

POST POND, LYME, NH
Wetland Evaluation and Impact Assessment

December 2006

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**POST POND, LYME, NH
Wetland Evaluation and Impact Assessment**

**Prepared for
Lyme Conservation Commission
Lyme NH**

**Prepared by
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Introduction

On August 10, 2006, a senior wetland scientist from Normandeau Associates Inc visited the wetland on Post Pond, Lyme, NH. The purpose of the site visit was to determine the current condition of the wetland and to assess the potential impacts of fluctuating water levels on the wetland flora and fauna due to periodic removal of beaver dams over the last decade. The study encompassed Clay Brook adjacent to the Robert G. Chaffee Wildlife Sanctuary and extended from the edge of Post Pond to below the northernmost beaver dam (Figure 1). The remaining stretch of stream to N. Thetford Rd was not walked but was inspected from aerial photographs and the bridge. The area of the wetland is approximately 15 acres.

Hydrology

The water levels on Post Pond and in the wetland are controlled by beaver dams located on Clay Brook. Two dams were observed during the site visit, as shown in Figure 1. The first dam had been artificially breached and at the time of the site visit, showed no influence on pond water levels. The second dam was intact and impounding water approximately 20-24 inches (Figure 2). Historically, these dams had been breached multiple times during the growing season over a period of years, and that this year the dams had been relatively undisturbed.

Observations on the day of the site visit indicated that recent water levels were approximately 4-6 inches higher than levels to which the vegetation had adapted. In some areas of the marsh, the vegetation has developed into pools and mounds, with the more water tolerant species growing in the pools and the drier-site species on the mounds. During the site visit, standing water levels were close to the tops of the mounds, submerging some ferns that are typically found on drier sites (Figure 3). Shrubs growing nearest to the marsh showed signs of stress (leaf stunting or loss, dieback) or death, symptoms which also indicated a recent condition of high water levels (Figure 4). This pattern is consistent with drier-site species which probably expanded onto the marsh during the years of dam removal.

Water levels on the day of the site visit were not recorded, but estimated from a second site visit on November 14, 2006. On that day water levels in the marsh were approximately 0.5 feet higher than the August visit, based flooding of shrubs and mounds in the vicinity of Little Post Pond, and relative water levels on the first breached beaver dam. The November 14 staff gage reading at the boat ramp was 3.2, or elevation 429.0 feet (NGVD 29) based on the Lyme Conservation Commission Post Pond Water Release Policy, Revision 2, dated June 6, 2006. At 0.5 feet lower, the August 10 water level would have been approximately 2.7 feet on the gage, or 428.5 feet NGVD.

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Substrates

Substrates are described in the Natural Resource Conservation Service Grafton County Area Soil Survey as including Peacham, Ossipee and Binghamville soils. The Peacham and Ossipee soils dominate the largest portion of the wetland surrounding Clay Brook. The Binghamville soils are found at the inlet, Trout Brook. The Peacham and Ossipee soils are commonly mapped together, as in this case, because of similarities in structure and management. Both are very poorly drained with a thick organic horizon underlain by stony, sandy loam. Both experience long periods of standing water. Binghamville soils are described as poorly drained silt loams associated with small drainages.

These descriptions were supported in the field with deep (6-18 inches), flooded muck soils over a loam substrate in the Clay Brook wetland, and few organics found near Trout Brook.

Vegetation

The Clay Brook wetland included a scrub-shrub border, shallow emergent marsh and deep marsh supporting submerged aquatic vegetation. All were distributed according to relative water levels in the marsh, with the taller shrubs along the upland-wetland edge, grading into shorter shrubs to shallow emergent marsh with the deep submerged aquatic vegetation distributed in depressions, Little Post Pond and adjacent to Clay Brook.

Dominant species included speckled alder (*Alnus incana*) and silky dogwood (*Cornus amomum*) in the tall shrub zone, stunted silky dogwood and meadowsweet (*Spiraea alba*) in the low shrub zone, and a wide variety of herbaceous species in the understory of the shrub zones and throughout the marsh. Dominant herbaceous species included tussock sedge (*Carex stricta*), bluejoint grass (*Calamagrostis canadensis*), lake sedge (*Carex lacustris*), soft-stem bulrush (*Scirpus tabernaemontani*), beaked sedge (*Carex rostrata*) and burreed (*Sparganium americanum*). Broad-leaved emergents such as pickerel weed (*Pontederia cordata*) and arrowhead (*Sagittaria latifolia*) occurred along the edges of Clay Brook with other species such as marsh fern (*Thelypteris palustris*), royal fern (*Osmunda regalis*), water smartweed (*Polygonum amphibium*) and three-way sedge (*Dulichium arundinaceum*). Pools and deep marsh habitats supported water lily (*Nymphaea odorata*), pond lily (*Nuphar luteum*), water shield (*Brasenia schreberi*), pondweeds (*Potamogeton* sp.), water smartweed, and bladderwort (*Utricularia* sp.). A list of plant species observed is provided in Table 2.

