



**Wetland and Watercourse  
Delineation and Ecological  
Assessment Report**

Public Works Site Redevelopment  
Bowdoinham, Maine

June 27, 2019

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### 1.0 INTRODUCTION

Baker Design Consultants (BDC) contracted Stantec Consulting Services Inc. (Stantec) to conduct wetland and watercourse delineations and an ecological and shoreline assessment of the Bowdoinham Public Works property, an approximately 20-acre site in Bowdoinham, Maine. The survey area (Site) is located west of River Road, between the Maine Central Railroad and the Cathance River (Appendix A, Figure 1). The Site consists of freshwater wetlands, forested and open-field uplands, and developed area associated with the public works facility. The following report summarizes the June 14, 2019 field surveys conducted by Stantec.

### 2.0 PROJECT AREA DESCRIPTION

The Site is located west of River Road between the Maine Central Railroad (west) and the Cathance River (east) in Bowdoinham, broadly within the Midcoast Level IV Ecoregion<sup>1</sup>. This region is characterized by an indented shoreline type of coast, or “drowned coast,” with long, narrow, rocky peninsulas and intervening deep, narrow estuaries. Eroding bluffs of glaciomarine clay provide sediments in the sheltered embayments to form extensive mud flats and salt marshes. The Site and the Cathance River are connected to Merrymeeting Bay to the south, the largest freshwater tidal bay north of the Chesapeake in the eastern United States. Development within the site consists of several buildings used by the Bowdoinham Public Works, a large gravel lot with several remnant concrete slabs, and a residence in the northeast corner of the Site adjacent to River Road.

The U.S. Department of Agriculture Soil Survey of Sagadahoc County, Maine<sup>2</sup> has mapped three primary soil types within the site: Buxton silt loam (marine terraces/backslopes, moderately well drained), Lamoine-Buxton complex (marine terraces/backslopes, somewhat poorly drained), and Pemaquid-Todds Point-Damariscotta soils (tidal marshes, very poorly drained).

### 3.0 METHODS

#### 3.1 WETLAND AND WATERCOURSE DELINEATIONS

Stantec conducted wetland and watercourse delineations within the Site on June 14, 2019. On-site wetlands and watercourses were identified in accordance with the definitions detailed in Maine’s Natural Resource Protection Act (NRPA), 38 M.R.S.A. §§ 480-B. Wetland boundaries under federal and state jurisdiction were determined using the technical criteria described in the U.S. Army Corps of Engineers

<sup>1</sup> Bailey, R.G., P.E. Avers, T. King, T., and W.H. McNab, eds. 1994. Ecoregions and subregions of the United States (map) (supplementary table of map unit descriptions compiled and edited by McNab, W.H., and R.G. Bailey): Washington, D.C., U.S. Department of Agriculture–Forest Service, scale 1:7,500,000.

<sup>2</sup> Web Soil Survey, Natural Resources Conservation Service, United States Department of Agriculture. Available at: <http://websoilsurvey.nrcs.usda.gov/> [accessed April 2019].



## ETLAND AND WATERCOURSE DELINEATION AND ECOLOGICAL ASSESSMENT REPORT

### Methods

(Corps) Wetlands Delineation Manual (Corps, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regional Supplement, Version 2.0 (Corps, 2012). Data were collected on dominant vegetation, evidence of wetland hydrology, and hydric soil criteria. Wetland communities were classified according to the *Classification of wetlands and deepwater habitats of the United States* (FGDC, 2013). Representative photographs were taken as appropriate.

Concurrent with the wetland delineation, streams and other potential Waters of the United States (WoTUS) were identified using the regulatory criteria established by the Maine Department of Environmental Protection (MDEP, 2018), the Corps (2005), and the Federal Clean Water Act (USEPA, 2015). Data were recorded on apparent flow regime, substrate, bankfull widths, ordinary high-water mark widths, water depths, and presence of aquatic organisms and vegetation. Representative photographs were taken as appropriate.

Wetland boundaries and streams were located using a Global Positioning System (GPS) receiver with a stated accuracy of within one meter but were not marked in the field with any flagging.

MDEP jurisdictional streams and Wetlands of Special Significance (WoSS) determinations made during the wetland and waterbody resource delineations were based on the criteria in the NRPA and limited to observable conditions at the time of the survey.

Full identification of WoSS involves contacting natural resource agencies such as the Maine Natural Areas Program (MNAP), the Maine Department of Inland Fisheries and Wildlife, and the U.S. Fish and Wildlife Service (USFWS) to determine if there are any documented occurrences of rare, threatened, or endangered species and communities within or in the vicinity of the project area. Stantec initiated contact with these agencies. Results received to date are included in Appendix C.

### 3.2 POTENTIAL VERNAL POOL IDENTIFICATION

Formal vernal pool surveys must be completed during the spring (e.g., April and early May) when obligate vernal pool indicator species, such as wood frogs (*Lithobates sylvaticus*) or spotted salamanders (*Ambystoma maculatum*) may be present and breeding at the vernal pools. A vernal pool is a temporary to semi-permanent body of water occurring in a shallow depression that typically fills with water during the spring or fall and may dry during the summer. Vernal pools have no permanent inlet or outlet and no viable populations of predatory fish.

Because the wetland delineation was conducted outside of the appropriate spring survey period to identify vernal pools, Stantec surveyed for and identified potential vernal pools (PVPs) as they were encountered during the wetland delineation. Evaluation of site features as PVPs was conducted according to the Maine Association of Wetland Scientists (MAWS) Vernal Pool Survey Protocol (MAWS, 2014). Stantec identified PVPs regulated by MDEP and the Corps based on definitions provided in Chapter 335, Significant Wildlife Habitat, of the Maine NRPA and the Corps' Maine General Permit, respectively. PVPs were identified based on physical and biological characteristics that are typical of vernal pools, including evidence of standing water, topographic position in the landscape, presence (or absence) of aquatic organisms, and vegetation type.



Results

### 3.3 ECOLOGICAL AND SHORELINE ASSESSMENT

During the wetland delineation, Stantec performed a general assessment of habitats and unique natural features on the Site. This assessment did not include a specific survey for any rare or exemplary natural communities or habitats, or any rare, threatened, and endangered (RTE) species. Observations were limited to those that occurred while traversing the site during the wetland delineations.

Stantec also performed a general assessment of the condition of the Cathance River shoreline along the eastern boundary of the site. The purpose of the assessment was to identify segments of the riverbank that could be locations for shoreline restoration, for BDC to consider when developing a master plan of the site. Stantec recorded general observations of the current state of the riverbank including vegetative cover, signs of erosion, and obvious areas of past disturbance or alteration. Stantec identified shoreline areas with natural/native vegetative cover versus areas with invasive plant species, and documented areas of natural riverbank versus areas with wood and/or rock material that is not endemic to this section of the Cathance River riparian corridor. The assessment was performed at high tide and observations were limited to shoreline areas that were adjacent to uplands or not inundated portions of wetlands in the northeast and southeast portions of the site.

## 4.0 RESULTS

### 4.1 WETLAND AND WATERCOURSE DELINEATIONS

Wetland and watercourse delineations were conducted at the Site on June 14, 2019. As a result of the delineations, portions of seven wetlands were identified within the Site. (Appendix A, Figure 1). Three WoSS were identified within the Site, including one wetland that contains a potentially significant vernal pool (PSVP) and two wetlands that are connected to the Cathance River. Other than the Cathance River, no other streams were identified within the project area. Table 1 summarizes the delineated wetland characteristics. Representative photographs of the delineated resources are included in Appendix B (Photos 1–10). Completed Corps Wetland Determination Data Forms are included in Appendix D for representative wetlands.



