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Public Service of New Hampshire
Seacoast Reliability Project

Madbury, Durham, Newington & Portsmouth, NH

Natural Resource Impact Assessment
Amended

Prepared For:
Public Service Company of New Hampshire
d/b/a Eversource Energy
780 North Commercial Street
Manchester, NH 03101

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1.0 Project Description

Since filing the Application on April 12, 2016, PSNH has secured contracts to acquire additional legal rights to construct the facility in three separate locations in the Town of Newington, NH: (1) underground at Gundalow Landing Circle; (2) Town owned land known as the Flynn Pit; and (3) underground at the Frink Farm, Newington Center Historic District and the Hannah Lane residential neighborhood. The changes in design have resulted in the following modifications to the Natural Resources Impact Assessment Report: Section 2.0, Proposed Work, Section 3.0, Water Resources, and 4.0 Compensatory Wetland Mitigation.

2.0 Proposed Work

The majority of the SRP will be constructed aboveground on overhead structures between about 65 and 103 feet above ground in height within an existing utility corridor. The line will include three sections of underground and undersea cable. Beginning in Madbury, the line will be overhead until the University of New Hampshire Parking Lot A where it will transition to an underground design, being buried about 2.5 feet deep to the top of duct and 5 feet deep total. It will remain underground for approximately 2,100 feet, adjacent to an existing utility and rail corridor under Main Street to a point near Colovos road on the UNH campus. At this point the line will transition back to an overhead design until the westerly shore of Little Bay in Durham, NH. It will cross under Little Bay using a combination of direct bury open trenching, jet plow and hand-jet technology. For this crossing it will be buried about 3.5 feet in the shallow tidal flats and shore landings, and 8 feet deep in the channel for a distance of approximately 5,750 feet. For this crossing, the transmission line will be necessarily split into three cables to maintain the required transmissivity for the Project. East of Little Bay, the line will remain underground for approximately 1,770 feet until it circumvents a pond in the Flynn Pit Town Forest in Newington. At this point it will emerge to an overhead design until reaching the Darius Frink Farm. The line will transition underground for approximately 2,700 feet to depths 2.5 to 4 feet deep to the top of duct and between 3.5 and 8 feet deep total across the Frink Farm and along the Hannah Lane neighborhood until a point slightly west of Fox Point road. The line will transition back to an overhead design until it terminates at the Portsmouth substation. In most locations, the existing distribution line will be co-located on the new structures and the existing distribution structures will be removed. In several locations, the existing distribution line will be relocated outside of the project corridor and the new structures will carry the new transmission cables only. A short portion of an existing transmission line will be relocated to accommodate the new SRP alignment at The Crossings at Fox Run Mall in Newington.

Substation improvements in Madbury and Portsmouth remain confined to the existing substation footprints. These improvements include the addition of electrical equipment required to operate the new line. No other substation modifications are proposed.

3.0 Water Resource Effects

The amended impacts to freshwater and estuarine water resources, including wetlands and streams, are predominantly temporary (Table 3.0-1). Direct fill impacts have been avoided where possible, resulting in a total of 778 square feet (0.02 acres) of permanent fill in freshwater wetlands; and 5,336 square feet (0.12 acres) of permanent fill in estuarine areas associated with Little Bay. Total proposed permanent impacts are 6,114 square feet ("SF"), or 0.14 acres. Permanent impacts to terrestrial areas are associated with new transmission line structures, their associated foundations, and relocated distribution structures. Permanent impacts to Little Bay are associated with concrete "mattresses" which are required by National Electrical Safety Code ("NESC") Code (NESC Section 352D) to be laid over the submarine cables where the minimum burial depths (42 inches to the top of the cable) cannot be reached due to bedrock or other material. The articulated concrete mattresses provide protection to the cables from accidental and environmental contact/disturbances. The extent of the need for concrete mattresses will not be identified until the project is installed, but has been conservatively estimated for the permit application review. Permanent wetlands to streams and rivers have been avoided.

Temporary impacts to freshwater wetlands primarily result from timber matting to access structure sites, to clear trees and to establish work pads around proposed structures (306,631 square feet, 7.04 acres). Temporary estuarine wetland impacts result from open cut-and-cover in the salt marsh (1,222 square feet; 0.03 acres), and sediment disturbance during cable burial via jet plow and hand-jetting across the tidal flat and subtidal waters (271,984 square feet; 6.24 acres). Temporary impacts to streams are minimal and limited to 568 SF (221 linear feet) of temporary culverts where streams pass through proposed work pad areas and in two locations where the underground line will be installed via an open trench.

Indirect, or secondary, impacts are related to vegetation conversion (permanent tree removal) of forested or forest canopy covered wetlands and upland clearing within stream buffers. Clearing is proposed within 306,724 SF (7.04 acres) of forested or forest canopy covered wetlands and within 87,200 SF (2.00 acres) of upland areas within 100 feet of perennial streams, 50 feet of intermittent streams and 25 feet of ephemeral streams.

Table 3.0-1. Summary of Total Proposed Direct Permanent and Temporary Wetland Impacts by Town.

Town	Permanent (SF)	Temporary (SF)	Total (SF)
Madbury	199	29,261	29,460
Durham	3,753	319,124	322,877
Newington	2,162	231,452	233,614
Portsmouth	0	0	0
Total (Sq. Ft.):	6,114	579,837	585,951
Total (Acres):	0.14	13.31	13.45

As required by State and Federal regulations, the SRP design has avoided and minimized impacts to water resources wherever it was feasible and reasonable to do so. The following sections describe the avoidance and minimization measures, and the type and extent of the remaining unavoidable impacts.

3.1 Impact Avoidance

Permanent and temporary impacts to water resources were avoided where possible throughout the design and engineering phases of project development. For example, there are no proposed impacts within the City of Portsmouth due to successful impact avoidance measures. Multiple rounds of preliminary design reviews were conducted between project engineering and environmental specialists. New structures were located outside of wetlands, unless technical constraints pertaining to project corridor limitations, structure height and maximum spans dictated that a structure be placed in a wetland resource. With the final design, 26 new structures, of the 179 proposed new or relocated transmission and distribution structures will be located within or partially within wetland areas and will result in permanent impacts.

Access routes and temporary work pads for construction were similarly reviewed and wetland crossings were avoided where possible. The required tree clearing along the edges of the existing corridor limited the amount of wetland avoidance; however other methods such as clearing during winter/frozen-ground conditions and hand cutting, may be employed to minimize temporary impacts associated with these activities (see below).

3.2 Impact Minimization

Engineering constraints limited the ability to avoid placing 26 new structures within or partially within wetland areas, thus wetlands have been avoided by approximately 85 percent of the 179 proposed new structures. Additionally, it should be noted that approximately 51 existing distribution structures will be removed from wetland areas by utilizing double circuit designs where necessary. The existing distribution line will be co-

located on the same new structures below the new transmission lines. This will result in the net decrease of 25 structures within wetland areas.

Several steps are planned to minimize the extent of temporary impacts on protected areas, including wetlands. For the terrestrial portions of the Project, temporary impacts will be associated with construction access, access for corridor tree removal, access for the removal of existing structures, and construction work pads around new structures. Timber mats (approximately 16 feet long by 4 feet wide) will be utilized where necessary depending on the ground conditions during construction activities. Work will be performed where possible during frozen conditions and using low-ground pressure vehicles as practicable. To the extent feasible, access paths already present in the corridor will be utilized to avoid creating new routes and minimize wetland crossings. Additionally, timber mats will be placed on shrubs to reduce mat timbers sinking into wetland soils. Previous similar projects have found that the shrubs survive the short-term matting. Streams will be spanned with timber mats from bank to bank, with no permanent impacts anticipated.

Potential impacts to water quality related to the construction of the SRP were also considered during project planning and design. Erosion control measures including adherence to New Hampshire Department of Environmental Services ("NHDES") Best Management Practices Manual for Utility Maintenance in and Adjacent to Wetlands and Waterbodies in New Hampshire and applicable internal Best Management Practices ("BMP") associated with erosion control and clearing during transmission line construction will be strictly enforced. The NHDES manual includes 14 different BMPs that are detailed in Appendix A of that document. BMP #1 through #13 are applicable to the access roads and work pad areas associated with the SRP, and will be utilized where needed.

In addition, the project alignment and all proposed work areas were reviewed to identify potentially high-risk sites for erosion and other soil disturbances associated with construction activities where enhanced BMPs may be needed in addition to those referenced in the applicable BMPs. These areas included steep upland slopes (generally >10 percent) that are located in close proximity to wetland and riparian resources where access roads or work pads are proposed. Minimal grading and gravel may be required in these locations to safely accommodate the required construction equipment. In addition to the standard BMPs, water bars will be installed on access roads that are located on steep (>10% slope) slopes and greater than 100 feet in length, with level spreaders located at the downslope end to disperse flow.

The identified high-risk sites are listed below, and identified on the Project's Environmental Mapping:

1. Proposed Structure #6 (Madbury): Steep slopes associated with Madbury Road up-gradient of Wetland MW1

2. Proposed Structures #13/14 (Durham): Steep slope north of Wetland DW91 and Stream DS92
3. Proposed Structures #28-#30 (Durham): Steep slopes to the north and south of the Oyster River (DS53) including small tributary streams (DS51, DS61, DS61A and DS61B) and multiple wetland areas (DW49, DW55, DW59, DW63)
4. Proposed Structure #47 (Durham): access road on steep slopes up-gradient of Wetland DW56
5. Proposed Structure #58 (Durham): access road and work pad on steep slopes up-gradient of Wetland DW31
6. Proposed Structures #66-#67 (Durham): access roads on steep slopes located immediately to the east and west of Wetland DW9
7. Proposed Structures #80-#81 (Durham): access road traverses steep side-slope up-gradient of Wetland DW42
8. Proposed Structures #82-#83 (Durham): steep access road immediately east of Structure #82 and up-gradient of Wetland DW38

Normandeau environmental monitors and PSNH construction monitors will be on site during construction to insure that the construction contractors follow the approved access plans and construction BMPs.

3.3 Impact Analysis

Unavoidable direct and secondary impacts to water resources and associated upland buffer areas were reviewed throughout the Project area. Direct impacts include permanent and temporary disturbances, as discussed above. Secondary impacts were also reviewed, including wetland conversion and upland clearing within perennial and intermittent stream buffers. Wetland conversion will occur where forested wetland areas within the SRP corridor are cleared to allow for the safe construction and operation of the proposed transmission line. Temporary direct impacts from timber matting to allow for mechanized clearing and construction of the transmission line may be necessary in these areas. These areas will not be stumped or grubbed and soil disturbance will be minimal. The forested wetlands will naturally convert to emergent or scrub-shrub resources following the clearing activities. Upland stream buffer tree removal within 100 feet of perennial streams, 50 feet of intermittent streams, and 25 feet of ephemeral streams was also quantified.

3.3.1 Direct Wetland Impacts

The SRP will impact greater than 20,000 square feet of tidal and non-tidal wetland and intersects with potential habitat for wetland-dependent threatened and endangered species. It is therefore classified as a Major project in accordance with Env-Wt 303.02(c) and Env-Wt 303.02(h).

Direct permanent wetland impacts associated with the SRP total 6,114 SF (0.14 acres). The breakdown of impacts by town and Cowardin cover class associated with the SRP is

summarized in Table 3.3-1. A detailed table of individual wetland resources, cover classification, functions and values, and impacts is included in Appendix A of this report.

3.3.2 Direct Stream Impacts

Direct permanent impacts to streams have been avoided, with all structures located in upland or wetland areas. Direct temporary impacts to streams total 568 square feet (221 linear feet) (see Table 3.3-2). The majority of streams will be crossed using temporary mat bridges, with matting placed parallel to, but outside of each bank, and other matting placed perpendicular to these and over the stream. Three streams are located within work pad areas, and may need temporary culverts during construction activities. Temporary culverts will be sized based on appropriate guidelines to accommodate flows. These areas will be inspected and maintained throughout construction by an environmental monitor and the temporary culverts will be removed when no longer needed.

Additionally, two perennial streams: College Brook (DS74) in Durham and an Unnamed Stream (NS107) in Newington, are proposed to be crossed with an open trench associated with underground line construction. A short section of these streams will be temporarily relocated using coffer dams to divert water around the impact area during construction in the channel. The underground electrical conduit will be installed and the impacted portion of the channel will be reconstructed with native material and stream flow will be restored to its original channel. The area will be stabilized as needed to support the disturbed banks.

3.3.3 Secondary Wetland and Stream Impacts

Secondary impacts include wetland conversion from a forested canopy to scrub-shrub and emergent due to tree removal within wetlands and upland stream buffer tree removal within 100 feet of perennial streams, 50 feet of intermittent streams and 25 feet of ephemeral streams.

The majority of the existing legal corridor is 100 feet wide; however the width of currently cleared and regularly maintained area is on average 60 feet, although it varies from nearly the entire 100 feet width to as narrow as 30 feet. To safely accommodate the proposed transmission line while meeting the applicable clearances for 115kV and the co-located distribution lines, the entire corridor will need to be cleared of capable tree species to its full width. Capable species are those woody (tree) species that have the potential of growing to a height (typically 30 feet) that could pose a risk to the structures and conductor if they were to fall. Lower growing shrubs and herbaceous vegetation will not be cleared as they will not grow up to a height that could endanger the line. Minimum clearances from all vegetation

Table 3.3-1. Proposed Direct Permanent and Temporary Wetland Impacts by Cover Class and Town.

	# Wetlands	Permanent Impact (SF)	Temporary Impact (SF)	Total (SF)
Madbury				
PEM/PSS	1	199	28,940	29,139
PSS	1	0	321	321
Sub-Total:	***2***	***199***	***29,261***	***29,460***
Durham				
E1UB (Subtidal)	1	0	49,832	49,832
E2US (Mud Flat)	1	3,550	114,166	117,716
E2EM (Salt Marsh)	1	0	624	624
E2RS (Rocky Shore)	1	0	279	279
PEM (Emergent/Marsh)	5	71	25,632	25,703
PEM/PSS	23	49	71,739	71,788
PEM/PSS/PFO	1	0	807	807
PEM/PSS/PUB	1	20	18,175	18,195
PEM (Wet Meadow)	8	17	7,502	7,519
PFO	3	26	4,514	4,540
PSS	11	20	16,366	16,386
PSS/PFO	4		9,488	9,488
Sub-Total:	***60***	**3,753**	**319,124**	**322,877**
Newington				
E1UB (Subtidal)	1	0	77,565	77,565
E2US (Mud Flat)	1	1,484	29,925	31,409
E2EM (Salt Marsh)	1	0	598	598
E2RS (Rocky Shore)	1	302	217	519
PEM (Emergent/Marsh)	2	133	16,500	16,633
PEM/PSS	8	192	62,614	62,806
PEM/PSS/PFO	3	0	9,718	9,718
PEM/PUB	2	0	976	976
PEM (Wet Meadow)	6	20	13,064	13,084
PSS	3	20	8,854	8,874
PSS/PFO	2	0	4,957	4,957
PSS/PUB	1	11	6,464	6,475
Sub-Total:	***31***	**2,162**	**231,452**	**233,614**
Portsmouth				
	0	*No Impacts*		
Sub-Total:	***0***	***0***	***0***	***0***
Total:	**SF**	**6,114**	**579,837**	**585,951**
	Acres	**0.14**	**13.31**	**13.45**

Table 3.3-2. Proposed Temporary Stream Impacts by Town and Flow Regime with Proposed Crossing Type.

Stream ID	Stream Type	Name	Temp. Impact (SF)	Temp. Impact (LF)	Crossing Type
Durham					
DS8	Ephemeral		0	0	Mat Bridge
DS32	Intermittent		0	0	Mat Bridge
DS34	Ephemeral		0	0	Mat Bridge
DS35	Perennial	Beaudette Brook	0	0	Mat Bridge
DS39	Perennial		207	68	Temp. Culvert
DS46	Perennial	LaRoche Brook	0	0	Mat Bridge
DS51	Perennial		20	10	Temp. Culvert
DS60	Perennial	LaRoche Brook	0	0	Mat Bridge
D061	Perennial		0	0	Mat Bridge
DS74	Perennial	College Brook	147	49	Diversion, Trench & Mat Bridge
DS92	Intermittent		0	0	Mat Bridge
		Subtotal:	*374*	*127*	
Newington					
NS8	Intermittent		0	0	Mat Bridge
NS14	Ephemeral		0	0	Mat Bridge
NS36	Ephemeral		45	45	Temp. Culvert
NS50	Intermittent		0	0	Mat Bridge
NS107	Perennial		149	49	Diversion, Trench & Mat Bridge
		Subtotal:	*194*	*94*	
		Total:	**568**	**221**	

must be maintained, and routine maintenance clearing according to PSNH's vegetation clearing procedures and practices is an important component of the SRP operation[1].

Wetland areas within the surveyed tree line boundary were quantified within each town (Table 3.3-3). Cleared wetlands will not be stumped or grubbed and PSNH will consult with individual landowners on the disposal of cut trees. The remaining logs and brush will be removed from wetlands and either sold or chipped for erosion control.

[1] Northeast Utilities, 2013. *Vegetation Clearing Procedures and Practices for Transmission Line Sections.* OTRM 230. Rev. 2 8/19/2013.

Stream buffers function to protect the riparian areas of streams from sedimentation by trapping runoff, erosion by binding the soils near and along stream banks, and providing shade to keep water cool and for cover, plus other habitat benefits for wildlife and aquatic organisms. Tree removal within wetland areas near streams is included in the forested wetland conversion calculation. Proposed tree clearing of upland areas within 100 feet of perennial streams, 50 feet of intermittent streams and 25 feet of ephemeral streams was quantified based on agency recommendations (Table 3.3-4). Cleared areas within these buffers will not be stumped or grubbed and ground disturbances will be limited to those associated with the logging equipment. Additionally, low-growing native shrubs and other species common within riparian buffers will not be removed. Over time, other shrub and low-growing woody species will colonize the cleared areas helping to enhance and restore stream functions.

3.3.4 Vernal Pool Impacts

At the Flynn Pit, the reclassification of the water body as a vernal pool results in an impact to the vernal pool envelope immediately adjacent to the pool; there are no direct impacts to the ponded area itself (See Environmental Maps, SEC Appendix 2). The envelope is defined by the US Army Corps of Engineers as a 100-foot band immediately adjacent to the high water mark of the pool to provide shade to the vernal pool and peripheral habitat for amphibians metamorphosing to terrestrial conditions. The proposed underground cable will result in temporary impacts to 7,377 square feet in the vernal pool envelope, of which all will be restored and allowed to revegetate with native species, although a 25-foot wide permanent easement corridor will be periodically mown to maintain access to the underground cable.

3.3.5 Effects on Wetland Functions and Values

Permanent impacts to wetlands and streams were avoided and minimized wherever possible. The remaining unavoidable permanent impacts to terrestrial (palustrine) wetlands are relatively minor in extent (778 SF) and distributed across 26 structures in 24 wetlands. Table 3.3-5 summarizes the total proposed permanent impact to each principal wetland function or value in each town. These data do not include functions or values that a wetland is classified as suitable for, if the wetland was not observed performing this function or value within or immediately adjacent to the ROW area. Additionally, because wetlands can have multiple principal functions or values, proposed permanent impacts to a given function or value will exceed the total permanent impact to each given wetland. The functions most commonly associated with the permanently impacted wetlands include floodflow alteration, fish and shellfish habitat, sediment/toxicant retention, production export, and wildlife habitat. The majority of the permanent impacts are associated with the potential need for concrete mattresses to protect the submarine cable in Little Bay. The final cable burial depth will determine if the mattresses are necessary. The resulting hard substrate will replace the soft sediments and affect the existing fish and shellfish habitat, the production export associated with that habitat, and wildlife habitat (primarily foraging wading birds). More details on the expected impacts to the estuarine resources associated with Little Bay are

included in Section 5. In the terrestrial ROW, the small footprint of the new transmission line structures is not expected to affect the existing wetland functions or values. The impacted wetland areas are primarily located within an existing electric corridor and are already subject to periodic maintenance including clearing and other repair work. Temporary impacts are anticipated to have minimal adverse effects on the functions and values associated with the impacted wetland systems. Applicable construction BMPs, on-site monitoring, and restoration of temporarily impacted areas according to standards and based on agency recommendations will be employed (Section 4.0).