Of note was the occasional presence of invasive species in this wetland. Purple loosestrife (*Lythrum salicaria*), Phragmites (*Phragmites australis*) and reed canary grass (*Phalaris arundinacea*) were all present in relatively low numbers (Figure 5). These species should be monitored over time to see if they are expanding and if control measures are needed.

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Wildlife

The evidence of an active beaver (*Castor canadensis*) population was found in the recently maintained dam (although no attempts to repair the breached dam were observed), a bank lodge south of Dam #1, frequent stumps, and beaver trails throughout the wetland. Vegetation clippings of cattail (*Typha latifolia*) and a sighting confirm the presence of muskrat (*Ondatra zibethicus*). An American bittern (*Botaurus lentiginosus*) was sighted several times, probably the same individual disturbed by my presence. Few other animal species were observed in the marsh, most likely due to the time of season and day (mid-day in early August is a poor time for wildlife observations); however, the diversity of plant species and the high interspersion of water and vegetation suggests that this wetland would provide excellent feeding and brood habitat for a range of waterbirds, including waterfowl (wood duck (*Aix sponsa*) and black duck (*Anas rubripes*) were observed), herons, and rails. Minnows and smaller fish, including pickerel were observed in the pools and stream.

The abundance and diversity of terrestrial and aquatic invertebrates was striking. These were not sampled, but casual observations showed many dragonfly and damselfly species (odonates), butterflies, skippers, wasps, flies and beetles throughout the wetland. The flooded sections of the marsh supported a high number of aquatic macroinvertebrates, both on the surface and submerged.

Functional Assessment

The Army Corps of Engineers Highway Methodology (modified by Normandeau and accepted by the Corps in 1999) was applied to develop a site-specific assessment of the wetland functions and values provided by this site. This method assesses the potential for a wetland to provide up to 14 functions and values. The functions are listed in Table 2, along with the rationale and brief description of each. The dominant functions are those identified as most significant based on the assessor's professional judgment and supported by the rationale. Dominance is a combination of the wetland's ability to provide a function and its opportunity to perform that function. Regionally significant functions are reserved for wetlands that provide functions and values that are important on a regional scale, such as endangered species habitat or unusual plant communities. An explanation of the rationale is provided as an Appendix to this report.

The Post Pond wetland is large and diverse, with good interspersion of water and vegetation (Figures 6 and 7). It is dominated by emergent vegetation, is level and has good connectivity with Post Pond and Clay Brook. All of these characteristics combine to allow the wetland to provide at some level most of the 14 functions and values evaluated under the Highway Methodology (Table 2). The most significant of the 14 are Floodflow Discharge, Wildlife Habitat, and Recreation. Floodflow Discharge was considered dominant due to the flat topography and dense vegetation of the wetland behind the beaver dam. These features allow it to store flood waters and desynchronize (slow the release of) those waters down Clay Brook. Wildlife Habitat is clearly an important function of this wetland because of its high interspersion of vegetation and

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water, high vegetation diversity, proximity to conservation land, and relatively large size. Many species of birds, mammals, amphibians and reptiles can utilize this wetland to fulfill some or all of their life cycle requirements. Recreation is a more subjective wetland value, but the ease of water access to the wetland from Post Pond and Clay Brook, the interpretive trails in the Chaffee Wildlife Sanctuary and the proximity of the Town Beach all encourage users of this wetland for hiking, boating and birding.

Some functions, such as Sediment/Toxicant/Pathogen Retention and Nutrient Removal/Retention/Transformation, are relatively unimportant at present. While the wetland has excellent potential to provide these functions through its vegetation composition and hydrologic setting, it has little opportunity because of the relatively undeveloped nature of Post Pond. However should nutrient or contaminant inputs increase in the future, these wetland functions could become significant. During certain periods of the year, the wetland may provide some Groundwater Recharge due to its dammed condition, and conversely may provide some base streamflow through groundwater discharge, but due to the much larger water source provided by Post Pond, this function is relatively unimportant.

Impacts of Fluctuating Water Levels

The Post Pond wetland has many characteristics that provide important wetland functions and values; however, it is vulnerable to fluctuations in water levels. The existing vegetation has adapted to the relatively stable conditions provided by a functional beaver dam. Allowing water levels to fluctuate substantially (a foot or more) on an erratic schedule during the growing season could be detrimental to the plant community, fish and wildlife over the long term.