ETLAND AND WATERCOURSE DELINEATION AND ECOLOGICAL ASSESSMENT REPORT

Results

Table 1. Summary of Delineated Wetlands

Wetland Identifier	Wetland Classification <sup>1</sup>	Dominant and Characteristic Vegetation	Hydric Soil Criteria	Evidence of Hydrology	Wetland of Special Significance	Additional Comments
W-01TTA	PEM	Trees: none Saplings / shrubs: none Herbs: bluejoint ( <i>Calamagrostis canadensis</i> ), sensitive fern ( <i>Onoclea sensibilis</i> ), king-of-the-meadow ( <i>Thalictrum pubescens</i> ), sweet-scented joe-pye-weed ( <i>Eutrochium purpureum</i> ), woodland horsetail ( <i>Equisetum sylvaticum</i> )	Histic epipedon	Soil saturation	Yes – within 250-feet of Cathance River, within 100-year floodplain	Occasionally mowed.
W-01TTB	PEM/PSS	Trees: black willow ( <i>Salix nigra</i> ), red maple ( <i>Acer rubrum</i> ) Saplings / Shrubs: black willow, Morrow's honeysuckle ( <i>Lonicera morrowii</i> ), gray willow ( <i>Salix bebbiana</i> ), rambler rose ( <i>Rosa multiflora</i> ), silky dogwood ( <i>Cornus amomum</i> ) Herbs: broad-leaf cat-tail ( <i>Typha latifolia</i> ), sensitive fern, spotted touch-me-not ( <i>Impatiens capensis</i> ), nodding sedge ( <i>Carex gynandra</i> ), cottongrass bulrush ( <i>Scirpus cyperinus</i> ), bluejoint, cinnamon fern ( <i>Osmundastrum cinnamomeum</i> ), interrupted fern ( <i>Osmunda claytoniana</i> ), eastern poison ivy ( <i>Toxicodendron radicans</i> )	Histic epipedon, Histosol	Surface water, High water table, Surface Water	Yes – within 250-feet of Cathance River, greater than 20,000 square feet of emergent marsh wetland, Contains S2 natural community, within 100-year floodplain, Tidal Wetland	Portions of the wetland are Freshwater Tidal Marsh along the Cathance River.
W-01TTC	PEM	Trees: none Saplings / Shrubs: none Herbs: sensitive fern, broad-leaf meadowsweet ( <i>Spiraea latifolia</i> ), bluejoint, common timothy ( <i>Phleum pratense</i> )	Depleted matrix	Soil saturation, High water table, Surface water	No	
W-01TTD	PFO/PEM	Trees: red maple, green ash ( <i>Fraxinus pennsylvanica</i> ) Saplings / Shrubs: American witch-hazel ( <i>Hamamelis virginiana</i> ), southern arrow-wood ( <i>Viburnum dentatum</i> ) Herbs: sensitive fern, spotted touch-me-not, woodland horsetail, cinnamon fern	Depleted matrix	Soil saturation, Water stained leaves, Drainage patterns	No	
W-01TTE	PEM	Trees: none Saplings / Shrubs: speckled alder ( <i>Alnus incana</i> ), broad-leaf meadowsweet, gray willow Herbs: cottongrass bulrush, sensitive fern, bluejoint, lamp rush ( <i>Juncus effusus</i> ), broad-leaf cat-tail, king-of-the-meadow	Depleted matrix	Soil saturation, Surface water	Yes – Contains potential significant wildlife habitat PSVP-01TT, within 100-year floodplain	Significant vernal pool status based on observable conditions at the time of the delineation, subject to formal vernal survey during appropriate spring amphibian breeding season.
W-01TTF	PSS	Trees: none Saplings / Shrubs: broad-leaf meadowsweet, Morrow's honeysuckle, silky dogwood, rambler rose, pussy willow ( <i>Salix discolor</i> ) Herbs: sensitive fern, black-girdle bulrush ( <i>Scirpus atrocinctus</i> ), spotted touch-me-not	Depleted matrix	Soil saturation, Surface water, Drainage patterns, Water stained leaves	No	
W-01TTG	PSS	Trees: none Saplings / Shrubs: speckled alder, gray birch ( <i>Betula populifolia</i> ), broad-leaf meadowsweet, rambler rose Herbs: bluejoint, sensitive fern, woodland horsetail	Depleted matrix	Soil saturation, Surface water, Drainage patterns, Water stained leaves	No	

<sup>1</sup> Wetland classification follows FGDC (2013):

PFO = Palustrine Forested

PEM = Palustrine Emergent

PSS = Palustrine Scrub-shrub



## Results

### 4.2 POTENTIAL VERNAL POOL IDENTIFICATION

Stantec identified one PSVP within the Site during the wetland delineation (Appendix B, Photos 11–12). PSVP-01TT is a natural-modified vernal pool feature within wetland W-01TTE. The pool is an approximately 30-foot by 30-foot natural depression within the wetland that may be slightly impounded by the trail adjacent to the east side of the wetland. Surface water, approximately 8–12 inches deep was observed at the time of the delineation. Wood frog tadpoles were observed swimming throughout the pool. Based on this information, the PSVP-01TT could be regulated as an SVP under the NRPA. A formal vernal pool survey conducted in mid-April to early-May during the appropriate amphibian breeding season would be necessary to determine whether or not the pool is an SVP.

### 4.3 ECOLOGICAL AND SHORELINE ASSESSMENT RESULTS

Stantec identified one unique natural feature within the Site, a portion of wetland W-01TTB is also a Freshwater Tidal Marsh which is considered a rare wetland type in Maine according to the MNAP. Close observation of this portion of wetland W-01TTB was limited during the wetland delineation due to the high tide. MNAP's response to Stantec's request for information on the Site also confirmed the presence of the Freshwater Tidal Marsh, which has a state rarity ranking of S2. The USFWS Information, Planning, and Consultation (IPaC) tool identified two other RTE species that may be present within the Site, the Northern Long-eared Bat (*Myotis septentrionalis*) and Atlantic Salmon (*Salmo salar*). The site is also located within Atlantic Salmon critical habitat. No other RTE species or habitats were observed during the wetland delineation but several state-listed rare plant species commonly associated with Freshwater Tidal Marshes may be present. Targeted field surveys conducted in mid to late summer would be necessary to confirm their occurrence.

Stantec also performed a general assessment of the Cathance River shoreline on the eastern boundary of the site (Appendix B, Photos 13–20). Where accessible during the high tide, Stantec made observations along the top of bank of the Cathance River to document the presence or absence of erosion, invasive species, and areas of past disturbances or shoreline alteration. Based on the observations made at the time of the visit to the Site, the shoreline in the southern half of the Site is relatively undisturbed and in its natural state. Starting near the northern boundary of wetland W-01TTB and extending to the southern delineation limit, the riverbank is generally stable and dominated by native emergent and shrub vegetation. A few scattered black willow trees are growing along the bank. Larger white pine (*Pinus strobus*) and eastern hemlock (*Tsuga canadensis*) trees are located within the upland at the southeastern corner of the Site. The shoreline in the northern half of the site shows evidence of historic disturbance and alteration but has naturalized and is currently stable. Rip-rap and larger rocks are present in the northeast corner of the Site along the shoreline immediately adjacent to River Road where a colony of Japanese knotweed (*Reynoutria japonica*) is present. Continuing south along the shoreline, exposed ends of timber cribbing were observed protruding from the bank, in and adjacent to wetland W-01TTB. Just north of the largest public works building, a trench dug into the bank extends northwest towards the center of the public works lot for approximately 75-feet. An 8- to 10-inch metal pipe outlet is located at the top of the trench to convey water to the river. The inlet location of the pipe and origin of the water are unknown. This segment of shoreline described above, as shown in yellow on Figure 1, could provide potential locations for shoreline restoration techniques to restore the riverbank to a more natural state, similar to the undisturbed portions in the southern half of the Site.