Table 3.3-3. Forested Wetland Conversion by Town.

	Wetland Conversion (SF)	Wetland Conversion (acres)
Madbury	2,072	0.05
Durham	216,621	4.97
Newington	76,726	1.76
Portsmouth	11,305	0.26
Total (SF):	**306,724**	**7.04**

Table 3.3-4. Upland Stream Buffer Tree Removal by Town.

	Perennial Stream Buffer (SF)	Intermittent Stream Buffer (SF)	Ephemeral Stream Buffer (SF)	Total (SF)
Madbury	7,383			7,383
Durham	53,324	11,452	4,221	68,997
Newington	5,010	4,691	1,119	10,820
Portsmouth	0	0	0	0
Total (SF):	**65,717**	**16,143**	**5,340**	**87,200**
Total (Acres):	**1.51**	**0.37**	**0.12**	**2.00**

Table 3.3-5. Permanent Impacts to Principal Functions and Values for Wetlands in each Town.

	Functions								Values				
Town	Groundwater Discharge	Floodflow Alteration	Fish/Shellfish	Sediment/Toxicant Retention	Nutrient Removal	Production Export	Shoreline/Sediment Stabil.	Wildlife Habitat	Recreation	Education/Scientific	Uniqueness/Heritage	Visual Quality/Heritage	RTE Habitat
Madbury	199	199	199	0	0	199	199	199	0	199	0	199	0
Durham	106	3,550	3,550	3,550	0	3,556	0	3,609	3,550	3,550	3,550	3,570	0
Newington	316	1,979	1,786	1,939	153	1,959	0	1,836	1,786	1,786	1,786	1,786	0
Portsmouth	0	0	0	0	0	0	0	0	0	0	0	0	0
Total (SF):	**621**	**5,728**	**5,535**	**5,489**	**153**	**5,714**	**199**	**5,644**	**5,336**	**5,535**	**5,336**	**5,555**	**0**

*RTE: Rare, Threatened and Endangered

3.3.6 Temporary Impacts Restoration Plan

Wetland and upland areas temporarily disturbed for access road and structure replacement activities will be restored. The likely wetland restoration areas will be associated with the location of timber mats shown for the structures and access roads in wetlands on the construction plans. Once timber mats and other temporary wetland protections have been removed, any displaced or compacted topsoil will be smoothed or graded to match previous or adjacent soil elevations. Acquired upland and wetland topsoil or reused topsoil will be evaluated for project use in any areas requiring fill, and will be spread and moderately compacted to match adjacent grades. Areas with disturbed soils will be stabilized with upland or wetland seed mix of native and naturalized species along with annual ryegrass (for erosion control while the other seed germinates). Alternative seed mixes or stabilization methods may be negotiated with individual landowners for upland areas by the contractor, as long as these alternatives are equally protective of jurisdictional wetlands and waterbodies and do not introduce noxious or invasive species.

Areas of the fringing salt marsh that will be temporarily impacted by the underwater cable installation will be restored immediately following completion of the cable laying. Prior to construction, all salt marsh peat will be salvaged within the impact area and stockpiled for replacement during restoration. The stockpiled peat blocks will be protected and maintained

for the duration of the installation period. Upon completion of construction, the underlying gravel substrates will be restored to match surrounding elevations. The peat blocks will be replaced and anchored with rebar stakes driven into the gravel and/or adjacent peat. Any open interstices between the peat blocks will be filled with a mixed sand to cover exposed roots and maintain grades. Additonal salt marsh cordgrass (*Spartina alterniflora*) will be planted in the interstices if the gap between peatblocks exceeds 4 inches. The seaward face of the restored peat will be protected from ice and wave action with a coir log.

All construction and restoration will be done under the supervision of the Engineer and an Environmental Monitor to ensure minimization of impacts to native vegetation and wildlife, and that all disturbed areas are stabilized.

The Environmental Monitor will assure compliance with permit conditions during and after the construction activities, including one year of post-construction corridor monitoring after one full growing season, and preparation of the appropriate compliance reports for submittal to NHDES. The monitoring will include a site inspection, vegetation cover estimates in restored wetlands and uplands by species in random plots, photographs, and wildlife observations. Areas with less than 80% cover at the end of the growing season will require additional seed or other appropriate enhancements. Any areas with erosion will be repaired immediately. Non-biodegradable erosion control materials will be removed as soon as they are no longer necessary. Other potential maintenance issues, such as erosion gullies or vandalism, will be documented and reported immediately to PSNH for repair.

Restored areas will be monitored for invasive species. Potential invasive species on this site include purple loosestrife, glossy and smooth buckthorn, bittersweet, multiflora rose and autumn olive among others. Invasive plants will be pulled and removed from restoration areas and disposed of in a manner and location to preclude their survival or spread. PSNH has a maintenance mowing protocol that encourages native shrubs while removing capable trees and non-native species. A monitoring report will be submitted to NHDES by November 1 of the year following construction impacts.

4.0 Compensatory Wetland Mitigation

Compensatory mitigation is proposed for unavoidable impacts to permanent wetland fill, and conversion of forested wetlands and stream buffers as a result of tree clearing. The first steps in mitigating wetland impacts are to avoid and minimize impacts. This has been a key component of the design for SRP project. The Project design team has worked with engineers and natural resource scientists to make design changes in order to avoid and minimize wetland impacts wherever possible (Sections 3.1 and 3.2)

Permanent direct wetland impacts are below the NHDES threshold for mitigation (10,000 SF of permanent wetland impact). Secondary impacts due to tree removal are in accordance with applicable U.S. Army Corps of Engineers ("USACE") regulations and guidance,

however, compensatory mitigation is proposed for direct and secondary Project impacts to wetlands and stream buffers.

SRP wetland resource impacts are currently calculated as 5,336 square feet of permanent estuarine impact, 778 square feet of permanent terrestrial wetland impact, 306,724 square feet of forested wetland conversion and 87,200 square feet of upland stream buffer clearing. Direct temporary impacts to streams total 568 square feet (221 linear feet). No direct impacts to vernal pools occur, but temporary impacts (7,377 square feet) will occur within the 100-foot vernal pool envelope of a vernal pool in Newington. A qualitative assessment of 13 wetland functions and values using the USACE Highway Methodology found that, while multiple functions were provided to some degree by most wetlands, the principal functions were the distinguishing features among the wetland types. The most common principal functions include: Groundwater Recharge/Discharge, Wildlife Habitat, Production Export, Sediment/Toxicant/Pathogen Retention, Floodflow Alteration and Nutrient Retention.

Because of the linear nature of the Project and its wetland resource impacts, high value within-project mitigation would be difficult. The Project includes four towns, multiple watersheds and a variety of freshwater and estuarine resources. During agency pre-application meetings, NHDES and USACE agreed that in-lieu fee payment into the State's Aquatic Resource Mitigation fund was appropriate compensatory mitigation for a linear project such as the SRP. Mitigation ratios were applied to these anticipated impacts in accordance with the New England Army Corps of Engineers Mitigation Guidance document and in coordination with the USACE and NHDES.

Calculations for payment into the In-Lieu Fee program based on the types and extent of wetland impacts by town are shown in Table 4-1. The dollar value shown in Table 4-1 may change during the review process with NHDES and USACE should design modifications result in changes in wetland impacts. Note that the calculated ARM Fund Payment has increased by $8,479.27 over the original Application value to a total of $318,450.38 following the modifications to the design included in this amended permit application filing. Although wetland impacts declined overall as a result of the amended design, the updated values for the 2016 Aquatic Resource Mitigation equalized values increased for most of the towns and resulted in the increased ARM fund payment.

Since the SRP SEC permit application was submitted on April 12, 2016, the Towns of Durham and Newington have developed permittee-responsible mitigation projects, summarized below. Both concepts have merit for compensation for different aspects of wetland resource impacts by the SRP if the regulatory agencies concur.

Table 4.-1. New Hampshire Aquatic Resource Mitigation (ARM) Fund Payment Calculation for Permanent and Secondary Wetland Impacts

Town	A: Secondary Impact: Forested Wetland Conversion (SF)	A1: Conversion Mitigation Area (15% of total area A)(SF)	B: Secondary Impact: Stream Buffer Clearing (SF)	B1: Conversion Mitigation Area (15% of total area B)(SF)	C: Permanent Impacts (SF)	Total Impacts for Mitigation by Town (SF) (Sum A1+B1+C)	ARM Payment (from NH DES ARM Fund Calculator by Town)[2] (USD)
Madbury	2,072	311	7,383	1,107	199	1,617	$6,501.15
Durham (Freshwater)	216,621	32,493	68,997	10,350	203	43,046	$192,471.01
Durham (Tidal)	-	-	-	-	3,550	3,550	$31,746.14
Newington (Freshwater)	76,726	11,509	10,820	1,623	376	13,508	$62,599.05
Newington (Tidal)	-	-	-	-	1,786	1,786	$16,553.44
Portsmouth	11,305	1,696	0	0	0	1,696	$8,579.60
Total:	306,724	46,009	87,200	13,080	6,114	65,203	$318,450.38

[2] http://des.nh.gov/organization/divisions/water/wetlands/wmp/; *ARM Fund Calculator Downloaded 8-31-16*

Durham- Wagon Hill Farm

Introduction and Site Description

The Town of Durham has proposed a shoreline stabilization project to reduce the amount of erosion from the Wagon Hill Farm shoreline bordering the Great Bay Estuary and the Oyster River, and to restore salt marsh that has already eroded. Wagon Hill Farm is Town-owned conservation land consisting of 139 acres with 1,100 feet of tidal frontage on the Little Bay, Oyster River and Smith Creek, and 8.5 acres of tidal and freshwater wetlands. The project proposes to stabilize a portion of the existing eroded shoreline, which is partially the result of uncontrolled foot and pet traffic along the shoreline. The erosion been exacerbated by rising sea level; wind, wave and ice action; and shading from mature trees on the bank. This erosion is continuing to degrade shoreline and salt marsh habitats and has negative impacts on wildlife, shellfish, and fish habitats. The erosion reduction plan proposes to stabilize and restore the shoreline using a living shoreline concept, as well as measures to halt foot traffic in the sensitive areas by re-designing nearby walking paths to discourage off-path travel, using fences and viewing platforms on the adjacent upland, and installing clear signage along the shoreline area.

Proposed Project

There are two primary objectives for this project: one) design and build a new shoreline that has both structural and biological elements, a living shoreline, that will minimize erosion, and two) re-establish the degraded salt marsh to further protect the shoreline. The resulting stabilized and restored shoreline will help to protect the water quality and aquatic habitats of the Oyster River and the Great Bay Estuary, including the adjacent Salt Marsh and Sparsely Vegetated Intertidal systems, both of which are Exemplary Natural Communities documented by NHNHB. Preliminary estimates suggest that approximately 10,000 square feet of salt marsh, plus approximately 1,100 linear feet of adjacent shoreline could be restored. The Town of Durham has partnered with University of New Hampshire coastal ecologists (Dr. David Burdick and Dr. Greg Moore) and coastal engineer (Dr. Tom Ballestero) and DES Coastal Program staff (Kirsten Howard and Kevin Lucey) to secure funding, collect baseline data, and design the living shoreline solution. This solution will likely include a combination of nearshore deflectors and energy dissipaters to protect against wave and ice action, enhancement of the existing salt marsh, and restoration of salt marsh previously lost to erosion, as well as protection of an upland area preserved for marsh migration as sea level rises. A 5-year monitoring program is proposed to study and assess the results of the project. Performance criteria will be established for evaluating the project with respect to the primary objectives (e.g., minimizing erosion and salt marsh development). Erosion and vegetation development criteria will be based on current erosion rates, salt marsh conditions and the design that is chosen for the site. The partnership between the town, UNH and DES will bring innovative techniques for addressing shoreline erosion and protection from human-caused destabilization. A successful project would serve as an example solution for addressing similar erosion problems elsewhere in the Great Bay Estuary. The details of the University of New Hampshire proposal are provided in Appendix B.

SRP Mitigation Proposal

The Wagon Hill Farm shoreline stabilization project provides the opportunity for the SRP to compensate for unavoidable wetland impacts in Durham. These impacts include approximately 203 square feet of permanent impact caused by SRP structures in freshwater wetlands, up to 3,550 square feet of permanent impact from concrete mattresses on tidal flats, and conversion of forested wetlands and stream buffers as a result of tree removal within the SRP project corridor. The shoreline stabilization project at Wagon Hill Farm will restore deteriorated or fully eroded salt marsh, and will reduce the loss of shoreline habitats and the associated sediment loading into critical estuarine habitats. Direct functional benefits to wetland habitats will include restoration and enhancement of Sediment and Shoreline Stabilization, Wildlife Habitat, Fish and Shellfish Habitat, and Production Export functions.

The Wagon Hill Farm project has been divided into phases for funding sources and milestones as shown on the attached schedule: Data Collection, Permitting, Engineering and Design, Construction, and Monitoring (Appendix B). Data collection and conceptual design under Engineering and Design are currently underway and are being funded by a matching $40,000 grant from the DES Coastal Program and matched by Durham. These tasks are expected to be complete by early 2017. The Permitting and remaining Engineering and Design costs have been funded with a second matching grant from DES Coastal Program and town monies for $42,500. Completion of these tasks is scheduled for mid-2017.

The Construction, Monitoring, and Maintenance components are broken into two phases: Phase 1 is proposed for 2017 and will restore 700 linear feet of shoreline and approximately 10,000 square feet of salt marsh; Phase 2 is projected for 2018 based on the results of Phase 1and will restore an additional 410 linear feet of eroding shoreline and potentially additional salt marsh. The total cost for construction, 5 years of monitoring, and maintenance is currently estimated as $200,000 for Phase 1, and $175,000 for Phase 2 for a total of $375,000. Final costs will vary depending on the final design. The costs for construction, monitoring and maintenance will be funded through a mix of money from the Lois Brown Trust, the Town of Durham general fund, and the SRP compensatory mitigation contribution for unavoidable wetland resource impacts in the town. The Lois Brown Trust has up to $100,000 available for this project. The Town of Durham voted to approve up to $84,000 for this project as part of the 2016 annual budget, pending regulatory permit approval for the PSNH contribution. This money will presumably be available in 2017. PSNH proposes to contribute the dollars calculated for the Durham portion of the In-Lieu Fee contribution for wetland impacts towards construction costs. Under the current amended proposal, the value of that contribution is approximately $224,000, although that may change during final design and the SEC permitting progress. Table 4-2 depicts the cost allocation by contributor for construction.

Table 4-2. Cost allocation by contributing partner for construction of the Wagon Hill Farm Shoreline Stabilization Project.

Contributing Partner	Amount
Lois Brown Trust	$100,000
Town of Durham	$51,000
PSNH	$224,000
Total	$375,000

Newington Conservation Easement

Introduction and Site Description

The Newington Conservation Commission is pursuing a 10- acre conservation easement on a 13-acre parcel on Old Post Road (Map 17 Lot 15) that borders an existing conservation parcel and encompasses a section of the Knights Brook Prime wetland (Figure B-1 in Appendix B). PSNH is working with the Town of Newington to develop a permittee-responsible compensatory mitigation project that would offset the wetland functional impacts of the Seacoast Reliability Project, and meet the town's goal of protecting this valuable parcel for wetland and wildlife habitat.

The Knights Brook system has been a top priority for conservation in Newington, and is listed as such in their 2009 Master Plan. The 10 acres proposed for easement support approximately 3.7 acres of wetland including a 200-foot section of Knights Brook, several springs, forested wetlands, shrub wetlands, wet meadow, and emergent marsh. The adjacent uplands are a mix of mowed fields and upland forest. A more detailed description of the habitats on site is provided in the Knights Brook Watershed Protection ARM Fund Pre-Proposal in Appendix C.

The landowners are retaining 3 acres of upland which contain their house, gardens and most outbuildings. They want to continue to maintain and use a set of walking paths through the easement lands. The walking paths are mowed grasses in the fields and a mix of cleared ground and bark mulch in the woodlands. Several wetland crossings have boardwalks and low bridges that were permitted in 2008.

A large portion of the parcel is ranked as Tier 1 habitat (Highest Ranked Habitat in NH) under the 2015 Wildlife Action Plan, with Knights Brook and its wetlands ranked as Supporting Landscape (Figure B-2). The Tier 1 ranking is assigned to the mowed fields, in recognition of their habitat value for a number of bird species with declining populations in NH. The landowners have stated their intention to continue mowing the fields under the conservation easement.

The parcel is adjacent to, or in close proximity to, existing protected lands along the Knights Brook corridor totaling approximately 100 acres (Figure B-1). These include a 38-acre parcel

(Map 17, Lot 8) under an agricultural easement that is predominantly hay fields and pasture, and contains considerable riparian habitat and a tributary to Knights Brook. Abutting the proposed parcel is a 36-acre conservation easement (Map 16, Lot 8) that contains a mix of wetland and forested upland and approximately 1,600 linear feet of Knights Brook. North of, and adjacent to, the 36-acre lot is a 26-acre parcel owned by the Town (Map 10, Lot 14), also under a conservation easement. This parcel abuts approximately 700 linear feet of Knights Brook and protects its riparian wetland as well as additional upland buffer. The acquisition of a conservation easement on the proposed parcel would increase the size of this block of protected lands, which also increases its value as watershed protection and wildlife habitat.

Project Status

With the help of the Rockingham County Conservation District, the Newington Conservation Commission (NCC) submitted an ARM Fund pre-proposal on April 22, 2016, to secure additional funds for the purchase of the conservation easement (Appendix C). The DES response indicated that the project needed to develop a functions and values assessment, a stewardship plan that addresses the use of the existing trails, puts limits on construction of new trails, and creates vegetative buffers to protect aquatic habitat. Since that time, the NCC has gotten a formal appraisal of the value of the easement, a full functions and values assessment by West Environmental LLC, and has negotiating the terms of a draft easement with the landowners using the DES conservation easement template. This easement commits the landowners to no new trail construction and limits the use of the existing trails for their private purposes only.

The DES had originally requested that a natural vegetative buffer be restored along the edges of all wetlands to protect water quality and wildlife habitat. After reviewing the Tier 1 designation of the mowed fields, DES has agreed that the value of the fields and wet meadow outweighs the benefits of the natural buffer along most of the wetlands. DES is requesting that a natural buffer along the wetland edge on the western edge of the mowed fields to protect the wetlands bordering Knights Brook. The landowners have agreed to allow a 100-foot natural buffer to regenerate in that area, although their footpath will remain. A Letter of Intent was signed between the landowner and the NCC, dated September 1, to commit to the purchase of the conservation easement (Appendix C). The draft conservation easement is also provided in Appendix C. The NCC will be the easement holder and has committed to annual monitoring to ensure the terms of the easement are maintained.

