



Wilkins Elementary School
80 Boston Post Road
Amherst, New Hampshire

Wetland Delineation Report

Prepared For:

SAU #39
1 School Street
Amherst, NH 03031

June 2021

1.0 Introduction

The purpose of this report is to characterize wetlands delineated in the vicinity of a proposed new school building to be built and expanded within the current location of the Wilkins Elementary School at 80 Boston Post Road in Amherst, NH. The proposed building site is long and narrow and is located between a steep excavated bank along its northern edge and wetlands associated with Beaver Brook along its southern edge.

2.0 Methods

On April 15 and June 4, 2021, Tighe & Bond delineated and assessed wetlands in the southern 14 +/- acres of the Wilkins Elementary School parcel. The review was limited areas within 100 +/- feet of the proposed new building, which includes the area around the existing school and the lower athletic field.

The wetland delineation was based on criteria specified in the *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1* (January 1987), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (January 2012). Wetlands were classified based on *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979).

Following the delineation, functions of the wetlands were assessed so these areas could be classified according to the Town of Amherst Zoning Ordinance (Sec. 4.11, F and Sec. 9.1). Wetland scores were determined for ecological integrity, wetland-dependent wildlife, and groundwater recharge using the *Method for inventorying and Evaluating Freshwater Wetlands in New Hampshire* (University of New Hampshire Cooperative Extension ,2015). Score sheets from these evaluations are attached.

3.0 Wetlands

Three wetland areas were delineated, including a large shrub dominated wetland associated with Beaver Brook along the southern edge of the proposed project, a forested wetland associated with an intermittent stream off the eastern end of the project, and a manmade ditch wetland that had been excavated through an upland along the northern edge of the project area.

Wetland function scores reported in the descriptions below are on a scale of 1-10.

3.1 Beaver Brook Wetland

The Beaver Brook wetland runs between Boston Post Road and Mack Hill Road. This wetland includes the channel of Beaver Brook, classified as riverine, lower perennial, unconsolidated bottom, mud (R2UB3); areas of ponded open water classified as palustrine, unconsolidated bottom, organic, semipermanently flooded (PUB4F); large areas of shrub swamp classified as palustrine, broad-leaved deciduous, seasonally flooded/saturated; and areas of intermingled marsh classified as palustrine, emergent, persistent, seasonally flooded/saturated.

The shrub swamp areas are dominated by species such as buttonbush (*Cephalanthus occidentalis*), winterberry (*Ilex verticillata*), speckled alder (*Alnus incana*), and meadowsweet (*Spirea alba*). Marsh areas intermingled with the shrub swamp are dominated by a variety of grasses and sedges including tussock sedge (*Carex stricta*), bluejoint grass (*Calamagrostis canadensis*) and phragmites (*Phragmites australis*). Phragmites is an invasive species and dominates patches within the northeastern portion of the wetland. Soils in the Beaver Brook wetland are predominantly very poorly drained deep organic soils (Borohemists), with poorly drained stratified sand and silt loam (Squamscott series) along wetland edges.

The Ecological Integrity of this wetland was scored as a 6.2. Major factors reducing the integrity of the wetland included the amount of development, roads, and human activity within 500 feet of the area. This wetland has moderate (1-5%) cover by invasive phragmites, which also reduced the Ecological Integrity score. This wetland scored 5.4 for Wetland Dependent Wildlife Habitat. Factors that reduced the habitat quality included the surrounding development and presence of invasive plants. Groundwater Recharge scored 6.2, with higher marks related to its location within a large area of stratified drift that is likely suitable for gravel wells.

This wetland meets the Amherst criteria as a Water Protection Wetland, which includes a 100-foot buffer. Beaver Brook itself would also be subject to a 100-foot buffer as a perennial stream.

3.2 Intermittent Stream Wetland

The Intermittent Stream wetland flows into the northeastern corner of the Beaver Brook wetland and runs along the northeastern tip of the project area. The two wetlands were distinguished as separate units at a constriction less than 50 feet wide where the two wetlands meet (Amherst Zoning, Sec. 9.1) and where the vegetation changes from shrub dominated to forest dominated wetlands.

This narrow wetland is somewhat larger than one acre, extending well beyond the study area. It was classified as a palustrine, forested, broad-leaved deciduous seasonally flooded/saturated (PFO1E) wetland. Dominant species here include red maple (*Acer rubrum*), American elm (*Ulmus americana*), silky dogwood (*Cornus amomum*), sensitive fern (*Onoclea sensibilis*), jewelweed (*Impatiens capensis*), and various sedges (*Carex* spp.). Soils in this area were noted to be poorly drained stratified sand and silt loam (Squamscott series).