## 5.0 REGULATORY DISCUSSION

### 5.1 WETLANDS AND WATERCOURSES

The Corps, MDEP, and Town of Bowdoinham regulate the wetlands and waterbodies (e.g., streams) identified within the Project area. Under the provisions of Section 404 of the Clean Water Act, the Corps regulates dredging or filling within WoTUS, which include navigable waters and all their tributaries, adjacent wetlands, and other waters or wetlands where degradation or destruction could affect interstate or foreign commerce. The Corps has issued a General Permit (GP) for the State of Maine that merges the federal and state permit review process for many applications.

In Maine, wetlands and waterbodies, as well as other protected natural resources, are regulated under 38 M.R.S.A. §§ 480-A – 480-JJ, the NRPA. Activities that do not impact a wetland or that impact less than 4,300 square feet of wetland are usually exempt from NRPA Tier permitting requirements. This exemption does not apply if the impact is:

1. in, on, or over a coastal wetland, great pond, river, stream, or brook;
2. within 25 feet of those resources identified above, or is more than 25 feet and no erosion control is used;
3. in a shoreland zone or a wetland protected by the shoreland zone;
4. part of a wetland with more than 20,000 square feet of open water or emergent vegetation, except artificial impoundments;
5. in a peatland;
6. part of a larger project; or
7. in Significant Wildlife Habitat.

Typically, projects with cumulative impacts to freshwater wetlands between 4,300 but less 15,000 square feet are eligible for review under the Tier 1 process. The Tier 2 review process applies to alterations that affect between 15,000 and 43,560 square feet (one acre) of freshwater wetlands. Cumulative freshwater wetland impacts that exceed one acre typically require a Tier 3 review. Impacts to WoSS, rivers, streams and brooks, great ponds, and Significant Wildlife Habitat typically require an Individual Permit.

Based on Stantec's 2019 delineation, portions of 3 (W-01TTA, W-01TTB, W-01TTE) of the seven wetlands within the Project area meet the characteristics to be considered WoSS. These include portions of wetlands within 250 feet of a coastal wetland (i.e., Cathance River), wetlands within the 100-year floodplain as mapped by the Federal Emergency Management Agency, and wetlands containing potential Significant Wildlife Habitat including PSVPs. Wetland W-01TTB would also be considered a WoSS because it contains greater than 20,000 square feet of emergent vegetation and contains an imperiled (S2) natural community, a freshwater tidal marsh, as defined by MNAP.



## ETLAND AND WATERCOURSE DELINEATION AND ECOLOGICAL ASSESSMENT REPORT

### Regulatory Discussion

The Town of Bowdoinham regulates activities with the Shoreland Zone, which is defined as:

1. All areas within 250 feet, horizontal distance, of the:
  1. normal high water line of any river
  2. upland edge of a coastal wetland, including all areas affected by tidal action
  3. upland edge of freshwater wetlands, which are
    1. Of ten or more contiguous acres; or of less than 10 contiguous acres and adjacent to a surface water body, excluding any river, stream or brook, such that in a natural state, the combined surface area is in excess of 10 acres; and
    2. Inundated or saturated by surface or ground water at a frequency and for a duration sufficient to support, and which under normal circumstances do support, a prevalence of wetland vegetation typically adapted for life in saturated soils.
    3. Freshwater wetlands may contain small stream channels or inclusions of land that do not conform to the criteria of this definition.
2. All land areas within 75 feet, horizontal distance, of the normal high-water line of tributary streams.
3. The Shoreland Zone includes any structure built on, over or abutting a dock, wharf or pier, or other structure extending or located below the normal high-water line of a water body or within a freshwater or coastal wetland.

Because portions of the Site are located within the 100-year floodplain, a Flood Plain Hazard Development permit may also be required by the Town of Bowdoinham. Stantec recommends consulting with the town's code enforcement officer regarding the local ordinances and permits that may be required for development at the Site.

## 5.2 VERNAL POOLS

Maine NRPA Chapter 335, Significant Wildlife Habitat, regulates SVPs as Significant Wildlife Habitat. Chapter 335 details specific definitions and standards regarding characterization and protection of SVPs in Maine.

Certain development projects in Maine may also be regulated under Chapter 375, Site Location of Development (Site Law). Under Site Law, MDEP may regulate vernal pools that are ecologically significant on a landscape level but do not meet the definition of an SVP. Under some circumstances, MDEP will review and possibly limit development within or beyond 250 feet of these high-functioning vernal pools.

The Corps may regulate impacts to these vernal pools if the project triggers Corps jurisdiction by filling or excavating wetlands or other WoTUS (e.g., streams). The Corps GP states that a Vernal Pool Management Area (VPMA) applies to all vernal pools identified within the Project area. The VPMA includes the vernal pool depression, the Vernal Pool Envelope (within 100 feet of the edge of the vernal pool depression), and the Critical Terrestrial Habitat (area within 100–750 feet of the edge of the vernal pool depression). Activities within 750 feet of a vernal pool may be regulated by the Corps and may require compensatory mitigation for unavoidable impacts. The amount of compensatory mitigation that



## ETLAND AND WATERCOURSE DELINEATION AND ECOLOGICAL ASSESSMENT REPORT

### Regulatory Discussion

may be required typically depends on the overall pool characteristics and an assessment of its habitat and landscape value.

Based on Stantec's survey, PSVP-01TT could be considered an SVP under the NRPA based on its physical characteristics and origin. Stantec recommends a seasonally appropriate vernal pool survey to determine the status of the PSVP or to treat the pool as an SVP if the project schedule and permitting move forward before the Spring vernal pool survey window.



References

## 6.0 REFERENCES

- Bailey, R.G., P.E. Avers, T. King, and W.H. McNab. 1994. *Ecoregions and subregions of the United States* (map and supplementary table). U.S. Department of Agriculture – Forest Service, Washington, D.C.
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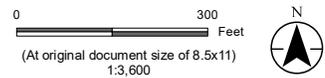


## Appendix A FIGURES





- Legend**
- Potential Significant Vernal Pool Center Point
  - 250' PSVP Critical Habitat
  - Delineated Wetland
  - Area of Potential Shoreline Restoration
  - Delineation Limits/Parcel Boundary
  - Tax Parcel



*Project Location*  
Bowdoinham, Maine

*Prepared by* REM on 2019-06-17  
TR by KWH on 2019-06-00  
IR Review by TT on 2019-06-00

*Client/Project*  
Baker Design Consultants  
Public Works Site Development  
Bowdoinham, ME

195601765

*Figure No.*  
**1**

*Title*  
**Wetland and Watercourse  
Delineation Results Map**

- Notes**
1. Wetland boundaries delineated in accordance with the USACE Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regional Supplement (Version 2.0).
  2. Wetland boundaries were located utilizing a Trimble GeoExplorer Series Receiver. Expected accuracy of GPS data is within 1 meter of actual position.
  3. Coordinate System: NAD 1983 StatePlane Maine West FIPS 1802 Feet
  4. Data Sources: Base features obtained from MEGIS.
  5. Background: Aerial imagery provided by ArcGIS Online World Imagery Mapping Service ([http://server.arcgisonline.com/arcgis/services/World\\_Imagery/MapServer](http://server.arcgisonline.com/arcgis/services/World_Imagery/MapServer)).

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## Appendix B REPRESENTATIVE PHOTOGRAPHS



# ETLAND AND WATERCOURSE DELINEATION AND ECOLOGICAL ASSESSMENT REPORT

## Appendix B Representative Photographs



Photo 1. (PEM) wetland W-01TTA. Stantec. June 14, 2019.



Photo 2. Northern (PSS) portion of wetland W-01TTB. Stantec. June 14, 2019.