SPR Mitigation Proposal

The Newington Conservation Easement project provides the opportunity for the SRP to compensate Newington for unavoidable permanent impacts caused by SRP structures in freshwater wetlands (approximately 376 square feet), up to 1,800 square feet of permanent impact from concrete mattresses on tidal flats and rocky shore, and conversion of forested wetlands and stream buffers as a result of tree removal within the SRP project corridor. Placing a conservation easement on this parcel will protect a section of Knights Brook and its

Prime Wetland, and will enlarge an existing protected block of habitat in a section of town with development potential. It will also narrow a gap in protection between two existing conservation easements. Direct functional benefits to wetland habitats will include protection and enhancement of Groundwater Discharge, Flood flow Alteration, Shoreline Stabilization, Sediment/Toxicant Removal, Nutrient Removal, Wildlife Habitat, and Production Export functions.

The 2016 appraisal value of the conservation easement is $260,000. PSNH proposes to contribute the dollars calculated for the In-Lieu Fee contribution for wetland impacts in Newington towards the purchase of the easement. Under the current amended proposal, the value of that contribution is approximately $79,000, although that may change during final design and the SEC permitting progress. The NCC has committed $100,000 from their conservation fund, and will request the remaining monies (estimated as $81,000) to be raised at through a special warrant article at the 2017 Town Meeting. Table 4-3 depicts the cost allocation by contributor for purchase of the easement.

Table 4-3. Cost allocation by contributing partners for the Newington Conservation Easement Acquisition.

Contributing Partner	Amount
Newington Conservation Commission Fund	$100,000
Town of Newington*	$81,000
PSNH	$79,000
Total	$260,000

*To be requested as a warrant article in the 2017 Town Meeting.

In-Lieu Fee Reversion

PSNH will continue to work with the applicable parties to develop a mitigation package that will be acceptable to NHDES and USACE. In the event that a town proposal does not come to fruition, or develop within an acceptable schedule for the agencies, PSNH agrees that the SRP compensatory mitigation funds will revert to the State In-Lieu Fee program to be dispersed by DES under the general Aquatic Resource Mitigation Fund grant program for the Salmon Falls-Piscatqua Rivers Service Area.

Appendix A. Wetland Resource Summary Table

PSNH Seacoast Reliability Project (SRP)
Wetland Summary Table

Wetland ID	Amend. Permanent Impact (SF)	Amend. Temporary Impact (SF)	Cowardin Class	Delineated Area (SF)	Town	Functions and Values^												
						GW	FF	FSH	STR	NUT	PE	SSS	WH	REC	EDU	UH	VQ	RTE
DNW2 (Subtidal)	0	127,397	E1UB	259,459	Durham/Newington	S	P	P	P	S	P	S	P	P	P	P	P	S
DNW2 (Salt Marsh)	0	1,222	E2EM	9,047	Durham/Newington	S	P	P	P	S	P	S	P	P	P	P	P	S
DNW2 (Rocky Shore)	302	496	E2RS	15,636	Durham/Newington	S	P	P	P	S	P	S	P	P	P	P	P	S
DNW2 (Intertidal Flats)	5,034	144,091	E2US	278,668	Durham/Newington	S	P	P	P	S	P	S	P	P	P	P	P	S
DW1	0	0	PEM1/PSS1	18,663	Durham	S	S	S	S	S	S	S	S	-	S	-	S	-
DW2	30	7,636	PEM1E	51,456	Durham	P	-	-	-	-	S	-	P	-	-	-	S	-
DW4	0	1,325	PEM1J	6,829	Durham	S	-	-	-	-	-	-	-	-	-	-	-	-
DW5	0	230	PSS1	18,121	Durham	S	-	-	-	-	-	-	-	-	-	-	-	-
DW6	0	3,857	PEM1E/PSS1E	35,338	Durham	S	S	-	S	-	P	S	P	-	-	-	S	-
DW7	0	667	PSS1	4,726	Durham	S	S	-	S	S	-	-	-	-	-	-	-	-
DW9	0	1,005	PSS1/PEM1	5,839	Durham	S	S	-	S	S	-	-	-	-	-	-	-	-
DW10	0	376	PSS1E/PEM1J	17,144	Durham	S	-	-	-	-	P	-	S	-	-	-	-	-
DW11	0	0	PEM1/PSS1	7,353	Durham	S	-	-	S	S	-	-	-	-	-	-	-	-
DW12	0	822	PSS1E/PEM1E	11,821	Durham	S	-	-	S	-	-	-	P	-	-	-	S	-
DW13	0	1,942	PSS1/PEM1	48,977	Durham	S	-	-	S	S	-	-	-	-	-	-	-	-
DW14	20	3,255	PEM1J/PSS1E	21,504	Durham	P	S	-	S	-	S	-	P	S	-	-	P	-
DW16	0	64	PEM1E	763	Durham	S	S	-	-	-	-	-	S	-	-	-	-	-
DW17	0	42	PSS1/PEM1	11,886	Durham	S	P	-	P	P	S	P	P	-	-	-	-	-
DW18	9	4,531	PSS1E/PEM1E	54,161	Durham	P	S	-	-	-	S	-	P	-	S	-	S	-
DW20	17	1,872	PEM1J	3,144	Durham	S	-	-	-	-	-	-	-	-	-	-	-	-
DW21	0	3,241	PSS/PEM	24,887	Durham	S	-	-	S	S	S	-	S	-	-	-	-	-
DW22	0	3,129	PSS1E/PFO14E	40,728	Durham	P	S	-	-	-	S	-	P	-	-	-	-	S
DW24	0	7,267	PSS1E/PEM1E	35,043	Durham	S	-	-	-	-	P	-	P	-	P	S	S	-
DW25	0	1,399	PEM/PSS	10,231	Durham	S	S	-	S	S	-	-	S	-	-	-	-	-
DW26	0	245	PEM1J	245	Durham	S	-	-	-	-	-	-	-	-	-	-	-	-
DW27	0	53	PSS1E/PEM1F	2,294	Durham	S	S	-	S	S	-	-	S	-	-	-	-	-
DW28	0	643	PEM1J	839	Durham	S	-	-	-	-	-	-	-	-	-	-	-	-
DW29	0	1,251	PEM/PSS	9,272	Durham	S	S	-	S	S	-	-	S	-	-	-	-	-
DW30	0	857	PSS1E/PEM1J	14,577	Durham	S	S	-	S	-	P	S	P	-	S	-	-	-
DW31	20	8,940	PEM	46,279	Durham	S	S	-	S	S	-	-	S	-	-	-	-	-
DW33	0	5,436	PEM/PSS	39,676	Durham	S	S	-	S	S	-	-	S	-	-	-	-	-
DW36	0	1,104	PSS1/PFO1	10,787	Durham	P	P	-	-	-	-	-	-	-	-	-	-	-
DW37	0	1,420	PEM/PSS	3,294	Durham	S	S	-	S	S	-	S	S	-	-	-	-	-
DW38	0	4,089	PSS1/PFO1	32,062	Durham	P	S	-	-	-	S	-	-	-	-	-	-	-
DW40	0	630	PSS1/PEM1	6,354	Durham	P	-	-	-	-	P	-	S	-	-	-	P	-
DW41	20	18,175	PEM/PSS/PUB	96,107	Durham	S	S	-	S	S	-	S	S	-	-	-	-	S
DW42	0	0	PSS1/PFO1	4,930	Durham	P	-	-	-	-	-	-	-	-	-	-	-	-
DW43	0	0	PSS/PFO	4,476	Durham	S	S	-	S	S	-	-	S	-	-	-	-	-
DW44	0	1,437	PEM1	7,145	Durham	P	-	-	-	-	-	-	-	-	-	-	-	-
DW45	0	1,135	PSS	7,812	Durham	S	-	-	-	-	-	-	S	-	-	-	-	-

PSNH Seacoast Reliability Project (SRP)
Wetland Summary Table

Wetland ID	Amend. Permanent Impact (SF)	Amend. Temporary Impact (SF)	Cowardin Class	Delineated Area (SF)	Town	Functions and Values^												
						GW	FF	FSH	STR	NUT	PE	SSS	WH	REC	EDU	UH	VQ	RTE
DW47	0	4,018	PEM/PSS	23,061	Durham	S	S	-	S	S	-	S	S	-	-	-	-	-
DW48	0	1,176	PSS/PEM	14,505	Durham	P	P	-	-	-	S	P	S	-	-	-	-	-
DW49	0	3,172	PEM/PSS	3,533	Durham	S	S	-	S	S	-	-	S	-	-	-	-	-
DW50	0	1	PEM1	2,753	Durham	P	-	-	-	-	-	-	-	-	-	-	-	-
DW52	0	807	PSS1/PFO1/PEM1	18,865	Durham	P	-	-	-	-	S	-	-	-	-	-	-	-
DW54	0	2,739	PSS1	12,577	Durham	P	-	-	-	-	-	-	-	-	-	-	-	-
DW55	0	0	PSS	687	Durham	S	-	-	S	-	-	-	S	-	-	-	-	-
DW56	20	13,910	PEM1/PSS1	41,860	Durham	P	-	-	-	-	S	-	S	-	-	-	-	-
DW58	0	8,060	PSS1/PEM4	70,192	Durham	P	P	-	-	-	P	P	P	-	-	-	-	-
DW59	0	0	PEM/PUB	3,150	Durham	S	S	S	S	S	-	S	-	-	-	-	-	-
DW63	0	0	PSS/PEM	6,200	Durham	S	S	-	S	S	-	S	S	-	-	-	-	-
DW65	7	3,917	PEM	8,221	Durham	P	-	-	S	S	-	-	-	-	-	-	-	-
DW67	14	5,086	PEM	15,266	Durham	P	S	-	S	S	-	-	S	-	-	-	-	-
DW69	0	53	PEM	7,574	Durham	P	S	-	P	S	-	-	S	-	-	-	-	-
DW71	0	0	PEM	163	Durham	P	-	-	-	-	-	-	-	-	-	-	-	-
DW72	0	0	PSS1	2,527	Durham	-	-	-	S	S	-	-	-	-	-	-	-	-
DW73	0	0	PSS1/PEM1	1,098	Durham	S	S	S	S	S	-	S	-	-	S	-	-	-
DW74	0	1,166	PFO1/SS1	2,795	Durham	S	P	-	S	S	-	S	-	-	-	-	-	-
DW76	20	4,321	PSS1	12,237	Durham	S	-	-	-	-	-	-	-	-	-	-	S	-
DW77	0	1,711	PSS1	9,755	Durham	P	-	-	P	-	-	-	-	-	-	-	-	-
DW78	0	0	PSS1	139	Durham	P	-	-	P	P	-	-	-	-	-	-	-	-
DW79	0	842	PSS1	2,189	Durham	S	-	-	S	S	-	-	-	-	-	-	-	-
DW80	0	935	PSS1	5,966	Durham	S	-	-	-	-	-	-	-	-	-	-	-	-
DW91	0	1,240	PSS1	4,177	Durham	S	S	-	-	-	-	S	S	-	-	-	-	-
DW93	6	1,946	PSS1	4,637	Durham	P	-	-	-	-	P	-	-	-	-	-	-	-
DW94	20	4,961	PSS1	12,802	Durham	S	-	-	S	-	S	-	-	-	-	-	-	-
DW100	0	1,915	PEM1E	6,571	Durham	S	S	-	P	-	-	-	-	-	-	-	-	-
DW101	0	4,019	PEM1/SS1E	3,219	Durham	S	-	-	S	-	-	-	S	-	-	-	-	-
DW102	0	0	PSS1E	5,043	Durham	-	-	-	S	-	-	-	-	-	-	-	-	-
DW103	0	0	PSS1/EM1B	12,099	Durham	P	-	-	S	S	S	-	S	-	-	-	-	-
DW104	0	0	PSS1/EM1E	874	Durham	P	-	-	S	S	-	-	-	-	-	-	-	-
DW105	0	153	PFO1E	1,227	Durham	S	-	-	S	S	S	-	S	-	S	-	-	-
MW1	0	321	PSS1	8,078	Madbury	P	-	-	-	-	P	-	-	-	-	-	-	-
MW2	199	28,940	PEM1/PSS1	74,736	Madbury	P	P	P	-	-	P	P	P	-	P	-	P	-
NW1*	20	6,583	PEM1/SS1	75,679	Newington	S	P	-	P	P	P	-	-	-	-	-	S	-
NW3	20	6,141	PEM1/SS1	80,336	Newington	S	P	-	S	S	-	S	-	-	-	-	-	-
NW4	0	1,900	PSS1E/PUB3/PFO14E	48,442	Newington	S	S	-	P	S	S	-	P	-	-	-	S	-
NW6	20	2,817	PSS1C	13,332	Newington	S	P	-	S	-	P	S	P	-	-	-	-	-
NW9	133	12,399	PEM1	44,940	Newington	P	-	-	S	-	-	-	-	-	-	-	S	-
NW10	0	3,507	PSS1E/PEM1E/PFO1B	31,671	Newington	P	-	-	-	-	-	-	P	S	-	-	-	-

PSNH Seacoast Reliability Project (SRP)
Wetland Summary Table

Wetland ID	Amend. Permanent Impact (SF)	Amend. Temporary Impact (SF)	Cowardin Class	Delineated Area (SF)	Town	Functions and Values^												
						GW	FF	FSH	STR	NUT	PE	SSS	WH	REC	EDU	UH	VQ	RTE
NW11	133	13,147	PSS1/PEM1	38,909	Newington	P	P	-	P	P	P	-	S	-	-	-	S	-
NW12*	0	3,310	PSS1E/PEM1E	30,058	Newington	S	S	-	S	-	P	S	P	-	-	-	-	-
NW13	0	211	PEM1/PUB	16,815	Newington	S	S	-	S	S	S	S	P	-	-	-	S	-
NW16	19	16,577	PEM1F/PSS1E	47,505	Newington	P	S	-	S	-	S	-	P	-	S	-	S	-
NW17*	0	4,507	PSS1	12,715	Newington	P	-	-	S	S	S	-	-	-	-	-	-	-
NW18	0	2,200	PEM1J/PSS1J	7,003	Newington	S	-	-	P	-	-	-	S	-	-	-	-	-
NW19	0	388	PEM1	578	Newington	S	-	-	-	-	S	-	-	-	-	-	-	-
NW20	0	1,658	PEM1J	1,929	Newington	P	-	-	S	-	-	-	S	-	-	-	-	-
NW21	0	252	PEM1	6,666	Newington	S	-	-	-	-	-	-	-	-	-	-	-	-
NW22	0	3,057	PFO1E/PSS1E	10,953	Newington	P	-	-	-	-	-	-	S	-	-	-	-	-
NW24	0	5,988	PEM1F/PSS1E/PFO1E	18,186	Newington	S	-	-	S	-	P	-	P	-	-	-	-	-
NW26	0	1,530	PSS1E	15,500	Newington	P	-	-	S	-	-	-	S	-	-	-	-	-
NW28	20	5,391	PEM1J	39,285	Newington	P	-	-	S	-	-	-	-	-	-	-	-	-
NW30	0	3,056	PEM1J	13,978	Newington	S	-	-	-	-	-	-	-	-	-	-	-	-
NW32	0	2,319	PEM1J	11,001	Newington	S	-	-	-	-	-	-	-	-	-	-	-	-
NW34*	11	6,464	PSS1E/PUBb	23,065	Newington	P	S	S	S	-	S	S	P	-	-	-	-	-
NW35	0	223	PEM1/SS1/FO1B	8,824	Newington	P	S	-	P	P	-	-	P	-	-	-	-	-
NW37	0	544	PEM1/SS1E	33,462	Newington	P	P	S	P	P	P	P	P	-	-	-	-	-
NW39	0	0	PEM1/SS1E	2,472	Newington	P	P	-	P	P	P	P	P	-	-	-	-	-
NW41	0	0	PEM1E	4,114	Newington	P	P	-	P	P	P	S	S	-	-	-	-	-
NW42	0	765	PEM1/UB1E	7,736	Newington	P	P	-	P	P	S	S	P	-	-	-	-	-
NW43	0	4,101	PEM1B	9,495	Newington	P	S	-	P	P	-	S	S	-	-	-	-	-
NW44	0	0	PEM1E	4,194	Newington	P	S	-	P	P	S	S	P	-	-	-	-	-
NW45*	0	14,112	PEM1/SS1B	27,199	Newington	P	P	-	P	P	-	-	P	-	-	-	-	-
NW100	0	0	PEM1E	6,727	Newington	S	S	-	P	-	-	-	S	-	-	-	-	-
NW102	0	0	PEM/PFO/PSS	33,836	Newington	S	-	-	S	S	-	-	-	-	-	-	-	-
NW104	0	0	PEM	716	Newington	S	S	-	S	S	-	-	-	-	-	-	-	-
NW105	0	0	PEM	3,070	Newington	S	-	-	S	S	-	-	-	-	-	-	-	-
NW106	0	0	PEM/PSS	6,017	Newington	S	S	-	S	S	-	-	-	-	-	-	-	-
PW1	0	0	PEM/PSS	2,440	Portsmouth	S	-	-	S	S	-	-	-	-	-	-	-	-
PW2	0	0	PEM1/SS1/FO1B	51,333	Portsmouth	P	S	-	S	S	-	-	P	-	-	-	-	-
PW3	0	0	PEM1B	2,132	Portsmouth	P	S	-	S	S	-	-	P	-	-	-	-	-
PW4	0	0	PEM1E	535	Portsmouth	P	S	-	P	P	-	-	S	-	-	-	-	-
PW5	0	0	PEM1/SS1E	2,760	Portsmouth	S	-	-	S	S	-	-	-	-	-	-	-	-

^ GW= Groundwater Recharge/Discharge; FF= Floodflow Alteration; FSH= Fish/Shellfish Habitat; STR= Sediment/Toxicant Retention; NUT= Nutrient Removal; PE= Production Export; SSS= Sediment/Shoreline Stabilization; WH= Wildlife Habitat; REC= Recreation; EDU= Education/Scientific Value; UH= Uniqueness/Heritage; VQ= Visual Quality/Aesthetics; RTE= Endangered Species
* Prime Wetland

Appendix B. Supporting Documents for Wagon Hill Farm Shoreline Stabilization, Durham, NH.

Living Shorelines as an Erosion Control and Habitat Mitigation Approach for Wagon Hill Farm, Durham, NH

David Burdick[1], Tom Ballestero[2] and Gregg Moore[1]
[1]Jackson Estuarine Laboratory [2]Environmental Research Group
University of New Hampshire

david.burdick@unh.edu

June 14, 2016

Project Summary: The Town of Durham has owned Wagon Hill Farm (WHF) and maintained public access to the shoreline at the mouth of the Oyster River estuary for more than 20 years. Over this time, officials noticed erosion along much of the shoreline of the property adjacent to the Oyster River. The shoreline along the River is naturally divided into three sections, with the area of most concern adjacent to a constructed beach. A split rail fence was erected near the beach to discourage pedestrian and pet access/disturbance to the eroding bank. The fence had to be relocated landward on two occasions to prevent it from eroding into the water. The beach has been periodically re-nourished with sand and small stones were added to a small section (as rip-rap) to reduce stormwater runoff erosion. Other sections of shoreline extending westward also have erosion issues exhibiting bank collapse and loss of several large trees falling into the River.

The Town would like to manage the shoreline to minimize erosion using best management practices representing the state-of-the-science. With increases in the rate of sea level rise expected over the next several decades and the successful use of living shorelines elsewhere along the mid-Atlantic, we would like to design, pilot, and monitor a living shoreline for WHF. To begin, we established a team of Town officials (Todd Selig, Mike Lynch and Rachel Gasowski), UNH researchers (David Burdick, Tom Ballestero and Gregg Moore) and NH DES Coastal Program staff (Kevin Lucey and Kirsten Howard) who have agreed to work collaboratively on this project.

