

Phase II Bog Turtle Survey

for the Green Brook Flood Risk Management Project Segment C1, Wetland Site Unit C1- W1/C1-WE

Middlesex Borough, Middlesex County, New Jersey

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Prepared for:

U.S. Army Corps of Engineers – New York District



**US Army Corps
of Engineers®**

Prepared by:

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1.0 Introduction

First Environment, Inc. (First Environment) was retained by the U.S. Army Corps of Engineers (USACE) to conduct a Phase II Bog Turtle Survey within wetland site unit C1-W1/C1-WE within the Green Brook Flood Risk Management Project in Middlesex Borough, Middlesex County, New Jersey (Figure 1). A small (0.12 ac) area of potential bog turtle habitat was documented within the Jersey Central Power & Light (JCP&L) transmission line right-of-way (ROW) containing a sedge and mixed herbaceous wet meadow situated along a small watercourse (Figure 2).

The bog turtle (*Glyptemys muhlenbergii*) is a federally-threatened and state-endangered species. Under the Green Brook Flood Risk Management Project, the USACE intends to construct a series of levees, floodwalls, and pump stations in Segments C1, C2, and H along the Bound Brook to attenuate flooding. Bog turtles have been historically documented in the region and in its review of the project, the U.S. Fish and Wildlife Service (USFWS) requested a Phase I Habitat Survey and follow-up Phase II Surveys at any potential habitat areas to determine the presence of the species. Accordingly, in October 2018 First Environment conducted a Phase I habitat survey in the project area's freshwater wetlands for the presence of suitable habitat for the bog turtle and recommended a Phase II survey be conducted in a portion of wetland site unit C1-W1/C1-WE (USACE, 2018). The results of the Phase II Survey are presented in this report.