# ETLAND AND WATERCOURSE DELINEATION AND ECOLOGICAL ASSESSMENT REPORT

## Appendix B Representative Photographs



Photo 3. Freshwater tidal marsh portion of wetland W-01TTB. Stantec. June 14, 2019.



Photo 4. Interior PEM portion of wetland W-01TTB. Stantec. June 14, 2019.



# ETLAND AND WATERCOURSE DELINEATION AND ECOLOGICAL ASSESSMENT REPORT

## Appendix B Representative Photographs



Photo 5. Southern portion of wetland W-01TTB. Stantec. June 14, 2019.



Photo 6. PEM wetland W-01TTC. Stantec. June 14, 2019.



**ETLAND AND WATERCOURSE DELINEATION AND ECOLOGICAL ASSESSMENT REPORT**

Appendix B Representative Photographs



Photo 7. PFO portion of wetland W-01TTD. Stantec. June 14, 2019.



Photo 8. PEM wetland W-01TTE. Stantec. June 14, 2019.



# ETLAND AND WATERCOURSE DELINEATION AND ECOLOGICAL ASSESSMENT REPORT

## Appendix B Representative Photographs



Photo 9. PSS wetland W-01TTF. Stantec. June 14, 2019.



Photo 10. PSS wetland W-01TTG. Stantec. June 14, 2019.



Appendix B Representative Photographs



Photo 11. PSVP-01TT in wetland W-01TTE. Stantec. June 14, 2019.



Photo 12. PSVP-01TT in wetland W-01TTE. Stantec. June 14, 2019.



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## Appendix B Representative Photographs



Photo 13. Natural, undisturbed Cathance River shoreline in the southern half of the Site. Stantec. June 14, 2019.



Photo 14. Upland area and trail sign at the southeast corner of the Site. Stantec. June 14, 2019.



# ETLAND AND WATERCOURSE DELINEATION AND ECOLOGICAL ASSESSMENT REPORT

## Appendix B Representative Photographs



Photo 15. Japanese knotweed stand over altered, rocky shoreline in the northeast corner of the Site. Stantec. June 14, 2019.



Photo 16. Cathance River shoreline facing south from wetland W-01TTA. Stantec. June 14, 2019.



# ETLAND AND WATERCOURSE DELINEATION AND ECOLOGICAL ASSESSMENT REPORT

## Appendix B Representative Photographs



Photo 17. Exposed end of timber cribbing extending from shoreline, just south of wetland W-01TTA. Stantec. June 14, 2019.



Photo 18. Trench located just north of the public works building. Stantec. June 14, 2019.



# ETLAND AND WATERCOURSE DELINEATION AND ECOLOGICAL ASSESSMENT REPORT

## Appendix B Representative Photographs



Photo 19. Small metal pipe draining into the trench/Cathance River. Stantec. June 14, 2019.



Photo 20. View south from behind the public works building towards the more natural portions of the shoreline.  
Stantec. June 14, 2019.



## Appendix C AGENCY RESPONSES





STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY

177 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

June 13, 2019

Tom Tetreau
Stantec
30 Park Drive
Topsham, ME 04086

Via email: tom.tetreau@stantec.com

Re: Rare and exemplary botanical features in proximity to: Public Works Project, Map U1 Lot 1, Bowdoinham, Maine

I have searched the Maine Natural Areas Program's Biological and Conservation Data System files in response to your request received June 11, 2019 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Bowdoinham, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, the project area includes a portion of Freshwater Tidal Marsh, a rare wetland type in Maine. Large, high quality examples of this open wetland type are rare in Maine and provide important habitat for a wide variety of plants and animals. MNAP recommends leaving an intact forested buffer around the wetlands associated with this Freshwater Tidal Marsh. If any disturbance is planned for these areas, please contact MNAP for further recommendations. Please refer to the table below, attached map, and attached factsheet for more information about this rare wetland type in Maine.

Table with 6 columns: Feature, State Status, State Rank, Global Rank, Occurrence Rank, Site. Row 1: Freshwater Tidal Marsh, N/A, S2, G4?, AB Excellent-Good, Cathance River

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

MOLLY DOCHERTY, DIRECTOR
MAINE NATURAL AREAS PROGRAM
90 BLOSSOM LANE, DEERING BUILDING



PHONE: (207) 287-8044
WWW.MAINE.GOV/DACF/MNAP

Letter to Tom Tetreau  
Comments RE: Public Works Project, Bowdoinham  
June 13, 2019  
Page 2 of 2

The Maine Natural Areas Program (MNAP) is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. MNAP welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by MNAP are to be published in any form, the Program should be informed at the outset and credited as the source.

The Maine Natural Areas Program has instituted a fee structure of \$75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for \$225.00 for three hours of our services.

Thank you for using MNAP in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,



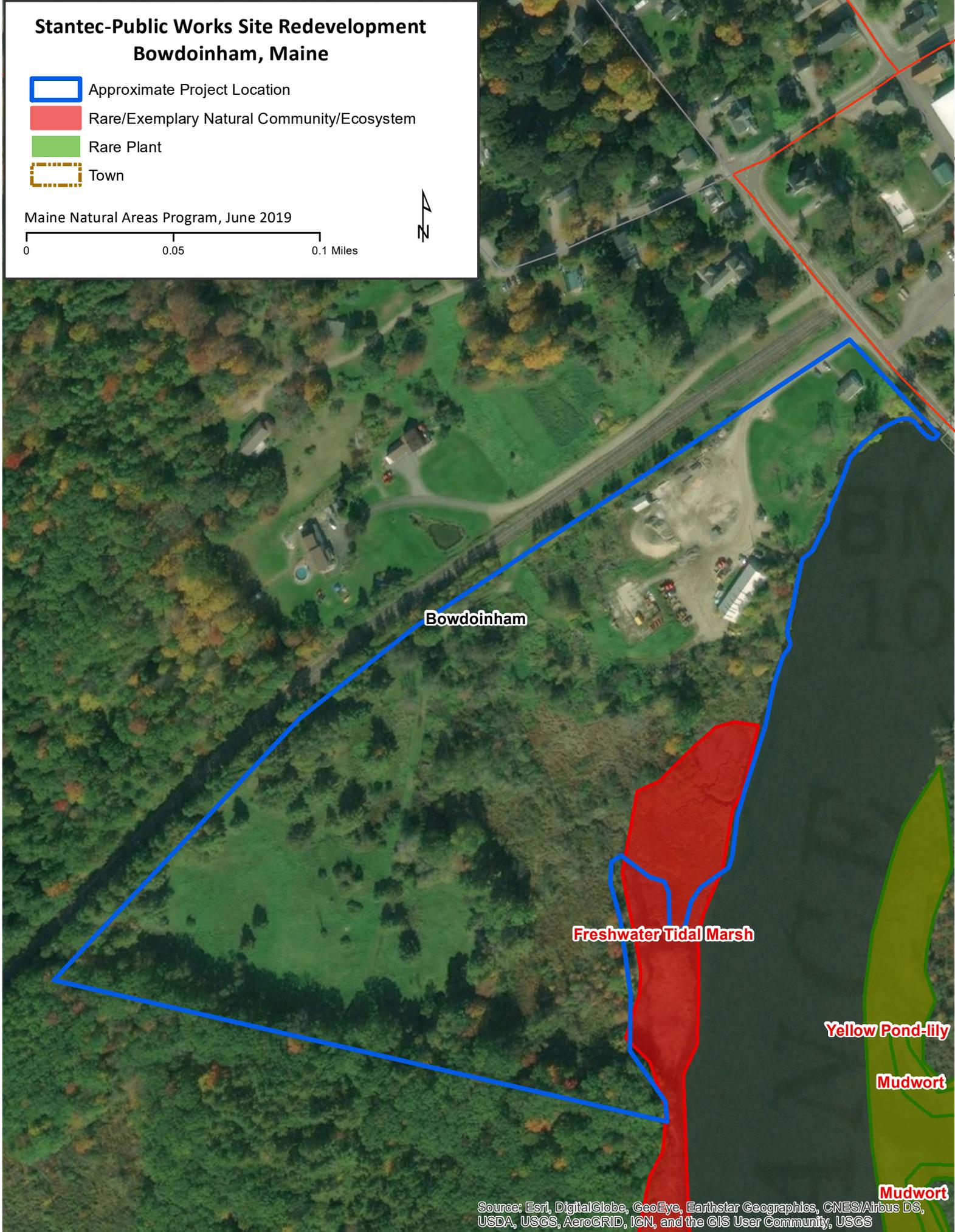
Kristen Puryear | Ecologist | Maine Natural Areas Program  
207-287-8043 | [kristen.puryear@maine.gov](mailto:kristen.puryear@maine.gov)

