species.

The results of the survey were based on turtles observed basking on logs and debris within the project area. The majority of the activity and logs being used was in the northern shore of the cove which can be attributed to better availability of basking locations and presence of significant sunlight during the day. Based on professional experience, numerous field visits, various age classes observed, consistent weather conditions throughout the survey and consistent numbers of turtles observed each visit, DuBois was able to estimate the total population of northern red-bellied cooters. These surveys were not performed during the optimal time of year; therefore, the accuracy of these estimates may vary from seasonal surveys.

7.1 Population Estimate

Marsh Creek Reservoir is a large reservoir with many areas that the red-bellied cooter could utilize for basking and overwintering. It is a relatively healthy ecosystem that supports a typical range of aquatic vegetation, fishery resources and aquatic and terrestrial wildlife. Certain reaches of the reservoir are more suitable to the habitat requirements of the northern red-bellied cooter than others. This survey focused on surveying Ranger Cove where the project is proposed, however individuals were sought within the entire reservoir for comparison purposes. The large majority of northern red-bellied cooters were found in the northern and northeastern portion of the Reservoir (Ranger Cove) within areas of high aquatic vegetation density and siltier substrate.

The results of the survey are based on cooters observed basking on logs and debris in the reservoir, and did not include those cooters that were not visible under water. The vast majority of observed individuals were seen on the banks of Ranger Cover and the cove off Little Conestoga Road. Use of these coves are likely attributed to the greater presence and availability of suitable basking substrates. The coves are more silted which provides shallower depths and greater density of aquatic vegetation. Our office has followed the PAFBC recommended guidelines on Phase 2 surveys in prior studies to assess and come up with an estimated number of a specific cooter in similar lacustrine environments in Pennsylvania from 2015 to 2020. On a project of smaller size but similar scale, DuBois (2016) trapped 123 northern red-bellied cooters out of a 14-acre reservoir after observing an average of 38.5 during four (4) basking surveys (31% of the RBT's were basking at any one time). Based on professional experience with several

other red-bellied cooter projects, eight (8) field investigations of this site, various age classes observed it is estimated that 67-79 red-bellied cooters may inhabit Ranger Cover at any given time during the active season. Over the course of the study period, weather conditions continued to get colder therefore these estimates may be less reliable than those of similar studies done over the course of varied seasons. It's likely that the cold nights prior to the October 6 and October 7 survey dates contributed to the decrease in observed turtles during these dates. Both nights dropped below 50 degrees which could possibly have triggered the initial brumation activities for some individuals.

Various age classes were observed throughout the study period. It is estimated that the number observed on each date is approximately **26-31%** of the actual population size. Based on this assessment and using the total mean number observed (20.75 northern red-bellied cooter), it is anticipated that the population size of the northern red-bellied cooters in the Ranger Cove is approximately **67-79 individuals**. It is estimated that on average approximately **20-30** northern red-bellied cooters were observed in other portions of the reservoir per survey, or an extrapolated estimate of **113-141** for the other portions. As result, the total population of Marsh Creek Reservoir is estimated to be approximately 180 – 220 northern red-bellied cooters.

7.2 Habitat Assessment

DuBois surveyed Marsh Creek Reservoir to determine how many suitable over-wintering locations are present along with the quality of those observed to determine how critical the project area was for the over-wintering life history traits of the northern red-bellied cooter. Optimal over wintering habitat was observed within Ranger Cove (the project area), which included suitable depths of water, soft substrate, and a flowing channel. Figure 4 provides a demarcation of an area likely to provide suitable overwintering areas for this species. Similarly, the northern most cove of the reservoir (away from the project area) contained conditions comparable to the project area and therefore was determined to also be suitable overwintering habitat. Along with suitable habitat conditions, these cove areas contained the greatest number of turtles in comparison to the rest of the reservoir. The southern portions of the reservoir are more limited in silt deposits and basking area availability. A small area adjacent to Carpenters Cove Lane also contained soft substrate conditions however few turtles were observed there, likely attributed to the lack of basking areas. Based on these findings, the southern areas of Marsh Creek Reservoir contain less than optimal overwintering habitat, although some turtles may use them for seasonal activities. Optimal overwintering habitat was observed in the northern and northeastern reaches of the reservoir, which includes the project area.