The most damaging hydrologic regime would be one of fluctuating water levels by periodically manipulating the beaver dam. This regime has occurred in the recent past during which time woody species expanded into the emergent marsh, as evidenced by dieback of woody species when the dam was left intact. Over the long term, a regime of fluctuating water levels would create conditions in which many plant species are excluded and would reduce the diversity of the marsh vegetation. This is also the most likely scenario in which some or all of the invasives could expand and dominate the wetland, disproportionately reducing its attractiveness for wildlife.

Maintaining water levels significantly lower (more than 1 foot) than observed during the site visit would alter the deep marsh aquatic vegetation to the detriment of water birds, fish and invertebrates. Woody plant species would expand on the marsh, potentially reducing habitat for the more wetland-dependent wildlife species.

Very high water levels can also alter the character of the wetland. Based on field observations, water levels maintained above 2.5 feet could result in more deep marsh (submerged and floating leaved plants) and less emergent marsh and shrub swamp, with a concurrent decline in vegetation/water interspersions.

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Summary

Water level fluctuations in the Post Pond wetland should be kept to a minimum to maintain the current high quality of the vegetation community, wildlife habitat and aquatic diversity of this wetland. Water levels should be maintained at an elevation which supports the current range of plant communities from deep marsh to shrub swamp, and retains the high vegetation-water interspersion that contribute to this wetland’s high functional quality. Based on the staff gage, a target water level between 2.0 and 2.5 feet would probably achieve that condition. Some minor fluctuation (0.5 ft +/-) on a natural cycle of spring high water levels and a slow decline over the growing season could be tolerated, and may enhance species diversity and wildlife habitat.

Monitoring of the wetland and water levels is recommended to document water level fluctuations and temporal patterns, and changes in vegetation under the new hydrologic regime. Minimum monitoring should include weekly water level readings during the growing season (May-October), and photographing the wetland at several fixed locations in August on an annual basis for a period of 3 years. More comprehensive wetland studies could include permanent plots or transects to track vegetation species composition and structure in several key locations, avian and fish surveys, and aerial photographs. Periodic review of these data by professionals will allow the Conservation Commission to adjust the water levels as needed to maximize the wetland functions and benefits.

Table 1. List of plant species observed during August 10, 2006 site visit to Post Pond.

Woody species		Herbaceous species	
Common Name	Scientific Name	Common Name	Scientific Name
Red maple	<i>Acer rubrum</i>	Tussock sedge	<i>Carex stricta</i>
White pine	<i>Pinus strobus</i>	Sedge	<i>Carex rostrata</i>
Speckled alder	<i>Alnus incana</i>	Sensitive fern	<i>Onoclea sensibilis</i>
Gray dogwood	<i>Cornus amomum</i>	Water smartweed	<i>Polygonum pennsylvanicum</i>
Meadowsweet	<i>Spiraea latifolia</i>	Marsh fern	<i>Thelypteris palustris</i>
Willow	<i>Salix sp</i>	Water hemlock	<i>Cicuta bulberifera</i>
Buttonbush	<i>Cephalanthus occidentalis</i>	Broad leaved cattail	<i>Typha latifolia</i>
Winterberry	<i>Ilex verticillata</i>	Purple loosestrife	<i>Lythrum salicaria</i>
Northern arrowwood	<i>Viburnum dentatum</i>	Bladderwort	<i>Utricularia vulgaris</i>
Sweet gale	<i>Myricum pennsylvanicum</i>	Royal fern	<i>Osmunda regalis</i>
		Bluejoint grass	<i>Calamagrostis canadensis</i>
		Soft-stemmed	<i>Scirpus tabernaemontani</i>

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bulrush

Herbaceous species (cont)

Common Name	Scientific Name
Burreed	<i>Sparganium americanum</i>
Three-way sedge	<i>Dulichium arundinaceum</i>
Arrow arum	<i>Sagittaria latifolia</i>
Pickerel weed	<i>Pontedaria cordatum</i>
Pond lily	<i>Nuphar luteum</i>
White water lily	<i>Nymphaea odorata</i>
Water shield	<i>Brassenia schreberi</i>
Spike rush	<i>Eleocharis sp</i>
Meadow rue	<i>Thalictrum pubescens</i>
Marsh St Johns wort	<i>Triadenum virginicum</i>
Water horehound	<i>Lycopus americanum</i>
Boneset	<i>Eupatorium perfoliatum</i>
Ironweed	<i>Eupatorium fistulosum</i>
Manna grass	<i>Glyceria canadensis</i>
Reed canary grass	<i>Phalaris arundinacea</i>
Horsetail	<i>Equisetum cf fluviatile</i>

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Table 2. WETLAND FUNCTIONAL ASSESSMENT
 (Modified from US Army Corps of Engineers Highway Methodology)