Ecological Integrity of this wetland rated as 7.2. Major factors reducing the integrity of the wetland included the amount of development, roads, and human activity within 500 feet of the area. The presence of invasive phragmites also reduced the score. This wetland scored 4.2 for Wetland Dependent Wildlife Habitat. Factors that reduced the habitat quality included the lack of open water areas and lack of wetland class diversity. Groundwater Recharge rated 1.6, with low marks due to the lack of a stratified drift aquifer or permeable soils for recharging groundwater.

Based on these scores, the Intermittent Stream Wetland meets the Amherst criteria as a Significant Wetland, which includes a 50-foot buffer. The intermittent stream within this wetland is also subject to a 50-foot buffer.

3.3 Drainage Ditch Wetland

The delineated drainage ditch wetland is a narrow, rock lined ditch that intercepts water from the toe of an excavated slope along the northwestern property line and diverts it west along a parking lot, where the intercepted water disappears through crushed stone into a subsurface drainage system or dry well. This wetland was classified as palustrine, emergent, persistent, seasonally flooded/saturated, excavated (PEM1Ex). Dominant vegetation in this wetland includes purple loosestrife (*Lythrum salicaria*), woolgrass (*Scirpus cyperinus*), reed canary grass (*Phalaris arundinacea*), soft rush (*Juncus effusus*), and broad-leaved cattail (*Typha latifolia*). Shallow soil observations in the ditch revealed poorly drained sands and the ditch had water at the soil surface during the April delineation.

Because this is a manmade drainage ditch through an upland, this wetland is not regulated by the Army Corps of Engineers or by the Town of Amherst. However, it is subject to New Hampshire Department of Environmental Services (NHDES) regulations. Because this wetland is not regulated in Amherst, no functional assessments were needed to determine local buffers.

4.0 Summary

Three wetlands were delineated in the vicinity of the proposed new school. These include 20+/- acres of scrub-shrub and marsh directly associated with Beaver Brook along the south side of the project, a forested wetland with an intermittent stream off the east end of the proposed project, and a manmade ditch wetland along the northwest property line. The Beaver Brook wetland meets Amherst criteria as a Water Protection Wetland, which includes a 100-foot buffer and the Intermittent Stream Wetland meets Amherst criteria as a Significant Wetland, which includes a 50-foot buffer. The Drainage Ditch wetland is not regulated locally, nor is it regulated by the Army Corps; however, it is regulated under NH DES rules.

1. ECOLOGICAL INTEGRITY	Score*	10	5	1	0	Notes
1. Land uses in watershed that degrade water quality?	5.0	<5% of watershed with such land uses	5-10% of watershed with such land uses	>10% of watershed with such land uses		Low density development, adjacent upslope athletic fields
2. Fill in Wetland?	10.0	Less than 1%	1-3%	>3%		
3. Agriculture in wetland?	10.0	Less than 5%	5-25%	> 25%		
4. Logging activity in wetland?	10.0	Less than 1%	1-10%	> 10%		
5. Human activity in wetland?	10.0	Low	Moderate	High		
6. Invasive plants in wetland?	5.0	<1%	1-5%	> 5%		Phragmites <=5%
7. Road/driveway/railroad crossings?	1.0	None	within 500ft of wetland	adjacent to or crossing wetland		
8. Human activity within 500 ft?	1.0	Little or None	evident in up to 25% of 500 ft zone	evident in more than 25% of 500 ft zone		
9. % impervious surface within 500 ft.?	5.0	< 3%	3-10%	>10%		
10. Structure regulating water flow?	5.0	None	Slight modification	Severe modification		

Average Score - Ecological Integrity **6.2**

2. WETLAND WILDLIFE HABITAT	Score*	10	5	1	0	Notes
1. Wetland acres?	3.0	> 100 acres	20-100 acres	<20 acres		GIS measured 20 ac evaluation
2. Ecological Integrity Avg. score?	6.2					
3. Water quality (Use F1, Q1 score)?	5.0					
4. Open water < 6.6ft deep?	10.0	> 3 acres	0.5 - 3 acres	< 0.5 acre		PABFb+PUBFb = 6ac
5. Deepwater Habitats?	5.0	stream ≥ 1 mile and/or lake/pond >10 acres	stream < 1 mile and/or lake/pond <10 acres	No deepwater		PUBHb = 1 ac
6. Wetland vegetation class diversity?	10.0	3 or more classes	2 classes	1 class		
7. Proximity to other wetlands?	10.0	connected/unconnected within 0.25 mile	connected 0.5-1mi. or unconnected 0.25-0.5 mi.	Not connected within 1 mile or > 0.5 mi. from unconnected		
8. Wildlife travel corridors?	1.0	Free access	Access partially blocked	Access blocked		
9. % of wetland edge undisturbed?	1.0	>95%	75-95%	< 75%		
10. Invasive plants (Use F1, Q6 score)	3.0					