There are a variety of possible reasons for increased erosion of WHF shorelines over the past twenty years. Therefore our first step is to monitor the erosion rate and causative factors in 2016 to assess the various possible reasons for shoreline erosion. Subsequent to a better understanding of causative factors, erosion control using living shorelines will be proposed as a series of alternatives of cross sections and materials for the three priority locations identified at past meetings. The section of shoreline between the beach and the historic crib wharf is a priority because: 1) rapid erosion has already been demonstrated; 2) site is highly visible to the public; 3) site is easily accessible; and 4) design can tie into existing shoreline structures (marsh and wharf). Our team will be working to resolve the technical issues and develop a set of plans by the end of this summer based upon new surveys, wetlands delineation, and functions and values assessment using a grant from the NH DES Coastal Program.

Project Design: Living shoreline alternatives will be presented as a series of cross sections and materials for three potential restoration locations with the understanding that one site will be chosen as a pilot project for restoration. A conceptual design plan will be developed for the tidal shoreline section targeted for restoration (pilot project), including project site data, specified design criteria, relevant design guidelines, and other key information. An itemized construction cost will be developed for the pilot project; currently an estimate for the project construction and post construction monitoring is $200,000.

Project Objectives: There are two primary objectives for this project that fit well with the proposed mitigation. First, we will design and build a new shoreline that has both structural and biological elements, a living shoreline, that will minimize erosion. Second, the salt marsh that once protected the shoreline will be re-established. Salt marshes have a variety of ecosystem services and some of these might be chosen as secondary objectives for the project (e.g., wildlife habitat, nitrogen cycling, carbon storage).

Monitoring Objectives: A monitoring plan will be prepared this summer that describes critical parameters and associated criteria for measuring the effectiveness of a proposed living shoreline project. Baseline data of erosion rates will be measured using erosion pins and a current survey will be compared to a previous survey in 2002 to estimate erosion rates. Following construction of the living shoreline, erosion pins will continue to be used to measure erosion and the structural elements and marsh plants will be evaluated over time to determine performance with respect to Objective #1 Minimizing erosion. The development of a healthy salt marsh is Objective #2. We will assess the vegetation development of both high and low salt marsh from planted and rehabilitated areas and compare to a reference site. Other monitoring metrics will be used to assess specific secondary objectives requested by stakeholders and indicative of changes to the functions and values of the habitat restored.

Project Evaluation: We are planning a five-year monitoring program to assess the pilot project. An assessment of the functions and values under current conditions will form the baseline from which to measure progress following shoreline construction. Performance criteria will be established for evaluating the project with respect to the primary objectives (e.g., minimizing erosion and salt marsh development). Erosion and vegetation development criteria will be based on current erosion rates, salt marsh conditions and the design that is chosen for the site. In addition, other metrics may be used and compared with performance criteria to evaluate the project relative to secondary objectives.

Living Shorelines as an Erosion Control Approach for Wagon Hill Farm, Durham, NH

Overview

Planning

Next Steps

A. Data Collection: Because there is a wide array of techniques and materials from which to develop a living shoreline and some materials may be more or less appropriate depending upon site conditions, as series of measurements are planned. Measures include short and longer-term information gathering.

1) Collect and annotate existing data for Wagon Hill Farm, including weather. This is often a cost-effective approach to data collection.

2) Tidal heights and wave climate will be measured using an array of pressure transducers with a weather station. These water level recorders will be installed and programmed to obtain wave heights from winds and boat wakes.

3) Shoreline elevation and slopes will be measured using a total station RTK for the entire shoreline, but detailed information will be gathered for the shoreline sections where restoration appears to be needed. Sunlight reaching the sediment surface will also be assessed at specific locations.

4) Long term direct measurement of erosion at the site using available overhead images is made difficult by trees and their shadows, so erosion pins will be installed and measured monthly. A wildlife camera will be trained on the visitors who inadvertently exacerbate erosion by damaging marsh peat. We also may need to set out some short-term sediment catching structures to plan for restoration of marsh and shoreline. This may be a series of sediment traps or a larger structure for correct scaling to the site.

B. Restoration Design: Erosion control using living shorelines will also be proposed as a series of alternatives considering cross sections and materials for three locations prioritized at past and future meetings. The section of shoreline between the beach and the historic crib wharf is a priority because:

1) Rapid erosion has already been demonstrated

2) Highly visible to the public

3) Site is easily accessible

4) Can tie into existing shoreline structures (marsh and wharf)

A second area of concern for the Town of Durham is the freshwater drainage that runs into the Oyster River towards the north point of the shoreline. This area was identified by Mike and may need a drainage plan incorporated into shoreline restoration.

C. Immediate Actions Summer 2016: Actions that can be accomplished without a state wetlands permit include tree trimming to increase light reaching the marsh surface. To reduce foot traffic in sensitive areas, signage and fences could be installed. . . .

Statement of Work for UNH Living Shorelines Team

Collect data, report on conditions and develop 3 designs for living shorelines at WHF using data and submitting some portion for 2016 ARM funding (August deadline).

1) Collect and annotate existing data for Wagon Hill Farm, including weather. [Time: 2 weeks]

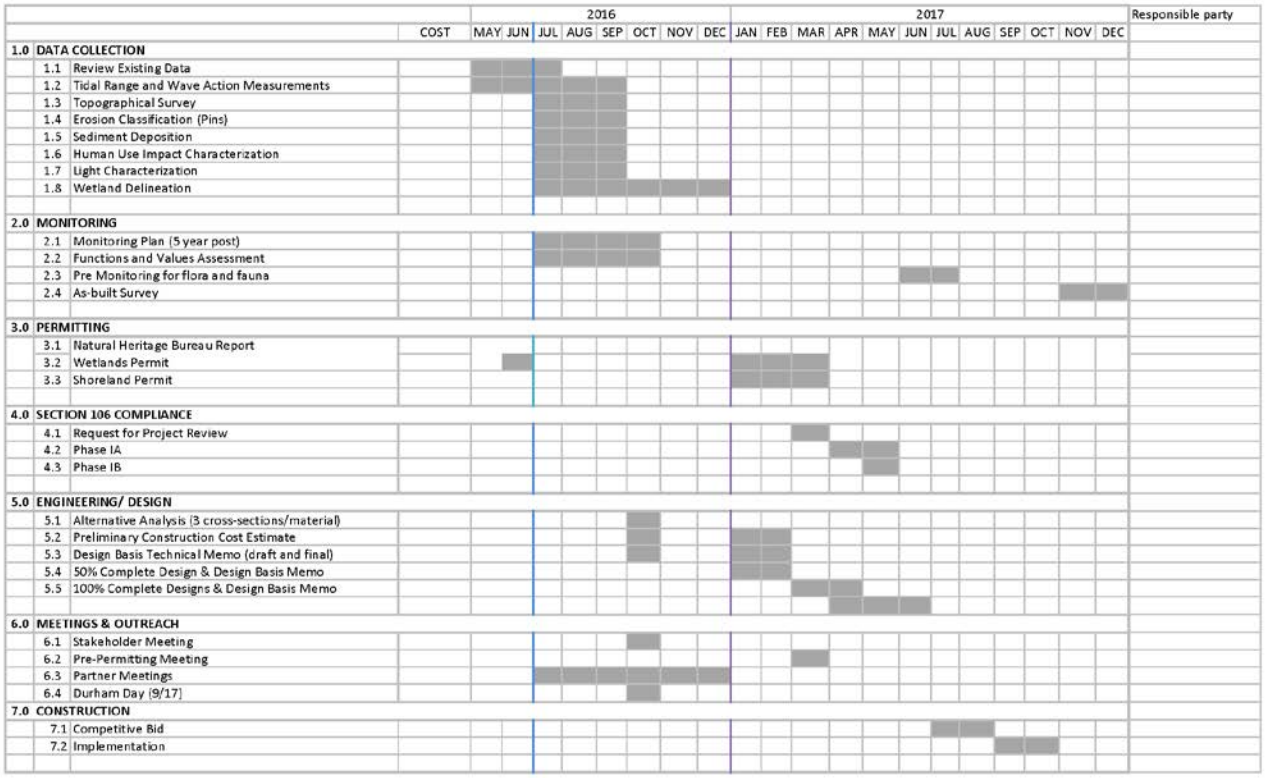
2) Tidal heights and wave climate will be measured using an array of [3?] vented pressure transducers and an associated weather station. These water level recorders will be installed and programmed to obtain wave heights from winds and boat wakes from May 15 to August 1. [Eq: 6k and time: 2 weeks]

3) Shoreline elevation and slopes will be measured using a total station RTK for specific, prioritized locations. Sunlight reaching the sediment surface will also be assessed at specific locations. [Eq: 1 k and time: 4 weeks]

4) Long term direct measurement of erosion at the site using available overhead images is made difficult by trees and their shadows, so erosion pins will be installed and measured monthly for 1 year (2016-2017). A wildlife camera will be trained on the visitors who inadvertently exacerbate erosion by damaging marsh peat (May through July). We also need to set out some short-term sediment catching structures to plan for restoration of marsh [Eq 2k and time: 6 weeks]

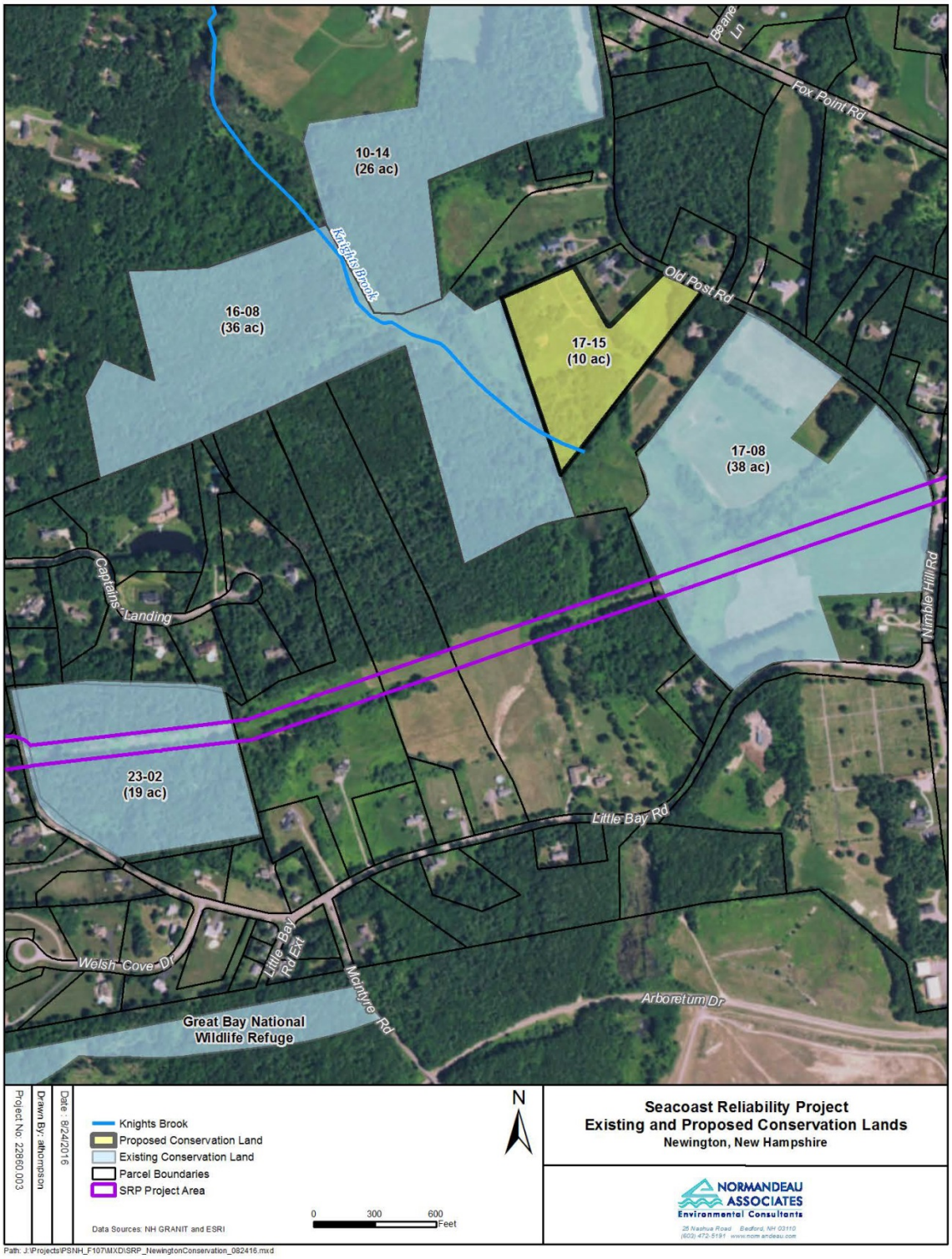
5) Living Shoreline Concepts and Alternatives for three sites based on priorities of the partnership (Town of Durham, UNH, and NHCP, DES). A living shoreline will be framed out in concept for the section between the town beach and the historic wharf or landing. Up to two alternative conceptual designs will be presented for the shoreline to develop a plan with strong buy-in for this highly visible section. Conceptual designs will be presented for two more shoreline sections as indicated by the priorities of the partnership. [Time: 4 weeks]

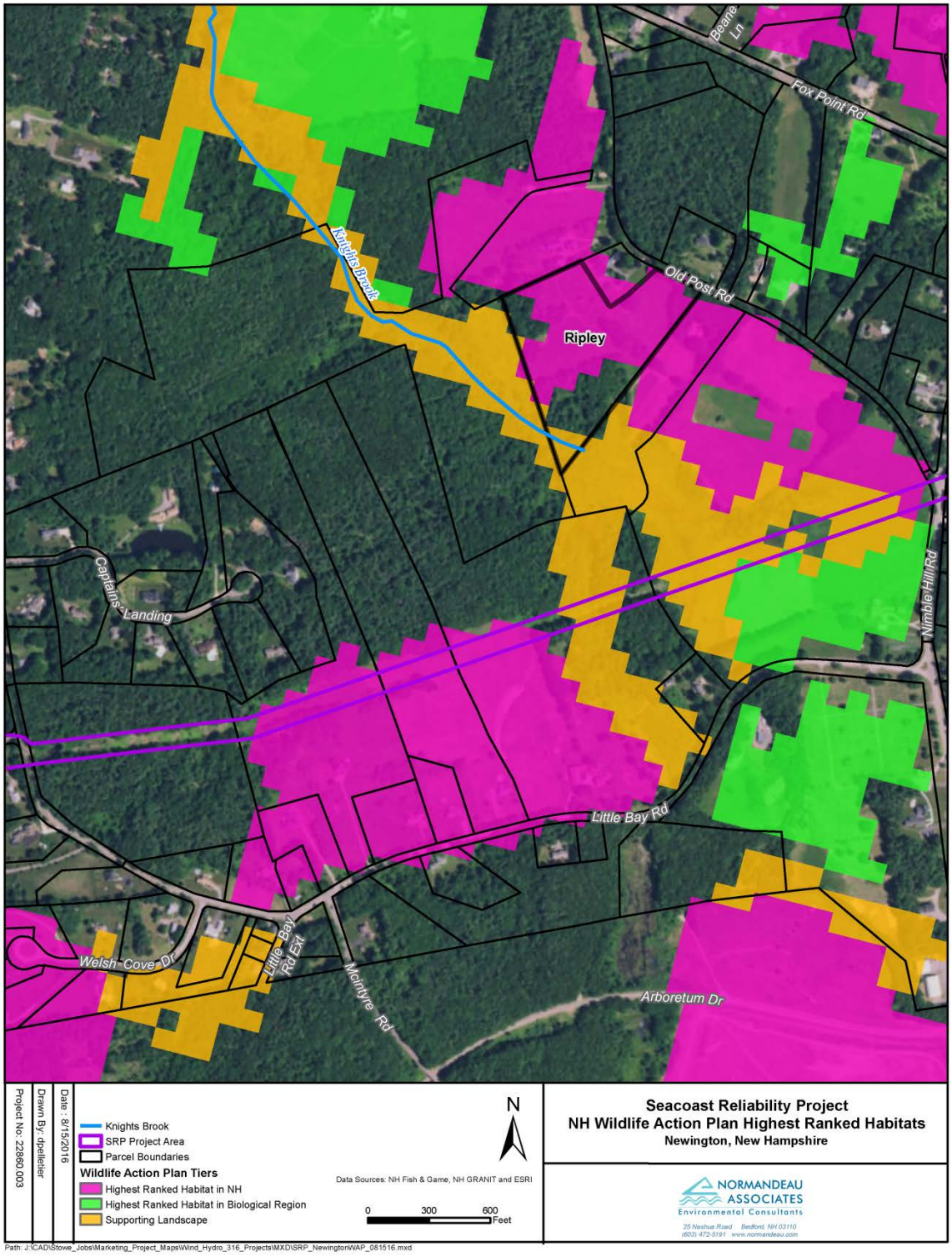
Proposed schedule for Wagon Hill Farm design, construction and monitoring.



				2016								2017												Responsible party
			COST	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1.0	**DATA COLLECTION**																							
	1.1	Review Existing Data																						
	1.2	Tidal Range and Wave Action Measurements																						
	1.3	Topographical Survey																						
	1.4	Erosion Classification (Pins)																						
	1.5	Sediment Deposition																						
	1.6	Human Use Impact Characterization																						
	1.7	Light Characterization																						
	1.8	Wetland Delineation																						
2.0	**MONITORING**																							
	2.1	Monitoring Plan (5 year post)																						
	2.2	Functions and Values Assessment																						
	2.3	Pre Monitoring for flora and fauna																						
	2.4	As-built Survey																						
3.0	**PERMITTING**																							
	3.1	Natural Heritage Bureau Report																						
	3.2	Wetlands Permit																						
	3.3	Shoreland Permit																						
4.0	**SECTION 106 COMPLIANCE**																							
	4.1	Request for Project Review																						
	4.2	Phase IA																						
	4.3	Phase IB																						
5.0	**ENGINEERING/ DESIGN**																							
	5.1	Alternative Analysis (3 cross-sections/material)																						
	5.2	Preliminary Construction Cost Estimate																						
	5.3	Design Basis Technical Memo (draft and final)																						
	5.4	50% Complete Design & Design Basis Memo																						
	5.5	100% Complete Designs & Design Basis Memo																						
6.0	**MEETINGS & OUTREACH**																							
	6.1	Stakeholder Meeting																						
	6.2	Pre-Permitting Meeting																						
	6.3	Partner Meetings																						
	6.4	Durham Day (9/17)																						
7.0	**CONSTRUCTION**																							
	7.1	Competitive Bid																						
	7.2	Implementation																						

Appendix C. Supporting Documents for Acquisition of a Conservation Easement along Knights Brook, Newington, NH.


Beane Ln
Fox Point Rd
10-14
(26 ac)
Knights Brook
Old Post Rd
16-08
(36 ac)
17-15
(10 ac)
17-08
(38 ac)
Captains Landing
Nimble Hill Rd
23-02
(19 ac)
Little Bay Rd
Welsh Cove Dr
Little Bay Rd Ext
McIntyre Rd
Arboretum Dr
Great Bay National Wildlife Refuge
Project No. 22860.003
Drawn By: athompson
Date: 8/24/2016
Knights Brook
Proposed Conservation Land
Existing Conservation Land
Parcel Boundaries
SRP Project Area
Data Sources: NH GRANIT and ESRI
0
300
600
Feet
N
Seacoast Reliability Project
Existing and Proposed Conservation Lands
Newington, New Hampshire
NORMANDEAU ASSOCIATES
Environmental Consultants
25 Nashua Road Bedford, NH 03110
(603) 472-5191 www.normandeau.com
Path: J:\Projects\PSNH_F107\MXD\SRP_NewingtonConservation_082416.mxd


Beane Ln
Fox Point Rd
Knights Brook
Old Post Rd
Ripley
Captains Landing
Nimble Hill Rd
Little Bay Rd
Little Bay Rd Ext
Welsh Cove Dr
McIntyre Rd
Arboretum Dr
Project No: 22860.003
Drawn By: dpelletier
Date: 8/15/2016
Knights Brook
SRP Project Area
Parcel Boundaries
Wildlife Action Plan Tiers
Highest Ranked Habitat in NH
Highest Ranked Habitat in Biological Region
Supporting Landscape
N
Data Sources: NH Fish & Game, NH GRANIT and ESRI
0 300 600 Feet
Seacoast Reliability Project
NH Wildlife Action Plan Highest Ranked Habitats
Newington, New Hampshire
NORMANDEAU ASSOCIATES
Environmental Consultants
25 Nashua Road Bedford, NH 03110
(603) 472-5191 www.normandeau.com
Path: J:\CAD\Stowe_Jobs\Marketing_Project_Maps\Wind_Hydro_316_Projects\MXD\SRP_NewingtonWAP_081516.mxd

NHDES-W-06-003

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

ARM FUND APPLICATION FORM AND PROJECT WORKSHEET

Water Division/ Shoreland Program
Land Resources Management

RSA 482-A:28-32 / Env-Wt 800

1. SHORT TITLE FOR PROPOSED PROJECT		
Knight's Brook Watershed Protection Phase I		
2. PROPOSED PROJECT LOCATION INFORMATION		
Street/Road: Old Post Road	Town/City: Newington	Service Area: Salmon Falls-Piscataqua
3. APPLICANT INFORMATION		
Applicant Name: Newington Conservation Commission		
Applicant Mailing Address: 205 Nimble Hill Road		
Contact Individual: Jane Hislop and/or Gerald Coogan, AICP, Interim Town Planner		
Daytime Telephone: 436-7640	Email (if any): gcoogan@townofnewingtonnh.com/jhislop@fs.fed.us	
4. GRANT AMOUNT REQUESTED; MATCHING FUNDS		
Total Amount Requested:$ 80,000	**Total Project Cost:** $300,000-400,000 +/-	
Source(s) And Amount(s) of Matching Funds: Source: NRCS $ 48,500 Source: Conservation Fund $100,000	Source: NAWCA $75,000 Source:	
5. RESOURCE WORKSHEET		
Aquatic Resources Involved in Project: See Table Below.		
Total preservation proposed: Upland: 6.24+/- Acres	Wetland: 3.76 +/- Acres	
Total length of stream(s) on property: 200 +/- Linear Feet % upland: 62%	% having 100-ft wooded zone: 200'- 300' +- in North direction 200'-300' +/- in South direction	
# confirmed vernal pools: N/A	# potential vernal pools: Undocumented	
Area of wetland restoration proposed: 1-2 +/- acres	Area of wetland creation proposed: acres	
Area of wetland enhancement proposed: acres	Area of upland enhancement proposed: acres	
6. SIGNATURE AND CERTIFICATION		
I hereby certify that: • The information contained in or otherwise submitted with this application is true, complete, and not misleading to the best of my knowledge and belief; • I understand that - Submitting false, incomplete, or misleading information is grounds for denying the application or revoking any award of ARM Funds that is made based on such information; and - I am subject to the penalties for making unsworn false statements specified RSA 641:3 or any successor New Hampshire statute.		
Signature: Jane E. Hislop	Date: 4/26/16	
Name, Title: Jane E. Hislop, Co-Chair of ConCom		

Lori.Sommer@des.nh.gov or (603) 271-4059
NHDES Wetlands Bureau, Concord, NH 03303-0095
www.des.nh.gov

Wetlands Arm Fund Application Form and Project Worksheet – Revised 03/18/2016

Page 1 of 4

NHDES-W-06-003

Summary of Aquatic Resource(s) Involved in Project

The following information is required to be provided about the aquatic resources found on the proposed ARM Fund site. This information is necessary to maximize the mitigation program goal of compensating for impacts lost through the payment projects for each grant round. The New Hampshire RSA 482-A:3 requires a wetland permit for any proposed project that involves dredging or filling of a wetland or stream resource. Before NHDES will issue a permit, applicants must show that their proposed project will avoid adverse impacts to aquatic resources and will minimize and mitigate those impacts which are unavoidable. A component of this analysis is to record the wetland resource type that will be lost through the development project and evaluate the functions and values it serves. With this information, NHDES can keep a record of those areas and functions lost and review ARM Fund projects with the goal to replace or protect those types and important functions lost.

Wetland Resources: Wetlands shall be classified by US Fish and Wildlife Service Manual WS/OBS-79/31 Classification of Wetlands and Deepwater Habitats of the United States, Cowardin et al, 1979, reprinted 1992.

Stream Resources: For funding requests to restore or improve stream systems, the streams on the project site shall be reviewed and the following information collected to the best extent possible:

Stream order according to New Hampshire Hydrography Dataset (NHHD)	Geomorphology including degradation
Rosgen stream type	Position within the surrounding landscape
Impacts to upstream and downstream flooding	Connectivity improvement for aquatic organism passage
Stream bed materials	Fisheries presence
Sediment Transport capacity	Characterization of the adjacent buffers in terms of vegetative coverage
Channel form	Floodplain connectivity

These general principals are described within the New Hampshire Stream Crossing Guidelines, University of New Hampshire, May 2009, found at:
http://des.nh.gov/organization/divisions/water/wetlands/documents/nh-stream-crossings.pdf

Lori.Sommer@des.nh.gov or (603) 271-4059
NHDES Wetlands Bureau, Concord, NH 03303-0095
www.des.nh.gov

Wetland Functions & Values: A wetland evaluation is the process of determining the values of a wetland based on an assessment of the functions it performs. The evaluation of wetland functions and values should be determined through use of the Method for Inventorying and Evaluating Freshwater Wetlands in New Hampshire, 2015 edition (2015 New Hampshire Method), available at http://nhmethod.org *OR* US Army Corps of Engineers, New England District highway methodology workbook supplement, 1999 edition (1999 US ACE Highway Workbook Supplement). The evaluation should focus on the following: Ecological Integrity, Wetland-Dependent Wildlife Habitat, Fish and Aquatic Habitat, Scenic Quality, Educational Potential, Wetland-based Recreation, Flood Storage, Groundwater, Sediment Trapping, Nutrient Trapping/Retention/Transformation, Shoreline Anchoring, Noteworthiness.

Please note a request for funds can be used for projects that protect or produce habitat improvements so as to provide enhancement of functions within a degraded wetland or improved connectivity in a riparian system. Possible improvements include water quality improvements, tidal flow manipulations, culverts and dam removal, as well as stream or river restoration/enhancement activities. The NHDES Coordinator should be contacted relative to information on deficient culvert crossing locations and analyses available for assessing geomorphic compatibility and aquatic organism passage.

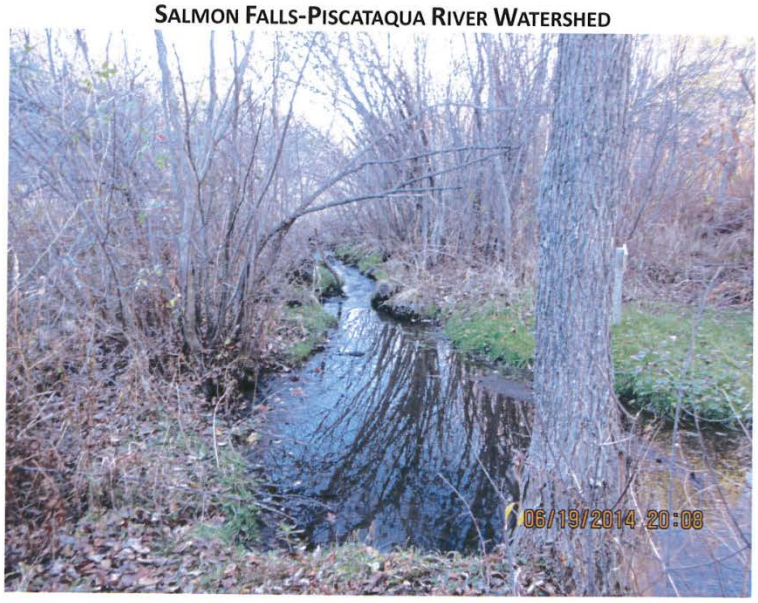
TABLE OF RESOURCES

Wetland ID or Number	**Resource Type** (list all that apply such as PFO, PSS, PEM, M1, M2, E2, RUB, etc.)	**Acreage** (by resource type)	**Wetland Functions** (List all that apply, and if possible, according to wetland ID or number)
1	PEM1E	.5	Flood flow Alteration, Groundwater Recharge/discharge, Sediment/Toxicant/Pathogen Retention, Nutrient Removal/Retention Transformation, Production Export, Sediment/Shoreline Stabilization Wildlife Habitat
2	PFO1/EM1E	.3	Groundwater Recharge/discharge, Wildlife Habitat
3	PFOI/SS1/EM1E	.62	Groundwater Recharge/discharge, Sediment/Shoreline Stabilization, Wildlife Habitat
4	PFO1/SS1E	1.14	Flood flow Alteration, Groundwater Recharge/discharge, Sediment/Toxicant/Pathogen Retention, Wildlife Habitat
5	PFO1E	0.4	Groundwater Recharge/discharge, Sediment/Toxicant/Pathogen, Nutrient Removal/Retention Transformation, Wildlife Habitat
6	PEM1Ed	.8	Groundwater Recharge/discharge, Sediment/Toxicant/Pathogen

Lori.Sommer@des.nh.gov or (603) 271-4059
NHDES Wetlands Bureau, Concord, NH 03303-0095
www.des.nh.gov

			Retention, Wildlife Habitat

NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES
2016 AQUATIC RESOURCE MITIGATION FUNDS
SALMON FALLS-PISCATAQUA RIVER WATERSHED



TITLE

KNIGHT'S BROOK WATERSHED PROTECTION
PHASE I

PREPROPOSAL

SUBMITTED BY:
NEWINGTON CONSERVATION COMMISSION
205 NIMBLE HILL ROAD
NEWINGTON, NH 03801

APRIL 22, 2016

KNIGHT'S BROOK WATERSHED PROTECTION PHASE I

PROJECT DESCRIPTION

Introduction:

The intention of this project is to permanently protect 10 acres of critical aquatic resources and their upland buffers, located off of Old Post Road in Newington, NH. The property is owned by the Ripley's for nearly three decades. They have been interested in the conservation potential for this property, but have also been approached by developers. The potential degradation of the high quality aquatic resources and their upland buffers from development here would be detrimental for the Knight's Brook, its riparian corridor, and the entire watershed. The Newington Conservation Commission is now negotiating for its permanent protection.

Goals:

To permanently protect 10 acres of critical aquatic and riparian resources and adjacent buffers within Newington's second largest freshwater wetland, and designated Prime Wetland. We propose to utilize NH DES, ARM funds to assist with permanent protection of the parcel that contains approximately 37% +/- wetland cover, with mostly scrub-shrub, wet meadow, shallow marsh, red maple swamp, and associated upland buffers.

Aquatic and Habitat Resource Protection:

The Knight's Brook is the second largest freshwater wetland complex in Newington (31 +/- acres) and includes a diverse stream corridor. This area has been a top priority for conservation for a number of years, and was specifically listed in the 2009 Newington Master Plan.

The site has gently sloping topography, and has 200+/- linear feet along Knight's Brook. Knight's Brook was designated a Prime Wetland in 2005, and is the second largest designated Prime Wetland in Newington.

The wetlands on-site include two small springs, and support wetland functions including: groundwater recharge/discharge; flood flow alteration; groundwater recharge/discharge; sediment/toxicant/ pathogen retention; nutrient removal/retention transformation; product export; sediment/shoreline stabilization and wildlife habitat.

Habitats here include abundant wet meadows, shallow marsh, scrub-shrub, and red maple forested wetlands and associated upland buffers. Upland habitats on site include approximately 5 acres +/- of managed fields, and a smaller amount of mixed forest dominated by mixed age canopy and sapling layers of white pine, red oak, black cherry, and gray birch. Highbush blueberry, staghorn sumac and some buckthorn and multiflora rose are also found in the shrub layers. No vernal pools have been verified on site, but a more in-depth review will occur later in the spring to complete a full wetland inventory for the site.

Other species found on site include: American elm, black birch, red maple, hemlock, grey birch, beech, red spruce, as well as speckled alder, and red-oiser dogwood. Plants found on site include:

Canada mayflower, winterberry, meadow sweet; bayberry; tussock sedge, cinnamon fern, royal fern, Jack-in-the-pulpit, wild geranium, Pink Lady's Slippers, Chicory, and Poison ivy.

There is a variety of wildlife that have been found throughout the stream corridor including; beaver, otter, mink, muskrat, raccoon, porcupine, fisher, weasel, skunk, red and grey fox, as well as a significant deer population. Wetlands and upland habitat with considerable undisturbed acreage also provide valuable habitat for birds of prey, song birds, migratory and ground nesting birds and include on-site viewings of woodcock, swallows, herons and other wading birds, barred owls, and a variety of duck species. It is likely that several threatened and endangered species may be included within this riparian corridor. The NH DRED, Natural Heritage Bureau will soon provide an up-to-date list for the site.

This parcel has 100 acres of protected lands adjacent or nearby making this a significant wildlife corridor. This area includes a large unfragmented block of riparian lands that serve as important wildlife habitat and water quality protection. This block of protected lands includes a 37.9 acre (Map 17 lot 10) protected farmland located just upstream of this site, another 25.95 acres in conservation easement (former mitigation) (Map 10, lot 14) located downstream, and directly adjacent is another 36 +/- acres in easement of a 43 acre parcel (Map 16, lot 8). The protection of this parcel enlarges existing protected lands, and is located within a large contiguous block of open lands. The majority of this area is identified in the 2015 NH WAP as Highest Ranked Habitat in New Hampshire.

Restoration at this site may likely be proposed by NRCS and may include restoration of former ditching, invasive plant control, and trail stabilization. To this end we plan to work with the NRCS, Wetland Restoration Easement (WRE) program on easement and restoration opportunities.

Supporting Documents:

The *Town of Newington Master Plan* (2009) specifically referenced this parcel, and the Planning Board endorsed it for open space protection. It is the largest freshwater wetland that is designated Prime Wetland under Newington's jurisdiction. It is an area of great natural beauty and if permanently protected will contribute to the health, significance, and diversity of an invaluable freshwater wetland complex in town.

The NH Fish & Game's *Wildlife Action Plan* (WAP) (2015) includes this parcel within the Highest Ranked Habitat in New Hampshire with supporting landscapes.

Possible Partnerships and Timeframe:

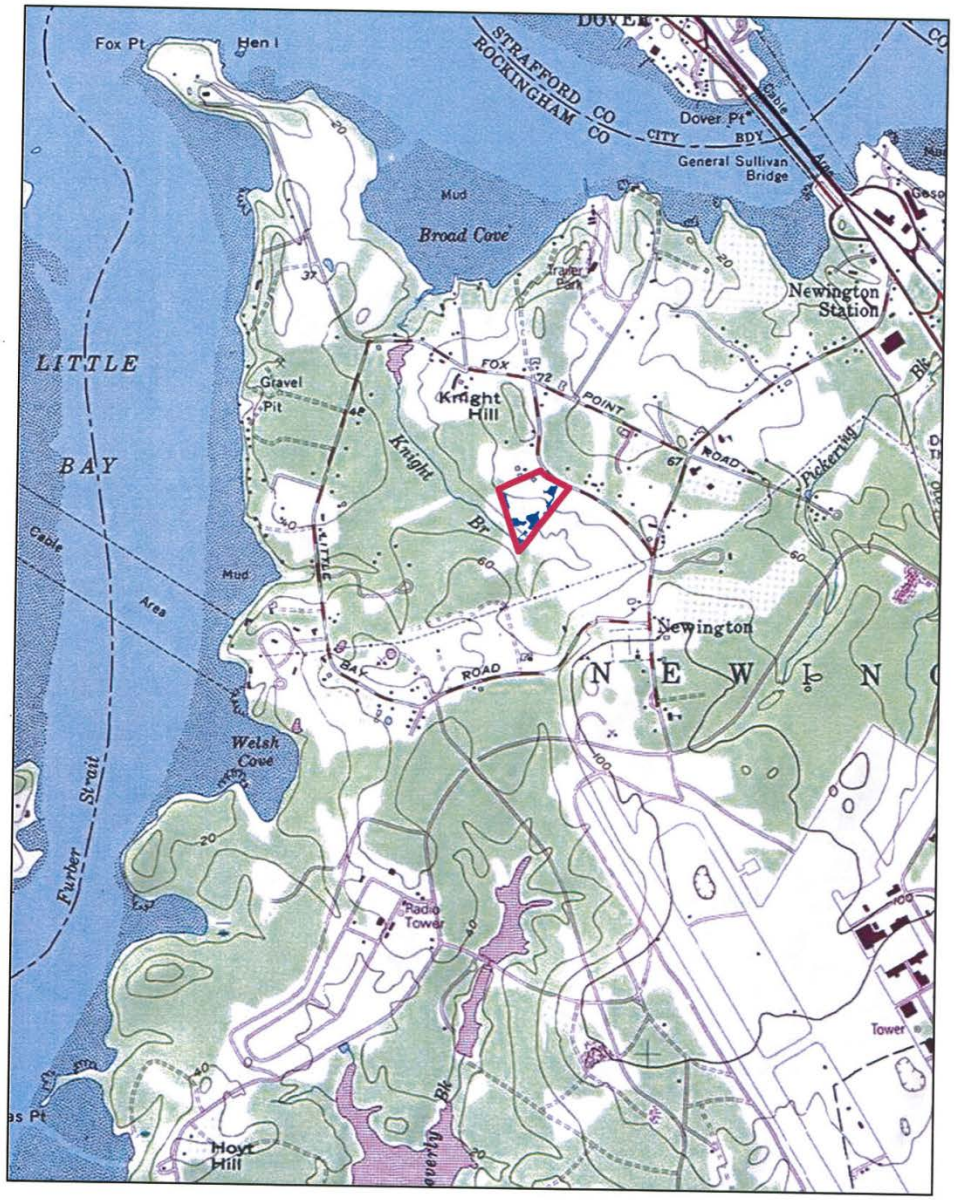
A conservation easement holder for this land will likely depend upon funding options and timing, but the intent is that this eligible parcel will rank highly with the NRCS/WRE program, and NRCS will be the easement holder in perpetuity. The Town of Newington has $100,000 available for conservation purposes within its conservation fund for this protection effort. Values of land extend far beyond the available funds from the conservation fund, so additional partners will be needed to ensure its permanent protection. The ability to leverage state and federal funds for permanent protection is essential to ensure the success of this conservation project. The following is proposed for funding, partners, and estimated timeframes:

NH DES, ARM	Fall/Winter 2017	$80,000
NRCS, WRE	Winter/Spring 2017	$48,500 (with easement)
Newington Conservation Fund	Spring 2017	$100,000 +/-
NAWCA small grant	Winter/Spring 2017	$75,000

By permanently protecting this site, the integrity of the high value aquatic resources will not be compromised. The prospect for protection and restoration of wetland functions and values and contiguous upland buffers offers considerable watershed protection and signifies the importance of immediate permanent protection.