Project: Post Pond _____ Wetland ID: Clay Brook _____ Location: Adjacent to Clay Brook north of dam _____ Investigators: SDA _____ Field
 Date: 8/10/06 _____

Wetland Area: Total 50 acres		On-Site			Geomorphology: Lacustrine
Wetland Classes (%): 25% PSS1, 75% PEM1					Drainage System: Clay Brook
NWI Class: PEM1n dominant		SCS Soils Class: Peacham/Ossippee			Contiguous Waterbody for Evaluation: Post Pond
Vegetation: Species Richness: High		Density: High			Inlets: 1 perennial Outlets: 1
Interspersion: Veg/Water: High		Class/Class: Medium			Potential Impacts: (type/area/class)
Surrounding Lands (%): 30% conservation lands, 20% pond, 30% forested, 10% residential, 10% farm					Beaver dam removal
Function	Function Occurrence	Rationale Numbers from Functions List	Principal Valuable Functions	Regionally Significant Functions	Comments
Groundwater Recharge/Discharge	x	Recharge: 2 Discharge: 2,6			Minor recharge and discharge may occur in the course of the year
Floodflow Storage & Desynchronization	x	2,3,9,13	X		Low topography and dam-controlled setting allow for flood containment and desynchronization
Fish and Shellfish Habitat	x	1,2,5,6,9,10			Provides spawning and nursery habitat for warm-water fish species. No shellfish observed in the marsh
Sediment/Toxicant/Pathogen Retention	x	1,5,6,7,8,10,11,12			Structure and composition of vegetation provide this function, but little opportunity because development is low
Nutrient Removal/Retention/Transformation	x	2,6,7,10,11			Structure and composition of vegetation provide this function, but little opportunity because development is low
Production Export	x	2,3,5,6			Exports of nutrient, invertebrates and fish downstream. Fish and invertebrate exchange to Post Pond
Sediment/Shoreline Stabilization	x	2,4,6,8			Dense vegetation protects shoreline from wave and ice action.
Wildlife Habitat	x	1,2,3,4,6,7,8,9,10,11,14,16,17	X		High vegetation/water interspersion, species diversity provide high quality habitat for birds, mammals, reptiles and amphibians dependent on permanent water.
Recreation (consumptive & non-consumptive)	x	3,4,6,7,8,9,11,12,13	X		Post Pond and Clay Brook provide canoe and kayak access to wetland, hiking trail on wetland border.

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Educational/Scientific Value	x	1,2,3,4,6,7,8,9,10			<i>Adjacent to wildlife sanctuary with interpretive trail, and town recreation area with good access</i>
Uniqueness/Heritage	?				<i>Status of rare species, communities or historic structures not known</i>
Visual Quality/Aesthetics	x	1,2,4,5,6,7,8,9,10,11			<i>Provides scenic vista for beach and pond users, and from N.Thetford Rd</i>
Endangered Species Habitat	?				<i>Status of rare species not known</i>
Other: Aquatic Diversity/ Abundance	x				<i>Invertebrate diversity very high during site visit – aquatics, odonates, skippers</i>