# Stantec-Public Works Site Redevelopment Bowdoinham, Maine

-  Approximate Project Location
-  Rare/Exemplary Natural Community/Ecosystem
-  Rare Plant
-  Town

Maine Natural Areas Program, June 2019

0 0.05 0.1 Miles



# Freshwater Tidal Marsh

State Rank S2

## Community Description

These tidal marshes are dominated by patchy stout herbs, typically a mixture of wild rice, softstem bulrush, and pickerelweed, often covering extensive areas. Mixed in with the tall herbs are lower forbs including several rare species. Some marshes may have mudflats dominated by forbs and low vegetation in patches among the graminoids; many have a very narrow band of low forbs near the high tide/upland interface. Brackish marsh species, such as chair-maker's rush, may be in these marshes as well, but at least some obligate freshwater plants such as pickerelweed, common arrowhead, sweet flag, and northern water-plantain will also be present. Bryophytes are essentially absent.

## Soil and Site Characteristics

Freshwater tidal marshes are associated with major rivers, in low-gradient areas of the mid to upper tidal reaches. Freshwater inputs lower the salinity to <1 ppt. Substrate is usually mud, or mud mixed with gravel. The tidal regime affects substrate and plant zonation.



Torrey's Bulrush

## Diagnostics

These graminoid dominated marshes occur along tidal rivers, with patches of forbs locally abundant. Obligate freshwater species are present, such as sweetflag, yellow water-lily, large yellow pond-lily, or pickerelweed.

## Similar Types

Brackish Tidal Marshes are most similar and grade into this type as salinity decreases. Mixed Graminoid Shrub Marshes and Pickerelweed - Macrophyte Aquatic Bed types can contain several of the same species, but do not occur in tidal settings.

## Conservation, Wildlife, and Management Considerations

Tidal marshes provide valuable wildlife habitat and have received considerable



Freshwater Tidal Marsh

conservation attention. Heavy metals, sewage overflows, and other pollutants have degraded the substrate in many areas, but some have recovered as water quality has improved over the past decades. Many occur on or adjacent to public lands or private conservation lands. Some have been managed for waterfowl by planting wild rice. With development of the uplands that border these marshes, maintenance of appropriate wetland buffers can help reduce degradation that could result from adjacent land uses. Invasive species such as Japanese knotweed and purple loosestrife have invaded the upper reaches at some sites. The prospect of sea level rise may also put these systems at greater risk in the future.

The tidal marshes of Maine's larger estuaries, especially Merrymeeting Bay, are important pre-migration staging habitat for thousands of waterfowl and wading birds. The rare New England siltsnail inhabits coastal marshes and small tidal rivers where the water ranges from fresh to upper brackish.

## Distribution

Upper tidal reaches of major rivers: most well known from the Kennebec and Penobscot Rivers (Laurentian Mixed Forest Province).

Landscape Pattern: Large Patch, often linear.

## Characteristic Plants

These plants are frequently found in this community type. Those with an asterisk are often diagnostic of this community.

### Herb

- Chair-maker's rush\*
- Common arrowhead
- Eaton's bur-marigold
- Nodding beggar ticks
- Northern water-plantain
- Parker's pipewort
- Pickerelweed\*
- Softstem bulrush\*
- Tidal arrowhead
- Wild rice\*

## Associated Rare Plants

- Beaked spikerush
- Eaton's bur-marigold
- Long's bitter-cress
- Parker's pipewort
- Pygmyweed
- Spongy arrowhead
- Stiff arrowhead
- Water-pimpernel

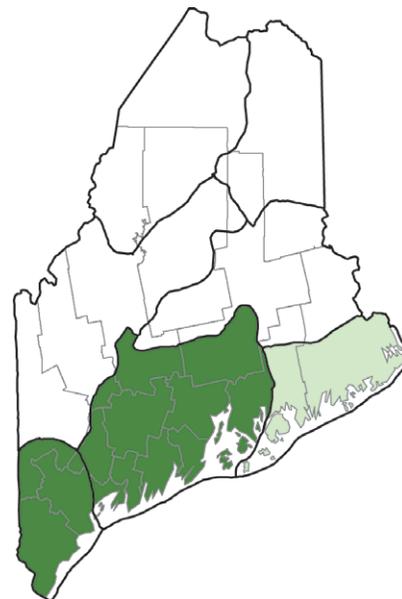
## Associated Rare Animals

- American oystercatcher
- Black-crowned night-heron
- Least bittern
- Short-eared owl

## Examples on Conservation Lands You Can Visit

- Merrymeeting Bay Wildlife Management Area - Sagadahoc Co.
- Muddy River Wildlife Management Area - Sagadahoc Co.
- Swan Island Wildlife Management Area - Sagadahoc Co.

## Location Map



- Community is known from this Ecoregion
- Community may occur in this Ecoregion
- Bailey's Ecoregion
- County





## United States Department of the Interior



### FISH AND WILDLIFE SERVICE

Maine Ecological Services Field Office

P. O. Box A

East Orland, ME 04431

Phone: (207) 469-7300 Fax: (207) 902-1588

<http://www.fws.gov/mainefieldoffice/index.html>

In Reply Refer To:

June 11, 2019

Consultation Code: 05E1ME00-2019-SLI-0840

Event Code: 05E1ME00-2019-E-02081

Project Name: Bowdoinham Public Works Redevelopment

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies the threatened, endangered, candidate, and proposed species and designated or proposed critical habitat that may occur within the boundary of your proposed project or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC Web site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the Endangered Species Consultation Handbook at: <http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

This species list also identifies candidate species under review for listing and those species that the Service considers species of concern. Candidate species have no protection under the Act but are included for consideration because they could be listed prior to completion of your project. Species of concern are those taxa whose conservation status is of concern to the Service (i.e., species previously known as Category 2 candidates), but for which further information is needed.

If a proposed project may affect only candidate species or species of concern, you are not required to prepare a Biological Assessment or biological evaluation or to consult with the Service. However, the Service recommends minimizing effects to these species to prevent future conflicts. Therefore, if early evaluation indicates that a project will affect a candidate species or species of concern, you may wish to request technical assistance from this office to identify appropriate minimization measures.

Please be aware that bald and golden eagles are not protected under the Endangered Species Act but are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may require development of an eagle conservation plan: [http://www.fws.gov/windenergy/eagle\\_guidance.html](http://www.fws.gov/windenergy/eagle_guidance.html) Information on the location of bald eagle nests in Maine can be found on the Maine Field Office Web site: <http://www.fws.gov/mainefieldoffice/Project%20review4.html>

Additionally, wind energy projects should follow the wind energy guidelines: <http://www.fws.gov/windenergy/> for minimizing impacts to migratory birds and bats. Projects may require development of an avian and bat protection plan.