WEST ENVIRONMENTAL
NEATLINE ASSOCIATES
www.nhgis.com
Data Sources: Background image is a 2010 1-foot resolution aerial photograph acquired by NHDOT and distributed by NH GRANIT. Road names from NH DOT. Town boundaries from NH GRANIT. All other features from West Environmental. All features and locations are approximate.
0
200
Feet
17-15
113
112
1
2
3
4
5
6

Tax Map 17 Lot 15, Newington



Compiled by the Rockingham County Conservation District, 2016.

The Town Of Newington
New Hampshire
Established 1713

OFFICE OF
SELECTMEN

September 1, 2016

Mr. and Mrs. John Ripley
50 Old Post Road
Newington, NH 03801

Re: Letter of Intent (LOI) regarding a Conservation Easement

Dear Mr. and Mrs. Ripley

The Town of Newington Conservation Commission (aka NCC) confirms the substance of the recent discussions with you (aka "Landowner") regarding our mutual interest in a potential purchase by the Town of Newington (acting through the Conservation Commission aka NCC) of a conservation easement on your property, consisting of approximately 10 acres in the Town of Newington, County of Rockingham and known as Tax Map 17, Lot 15. The Property is of part of the Knights Brook Watershed and is located in an area that satisfies the criteria established by the NCC as part of its Open Space Preservation Plan for conservation easements. The NCC is interested in the eventual acquisition of a conservation easement (aka "Easement") on the Property. This letter will serve as a Letter of Intent (LOI) setting forth the understanding of the parties regarding the preliminary steps for undertaking this easement project.

Both the Landowner and the NCC agree to the following:

1. The property interest to be acquired through a conservation easement consists of the parcel of land known as Tax Map 17, Lot 15 (aka 50 Old Post Road) on the Town of Newington, NH official Tax Map;

2. Mr. and Mrs. Ripley (aka "Landowner") and the NCC agree on a purchase price of $260,000 for the acquisition of the "Easement" which is the appraised value of the property. See Appraisal Report, Proposed Conservation Easement on 10.00 acres prepared by Knight Appraisal (Peter Knight), July 1, 2016. A copy of the appraisal is available at the Town office for inspection;

3. The following sources would provide the funds for the acquisition of the conservation easement:

    a) Town of Newington Conservation Fund - $100,000

205 Nimble Hill Road • Newington, NH 03801 • (603) 436-7640 • Fax (603) 436-7188 • Email: selectmen@newington.nh.us

b) Seacoast Reliability Project Mitigation funds	$ 80,000 (est)
c) Town of Newington 2017 Town Meeting special article	$ 80,000[1]
Total	$260,000

4. If the required funding is secured, the Landowner and NCC will enter into an **Agreement to Purchase the Development Rights,** to which both parties would agree;

5. Both the Landowner and the NCC agree that this Letter of Intent (LOI) is not a contractually binding agreement on the parties and is only an expression of the intent of the parties to pursue a conservation easement agreement. This LOI does not obligate either party to proceed to the completion of a purchase and sale of an Easement.

6. The Landowner acknowledges and fully understands that a conservation easement transaction and agreement can be a complex undertaking and can require some time to complete. The NCC advises you to seek legal and/or tax advice to assist you in carrying out this potential conservation easement project.

If this LOI accurately reflects the present understanding with respect to the above, please sign the enclosed copy of this letter and return it to the above address. The NCC looks forward to working with you on this conservation easement.

Please call Gerald Coogan, AICP, Interim Town Planner at 436 – 7640 or 748 – 5580 or by e mail at gcoogan@townofnewingtonnh.com if you have any questions regarding the above or the process moving forward to the completion of a conservation easement.

Sincerely,

Jane E. Hislop

Jane Hislop,
Co-Chair, NCC

Jim Weiner

Jim Weiner,
Co-Chair, NCC

As the Landowner of Tax Map 17, Lot 15, we have read and agree to the above LOI:

John C. Ripley

John Ripley

Dated: 09/01/16

Margaret Ripley

Margaret Ripley

Dated: 09/01/16

[1] This is a special warrant article that requires favorable action at the March 2017 Town Meeting. At present, the $80,000 is an estimate.

ARM Easement Template DRAFT Ripley Conservation Easement Newington

This easement language has been reviewed and approved by the Grantors and representatives from the Newington Conservation Commission. The final conservation easement will utilize the content of this easement but will likely be crafted by the Town of Newington and may include modifications in the language but not the intent.

September 8, 2016

DEPARTMENT OF ENVIRONMENTAL SERVICES
CONSERVATION EASEMENT DEED
For the Aquatic Resource Mitigation Fund Program

[Name of Grantor(s)], with a principal mailing address of [street name and number], Town/City of [town/city name], County of [county name], State of New Hampshire, (hereinafter referred to as the "Grantor," which word where the context requires includes the plural and shall, unless the context clearly indicates otherwise, include the Grantor's executors, administrators, legal representatives, devisees, heirs, successors and assigns), for consideration paid, with WARRANTY COVENANTS, grant[s] in perpetuity to [name of grantee] , with a principal mailing address of _____ [street name and number], County of [county name], State of New Hampshire, (hereinafter referred to as the "Grantee" which shall, unless the context clearly indicates otherwise, include the Grantee's executors, administrators, legal representatives, devisees, heirs, successors and assigns), this CONSERVATION EASEMENT (herein referred to as the "Easement"), and with a Third Party Right of Enforcement therein granted to the STATE OF NEW HAMPSHIRE acting through its DEPARTMENT OF ENVIRONMENTAL SERVICES, an administrative agency duly organized and existing under the laws of the State of New Hampshire, with a principal place of business at 29 Hazen Drive, City of Concord, County of Merrimack, State of New Hampshire, 03302, (the "Third Party Holder"), over the parcel of land (herein referred to as the "Property") with any and all buildings, structures, and improvements thereon/being unimproved land situated on _____ in the Town/City of, County of [county name] , State of New Hampshire, with said Property and Easement more particularly bounded and described in Appendix "A" attached hereto and made a part hereof and on a plan set dated [plan date] prepared by [name of preparer of plan], titled "[title of plan] ", Sheets __ through __ inclusive (the "Overlay Plan") on file with the Town and with the N.H. Department of Environmental Services.

The Grantee has identified the Property as critical wildlife habitat, which includes fields, wetland, riverine and upland habitats that provide significant habitat for numerous species of wildlife and possesses the following attributes:

1. The Property includes lands that are ranked "Highest Ranking Habitat by Ecological Condition in the State" in New Hampshire in the New Hampshire Wildlife Action Plan.

1. CONSERVATION PURPOSES

The Easement hereby granted is pursuant to NH RSA 477:45-47, and in compliance with the New Hampshire Aquatic Resources Mitigation Fund Final In-lieu Fee Program Instrument (U.S. Army Corps of Engineers, New England District, Regulatory Division, File Number NAE-2005-1142), exclusively for the following conservation purposes:

A. To conserve and protect in perpetuity the natural vegetation, soils, hydrology and habitat as

documented in the baseline documentation report dated [report date] entitled "[report title]" (the "Report"), which Report is on file at the office of the Grantee and the Department of Environmental Services and is incorporated herein in full.

B. To restore, protect, manage, maintain, and enhance the functional values of wetlands, vernal pools, streams, riparian areas and other lands, and for the conservation of natural values including fish and wildlife and their habitat, ecological integrity of the water resources, water quality improvement, flood water retention, groundwater recharge, and open space.

C. To prevent any future development, construction, or use that will negatively impair or interfere with the conservation values of the Property as documented in the baseline documentation report while accommodating the reserved rights of Grantor as allowed under Section 5.

All of the purposes set forth herein are consistent and in accordance with the U.S. Internal Revenue Code, Section 170(h).

2. DEFINITIONS

A. Agriculture and Forestry: For the purposes of this Easement, "agriculture" and "forestry" shall include animal husbandry, floriculture, and horticulture activities; the production of plant and animal products for domestic or commercial purposes; the growing of food crops: or forest trees of any size capable of producing timber or other forest products; the construction of roads or other access ways for the purpose of removing forest products from the Property; and the sale of products produced on the Property (such as firewood and maple syrup), all as not detrimental to the Purposes of this Easement.

B. Ecological Integrity: For the purposes of this Easement, "Ecological Integrity" describes a condition in which natural processes (e.g., floods, fire, drought, seed dispersal, nutrient cycling, and maintenance of microclimates) are allowed to occur within their natural variation over time without human manipulation or suppression (i.e., the timing, duration and extent of a flood is allowed to run its course). These natural processes influence the structure and composition of habitats that support native plants, animals and other organisms in groupings appropriate to the natural landscape. This dynamic and changing environment provides opportunities for biological evolution.

C. Riparian/Wetland Buffer: ~~The 100' and 200' buffers are preferred but these may be discussed according to the property and site conditions.~~ For the purposes of this Easement, "Riparian/Wetland Buffer" shall be the areas within 100 feet of intermittent streams and wetland areas, 200 feet of perennial streams, and 200 feet of Significant Wetland Areas as defined below. The Riparian/Wetland Buffer edge shall be measured from the edge of the normal high water mark of the stream or the wetland boundary. In cases where the top of an embankment is less than 50 feet from the stream or wetland edge, the riparian or wetland edge shall be measured from the top of embankment which shall be defined as a break in slope. In cases where wetlands surround a stream beyond 50 feet from the stream edge, the Riparian/Wetland Buffer shall be measured from the boundary of the upland edge of the wetland area.

D. Significant Wetland Areas: For the purposes of this Easement, "Significant Wetland Areas" are those areas that, by virtue of their unspoiled condition, unique physical or biological features, rarity, and/or exemplary nature, have [special value] in a particular locale. This value is reflected in a [high degree of functioning relative to its ecological integrity], wildlife and aquatic life habitat, flood storage,

groundwater interactions, and/or sediment and toxicant attenuation, and special social values such as education, scenic quality, and recreation. Significant wetlands are typically identified and evaluated by wetland scientists, wildlife biologists, or Natural Heritage Bureau ecologists through fieldwork and/or high resolution aerial photograph interpretation. Significant wetlands include, but are not necessarily limited to:

1. Wetland communities or systems that are classified as exemplary due to their high quality as determined by their size, condition, and the condition of the surrounding landscape. See Sperduto, D.D. and William F. Nichols. 2011. Natural Communities of New Hampshire. 2nd Ed. NH Natural Heritage Bureau, Concord, NH. Pub. UNH Cooperative Extension, Durham, N.H. for further explanation of the characteristics of an exemplary wetland.
2. Wetland communities or systems that are classified as exemplary (S1 and S2) due to their rarity in the State of New Hampshire by the NH Natural Heritage Bureau. Rare wetland types need not be of high quality to qualify as exemplary, but they must be considered viable in light of their size, condition, and landscape context. See Sperduto, D.D. and William F. Nichols. 2011. Natural Communities of New Hampshire. 2nd Ed. NH Natural Heritage Bureau, Concord, NH. Pub. UNH Cooperative Extension, Durham, NH. for further explanation of S rankings.
3. New Hampshire Wildlife Action Plan [include current reference] Tier 1 and Tier 2 wetlands.
4. Wetlands providing habitat for endangered, threatened and special concern plants and wildlife as identified by the State and US Fish and Wildlife Service.

Examples of significant wetland types in New Hampshire include, but are not limited to cedar swamps, black gum swamps, vernal pools, exemplary natural communities tracked in the Natural Heritage Bureau ("NHB") database, any wetland community type ranked by the NHB as critically imperiled/or imperiled, bogs, fens (peat lands), and floodplain forests.

E. Wildlife Habitat Management: For the purposes of this Easement, "Wildlife Habitat Management" shall include, but not be limited to, alteration of vegetation and soil and the placement of structures to provide habitat for a wide range of wildlife species; the construction or modification of roads or other access ways for the purpose of performing such activities; the use of farm or forest equipment; the sale of agricultural or forest products produced in association with such management; all as not to be detrimental to the Purposes of this Easement and guided by a stewardship plan.

3. USE LIMITATIONS

Subject to the exceptions specified in Section 4 and reserved rights specified in Section 5 below:

A. No use shall be made of the Property, and no activity shall be permitted thereon, which is inconsistent with the purposes of this Easement, as stated in Section 1.

B. The Property shall not be subdivided and none of the individual tracts that together comprise the Property shall be conveyed separately from one another.

C. Except as described in Section 4, no structure or improvement, including, but not limited to, a dwelling, any portion of a septic system, tennis court, swimming pool, dock, aircraft landing strip, tower, commercial facility, conduit or utility line, billboard or other means of advertising display, driveway or

road, mobile home or other temporary or permanent structure or improvement, shall be constructed, placed, or introduced onto the Property.

D. No advertising signs shall be displayed on the property.

E. Except as described in Section 4, there shall be no mining, quarrying, excavation, or removal of rocks, minerals, gravel, sand, topsoil, or other similar materials on the Property. No rocks, minerals, gravel, sand, topsoil, or other similar materials shall be removed from the Property.

F. There shall be no dumping, injection, burning, or burial of refuse, trash, rubbish, debris, junk, waste, man-made materials or materials then known to be environmentally hazardous, including vehicle bodies or parts, or other similar substances.

G. There shall not be conducted on the Property any industrial or commercial activities.

4. EXCEPTIONS to Section 3, Use Limitations.

A. New ancillary structures and improvements such as a road, fence or bridge, may be constructed, placed, or introduced onto the Property only as necessary for the accomplishment of conservation, wildlife habitat management, or noncommercial pedestrian outdoor recreational uses of the Property and provided that they are not detrimental to the purposes of this Easement. Such structures and improvements may be allowed only if the impacts to wetland soils, intermittent or perennial streams, vernal pools, or other hydrology is temporary, and subject to Section 10, Discretionary Consent.

B. Existing ancillary structures or improvements shall be maintained in a manner which is the least detrimental to the conservation purposes of this Easement and may remain in their current state on the Easement as depicted on the Use Limitations Map to be included in the Baseline Documentation Report on file with the Grantor, Grantee and Third Party Holder(s).

C. Certain activities such as the removal, filling, or other disturbances of soil surface, or any changes in topography, or natural habitat shall be allowed if the following applies to the activity:

i. Is commonly necessary in the accomplishment of the conservation, habitat management, or noncommercial pedestrian outdoor recreational uses of the Property specifically reserved by Grantor and as allowed under Section 5, Reserved Rights, of this Easement; and

ii. Does not harm state or federally recognized threatened, endangered, or species of conservation concern, such determination of harm to be based upon information from the New Hampshire Natural Heritage Bureau and the New Hampshire Fish & Game Department, Non game and Endangered Species Program or the agency then recognized by the State of New Hampshire as having responsibility for identification and/or conservation of such species; and

iii. The activity only temporarily impacts wetland soils, intermittent or perennial streams, vernal pools, or other hydrology unless allowed under this section of this Easement.

D. Outdoor signs shall be displayed on the Property, but not in a water, wetland, or Riparian/Wetland Buffer unless they are to identify plants or provide other information related to the ecosystem, if desirable

or necessary in the accomplishment of conservation or noncommercial pedestrian outdoor recreational uses of the Property, and provided such signs are not detrimental to the purposes of this Easement.

Prior to commencement of any such activities, all necessary federal, state, and local permits and approvals shall be secured and such notices as may be required under Section 6 of this Easement shall be delivered to the Grantee and Third Party Holder(s).

5. RESERVED RIGHTS

A. The Grantee reserves the right to control or remove non-native or invasive species - Only with written permission from the Grantor.

B. The Grantor reserves the right to conduct Forest Management Activities on the Property under the supervision of a licensed forester in emergency situations such as combating active fires or threats from active fires or other immediate safety reasons without a Stewardship Plan.

C. Subject to written approval from the Grantee and in accordance with a written plan approved by DES, the Grantor reserves the right to construct, re-construct, and maintain structures or make other improvements intended to restore wetland functions and values and/or to make wildlife habitat improvements so as to provide enhancement of functions within degraded wetland or riparian systems on the Property, provided that such construction and required maintenance are not detrimental to the Purposes of this Easement. Prior to commencement of any such activities, all necessary federal, state, local, and other governmental permits and approvals shall be secured and such notices as may be required under Section 6 of this Easement shall be delivered to the Grantee and Third Party Holder(s).

D. The Grantor must notify the Grantee in writing at least thirty (30) days before any exercise of the aforesaid reserved rights.

6. NOTIFICATION OF TRANSFER, MAINTENANCE OR OTHER ACTIVITIES

A. The Grantor agrees to notify the Grantee and DES in writing 10 days before the transfer of title to the Property [or any division of ownership thereof permitted hereby].

B. This deed creates a perpetual conservation easement that can be modified only in accordance with the provisions of this instrument, including Section 14, Extinguishment & Condemnation. The Grantor and the Grantee shall together notify the DES and the New England District of the U.S. Army Corps of Engineers sixty (60) days prior to taking any action under these sections.

C. The Grantee shall be under no obligation to maintain the Property or pay any taxes or assessments thereon.

D. Except as otherwise specifically stated in this Easement, Grantor shall notify Grantee and Third Party Holder in writing 30 days before exercising any right reserved herein. The notice shall describe the nature, scope, design, location, timetable and any other material aspect of the proposed activity in sufficient detail to permit Grantee to evaluate the proposed activity with the purposes of this Easement.

7. BENEFITS, BURDENS, AND ACCESS

A. The burden of the Easement conveyed hereby shall run with the Property and shall be enforceable against all future owners and tenants in perpetuity; the benefits of this Easement shall not be appurtenant to any particular parcel of land but shall be in gross and assignable or transferable only to the State of New Hampshire, the U.S. Government, or any subdivision of either of them, consistent with Section 170(c)(1) of the U.S. Internal Revenue Code of 1986, as amended, or to any qualified organization within the meaning of Section 170(h)(3) of said Code, which organization has among its purposes the conservation and preservation of land and water areas and agrees to and is capable of enforcing the conservation purposes of this Easement. Any such assignee or transferee shall have like power of assignment or transfer.

B. The Grantee and Third Party Holder shall have access to the Property and all of its parts for such inspection as necessary to determine compliance with and to enforce this Easement and exercise the rights conveyed hereby and fulfill the responsibilities and carry out the duties assumed by the acceptance of this Easement. Third Party Holder meaning NHDES, and walking access on easement will be allowed following REASONABLE notice – may want to allow access to adjacent backland for same purpose (monitoring).

C. Members of the general public [~~shall~~shall not] have access to the Property for outdoor recreation and education activities.

D. The Grantor is allowed to maintain existing walking trails for personal use, including mowing, boardwalk repair, and minor brush clearing as necessary. No new trails will be constructed without permission from the Grantee.

E. AGRICULTURE LIMITATIONS

For the purposes of this Easement, agriculture for ~~industrial or~~ commercial purposes shall be performed, to the extent reasonably practicable, in accordance with a coordinated management plan for the site and the soils of the Property but not in a water, wetland, or Riparian/Wetland Buffer. Said agriculture shall not be detrimental to the Purposes of this Easement. Said agricultural management activities shall be in accordance with the then-current scientifically-based practices recommended by the University of New Hampshire's Cooperative Extension Service, by the U.S. Department of Agriculture's Natural Resources Conservation Service, by the New Hampshire Department of Agriculture, Markets, and Food, including but not limited to recommended practices in said NH Department's "Manual of Best Management Practices (BMP's) for Agriculture in New Hampshire" as may be revised, updated, or superseded from time to time, or by other successor governmental natural resource conservation and management agencies then active.

Agriculture as defined in Section 2 A shall be limited to the area designated as the Agricultural Use Area defined on the Use Limitations Map (Figure 1) included in the Baseline Documentation Report and on file with the Grantor, Grantee and Third Party Holder(s). Agricultural use in the designated area shall be limited to the following:

i. Agricultural Use Area 1: Allowed uses include: Annual mowing after July 30 to protect breeding field species.

ii. The Grantor shall not apply for nor receive any depredation permits associated with agricultural use within the Agricultural Use Area as defined above.

8. LEGAL REMEDIES OF GRANTEE

A. When a breach of this Easement, or conduct by anyone inconsistent with this Easement, comes to the attention of the Grantee, it shall notify the Grantor in writing of such breach or conduct, delivered in hand or by certified mail, return receipt requested.

B. The Grantor shall, within thirty (30) days after receipt of such notice or after otherwise learning of such breach or conduct, undertake those actions, including restoration, which are reasonably calculated to cure swiftly said breach, or to terminate said conduct, and to repair any damage. The Grantor shall promptly notify the Grantee of its actions taken under this section.

C. If the Grantor fails to take such proper action under the preceding paragraph, the Grantee shall, as appropriate to the purposes of this Easement, undertake any actions that are reasonably necessary to cure such breach or to repair any damage in the Grantor's name or to terminate such conduct. The cost thereof, including, but not limited to, the Grantee's reasonable expenses, expert fees, court costs, and legal fees, shall be paid by the Grantor, provided that the Grantor is directly or primarily responsible for the breach.

D. Nothing contained in this Easement shall be construed to entitle the Grantee to bring any action against the Grantor for any injury to or change in the Property resulting from causes beyond the Grantor's control, including, but not limited to, unauthorized actions by third parties, natural disasters such as fire, flood, storm, and earth movement, or from any prudent action taken by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to the Property resulting from such causes.

E. The Grantee and the Grantor reserve the right, separately or collectively, to pursue all legal remedies against any third party responsible for any actions detrimental to the conservation purposes of this Easement.

F. No delay or omission by Grantee in the exercise of any right or remedy upon any breach by Grantor shall impair Grantee's rights or remedies or be construed as a waiver.

G. Grantee shall have the right to enforce this Easement by appropriate legal means and to obtain injunctive and other equitable relief against any violations, including without limitation, relief requiring restoration of the Property to its condition prior to the time of the violation, and shall be in addition to, and not limitation of, any other rights and remedies available to the Grantee.

H. Grantee, by its acceptance of this Easement, does not undertake any liability or obligation relating to the condition of the Property.

I. The State of the New Hampshire shall have the ability to enforce the terms of this Easement including through any civil, injunctive, or equitable action or through other relief against Grantee and/or Grantor as may be necessary in the event Grantee and/or Grantor has not, in the State's opinion, taken steps necessary under this section to adequately preserve and protect the conservation purposes of this Easement. Both the Grantor and Grantee hereby waive any defense with respect to standing or

jurisdiction. All reasonable costs of such enforcement shall be paid by the party against whom relief is obtained. The interests held by the Third Party Holder are assignable or transferable to any party qualified to become the Grantee's assignee or transferee as specified in Section 7. above. Any such assignee or transferee shall have like power of assignment or transfer.

9. DISCRETIONARY CONSENT

Grantee's consent for an activity otherwise prohibited under Section 3, Use Limitations, may be given only: if, owing to unforeseen or changed circumstances, such an activity is deemed desirable by Grantor, Grantee and Third Party Holder; and at the Grantee's sole discretion if the activity: (1) is non-commercial and not for economic benefit; (2) does not impair the conservation values of the Property; and (3) is consistent with the Purposes of this Easement as defined in Article 1 above and does not place at risk any rare flora or fauna, exemplary natural communities, critical wildlife habitat, and unique ecological features. Such requests for permission shall be in writing and shall describe the proposed activity in sufficient detail to allow the Grantee to make the judgments listed above. Notwithstanding the foregoing, neither the Grantee nor Grantor have the right or power to agree to any activity that runs counter to the Purposes of this Easement or that would result in the Easement's termination, nor to allow commercial recreational or educational activities that could be deemed more than *de minimus*, nor to allow any residential, commercial, or industrial structures or activities other than those specifically permitted under the terms of this Easement.

10. NOTICES

All notices, requests and other communications, required or permitted to be given under this Easement shall be in writing, except as otherwise provided herein, and shall be delivered in hand or sent by certified mail, postage prepaid, return receipt requested to the appropriate address set forth above or at such other address as the parties may hereafter designate by notice given in accordance herewith. Notice shall be deemed to have been given when so delivered or so mailed.

11. SEVERABILITY

If any provision of this Easement, or the application thereof to any person or circumstance, is found to be invalid by a court of competent jurisdiction, by confirmation of an arbitration award or otherwise, the remainder of the provisions of this Easement or the application of such provision to persons or circumstances other than those to which it is found to be invalid, as the case may be, shall not be affected thereby.

12. EXTINGUISHMENT & CONDEMNATION

A. Extinguishment. The Grantor acknowledges that, at the time of the conveyance of this Easement to the Grantee, this Easement gives rise to a real property right, immediately vested in the Grantee. If a change in conditions takes place which makes it impossible or impractical for the continued protection of the Property for conservation purposes and the restrictions contained herein are extinguished by judicial proceeding, the parties agree upon a subsequent sale or exchange of the Property, the Grantee shall be entitled to a portion of the net proceeds. For this purpose, the Grantee's interest shall be the amount by which the fair market value of the Property immediately prior to the

execution of this Easement is reduced by the use limitations imposed hereby. The values of the interest of the Grantor and Grantee's interests shall be determined by an appraisal prepared by a qualified appraiser at the time of extinguishment. The Grantee shall use its share, if any, of the proceeds in a manner consistent with the conservation Purposes of this Easement.

B. Condemnation. Whenever all or part of the Property is taken in in exercise of eminent domain by public, corporate, or other authority so as to abrogate the restrictions imposed by this Easement, the Grantor and the Grantee shall join in appropriate actions at the time of such taking to recover the full value of the taking and all incidental or direct damages resulting from the taking. In such event, the proceeds shall be divided between the Grantor and the Grantee in the same manner as described in the preceding paragraph, Extinguishment. The values of the interest of the Grantor's and Grantee's shall be determined by an appraisal prepared by a qualified appraiser at the time of condemnation. The Grantee shall use its share, if any, of the proceeds in a manner consistent with the conservation Purposes of this Easement.

13. ADDITIONAL EASEMENT

Should the Grantor determine that the expressed purposes of this Easement could better be effectuated by the conveyance of an additional easement, the Grantor may execute an additional instrument to that effect, provided that the conservation purposes of this Easement are not diminished thereby and that a public agency or qualified organization, described in Section 7.A. above, accepts and records the additional easement. Any additional easements shall contain a provision that they are subject to this easement.

14. SEPARATE PARCEL

The Grantor agrees that for the purpose of determining compliance with any present or future bylaw, order, ordinance, or regulation (within this section referred to as "legal requirements") of the Town/City of [town or city name], the State of New Hampshire or any other governmental unit, the Property shall be deemed a separate parcel of land and shall not be taken into account in determining whether any land of the Grantor, other than the Property, complies with any said legal requirements. The Property shall not be taken into account to satisfy in whole or in part any of said legal requirements or any area, density, setback or other dimensional standard applicable to such land.

15. MERGER

The Grantor and Grantee explicitly agree that it is their express intent, forming a part of the consideration hereunder, that the provisions of the Easement set forth herein are to last in perpetuity, and that to that end no purchase or transfer of the underlying fee interest in the Property by or to the Grantee or any successor or assign shall be deemed to eliminate the Easement, or any portion thereof, granted hereunder under the doctrine of merger or any other legal doctrine.

16. THIRD PARTY RIGHT OF ENFORCEMENT

A. If the Easement Holder ceases to enforce the Easement conveyed hereby or fails to enforce it within thirty (30) days after receipt of written notice from the Third Party

Holder requesting such, then the notifying Third Party Holder shall have all the rights heretofore granted to the Easement Holder to enforce this Easement. All reasonable costs of such enforcement shall be paid by the Easement Holder.

B. The interests held by the Third Party Holder are assignable or transferable to any party qualified to become the Easement Holder's or Third Party Holder's assignee or transferee as specified in Section 7 above. Any such assignee or transferee shall have like power of assignment or transfer. Any holder of an interest in this Easement desiring to transfer or assign its interest shall send written notice describing said intention to all other holders of any interest in this Easement at least thirty (30) days prior to such transfer or assignment taking effect.

The Grantee, by accepting and recording this Easement, agrees to be bound by and to observe and enforce the provisions hereof and assumes the rights and responsibilities herein granted to and incumbent upon the Grantee, all in the furtherance of the conservation purposes for which this Easement is delivered.

This is a conveyance to the state, a state agency, a county, a city, a town and/or village district pursuant to NH RSA 78-B:2 and is exempt from the New Hampshire Real Estate Transfer Tax.

IN WITNESS WHEREOF, I (We) have hereunto set my (our) hand(s) this _____ day of , 20__.

Name of Grantor

Name of Grantor

The State of New Hampshire
County of

Personally appeared _____ and

_____ this _____ day of _____, 20__ and

acknowledged the foregoing to be his/her/their voluntary act and deed.

Before me,

Justice of the Peace/Notary Public

My commission expires:

ACCEPTED: [Name of Grantee]

By:

Title:
Duly Authorized

Date:

The State of New Hampshire
County of

Personally appeared
Title
of the [Name of Grantee] , this _____ day of _____, [month and year] and acknowledged the foregoing on behalf of the [Name of Grantee]

.

Before me,
Justice of the Peace/Notary Public

My commission expires:

ARM Easement Template DRAFT Ripley Conservation Easement Newington

ACCEPTED: [Name of Third Party Enforcement Holder]

By:

Title:
Duly Authorized

Date:

The State of New Hampshire
County of

Personally appeared
Title
of the [Name of Grantee] , this _____ day of _____, [month and year] and acknowledged the foregoing on behalf of the [Name of Grantee]

.

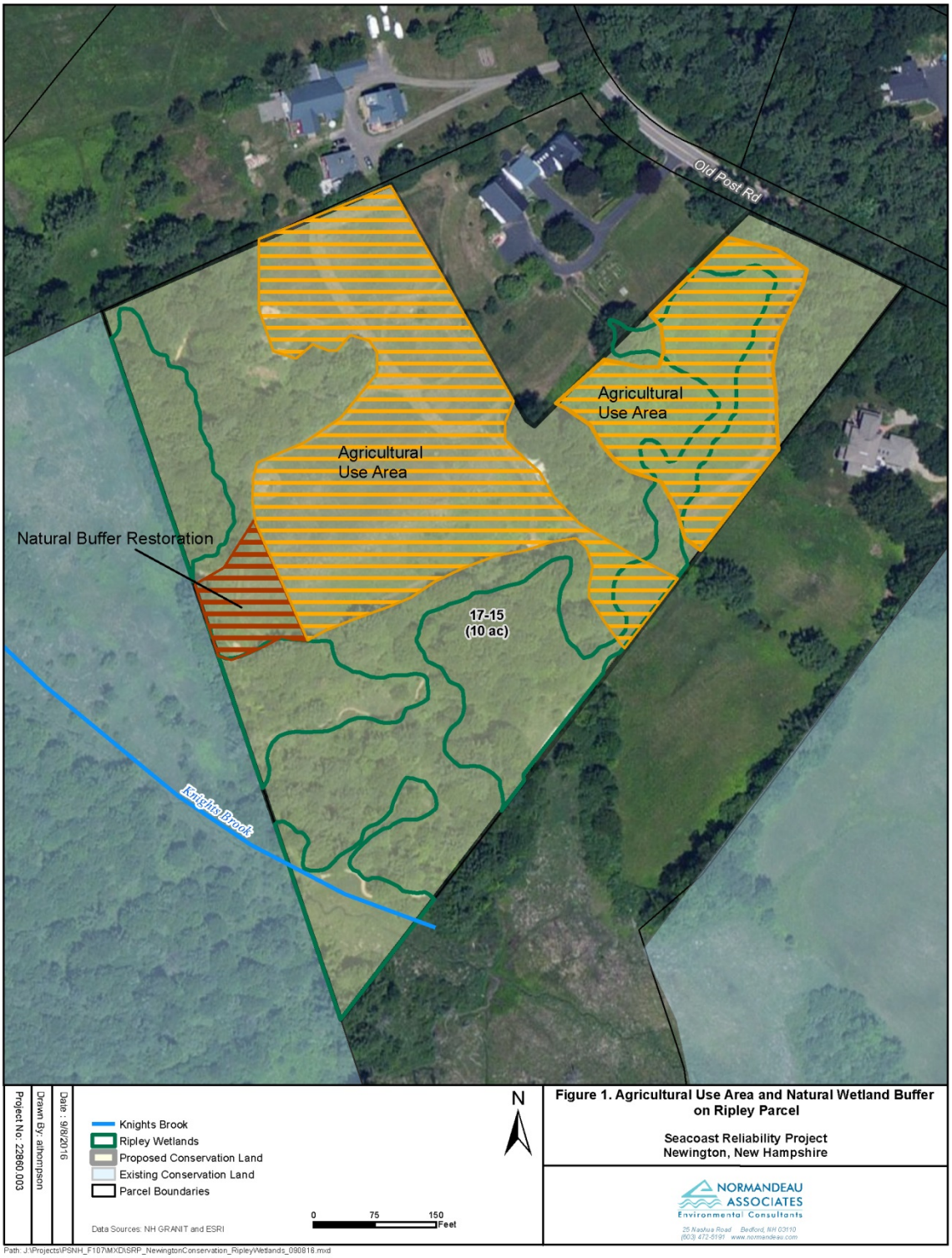
Before me,
Justice of the Peace/Notary Public

My commission expires:

Optional Items ARM Fund Easement Deed

If appropriate, insert at the language at the end of Section 1 prior to the sentence referring to the Internal Revenue Code.

These purposes are consistent with the clearly delineated open space conservation goals and/or objectives as stated in the [date] Master Plan of the Town/City of [town/city name], which states "_____" and with New Hampshire RSA 79-A which states: "It is hereby declared to be in the public interest to encourage the preservation of open space, thus providing a healthful and attractive outdoor environment for work and recreation of the state's citizens, maintaining the character of the state's landscape, and conserving the land, water, forest, agricultural and wildlife resources.".


Old Post Rd
Agricultural Use Area
Agricultural Use Area
Natural Buffer Restoration
17-15 (10 ac)
Knights Brook
Project No: 22860.003
Drawn By: athompson
Date: 9/8/2016
Knights Brook
Ripley Wetlands
Proposed Conservation Land
Existing Conservation Land
Parcel Boundaries
Data Sources: NH GRANIT and ESRI
0 75 150
Feet
N
Figure 1. Agricultural Use Area and Natural Wetland Buffer on Ripley Parcel
Seacoast Reliability Project
Newington, New Hampshire
NORMANDEAU ASSOCIATES
Environmental Consultants
25 Nashua Road Bedford, NH 03110
(603) 472-5191 www.normandeau.com
Path: J:\Projects\PSNH_F107\MXD\SRP_NewingtonConservation_RipleyWetlands_090816.mxd

WEST ENVIRONMENTAL INC.
48 Stevens Hill Road, Nottingham, NH 03290
603-734-4298 ♦ mark@westenv.net

Lori Sommer
NHDES Wetlands Bureau
PO Box 95
Concord, NH 03302

September 15, 2016

RE: Ripley Wetland Evaluation

Dear Lori,
At your request, West Environmental, Inc. (WEI) completed Functional Assessment data forms(attached) which coincide with the wetland identified on our preliminary wetland map. The attached map was prepared by WEI and is based on aerial photo interpretation and a field inspection on March 1, 2016. This map is a 2010 aerial ortho photo map prepared with Neatline Associates. There are six wetlands including a wet meadow (6), two forested wetlands (4 & 5), two scrub shrub wetlands (2 & 3) all draining into Wetland 1 the 21 acre Knights Brook Prime Wetland.

The Knights Brook wetland complex is one of the largest wetland systems in Newington. This wetland has seven principle functions and includes shallow marsh, scrub shrub and forested wetland habitat.

Wetlands 2 and 3 are both springs in small emergent areas that feed thick scrub-shrub wetlands. These wetland provide groundwater discharge, production export and wildlife habitat.

Wetlands 4 and 5 are forested wetlands that border the Knights Brook wetland complex. These wetlands provide sediment toxicant pathogen retention and wildlife habitat.

Wetland 6 is a wet meadow with an unmaintained ditch/swale system. this wetland provides floodflow alteration, sediment toxicant pathogen retention, sediment shoreland stabilization and wildlife habitat.

The diversity of these wetlands and their connection to Knights Brook make them important to protect.

This completes our report at this time. If you have any further questions, please call our office at (603) 734-4298. Thank you.

Sincerely,
West Environmental, Inc.

Mark C. West, President
NH Certified Wetland Scientist

cc: Sarah Allen and Jane Hislop


Map 17 Lot 15
Newington, NH
N
WEST ENVIRONMENTAL
NEATLINE ASSOCIATES
www.nhgis.com
Data Sources: Background image is a 2010 1-foot resolution aerial photograph acquired by NHDOT and distributed by NH GRANIT. Road names from NH DOT. Town boundaries from NH GRANIT. All other features from West Environmental. All features and locations are approximate.
0
200
Feet
17-15
1
2
3
4
5
6

Ripley Wetland 1

West Environmental, Inc.
Town of Newington Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 30 Size: 21± Date: 10/8/02 WEI Project # 01-064NH
Classification: PFO1/SS1/EM1Eb
Film Roll #: MW1 Photograph #: 1 – 12 Aerial Photograph #: 4.-5.

Wetland Functions

beaver dams have created very poorly drained marshes on previous silt loam.

Groundwater Recharge/Discharge

Geology: Scitico
Restrictive layer present: y (n)
Subsoil type: clay
Other geologic features:
Function Present: (y) n

Hydrology
Groundwater relationship present: (y) n
Variable water levels observed: (y) n
Springs or seeps observed: (y) n
Contains only inlet or outlet: y n

Principal Function
Discharge.
(Yes) No

Floodflow Alteration

Watershed Information
Land cover in catchment area? Ag fields Forest.
Watershed position: H (M) L
Other catchment storage: y (n)
Watercourse associated: (y) n
Contains hydric soils: (y) n
Function Present: (y) n

Topographic Information
Topography of watershed: moderate to gentle slopes
Topography of wetland: flat to gentle slop.
Constricted outlet: (y) n beaver dams
High degree of impervious surfaces in wetland watershed: y (n)
Land uses downstream protected by this wetland: (y) n (Yes) No

Sediment/Toxicant/Pathogen Retention

Soils
Organic Soils: (y) n
Broad boundary transition: (y) n
Vegetation
Herbaceous vegetation: (y) n
Dense vegetation: (y) n
Function Present: (y) n

Setting & Hydrology
Upstream sources of pollution: (y) n Ag fields
Erosion/sedimentation observed: y (n)
Difuse flow/slow moving water: (y) n
Does wetland flood: (y) n
Long water retention: (y) n (Yes) No

Nutrient Removal/Retention Transformation

Hydrology
Open water present: (y) n in places
Slow moving water: (y) n
Nutrients upslope: (y) n
Function Present: (y) n

Transformers
Organic soils: (y) n
Aquatic vegetation: (y) n
Abundant vegetation: (y) n
(Yes) No

Production Export

Vegetation
Density: (H) M L
Interspersion: (H) M L
Diversity: (H) M L
Food source: (y) n
Function Present: (y) n

Export
Detritus: (y) n
Aquatic plants: (y) n
Berry producing shrubs: (y) n
Nectar sources: (y) n
Seed/mast sources: (y) n (Yes) No

slumbs
N. arrowood.
swamp rose
meadowsweet

old Beaver Impoundment
PFO5/EM1/SS1Eb
Bluejoint
Reed canary grass
purple loosestrife
sedges.

Em. grasses sedges rushes

Wet meadow w/ pockets of shallow marsh
used as pasture
Dom veg. T RM S
Speckled alder
winterberry
bayberry

Wetland 30

Sediment/Shoreline Stabilization
Is wetland associated with surface water? (if no, stop), Perennial or intermittent yes

Characteristics of Stream
Elevation change present (y) n
High seasonal flows (y) n
Channelized flow (y) n
Open water fetch (y) n

Function Present (y) n

Description of Bank
Bank present (y) n
Bank vegetated (y) n
Bank eroded y (n)
Steep bank (y) n
Stabilized Bank (y) n

(Yes) No

Wildlife Habitat
Diversity
Aquatic insect habitat (y) n
Amphibian habitat (y) n
Fisheries habitat y n ?
Cavity trees (y) n
Vernal pool y (n)
Defined stream channel (y) n
Food sources (y) n
Cover/nesting sources (y) n
Function Present (y) n

Connections
Corridor
Wetland connections (y) n
Upland connections (y) n
Islands (y) n

(Yes) No

Buffer
Type Ag/Forested
Width 200+
Buffer stream or wetland (y) n
Does buffer provide shade (y) n in places

Degradation
Present (y) n minor.
Type some reed canary grass areas.

Yes ~~No~~

Wetland Values

Recreational Value
Parking available (y) n
Watercraft access y (n)
Fishing available y n ?
Hunting permitted (y) n
Walking/biking trails y n ?
Value H (M) L

Restoration Stabilization Potential
y n
Restoration area size:

Educational/Scientific Value
Unique habitats/plant species (y) n
Diverse wildlife habitat (y) n
Parking/access (y) n
Value (H) M L

Comments/Wildlife Notes
probable New England Cottontail habitat.
extensive scrub shrub lots of migratory warblers
woodcock thicket
Wild Turkey

Uniqueness/Heritage
Urban upland/proximity y (n)
Rapid development upland y (n)
Critical habitat/threatened or endangered species (y) n NE cottontail
Archaeological sites y n ?
Stonewalls present (y) n
Historic sites (y) n – historic Ram.
Ecological health/vigor (y) n
Value (H) M L

Wetland Evaluation Data Form

WETLAND ID: 2+3	Ripley Newington	Page 1

GROUNDWATER RECHARGE/DISCHARGE

Geology		Hydrology		Function Present	Principal Function
Restrictive Layer?	☑Yes ☐No	Groundwater Relationship?	☑Yes ☐No	☑Yes ☐No	☑Yes ☐No
Subsoil Type Present	clay&silt.	Variable Water Levels?	☑Yes ☐No		
Other Geologic Features:	-	Springs/Seeps Observed?	☑Yes ☐No	springs in both wetlands	
		Contains Only Inlet/Outlet?	☑Yes ☐No outlet only	Discharge.	

FLOODFLOW ALTERATION

Watershed Information		Topographic Information		Function Present	Principal Function
Size: 1 acre each.		Topography of Watershed:	gentle slopes.	☐Yes ☑No	☐Yes ☑No
Adjacent Land Cover		Topography of Wetland:	→ sloping		
shrub/Forest 70%		Constricted Outlet?	☐Yes ☑No		
Residential		High Degree of Impervious			
Comm/Industr.		Surfaces in Wet.Watershed?	☐Yes ☑No		
~~Agricultural~~ fields 30%		Downstream Protection?	☑Yes ☐No		
Assoc. w/ Water Course?	☑Yes ☐No	seep not channel.			
Other Catch. Storage?	☐Yes ☑No				
Contains Hydric A Soils?	☐Yes ☑No				
Watershed Position	☑H ☐M ☐L				

SEDIMENT/TOXICANT/PATHOGEN RETENTION

Soils		Setting & Hydrology		Function Present	Principal Function
Organic Soils?	☐Yes ☑No	Upstream Sources of Poll.?	☐Yes ☑No	☑Yes ☐No	☐Yes ☑No
Broad Boundary Trans.?	☑Yes ☐No	Erosion/Sed. Observed?	☐Yes ☑No		
Vegetation		Diffuse Flows/Slow Water?	☐Yes ☑No		
Dense Vegetation?	☑Yes ☐No	Does Wetland Flood?	☐Yes ☑No		
Herbaceous Vegetation?	☑Yes ☐No	Long Water Retention?	☐Yes ☑No		

NUTRIENT REMOVAL/RETENTION TRANSFORMATION

Hydrology		Transformers		Function Present	Principal Function
Open Water Present?	☐Yes ☑No	Organic Soils?	☐Yes ☑No	☐Yes ☑No	☐Yes ☑No
Slow Moving Water?	☐Yes ☑No	Aquatic Vegetation?	☐Yes ☑No		
Nutrients Upslope?	☑Yes ☐No	Abundant Vegetation?	☑Yes ☐No		

PRODUCTION EXPORT

Vegetation		Export		Function Present	Principal Function
Food Source?	☑Yes ☐No	Vernal Pool?	☐Yes ☑No	☑Yes ☐No	☑Yes ☐No
Density:	☐H ☑M ☐L	Aquatic Plants?	☐Yes ☑No		
Interspersion:	☐H ☑M ☐L	Berry Producing Shrubs?	☑Yes ☐No		
Diversity:	☐H ☑M ☐L	Nectar Sources?	☑Yes ☐No		
		Seed/Mast Sources?	☑Yes ☐No		

SEDIMENT/ SHORELINE STABILIZATION

Assoc. w/ surface water? ☐Yes ☑No		Description of Stream Setting		Function Present	Principal Function
Perennial or Intermittent				☐Yes ☑No	☐Yes ☑No
If No, STOP, if yes, stream characteristics:		Stream Course in Wetland?	☐Yes ☐No		
Elev. Change Present?	☐Yes ☐No	Stream Course in Upland?	☐Yes ☐No		
High Flows Present?	☐Yes ☐No	Bank Vegetated?	☐Yes ☐No		
Channelized Flow?	☐Yes ☐No	Bank Eroded?	☐Yes ☐No		
Open Water Fetch?	☐Yes ☐No	Steep Bank?	☐Yes ☐No		
		Stabilized Bank?	☐Yes ☐No		

WEST ENVIRONMENTAL INC.

Wetland Evaluation Data Form

WETLAND ID: 2+3	Ripley Newington	Page 2

WILDLIFE HABITAT

Existing Critical Habitat ☐Yes ☑No **Type:** **Function Present** ☑Yes ☐No **Principal Function** ☑Yes ☐No

Critical Habitat Features ☐Yes ☑No **Specific Habitat Features:**

Diversity

Aquatic Insect Habitat?	☑Yes	☐No
Amphibian Habitat?	☑Yes	☐No
Fisheries Habitat?	☐Yes	☑No
Cavity Trees?	☑Yes	☐No
Food Sources?	☑Yes	☐No
Cover?	☑Yes	☐No

Connectivity

Corridor (through or adj.)?	☑Yes	☐No
Wetland Connectivity?	☑Yes	☐No
Upland Connectivity?	☑Yes	☐No

Strengths of Upland Habitat: adjacent to several conservation parcels.

Vegetated Buffer
Type: shrub/Forest/Fields
Width: 100+

Habitat Degradation
% of Buffer w/Encroachment: 0%
Activities Adversely Affecting Wildlife Function:

Buffer Provides Shade to Stream?	☐Yes	☑No
Significant Disturbance?	☐Yes	☑No
Structures Obstructing Wildlife Movement?	☐Yes	☑No
Buffer Safeguards Wetland?	☑Yes	☐No
Prox. to Beaver/Mink/Otter?	☑Yes	☐No beaver.

Restoration Stabilization Potential ☐Yes ☑No

Describe:

H20 Quality Degradation ☐Yes ☑No

Invasive Species Present ☑Yes ☐No
Type: glossy buckthorn. purple loosestrife.

Comments:

WEST ENVIRONMENTAL

Wetland Evaluation Data Form

WETLAND ID: 4 + 5. | Ripley Newington | Page 1

GROUNDWATER RECHARGE/DISCHARGE

Geology		Hydrology		Function Present	Principal Function
Restrictive Layer?	☑Yes ☐No	Groundwater Relationship?	☑Yes ☐No	☑Yes ☐No	☐Yes ☑No
Subsoil Type Present	silt/clay	Variable Water Levels?	☑Yes ☐No		
Other Geologic Features:		Springs/Seeps Observed?	☑Yes ☐No	minor seeps. discharge.	
		Contains Only Inlet/Outlet?	☑Yes ☐No	outlet.	

FLOODFLOW ALTERATION

Watershed Information		Topographic Information		Function Present	Principal Function
Size: 2 acres.		Topography of Watershed:	gentle slopes	☑Yes ☐No	☐Yes ☑No
Adjacent Land Cover		Topography of Wetland:	very gentle slope		
Forest/Fields 100%		Constricted Outlet?	☐Yes ☑No		
Residential		High Degree of Impervious			
Comm/Industr.		Surfaces in Wet. Watershed?	☐Yes ☑No		
Agricultural		Downstream Protection?	☐Yes ☑No		
Assoc. w/ Water Course?	☐Yes ☑No				
Other Catch. Storage?	☐Yes ☑No				
Contains Hydric A Soils?	☐Yes ☑No				
Watershed Position	☑H ☐M ☐L				

SEDIMENT/TOXICANT/PATHOGEN RETENTION

Soils		Setting & Hydrology		Function Present	Principal Function
Organic Soils?	☐Yes ☑No	Upstream Sources of Poll.?	☑Yes ☐No possible fertilizer	☑Yes ☐No	☑Yes ☐No
Broad Boundary Trans.?	☑Yes ☐No	Erosion/Sed. Observed?	☐Yes ☑No		
Vegetation		Diffuse Flows/Slow Water?	☑Yes ☐No		
Dense Vegetation?	☑Yes ☐No	Does Wetland Flood?	☑Yes ☐No very shallow.		
Herbaceous Vegetation?	☑Yes ☐No	Long Water Retention?	☑Yes ☐No		

NUTRIENT REMOVAL/RETENTION TRANSFORMATION

Hydrology		Transformers		Function Present	Principal Function
Open Water Present?	☐Yes ☑No	Organic Soils?	☐Yes ☑No	☑Yes ☐No	☐Yes ☑No
Slow Moving Water?	☐Yes ☑No	Aquatic Vegetation?	☐Yes ☑No		
Nutrients Upslope?	☑Yes ☐No	Abundant Vegetation?	☑Yes ☐No		

PRODUCTION EXPORT

Vegetation		Export		Function Present	Principal Function
Food Source?	☑Yes ☐No	Vernal Pool?	☐Yes ☑No	☑Yes ☐No	☐Yes ☑No
Density:	☐H ☑M ☐L	Aquatic Plants?	☐Yes ☑No		
Interspersion:	☐H ☑M ☐L	Berry Producing Shrubs?	☑Yes ☐No		
Diversity:	☐H ☑M ☐L	Nectar Sources?	☑Yes ☐No		
		Seed/Mast Sources?	☑Yes ☐No		

SEDIMENT/ SHORELINE STABILIZATION

Assoc. w/ surface water? ☐Yes ☑No	Description of Stream Setting		Function Present	Principal Function
Perennial or Intermittent			☐Yes ☑No	☐Yes ☑No
If No, STOP, if yes, stream characteristics:	Stream Course in Wetland?	☐Yes ☐No		
Elev. Change Present? ☐Yes ☐No	Stream Course in Upland?	☐Yes ☐No		
High Flows Present? ☐Yes ☐No	Bank Vegetated?	☐Yes ☐No		
Channelized Flow? ☐Yes ☐No	Bank Eroded?	☐Yes ☐No		
Open Water Fetch? ☐Yes ☐No	Steep Bank?	☐Yes ☐No		
	Stabilized Bank?	☐Yes ☐No		

WEST ENVIRONMENTAL

Wetland Evaluation Data Form

WETLAND ID: 475	Ripley Newington	Page 2

WILDLIFE HABITAT

Existing Critical Habitat ☐Yes ☑No **Type:** **Function Present** ☑Yes ☐No **Principal Function** ☑Yes ☐No

Critical Habitat Features ☐Yes ☑No **Specific Habitat Features:**

Diversity

Aquatic Insect Habitat?	☐Yes ☑No
Amphibian Habitat?	☑Yes ☐No
Fisheries Habitat?	☐Yes ☑No
Cavity Trees?	☑Yes ☐No
Food Sources?	☑Yes ☐No
Cover?	☑Yes ☐No

Connectivity

Corridor (through or adj.)?	☑Yes ☐No
Wetland Connectivity?	☑Yes ☐No
Upland Connectivity?	☑Yes ☐No

Strengths of Upland Habitat: part of conservation block.

Vegetated Buffer
Type: Forest + Field
Width: 100+

Buffer Provides Shade to a Stream?	☐Yes ☑No
Buffer Safeguards Wetland?	☑Yes ☐No

Habitat Degradation
% of Buffer w/Encroachment: 10% fields
Activities Adversely Affecting Wildlife Function:

Significant Disturbance?	☐Yes ☑No
Structures Obstructing Wildlife Movement?	☐Yes ☑No
Prox. to Beaver/Mink/Otter?	☐Yes ☑No

Restoration Stabilization Potential ☐Yes ☑No
Describe:

H20 Quality Degradation ☐Yes ☑No

Invasive Species Present ☑Yes ☐No
Type: glossy buckthorn.

Comments:

WEST ENVIRONMENTAL

Wetland Evaluation Data Form

WETLAND ID: 6 | Ripley Newington | Page 1

GROUNDWATER RECHARGE/DISCHARGE

Geology		Hydrology		Function Present	Principal Function
Restrictive Layer?	☑Yes ☐No	Groundwater Relationship?	☑Yes ☐No	☑Yes ☐No	☐Yes ☑No
Subsoil Type Present	silt/clay	Variable Water Levels?	☑Yes ☐No		
Other Geologic Features:		Springs/Seeps Observed?	☐Yes ☑No	discharge.	
		Contains Only Inlet/Outlet?	☑Yes ☐No outlet		

FLOODFLOW ALTERATION

Watershed Information		Topographic Information		Function Present	Principal Function
Size: 4 acres		Topography of Watershed:	gentle slopes.	☑Yes ☐No	☑Yes ☐No
Adjacent Land Cover		Topography of Wetland:	depression.		
Forest	Fields/Roads	Constricted Outlet?	☑Yes ☐No	reduced by ditching	
Residential	20% 8%	High Degree of Impervious			
Comm/Industr.		Surfaces in Wet.Watershed?	☐Yes ☑No		
Agricultural		Downstream Protection?	☑Yes ☐No		
Assoc. w/ Water Course?	☑Yes ☐No	intermittent.			
Other Catch. Storage?	☐Yes ☑No				
Contains Hydric A Soils?	☐Yes ☑No				
Watershed Position	☑H ☐M ☐L				

SEDIMENT/TOXICANT/PATHOGEN RETENTION

Soils		Setting & Hydrology		Function Present	Principal Function
Organic Soils?	☐Yes ☑No	Upstream Sources of Poll.?	☑Yes ☐No	☑Yes ☐No	☑Yes ☐No
Broad Boundary Trans.?	☑Yes ☐No	Erosion/Sed. Observed?	☐Yes ☑No		
Vegetation		Diffuse Flows/Slow Water?	☑Yes ☐No		
Dense Vegetation?	☑Yes ☐No	Does Wetland Flood?	☑Yes ☐No		
Herbaceous Vegetation?	☑Yes ☐No	Long Water Retention?	☑Yes ☐No		

NUTRIENT REMOVAL/RETENTION TRANSFORMATION

Hydrology		Transformers		Function Present	Principal Function
Open Water Present?	☐Yes ☑No	Organic Soils?	☐Yes ☑No	☑Yes ☐No	☐Yes ☑No
Slow Moving Water?	☐Yes ☑No	Aquatic Vegetation?	☐Yes ☑No		
Nutrients Upslope?	☑Yes ☐No	Abundant Vegetation?	☑Yes ☐No		

PRODUCTION EXPORT

Vegetation		Export		Function Present	Principal Function
Food Source?	☐Yes ☑No	Vernal Pool?	☐Yes ☑No	☐Yes ☑No	☐Yes ☑No
Density:	☐H ☑M ☐L	Aquatic Plants?	☐Yes ☑No		
Interspersion:	☐H ☐M ☑L	Berry Producing Shrubs?	☐Yes ☑No		
Diversity:	☐H ☐M ☑L	Nectar Sources?	☐Yes ☑No		
		Seed/Mast Sources?	☑Yes ☐No		

SEDIMENT/ SHORELINE STABILIZATION

Assoc. w/ surface water? ☑Yes ☐No	Description of Stream Setting		Function Present	Principal Function
Perennial or Intermittent			☑Yes ☐No	☑Yes ☐No
If No, STOP, if yes, stream characteristics:	Stream Course in Wetland?	☑Yes ☐No		
Elev. Change Present? ☑Yes ☐No	Stream Course in Upland?	☑Yes ☐No		
High Flows Present? ☐Yes ☑No	Bank Vegetated?	☑Yes ☐No		
Channelized Flow? ☑Yes ☐No	Bank Eroded?	☐Yes ☑No		
Open Water Fetch? ☐Yes ☑No	Steep Bank?	☐Yes ☑No		
	Stabilized Bank?	☑Yes ☐No		

WEST ENVIRONMENTAL

Wetland Evaluation Data Form

WETLAND ID: 6	Ripley Newington	Page 2

WILDLIFE HABITAT

Existing Critical Habitat ☐Yes ☑No **Type:** **Function Present** ☑Yes ☐No **Principal Function** ☑Yes ☐No

Critical Habitat Features ☐Yes ☑No **Specific Habitat Features:**

Diversity

Aquatic Insect Habitat?	☑Yes ☐No
Amphibian Habitat?	☑Yes ☐No
Fisheries Habitat?	☐Yes ☑No
Cavity Trees?	☐Yes ☑No
Food Sources?	☐Yes ☑No
Cover?	☐Yes ☑No

Connectivity

Corridor (through or adj.)?	☑Yes ☐No
Wetland Connectivity?	☑Yes ☐No
Upland Connectivity?	☑Yes ☐No

Strengths of Upland Habitat: part of large conservation block.

Vegetated Buffer
Type: Fields 25-100'
Width:

Buffer Provides Shade to a Stream? ☐Yes ☑No

Buffer Safeguards Wetland? ☐Yes ☐No somewhat.

Habitat Degradation
% of Buffer w/Encroachment: 50%
Activities Adversely Affecting Wildlife Function: road.

Significant Disturbance? ☑Yes ☐No
Structures Obstructing Wildlife Movement? ☐Yes ☑No
Prox. to Beaver/Mink/Otter? ☐Yes ☑No

Restoration Stabilization Potential ☑Yes ☐No
Describe: Ditch removal?

H20 Quality Degradation ☐Yes ☑No

Invasive Species Present ☑Yes ☐No
Type: reed canary grass.

Comments:

WEST ENVIRONMENTAL