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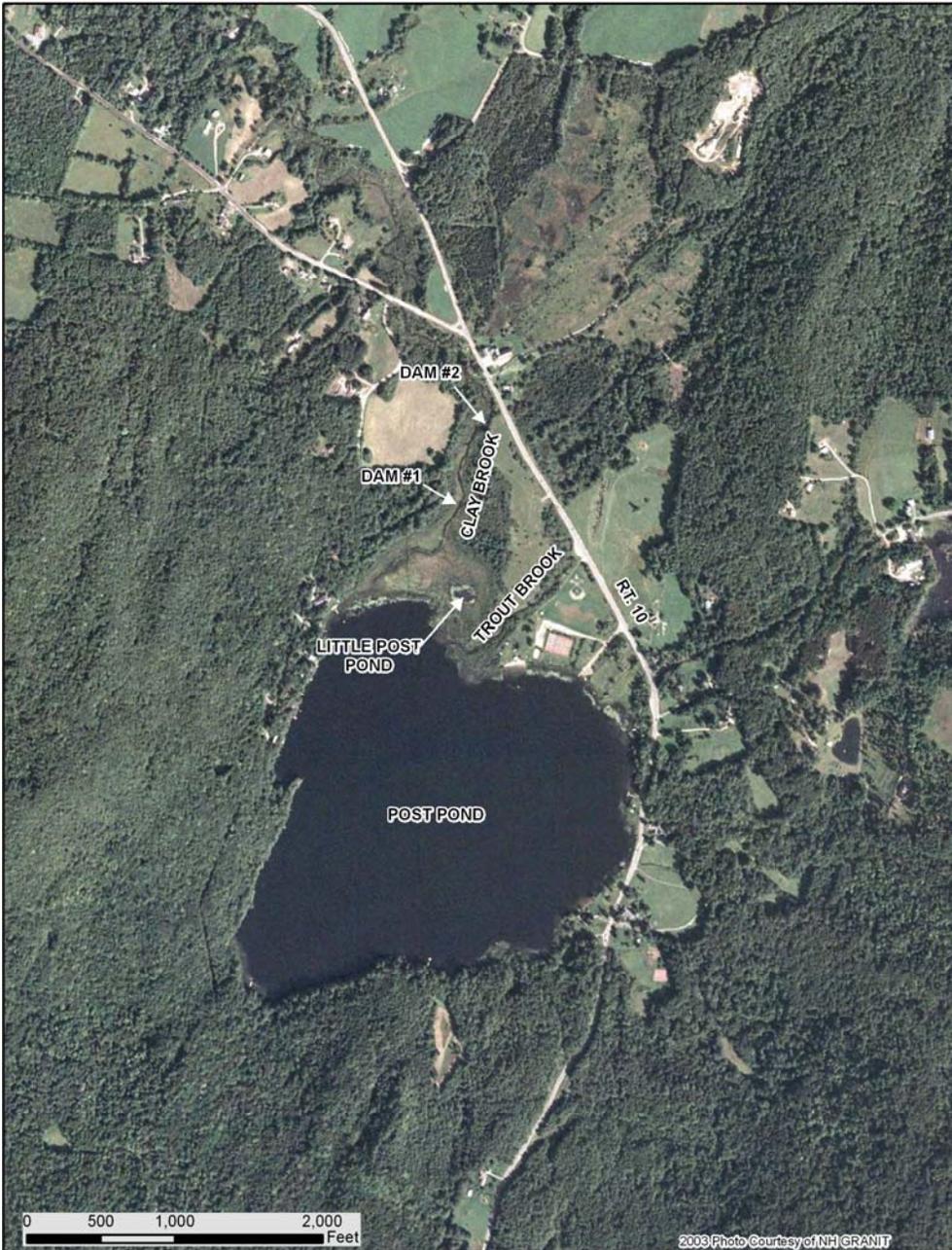


Figure 1. Locus and site map showing Post Pond, named streams, and Clay Brook wetland.

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Figure 2. Second (downstream) beaver dam currently controlling water levels on Post Pond.



Figure 3. Marsh fern submerged by higher water levels from the intact beaver dam.

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Figure 4. Stressed and dead shrubs along the marsh edge, presumably due to high water levels from the intact beaver dam.



Figure 5. Breached beaver dam upstream of active dam. Note scattered purple loosestrife around dam.

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Figure 6. Just upstream of breached beaver dam showing diversity of vegetation, high interspersion of water and vegetation, and fern-topped mounds with flooded pools near the shrub border.



Figure 7. Zonation in the shallow marsh adjacent to Post Pond. Clay Brook flows through the dark green zone of soft-stem bulrush, with the lighter green bluejoint grass dominating a low berm. Note also the one purple loosestrife plant and the dead shrub, probably from high water levels.

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APPENDIX

Wetland Functional Assessment

USACE 1995 Highway Methodology Descriptive Approach
as Modified by Normandeau Associates 1999

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FUNCTION: GROUNDWATER RECHARGE

Considers the potential and effectiveness for the wetland to serve as a groundwater recharge area.

Considerations/Qualifiers

Wetland Basin Characteristics

- 1. Wetland is underlain by stratified drift.
- 2. Wetland is associated with a watercourse, but lacks a defined outlet or contains a constricted outlet.

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Surrounding Lands

- 3. Public or private wells occur downstream of wetland.
- 4. Potential exists for public or private wells downstream of wetland.
- 5. Groundwater quality of stratified drift aquifer within or downstream of wetland meets drinking water standards.

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Soils

- 6. Fragipan or impervious soils do not occur in wetland.
- 7. Wetland soils more pervious than surrounding uplands.

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Hydrologic Data

- 8. Amount of water entering wetland greater than amount leaving.

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FUNCTION: GROUNDWATER DISCHARGE

Considers the potential and effectiveness for the wetland to serve as a groundwater discharge area.

Considerations//Qualifiers

Wetland Basin Characteristics

- 1. Wetland basin configuration is hillside.
- 2. Wetland is located low in local watershed.

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Soils

- 3. Wetland soils less pervious than surrounding uplands.

Hydrologic Data

- 4. Amount of water entering wetland less than amount of water leaving wetland.
- 5. Signs of groundwater discharge present.
- 6. Temperature of water suggests discharge.
- 7. Quality of water associated with wetland meets Class A or B standards.
- 8. Wetland associated with important cold-water fish resources.