Average Score - Wildlife Habitat **5.4**

8. GROUNDWATER	Score*	10	5	1	0	Notes
1. Stratified drift aquifer beneath wetland?	10.0	Wetland overlies aquifer	Aquifer within 1/4 mile	Aquifer > 1/4 mile of wetland		Amherst Environmental Poster
2. Public water supply area?	10.0	Wetland in in Favorable Gravel Well area	Wetland within 1/4 mile of Favorable Gravel Well area	Wetland > 1/4 mile of Favorable Gravel Well area		SPNHF FGWA mapping
3. Public wellhead protection area (WHPA)?	1.0	>75% of WHPA includes wetland	25%-75% of WHPA includes wetland	<25% of WHPA includes wetland		Amherst Wetland & Water Res Map
4. Percent cover of highly permeable soils within 100 ft.?	10.0	> 50% of Table 3 soils	25-50% of Table 3 soils	< 25% of Table 3 soils		NRCS Soil Mapping
5. Percent cover of highly permeable soils WITHIN the wetland	1.0	> 50% of Table 4 soils	25-50% of Table 4 soils	< 25% of Table 4 soils		NRCS Soil Mapping

Average Score - Groundwater **6.2**

*Refer to the Method for Inventorying and Evaluating Freshwater Wetlands In New Hampshire (Stone et al., 2015), Section 3, for detailed guidance on scoring questions.

1. ECOLOGICAL INTEGRITY	Score*	10	5	1	0	Notes
1. Land uses in watershed that degrade water quality?	5.0	<5% of watershed with such land uses	5-10% of watershed with such land uses	>10% of watershed with such land uses		Low density development
2. Fill in Wetland?	10.0	Less than 1%	1-3%	>3%		
3. Agriculture in wetland?	10.0	Less than 5%	5-25%	> 25%		
4. Logging activity in wetland?	10.0	Less than 1%	1-10%	> 10%		
5. Human activity in wetland?	10.0	Low	Moderate	High		
6. Invasive plants in wetland?	10.0	<1%	1-5% within 500ft of wetland	> 5% adjacent to or crossing wetland		<i>Lonicera morrowii+Rosa multiflora+Euonymus alatus ~1%</i>
7. Road/driveway/railroad crossings?	1.0	None	evident in up to 25% of 500 ft zone	evident in more than 25% of 500 ft zone		
8. Human activity within 500 ft?	1.0	Little or None	3-10%	>10%		
9. % impervious surface within 500 ft.?	10.0	< 3%	Slight modification	Severe modification		
10. Structure regulating water flow?	5.0	None				

Average Score - Ecological Integrity 7.2

2. WETLAND WILDLIFE HABITAT	Score*	10	5	1	0	Notes
1. Wetland acres?	1.0	> 100 acres	20-100 acres	<20 acres		
2. Ecological Integrity Avg. score?	7.2					
3. Water quality (Use F1, Q1 score)?	5.0					
4. Open water < 6.6ft deep?	1.0	> 3 acres	0.5 - 3 acres	< 0.5 acre		
5. Deepwater Habitats?	1.0	stream ≥ 1 mile and/or lake/pond >10 acres	lake/pond <10 acres	No deepwater		
6. Wetland vegetation class diversity?	1.0	3 or more classes	2 classes	1 class		
7. Proximity to other wetlands?		connected/unconnected within 0.25 mile	connected 0.5-1mi. or unconnected 0.25-0.5 mi.	Not connected within 1 mile or > 0.5 mi. from unconnected		
8. Wildlife travel corridors?	10.0	Free access	Access partially blocked	Access blocked		
9. % of wetland edge undisturbed?	1.0	>95%	75-95%	< 75%		
10. Invasive plants (Use F1, Q6 score)	10.0					

Average Score - Wildlife Habitat 4.2

8. GROUNDWATER	Score*	10	5	1	0	Notes
1. Stratified drift aquifer beneath wetland?	1.0	Wetland overlies aquifer	Aquifer within 1/4 mile	Aquifer >1/4 mile of wetland		Amherst Environmental Poster
2. Public water supply area?	5.0	Wetland in Favorable Gravel Well area	Wetland within 1/4 mile of Favorable Gravel Well area	Wetland > 1/4 mile of Favorable Gravel Well area		SPNH FGWA mapping
3. Public wellhead protection area (WHPA)?	1.0	>75% of WHPA includes wetland	25%-75% of WHPA includes wetland	<25% of WHPA includes wetland		Amherst Wetland & Water Res Map
4. Percent cover of highly permeable soils within 100 ft.?	1.0	> 50% of Table 3 soils	25-50% of Table 3 soils	< 25% of Table 3 soils		NRCS Soil Mapping
5. Percent cover of highly permeable soils WITHIN the wetland	1.0	> 50% of Table 4 soils	25-50% of Table 4 soils	< 25% of Table 4 soils		Onsite determination: Squamscott Soils

Average Score - Groundwater 1.6

*Refer to the Method for Inventorying and Evaluating Freshwater Wetlands in New Hampshire (Stone et al., 2015), Section 3, for detailed guidance on scoring questions.