Phase I Bog Turtle Habitat Survey

for the Green Brook Flood Risk Management Project Segments C5 through D

Somerset and Middlesex Counties, New Jersey

July 21, 2020

Prepared for:	U.S. Army Corps of Engineers – New York District
	US Army Corps of Engineers®
Prepared by:	First Environment, Inc.

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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 I habitat survey for the federally-threatened and state-endangered bog turtle (*Glyptemys muhlenbergii*) in Segments C5 through D of the Green Brook Flood Risk Management (FRM) project in Middlesex and Somerset counties, New Jersey (Figure 1). Under the Green Brook Flood Risk Management Project, USACE intends to attenuate flooding along Green Brook and its tributaries through the construction of a series of levees, floodwalls, and pump stations. The bog turtle has been historically documented in the region, and in its review of the project the U.S. Fish and Wildlife Service (USFWS) asked for a Phase I Survey to determine the potential presence of bog turtles within the project area. A Phase I and Phase II survey of Segments C1-C4 conducted by First Environment in 2018-2019 identified one potential bog turtle habitat that was determined negative for bog turtle presence. The results of the Segment C5 through D Phase I Survey are presented in this report.

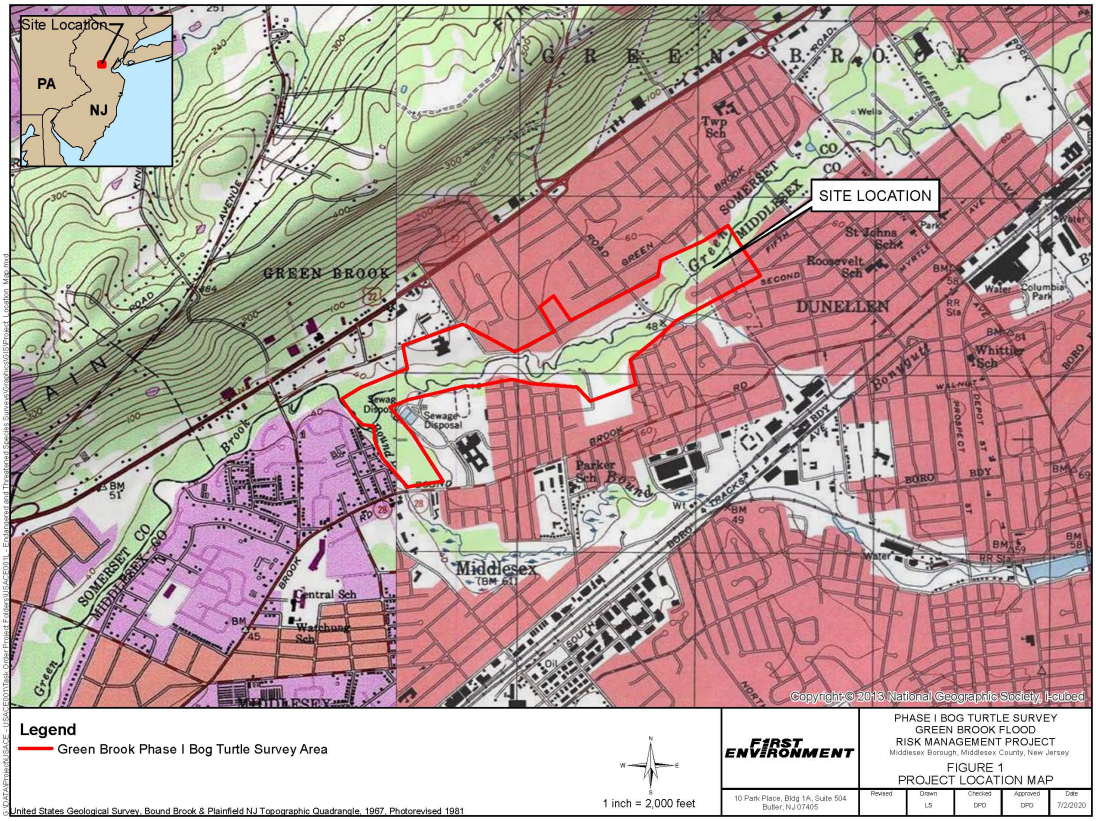


Figure 1 – Project Location Map

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*), tussock sedge (*Carex stricta*), sedges (*Carex sp.*) wool grass (*Scirpus cyperinus*), common rush (*Juncus effusus*), skunk cabbage (*Symplocarpus foetidus*), jewelweed (*Impatiens capensis*), smartweed (*Polygonum*), arrowhead (*Sagittaria*) sensitive fern (*Onoclea sensibilis*), smartweed (*Polygonum* sp.), marsh fern (*Thelypteris palustris*), peat moss (*Sphagnum* sp.), speckled alder (*Alnus serrulata*), willow (*Salix* sp.), 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 stiltgrass (*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 U.S. Fish and Wildlife Service in 1997 (Ernst and Lovich, 2009; USFWS, 2001).

2.0 Methods

The Phase I Bog Turtle Survey was conducted over the course of three days: 28 May, 3 June, and 8 June 2020 and encompassed 17 discrete wetlands (Figure 2). Surveys were conducted by Jason Tesauro, a USFWS Recognized Qualified Bog Turtle Surveyor. Each wetland was evaluated on foot for the presence of the following habitat components listed in the U.S. Fish and Wildlife Service's Bog Turtle Phase I Habitat Survey guidelines:

- substrates of saturated organic and/or mineral 'mucky' soils with high penetrability;
- hydrologic regime maintained by a consistent supply of groundwater;
- dominance of herbaceous and scrub-shrub hydrophytic vegetation including sedges and other hummock-forming graminoids.

Representative habitat photographs and GPS coordinates were taken at each survey location. Phase I data sheets were also completed. The weather conditions during the survey were non-inclement with air temperatures between 70° to 80°F.

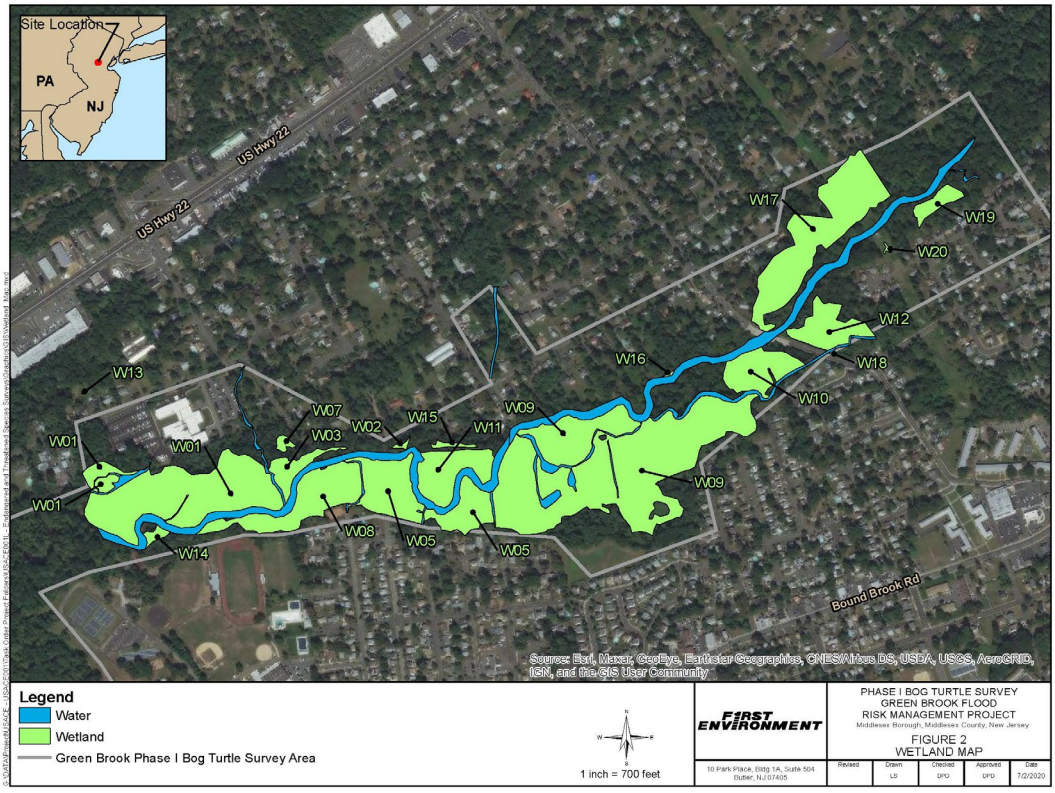


Figure 2 – Wetland Map

3.0 Results

Potential bog turtle habitat was not identified in any of the 17 wetlands surveyed in this investigation. Wetlands within the project area are generally floodplain forest maintained hydrologically by surface run-off and stream overflow. Small areas of emergent wetland habitat were identified within three wetlands: W01, W09, and W17, but none met all three of the floristic, hydrologic, and substrate Phase I criteria to be classified as potential bog turtle habitat. Descriptions and photographs of the habitat conditions at each wetland are presented in the following section. Location references for all photographs are provided in Figure 3, Appendix A.

3.1 Bog Turtle Phase I Habitat Survey – Wetland Descriptions and Photographs

3.1.1 Wetland W01

W01 contains a sizeable section of the Green Brook floodplain in the west end of the project area. The habitat is characterized by mostly mature floodplain swamp with impressively large specimens of pin oak and other hardwoods. Off-road vehicle (ORV) use was extensive in the forested portions of the site, with many rutted areas containing standing water. In the NW corner of the site, the hardwood swamp gives way to a small, mucky, spring-fed marsh occurring in the footprint of what appeared to be a former pond. Dominant flora observed within this sunny, emergent wetland included reed canarygrass, water purslane, and thick mats of duckweed. Willow and box elder were the most common woody plants. A snapping turtle and several green frogs were observed among the duckweed. Dragonflies were abundant. While conditions were too flooded and lacked the microtopography required by bog turtles, the prodigious groundwater discharge and rich concentration of wetland biodiversity were unique to the study area.

W01 photo 1: Floodplain forest community showing standing water in ORV path

W01 photo 2: Groundwater-fed marsh

Wetland W02

W02 is an intermittently flooded, forested depression in the floodplain of the Green Brook and bordered on the north by an earthen levee. A bike trail crosses a portion of the site. Vegetation observed included several hardwoods and sparse herbaceous ground cover, including garlic mustard and sedges. Hydrology is driven by stream flooding; substrates were damp but firm during the site visit. W02 does not contain potential bog turtle habitat.

W02: Intermittently flooded basin containing a well-worn bike/pedestrian trail

Wetland W03

W03 is a floodplain swamp dominated by box elder, silver maple, and green ash. Smartweeds, Japanese stiltgrass, and various graminoids were common in the understory. Hydrology is driven by surface run-off; substrates were firm and mostly dry during the site visit. W03 does not contain potential bog turtle habitat.

W03: Hardwood swamp and lush herbaceous ground cover

Wetland W05

W05 is a floodplain swamp bordered to the north by Green Brook and John Street to the south. Dominant flora observed included sweet gum, pin oak, box elder, silver maple and ground cover comprising smartweed and several sedges. Portions of the site occurring with private residential lots were cleared and appeared to be maintained in an herbaceous condition. One flooded depression was noted. Hydrology is entirely driven by surface run-off and stream flooding. Substrates during the site visit ranged from dry to saturated with no penetrability. W05 does not contain potential bog turtle habitat.

W05 photo 1: Hardwood swamp community showing thick herbaceous cover of smartweeds and several graminoids

W05 photo 2: Hardwood swamp with small area of intermittent standing water bordering residential properties

Wetland W07

W07 is a young hardwood swamp with a sparse canopy permitting the development of thick herbaceous understory. Dominant flora observed included red maple, box elder, multiflora rose, greater bladder sedge, smartweed, Japanese stiltgrass, and several other unidentified native grasses. Hydrology is driven by surface run-off; substrates were dry and firm during the site visit. W07 does not contain potential bog turtle habitat.

W07: Sparsely canopied, young hardwood swamp community with thick herbaceous cover

Wetland W08

W08 is a floodplain swamp NE of Middlesex High School. Dominant flora observed included sweet gum, pin oak, box elder, silver maple and ground cover comprising Japanese knotweed, smartweed, and several sedges. As with W05 (which is contiguous to the east), portions of the site occurring with private residential lots were cleared and maintained in an herbaceous condition. A stand of the nonnative yellow flag, a marsh species, was observed in one of the lots. Hydrology is driven by surface run-off, stormwater outfalls, and stream flooding. Substrates during the site visit ranged from dry to saturated with no penetrability. W08 does not contain potential bog turtle habitat.

W08 photo 1: Hardwood swamp and herbaceous communities bordering residential properties

W08 photo 2: Intermittently flooded depression along forested floodplain

Wetland W09

W09 is a floodplain swamp on the south side of Green Brook with several modified areas that support emergent and open water habitats. Dominant vegetation observed in the swamp included sweet gum (several massive specimens), pin oak, box elder, American elm, basswood, ash, red maple, silver maple, spicebush, and a lush carpet of herbs. Emergent wetland occurs in two areas: 1) directly behind residences of Fairfield Street and Fairfield Avenue, and 2) within a partially drained impoundment (one of several) along the Green Brook floodplain north of Fairfield Street. The emergent wetland closer to Fairfield Street and Fairfield Avenue appeared to have been cleared and altered in the past, as indicated by uneven terrain and mounds of soil colonized by flora typically associated with soil disturbance (e.g., Japanese hops). The emergent wetland flora that colonized this area included cattail, reed canarygrass, sedges, manna grass, rice-cutgrass, and Japanese stiltgrass. This community is supported by surface water run-off that creates seasonally and/or intermittently saturated conditions. The emergent wetland area occupying the former pond contained some superficial elements of potential bog turtle habitat, e.g. herbaceous vegetation (rice-cut grass, sedges, smartweed, arrowhead), saturated 'mucky' soils, and shallow water; however, the area was very small in size, occupying the drained edges of the former impoundment, and lacked perennial groundwater discharge and other habitat structure. Eastern painted turtles were abundant in the areas of remaining standing water. An adjacent pond surrounded by a dense stand of bamboo also contained eastern painted turtles and bullfrogs. W9 does not contain potential bog turtle habitat.

W9 photo 1: Mature hardwood swamp community containing extensive herbaceous ground cover

W9 photo 2: Emergent marsh community formed in a disturbed area along water main and bordering residential homes along Fairfield Ave

W9 photo 3: Permanent pond

W9 photo 4: Marsh occupying a partially-drained impoundment (dam visible in far-right corner)

Wetland W10

W10 is a floodplain swamp. Dominant vegetation observed included red maple, pin oak, box elder, yellow poplar, American beech, spicebush, Japanese knowtweed, Japanese stiltgrass, garlic mustard, reed canarygrass, and greater bladder sedge. Hydrology is driven by surface run-off and stream flooding. Topography is somewhat variable with raised areas and depressions—some of which contained shallow ponding. Substrates during the time of the visit ranged from damp to dry. W10 does not contain potential bog turtle habitat.

W10 photo 1: Hardwood swamp community with shallow depressions dominated by graminoids

W10 (photo 2): Hardwood swamp colonized by Japanese Knotweed

Wetland W11

W11 is a floodplain swamp dominated by silver maple, box elder, ash, and other hardwoods. Smartweeds, Japanese stiltgrass, and garlic mustard carpeted the forest floor. Several areas contained bare soil from ORV disturbance. Hydrology is driven by surface run-off and stream flooding. Substrates were generally damp and firm. W11 does not contain potential bog turtle habitat.

W11 (photo 1): Hardwood swamp community

W11 (photo 2): Portions of hardwood swamp disturbed by ORV use

Wetland W12/W18

W12 is a floodplain swamp with a small emergent wetland component bordering Warrenville Road. Dominant vegetation observed in the swamp included red maple, silver maple, ash, box elder, American sycamore, black locust, willow, pin oak; Japanese stiltgrass, Japanese knotweed were dominant herbs in the forest. Portions of the swamp had been altered by excavation and ORVs. The emergent component of the wetland consists of a mosaic of reed canarygrass, Japanese stiltgrass, and common reed. Hydrology throughout the forested and emergent areas is driven by surface run-off and stream flooding. Disturbed areas contained shallow ponding. Substrates during the time of the visit ranged from damp to dry; standing water was not present. W18 consists of a small sliver of wetland separated from W12 by a drainage channel and is ecologically identical to W12. W12/W18 do not contain potential bog turtle habitat.

W12 (photo 1): Emergent marsh community bordering Green Brook and Warrenville Road

W12 (photo 2): View of emergent marsh habitat facing Warrenville Road

W12 (photo 3): Intermittent pool within hardwood swamp

W12/W18: Watercourse separating W12 and the small sliver of forested, mostly roadside wetland within W18 (right side of photo)

Wetland W14

W14 contains floodplain swamp dominated by sliver maple, sweet gum, Japanese knotweed, Japanese barberry, and Japanese stiltgrass. Hydrology is driven by stream flooding; substrates were dry and firm during the site visit. W14 does not contain potential bog turtle habitat.

W14: Hardwood swamp community

Wetland W15

W15 is a forested swale located on a residential lot separated from the Green Brook floodplain by an earthen levee. The area is used as a dump for tree and landscaping debris and appeared to be mowed seasonally. Vegetation observed include red maple, American sycamore, American elm, snakeroot, and Japanese stiltgrass. Hydrology is driven by surface run-off; substrates are intermittently saturated. W15 does not support potential bog turtle habitat.

W15: Sparsely forested, managed wetland area occurring along the edge of residential property

Wetland W16

W16 contains the shoreline and floodplain of the Green Brook. Dominant vegetation observed included Japanese knotweed, smartweed, and box elder. Hydrology is driven by stream flooding; substrates are comprised by alluvium and mineral soils. W16 does not contain potential bog turtle habitat.

W16: Shoreline and forested floodplain along Green Brook

Wetland W17

W17 is a floodplain swamp bordering the north side of Green Brook and is intersected by a JCP&L overhead transmission line right-of-way (ROW). The maintained ROW contains emergent marsh and several ponds. Dominant vegetation observed in the forested portions of the site included pin oak, red maple, shagbark hickory, box elder, blackhaw, snakeroot, false nettle, greater bladder sedge, Japanese stiltgrass. Emergent wetland habitat under the ROW contained reed canarygrass, fringed sedge, sensitive fern, Japanese knotweed, jewelweed, smartweed, soft rush, and scattered multiflora rose and wild raspberry. Water plantain and spatterdock were dominant in the ponds. The hydrology throughout W17 appeared to be mostly driven by surface run-off (stormwater outfalls observed in forested portions) and stream flooding, with perhaps a small groundwater component contributing to the hydrology of the ponds. Substrates at the time of the visit were firm and mostly dry with the exception of the ponds and a stormwater ditch. Despite supporting an extensive marsh community (the largest of its kind encountered in the study area), W17 does not contain the appropriate soils and hydrology to provide potential bog turtle habitat.

W17 (photo 1): Extensive emergent marsh community under the JCP&L utility ROW

W17 (photo 2): Hardwood swamp community - east side of ROW

W17 (photo 3): Hardwood swamp community - west side of ROW

W17 (photo 4): Flooded drainage ditch excavated along residential properties

Wetland W19

W19 consists of a sparsely canopied, red maple-dominant floodplain swamp bordering the south side of Green Brook. Hydrology is driven by surface run-off. Substrates at the time of the visit were dry and firm. Dominant herbaceous flora observed included smartweed, Japanese knotweed, and fringed sedge. Surface water was present in a small intermittent pond along the east end of the wetland, bordering residential properties. W19 does not contain suitable bog turtle habitat.

W19 (photo 1): Intermittent woodland pond within hardwood swamp community

W19 (photo 2): Patch of herbaceous vegetation in forest gap

Wetland W20

W20 consists of a small, intermittently flooded depression under the JCP&L ROW. Hydrology is driven by surface run-off and occasional stream flooding. Substrates at the time of the visit were dry and firm. Dominant herbaceous flora observed included reed canary grass, Japanese knotweed, Japanese stiltgrass, and greater bladder sedge. W20 does not contain suitable bog turtle habitat.

W20: Intermittently flooded herbaceous wetland under JCP&L ROW

Conclusions and Recommendations

A Phase I Bog Turtle Survey of 17 wetlands within the Segment C5 through D of the Green Brook Flood Risk-Management project did not identify any potential bog turtle habitats. Wetlands were mostly closed-canopy, floodplain swamp subjected to extensive and frequent flooding. Of the few emergent wetland communities that occur in the survey area (W01, W09, and W17), only W09 is characterized by significant groundwater discharge—a core requirement of bog turtles. Nevertheless, W09 does not contain the plant community and habitat structure required by the species and has been historically altered to form an impoundment. Based on the results of this investigation, no further bog turtle survey is warranted for this portion of the project.

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

Appendix A: Phase 1 Survey Photograph Locations

Appendix B: 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, Butler, 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 AFFILATIONS:

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

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

Appendix C: Phase I Datasheets

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: W01

PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM

Coordinates 40.586730, -74.498172 **Project Type** Flood retention

Entity Requesting Phase 1 Survey ACOE

County/Township/Municipality Somerset, Green Brook

Lead Surveyor Tesauro **Affiliation** FE

Other Assistants Present

Date/Condition

Date of Survey 6/8/20 **Time In** **Time Out** **Air Temp.** F ° C°

Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes X No __ Unknown

Drought Index*[1] (Circle): none D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)

Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** 17

Estimate wetland size (acres) __ < 0.1 __ 0.1 - 0.5 __ 0.5 - 1 __ 1 - 2 __ 2 - 4 X 5+ __ 10+

Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 __ 21-40 __ 41-60 X > 60

Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**

X Springs/Seeps __ Springhouse X Trib/Stream __ Pond X Stormwater __ Iron Bacteria __ Watercress

X Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] X Routine Flooding[5])

__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)

__ Small Puddles/Depressions (_____ inches deep) X Saturated soils present? If yes, year-round? X Likely __ Unlikely __ Unk

X Yes __ No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

Former pond in small section of site that supports marsh

Estimate time period (in years) of disturbance*: __ ≤ 5 __ 6-10 __ 11-20 X > 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

NO

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: W01

X Yes __ No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:
ORV traffic

Wetland Info

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:
Mineral soils

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	2.5	2.5	3 in.	3 in.
PSS Portion of Wetland:	2.5	2.5	3 in.	3 in.
PFO Portion of Wetland:	95	0	— in.	— in.
POW/PUB Portion of Wetland:			in.	in.

Wetland Type/Vegetation

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum* spp.	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	. Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, ~~rush, grass~~, shrub, tree species):
Duckweed, water purslane, box elder → Dominant in herbaceous area.
Pin oak, sweetgum + other hardwoods dominant in PFO

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: WO1

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

Floodplain swamp bordered by development

Landscape Info

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

X None of it – the entire wetland is within the property boundaries

__ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

__ None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? __ Yes __ No If yes, which ones?

Snapping turtle, green frog

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

Lead Surveyor Opinion

(*) X Yes __ No __ Unsure The **hydrology** criterion for bog turtle habitat is met.

X Yes __ No __ Unsure The **soils** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **vegetation** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).

X This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

(*): Applies to small area in NW corner. rest is hardwood swamp fed by run-off, floods

Notes (How did you reach this opinion?):

Floodplain swamp fed by overflow, run-off; 95% closed canopy

Lead Surveyor – **please sign** below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Josh Tesmer **Signature** [signature]

Date 7/3/2020

Contact Information 2018416879

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: W02

PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM

Coordinates 40.587553, -74.492090 **Project Type** Flood retention

Entity Requesting Phase 1 Survey ACOE

County/Township/Municipality Somerset, Green Brook

Lead Surveyor Tesauro **Affiliation** FE

Other Assistants Present

Date/Condition

Date of Survey 6/3/2020 **Time In** **Time Out** **Air Temp.** F ° C°

Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes X No __ Unknown

Drought Index*[1] (Circle) none D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)

Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** 17

Estimate wetland size (acres) __ < 0.1 X 0.1 - 0.5 __ 0.5 - 1 __ 1 - 2 __ 2 - 4 __ 5+ __ 10+

Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 __ 21-40 X 41-60 __ > 60

Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**

__ Springs/Seeps __ Springhouse X Trib/Stream __ Pond __ Stormwater __ Iron Bacteria __ Watercress

__ Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] X Routine Flooding[5])

__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)

__ Small Puddles/Depressions (____ inches deep) X Saturated soils present? If yes, year-round? X Likely __ Unlikely __ Unk

X Yes __ No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

Floodings, ORV/Bikes

Estimate time period (in years) of disturbance*: X ≤ 5 __6-10 __11-20 __ > 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: W02

X Yes ~~X~~ No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:

ORV, bike trail through site

Wetland Info

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Mineral soils; alluvium/silt

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:			in.	in.
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:	100	0	0 in.	0 in.
POW/PUB Portion of Wetland:			in.	in.

Wetland Type/Vegetation

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum* spp.	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	. Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):

~~Japanese Knotweed~~, Box elder, American elm, Silver maple, Garlic mustard, smartweed

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W02

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

Floodplain swamp surrounded by development

Landscape Info

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

- X None of it – the entire wetland is within the property boundaries
- __ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

__ None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? __ Yes X No If yes, which ones?

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

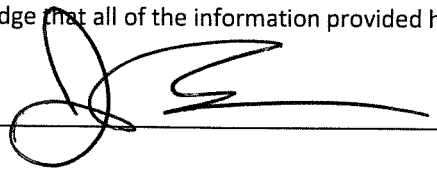
Lead Surveyor Opinion

__ Yes X No __ Unsure The **hydrology** criterion for bog turtle habitat is met.
__ Yes X No __ Unsure The **soils** criterion for bog turtle habitat is met.
__ Yes X No __ Unsure The **vegetation** criterion for bog turtle habitat is met.
__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).
__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).
__ This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Floodplain swamp driven by stream overflow

Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Jason Teravo **Signature** 

Date 7/3/2020

Contact Information 201 841 6879

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range

(Revised April 29, 2020) Please do not edit document.

Wetland ID: W03

PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM

Coordinates 40.587350, -74.499219 **Project Type** Flood Retention

Entity Requesting Phase 1 Survey ACOE

County/Township/Municipality

Lead Surveyor Tesauro **Affiliation** FE

Other Assistants Present

Date/Condition

Date of Survey 6/8/2020 **Time In** **Time Out** **Air Temp.** F ° C°

Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes X No __ Unknown

Drought Index*[1] (Circle): none D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)

Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** _____

Estimate wetland size (acres) __ < 0.1 __ 0.1 - 0.5 __ 0.5 - 1 X 1 - 2 __ 2 - 4 __ 5+ __ 10+

Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 __ 21-40 __ 41-60 X > 60

Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**

__ Springs/Seeps __ Springhouse X Trib/Stream __ Pond X Stormwater __ Iron Bacteria __ Watercress

__ Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] X Routine Flooding[5])

__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)

__ Small Puddles/Depressions (_____ inches deep) X Saturated soils present? If yes, year-round? X Likely __ Unlikely __ Unk

__ Yes X No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

Estimate time period (in years) of disturbance*: __ ≤ 5 __6-10 __11-20 __ > 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.

[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.

[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: W03

__ Yes X No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:

Wetland Info

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Mineral soils

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:			in.	in.
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:	100	0	0 in.	0 in.
POW/PUB Portion of Wetland:			in.	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Wetland Type/Vegetation

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum* spp.	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	. Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):

Mixed hardwoods – silver maple, elm etc.

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W03

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

Floodplain swamp surrounded by development

Landscape Info

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

- X None of it – the entire wetland is within the property boundaries
- __ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

__ None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? __ Yes X No If yes, which ones?

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

Lead Surveyor Opinion

__ Yes X No __ Unsure The **hydrology** criterion for bog turtle habitat is met.
__ Yes X No __ Unsure The **soils** criterion for bog turtle habitat is met.
__ Yes X No __ Unsure The **vegetation** criterion for bog turtle habitat is met.
__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).
__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).
X This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Floodplain swamp still maintained by stream overflow, run-off

Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Jason Tesauro **Signature** _____

Date 7/3/2020

Contact Information 201 841 6879

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: W05

PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM

Coordinates 40.586862, -74.496675 **Project Type** Flood Retention

Entity Requesting Phase 1 Survey ACOE

County/Township/Municipality

Lead Surveyor Tesauro **Affiliation** FE

Other Assistants Present

Date/Condition

Date of Survey 6/3/2020 **Time In** **Time Out** **Air Temp.** F ° C°

Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes X No __ Unknown

Drought Index*[1] (Circle) none D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)

Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** _____

Estimate wetland size (acres) __ < 0.1 __ 0.1 - 0.5 __ 0.5 - 1 __ 1 - 2 __ 2 - 4 __ 5+ X 10+

Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 __ 21-40 __ 41-60 X > 60

Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**

__ Springs/Seeps __ Springhouse X Trib/Stream __ Pond X Stormwater __ Iron Bacteria __ Watercress

__ Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] X Routine Flooding[5])

__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)

X Small Puddles/Depressions (____ inches deep) X Saturated soils present? If yes, year-round? __ Likely X Unlikely __ Unk

__ Yes X No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

Estimate time period (in years) of disturbance*: __ ≤ 5 __6-10 __11-20 __ > 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: WO5

X Yes __ No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:

Some clearing in residential lots that extend into floodplain

Wetland Info

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

mineral soils

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:			in.	in.
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:	100	—	— in.	— in.
POW/PUB Portion of Wetland:			in.	in.

Wetland Type/Vegetation

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	(Tearthumb Spp. *Polygonum* spp.)	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	. Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	(Red Maple *Acer rubrum*)	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):

Pin oak, silver maple, box elder, sedges, sweetgum

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W05

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

Floodplain swamp surrounded by development

Landscape Info

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

X None of it – the entire wetland is within the property boundaries

__ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

__ None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? __ Yes X No If yes, which ones?

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

Lead Surveyor Opinion

__ Yes X No __ Unsure The **hydrology** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **soils** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **vegetation** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).

X This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Floodplain swamp maintained by stream overflow

Lead Surveyor – **please sign** below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Jason Teswro **Signature** _____

Date 7/3/2020

Contact Information 201 841 6879

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: WO7

PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM

Coordinates 40.587684, -74.494639 **Project Type** Flood Retention

Entity Requesting Phase 1 Survey ACOE

County/Township/Municipality Somerset, Green Brook

Lead Surveyor Tesauro **Affiliation** FE

Other Assistants Present

Date/Condition

Date of Survey 6/8/2020 **Time In** **Time Out** **Air Temp.** F ° C°

Last Precipitation __ < 24 hours X < 7 days __ > 1 week __ unknown **Drought conditions?** __ Yes (No) __ Unknown

Drought Index*[1] (Circle): (none) D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)

Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** _____

Estimate wetland size (acres) __ < 0.1 X 0.1 - 0.5 __ 0.5 - 1 __ 1 - 2 __ 2 - 4 __ 5+ __ 10+

Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 __ 21-40 X 41-60 __ > 60

Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**

__ Springs/Seeps __ Springhouse __ Trib/Stream __ Pond __ Stormwater __ Iron Bacteria __ Watercress

__ Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (X Seasonal Flooding[4] __ Routine Flooding[5])

__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)

__ Small Puddles/Depressions (____ inches deep) X Saturated soils present? If yes, year-round? X Likely __ Unlikely __ Unk

__ Yes __ No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

Storm water run off from road

Estimate time period (in years) of disturbance*: X ≤ 5 __6-10 __11-20 __ > 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: W07

__ Yes X No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:

Wetland Info

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Mineral soils

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:			in.	in.
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:	100	—	— in.	— in.
POW/PUB Portion of Wetland:			in.	in.

Wetland Type/Vegetation

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum* spp.	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):

Box elder, greater bladder sedge

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W07

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

Floodplain swamp surrounded by development

Landscape Info

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

X None of it – the entire wetland is within the property boundaries

__ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

X None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? __ Yes X No If yes, which ones?

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

Lead Surveyor Opinion

__ Yes X No __ Unsure The **hydrology** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **soils** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **vegetation** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).

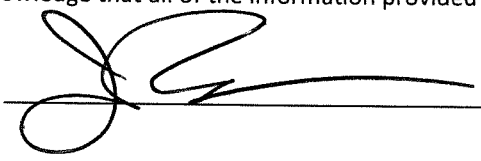
__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).

X This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Floodplain swamp maintained by stream overflow & stormwater runoff from road

Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Jason Tesauro **Signature** 

Date 7/3/2020

Contact Information 201 841 6879

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: WO8

PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM

Coordinates 40.586253 -74.495296 **Project Type** Flood retention

Entity Requesting Phase 1 Survey ACOE

County/Township/Municipality Middlesex, Dunellen

Lead Surveyor Tesauro **Affiliation** FE

Other Assistants Present

Date/Condition

Date of Survey 6/8/2020 **Time In** _____ **Time Out** _____ **Air Temp.** _____ F ° C°

Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes X No __ Unknown

Drought Index*[1] (Circle): none D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)

Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** _____

Estimate wetland size (acres) __ < 0.1 __ 0.1 - 0.5 __ 0.5 - 1 __ 1 - 2 __ 2 - 4 X 5+ __ 10+

Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 __ 21-40 __ 41-60 X > 60

Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**

__ Springs/Seeps __ Springhouse X Trib/Stream __ Pond X Stormwater __ Iron Bacteria __ Watercress

X Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] X Routine Flooding[5])

__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)

X Small Puddles/Depressions (____ inches deep) X Saturated soils present? If yes, year-round? X Likely __ Unlikely __ Unk

__ Yes __ No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

Estimate time period (in years) of disturbance*: __ ≤ 5 __ 6-10 __ 11-20 __ > 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: W08

Wetland Info

X Yes __ No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:
Small areas cleared within residential lots extend into floodplain

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:
Mineral soils

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:			in.	in.
PSS Portion of Wetland:	2%	0%	in.	in.
PFO Portion of Wetland:	98%	0%	in.	in.
POW/PUB Portion of Wetland:			in.	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Wetland Type/Vegetation

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum spp.*	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):
Silver maple, sedges, Jap. Knotweed, sweetgum, box elder, pin oak
Small patches yellow flag

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W08

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

Floodplain swamp surrounded by development

Landscape Info

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

X None of it – the entire wetland is within the property boundaries

__ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

__ None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? __ Yes X No If yes, which ones?

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

Lead Surveyor Opinion

__ Yes X No __ Unsure The **hydrology** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **soils** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **vegetation** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).

X This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Floodplain swamp maintained by stream overflow

Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Jason Tesauro **Signature** _____

Date 7/3/2020

Contact Information 201 841 6879

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: W09

PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM

Coordinates 40.587307, -74.485955 **Project Type** Flood retention

Entity Requesting Phase 1 Survey ACOE

County/Township/Municipality Middlesex, Dunellen

Lead Surveyor Tesauro **Affiliation** FE

Other Assistants Present

Date/Condition

Date of Survey 6/3/2020 **Time In** **Time Out** **Air Temp.** F ° C°

Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes X No __ Unknown

Drought Index*[1] (Circle): none D0 D1 D2 D3 D4 **Wetland Photos Taken** __ Yes __ No (Provide photo location map)

Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** _____

Estimate wetland size (acres) __ < 0.1 __ 0.1 - 0.5 __ 0.5 - 1 __ 1 - 2 __ 2 - 4 __ 5+ X 10+

Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 __ 21-40 __ 41-60 X > 60

Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**

__ Springs/Seeps __ Springhouse __ Trib/Stream X Pond X Stormwater X Iron Bacteria __ Watercress

__ Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] __ Routine Flooding[5])

__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)

X Small Puddles/Depressions (2" inches deep) X Saturated soils present? If yes, year-round? X Likely __ Unlikely __ Unk

X Yes __ No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

old fill associated with watermain; ponds dug / dammed

Fill ponds

Estimate time period (in years) of disturbance*: __ ≤ 5 __ 6-10 X 11-20 X > 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: W09

__ Yes X No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:

Wetland Info

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

mineral soils

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	3%	< 0.1%	2 in.	3 in.
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:	95%	0%	in.	in.
POW/PUB Portion of Wetland:	2%	0%	in.	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Wetland Type/Vegetation

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum* spp.	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	. Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):

Japanese hops, pin oak, basswood, ash, silver maple, box elder

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W09

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

Flood plain swamp surrounded by development

Landscape Info

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

X None of it – the entire wetland is within the property boundaries

__ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

__ None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? X Yes __ No If yes, which ones?

eastern painted turtle, bullfrog, green frog

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

Lead Surveyor Opinion

__ Yes X No __ Unsure The **hydrology** criterion for bog turtle habitat is met.

(X) Yes __ No __ Unsure The **soils** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **vegetation** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).

X This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Small 'mucky' herbaceous area in drained pond <0.1 acre; vegetation & structure not suitable; remainder of site is PFO or disturbed wetland.

Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Jason Lesavoy **Signature** _____

Date 7/31/2020

Contact Information 201 841 6879

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: WL0
PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM
Coordinates 40.589145, -74.482729 **Project Type** Flood retention
Entity Requesting Phase 1 Survey ACOE
County/Township/Municipality Middlesex, Dunellen
Lead Surveyor Tesauro **Affiliation** FE
Other Assistants Present

Date/Condition

Date of Survey 5/28/2020 **Time In** **Time Out** **Air Temp.** F ° C°
Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes X No __ Unknown
Drought Index*[1] (Circle: none D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)
Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** _____
Estimate wetland size (acres) __ < 0.1 __ 0.1 - 0.5 __ 0.5 - 1 __ 1 - 2 X 2 - 4 __ 5+ __ 10+
Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 __ 21-40 __ 41-60 X > 60
Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**
__ Springs/Seeps __ Springhouse X Trib/Stream __ Pond X Stormwater __ Iron Bacteria __ Watercress
__ Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] X Routine Flooding[5])
__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)
X Small Puddles/Depressions (<1" inches deep) X Saturated soils present? If yes, year-round? X Likely __ Unlikely __ Unk
__ Yes __ No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

Estimate time period (in years) of disturbance*: __ ≤ 5 __ 6-10 __ 11-20 __ > 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: W10

__ Yes X No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:

Wetland Info

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Mineral soils

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%.

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:			in.	in.
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:	100	0%	in.	in.
POW/PUB Portion of Wetland:			in.	in.

Wetland Type/Vegetation

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum* spp.	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	. Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):

Yellow poplar, beech, box elder, pin oak, Jap. knotweed, garlic mustard, greater bladdersedge

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W10

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

Floodplain swamp surrounded by development

Landscape Info

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

X None of it – the entire wetland is within the property boundaries

__ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

__ None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? __ Yes X No If yes, which ones?

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

Lead Surveyor Opinion

__ Yes X No __ Unsure The **hydrology** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **soils** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **vegetation** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).

X This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Floodplain swamp maintained by stream overflow

Lead Surveyor – **please sign** below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Jason Tesauro **Signature** _____

Date 7/3/2020

Contact Information 201 841 6879

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: W11

PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM

Coordinates 40.587527 -74.490056 **Project Type** Flood retention

Entity Requesting Phase 1 Survey ACOE

County/Township/Municipality Somerset, Green Brook

Lead Surveyor Tesauro **Affiliation** FE

Other Assistants Present

Date/Condition

Date of Survey 6/3/2020 **Time In** **Time Out** **Air Temp.** F ° C°

Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes __ No __ Unknown

Drought Index*[1] (Circle): none D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)

Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** _____

Estimate wetland size (acres) __ < 0.1 __ 0.1 - 0.5 __ 0.5 - 1 X 1 - 2 __ 2 - 4 __ 5+ __ 10+

Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 __ 21-40 __ 41-60 X > 60

Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**

__ Springs/Seeps __ Springhouse X Trib/Stream __ Pond __ Stormwater __ Iron Bacteria __ Watercress

__ Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] X Routine Flooding[5])

__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)

__ Small Puddles/Depressions (_____ inches deep) X Saturated soils present? If yes, year-round? __ Likely X Unlikely __ Unk

X Yes __ No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

Some ORV tire ruts

Estimate time period (in years) of disturbance*: X ≤ 5 __ 6-10 __ 11-20 __ > 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

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[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: W11

Wetland Info

X Yes ~~X~~ No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:

ORV traffic in portions of site

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Mineral soils

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%.

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:			in.	in.
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:	100	0%	in.	in.
POW/PUB Portion of Wetland:			in.	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Wetland Type/Vegetation

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum spp.*	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):

Garlic mustard, Silver maple, box elder, ash

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W11

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

Floodplain swamp surrounded by development

Landscape Info

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

X None of it – the entire wetland is within the property boundaries

__ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

__ None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? __ Yes X No If yes, which ones?

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

Lead Surveyor Opinion

__ Yes X No __ Unsure The **hydrology** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **soils** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **vegetation** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).

X This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Floodplain swamp maintained by stream overflow

Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Jason Tessmer **Signature** _____

Date 6/3/2020

Contact Information _____

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: W12 / W18
PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM
Coordinates 40.589751 -74.481845 **Project Type** Flood retention
Entity Requesting Phase 1 Survey ACOE
County/Township/Municipality Middlesex, Dunellen
Lead Surveyor Tesauro **Affiliation** FE
Other Assistants Present

Date/Condition

Date of Survey 5/28/2020 **Time In** **Time Out** **Air Temp.** F ° C°
Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes X No __ Unknown
Drought Index*[1] (Circle) (none) D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)
Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** _____
Estimate wetland size (acres) __ < 0.1 __ 0.1 - 0.5 __ 0.5 - 1 __ 1 - 2 X 2 - 4 __ 5+ __ 10+
Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 X 21-40 __ 41-60 __ > 60
Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**
__ Springs/Seeps __ Springhouse X Trib/Stream __ Pond X Stormwater __ Iron Bacteria __ Watercress
X Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] X Routine Flooding[5])
__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)
X Small Puddles/Depressions (____ inches deep) __Saturated soils present? If yes, year-round? X Likely __ Unlikely __ Unk
X Yes __ No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?
Testpits dug in recent years; old modification of surface soils, too
Estimate time period (in years) of disturbance* (X ≤ 5) __6-10 __11-20 (X > 20)
For ditches that may be present, is there bog turtle habitat? If yes, describe:
Ditched stream channel separates W12 + W18

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: W12/W18

Wetland Info

__ Yes X No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Mineral soils

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	20%	0	in.	in.
PSS Portion of Wetland:	5%	0	in.	in.
PFO Portion of Wetland:	75%	0	in.	in.
POW/PUB Portion of Wetland:			in.	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Wetland Type/Vegetation

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum* spp.	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):

Jap. Knotweed, silver maple, pin oak, black locust, American sycamore ash, boxelder; herbaceous area alongside road - gets regularly inundated

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W12/W18

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

Floodplain swamp surrounded by development

Landscape Info

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

__X__ None of it – the entire wetland is within the property boundaries

__ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

__ None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes __X__ No __ Unk Habitat **off-site**? __ Yes __X__ No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes __X__ No If yes, how many?_____

Other herps observed? __ Yes __X__ No If yes, which ones?

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

Lead Surveyor Opinion

__ Yes __X__ No __ Unsure The **hydrology** criterion for bog turtle habitat is met.

__ Yes __X__ No __ Unsure The **soils** criterion for bog turtle habitat is met.

__ Yes __X__ No __ Unsure The **vegetation** criterion for bog turtle habitat is met.

__ Yes __X__ No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).

__ Yes __X__ No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).

__ This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Floodplain swamp maintained by stream overflow

Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Jason Tesauro **Signature** _____

Date 7/3/2020

Contact Information 201 841 6879

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: W14

PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM

Coordinates 40.586150 -74.497588 **Project Type** Flood retention

Entity Requesting Phase 1 Survey ACOE

County/Township/Municipality ~~Somerset~~ Middlesex, Dunellen

Lead Surveyor Tesauro **Affiliation** FE

Other Assistants Present

Date/Condition

Date of Survey 6/8/2020 **Time In** **Time Out** **Air Temp.** F ° C°

Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes X No __ Unknown

Drought Index*[1] (Circle): none D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)

Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** _____

Estimate wetland size (acres) __ < 0.1 __ 0.1 - 0.5 X 0.5 - 1 __ 1 - 2 __ 2 - 4 __ 5+ __ 10+

Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 __ 21-40 __ 41-60 X > 60

Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**

__ Springs/Seeps __ Springhouse __ Trib/Stream __ Pond __ Stormwater __ Iron Bacteria __ Watercress

__ Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] X Routine Flooding[5])

__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)

__ Small Puddles/Depressions (_____ inches deep) __Saturated soils present? If yes, year-round? __ Likely __ Unlikely __ Unk

__ Yes X No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

Estimate time period (in years) of disturbance*: __ ≤ 5 __6-10 __11-20 __ > 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: W14

__ Yes X No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:

Wetland Info

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Mineral soils

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:			in.	in.
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:	100	0%	in.	in.
POW/PUB Portion of Wetland:			in.	in.

Wetland Type/Vegetation

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum* spp.	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	. Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):

Silver maple, sweetgum, barberry, Knotweed

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W14

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

Floodplain swamp surrounded by development

Landscape Info

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

- X None of it – the entire wetland is within the property boundaries
- __ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

__ None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? __ Yes X No If yes, which ones?

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

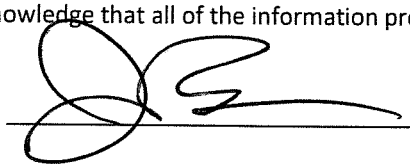
Lead Surveyor Opinion

__ Yes X No __ Unsure The **hydrology** criterion for bog turtle habitat is met.
__ Yes X No __ Unsure The **soils** criterion for bog turtle habitat is met.
__ Yes X No __ Unsure The **vegetation** criterion for bog turtle habitat is met.
__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).
__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).
X This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Floodplain swamp maintained by stream overflow

Lead Surveyor – **please sign** below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Jason Tesauro **Signature** 

Date 7/3/2020

Contact Information 201 841 6879

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: W15

PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM

Coordinates 40.587779 -74.491066 **Project Type** Flood reduction

Entity Requesting Phase 1 Survey ACOE

County/Township/Municipality Somerset, Green Brook

Lead Surveyor Tesauro **Affiliation** FE

Other Assistants Present

Date/Condition

Date of Survey 6/3/2020 **Time In** **Time Out** **Air Temp.** F ° C°

Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes X No __ Unknown

Drought Index*[1] (Circle) none D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)

Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** _____

Estimate wetland size (acres) __ < 0.1 X 0.1 - 0.5 __ 0.5 - 1 __ 1 - 2 __ 2 - 4 __ 5+ __ 10+

Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 __ 21-40 X 41-60 __ > 60

Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**

__ Springs/Seeps __ Springhouse __ Trib/Stream __ Pond __ Stormwater __ Iron Bacteria __ Watercress

__ Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] __ Routine Flooding[5])

__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)

__ Small Puddles/Depressions (____ inches deep) __Saturated soils present? If yes, year-round? __ Likely __ Unlikely __ Unk

X Yes X No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

Cold levee built along edge of residential lot

Estimate time period (in years) of disturbance*: __ ≤ 5 __ 6-10 __ 11-20 X ≥ 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: W15

X Yes __ No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:
mowing ; dumping of landscaping debris

Wetland Info

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:
mineral soils

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100	0	~~in.~~	~~in.~~
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:			in.	in.
POW/PUB Portion of Wetland:			in.	in.

Wetland Type/Vegetation

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum* spp.	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	. Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):
American Sycamore, White Snakeroot

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W15

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

Residential / yard; floodplain swamp

Landscape Info

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

X None of it – the entire wetland is within the property boundaries

__ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

__ None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? __ Yes X No If yes, which ones?

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

Lead Surveyor Opinion

__ Yes X No __ Unsure The **hydrology** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **soils** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **vegetation** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).

X This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Edge of floodplain swamp - extends into lawn

Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Jason Tesauro **Signature** [signature]

Date 7/3/2020

Contact Information 2018416879

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: W16

PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM

Coordinates 40.589017, -74.485127 **Project Type** Flood retention

Entity Requesting Phase 1 Survey ACOE

County/Township/Municipality Somerset, Green Brook

Lead Surveyor Tesauro **Affiliation** FE

Other Assistants Present

Date/Condition

Date of Survey 6/8/2020 **Time In** **Time Out** **Air Temp.** F ° C°

Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes X No __ Unknown

Drought Index*[1] (Circle): none D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)

Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** _____

Estimate wetland size (acres) __ < 0.1 X 0.1 - 0.5 __ 0.5 - 1 __ 1 - 2 __ 2 - 4 __ 5+ __ 10+

Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 __ 21-40 X 41-60 __ > 60

Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**

__ Springs/Seeps __ Springhouse X Trib/Stream __ Pond __ Stormwater __ Iron Bacteria __ Watercress

__ Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] __ Routine Flooding[5])

__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)

__ Small Puddles/Depressions (____ inches deep) __Saturated soils present? If yes, year-round? __ Likely __ Unlikely __ Unk

__ Yes X No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

Estimate time period (in years) of disturbance*: __ ≤ 5 __6-10 __11-20 __ > 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: WL6

__ Yes X No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:

Wetland Info

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Mineral; alluvium

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	2%	0%	in.	in.
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:	~~100~~ 98%	0%	in.	in.
POW/PUB Portion of Wetland:			in.	in.

Wetland Type/Vegetation

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum* spp.	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):

Japanese Knotweed, boxelder; small shoreline area w/ polygonum spp.

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W16

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

Floodplain swamp surrounded by development

Landscape Info

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

X None of it – the entire wetland is within the property boundaries

__ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

__ None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? __ Yes X No If yes, which ones?

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

Lead Surveyor Opinion

__ Yes X No __ Unsure The **hydrology** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **soils** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **vegetation** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).

__ This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Floodplain swamp maintained by stream overflow

Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Jason Lesavoy **Signature** _____

Date 7/3/2020

Contact Information 201 841 6879

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: W17

PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM

Coordinates 40.591861, -74.480906 **Project Type** Flood retention

Entity Requesting Phase 1 Survey ACOE

County/Township/Municipality Somerset, Green Brook

Lead Surveyor Tesauro **Affiliation** FE

Other Assistants Present

Date/Condition

Date of Survey 5/28/2020 **Time In** **Time Out** **Air Temp.** F ° C°

Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes __ No X Unknown

Drought Index*[1] (Circle: none D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)

Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** _____

Estimate wetland size (acres) __ < 0.1 __ 0.1 - 0.5 __ 0.5 - 1 __ 1 - 2 __ 2 - 4 __ 5+ X 10+

Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 __ 21-40 X 41-60 __ > 60

Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**

__ Springs/Seeps __ Springhouse X Trib/Stream X Pond __ Stormwater __ Iron Bacteria __ Watercress

X Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] X Routine Flooding[5])

__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)

__ Small Puddles/Depressions (____ inches deep) X Saturated soils present? If yes, year-round? X Likely __ Unlikely __ Unk

X Yes __ No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

Old ponds dug; ditch dug along residential yards, stormwater outfall

Estimate time period (in years) of disturbance*: __ ≤ 5 __ 6-10 __ 11-20 X 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

NO

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: W17

X Yes __ No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:

Occasional R.O.W. maintenance

Wetland Info

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Mineral soils

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%.

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	15%	0%	in.	in.
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:	85%	0%	in.	in.
POW/PUB Portion of Wetland:			in.	in.

Wetland Type/Vegetation

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum spp.*	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):

POW: Sedges – fringed, greater bladder sedge, spatterdock (pond), water plantain

PFO: Forest: pin oak, shagbark hickory, Snakeroot.

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W17

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

Floodplain swamp surrounded by development

Landscape Info

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

X None of it – the entire wetland is within the property boundaries

__ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

X None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? X Yes __ No If yes, which ones?

green frog

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

Lead Surveyor Opinion

__ Yes X No __ Unsure The **hydrology** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **soils** criterion for bog turtle habitat is met.

__ Yes (X) No __ Unsure The **vegetation** criterion for bog turtle habitat is met. * suboptimal but could be okay hydro/soils were good

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).

X This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Floodplain swamp, marsh supported by flooding; ponds excavated in marsh w/in row

Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Josh Lesavoy **Signature** _____

Date 7/3/2020

Contact Information 2018416879

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: W19

PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM

Coordinates 40.592066, -74.478832 **Project Type** Flood reduction

Entity Requesting Phase 1 Survey ACOE

County/Township/Municipality Middlesex, Dunellen

Lead Surveyor Tesauro **Affiliation** FE

Other Assistants Present

Date/Condition

Date of Survey 5/28/2020 **Time In** **Time Out** **Air Temp.** F ° C°

Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes X No __ Unknown

Drought Index*[1] (Circle): none D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)

Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** _____

Estimate wetland size (acres) __ < 0.1 __ 0.1 - 0.5 __ 0.5 - 1 X 1 - 2 __ 2 - 4 __ 5+ __ 10+

Estimate % Canopy Cover*[3] __ 0% __ ≤ 5 __ 6-20 __ 21-40 X 41-60 __ > 60

Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**

__ Springs/Seeps __ Springhouse X Trib/Stream X Pond __ Stormwater __ Iron Bacteria __ Watercress

__ Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] __ Routine Flooding[5])

__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)

__ Small Puddles/Depressions (____ inches deep) X Saturated soils present? If yes, year-round? X Likely __ Unlikely __ Unk

__ Yes X No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

Estimate time period (in years) of disturbance*: __ ≤ 5 __ 6-10 __ 11-20 __ > 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: W19

__ Yes X No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:

Wetland Info

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Mineral soils

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:			in.	in.
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:	98	0%	in.	in.
POW/PUB Portion of Wetland:	2%	0%	in.	in.

Wetland Type/Vegetation

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum spp.*	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	. Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):

Japanese Knotweed, Fringed sedge

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W19

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

Floodplain swamps surrounded by development

Landscape Info

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

X None of it – the entire wetland is within the property boundaries

__ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

__ None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent areas surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? __ Yes X No If yes, which ones?

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

Lead Surveyor Opinion

__ Yes X No __ Unsure The **hydrology** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **soils** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure The **vegetation** criterion for bog turtle habitat is met.

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).

__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).

X This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Floodplain wetland maintained by stream overflow

Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Jason Lesauro **Signature** [signature]

Date 7/3/2020

Contact Information 201 841 6879

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form** for the **Northern Population Range
(Revised April 29, 2020) Please do not edit document.

Wetland ID: W20

PNDI # (for PA):

General Info

Property/Project Name Green Brook FRM

Coordinates 40.591287, -74.47870 **Project Type** Flood retention

Entity Requesting Phase 1 Survey ACOE

County/Township/Municipality Middlesex, Dunellen

Lead Surveyor Tesauro **Affiliation** FE

Other Assistants Present

Date/Condition

Date of Survey 5/28/2020 **Time In** **Time Out** **Air Temp.** F ° C°

Last Precipitation __ < 24 hours X 1-7 days __ > 1 week __ unknown **Drought conditions?** __ Yes X No __ Unknown

Drought Index*[1] (Circle): none D0 D1 D2 D3 D4 **Wetland Photos Taken** X Yes __ No (Provide photo location map)

Notes (*e.g.*, details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):

Wetland Info

Wetland Size _____ acres, if known **# Wetlands w/in Project Area[2]** _____

Estimate wetland size (acres) __ < 0.1 X 0.1 - 0.5 __ 0.5 - 1 __ 1 - 2 __ 2 - 4 __ 5+ __ 10+

Estimate % Canopy Cover*[3] X 0% __ ≤ 5 __ 6-20 __ 21-40 __ 41-60 __ > 60

Hydrology and Soils (check all that apply): **use additional pages to further discuss pertinent general wetland information**

__ Springs/Seeps __ Springhouse X Trib/Stream __ Pond X Stormwater __ Iron Bacteria __ Watercress

__ Water Visible on Surface Evidence of Flooding X Yes __ No If yes, (__ Seasonal Flooding[4] X Routine Flooding[5])

__ Rivulets (_____inches deep) __ Subsurface Tunnel/Rivulets __ Tire Ruts (_____inches deep)

__ Small Puddles/Depressions (____ inches deep) __Saturated soils present? If yes, year-round? __ Likely __ Unlikely__ Unk

__ Yes X No Are there any signs of disturbance to *hydrology* (*e.g.*, drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?

Estimate time period (in years) of disturbance*: __ ≤ 5 __6-10 __11-20 __ > 20

For ditches that may be present, is there bog turtle habitat? If yes, describe:

[1] (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.
[2] Each wetland must have a separate Phase 1 habitat assessment data form completed.
[3] Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.
[4] Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
[5] Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: W20

X Yes __ No Are there any signs of disturbance to *vegetation* (*e.g.*, mowing, pasturing, burning)? If yes, describe:

R.O.W. maintenance

Wetland Info

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed[6] 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Mineral Soils

How much suitable habitat is in this wetland? Estimate acreage or percentage: 0%

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	X 100%	0%	in.	in.
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:			in.	in.
POW/PUB Portion of Wetland:			in.	in.

Wetland Type/Vegetation

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. *Alnus* spp.	Common Reed *Phragmites australis*	Jewelweed *Impatiens capensis*	Rice Cutgrass *Leersia oryzoides*	Spicebush *Lindera benzoin*	Willow spp. *Salix* spp.
Alder-leaved Buckthorn *Rhamnus alnifolia*	Dogwood Spp. *Cornus* spp.	Mile-A-Minute *Persicaria perfoliata*	Rough-leaved Goldenrod *Solidago patula*	Spike-Rush *Eleocharis palustris*	Woolly-fruited Sedge *Carex lasiocarpa*
American Elm *Ulmus americana*	Duck Potato *Sagittaria latifolia*	Multiflora Rose *Rosa multiflora*	Sensitive Fern *Onoclea sensibilis*	Swamp Rose *Rosa palustris*	Woolly Bulrush or Woolgrass *Scirpus cyperinus*
Arrowhead *Sagittaria latifolia*	Eastern Red Cedar *Juniperus virginiana*	Poison Sumac *Toxicodendron vernix*	Shrubby Cinquefoil *Dasiphora fruticosa*	Sweetflag *Acorus calamus*	Yellow-Green Sedge *Cyperus esculentus*
Carpetgrass *Axonopus fissifolius*	Eastern Tamarack *Larix laricina*	Porcupine Sedge *Carex hystericina*	Skunk Cabbage *Symplocarpus foetidus*	Tearthumb Spp. *Polygonum* spp.	
Cattail *Typha* spp.	Grass-of-Parnassus *Parnassia glauca*	Purple Loosestrife *Lythrum salicaria*	Smooth Sawgrass *Cladium mariscoides*	. Tussock Sedge *Carex stricta*	
Cinnamon Fern *Osmundastrum cinnamomeum*	Inland sedge *Carex interior*	Red Maple *Acer rubrum*	Soft Rush or Common Rush *Juncus effusus*	Viburnum Spp. *Viburnum* spp.	
Common Boneset *Eupatorium perfoliatum*	Japanese Stiltgrass *Microstegium vimineum*	Reed Canary Grass *Phalaris arundinacea*	Sphagnum Moss *Sphagnum* spp.	White turtlehead *Chelone glabra*	

Notes on additional plant species (*e.g.*, sedge, rush, grass, shrub, tree species):

Japanese Knotweed, greater bladdersedge

[6] No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: W20

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

Floodplain, residential / development

Landscape Info

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

- X None of it – the entire wetland is within the property boundaries
- __ Some of it – _____ Acres or _____% of the wetland appears to be located off-site

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

__ None of it __ All of it __ Part of it (____ acres or ____% of the off-site portion)

Is there potential bog turtle habitat **within 300 feet***? __ Yes X No __ Unk Habitat **off-site**? __ Yes X No __ Unk

If yes, how did you conclude this?

Adjacent area surveyed

Species

Were any bog turtles observed? __ Yes X No If yes, how many?_____

Other herps observed? __ Yes X No If yes, which ones?

*Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.

*Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.

Lead Surveyor Opinion

__ Yes X No __ Unsure The **hydrology** criterion for bog turtle habitat is met.
__ Yes X No __ Unsure The **soils** criterion for bog turtle habitat is met.
__ Yes X No __ Unsure The **vegetation** criterion for bog turtle habitat is met.
__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (fair to good quality).
__ Yes X No __ Unsure This wetland **HAS** potential bog turtle habitat (low to very low quality).
X This wetland does **NOT** have potential bog turtle habitat. __ **UNSURE** if suitable habitat is present.

Notes (How did you reach this opinion?):

Floodplain depression that's maintained by stormwater + overflow from Green Brook

Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Jason Lesuuve **Signature** _____

Date 7/3/2020

Contact Information 201 841 6875

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

July 2020

Prepared by:
First Environment, Inc.

US Army Corps of Engineers®