FUNCTION: FLOODFLOW ALTERATION (Storage & Desynchronization)

Considers the potential and effectiveness of the wetland in reducing flood damage and retaining water over prolonged periods, adding to the stability of the wetland ecological system or buffering features of social or economic value situated in erosion-prone areas.

NOTE: Add note to comments section on form if contained within designated 100-year floodplain.

Considerations/Qualifiers

Wetland Basin Characteristics

- 1. Area of wetland is large relative to its watershed.
- 2. Wetland exists in a relatively broad and flat area that has floodwater storage potential.
- 3. Wetland receives floodwaters, but lacks a defined outlet or contains a constricted outlet.

Surrounding Land/Watershed Characteristics

- 4. Wetland watershed contains a high degree of impervious surfaces.
- 5. Wetland occurs in upper to middle watershed.
- 6. Effective flood storage small or non-existent upstream of the wetland.
- 7. Land uses downstream protected by wetland to next dam or major tributary or confluence.

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Vegetation

- 8. Wetland dominated by forested or shrub vegetation.
- 9. High stem density of multi-stemmed, woody and/or persistent emergent vegetation.

Hydrologic Data

- 10. Wetland is associated with one or more watercourse(s).
- 11. Wetland contains a sinuous water course (WET 2).
- 12. Diffuse water flow through wetland.
- 13. Channel flow velocity reduced by wetland.
- 14. Wetland buffers flooding from non-channel (overland or sheetflow) sources.

FUNCTION: FISH AND SHELLFISH HABITAT

Considers the suitability of watercourses or waterbodies (ponds, lakes, perennial streams, rivers) associated with the wetland for fish and shellfish habitat.

NOTE: If no perennial aquatic habitat exists, note in comments section of wetland functional assessment form.

Considerations/Qualifiers

Wetland Basin Characteristics

- 1. Wetland is part of a larger, contiguous waterbody.

Surrounding Land/Watershed Characteristics/Water Quality

- 2. Forest land dominant in watershed above wetland.
- 3. Water quality of the watercourse or waterbody associated with the wetland meets Class A or B standards.

Vegetation Habitat Characteristics

- 4. Watercourse or waterbody well shaded by vegetation.
- 5. Abundance of cover objects present (submerged logs and boulders, overhanging and aquatic vegetation).

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6. Spawning areas present (submerged vegetation or gravel beds).
7. No barrier(s) to fish (such as dams [including beaver dams], waterfalls, non-passable culverts, etc.) along the stream reach associated with the wetland.
8. Diversity of riffle, pool and run stream habitat exists.
9. Size and depth of aquatic habitat associated with the wetland sufficient to support large fish/shellfish populations.
10. Evidence of fish or fish known to be present.

Hydrologic Characteristics

11. Stream width (bank to bank), more than 50 feet.
12. Channelized (humanly disturbed) streams absent.

Other

13. Wetland or connected waterbody stocked with fish.

FUNCTION: *SEDIMENT/TOXICANT RETENTION*

Considers the potential and effectiveness of the wetland as a trap for water-borne sediment and attached contaminants from surrounding uplands, or upstream eroding wetland areas.

Considerations/Qualifiers

Wetland Basin Characteristics

1. Wetland basin configuration provides prolonged water retention time.

Surrounding Land/Watershed Characteristics

2. Potential or known sources of transportable sediment in the watershed above the wetland.
3. Potential or known sources of toxicants in watershed (other than road or parking lot runoff).
4. Wetland associated with a watercourse or waterbody sensitive to increased sediment/toxicant loads.

Soils

5. Peat, muck or fine-grained mineral soils high in organic matter present.

Vegetation/Habitat Characteristics

- 6. High stem density of multi-stemmed, woody and/or persistent emergent vegetation.
- 7. Moderate to high degree of open water and vegetation interspersion.
- 8. Opportunity for sediment settling within quiescent open water present.

Hydrologic Data

- 9. Channelized flows have visible velocity decrease in wetland (sinuous channel).
- 10. Diffuse water flow through the wetland.
- 11. No indicators of erosive forces present such as high water velocities, bed scouring and shoreline erosion.

Other

- 12. Flood flow alteration function is important.

FUNCTION: NUTRIENT REMOVAL/RETENTION/TRANSFORMATION

Consider the potential and effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands, and the wetlands ability to process these nutrients into other forms or trophic levels.

Considerations/Qualifiers

Wetland Basin Characteristics

- 1. Wetland large relative to size of watershed.
- 2. Wetland basin configuration provides prolonged water retention time.

Surrounding Land/Watershed Characteristics

- 3. Potential sources of excess nutrients present in the watershed above wetland.
- 4. Wetland associated with waterbody sensitive to increased nutrient loads.

Soils

- 5. Fine-grained mineral soils with high cation exchange capacity are present for phosphorus removal.