Migratory birds are also a Service trust resource. Under the Migratory Bird Treaty Act, construction activities in grassland, wetland, stream, woodland, and other habitats that would result in the take of migratory birds, eggs, young, or active nests should be avoided. Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g.,

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cellular, digital television, radio, and emergency broadcast) can be found at:  
<http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm> and at:  
<http://www.towerkill.com>; and at:  
<http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

## Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Maine Ecological Services Field Office**

P. O. Box A

East Orland, ME 04431

(207) 469-7300

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## Project Summary

Consultation Code: 05E1ME00-2019-SLI-0840

Event Code: 05E1ME00-2019-E-02081

Project Name: Bowdoinham Public Works Redevelopment

Project Type: SHORELINE USAGE FACILITIES / DEVELOPMENT

Project Description: Potential redevelopment (public use - parking, walking trails, water access) of existing ~20-acre public works parcel.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/44.00587292471877N69.89835986747991W>



Counties: Sagadahoc, ME

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## Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

### Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

### Fishes

NAME	STATUS
Atlantic Salmon <i>Salmo salar</i> Population: Gulf of Maine DPS There is <b>final</b> critical habitat for this species. Your location overlaps the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/2097">https://ecos.fws.gov/ecp/species/2097</a>	Endangered

### Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Atlantic Salmon <i>Salmo salar</i> <a href="https://ecos.fws.gov/ecp/species/2097#crithab">https://ecos.fws.gov/ecp/species/2097#crithab</a>	Final

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## Appendix D CORPS WETLAND DETERMINATION DATA FORMS



**WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**

Project/Site: Bowdoinham Public Works City/County: Bowdoinham/Sagadahoc Sampling Date: 6/14/2019  
 Applicant/Owner: Baker Design Consultants State: ME Sampling Point: Wetland  
 Investigator(s): Tom Tetreau Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%) 0 - 0  
 Subregion (LRR or MLRA): LRR R Lat: 44.005804 Long: -69.897911 Datum: NAD83  
 Soil Map Unit Name: \_\_\_\_\_ NWI Classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (if no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (if needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____ if yes, optional Wetland Site ID: <u>01TTB</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required: check all that apply)	Surface Soil Cracks (B6)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible in Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsley Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches) _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches) <u>0</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches) <u>0</u>	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION - Use scientific names of plants**

Sampling Point: **Wetland**

	(Plot Size: <u>30'</u> radius )	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b>					<b>Dominance Test Worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
<u>Salix nigra</u>		<u>10</u>	<u>X</u>	<u>OBL</u>	
		<u>10</u> = Total Cover			<b>Prevalence Index Worksheet:</b> OBL species <u>120</u> x 1 <u>120</u> FACW species <u>25</u> x 2 <u>50</u> FAC species <u>0</u> x 3 <u>0</u> FACU species <u>0</u> x 4 <u>0</u> UPL species <u>0</u> x 5 <u>0</u> Column Totals <u>145</u> (A) <u>170</u> (B) Prevalence Index = B/A = <u>1.17</u>
<b>Shrub Stratum</b>	(Plot Size: <u>15'</u> radius )				
<u>Salix nigra</u>		<u>10</u>	<u>X</u>	<u>OBL</u>	
		<u>10</u> = Total Cover			
<b>Herb Stratum</b>	(Plot Size: <u>5'</u> radius )				
<u>Typha latifolia</u>		<u>80</u>	<u>X</u>	<u>OBL</u>	
<u>Onoclea sensibilis</u>		<u>15</u>		<u>FACW</u>	
<u>Impatiens capensis</u>		<u>10</u>		<u>FACW</u>	
<u>Carex gynandra</u>		<u>10</u>		<u>OBL</u>	
<u>Calamagrostis canadensis</u>		<u>10</u>		<u>OBL</u>	
		<u>125</u> = Total Cover			
<b>Woody Vine Stratum</b>	(Plot Size: <u>30'</u> radius )				<b>Hydrophytic Vegetation Indicators:</b> <input checked="" type="checkbox"/> 1- Rapid Test For Hydrophytic Vegetation <input checked="" type="checkbox"/> 2- Dominance Test is => 50% <input checked="" type="checkbox"/> 3- Prevalence Index is =< 3.0 4- Morphological Adaptations 5- Problematic Hydrophytic Vegetation
		_____ = Total Cover			
<b>Definitions of Vegetation Strata:</b> Tree- Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub- Woody plants less than 3 in. DBH and greater than or equal to 3.28ft (1m) tall. Herb- All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28ft tall. Woody Vines- All woody vines greater than 3.28ft in height.					Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
					Remarks: (Include photo numbers here or on a separate sheet.)

**SOIL**

Sampling Point: **Wetland**

Depth (inches)	Matrix		Redox Features					Remarks
	Color	%	Color	%	Type	Loc	Texture	
0-12	10YR 2/1	100					Muck	
12-18	10YR 5/1	75	10YR 4/4	25	C	M	Silt	

<b>Hydric Soil Indicators:</b>		<b>Indicators for Problematic Soils:</b>	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (B15)	<input type="checkbox"/> 2 cm Muck (A10)	
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> Coast Prarie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matric (F2)	<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Polyvalue Below Surface (S8)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Thin Dark Surface (S9)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Mesic Spodic (TA6)	
<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Red Parent Material (F21)	
<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Dark Surface (S7)		<input type="checkbox"/> Other (Explain in Remarks)	

<p><b>Restrictive Layer (if observed):</b></p> <p style="text-align: center;">Type: <u>Dense</u></p> <p>Depth (inches): <u>18</u></p>	<p>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
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Remarks:

**WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**

Project/Site: Bowdoinham Public Works City/County: Bowdoinham/Sagadahoc Sampling Date: 6/14/2019  
 Applicant/Owner: Baker Design Consultants State: ME Sampling Point: Upland  
 Investigator(s): Tom Tetreau Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): Shoulder Local relief (concave, convex, none): Convex Slope (%) 3 - 5  
 Subregion (LRR or MLRA): LRR R Lat: 44.005825 Long: -69.897941 Datum: NAD83  
 Soil Map Unit Name: \_\_\_\_\_ NWI Classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (if no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (if needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/> if yes, optional Wetland Site ID: <u>01TTB</u>
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	

Remarks: (Explain alternative procedures here or in a separate report.)  
 Appears to be an area of old fill.

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required: check all that apply)	Surface Soil Cracks (B6)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Moss Trim Lines (B16)
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<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsley Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)

Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches) _____	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches) _____	
Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches) _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION - Use scientific names of plants**

Sampling Point: **Upland**

<b>Tree Stratum</b>	(Plot Size: <u>30'</u> radius )	Absolute % Cover	Dominant Species?	Indicator Status
<u>Fraxinus americana</u>		<u>15</u>	<u>X</u>	<u>FACU</u>
		<u>15</u>	= Total Cover	

<b>Shrub Stratum</b>	(Plot Size: <u>15'</u> radius )	Absolute % Cover	Dominant Species?	Indicator Status
<u>Cornus amomum</u>		<u>5</u>	<u>X</u>	<u>FACW</u>
		<u>5</u>	= Total Cover	

<b>Herb Stratum</b>	(Plot Size: <u>5'</u> radius )	Absolute % Cover	Dominant Species?	Indicator Status
<u>Phleum pratense</u>		<u>40</u>	<u>X</u>	<u>FACU</u>
<u>Rubus idaeus</u>		<u>40</u>	<u>X</u>	<u>FACU</u>
		<u>80</u>	= Total Cover	

<b>Woody Vine Stratum</b>	(Plot Size: <u>30'</u> radius )	Absolute % Cover	Dominant Species?	Indicator Status
<u>Parthenocissus quinquefolia</u>		<u>20</u>	<u>X</u>	<u>FACU</u>
		<u>20</u>	= Total Cover	

**Dominance Test Worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)  
 Total Number of Dominant Species Across All Strata: 5 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 20% (A/B)

**Prevalence Index Worksheet:**

OBL species 0 x 1 0  
 FACW species 5 x 2 10  
 FAC species 0 x 3 0  
 FACU species 115 x 4 460  
 UPL species 0 x 5 0  
 Column Totals 120 (A) 470 (B)  
 Prevalence Index = B/A = 3.92

**Hydrophytic Vegetation Indicators:**

- 1- Rapid Test For Hydrophytic Vegetation
- 2- Dominance Test is => 50%
- 3- Prevalence Index is =< 3.0
- 4- Morphological Adaptations
- 5- Problematic Hydrophytic Vegetation

**Definitions of Vegetation Strata:**

Tree- Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub- Woody plants less than 3 in. DBH and greater than or equal to 3.28ft (1m) tall.