Figure 1: Project location map showing potential bog turtle habitat

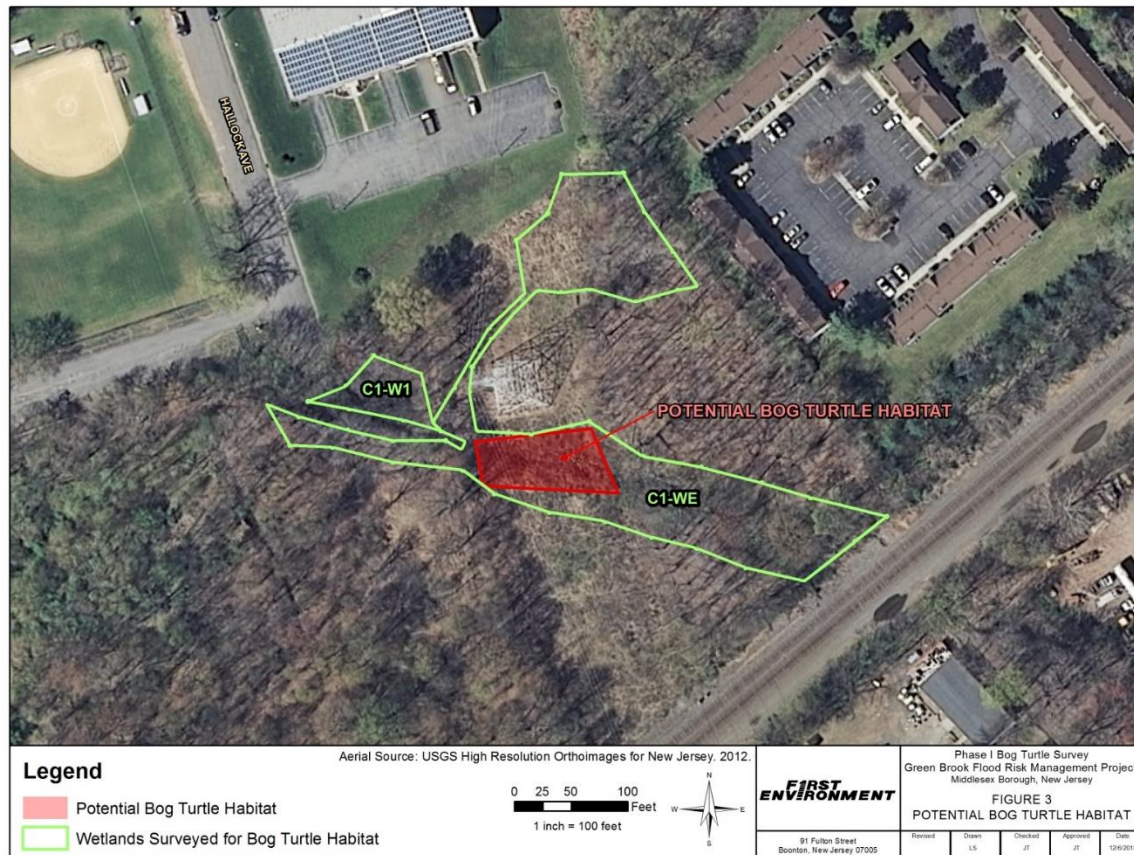


Figure 2: Phase II bog turtle survey area

1.1 Species Background

The bog turtle is a semi-aquatic, freshwater turtle that prefers shallow, emergent wetlands with highly penetrable substrates saturated by perennial groundwater discharge. Bog turtle habitats fall under several wetland community classifications including freshwater marsh, medium and rich fen, wet meadow, and shrub swamp. Most bog turtle sites support a mosaic of herbaceous and woody-dominated communities. Key habitat features include soft 'mucky' soils (composed of organic or mineral material), springs and seeps, rivulets, shallow pools, and hummocks, often in the form of tussock-forming vegetation. Common flora of bog turtle habitats in the Mid-Atlantic region include rice cutgrass (*Leersia oryzoides*), cattail (*Typha spp.*), tussock sedge (*Carex stricta*), sedges (*Carex spp.*) wool grass (*Scirpus cyperinus*), common rush (*Juncus effusus*), skunk cabbage (*Symplocarpus foetidus*), jewelweed (*Impatiens capensis*), tearthumb (*Polygonum spp.*), arrowhead (*Sagittaria*) sensitive fern (*Onoclea sensibilis*), marsh fern (*Thelypteris palustris*), peat moss (*Sphagnum sp.*), speckled alder (*Alnus serrulata*), willow (*Salix spp.*), silky dogwood (*Cornus amomum*), poison sumac (*Rhus vernix*), spicebush (*Lindera benzoin*), northern arrowwood (*Viburnum dentatum*), red maple (*Acer rubrum*), pin oak (*Quercus palustris*), and gray birch (*Betula populifolia*). Nonnative and/or invasive species including purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), Japanese stilt-grass (*Microstegium vimineum*), and multiflora rose (*Rosa multiflora*) can also be abundant. Habitats tend to be small and localized, with many sites falling under an acre in size. Bog turtles are generally active April through October. Breeding occurs in the spring, and in June, females lay eggs atop moss-covered sedge tussocks or other raised surfaces

in the wetland. Hatchlings emerge in September. Brumation typically occurs in tunnels saturated by groundwater, which provides a thermal buffer. Bog turtles are omnivorous and can live in excess of 50 years and perhaps much longer. The species was listed as threatened by the USFWS in 1997 (Ernst and Lovich, 2009; USFWS, 2001).

2.0 Methods

The Phase II Bog Turtle Survey was conducted by Jason Tesauro, recognized USFWS bog turtle surveyor, and Dana Flynn, biologist with Louis Berger (LB). Bog turtle survey methods were consistent with the USFWS Phase II survey guidelines (USFWS, 2001) and consisted of walking slowly through the potential habitat area on warm sunny days, visually scanning potential basking habitat, probing any mucky pools and rivulets for submerged turtles with a wooden probe stick, and over-turning thatch and cover for concealed turtles. The potential habitat area was surveyed at the rate of two person-hours per visit.

3.0 Results

Phase II bog turtle surveys were performed on 24 April, 2 May, 6 May, and 15 May 2019 between 0900-1300 hours under partly sunny and sunny skies with ambient air temperatures between 56-64 degrees Fahrenheit (Table 1). Over the course of eight person-search hours spanning four surveys, no bog turtles or signs of their presence were documented at the identified portion of wetland site unit C1-W1/C1-WE. The only herpetofauna documented during the survey was the green frog (*Lithobates clamitans melanota*), several of which were observed along the stream that flows through the center of the potential habitat area.

DATE	SURVEYORS	TIMES/CONDITIONS	OBSERVED HERPETOFAUNA
24 April 2019	J. Tesauro, D. Flynn	0900-1000h; 63-65F, sunny	green frog (<i>Lithobates clamitans melanota</i>)
2 May 2019	J. Tesauro, D. Flynn	0900-1000 h; 56-60F, partly sunny	none
6 May 2019	J. Tesauro, D. Flynn	0930-1030 h; 59-63F, sunny	green frog (<i>Lithobates clamitans melanota</i>)
15 June 2019	J. Tesauro, D. Flynn	1200-1300 h; 61-64F, overcast	green frog (<i>Lithobates clamitans melanota</i>)

4.0 Conclusions & Recommendations

The Phase II survey at wetland site unit C1-W1/C1-WE failed to detect the presence of bog turtles. The openness and short stature of the vegetation in the potential habitat (Figures 3 & 4) provided ideal opportunities for visual and tactile turtle searching, and First Environment is confident that bog turtles would have been detected if a population was present. Bog turtles are extremely rare in Middlesex County and have been mostly extirpated from areas characterized by extensive urbanization. The potential bog turtle habitat was limited both in size and quality (e.g., stormwater run-off; historical filling activities for JCP&L tower pad construction), and is isolated from other bog turtle habitats, with the nearest known population occurring eight miles north in the Great Swamp National Wildlife Refuge. No further bog turtle surveys are recommended for the C1-W1/C1-WE wetland site unit.



Figure 3: Bog turtle habitat survey area facing SE; the short-statured, mostly native plant community comprised of sedges, rushes, ferns, skunk cabbage, and a variety of forbs provided favorable search conditions for the bog turtle surveyors



Figure 4. Biologist, Dana Flynn, surveying for bog turtles on 15 June 2019

5.0 References

Ernst, C.H. and J.E. Lovich. 2009. Turtles of the United States and Canada. 2nd Edition, Johns Hopkins University Press, Baltimore.)

U.S. Army Corps of Engineers. December 19, 2018. Phase I Bog Turtle Habitat Survey for the Green Brook Flood Risk Management Project, Segments C1, C2 and H, Middlesex Borough, Middlesex County, New Jersey.

U.S. Fish and Wildlife Service. 2001. Bog Turtle (*Clemmys muhlenbergii*), Northern Population, Recovery Plan. Hadley, Mass. 103 pp.

Appendix A: Qualifications of Personnel

Jason Tesauro

EDUCATION:

- 1998 – 2002: Rutgers the State University of New Jersey
 Graduate School
 M.S. Ecology and Evolution
 Advisor: Dr. David Ehrenfeld
 Thesis: The Effects of Livestock Grazing on the Bog turtle (*Clemmys muhlenbergii*)
- 1992 – 1997: Rutgers the State University of New Jersey
 Rutgers College
 B.A. Anthropology
 Minor – Biological Sciences

EMPLOYMENT HISTORY:

- Biologist - First Environment, Boonton, New Jersey (2018 - present)
- Wildlife Ecologist - Jason Tesauro Consulting, LLC, Millbrook, New York (2003 - present)
- Associate Biologist - Hudsonia, Ltd., Annandale, New York (1998 - present)
- Wildlife Ecologist - Environmental Defense Fund, Washington, D.C. (2003 - 2010)
- Senior Zoologist - New Jersey Division of Fish and Wildlife Endangered & Nongame Species Program, Hampton, New Jersey (1994 - 2003)

PUBLICATIONS/ARTICLES:

- Tesauro, J. 2001. Restoring wetland habitats with cows and other livestock. *Conservation Biology in Practice* 2:26-30.
- Tesauro, J. and David Ehrenfeld. 2007. The effects of livestock grazing on the bog turtle [*Glyptemys (=Clemmys) mulenberghii*]. *Herpetologica* 63:293-300.
- Lathrop, R., P. Montesano, J. Tesauro, and B. Zarate. 2005. Statewide mapping and assessment of vernal pools: A New Jersey case Study. *Journal of Environmental Management* 76:230-238.
- Bell-Travis, K., I. Haeckel, G. Stevens, J. Tesauro, and E. Kiviat. Bog Turtle (*Glyptemys muhlenbergii*) Dispersal Corridors and Conservation in New York, USA. *Herpetological Conservation and Biology* 13(1):257–272.

PROFESSIONAL CERTIFICATIONS:

- U.S. Fish and Wildlife Service Recognized Qualified Bog Turtle Surveyor/Trapper for Pennsylvania, New Jersey, and New York

PROFESSIONAL AFFILIATIONS:

- Board of Directors, The Wetlands Trust, Burdett, New York (January 2016 - present)
- Board of Directors, The Wetlands Conservancy, Brooktondale, New York (March 2015 - present)

Dana Flynn

EDUCATION:

2002 – 2006: University of Delaware
B.S. Wildlife Conservation

EMPLOYMENT HISTORY:

Senior Environmental Scientist – Louis Berger, U.S., Morristown, New Jersey (2007 - present)

Field Biologist – New Jersey Audubon, Cape May Court House, New Jersey (2007)

Wildlife Technician – New Jersey Division of Fish and Wildlife, Clinton, New Jersey (2006-2007)

Wildlife Technician – University of Delaware, Department of Entomology & Wildlife Ecology (2006)

PUBLICATIONS/ARTICLES:

N/A

PROFESSIONAL CERTIFICATIONS:

Certified Ecologist, Ecological Society of America

Certified Wildlife Biologist – The Wildlife Society

PROFESSIONAL AFFILIATIONS:

Ecological Society of America (2017 - present)

New Jersey Chapter of The Wildlife Society (2013-present)

The Wildlife Society (National) (2008-present)

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