The habitat survey also documented approximately 16 basking locations with the majority (13) located along the northwestern shore of Ranger Cove. Figure 4 provides the approximate locations of these. However, the presence and locations of some of these features is ever changing with the fluctuating reservoir levels and presence and availability of downed and semi-submerged logs and other basking areas.

9.0 CONSERVATION MEASURES

DuBois has participated in similar projects over the last several years, beginning with Westtown Lake in 2015 and proceeding to a few South Jersey lakes and Lake Williams in 2021. The dredging of the Ranger Cove portion of Marsh Creek Reservoir is expected to affect the northern red-bellied cooter population if construction timing restrictions are not followed. Based on observations it is believed that northern red-bellied cooters over-winter primarily in a portion of the project area as demarcated on Figure 4 as a hibernation zone. Therefore, it is likely that the dredging operation would encounter/disturb, injure,

or take this species if conducted in the area depicted on Figure 4 during the "inactive" brumation/overwintering period.

Turtles encountered during the overwintering period would not be able to take refuge elsewhere and relocations would not be possible due to cold temperatures. However, based on the project description, if the project is conducted during the active season (April 15-October 15) it is expected that individuals would be able to take refuge to other portions of the lake or areas already dredged. This is consistent with PAFBC's recommendation as provided within their Species Impact Review correspondence dated September 21, 2021 and provided in Appendix B. In that correspondence, the PAFBC recommended *"…the dredging activity be conducted during the species active season April 15 to October 15 to minimize impacts to the species of concern."*. If the project must be constructed within or partially within the "inactive" period due to other project constraints, then DuBois recommends SPLP only work outside of the hibernation and 100-foot buffer as demarcated on Figure 4. If work needs to be conducted outside of the active season and in the hibernation and 100-foot buffer zones, DuBois recommends SPLP work closely with the PAFBC and apply for a Special Permit for a "take" per Title 58, Chapter 75.4.

This assessment also observed an important area for basking along the northwestern shoreline of the project area, documenting 13 basking locations. It is known that the dredging will remain 10 feet from the shoreline as currently proposed, This 10-foot buffer would not only provide preservation of an important basking and hibernation area but provide areas of refuge during the dredging operation. In addition, the same shoreline to south of the project was noted as lacking suitable basking structures. Having additional structures installed would not only create habitat, it would also provide additional points of nearby refuge for cooters that flee the cove during the dredging operation.

As a final conversation measure, DuBois recommends a qualified herpetologist, who possesses the necessary Scientific Collector's Permit issued by the PAFBC to be on-site during any agreed upon habitat improvement or in-water work associated with this project. The herpetologist would be on-site to provide training and consultation services to project personnel, direct the habitat improvement work, and handle and relocate, if necessary, encountered northern red-bellied cooters. The herpetologist would be responsible for daily documentation and reporting of encounters, observations, and actions related to this species. Preparation of a brief final report for submittal to the PAFBC would be an additional responsibility.

In summary, based on this biological assessment and the PAFBC September 21, 2021 recommendation, DuBois recommends the following conservation measures to ensure impacts to this species are minimized:

- **Conduct the dredging action during the species active season from April 15 to October 15th**
- **Install additional basking structures (minimum of 8) along the northwestern shoreline with 3 placed inside the turbidity curtain line and 5 outside of the turbidity curtain line to provide additional nearby refuge for displaced individuals.**
- **Provide a minimum of 2 ramps over the turbidity curtain line to provide access to additional refuge areas.**
- **Employee a full-time, qualified herpetologist, who possesses the necessary Scientific Collector's Permit issued by the PAFBC to oversee habitat improvement and in-water work when conducted northeast of the line demarcated on Figure 4.**
- **Coordinate with PAFBC regarding finalizing these recommendations into a project-specific "Conservation Plan"**

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APPENDIX B

PAFBC CORRESPONDENCES

Pennsylvania Fish & Boat Commission
established 1866

Division of Environmental Services
Resource Extraction Section
595 E Rolling Ridge Dr.
Bellefonte, PA 16823

December 23, 2021

IN REPLY REFER TO
SIR# 55023

Energy Transfer
Nicholas J. Bryan
101 W. Third St.
3rd Floor
Williamsport, Pennsylvania 17701

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No. 741959_1
Marsh Creek Lake Restoration
CHESTER County: Upper Uwchlan Township

Dear Nicholas J. Bryan:

This responds to your updated inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. Previous correspondence from this office, September 21, 2021, requested a Habitat Assessment be conducted within Marsh Creek Lake for the **Northern Red-bellied Cooter (*Pseudemys rubriventris*, Threatened)**. In response, a Habitat Assessment was conducted by Bryon DuBois, "Northern Red-bellied Cooter Biological Assessment – Marsh Creek Lake Restoration Project, November 22, 2021". The document provides details related to essential overwintering habitat, occurrences of the species, a population estimate, and conservation recommendations to avoid/minimize impacts to the species during project implementation.

Northern Red-bellied Cooter (*Pseudemys rubriventris*, Threatened)

Based on our review, the project area contains overwintering habitat and the species of concern occurs frequently within the project area. Therefore, significant impacts to the species of concern are anticipated and additional measures are necessary to minimize and avoid impacts to the species of concern.

The following Avoidance Measures are recommended:

1) Conduct all in-water work, including but not limited to dredging, during the species' Active Season (April 15 – October 15);

2) Provide oversight by a Qualified Biologist during all in-water work within the area indicated on the Habitat Suitability Map (Figure 4.);
3) Coordinate with PAFBC to discuss and develop methods used for a Clearance Survey;
4) Install exclusion barriers (i.e., the impermeable silt curtain) to prevent the species of concern from entering the project area;
5) Install multiple devices to provide suitable passage over the exclusion barrier for individuals to seek refuge outside the impact area (i.e., ramps over the turbidity curtain);
6) For upland areas considered suitable for turtle nesting, conduct construction prior to the species Nesting Season (begins May 15) and install an exclusion barrier such as a silt fence if turtle movement within the project area is anticipated.

Additionally, the following Conservation Measures are recommended:

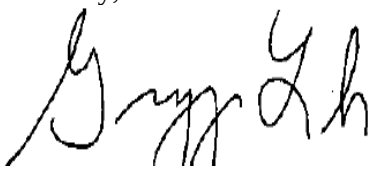
A) Replace all basking habitat impacted by the project and install additional basking structures to provide areas of refuge during and following construction;
B) We recommend the area identified as overwintering habitat on the Habitat Suitability Map (Figure 4) be excluded from the dredged area. This critical habitat is not easily replaced and removing the sediment deposits may have adverse impacts to the population;
C) Coordinate with PAFBC to create a Conservation Plan which mitigates for impacts resulting from construction. This may include activities such as conducting a study to estimate the size of the Red-bellied Cooter population during the preconstruction clearance and/or the creation of nesting habitat in the upland area disturbed by the upland portion of the project;
D) The Conservation and Pre-construction Clearance Survey Plans should be submitted for Commission review and approval at least 60 days prior to their implementation. If necessary, we recommend that a meeting be scheduled to discuss the details of these plans.

Based on the submitted documents, the project scope, and the potential need for a Special Take Permit, PNDI clearance from the Pennsylvania Fish and Boat Commission is PENDING. Continued consultation related to a site-specific Clearance Survey and site-specific Conservation Plan are requested to resolve outstanding issues.

This response represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Gregory Lech (glech@pa.gov) and Jordan Allison (jorallison@pa.gov) and refer to the SIR # 55023. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,



Gregory Lech
Resource Extraction Section

GPL/dn

1. PROJECT INFORMATION

Project Name: **Marsh Creek Lake Restoration**
Date of Review: **9/2/2021 10:42:05 AM**
Project Category: **Habitat Conservation and Restoration, Other**
Project Area: **30.11 acres**
County(s): **Chester**
Township/Municipality(s): **UPPER UWCHLAN TOWNSHIP**
ZIP Code:
Quadrangle Name(s): **DOWNINGTOWN**
Watersheds HUC 8: **Brandywine-Christina**
Watersheds HUC 12: **Marsh Creek**
Decimal Degrees: **40.073173, -75.713012**
Degrees Minutes Seconds: **40° 4' 23.4219" N, 75° 42' 46.8416" 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	No Known Impact	No Further Review Required
PA Fish and Boat Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
U.S. Fish and Wildlife Service	**Potential Impact**	**MORE INFORMATION REQUIRED, See Agency Response**

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.

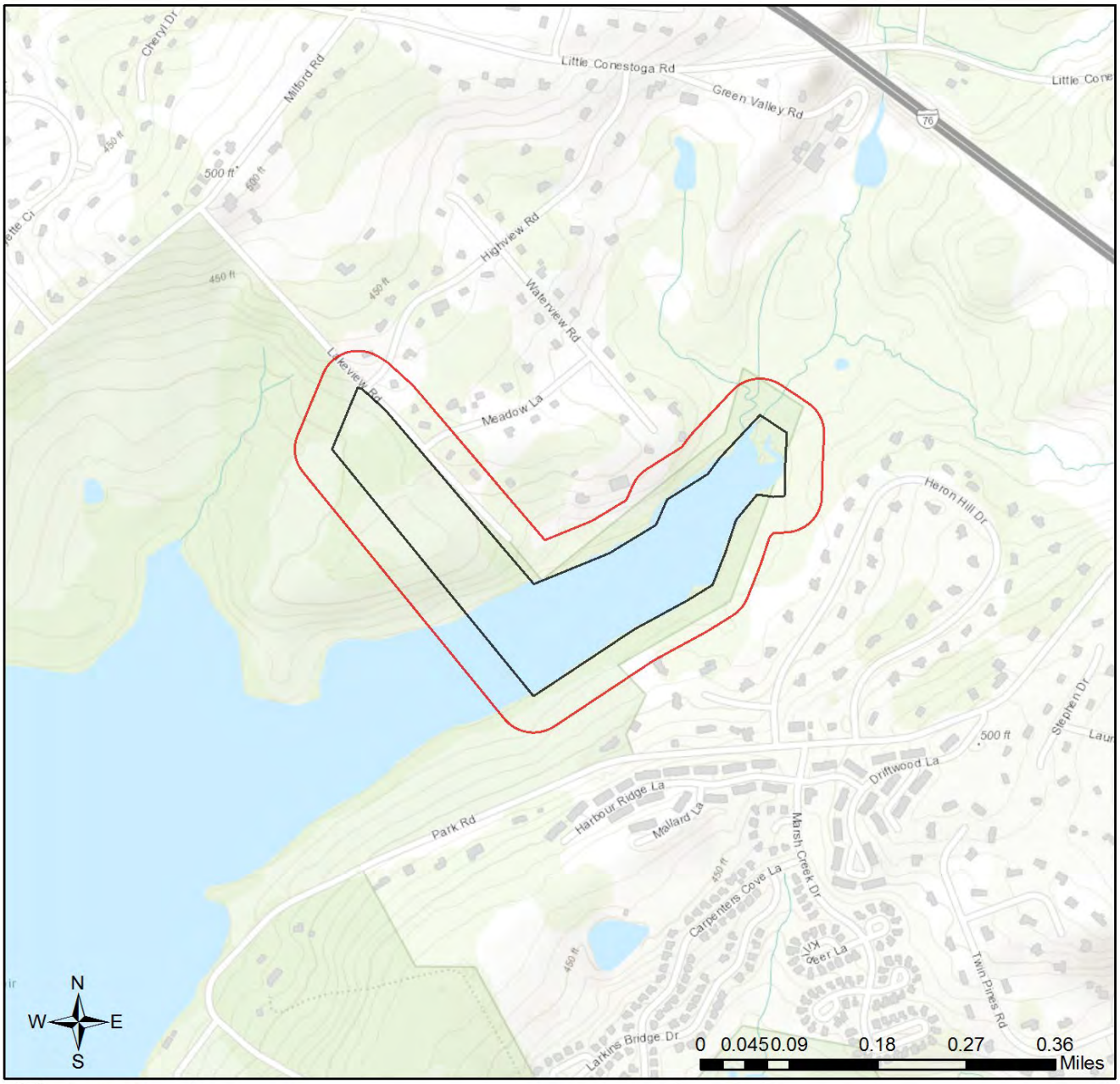
Marsh Creek Lake Restoration

Project Boundary

Buffered Project Boundary

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Marsh Creek Lake Restoration



Project Boundary

Buffered Project Boundary

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

RESPONSE TO QUESTION(S) ASKED

Q1: Accurately describe what is known about wetland presence in the project area or on the land parcel by selecting ONE of the following. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur.
Your answer is: Someone qualified to identify and delineate wetlands has investigated the site, and determined that wetlands ARE located in or within 300 feet of the project area. (A written report from the wetland specialist, and detailed project maps should document this.)

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

PA Fish and Boat Commission
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).

PFBC 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.)

Scientific Name	Common Name	Current Status
Sensitive Species**		Threatened

U.S. Fish and Wildlife Service
RESPONSE:

Information Request: Conduct a Bog Turtle Habitat (Phase 1) Survey in accordance with USFWS Guidelines for Bog Turtle Surveys (April 2020). Evaluate all wetlands within 300 feet of the project area, which includes all areas that will be impacted by earth disturbance or project features (e.g., roads, structures, utility lines, lawns, detention basins, staging areas, etc.). IF THE PHASE 1 SURVEY IS DONE BY A QUALIFIED BOG TURTLE SURVEYOR (see https://www.fws.gov/northeast/pafo/endangered/surveys.html): 1) Send positive results to USFWS for concurrence, along with a project description documenting how impacts will be avoided. OR, conduct a Phase 2 survey and send Phase 1 and 2 results to USFWS for concurrence. 2) Send a courtesy copy of negative results to USFWS (label as "Negative Phase 1 Survey Results by Qualified Bog Turtle Surveyor: USFWS Courtesy Copy"). USFWS approval of negative results is not necessary when a qualified surveyor does the survey in full accordance with USFWS guidelines. IF THE PHASE 1 SURVEY IS NOT DONE BY A QUALIFIED SURVEYOR: Send ALL Phase 1 results to USFWS for concurrence, and if potential habitat is found, also send a project description documenting how impacts will be avoided. As a qualified bog turtle surveyor, I _____ (name) certify that I conducted a Phase 1 survey of all wetlands in and within 300 feet of the project area on _____(date) and determined that bog turtle habitat is absent.
_____ (Signature)

* 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) (see AGENCY CONTACT INFORMATION). 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 (but not USFWS).
*If information was requested by USFWS, applicants must email, or mail, project information to IR1_ESPenn@fws.gov to initiate a review. USFWS will not accept uploaded project materials.

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.

APPENDIX C

STATEMENT OF QUALIFICATIONS

Bryon DuBois
Principal Senior Biologist
bdubois@denviro.com

190 North Main Street
Manahawkin, NJ 08050
609-488-2857

Education:

B.S. Biology & Ecology,
West Chester University, 1993

Professional Affiliations:

NJ Department of Environmental Protection Wetland Mitigation Council 2003 – 2013; 2016 - Present

New Jersey Builders Association 1999 – Present

Shore Builders Association 2001 – 2013

Builders League of South Jersey 2013 - Present

Member: Society of Wetland Scientists 1997 – Present

Member: The Ecological Society of America 1998 – Present

Member: New Jersey Division of Fish, Game and Wildlife Conservation Corps. 2000 – Present

Member: Pine Beach Environmental Commission 1995 – 2003

Association of N.J. Environmental Commission (ANJEC) 1995 – 2010

N.J. Concrete & Aggregate Society 2003 – 2013

Southern Ocean County Chamber of Commerce 2014 - Present

Fields of Competence:

Mr. Bryon DuBois has over 27 years' experience in the fields of regulatory compliance, ecology, biology, wetland science, wildlife management, hydrology and habitat restoration. He has managed numerous large scale projects through the approval process in New Jersey, Pennsylvania, Maryland and Delaware. Mr. DuBois is highly respected by the regulatory agencies in N.J. and surrounding states. He has made positive contributions to policies effecting protected species (both state and federal), wetland mitigation, regulation and coastal zone policies through NJDEP, PADEP, MDDNR, DEDNR and ACOE. These contributions have also been through invited participation and professional guidance provided in regulatory agency stakeholder processes.

Professional Experience:

After seven (7) early years in the consulting business Mr. Bryon DuBois created an environmental consulting firm in 2000 that focused on ecological and environmental issues that the regulated community was facing. Mr. DuBois has applied logical and objective solutions to some of the most difficult environmental projects and has constantly found a balance between environmentalists and developers alike. Mr. DuBois operates the firm and ensures successful completion of projects through management and coordination of numerous employees. Mr. DuBois operates the firm to promote the client's interest while providing the regulatory agencies with the documentation they require for approvals. The end result is typically a project or product that is both environmentally sound and in the best interest of the client.

Mr. DuBois has been requested to present topics related to environmental regulations at the Atlantic City Builders Convention, the Eastern Region Airports Conference in Hershey, Pennsylvania, the U.S. Fish and Wildlife Bog Turtle Convention, the N.J. Pinelands Commission, the Louisiana Fish and Game and dozens of planning boards in towns across N.J. and P.A. His diverse experience has made him a respectable candidate to speak publicly on projects that require many different issues from ecology to water quality.

Mr. DuBois is responsible for performing wetland delineations under the jurisdiction of multiple agencies and has more than 25 years of experience performing wetland delineations on more than 1,800 acres of land over three states. Mr. DuBois authors Freshwater Wetland Delineation Reports and has prepared more than 1,000 Freshwater Wetland Letter of Interpretation applications for submittal to the NJDEP for verification of the delineated wetland limits.

Mr. DuBois began designing and managing the construction of wetland mitigation projects tailored to a specific habitat type or land use in 1998. Over the years his projects were approved and exceeded the standard requirements without increasing costs for the client. These mitigation projects helped Mr. DuBois become nominated to the State of New Jersey's Wetland Mitigation Council in 2003 by the Governor of New Jersey. Mr. DuBois has reviewed and received approval for numerous mitigation related projects and banks in New Jersey, Pennsylvania and Maryland.

From 2003 to the present-day Mr. DuBois has successfully managed, designed and received approval for projects ranging from airports to industrial centers, wastewater management facilities and large commercial areas along with thousands of residential dwellings. This has involved performing numerous long term studies on several influential species such as Bog Turtles, Pine Snakes, and Indiana Bats along with assessments of habitat and creation of mitigation measures. Mr. DuBois has held over 320 scientific collecting permits for surveys performed within the Mid-Atlantic States, many of which involve a telemetry component.

Mr. DuBois also has extensive experience coordinating with various utility companies to provide wetland, ecological surveys and monitoring services necessary to support utility line improvement and upgrade projects, which also involves regulatory agency coordination through implementation of both Pennsylvania Fish and Boat Commission and New Jersey Department of Environmental Protection standards

Bryon DuBois
Principal Senior Biologist
bdubois@denviro.com

190 North Main Street
Manahawkin, NJ 08050
609-488-2857

Certifications:

Professional Wetland Scientist
Society of Wetland Scientist

Certified Sr. Ecologist, The Ecological Society of America

Recognized Qualified Bog Turtle Surveyor – N.J., N.Y., P.A., D.E., M.D.

Recognized Qualified Indiana and Northern Long Eared Bat Surveyor – N.J., N.Y., P.A.

Certified Subsurface Evaluator NJDEP# 0001940

Recognized Qualified Delmarva Fox Squirrel Surveyor – M.D., D.E.

Pennsylvania Qualified Herpetologist for Various Species

The projects of relevance presented below have been successfully completed through the management and coordination of Mr. DuBois with the client and regulatory agencies.

Projects of Relevance:

NEW JERSEY:

- *NJ DOT Permitting and Threatened and Endangered Species*
  - Route 206 – Taylor, Wiseman, Taylor and NJDOT, Atlantic County, NJ
  - Route 46 - Taylor, Wiseman & Taylor and NJDOT, Warren County, NJ
- *Ecological Monitoring, Threatened/Endangered Species Studies & Wetlands Assessments*
  - A.C. Electric Co. South Jersey Multiple Transmission Line Upgrades
    - BL England Transmission Line Upgrade, Atlantic, Burlington & Salem Counties
    - Cove Road Transmission Line Upgrade, Cape May County
    - Orchard to Lewis Transmission Line Upgrades, Atlantic County
    - Oyster-Creek Cardiff Transmission Line Wetland Mitigation, Ocean County
- *Threatened/Endangered Species Studies & Permitting- Pinelands*
  - NJNG Southern Reliability Line – Townships of Manchester, Jackson, Lakehurst, Plumsted, Chesterfield, and North Hanover, Ocean and Burlington Counties, NJ
  - Clayton Companies - Shulton Property, Glidden Sand Mine & Woodmansie Sand Mine – Ocean and Burlington Counties, NJ
  - Cutt Brothers Farm Service Restoration project- Burlington County
- *Federal Involvement/Federal Oversight*
  - Swamp Pink Monitoring at Various Sites – Atlantic, Warren Counties, NJ
  - Various Distribution Center Applications; Bat Studies – Warran Township, Montville Township, Morris Co, NJ, Mt. Pocono, Northampton Co, PA.
  - Bear Creek Construction Monitoring- Burlington County, NJ.
- *Wetland Mitigation Approvals/Monitoring*
  - GEHR Mitigation Bank - Evergreen Environmental, Gloucester County, NJ
  - MBB Mitigation Bank - Evergreen Environmental
  - Bell Labs –Riparian Mitigation - Toll Brothers, Inc. Monmouth County, NJ
  - Bamm Hollow – Wetland Mitigation - Toll Brothers, Inc., Monmouth County, NJ

PENNSYLVANIA:

- *Threatened/Endangered Species Studies*
  - Westtown Lake Turtle Relocation, Westtown School, Chester County, PA
  - Haverford College Red Bellied Turtle Relocation, Delaware County, PA
- *Threatened/Endangered Species Studies & ACOE Permitting*
  - Scudder Falls Bridge Replacement, Michael Baker Inc., Yardley, PA
- *Permitting and Jurisdictional Determinations*
  - Brookdale – 1200 Acre wetland delineation, SK Design Group, Monroe County PA
  - Shartlesville – 520-acre wetland delineation in Burkes County, PA
  - 2016 PPL Reliability Project – Surveyed approximately 100 Miles of PPL Right of way throughout Lancaster, Lebanon and Berks County.

DELAWARE:

- *Threatened/Endangered Species Studies, Permitting & Wetlands*
  - DPL - Church to Wye Mills Transmission Line Upgrade, Kent County, DE
  - DPL - MD Transmission Line Upgrades from 2009-2014 Kent County to Sussex County DE

MARYLAND:

- *Threatened/Endangered Species Studies, Permitting & Wetlands*
  - Pepco – Bald Eagle Hazing and Nest Construction, Brandywine MD.
  - Kent County Wetland Mitigation Project, Delineation and Assessment

Ethan DuBois
Staff Biologist
edubois@denviro.com

190 North Main Street
Manahawkin, NJ 08050
609-488-2857

Education:

B.S. Environmental Science Elizabethtown College 2020

M.S. Wildlife & Fisheries Resources Clemson University 2021

Certifications:

USFWS Qualified Bog Turtle Surveyor - NJ

Delaware DNREC Sediment & Stormwater Program Blue Card

Career Positions:

DuBois & Associates, Manahawkin, NJ – Staff Biologist, 2014 – Present

Qualifications:

Mr. Ethan DuBois is a Staff Biologist with the firm of DuBois Environmental Consultants. He is responsible for assisting with faunal and floral sampling investigations, environmental site assessments and on-site soil analysis. He also assists in conducting various rare, threatened and endangered species studies. Since starting at DuBois Environmental Consultants, Mr. DuBois has participated in conducting studies on several species such as Bog Turtles, Northern Pine Snakes, Timber Rattlesnakes, Pine Barrens Treefrogs, Red-Bellied Turtles, Red-headed Woodpeckers and Eastern Tiger Salamanders.

Mr. E. DuBois has assisted in habitat and visual surveys for Bog Turtles in New Jersey, Pennsylvania, and Maryland. These activities include helping with directed visual surveys, implementation of data collection and habitat analysis. He has also been responsible for the maintenance and operation of multiple ecological trapping arrays, including drift fence-box funnel trap arrays designed to capture threatened and endangered snake species, as well as bog turtle trapping arrays in Pennsylvania.

In conjunction with performing surveys for a variety of environmental/ecological assessments, Mr. E. DuBois has gained extensive experience using ESRI Arc Map Geographic Information Systems (GIS) software and global positioning systems (GPS). Maps are created to depict a visual representation for clients of site-specific characteristics in relation to various projects. These tools are also used in mapping species such as turtles, bats and snakes.

Mr. E. DuBois also performs biological/environmental construction monitoring associated with utility right-of-way's throughout New Jersey, Pennsylvania, Delaware and Maryland. Environmental oversight ensures the project is conducted in an environmentally responsible manner and in accordance with all applicable soil erosion and sediment control (SESC) standards and best management practices. Biological oversight in and around sensitive habitats ensures that the project does not have any adverse impacts to sensitive habitats or rare faunal and floral species.

Projects of Relevance:

Phase 1 and Phase 2 Bog Turtle Surveys along Several Transmission Line Upgrade Projects within Lancaster, Northampton, Lebanon, Adams and Berks Counties, PA Gloucester, Salem and Warren Counties, NJ, and Harford County, MD: Performed phase 1 and phase 2 bog turtle surveys under the supervision of a qualified bog turtle surveyor. Assessed numerous wetlands for bog turtle habitat suitability and performed phase 2 surveys within wetlands determined to contain suitable habitat parameters. These surveys were coordinated with the USFWS, the PA Fish and Boat Commission, and the NJDEP.

Ethan DuBois
Staff Biologist
edubois@denviro.com

190 North Main Street
Manahawkin, NJ 08050
609-488-2857

Education:

Mr. E. DuBois received a Bachelor of Science degree in Environmental Science with a Business Administration Minor in May of 2020. Following graduation, Mr. E. DuBois began an M.S Program in Wildlife and Fisheries Resources at Clemson University. Here, Mr. E. DuBois selected graduate level classes including Wildlife Habitat Management, Restoration Ecology, Global Change Ecology, Fisheries Management and Conservation, as well as Conservation Issues.