Herb- All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28ft tall.

Woody Vines- All woody vines greater than 3.28ft in height.

Hydrophytic Vegetation Present? Yes      No X

Remarks: (Include photo numbers here or on a separate sheet.)

**SOIL**

Sampling Point: **Upland**

Depth (inches)	Matrix		Redox Features					Remarks
	Color	%	Color	%	Type	Loc	Texture	
0-2	10YR 2/1	100					Loam	
2-6	10YR 3/2	100					Sandy Loam	

<b>Hydric Soil Indicators:</b>		<b>Indicators for Problematic Soils:</b>	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (B15)	<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> Coast Prarie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matric (F2)	<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Polyvalue Below Surface (S8)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Thin Dark Surface (S9)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Mesic Spodic (TA6)	
<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Red Parent Material (F21)	
<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Dark Surface (S7)		<input type="checkbox"/> Other (Explain in Remarks)	

<p><b>Restrictive Layer (if observed):</b></p> <p>Type: <u>Gravel Fill</u></p> <p>Depth (inches): <u>6</u></p>	<p>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>
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Remarks:

**WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**

Project/Site: Bowdoinham Public Works City/County: Bowdoinham/Sagadahoc Sampling Date: 6/14/2019  
 Applicant/Owner: Baker Design Consultants State: ME Sampling Point: Wetland  
 Investigator(s): Tom Tetreau Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%) 0 - 0  
 Subregion (LRR or MLRA): LRR R Lat: 44.004370 Long: -69.899653 Datum: NAD83  
 Soil Map Unit Name: \_\_\_\_\_ NWI Classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (if no, explain in Remarks.)  
 Are Vegetation X, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No X  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (if needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No _____ if yes, optional Wetland Site ID: <u>01TTC</u>
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)  
 Occasionally mowed.

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required: check all that apply)	Surface Soil Cracks (B6)
<u>X</u> Surface Water (A1)	_____ Drainage Patterns (B10)
_____ Water-Stained Leaves (B9)	_____ Moss Trim Lines (B16)
<u>X</u> High Water Table (A2)	_____ Dry-Season Water Table (C2)
_____ Aquatic Fauna (B13)	_____ Crayfish Burrows (C8)
<u>X</u> Saturation (A3)	_____ Saturation Visible in Aerial Imagery (C9)
_____ Marl Deposits (B15)	_____ Stunted or Stressed Plants (D1)
_____ Water Marks (B1)	_____ Geomorphic Position (D2)
_____ Hydrogen Sulfide Odor (C1)	_____ Shallow Aquitard (D3)
_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Microtopographic Relief (D4)
_____ Presence of Reduced Iron (C4)	_____ FAC-Neutral Test (D5)
_____ Recent Iron Reduction in Tilled Soils (C6)	
_____ Thin Muck Surface (C7)	
_____ Inundation Visible on Aerial Imagery (B7)	
_____ Other (Explain in Remarks)	
_____ Sparsley Vegetated Concave Surface (B8)	

Surface Water Present? Yes <u>X</u> No _____ Depth (inches) <u>0.5</u>	Wetland Hydrology Present? Yes <u>X</u> No _____
Water Table Present? Yes <u>X</u> No _____ Depth (inches) <u>0</u>	
Saturation Present? Yes <u>X</u> No _____ Depth (inches) <u>0</u>	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION - Use scientific names of plants**

Sampling Point: **Wetland**

<p><b>Tree Stratum</b> (Plot Size: <u>30'</u>radius )</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:35%;"></th> <th style="width:15%;">Absolute % Cover</th> <th style="width:15%;">Dominant Species?</th> <th style="width:15%;">Indicator Status</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td colspan="4" style="text-align: right;">_____ = Total Cover</td> </tr> </tbody> </table> <p><b>Shrub Stratum</b> (Plot Size: <u>15'</u>radius )</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:35%;"></th> <th style="width:15%;">Absolute % Cover</th> <th style="width:15%;">Dominant Species?</th> <th style="width:15%;">Indicator Status</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td colspan="4" style="text-align: right;">_____ = Total Cover</td> </tr> </tbody> </table> <p><b>Herb Stratum</b> (Plot Size: <u>5'</u>radius )</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:35%;"></th> <th style="width:15%;">Absolute % Cover</th> <th style="width:15%;">Dominant Species?</th> <th style="width:15%;">Indicator Status</th> </tr> </thead> <tbody> <tr> <td><u>Onoclea sensibilis</u></td> <td style="text-align: center;">50</td> <td style="text-align: center;">X</td> <td style="text-align: center;">FACW</td> </tr> <tr> <td><u>Phleum pratense</u></td> <td style="text-align: center;">40</td> <td style="text-align: center;">X</td> <td style="text-align: center;">FACU</td> </tr> <tr> <td><u>Spiraea latifolia</u></td> <td style="text-align: center;">20</td> <td></td> <td style="text-align: center;">FACW</td> </tr> <tr> <td colspan="4" style="text-align: right;">110 = Total Cover</td> </tr> </tbody> </table> <p><b>Woody Vine Stratum</b> (Plot Size: <u>30'</u>radius )</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:35%;"></th> <th style="width:15%;">Absolute % Cover</th> <th style="width:15%;">Dominant Species?</th> <th style="width:15%;">Indicator Status</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td colspan="4" style="text-align: right;">_____ = Total Cover</td> </tr> </tbody> </table>		Absolute % Cover	Dominant Species?	Indicator Status	_____	_____	_____	_____	_____ = Total Cover					Absolute % Cover	Dominant Species?	Indicator Status	_____	_____	_____	_____	_____ = Total Cover					Absolute % Cover	Dominant Species?	Indicator Status	<u>Onoclea sensibilis</u>	50	X	FACW	<u>Phleum pratense</u>	40	X	FACU	<u>Spiraea latifolia</u>	20		FACW	110 = Total Cover					Absolute % Cover	Dominant Species?	Indicator Status	_____	_____	_____	_____	_____ = Total Cover				<p><b>Dominance Test Worksheet:</b></p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>2</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)</p> <hr/> <p><b>Prevalence Index Worksheet:</b></p> <p>OBL species <u>0</u> x 1 <u>0</u></p> <p>FACW species <u>70</u> x 2 <u>140</u></p> <p>FAC species <u>0</u> x 3 <u>0</u></p> <p>FACU species <u>40</u> x 4 <u>160</u></p> <p>UPL species <u>0</u> x 5 <u>0</u></p> <p>Column Totals <u>110</u> (A) <u>300</u> (B)</p> <p>Prevalence Index = B/A = <u>2.73</u></p> <hr/> <p><b>Hydrophytic Vegetation Indicators:</b></p> <p><u>    </u> 1- Rapid Test For Hydrophytic Vegetation</p> <p><u>X</u> 2- Dominance Test is =&gt; 50%</p> <p><u>X</u> 3- Prevalence Index is =&lt; 3.0</p> <p><u>    </u> 4- Morphological Adaptations</p> <p><u>    </u> 5- Problematic Hydrophytic Vegetation</p> <hr/> <p><b>Definitions of Vegetation Strata:</b></p> <p>Tree- Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.</p> <p>Sapling/Shrub- Woody plants less than 3 in. DBH and greater than or equal to 3.28ft (1m) tall.</p> <p>Herb- All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28ft tall.</p> <p>Woody Vines- All woody vines greater than 3.28ft in height.</p> <hr/> <p style="text-align: center;">Hydrophytic Vegetation Present? Yes <u>X</u> No <u>    </u></p>
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**SOIL**