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Vegetation/Habitat Characteristics

- 6. Multiple wetland classes with primarily forested, scrub/shrub and/or persistent emergent vegetation.
- 7. Open water habitat with sufficient aquatic vegetation to utilize excess nutrients exists.
- 8. Presence of high nutrient aquatic plant indicators (e.g., duckweed, algae) or eutrophic appearance within wetland.

Hydrologic Data

- 9. Channelized flows have visible velocity decrease in wetland (sinuous channel).
- 10. Diffuse water flow through wetland.
- 11. Wetland saturated for most of the season and ponded water present in wetland.

Other

- 12. Sediment/toxicant retention function is important.

FUNCTION: PRODUCTION EXPORT (Nutrient)

Evaluates the suitability of the wetland for the production of organic material and its subsequent physical transport to areas downstream or to waters within the same basin.

NOTE: If no perennial outlet exists, note in comments section of wetland functional assessment form.

Considerations/Qualifiers

Wetland Basin Characteristics

- 1. Potential to flush relatively large amounts of organic plant material from wetland exists (wetland basin configuration/gradient).

Vegetation/Habitat Characteristics

- 2. High vegetation density and/or plant productivity present (excluding bogs).
- 3. Multiple wetland classes exist including shallow, deep marsh or aquatic bed.
- 4. Emergent plant communities dominated by non-persistent species.
- 5. Detritus development for export present within wetland.

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Hydrologic Data

| 6. Nutrients exported in wetland watercourses (perennial outlet present).

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Other

| 7. Important fish or shellfish habitat exists within or downstream of the wetland.

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FUNCTION: *SEDIMENT/SHORELINE STABILIZATION*

Considers the potential and effectiveness of the wetland in preventing shoreline or bank erosion caused by waves, currents, tides or ice.

NOTE: If no perennial water is associated with the wetland, note in comments section of wetland functional assessment form.

Considerations/Qualifiers

Wetland Basin Characteristics

1. Topographical gradient in wetland 3% or greater (streambank erosion potential exists).

Surrounding Land/Watershed Characteristics

2. The watershed is of sufficient size to produce channelized flow.

Soils

3. Shoreline soils are fine-textured (i.e. marine or lake fines, alluvial soils).

Vegetation/Habitat Characteristics

4. Wide wetland (>10') bordering watercourse, lake, or pond.
5. Vegetation comprises large trees and shrubs which withstand major flood events or erosive times and stabilizes the shoreline or bank on a large scale (feet).
6. Vegetation comprises dense resilient herbaceous layer which stabilizes the shoreline or bank on a small scale (inches) during minor flood events or potentially erosive times.

Hydrologic Data

7. High water velocities in wetland.
8. Non-distinct or gradual bank exists between watercourse or waterbody and bordering wetland.
9. A distinct step exists between watercourse or waterbody and bordering wetland (sharp bank) with dense roots throughout.

Other

10. Erosion indications (scouring), siltation present.

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11. Water body depth and area sufficient to support potentially damaging waves.
12. Motor boating activity present.

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FUNCTION: WILDLIFE HABITAT

Considers the suitability of the wetland as habitat for those animals typically associated with wetlands and the wetland edge. Also the use of the wetland as habitat for migrating species and species dependent upon the wetland at some time in their life cycle.

Considerations/Qualifiers

Wetland Basin Characteristics

1. Size of wetland sufficient to support large wildlife populations.
2. Irregular (sinuous) edge between the wetland and upland.

Surrounding Land/Watershed Characteristics

3. More than 40% of wetland edge is bordered by upland wildlife habitat (brushland, woodland, active farmland, or idle land) at least 500 feet in width.
4. Surrounding uplands provide special habitat features (fruit/mast-bearing trees, snags/cavities, turtle nest sites).
5. Wildlife access (overland) to other wetland types present.
6. Wetland contiguous with other wetland systems via watercourse or lake.
7. Wetland not fragmented substantially by development. (Use NH criteria for wetland separation).
8. Water quality of the watercourse or waterbody associated with the wetland meets Class A or B standards.

Vegetation/Habitat Characteristics

9. Wetland exhibits high degree of plant species richness.
10. Stem density of wetland vegetation high.
11. Wetland exhibits high degree of interspersions of vegetation and open water.
12. Wetland exhibits a high degree of diversity (class/class interspersions) in plant community structure.
13. Two or more islands or inclusions of upland within wetland present.
14. Wetland contains a relatively high number of wetland classes and/or subclasses.
15. Plant species with high wildlife food value are common in wetland.

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- 16. More than three acres of shallow permanent open water (less than 6.6 feet deep), including watercourses or waterbodies in or adjacent to wetland present.
- 17. Wildlife or signs of wildlife (tracks, scats, nesting areas, etc.) observed.
- 18. Potential for vernal pool habitat exists.

Other

- 19. Wetland not degraded by human activity.
- 20. Active habitat management exists.

FUNCTION: RECREATION (Consumptive and Non-Consumptive)

Considers the suitability of the wetland and associated watercourses for canoeing, boating, fishing, hunting and other active or passive recreational activities.

Considerations/Qualifiers

Surrounding Land/Watershed Characteristics

- 1. Wetland is located within a nature preserve, park lands or wildlife management area.

Other

- 2. Visual quality/aesthetics function is important.
- 3. Wildlife habitat function is important.
- 4. Fishing available within or from wetland.
- 5. Hunting is permitted in wetland.
- 6. Hiking occurs or has potential to occur within or around wetland.
- 7. General appearance and condition of the wetland unpolluted and/or undisturbed.
- 8. Off-road public parking available at potential recreational site.
- 9. Good accessibility within and around the wetland.
- 10. Wetland is within short drive or walk of dense human populations.
- 11. Waterbody accessible to non-powered boats.

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- 12. Waterbody navigable to non-powered boats.
- 13. No known restrictions or safety hazards limiting public use.

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FUNCTION: EDUCATION/SCIENTIFIC VALUE

Considers the suitability of the wetland as a site for an Aoutdoor classroom@ or as a location for scientific study or research.

Considerations/Qualifiers

Surrounding Land/Watershed Characteristics

1. More than 40% of wetland edge is bordered by undeveloped upland habitat more than 500 feet wide.
2. Wetland is located within a nature preserve, park lands or wildlife management area.

Vegetation/Habitat Characteristics

3. Potential educational site contains multiple wetland classes which are easily accessible.
4. Wildlife habitat function is important.

Other

5. Wetland contains or is known to contain threatened, rare or endangered species.
6. General appearance of and condition of the wetland unpolluted and/or undisturbed.
7. Off-road parking suitable for school buses within or near wetland.
8. Potential educational site is within safe walking distance or short drive to schools.
9. Direct pedestrian access to waterbody at potential educational site available.
10. Handicap accessibility.
11. No known restrictions or safety hazards limiting public use.
12. Site is currently used for educational or scientific purposes.

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FUNCTION: UNIQUENESS/HERITAGE

Considers the wetland for certain special values such as archaeological sites, rarity or uniqueness, its overall health and appearance, its role in the ecological system of the area, its relative importance as a typical pristine example of a wetland type in this geographic location.

Considerations/Qualifiers

Surrounding Land/Watershed Characteristics

1. Upland surrounding wetland primarily urban or developing rapidly (open space value).
2. Quality of water associated with wetland high.

Other

3. General appearance and condition of the wetland unpolluted and/or undisturbed.
4. Historical buildings or structures occur within wetland.
5. Presence of pond or pond site and remains of dam occur within wetland.
6. Wetland is a national natural landmark, associated with a designated scenic river or recognized as an exemplary natural community.
7. Wetland has local significance because it has biological, geological, or other features which are locally rare or unique (<1 such feature/square mile).
8. Wetland is known to contain an important archaeological site.
9. Wetland is located in an area experiencing a high wetland loss rate.

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FUNCTION: VISUAL QUALITY/AESTHETICS

Considers the visual and aesthetic quality or usefulness of the wetland.

Considerations/Qualifiers

Surrounding Land/Watershed Characteristics

1. Primarily undeveloped surrounding land use visible from primary viewing location(s).
2. Visible surrounding land form contrasts with wetland.
3. Wetland provides visual and/or acoustic buffer.

Vegetation/Habitat Characteristics

4. Multiple wetland classes visible from primary viewing locations.
5. Emergent marsh and/or open water visible from primary viewing location(s).
6. Wetland dominated by flowering plants or plants which turn vibrant colors in the fall.

Other

7. Wildlife habitat function is important.
8. General appearance and condition of wetland unpolluted and/or undisturbed.
9. Wetland is easily accessed.
10. Low noise level at primary viewing locations.
11. Unpleasant odors absent at primary viewing locations.

FUNCTION: ENDANGERED SPECIES HABITAT

Considers the suitability of the wetland to support threatened or endangered plant and/or wildlife species because of specialized habitat requirements.

NOTE: List known species in comments section of form.

Considerations/Qualifiers

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Surrounding Land/Watershed Characteristics

1. Little disturbance has occurred in and around the wetland. (<10% contiguous habitat developed).

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Other

2. Wetland contains or is known to contain threatened or endangered species.
3. Wetland contains critical habitat for a state or Federally listed threatened or endangered species.
4. Wetland has local significance because it has biological, geological, or other features which are locally rare or unique.

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