Sampling Point: **Wetland**

Depth (inches)	Matrix		Redox Features						Remarks
	Color	%	Color	%	Type	Loc	Texture		
0-1	10R 3/1	100						Muck	
1-9	10YR 4/2	80	10YR 4/6	20	C	M		Silt Loam	
9-19	10YR 4/1	75	10YR 4/6	25	C	M		Silt Loam	

<b>Hydric Soil Indicators:</b>			<b>Indicators for Problematic Soils:</b>		
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (B15)	<input type="checkbox"/> 2 cm Muck (A10)			
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> Coast Prarie Redox (A16)			
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matric (F2)	<input type="checkbox"/> Dark Surface (S7)			
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Polyvalue Below Surface (S8)			
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Thin Dark Surface (S9)			
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Iron-Manganese Masses (F12)			
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)			
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Mesic Spodic (TA6)			
<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Red Parent Material (F21)			
<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Very Shallow Dark Surface (TF12)			
<input type="checkbox"/> Dark Surface (S7)		<input type="checkbox"/> Other (Explain in Remarks)			

<p><b>Restrictive Layer (if observed):</b></p> <p>Type: <u>Dense</u></p> <p>Depth (inches): <u>19</u></p>	<p>Hydric Soil Present? Yes <u>X</u> No <u>    </u></p>
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Remarks:

**WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**

Project/Site: Bowdoinham Public Works City/County: Bowdoinham/Sagadahoc Sampling Date: 6/14/2019  
 Applicant/Owner: Baker Design Consultants State: ME Sampling Point: Upland  
 Investigator(s): Tom Tetreau Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): Shoulder Local relief (concave, convex, none): Convex Slope (%) 1 - 3  
 Subregion (LRR or MLRA): LRR R Lat: 44.004481 Long: -69.899655 Datum: NAD83  
 Soil Map Unit Name: \_\_\_\_\_ NWI Classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (if no, explain in Remarks.)  
 Are Vegetation , Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (if needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/> if yes, optional Wetland Site ID: <u>01TTC</u>
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	

Remarks: (Explain alternative procedures here or in a separate report.)  
 Occasionally mowed.

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required: check all that apply)	Surface Soil Cracks (B6)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible in Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsley Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)

Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches) _____	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches) _____	
Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches) _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION - Use scientific names of plants**

Sampling Point: **Upland**

<p><b>Tree Stratum</b> (Plot Size: <u>30'</u>radius )</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:35%;"></th> <th style="width:15%;">Absolute % Cover</th> <th style="width:15%;">Dominant Species?</th> <th style="width:15%;">Indicator Status</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td colspan="4" style="text-align: right;">_____ = Total Cover</td> </tr> </tbody> </table> <p><b>Shrub Stratum</b> (Plot Size: <u>15'</u>radius )</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:35%;"></th> <th style="width:15%;">Absolute % Cover</th> <th style="width:15%;">Dominant Species?</th> <th style="width:15%;">Indicator Status</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td colspan="4" style="text-align: right;">_____ = Total Cover</td> </tr> </tbody> </table> <p><b>Herb Stratum</b> (Plot Size: <u>5'</u>radius )</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:35%;"></th> <th style="width:15%;">Absolute % Cover</th> <th style="width:15%;">Dominant Species?</th> <th style="width:15%;">Indicator Status</th> </tr> </thead> <tbody> <tr> <td><u>Phleum pratense</u></td> <td style="text-align: center;">90</td> <td style="text-align: center;">X</td> <td style="text-align: center;">FACU</td> </tr> <tr> <td><u>Solidago rugosa</u></td> <td style="text-align: center;">5</td> <td></td> <td style="text-align: center;">FAC</td> </tr> <tr> <td colspan="4" style="text-align: right;">95 = Total Cover</td> </tr> </tbody> </table> <p><b>Woody Vine Stratum</b> (Plot Size: <u>30'</u>radius )</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:35%;"></th> <th style="width:15%;">Absolute % Cover</th> <th style="width:15%;">Dominant Species?</th> <th style="width:15%;">Indicator Status</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td colspan="4" style="text-align: right;">_____ = Total Cover</td> </tr> </tbody> </table>		Absolute % Cover	Dominant Species?	Indicator Status	_____	_____	_____	_____	_____ = Total Cover					Absolute % Cover	Dominant Species?	Indicator Status	_____	_____	_____	_____	_____ = Total Cover					Absolute % Cover	Dominant Species?	Indicator Status	<u>Phleum pratense</u>	90	X	FACU	<u>Solidago rugosa</u>	5		FAC	95 = Total Cover					Absolute % Cover	Dominant Species?	Indicator Status	_____	_____	_____	_____	_____ = Total Cover				<p><b>Dominance Test Worksheet:</b></p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>1</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0%</u> (A/B)</p> <hr/> <p><b>Prevalence Index Worksheet:</b></p> <p>OBL species <u>0</u> x 1 <u>0</u></p> <p>FACW species <u>0</u> x 2 <u>0</u></p> <p>FAC species <u>5</u> x 3 <u>15</u></p> <p>FACU species <u>90</u> x 4 <u>360</u></p> <p>UPL species <u>0</u> x 5 <u>0</u></p> <p>Column Totals <u>95</u> (A) <u>375</u> (B)</p> <p>Prevalence Index = B/A = <u>3.95</u></p> <hr/> <p><b>Hydrophytic Vegetation Indicators:</b></p> <p>_____ 1- Rapid Test For Hydrophytic Vegetation</p> <p>_____ 2- Dominance Test is =&gt; 50%</p> <p>_____ 3- Prevalence Index is =&lt; 3.0</p> <p>_____ 4- Morphological Adaptations</p> <p>_____ 5- Problematic Hydrophytic Vegetation</p> <hr/> <p><b>Definitions of Vegetation Strata:</b></p> <p>Tree- Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.</p> <p>Sapling/Shrub- Woody plants less than 3 in. DBH and greater than or equal to 3.28ft (1m) tall.</p> <p>Herb- All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28ft tall.</p> <p>Woody Vines- All woody vines greater than 3.28ft in height.</p> <hr/> <p style="text-align: center;">Hydrophytic Vegetation Present? Yes _____ No <u>X</u></p>
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<p>Remarks: (Include photo numbers here or on a separate sheet.)</p>   																																																					

**SOIL**

Sampling Point: **Upland**

Depth (inches)	Matrix		Redox Features					Remarks
	Color	%	Color	%	Type	Loc	Texture	
0-12	10YR 4/3	100					Silt Loam	
12-18	10YR 4/2	100					Silt Loam	

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7)

- Polyvalue Below Surface (B15)
- Thin Dark Surface (S9)
- Loamy Mucky Mineral (F1)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Soils:**

- 2 cm Muck (A10)
- Coast Prarie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Dark Surface (S7)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Mesic Spodic (TA6)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

**Restrictive Layer (if observed):**

Type: Dense  
 Depth (inches): 18

Hydric Soil Present? Yes  No

Remarks: