ALSTEAD COMPREHENSIVE WETLANDS COMPARATIVE EVALUATION

Prepared for:
Alstead Conservation Commission

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Cover photograph – This American bittern was observed feeding in a wetland in June 2019. After this photo was taken it quickly plucked a green frog from the edge of the wetland and swallowed it whole.

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INTRODUCTION

The Alstead Conservation Commission has a defined history of proactive planning for the protection of its most significant natural resources over the past decade. One of its actions was to engage the community with a conservation planning process. This included a series of community forums to help identify conservation focus areas and the development of the Alstead Land Conservation Plan (Monadnock Community Conservation Partnership 2009). This plan was prepared to help provide guidance for land conservation efforts identified in the 2007 Alstead Master Plan, including the Town's Vision statement to protect and conserve its natural resources as follows:

- Seek to permanently protect large areas of unfragmented forests and agricultural land through purchase in fee or development rights.
- Enhance protection measures for water resources, farmland, river corridors, groundwater, forested areas, wildlife habitat, wetlands and open space.
- Seek ways to protect the Cold River corridor, designated as a special resources of statewide significance by the NH Rivers Program.
- Collaborate with the several entities already working to protect the water resources found in Alstead and update the Water Resources Management Plan
- Review the Town's Zoning Ordinance periodically to ensure that local zoning adequately balances potential development while protecting natural resources.
- Create an Open Space Plan and a Land Conservation Plan to protect and preserve sensitive environmental areas and help guide public policy regarding development.
- Maintain recreational opportunities such as hunting, fishing, snowmobiling, cross country skiing, horseback riding and hiking, in concert with an Open Space and Land Conservation Plan.
- Foster a good relationship between outdoor enthusiasts and land owners.
- Support sustainable development through use of environmentally friendly regulations, building practices, energy sources, and reduced carbon emissions where appropriate.
- Support efforts to implement the Town's Hazard Mitigation Plan and Cold River Restoration Plan.

Since then, the Alstead Conservation Commission has continued with their conservation planning efforts and identifying significant natural resources to benefit its residents. In 2018, the conservation commission contracted with Moosewood Ecological to initiate a town-wide wetlands evaluation. The overall purpose of this project is to better understand the ecological functions and societal values of Alstead's wetlands.

Wetland resources represent some of our most fragile ecosystems and are particularly sensitive to certain types of adjacent land uses. Wetland resources provide a variety of ecological functions and societal values, including:

- Water quality maintenance
- Flood control
- Wildlife and fisheries habitat
- Drinking water sources
- Recreation
- Visual quality and aesthetics
- Rare and endangered species habitat and natural communities
- Groundwater recharge and discharge
- Shoreline stabilization
- Educational and scientific value
- Overall biological diversity of Alstead

Wetlands generally include familiar places such as marshes, wet meadows, beaver impoundments, swamps, fens, bogs, streams, ponds, and lakes. As noted above, they perform a variety of ecological functions and values that benefit humans. They also serve as significant habitats for wildlife and plants. In New Hampshire, wetlands are defined by RSA 482-A:2 as "an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal conditions does support, a prevalence of vegetation typically adapted for life in saturated soils conditions." They are further defined by three particular elements, including hydrophytic vegetation, hydric soils, and wetlands hydrology. As such, wetlands are

regulated by the NH Dept. of Environmental Services Wetlands Bureau as defined in RSA 482-A:2. They are also regulated at the federal level by the US Army Corps of Engineers.

To better understand the distribution of wetlands and the functional roles that they perform in Alstead a town-wide wetlands comparative evaluation was conducted using the Method for Inventorying and Evaluating Freshwater Wetlands in New Hampshire (Stone and Mitchell 2015), also referred to as the "NH Method." The general approach of this method is to evaluate wetlands on the basis of their *functional value*, that is, the value that they hold for human society in improving and maintaining quality of life. The complete document can be found at nhmethod.org

The overall purpose of this evaluation is to provide a better sense of both the location and the characteristics of the wetlands within Alstead. The fact that a *comparative* method was employed suggests that the reader has great latitude in placing a higher or lower value on a particular wetland under scrutiny. As is described below, the intention is to allow for a comparison of wetland *functions*, and not an overall value that a wetland received as a whole. This report serves to engender an understanding of the reasons *why* a particular wetland can serve a particular function better than others, as well as what it uniquely contributes to a given area of the town.

The NH Method arose out of an increasing need to adequately understand and evaluate wetland resources in the state of New Hampshire. Adopted from the Method for Evaluation of Inland Wetlands in Connecticut developed by Al Levere and Alan Ammann, it was initiated and supported by the Wetlands Studies Project of the Audubon Society of New Hampshire under the guidance of Amanda Lindley Stone.

A tremendous amount of research and field testing went into both the parent edition in Connecticut, as well as the current methodology used in New Hampshire, which was revised in 2015. The primary objective of the written work was that it be understandable by the general public; however, contrary to many of the current methods of wetland evaluation available to consulting scientists and researchers, this guide has successfully provided a manual of broad appeal for the lay person.

The fundamental tenet of this methodology is that it identifies various functions of wetlands and assigns a value to those functions. For the purpose of this work, a

"function" is defined as what the wetland does (e.g., provides floodwater storage, improves water quality) and a "value" is the evaluation of how important a particular function is.

The NH Method is a rapid assessment that asks a set of questions that are answered using field assessments and remote spatial data (e.g., aerial photography) in a geographic information system (GIS). The accuracy of the assessment is dependent on the theoretical knowledge of the observer regarding the abiotic and biotic factors that influence the "field indicators" observed.

As mentioned above, the Alstead Conservation Commission contracted with Moosewood Ecological LLC in 2018 to initiate the first phase of the town's wetlands evaluation project. The first phase had two main goals, including mapping wetlands throughout the town and evaluating wetlands using the NH Method (Stone and Mitchell 2013).

A major effort put forth as part of the wetlands evaluation project was to revise the wetlands data layer to better reflect the true extent of Alstead's wetlands. This revised data was achieved using 2015 aerial photography interpretation (API) in combination with the National Wetlands Inventory (NWI) and hydric soils data. Discernible wetlands were mapped as entire systems. No attempt was made to adjust boundaries between the existing Cowardin (1979) system of wetland classification used by the NWI.

As part of this mapping process wetlands were field-checked to the extent possible using a combination of roadside surveys and limited on-site assessments of selected properties. Mapping data is used for planning purposes only, and wetlands do not reflect jurisdictional wetland boundaries. Users agree with Moosewood Ecological LLC's GIS data disclaimer (Appendix A).

All wetlands 1 acre and larger were selected for the wetlands evaluation. The goal of the evaluation was to better understand wetlands as they related to water quality, flood control, and groundwater recharge. As such, five functions were chosen from the NH Method for Alstead's evaluation. These included Flood Storage, Groundwater Recharge, Sediment Trapping, Nutrient Transformation, and Shoreline Anchoring.

In 2019, the conservation commission initiated the second phase of the wetlands project though the assistance by Moosewood Ecological LLC. They sought to develop a

more comprehensive comparative evaluation that included the remaining 7 functional values. These included Ecological Integrity, Wetland-dependent Wildlife Habitat, Fish and Aquatic Life Habitat, Educational Potential, Scenic Quality, Wetland-based Recreation, and Noteworthiness.

RESULTS AND DISCUSSION

Wetlands Overview

A total of 271 palustrine wetlands were mapped (Littleton 2019), covering approximately 1,096 acres, or 4.4% of Alstead (Figure 1). Of the 271 wetlands, 31 were identified as potential vernal pools (Figure 2). Palustrine wetlands are characterized by the presence of trees, shrubs, and emergent vegetation such as grasses, sedges, rushes, and wildflowers. They range from permanently saturated to flooded areas such as marshes, swamps, peatlands, beaver ponds and lakes shores to areas that's are only seasonally ponded such as vernal pools.

The average size of all palustrine wetlands in Alstead was 4.1 acres, ranging from 0.01 acre to 43.5 acres. All wetlands 1-acre and larger were chosen to be evaluated for this project, resulting in a total of 138 wetlands covering 873 acres for the comprehensive comparative evaluation in Alstead. The average size of these wetlands was 6.3 acres. The evaluation results for these 138 wetlands can be found in Appendix B. These tables provide the overall scores for each of the 12 functional values. Data forms for each functional value can be found in Appendix C. Below is a summary of the wetlands that scored in the top 10% for wetland functions.

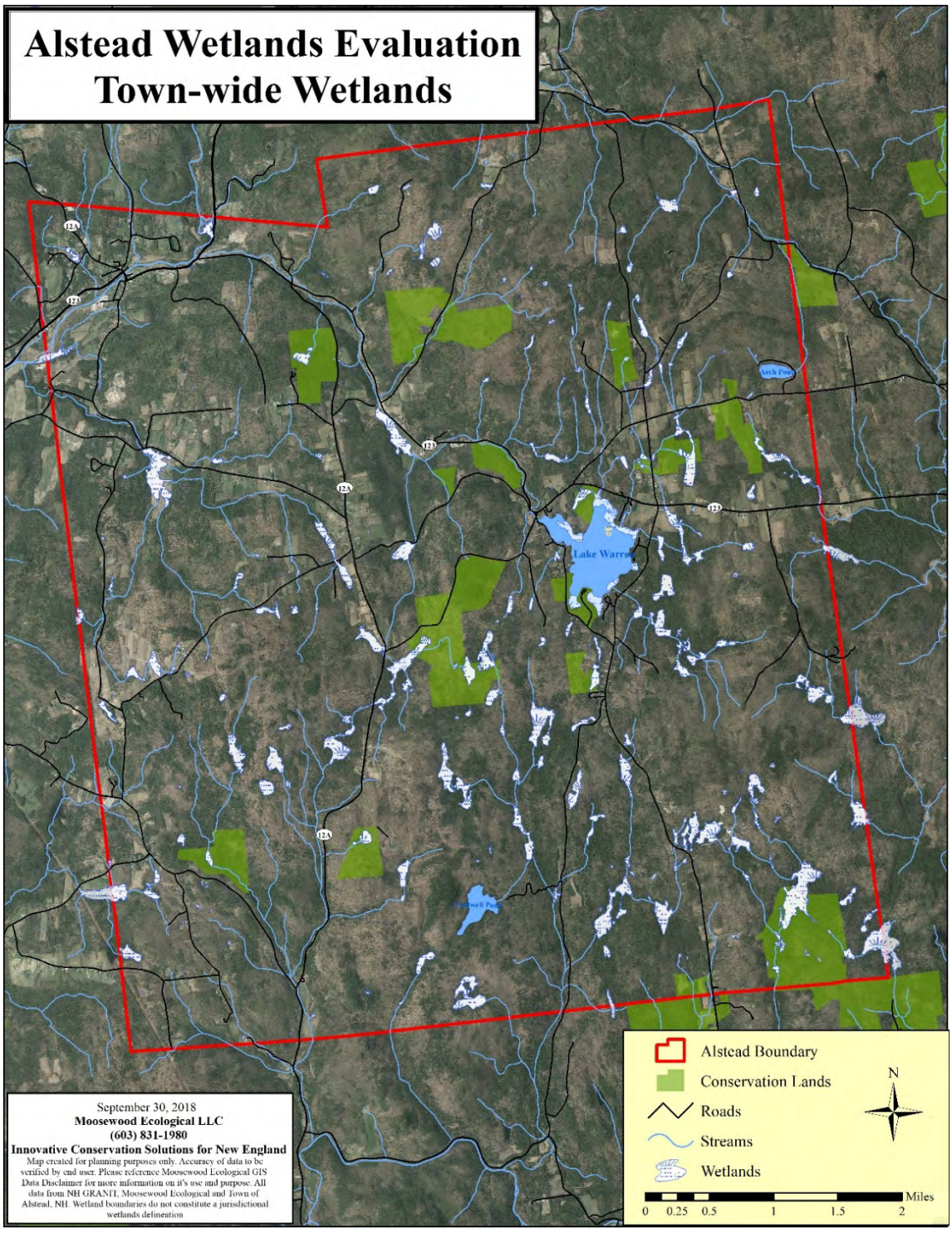

Figure 1 Distribution of wetlands in Alstead, NH.

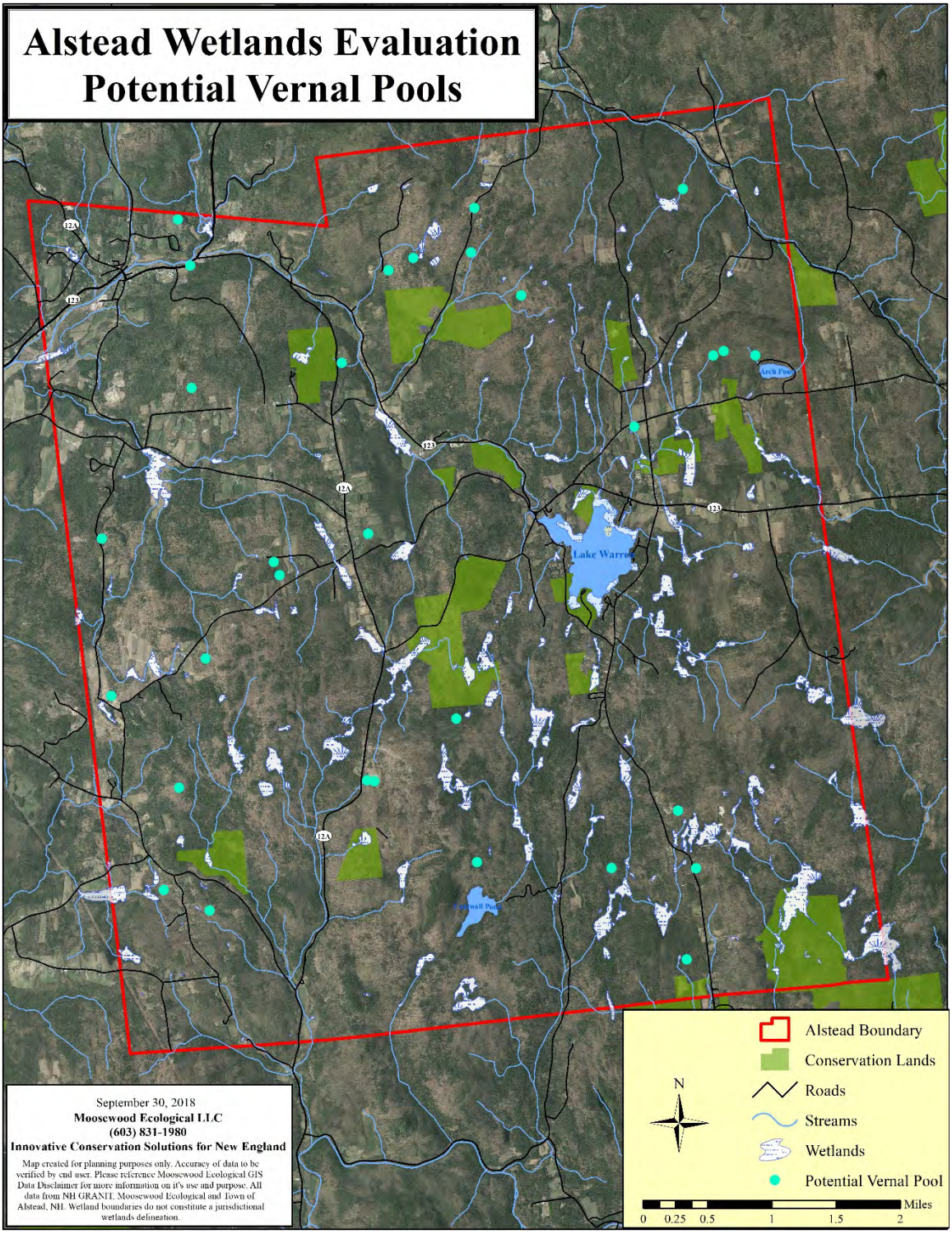

Figure 2 Distribution of potential vernal pools in Alstead, NH.

Wildlife Habitats and Ecological Integrity

There are three functional values that help us better understand which wetlands scored highest for providing the best ecological integrity and wildlife habitats. These functional values include Ecological Integrity, Wetland-dependent Wildlife Habitat, and Fish and Aquatic Life Habitat. Ecological Integrity is an overall view of the health or condition of a wetland. It seeks to better understand which wetlands demonstrate healthy signs of an unstressed ecosystem as it relates to unimpaired structure and function of wetlands by human activities; native plant diversity and presence on invasive, non-native plants; and properly functioning ecological processes. More specifically, this function addresses the following aspects:

- Land use within the wetland's watershed
- Evidence of the wetland being filled by humans
- Impacts of agriculture and logging, as well as other human activities such as trails, roads, and garbage within wetlands
- Presence of invasive plants
- Level of roadways within and adjacent to wetlands
- Level of human activity within 500 feet of wetlands
- Percent of impervious surfaces within 500 feet of wetlands
- Presence of human-made structures (such as dams and culverts) that regulate flow of water within wetlands

Wetlands provide habitat for a variety of wildlife. An evaluation of the Wetland-dependent Wildlife Habitat and Fish and Aquatic Life Habitat helps us to understand which wetlands in Alstead perform the best for these functional values. Wetland-dependent species are wildlife that typically use both upland and wetland habitats for their life cycles. These include a diverse assemblage of species such as moose, otter, mink, snakes, turtles, frogs, salamanders, waterfowl, eagle, osprey, and herons. The other functional value examines how well wetlands perform for aquatic species including fish, mussels, clams, crayfish, and aquatic macroinvertebrates.

Many topics are addressed to evaluate the functionality of wetlands as wildlife habitat. These include:

- Size of wetland and overall ecological integrity
- Water quality degradation due to land use within the wetland's watershed
- Type and size of open water habitats
- Number of different vegetated wetland habitats
- Proximity to other wetlands
- Access of travel corridors for wildlife
- Presence of invasive plants
- Level of disturbance within 500 feet of the wetland
- Stream width within a wetland
- Level of alteration of the stream channel within a wetland
- Diversity of substrates within the stream channel
- Presence of large trees and boulders
- Presence of floating and submerged vegetation
- Presence of human-made structures that restrict movement of aquatic organisms
- Presence of species of conservation concern

The top 10% for Ecological Integrity includes wetlands that scored 9.5-10. There is a total of 46 wetlands that score within this range (Table 1 and Figure 3). There are 18 wetlands that ranked within the top 10% scoring bracket for Wetland-dependent Wildlife Habitat, and 25 wetlands for Fish and Aquatic Life (Tables 2 and 3 and Figures 4 and 5, respectively). These wetlands scored high for this function due to their proximity to developments (roads, homes, businesses, etc.) whereby having relatively low human-related stressors.

Table 1 Top scoring wetlands for Ecological Integrity.

Score	Wetland
10	18, 52, 53, 54, 86, 87, 88, 89
9.5	5, 7, 8, 9, 11, 12, 13, 14, 16, 17, 20, 21, 26, 29, 30, 31, 34, 36, 37, 38
	39, 41, 42, 43, 44, 56, 81, 85, 92, 94, 98, 100, 101, 111, 113, 126, 127, 128

Table 2 Top scoring wetlands for Wetland-dependent Wildlife Habitat.

Score	Wetland
8.5	11
8.1	7, 14
7.7	30, 36, 44, 55, 88, 89
7.6	21, 34
7.5	84
7.2	9, 24, 31, 43, 85, 113

Table 3 Top scoring wetlands for Fish and Aquatic Life Habitat.

Score	Wetland
6	7
5.6	99
5.1	14
4.8	111
4.7	6, 36, 84
4.6	54
4.5	11
4.4	1, 8, 68
4.3	23, 37, 43, 66, 77, 78, 85, 87, 88, 89, 96, 114, 115

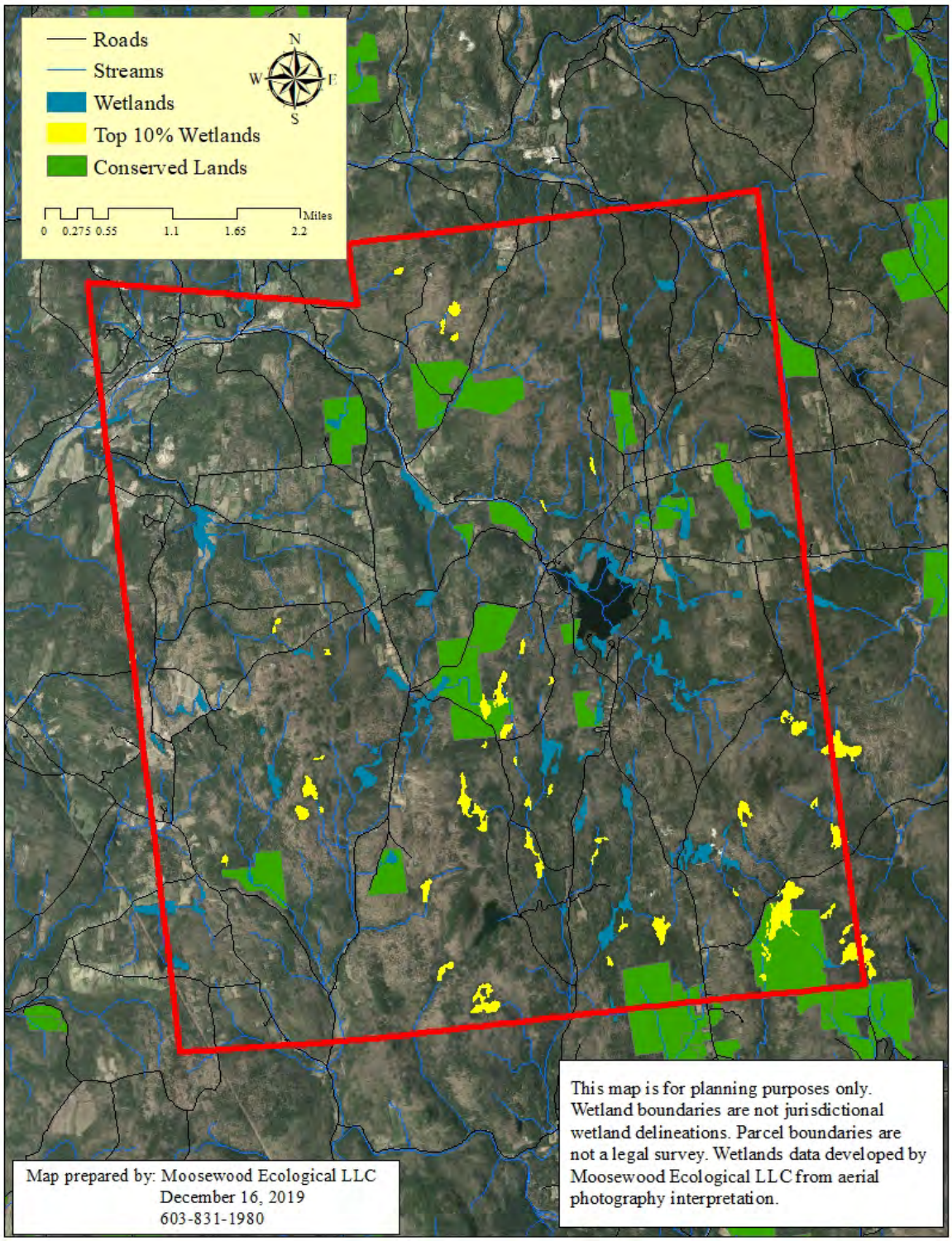

Figure 3 Location and distribution of the top 10% scoring wetlands for Ecological Integrity.

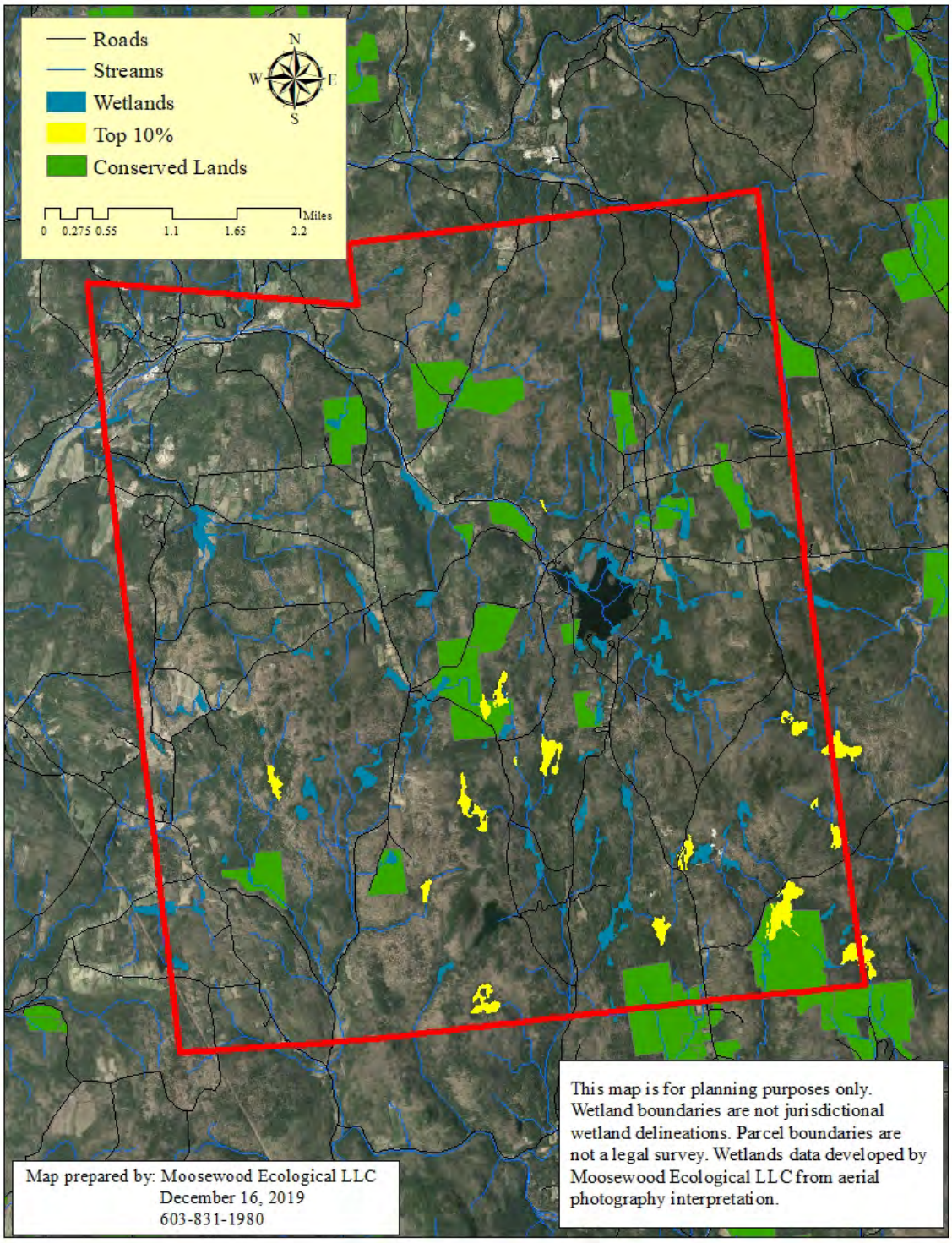

Figure 4 Location and distribution of the top 10% scoring wetlands for Wetland dependent Wildlife Habitat.

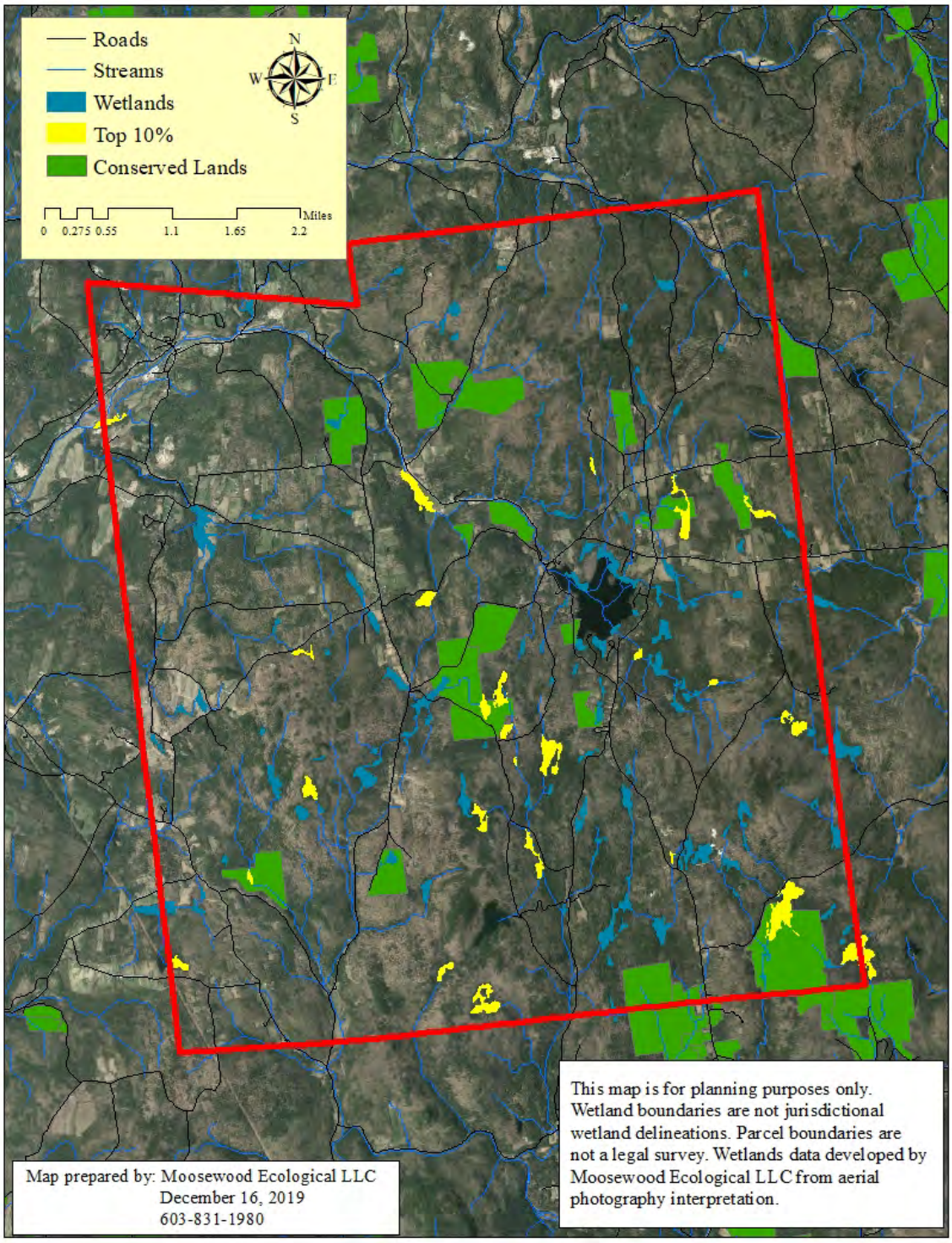

Figure 5 Location and distribution of the top 10% scoring wetlands for Fish and Aquatic Life Habitat.

Scenic Quality, Education, and Wetland-based Recreation

Wetlands provide a variety of benefits that humans value outside of the ecological functions that they perform. These include scenic quality, education, and recreation. Wetlands are often revered for their beauty and wildness, as well as their soothing ability to promote calmness. While viewing over a wetland one might find a striking contrast with its surrounding forested and hilly landscape. These visual contrasts are possibly marked by the presence of open water and marsh habitat with shrubs along the back edge where the wetland starts to meet the forest. Scenic Quality is evaluated by a variety of parameters, including accessibility, visual extent across the wetland, visual contrast with the surrounding landscape, and level of visual disturbance. The top 10% scoring bracket for Scenic Quality included 17 wetlands (Table 4 and Figure 6).

Table 4 Top scoring wetlands for Scenic Quality.

Score	Wetland
10	11
9.5	24, 99, 129
8.5	7, 36, 46, 51, 55, 84, 87, 96, 123
8.3	2, 70, 97, 138

Education Potential assesses the overall ability of a wetland to provide a site for field studies that examines ecological principals important for healthy ecosystems. Topics covered for the evaluation of each wetland included the overall ecological integrity, scoring for wildlife habitats, parking and accessibility, number of wetland habitats available for study, and scenic value. A total of 14 wetlands were identified as being within the top 10% scoring bracket (Table 5 and Figure 7).

Table 5 Top scoring wetlands for Educational Potential.

Score	Wetland
8.3	99
8.1	70
7.5	45, 96
7.3	97, 123
7.1	11
6.8	24
6.6	2
6.2	6.2
6.1	76
5.8	19
5.7	48
5.6	138

Another value that we receive from wetlands is the ability for recreational activities. Recreational opportunities within and adjacent to wetlands include hiking, hunting, fishing, canoeing and kayaking, nature observation, and photography. Evaluating a wetland's function for Wetland-based Recreation includes accessibility to open water, adequate parking, trails-based recreation, wildlife habitat quality, and scenic value. There are 15 wetlands that rise to the top 10% scoring bracket for this functional value (Table 6 and Figure 8).

Table 6 Top scoring wetlands for Wetland-based Recreation.

Score	Wetland
6.6	11
7.1	24
7.6	33
7.8	46, 129
6.1	51
5.9	70
6.2	84
6.8	99
5.7	116, 131, 133, 134
8.2	123
5.8	137

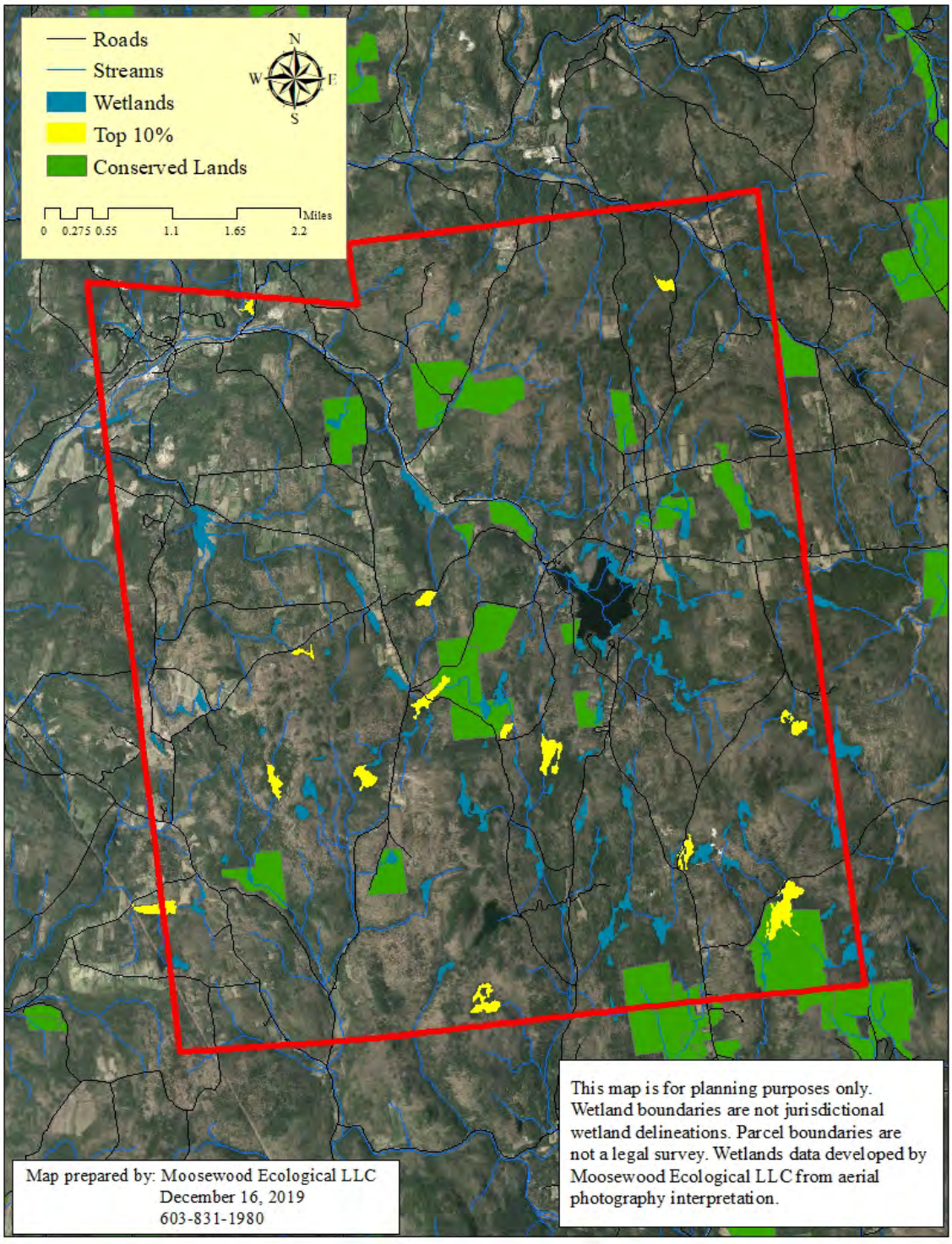

Figure 6 Location and distribution of the top 10% scoring wetlands for Scenic Quality.

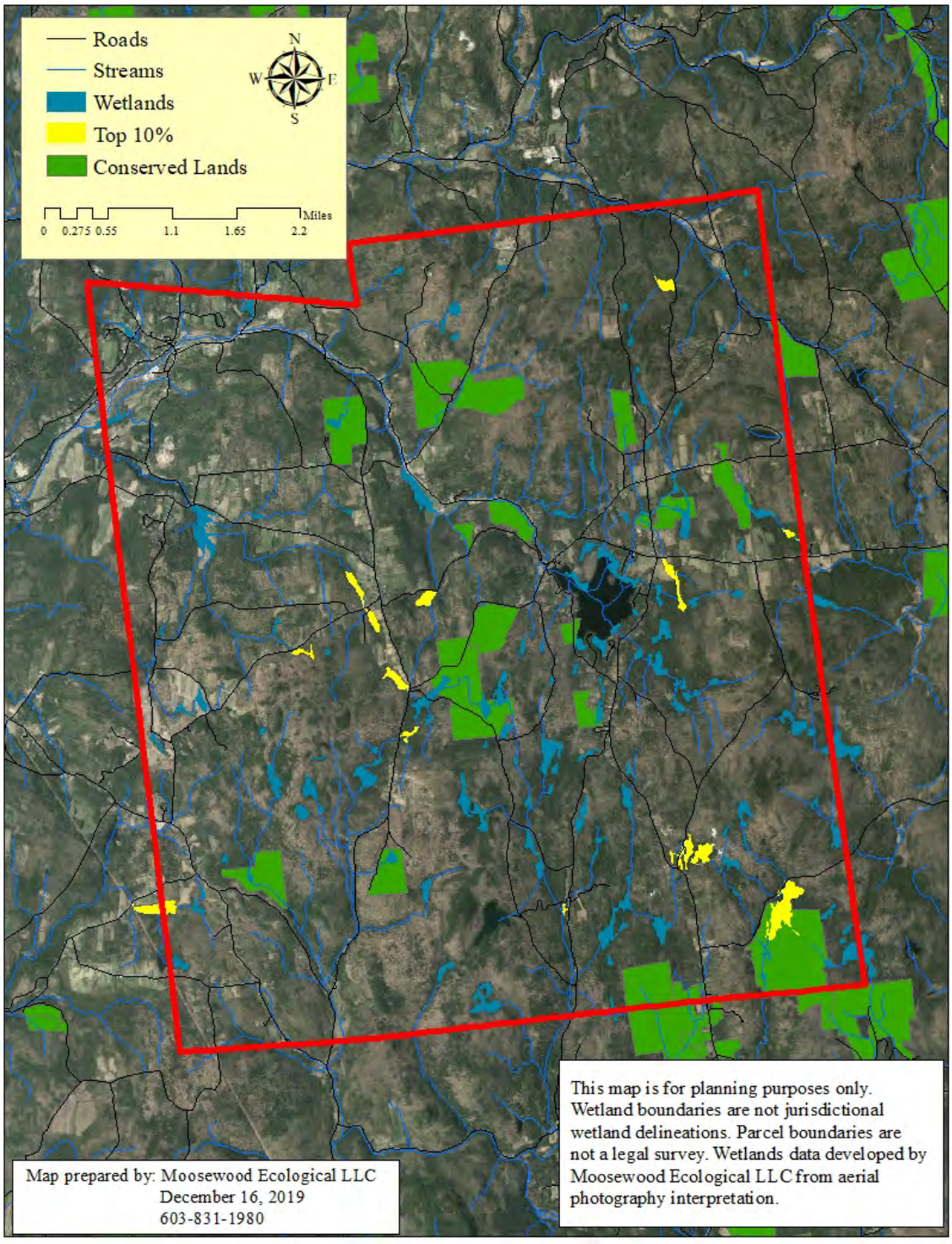

Figure 7 Location and distribution of the top 10% scoring wetlands for Education Potential.

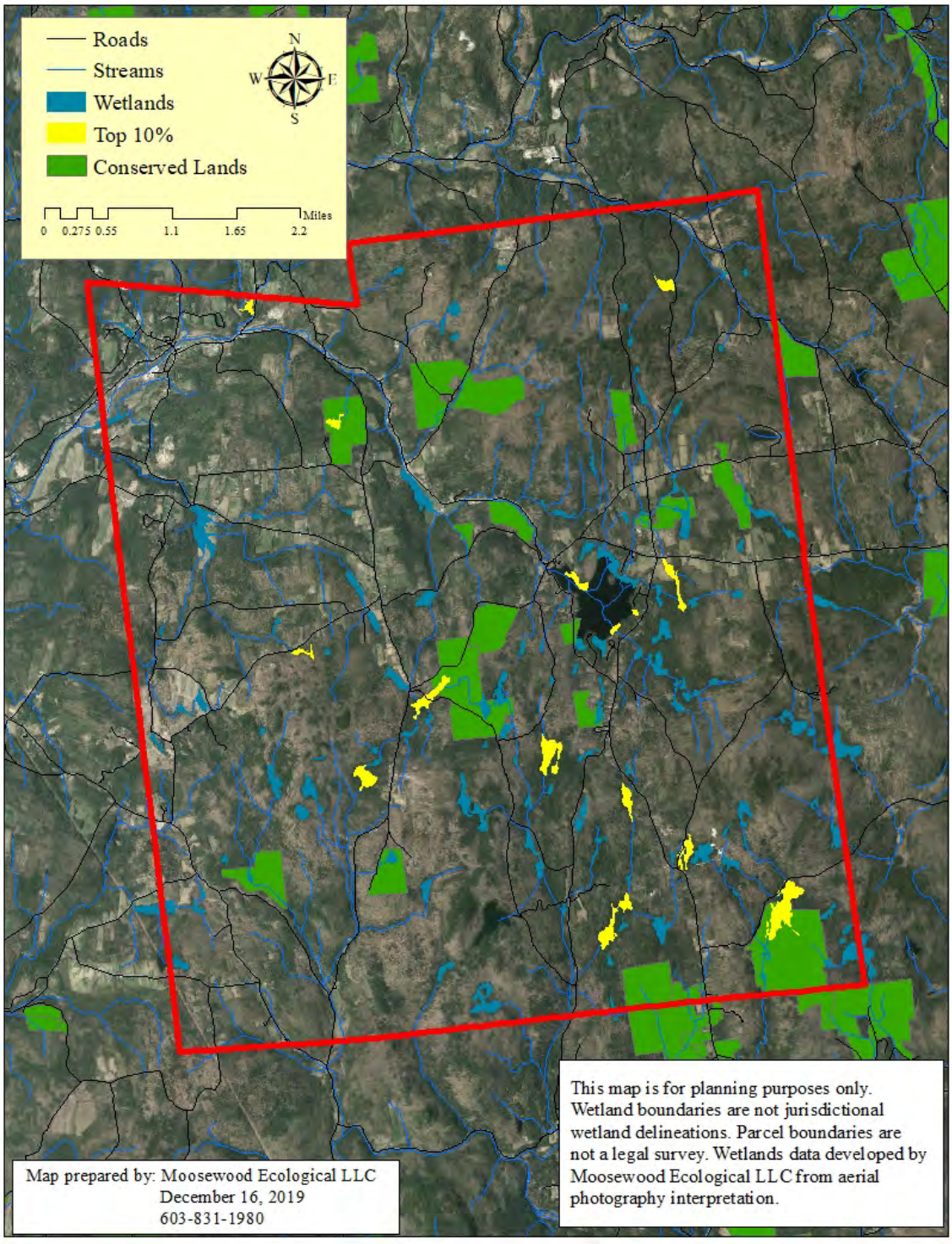

Figure 8 Location and distribution of the top 10% scoring wetlands for Wetland-based Recreation.

Flood Storage

Wetlands naturally help with storing floodwaters during heavy rainfall and melting snow during late winter and spring. During these events wetlands temporarily retain water in depressions, and the various types of vegetation (i.e., shrubs, trees, grasses, and wildflowers) help to slow the release of floodwaters, regulating flooding downstream. Various land uses can affect the ability of wetlands to store floodwaters. These include the increase of impervious surfaces such as roads, parking lots, and buildings that prevent the natural infiltration of rain and snow into the ground. Loss of forested habitat and floodplain wetlands can also negatively impact the flood storage capabilities of wetlands. These elements are critical as our rain events have changed over the past several decades, resulting in more intense storms and rainfall. Therefore, our wetlands and intact uplands forests are vital to helping retain floodwaters during such heavy rain events.

The intent of evaluating this function was to better understand those wetlands in Alstead that have relatively high value to attenuate floodwaters. A variety of features were used for this evaluation, including wetland size, watershed size, location of the wetland within a watershed, and estimating the flood storage volume. Since all wetlands were not visited, we assigned a standard water storage depth of 1 foot, as recommended by the NH Method.

The resulting flood storage index provides an approximate value on a wetland's ability to store floodwaters. Table 7 and Figure 9 provide a summary of the flood storage indices of wetlands throughout Alstead.

Table 7 Flood storage index summary for Alstead, NH.

Flood Storage	Number of	Acreage			
Index	Wetlands	Minimum	Maximum	Mean	Total
Moderate Value	33	4.9	43.4	14.3	471.5
Low-Moderate Value	87	1.1	22	4.3	377.2
Low Value	18	1	1.9	1.4	24.3

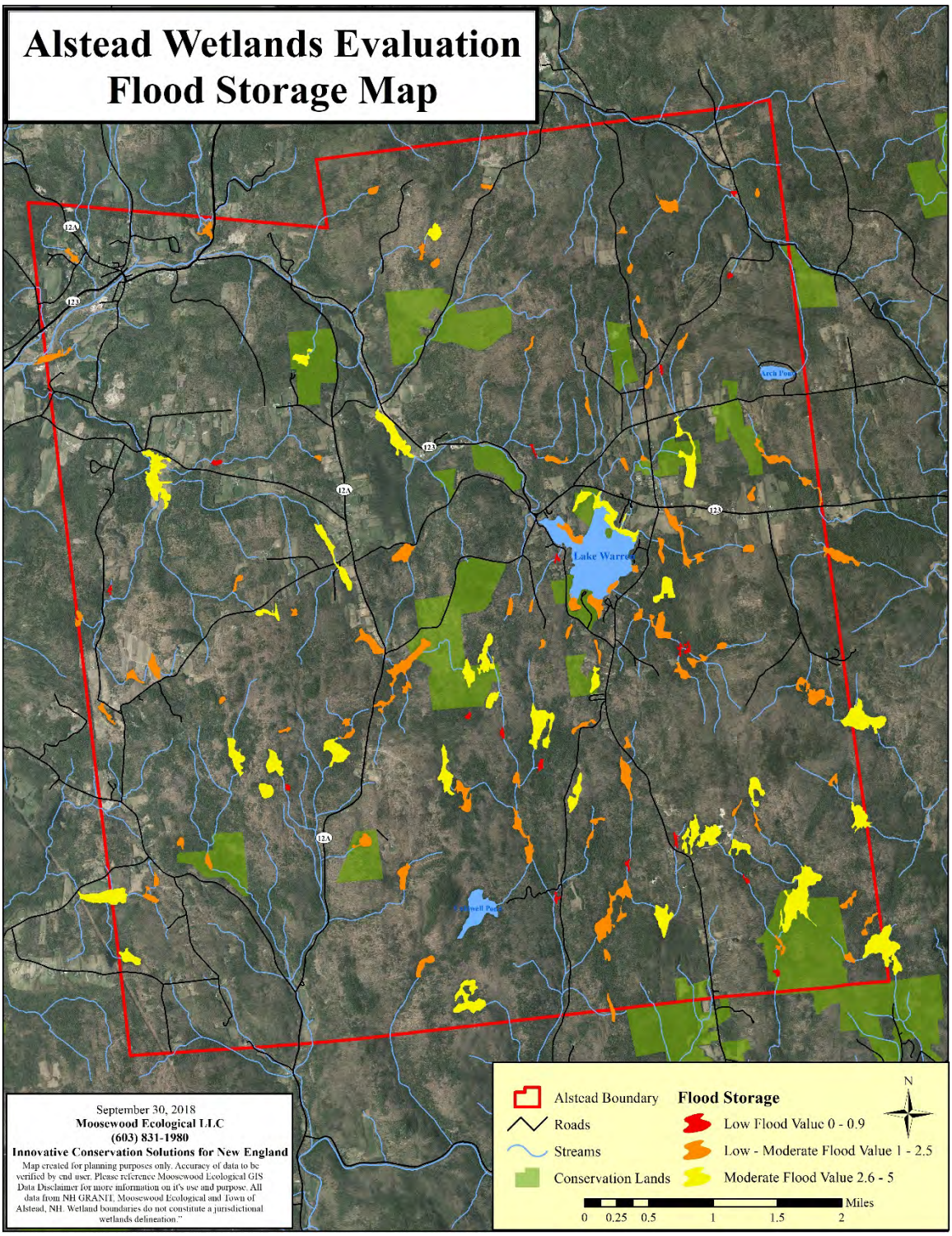

Figure 9 Distribution and flood storage values of wetlands in Alstead, NH.

Water Quality

Wetlands have a tremendous ability of helping to maintain good water quality by controlling sediments, nutrients, and other toxic materials in surface waterbodies and other wetlands. These elements can be very harmful or fatal for a variety aquatic wildlife. It also has negative effects on aquatic-dependent species such as beaver, otter, mink, waterfowl, frogs, and salamanders, as well as humans.

Three critical ecological functions were included in this study to serve as a surrogate to better understand which wetlands in Alstead help to maintain overall good water quality. These included Sediment Trapping, Nutrient Removal, Retention, and Transformation, and Shoreline Anchoring.

Sediment Trapping is the process by which plants within wetlands and the adjacent upland forest prevent sediments from entering surface waters. This is important since toxicants, such as pesticides and petroleum products, adhere to sediments and enter our lakes and rivers. Wetland plants play a vital role in preventing these toxicants from entering into aquatic systems that we enjoy for swimming, boating, and fishing. This functional value addresses topics such as flood storage value, constriction of wetland outlet, percent of vegetation present, size ratio of the wetland to its watershed, character of the flow through the wetland, wetland gradient, and the average depth of water during the growing season.

Nutrient attenuation involves the retention, removal, and uptake of nutrients as they enter wetlands. This function is achieved by plants and soils that capture or transform excess nutrients such as phosphorus and nitrogen into less harmful agents that typically impact water quality and aquatic organisms, such as fish. Elements this functional value evaluates includes flood storage and sediment trapping values, percent of vegetation cover, soils types within the wetland, and the length of time of standing water or saturated soils.

Lastly, Shoreline Anchoring involves the stabilization of edges of ponds, lakes, and streams to prevent sediments from entering wetlands and aquatic systems. Trees, shrubs, and herbaceous plants help to hold soil in place during heavy water flows associated with rainfall and snow melting events. This helps to stabilize banks, trap sediments, and attenuate nutrients.

These three functional values can provide a sense of the overall ability of a wetland to help maintain and/or control water quality. Table 8 and Figure 10 provide a summary of the water quality indices of wetlands throughout Alstead.

Table 8 Water quality index summary for Alstead, NH.

Water Quality	Number of	Acreage			
Index	Wetlands	Minimum	Maximum	Mean	Total
Highest Value	16	2.2	29.1	12.5	200.3
Higher Value	97	1	43.4	5.5	534
Moderate Value	25	1	22	5.6	138.7

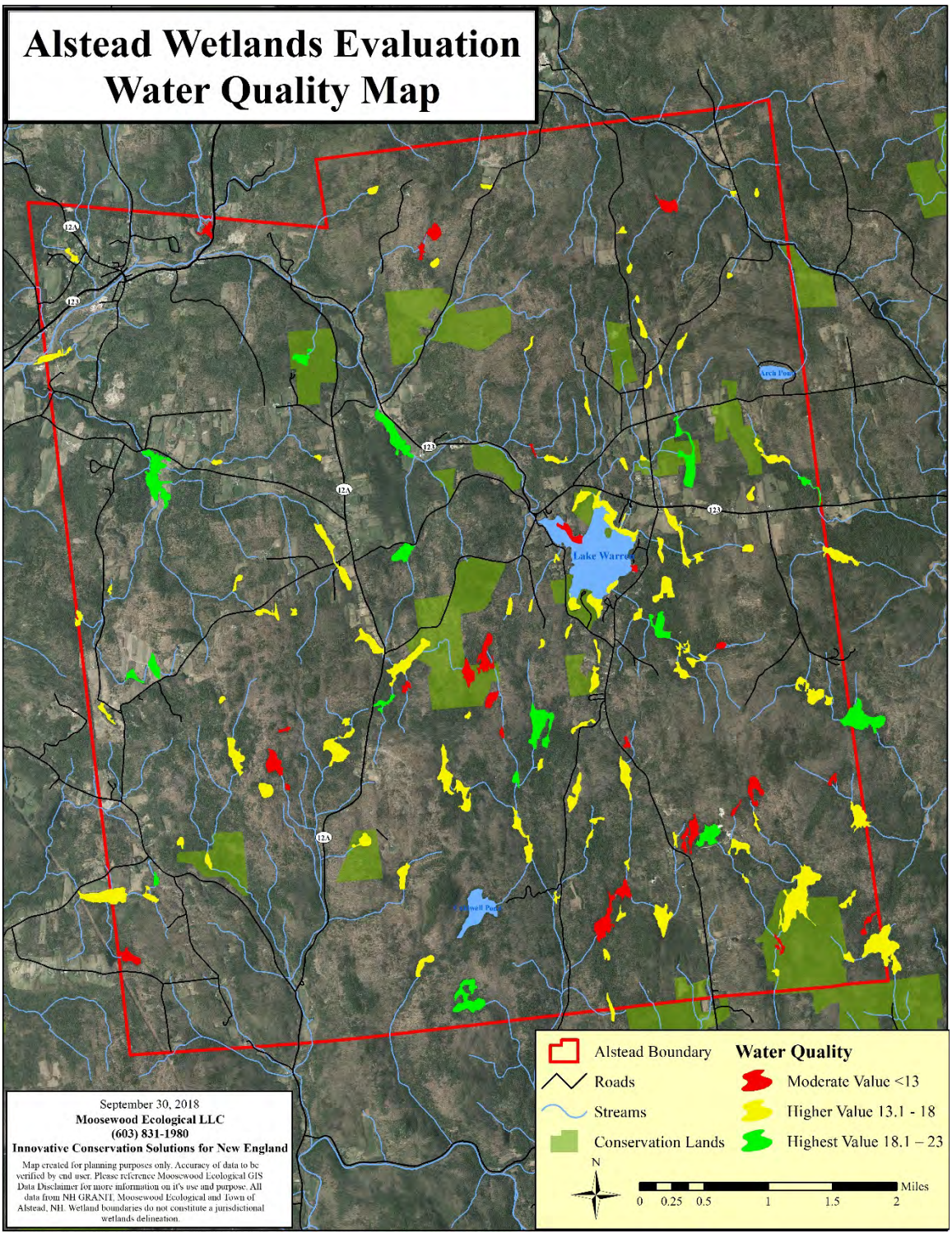

Figure 10 Distribution and water quality values of wetlands in Alstead, NH.

Groundwater Recharge

Wetlands have an important ability to recharge groundwater resources. In certain circumstances they can provide a source to recharge drinking water supplies located within the ground.

Groundwater resources are stored in two main types of aquifers and can serve as sources for drinking water. Aquifers can be located within saturated areas of sand and gravel deposits or in fractured bedrock. In the past as glaciers melted, they left behind layers of coarse sediments including sand and gravel. The space between these sediments provides opportunity for groundwater storage and flow. Groundwater stored in *stratified drift aquifers* of this kind can serve as an excellent source for drinking water. Locating and protecting these geologic features can help to ensure a supply of clean drinking water for the community as these areas are vulnerable to contamination.

Questions associated with the Groundwater Recharge function are related to how well a particular wetland can recharge groundwater resources since clean drinking water is vital to all wildlife and humans alike. Therefore, this function mainly relates to the wetlands in relation to Alstead's stratified drift aquifers. These are located along the Cold River and Darby Brook in the northwestern part of town, as well as south of Lake Warren. Other attributes this function takes into account are the types of soils that are conducive to recharging these aquifers. Table 9 and Figure 11 provide a summary of the groundwater recharge indices of wetlands throughout Alstead.

Table 9 Groundwater index summary for Alstead, NH.

Groundwater	Number of	Acreage			
Index	Wetlands	Minimum	Maximum	Mean	Total
Very High Value	6	1	29.1	8.4	50.5
Moderate Value	2	1.8	22.8	12.3	24.6
Moderate-Low Value	4	1.3	4.6	2.6	10.3
Low Value	126	1	43.4	6.3	787.6

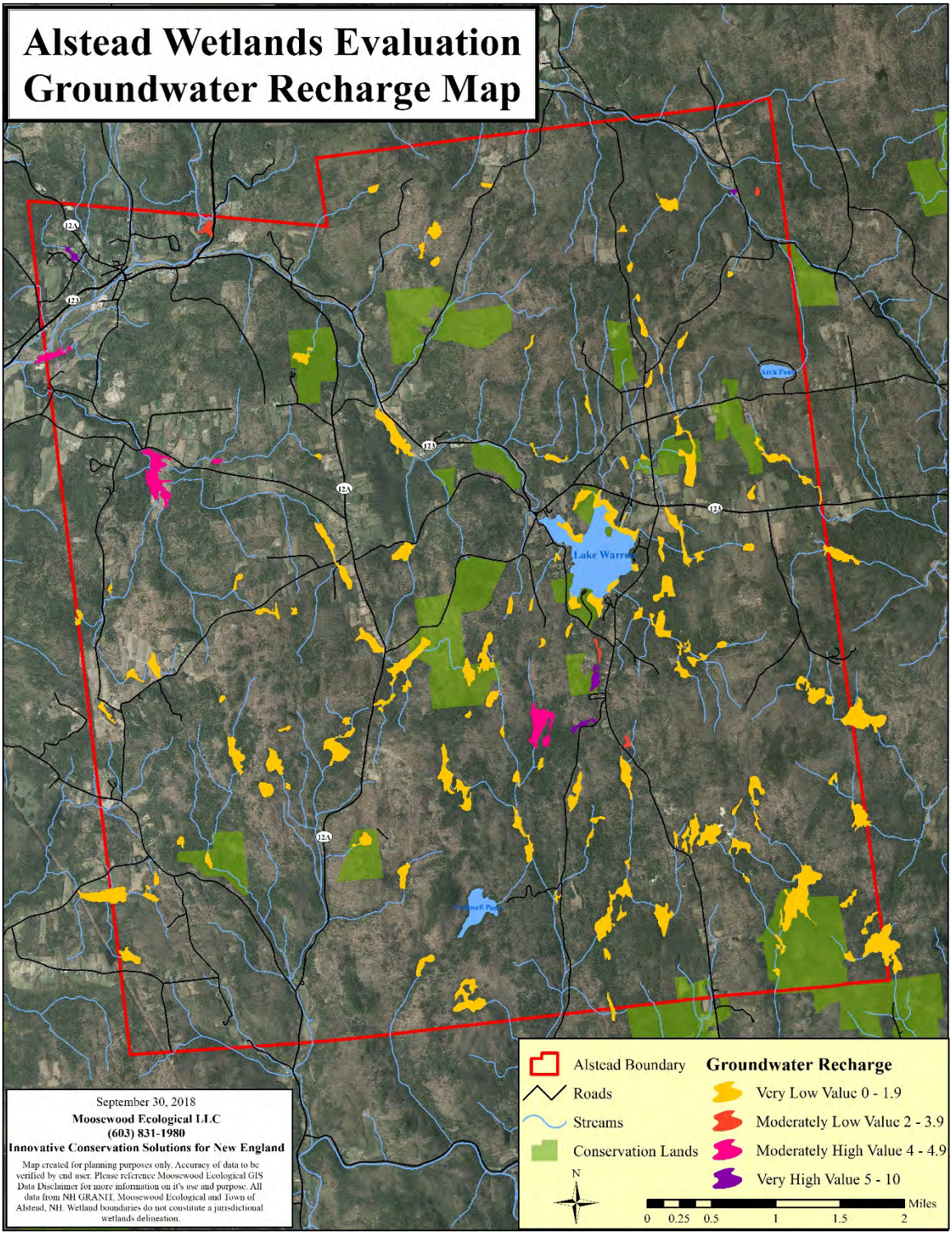

Figure 11 Distribution and groundwater recharge values of wetlands in Alstead, NH.

Noteworthiness

This part of the wetlands evaluation affords the opportunity to examine a variety of other attributes that are important beyond the ecological functions and societal values outlined above. Noteworthiness informs us about how a particular wetland fits into the larger landscape of conservation planning and local/regional significance. Topics addressed include local significance due to high scores for each functional value, proximity of wetlands within conservation plans such as the NH Wildlife Action Plan and other regional plans, as well as biological, geological, historical, and archaeological significance.

CONCLUSIONS

Alstead contains a wide array of wetland habitats that are used by many species of plants and wildlife. Numerous species of greatest conservation need identified by the NH Wildlife Action Plan (2015) can be found using these wetlands and adjacent habitats. Alstead's wetlands and their riparian edges provide some of the most diverse areas where aquatic, semi-aquatic, and terrestrial species can be found breeding, feeding, rearing young, and migrating. Some of these wetlands also offer great functionality for storing floodwaters, helping to maintain good water quality, and recharging groundwater resources. It is clear that Alstead has some very significant wetlands that offer great environmental benefits for humans and wildlife alike.

Planning for the protection of significant habitats, ecological resources, and biological diversity is an ongoing process as more is learned from scientific research and the effects of land use. Fortunately, today communities and land use planners are better equipped with various tools to assist with informed decision making. One such tool is the Alstead Wetlands Comparative Evaluation project.

The data developed during this project can be used in a variety of manners. This report should be viewed as an extension of the Alstead Conservation Plan (2009) as it builds upon the natural resources data currently known in the town. Other uses include, but are not limited to, the following:

- Landowner outreach for wetlands management based on the functions identified above. An informational packet can be prepared to assist landowners with land use and management adjacent to wetlands. This packet could include a list of the functional values for each wetland, a map of the wetland or wetlands on the property, a copy of the description of each wetland type found in the NH Wildlife Action Plan, and a brochure(s) about each wetland type. Brochures can be ordered from the UNH Cooperative Extension at:
  https://extension.unh.edu/tags/habitat-stewardship-brochures
- Outreach and education on the functional values of wetlands for community members and town officials, including the board of selectmen, planning board, and zoning board of adjustment
- Local planning techniques and decision-making such as zoning and subdivision regulations, as well as identifying prime wetlands under RSA 482 A:15
- Comments by the Conservation Commission to the NH Wetlands Bureau and the US Army Corps of Engineers on state and federally permitted projects association with wetlands and their adjacent uplands
- Voluntary land protection efforts with willing landowners interested in the conservation of their wetlands and surrounding landscape
- Development of a town-wide conservation plan that identifies significant wetlands and other natural resources in Alstead
- Acquisition of potential grant funding for wetlands conservation

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WETLANDS RESOURCES

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APPENDIX A

GIS DATA DISCLAIMER

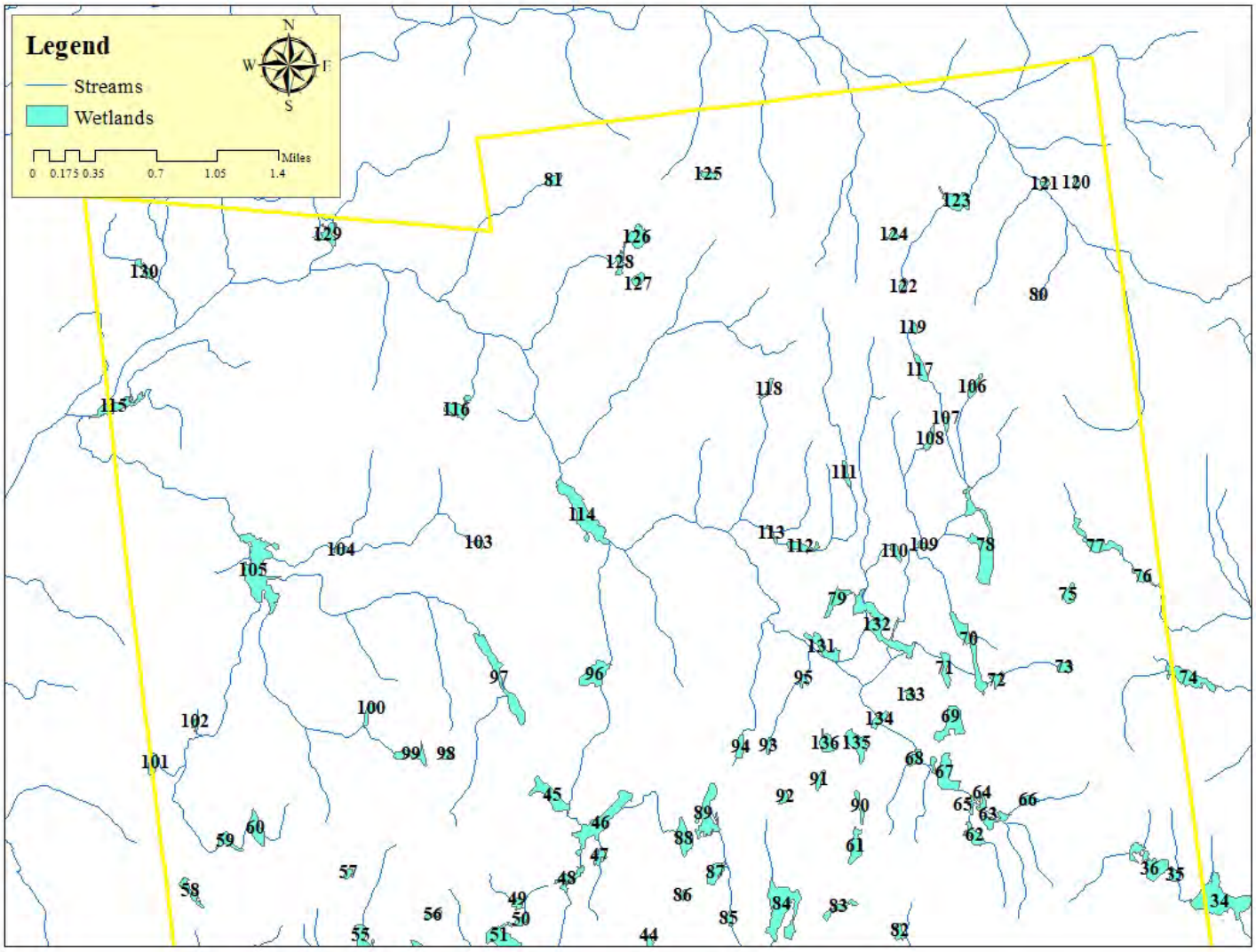
Moosewood Ecological LLC GIS Data Disclaimer

A variety of existing and newly created data layers were used to prepare the wetland maps. These existing data have been developed by numerous government agencies and other sources. They have been produced specifically for the town, the state of New Hampshire, or the entire United States using *remote data*. These sources of remote data were developed from the interpretation of satellite imagery and aerial photography. The data were produced at various scales and therefore, represent different degrees of errors, omissions, and inaccuracies. Moosewood Ecological LLC developed the wetlands data from aerial photography interpretation.

The maps are for education and planning purposes only. They are suitable for general land use planning. However, they are not suitable for detailed site planning and design, including wetlands delineations and other jurisdictional determinations. As such, boundaries of wetlands are approximate locations and should be field verified. The accuracy of the data is the end user's responsibility, and Moosewood Ecological LLC cannot be responsible for the accuracy and completeness of the data. Moosewood Ecological LLC makes no warranty, expressed or implied, as to the accuracy or completeness of the data. Furthermore, Moosewood Ecological LLC shall assume no responsibility for any errors, omissions, or inaccuracies in the information provided.

APPENDIX B

WETLANDS RANKING RESULTS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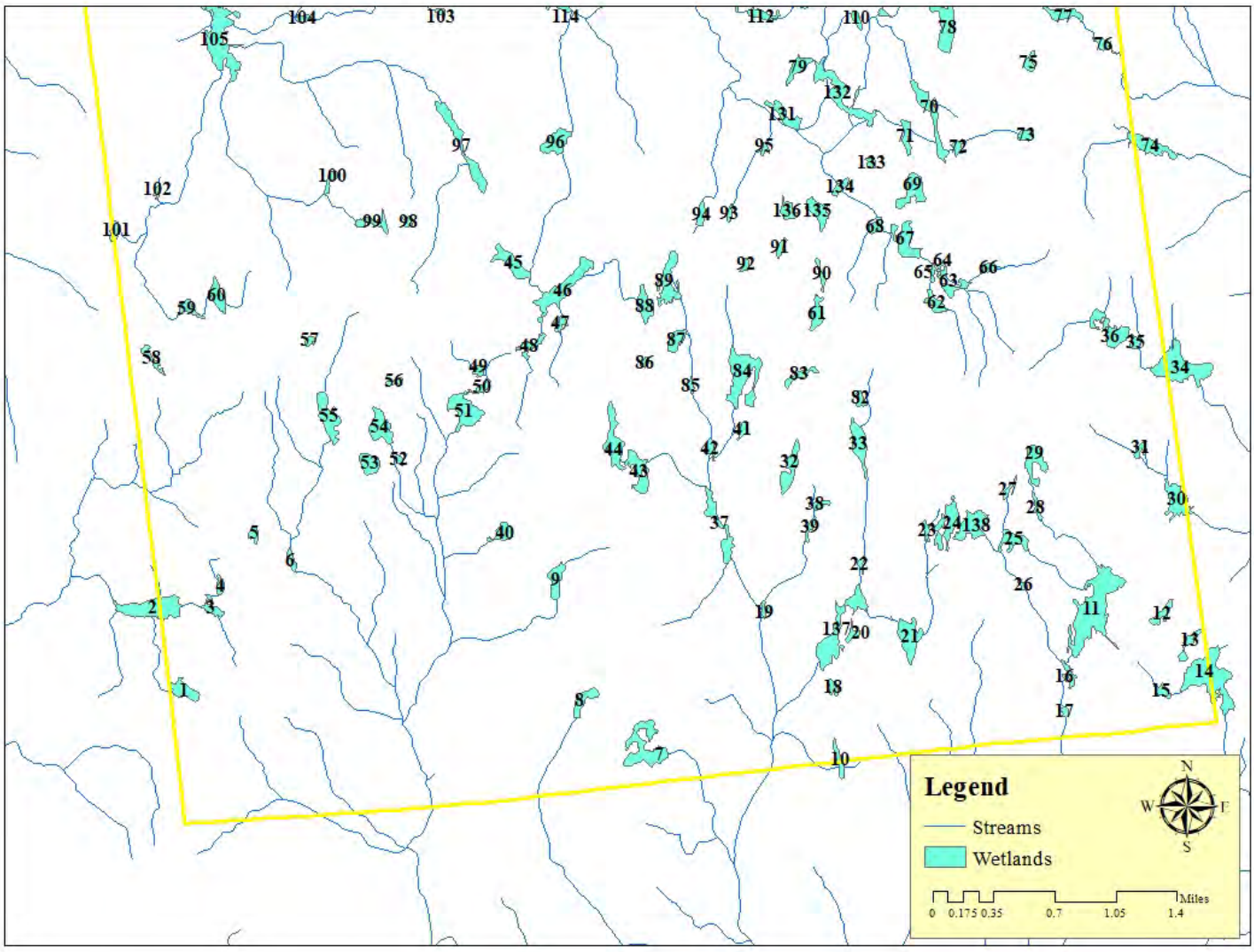
Legend
Streams
Wetlands
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Miles
0 0.175 0.35 0.7 1.05 1.4

Wetland Name	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20
Wetland Acres	7.1	20.6	3.9	2.2	2.3	2.7	20.0	6.1	7.1	3.6	43.4	4.0	3.7	32.3	2.7	3.1	1.4	2.1	1.4	2.3
Watershed Acres	51.5	463.8	207.5	70.1	26.4	660.0	121.8	137.3	198.4	22.2	408.4	114.5	169.4	384.0	118.0	597.0	706.0	32.5	1455.8	12.9
Wetland Scores																				
Ecological Integrity	7.8	5.8	9.0	8.0	9.5	9.0	9.5	9.5	9.5	9.0	9.5	9.5	9.5	9.5	5.8	9.5	9.5	10.0	6.6	9.5
Wildlife Habitat	6.6	6.7	6.5	5.6	5.9	6.2	8.1	6.3	7.2	5.8	8.5	5.9	6.3	8.1	5.8	6.8	6.3	6.4	4.5	6.2
Fish/Aquatic Habitat	4.4	3.3	3.3	3.7	2.5	4.7	6.0	4.4	3.7	3.5	4.5	2.5	2.5	5.1	3.9	2.2	3.9	3.5	3.9	3.0
Scenic Quality	6.0	8.3	7.0	4.5	2.5	6.2	8.5	4.5	7.7	2.5	10.0	2.5	5.3	7.7	5.3	5.3	5.3	2.5	6.8	5.3
Educational Value	3.2	6.6	4.3	3.6	2.6	4.3	5.0	3.6	4.6	2.6	7.1	2.6	4.1	4.8	3.6	4.1	4.1	2.8	5.8	3.4
Recreation	4.1	3.8	3.4	2.0	2.6	3.2	4.1	3.0	4.3	2.6	6.6	2.6	3.1	4.6	3.0	3.2	3.1	2.7	4.5	3.1
Floodwater Storage	3.0	3.6	1.3	1.2	1.6	1.1	3.9	1.9	2.0	2.2	4.5	1.6	1.4	3.2	1.3	2.1	0.8	1.4	0.8	2.1
Groundwater	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.6	0.8
Sediment Trapping	6.3	7.1	4.8	7.3	7.4	5.3	7.7	8.1	6.1	8.9	7.2	8.1	6.6	4.3	8.0	5.6	4.7	8.1	6.7	8.9
Nutrient Transformation	3.3	3.5	2.6	5.7	6.8	5.3	4.5	7.0	3.0	6.2	3.7	6.9	4.6	3.7	6.9	6.5	6.1	5.9	7.5	6.2
Shoreline Anchoring	2.0	5.8	7.8	5.5	0.0	6.5	6.5	6.5	6.5	0.0	6.5	0.0	0.0	7.8	5.3	0.0	5.5	0.0	5.5	0.0
Noteworthiness	10.0	30.0	20.0	10.0	20.0	20.0	40.0	30.0	30.0	20.0	30.0	30.0	30.0	30.0	20.0	30.0	30.0	20.0	30.0	20.0

Wetland Name	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30	W31	W32	W33	W34	W35	W36	W37	W38	W39	W40
Wetland Acres	12.7	1.3	1.8	11.9	6.9	1.1	1.6	6.1	9.0	11.8	2.3	9.2	10.2	26.1	2.3	12.0	11.3	2.2	2.0	5.3
Watershed Acres	332.4	373.4	199.4	69.6	66.7	115.8	15.8	137.3	112.3	265.9	98.8	30.4	216.0	348.5	249.8	225.5	1144.7	107.7	129.2	66.4
Wetland Scores																				
Ecological Integrity	9.5	8.5	7.1	5.7	7.5	9.5	8.5	7.5	9.5	9.5	9.5	7.5	7.5	9.5	6.3	9.5	9.5	9.5	9.5	9.0
Wildlife Habitat	7.6	6.7	5.5	7.3	4.1	6.3	7.1	5.5	5.8	7.7	7.2	6.1	7.0	7.6	6.3	7.7	6.7	5.8	5.9	4.8
Fish/Aquatic Habitat	3.7	3.9	4.3	2.9	2.5	2.5	4.2	3.3	2.0	3.7	3.3	2.9	3.7	2.8	2.5	4.7	4.3	2.5	2.5	2.5
Scenic Quality	7.7	5.3	7.0	9.2	6.2	7.0	6.0	5.3	6.0	7.7	6.2	2.5	7.7	7.7	4.5	8.5	5.3	2.5	2.5	3.8
Educational Value	5.0	4.2	6.2	6.8	4.6	4.3	4.7	4.3	3.5	4.1	5.3	3.1	4.2	3.9	3.3	4.8	4.3	2.6	2.6	3.1
Recreation	5.2	3.2	4.1	7.1	3.7	3.5	4.8	4.5	4.0	4.6	3.6	4.1	7.6	5.2	3.0	5.5	3.2	2.5	2.6	3.3
Floodwater Storage	2.5	0.8	0.9	3.3	3.0	0.6	1.8	1.0	2.7	3.1	1.3	3.3	2.3	4.8	1.4	2.5	2.2	1.1	1.0	2.4
Groundwater	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Sediment Trapping	5.6	6.0	3.4	7.0	9.0	6.7	6.8	6.0	6.2	6.3	6.0	8.3	5.6	7.1	7.5	6.2	5.5	8.0	8.0	8.2
Nutrient Transformation	3.0	5.5	3.9	3.5	7.4	4.5	2.1	1.8	3.2	3.3	3.9	8.3	4.0	4.6	6.8	4.1	5.5	6.8	6.8	5.1
Shoreline Anchoring	7.8	5.5	5.8	2.0	0.0	5.5	0.3	5.3	2.0	5.3	1.0	0.0	5.5	6.5	0.0	5.3	5.3	0.0	0.0	0.0
Noteworthiness	20.0	10.0	20.0	20.0	30.0	30.0	20.0	20.0	30.0	30.0	30.0	20.0	20.0	30.0	20.0	30.0	30.0	20.0	20.0	20.0

Wetland Name	W41	W42	W43	W44	W45	W46	W47	W48	W49	W50	W51	W52	W53	W54	W55	W56	W57	W58	W59	W60
Wetland Acres	1.9	2.9	9.7	13.2	10.0	17.9	2.5	4.2	1.8	2.4	14.6	1.0	6.7	10.6	12.2	1.5	1.4	3.6	3.8	6.5
Watershed Acres	370.1	25974.5	199.7	150.1	603.6	450.1	69.3	219.4	45.7	152.0	226.1	41.2	13.6	33.0	180.9	19.9	16.9	48.9	237.0	169.0
Wetland Scores																				
Ecological Integrity	9.5	9.5	9.5	9.5	6.7	8.5	9.0	6.6	9.0	8.5	8.5	10.0	10.0	10.0	7.7	9.5	8.0	5.8	5.8	7.2
Wildlife Habitat	6.3	6.3	7.2	7.7	5.5	7.1	6.6	5.9	6.6	6.6	7.1	6.8	6.4	8.2	7.7	6.8	4.7	3.1	4.5	4.6
Fish/Aquatic Habitat	2.9	2.9	4.3	3.4	2.5	3.7	3.3	3.3	3.3	3.3	3.7	3.8	3.8	4.6	3.7	2.2	2.5	2.9	2.9	2.5
Scenic Quality	3.8	5.5	7.7	7.7	7.7	8.5	7.0	5.3	7.0	7.0	8.5	3.2	3.2	7.3	8.5	3.2	2.5	3.8	7.0	4.5
Educational Value	3.4	3.6	4.1	4.0	7.5	5.0	4.3	5.7	4.8	4.3	5.0	3.4	3.4	4.8	4.7	3.2	2.7	4.2	5.2	5.0
Recreation	2.8	3.1	5.3	5.4	4.2	7.8	4.1	5.4	4.3	4.3	6.1	2.8	2.8	5.4	5.5	3.0	2.4	3.0	3.9	3.5
Floodwater Storage	0.9	1.1	2.3	3.2	1.8	2.3	1.4	1.3	1.2	1.2	2.9	0.4	3.0	3.3	2.6	1.3	1.4	2.0	1.3	2.0
Groundwater	1.6	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Sediment Trapping	5.4	6.7	6.8	6.3	7.4	6.2	6.1	6.6	6.0	6.0	6.3	5.8	9.0	7.0	6.1	5.3	7.3	8.1	8.0	8.1
Nutrient Transformation	5.3	6.6	4.0	3.3	7.8	3.1	3.9	3.8	3.8	2.8	3.2	3.4	5.6	3.5	4.9	1.7	5.7	7.0	7.9	7.0
Shoreline Anchoring	5.5	5.5	5.3	4.0	0.0	4.0	3.0	7.8	6.5	7.8	5.3	0.0	0.0	2.0	6.5	2.0	0.0	0.0	5.5	5.5
Noteworthiness	30.0	20.0	30.0	30.0	30.0	30.0	10.0	30.0	20.0	20.0	20.0	20.0	20.0	30.0	20.0	20.0	0.0	0.0	20.0	10.0

Wetland Name	W61	W62	W63	W64	W65	W66	W67	W68	W69	W70	W71	W72	W73	W74	W75	W76	W77	W78	W79	W80
Wetland Acres	6.0	4.7	4.3	1.9	1.5	2.3	11.1	2.9	10.5	12.4	4.3	2.6	2.9	11.0	2.9	4.1	8.8	19.6	5.7	1.1
Watershed Acres	64.1	132.8	319.6	339.0	512.4	172.0	634.5	755.1	50.7	367.2	28.7	248.2	72.0	248.0	15.7	366.3	221.1	624.1	27.2	69.8
Wetland Scores																				
Ecological Integrity	7.5	8.0	8.0	9.0	8.5	9.0	9.0	8.0	8.5	6.1	7.5	9.0	8.0	8.5	3.5	6.6	8.5	8.0	8.0	7.5
Wildlife Habitat	4.6	4.2	6.0	6.2	5.7	6.1	6.2	5.1	5.3	5.9	5.2	5.7	4.6	4.2	3.5	5.5	6.1	5.5	5.6	3.8
Fish/Aquatic Habitat	2.5	2.9	3.3	2.6	3.5	4.3	3.9	4.4	2.5	2.9	2.5	2.5	2.5	3.5	2.5	3.1	4.3	4.3	2.5	2.5
Scenic Quality	3.2	3.8	7.0	4.5	4.5	6.0	7.0	4.5	2.5	8.3	2.5	4.5	4.5	6.0	1.7	4.8	5.3	7.0	3.2	2.5
Educational Value	4.9	2.9	4.6	3.8	3.8	3.7	4.3	3.8	2.9	8.1	2.9	3.2	3.5	3.8	2.3	6.1	4.6	4.6	3.5	3.3
Recreation	4.0	2.5	4.2	3.6	3.5	4.7	3.5	3.6	3.1	5.9	3.1	2.9	2.7	4.4	2.7	3.5	3.7	4.1	3.3	3.7
Floodwater Storage	2.6	1.8	1.3	0.9	0.8	1.2	1.8	1.1	3.3	2.3	2.4	1.2	1.5	2.3	2.1	1.3	2.0	2.5	2.7	0.7
Groundwater	6.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Sediment Trapping	7.5	8.1	5.3	8.7	5.4	6.0	6.8	5.4	9.0	6.2	8.2	7.3	8.1	6.2	8.2	8.0	6.0	8.2	8.2	8.0
Nutrient Transformation	7.0	7.0	4.5	6.9	6.2	1.8	6.7	5.3	7.5	3.1	7.1	6.7	7.9	3.1	8.1	6.9	3.8	8.2	7.2	5.7
Shoreline Anchoring	0.0	0.0	7.8	0.0	5.5	4.0	6.5	6.5	0.0	4.0	0.0	0.0	0.0	4.0	0.0	5.3	7.8	6.5	0.0	0.0
Noteworthiness	30.0	20.0	30.0	30.0	20.0	30.0	30.0	30.0	20.0	30.0	20.0	10.0	30.0	20.0	20.0	20.0	20.0	30.0	10.0	0.0

Wetland Name	W81	W82	W83	W84	W85	W86	W87	W88	W89	W90	W91	W92	W93	W94	W95	W96	W97	W98	W99	W100
Wetland Acres	2.7	2.1	3.6	22.8	1.4	1.1	5.3	7.7	12.6	2.3	1.9	1.5	1.3	3.0	1.2	9.6	15.0	1.5	4.9	2.6
Watershed Acres	28.3	47.6	58.9	323.5	148.9	19.3	52.1	23.7	44.7	114.4	83.1	19.6	17.2	33.0	62.2	879.3	347.3	16.5	34.1	41.5
Wetland Scores																				
Ecological Integrity	9.5	7.5	5.2	9.0	9.5	10.0	10.0	10.0	10.0	7.5	7.5	9.5	9.0	9.5	5.0	8.5	4.3	9.5	8.1	9.5
Wildlife Habitat	5.0	5.1	4.9	7.5	7.2	6.4	8.2	7.7	7.7	4.7	4.2	6.3	5.8	6.8	5.0	5.6	4.8	5.9	6.9	6.1
Fish/Aquatic Habitat	3.5	3.1	3.5	4.7	4.3	2.5	4.3	4.3	4.3	1.6	1.6	2.5	2.5	3.5	2.5	4.3	3.5	2.5	5.6	3.3
Scenic Quality	2.5	6.8	4.5	8.5	7.0	2.5	8.5	7.7	7.7	2.5	2.5	4.5	2.5	2.5	2.3	8.5	8.3	2.5	9.2	7.0
Educational Value	2.7	5.4	4.8	5.2	4.5	2.7	4.9	4.2	4.2	2.7	3.1	2.9	3.0	2.8	3.1	7.5	7.3	2.6	8.3	4.3
Recreation	2.4	3.8	3.4	6.2	3.7	2.7	5.6	5.4	5.4	3.9	3.8	3.0	3.2	2.7	2.4	3.5	5.0	2.6	6.8	3.5
Floodwater Storage	2.0	1.3	1.9	3.3	0.8	0.9	2.7	3.0	3.6	1.3	1.1	1.3	1.3	2.0	0.8	1.8	2.5	1.4	2.7	1.7
Groundwater	0.8	3.2	6.2	4.4	0.8	0.8	0.8	0.8	0.8	2.4	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Sediment Trapping	8.1	4.8	7.4	6.9	5.4	7.3	7.0	7.0	7.1	8.0	8.0	8.0	7.3	7.4	6.5	6.7	6.8	7.3	7.0	6.1
Nutrient Transformation	7.0	7.2	6.9	4.2	1.6	6.6	3.3	3.4	3.5	6.9	5.8	6.9	6.7	7.9	7.5	4.9	4.1	5.8	3.3	4.0
Shoreline Anchoring	0.0	5.3	5.3	7.8	4.3	0.0	2.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5	4.0	0.0	4.3	3.0
Noteworthiness	20.0	20.0	20.0	30.0	20.0	30.0	20.0	30.0	30.0	10.0	0.0	20.0	10.0	20.0	10.0	20.0	20.0	20.0	20.0	20.0

Wetland Name	W101	W102	W103	W104	W105	W106	W107	W108	W109	W110	W111	W112	W113	W114	W115	W116	W117	W118	W119	W120
Wetland Acres	3.2	1.1	1.1	1.8	29.1	2.8	1.1	2.6	1.2	2.2	2.4	4.0	1.2	20.0	7.7	5.8	4.0	1.7	1.1	1.3
Watershed Acres	37.4	60.3	14.0	445.5	2887.3	58.7	177.8	19.2	776.7	21.9	93.0	212.2	294.9	5908.3	48349.1	31.5	135.9	27.6	16.7	10.5
Wetland Scores																				
Ecological Integrity	9.5	8.5	5.2	8.0	4.8	7.5	7.0	4.7	3.5	7.0	9.5	9.0	9.5	4.8	4.4	9.0	7.0	10.0	8.5	9.0
Wildlife Habitat	6.2	4.7	2.2	3.8	3.9	4.2	4.0	3.8	3.9	5.0	5.4	5.7	7.2	3.4	4.4	5.7	5.1	5.5	5.2	4.7
Fish/Aquatic Habitat	4.2	3.7	1.6	2.9	3.5	1.6	3.5	1.6	2.7	1.6	4.8	2.1	3.3	4.3	4.3	3.3	3.9	2.5	1.6	2.5
Scenic Quality	7.0	0.0	2.5	3.7	7.7	2.5	2.5	1.7	5.2	1.7	3.2	3.2	7.0	6.2	7.7	7.7	2.5	2.5	2.5	2.5
Educational Value	4.4	3.9	3.2	3.4	5.2	2.6	4.4	4.8	6.4	2.5	3.4	3.4	4.9	5.1	4.5	4.7	2.9	2.6	2.9	2.9
Recreation	4.2	3.8	2.8	3.1	3.1	2.9	3.3	2.9	3.5	2.3	2.6	3.3	5.0	4.4	4.7	5.7	2.4	2.5	2.4	3.0
Floodwater Storage	2.2	0.7	1.0	0.9	3.1	1.5	0.6	2.1	1.0	2.4	1.3	1.3	0.8	2.6	2.5	2.7	1.4	1.4	1.0	1.5
Groundwater	0.8	0.8	0.8	4.4	4.4	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	4.4	0.8	0.8	0.8	0.8	2.4
Sediment Trapping	6.7	5.2	8.0	4.7	5.6	8.1	4.8	8.9	4.1	8.9	6.0	8.0	5.3	5.7	4.2	7.5	5.3	8.1	7.3	7.5
Nutrient Transformation	3.0	3.6	6.8	6.1	7.7	6.9	6.1	8.2	7.0	7.3	5.5	6.9	3.2	6.7	5.3	6.0	6.4	6.9	6.6	7.8
Shoreline Anchoring	6.5	4.3	0.0	6.5	6.5	0.0	6.5	0.0	5.5	0.0	6.5	0.0	4.0	6.5	6.5	5.3	5.5	0.0	0.0	0.0
Noteworthiness	20.0	10.0	10.0	20.0	20.0	0.0	20.0	20.0	10.0	20.0	10.0	0.0	10.0	20.0	20.0	20.0	0.0	10.0	0.0	20.0

Wetland Name	W121	W122	W123	W124	W125	W126	W127	W128	W129	W130	W131	W132	W133	W134	W135	W136	W137	W138
Wetland Acres	1.0	1.6	7.7	1.6	1.8	6.5	2.4	2.8	4.6	3.1	7.2	19.2	1.6	2.7	7.2	4.6	22.0	12.5
Watershed Acres	1445.6	5.4	173.0	7.5	47.1	69.6	15.3	90.5	38745.3	144.5	3225.1	3225.1	3225.1	3225.1	3225.1	3225.1	917.7	81.8
Wetland Scores																		
Ecological Integrity	6.1	8.5	8.1	6.1	8.0	9.5	9.5	9.5	4.0	4.7	5.6	4.7	6.6	6.6	6.8	5.6	8.1	4.7
Wildlife Habitat	3.5	5.3	5.6	4.0	4.7	6.8	5.9	6.3	2.6	3.5	6.8	6.2	6.9	6.9	6.8	6.8	6.9	5.3
Fish/Aquatic Habitat	3.9	1.6	2.5	1.6	2.5	3.4	2.5	2.5	3.9	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.0
Scenic Quality	4.7	2.5	8.5	1.7	5.3	7.0	2.5	6.8	9.2	7.0	6.2	6.2	6.2	6.2	6.2	6.2	6.8	8.3
Educational Value	4.9	2.8	7.3	5.0	5.2	3.4	2.6	3.7	7.2	3.8	4.6	4.5	4.7	4.7	4.7	4.7	4.0	5.6
Recreation	3.4	2.5	8.2	2.9	2.2	5.1	2.6	5.0	7.8	3.7	5.7	4.7	5.7	5.7	4.8	4.8	5.8	4.9
Floodwater Storage	0.6	1.8	2.1	1.8	1.2	2.9	2.1	1.4	2.3	1.4	2.0	2.6	1.2	1.4	2.0	1.8	2.3	3.6
Groundwater	5.2	0.8	0.8	0.8	0.8	0.8	0.8	0.8	2.4	5.2	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Sediment Trapping	4.1	8.8	6.2	8.8	6.6	6.3	8.9	6.1	4.3	6.6	6.1	6.2	6.0	6.1	6.1	6.1	6.8	7.7
Nutrient Transformation	6.9	6.1	3.1	8.1	4.6	3.2	7.2	1.9	3.7	3.8	2.8	5.0	2.6	4.7	2.8	4.8	5.0	5.5
Shoreline Anchoring	5.5	0.0	0.3	0.0	4.3	0.3	0.0	2.0	0.3	4.3	3.3	6.5	4.3	5.3	4.3	5.3	1.0	6.5
Noteworthiness	20.0	10.0	20.0	20.0	10.0	20.0	20.0	20.0	30.0	0.0	10.0	20.0	10.0	10.0	0.0	0.0	20.0	20.0

APPENDIX C

WETLANDS EVALUATION DATA SHEETS

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

1 – ECOLOGICAL INTEGRITY

Evaluation Questions	Observations & Notes	Answers	Score
1. Are there land uses in the wetland's watershed that could degrade water quality in the wetland?		a. Less than 5% of the watershed has land uses that could degrade water quality. b. 5-10% of the watershed has land uses that could degrade water quality. c. > 10% of the watershed has land uses that could degrade water quality.	10 5 1
2. Is there evidence of fill in the wetland?		a. Less than 1 % b. From 1-3 % c. More than 3 %	10 5 1
3. What percentage of the wetland has been altered by agricultural activities?		a. Less than 5 % b. From 5 to 25 % c. More than 25 %	10 5 1
4. What percentage of the wetland has been adversely impacted by logging activity within the last 10 years?		a. Less than 1% b. From 1 to 10 % c. More than 10 %	10 5 1
5. How much human activity is taking place in the wetland (e.g. ATV use, trails, cars, dumping of brush and garbage, etc.)?		a. Low: Few trails in use, little or no traffic, and little or no litter. b. Moderate: Some used trails, roads, litter c. High: Many trails, roads, and/or litter	10 5 1
6. What percentage of the wetland is occupied by invasive plant species?		a. None b. 1-5% of the wetland has invasive species c. > 5% of the wetland has invasive species	10 5 1
7. Are there roads, driveways and/or railroads crossing or adjacent to the wetland or come within 500 ft. of the wetland?		a. No roads, driveways or railroads. within 500 ft. of, or in the wetland b. Roads, driveways, railroads are within 500 ft of the wetland c. Roads, driveways, railroads cross, or are adjacent to, the wetland	10 5 1
8. How much human activity is taking place in the upland within 500 feet of the wetland edge?		a. Less than 5% or no activity b. Human activity evident in up to 25% of the 500 ft zone c. Human activity evident in more than 25% of the 500 ft zone	10 5 1
9. What is the percent of impervious surface within 500 feet of the wetland edge?		a. Less than 3% impervious area within 500 ft of the wetland edge b. 3-10% impervious area within 500 ft of the wetland edge c. Greater than 10% impervious area within 500 ft of the wetland edge	10 5 1
10. Is there a human-made structure that regulates the flow of water through the wetland?		a. No human made structures present **upstream of, or in** the wetland. b. One or more human made structures present **upstream of, or** in the wetland but hydrologic modification is slight c. One or more human made structures present **upstream of, or** in the wetland that severely block or alter surface water hydrology	10 5 1

AVERAGE SCORE FOR ECOLOGICAL INTEGRITY
(Add scores for each question and divide by 10) _____

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

2 – WETLAND-DEPENDENT WILDLIFE HABITAT

Evaluation Questions	Observations & Notes	Answers	Score
1. What is the wetland acreage (including upland islands)?		a. More than 100 acres b. From 20 - 100 acres c. Less than 20 acres	10 5 1
2. What is the score for Ecological Integrity?		Average score for **Ecological Integrity**	_____
3. Has water quality in the wetland been degraded by land use in the watershed?		Record Answer from **Ecological Integrity**, Question 1	_____
4. What is the area of shallow permanent open water less than 6.6 feet deep, including streams and shallow ponds that are part of the wetland complex?		a. More than 3 acres b. From 0.5 to 3 acres c. Less than 0.5 acre	10 5 1
5. Is there deepwater habitat (lakes or ponds > 6.6ft deep) and/or 4th order or higher rivers associated with the wetland?		a. Deepwater stream ≥1 mile long and/or lake or pond ≥10 acres present b. Deepwater stream < 1 mile long and/or lake or pond < 10 acres present c. No deepwater stream, lake or pond present	10 5 1
6. What is the diversity of vegetation classes in the wetland? *Refer to Appendix F for more information about wetland vegetation classes.*		a. Three or more wetland classes (including upland islands) present b. Two wetland classes (including upland islands) present c. One wetland class present	10 5 1
7. Are other wetlands in close proximity to the study wetland?		a. Other connected or unconnected wetlands within a 0.25 mile distance b. Wetland connected to other wetlands within a 0.5 to 1 mile distance by perennial stream or lake, **OR** other unconnected wetlands are present within a 0.25 to 0.5 mile distance c. Wetland not hydrologically connected to other wetlands within 1 mile and more than 0.5 miles from other unconnected wetlands.	10 5 1

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

2 – WETLAND-DEPENDENT WILDLIFE HABITAT (continued)

Evaluation Questions	Observations & Notes	Answers	Score
8. Are there wildlife travel corridors allowing access to other wetlands?		a. Free access along well vegetated stream corridor, woodland, or lakeshore b. Access partially blocked by roads, urban areas, or other obstructions c. Access blocked by roads, urban areas, or other obstructions	10 5 1
9. What percentage of the wetland edge is bordered by undisturbed woodland or idle land (e.g. shrub land or abandoned fields) at least 500 feet in width?		a. More than 95% of the wetland b. More than 75-95% of the wetland c. Less than 75% of the wetland	10 5 1
10. What percentage of the wetland is occupied by invasive plant species?		Record Answer from **Ecological Integrity**, Question 6	_____

AVERAGE SCORE FOR WILDLIFE HABITAT
(Add scores for each question and divide by 10) _____

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

3 – FISH AND AQUATIC LIFE HABITAT

Evaluation Questions	Observations & Notes	Answers	Score
1. What is the dominant land use in the watershed above wetland?		a. Woodland, wetland, or abandoned farmland b. Active farmland or rural residential c. Urban and heavily developed suburban areas, commercial and industrial areas.	10 5 1
2. Has water quality in the wetland been degraded by land use in the watershed?		Record Answer from **Ecological Integrity**, Question 1	_____
3. What is the area of <u>shallow</u> permanent open water less than 6.6 ft deep, including streams and ponds within the wetland?		Record Answer from **Wetland-Dependent Wildlife Habitat**, Question 4	_____
4. What is the acreage of <u>deepwater</u> habitats deeper than 6.6 feet (pond or lake) associated with the wetland?		a. More than 100 acres b. From 10 to 100 acres c. Less than 10 acres d. deepwater pond or lake not present	10 5 1 0
5. What is the width (bank to bank) of the stream within the wetland?		a. More than 50 feet b. From 25 to 50 feet c. Less than 25 feet d. No stream present	10 5 1 0
6. Does the stream channel appear to have been recently altered?		a. Stream is in a natural channel, either a meandering low gradient stream, **OR** a steeper gradient stream with pools and riffles b. Portions of stream appear recently modified, **OR** stream formerly channelized but has regained some natural channel features c. Stream appears to have been recently been channelized, **OR** stream is confined in a non-vegetated chute or pipe d. No stream present	10 5 1 0
7. Within the wetland, what is the diversity of substrate types in the area(s) <u>occupied by open water</u> (flowing or standing) for the non-growing season?		a. 4 or more substrate types b. 2 or 3 substrate types c. 1 substrate type	10 5 1
8. How abundant are coarse woody material and large rocks associated with the open water portion of the wetland?		a. Moderately Abundant to Abundant: More than 10% of the open water portion of the wetland area contains cover objects such as logs, stumps, branches and rocks b. Scarce: Less than 10% of the ~~water~~ open water portion of the wetland wetland area contains cover objects c. No visible woody materials or rocks	10 5 1

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

Evaluation Questions	Observations & Notes	Answers	Score
9. What is the abundance of floating & submerged vegetation?	Date of Observation:	a. Abundant: More than 70% of water area contains cover objects such as pond lilies, pondweed, and bladderwort b. Moderately abundant: From 30 to 70% of water area contains floating and submerged vegetation c. Scarce: Less than 30% of the water area contains floating and submerged vegetation	10 5 1
10. Are there artificial barriers to the passage of aquatic life? **(e.g. dams, elevated culverts, bridge with a width less than the natural stream channel, road crossings, etc. along the stream reach associated with the wetland).**		a. No artificial barrier(s) present. b. An artificial barrier is present and equipped with a fish ladder or other provisions for fish passage, or artificial barrier is only present during extreme low water c. Dam, elevated culverts or other artificial barrier(s) is present without provisions for fish passage d. Stream not present	10 5 1 0
11. Are fish or aquatic species present that are rare, threatened, endangered or "Species of Greatest Conservation Need"?		a. Documented occurrence of a rare or endangered fish or aquatic life species within or immediately adjacent to the subject wetland b. Documented occurrence of a rare or endangered fish or aquatic life species within .5 miles of wetland and suitable habitat exists for this species within the wetland c. No documented occurrence of a rare or endangered fish or aquatic life species within .5 miles of wetland, but suitable habitat exists and wetland is within range of one or more rare species d. No documented occurrence of a rare or endangered fish or aquatic life species within .5 miles of wetland, and suitable habitat is not known to exist	10 5 1 0

AVERAGE SCORE FOR FISH & AQUATIC LIFE HABITAT
(Add scores for each question and divide by 11) _____

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

4 – SCENIC QUALITY

Primary viewing Site: _____

Evaluation Questions	Observations & Notes	Answers	Score
1. How many wetland vegetation classes are visible from the primary viewing location(s)? *Refer to Appendix F for more information about wetland vegetation classes.*		a. Three or more classes b. Two classes c. One class	10 5 1
2. Is there public access at the viewing site?		a. Viewing site is on a property with public access, and trails to the site, or site is along a road. b. Wetland is on property with public access but no trails to the site. c. Wetland is on a property that does not have public access.	10 5 1
3. What is the visible extent across the wetland?		a. Large expanse visible and low growing plants, or mixed vegetation classes you can see through b. View is somewhat restricted by trees and shrubs c. Forested or scrub-shrub wetland with little or no expanse visible.	10 5 1
4. What is the approximate extent of open water (including streams) visible from the primary viewing location/s?		a. More than 3 acres b. From 1 to 3 acres c. Less than 1 acre	10 5 1
5. Does the wetland provide visual contrast with the surrounding landscape?		a. High level of visual contrast with surrounding natural landscape. b. Some visual contrast with surrounding natural landscape c. Little visual contrast with surrounding landscape, or surrounding landscape is developed	10 5 1
6. What is the general appearance of the wetland and surrounding land use(s) visible from primary viewing location(s)?		a. Wetland is undisturbed and natural. No visual detractors, such as buildings, litter, abandoned cars, or powerlines b. Limited disturbance in and/or around wetland. Minor visual detractors c. Severe visual detractors present	10 5 1

AVERAGE SCORE FOR SCENIC QUALITY
(Add scores for each question and divide by 6) _____

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

5 – EDUCATIONAL POTENTIAL

Primary Educational Site(s): _____

Evaluation Questions	Observations & Notes	Answers	Score
1. What is the Ecological Integrity of the wetland?		Average Score from **1- Ecological Integrity**	_____
2. Does the wetland have high value wildlife habitat?		Average Score from **2 – Wetland-Dependent Wildlife Habitat**	_____
3. Does the wetland have high value fish and aquatic life habitat?		Average Score from **3 – Fish & Aquatic Life Habitat**	_____
4. Is all or part of the wetland on public or private property that has public or private access (i.e. with written permission)?		a. Wetland is on a property with public or private access and trails to the site. b. Wetland is on a property with public or private access but no trails to the site. c. Wetland is on a property that does not currently have public or private access.	10 5 1
5. How close is the educational site to off-road parking suitable for 5-10 vehicles or large enough for a school bus?		a. Adequate parking is available less than a 5 minute walk from the educational site. b. Adequate parking is a 5-15 minute walk from educational site, or parking is limited to less than 5 cars. c. Adequate parking is more than 15 mins walk from the educational site, or no adequate parking is available.	10 5 1
6. How many wetland vegetation classes are accessible or potentially accessible for study at the educational site? *Refer to Appendix F for more information about wetland vegetation classes.*		a. Three or more wetland vegetation classes b. Two wetland vegetation classes c. One wetland vegetation class	10 5 1
7. Is there access to open water (include streams) associated with the wetland at educational site?		a. Direct access to water available b. Water access is a short distance (5 mins or less) from the educational site c. No access or access not feasible d. No open water	10 5 1 0
8. What is the aesthetic and visual quality of the educational site?		Average Score from **4 – Scenic Quality**	_____
9. Is the educational site accessible to the disabled?		a. Yes b. No	10 0

AVERAGE SCORE FOR EDUCATIONAL POTENTIAL
(Add scores for each question and divide by 9) _____

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

6 – WETLAND-BASED RECREATION (CANOEING, KAYAKING, AND WILDLIFE OBSERVATION)

Evaluation Questions	Observations & Notes	Answers	Score
1. Are there opportunities for wildlife observation?		Average score for **2 – Wetland-Dependent Wildlife Habitat**	_____
2. Is there access to suitable open water for canoes and kayaks?		a. Open water is present, with easy access b. Open water is present, but site is not easily accessed for canoes/kayaks. c. Open water is present but no access is allowed or possible d. No open water suitable for canoe/kayak	10 5 1 0
3. Are there trail-based recreation opportunities?		a. Maintained trails are present in and immediately adjacent to the wetland b. Trails are present but not maintained c. No trails are present	10 5 1
4. Are there off-trail recreation opportunities?		a. Wetland has open water greater than 0.5 acres in size **AND** an undisturbed 500 ft buffer for greater than 75% of the wetland edge. b. Wetland has open water greater than 0.5 acres in size **OR** an undisturbed 500 ft buffer for greater than 75% of the wetland edge. c. Wetland has neither open water nor an undisturbed buffer greater than 75% d. No access to potential recreation site or access not feasible	10 5 1 0
5. Is there off-road public parking at the potential recreation site for at least two cars?		a. Adequate parking is available less than 5 minutes from the recreation site. b. Adequate parking is a 5-10 minute walk from the recreation site, or parking is limited. c. Adequate parking is more than 10 minutes walk from the recreation site, or no adequate parking is available. d. No access to potential recreational site or access is not feasible	10 5 1 0
6. What is the scenic quality of the potential recreational site?		Average score from **4 – Scenic Quality**	_____

AVERAGE SCORE FOR WATER-BASED RECREATION
(Add scores for each question and divide by 6) _____

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

7 – FLOOD STORAGE

Instead of manually calculating the Wetland Flood Index on this data sheet, you can use the Flood Index Worksheet, an Excel spreadsheet provided on the NH Method website which is set up to do all the calculations for you. An example of the spreadsheet is provided in Table 3.

Note that this function is scored somewhat differently from the other NH Method function. A series of factors are developed that are then use to derive the Flood Storage Index. The numerical scores for the factors do not correspond to the 10, 5, 1, 0 scoring scale used in the other functions.

In the following situations, the Flood Value Index does not need to be calculated for the wetland being studied. Instead a certain flood index range can be assumed:

1. Wetlands with slopes greater than 10% (10' vertical :100' horizontal) as measured along the flow path, where it is obvious that little flood attenuation could occur, **should be assigned a Low Flood Index Value range (0.0 to 0.9).**
2. For large ponds or lakes or wetlands with ponded water surface area greater than 200 acres and streams that are Fourth Order or higher (i.e. 4th, 5th, 6th etc.) **assign a High Flood Index Value range (7.6 to 10.0)**

Evaluation Questions	Observations and Notes	Answers	Factor
1. What is the Wetland Acreage (W)? *Be sure to EXCLUDE the acreage of any upland islands from the total wetland acreage*		_____acres	
2. What is the Watershed Acreage (S)?		_____acres	
3. What is the Water Storage Depth in the wetland (D)?		a. Use the actual water storage depth if known b. Assign a default value of 1.0 if the wetland is located in a 100 year floodplain c. Assign a default value of 1.0 ft if the actual water storage depth is not known	**D**= ___ ft **D**=1.0 ft **D**=1.0 ft
4. What is the Wetland Storage Volume (V)?		Multiply Water Storage Depth by Wetland acreage: D x W = V	**V**=_____ acre feet
5. Wetland Storage Volume Factor (F)		Insert value from Table 1	**F**= _____
6. Watershed Area Factor (A)		Insert value from Table 2	**A**=_____
7. Location of wetland within the watershed (L) *(Choose the highest factor that applies)*		a. Wetland located within 1,000 ft of a 4th order or higher stream OR within 1000 ft of a pond/lake that outlets to a 4th order or higher stream b. Wetland located within 500 ft of a perennial stream (less than 4th order) c. Neither of the above situations apply to the study wetland	1.0 0.8 0.6

SCORE FOR WETLAND FLOOD INDEX = F x A x L x 10 _____

Use the score to locate the Value Range below and assign Flood Index Value

Wetland Flood Index Values	Flood Value Type
0.0 – 0.9	Low Flood Value
1.0 – 2.5	Low to Moderate Flood Value
2.6 – 5.0	Moderate Flood Value
5.1 – 7.5	Moderate to High Flood Value
7.6 – 10.0	High Flood Value

NH METHOD FOR THE EVALUATION OF FRESHWATER WETLANDS *(revised December, 2015)*

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

TABLE 1*	
Wetland Storage Volume Factor (F)	
Wetland Storage Volume (V) (acre-feet)	**Value of F**
≥ 200	1.000
150	0.950
100	0.900
75	0.850
50	0.800
37.5	0.750
25	0.700
18.75	0.650
12.5	0.600
9.375	0.550
6.25	0.500
4.69	0.450
3.125	0.400
2.36	0.350
1.6	0.300
1.2	0.250
0.8	0.200
0.6	0.150
0.4	0.100
0.3	0.075
0.2	0.050
0.15	0.037
0.1	0.025
0.05	0.012
0	0.000

TABLE 2*	
Watershed Area Factor (A)	
(P) Wetl. Area/Wshed Area x 100	**Value for A**
≥10%	1.00
9%	0.95
8%	0.90
7%	0.85
6%	0.80
5%	0.75
4%	0.70
3%	0.65
2%	0.60
1%	0.55
< 1%	0.50

(you will need to interpret your value to the closest value in Tables 1 and 2)

SEE BELOW LEFT FOR EXAMPLES OF WETLAND FLOOD INDEX CALCULATION:

Example 1: *(See Wetland I.D. 1 in Table 3 – sample spreadsheet)*

Wetland Area (W) = 0.25 acres
Watershed Area (S) = 25 acres
Water Storage Depth (D) = 0.5 ft (known depth)
Water Storage Volume (V) = 0.5 ft x 0.25 acres = 0.125 acre-feet
Wetland Storage Volume Factor (F) = 0.03 (from Table 1)
Watershed Area Factor (A) = 0.55 (from Table 2, where 0.25 acres/25 acres x 100 = 1%)
Location in Watershed (L) = 0.8
Wetland Flood Index = 0.03 x 0.55 x 0.80 = 0.0132
Flood Value Type = Low Flood Value

Example 2: *(see Wetland I.D. W3 in Table 3 – sample spreadsheet)*

Wetland Area (W) = 33 acres
Watershed Area (S) = 17,937 acres
Water Storage Depth (D) = 1.0 ft (default value)
Water Storage Volume (V) = 1.0 ft x 33 acres = 33 acre-feet
Wetland Storage Volume Factor (F) = 0.73 (from Table 1)
Watershed Area Factor (A) = 0.5 (from Table 2, where 33 acres/17,937 acres x 100 = 0.18%)
Location in Watershed (L)= 1.0
Wetland Flood Index Value Type = 0.73 x 0.5 x 1.0 = 3.65
Flood Value = Moderate Flood Value

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

Table 3: Example of Flood Index Worksheet for Multiple Wetlands

Use the Excel spreadsheet on the NH Method Website
for automated calculation of the Flood Water Storage Index

Flood Index = (F x A x L) x 10
Where:
Maximum Wetland Storage Volume = 200 acre-ft
Maximum Wetland Flood Function Value = 10

"Red" headings indicate data input columns
"Black" headings indicate columns where the figures are automatically calculated

Wetland I.D.	Wetland Acreage (W)	Watershed Acreage (S)	Wetland Area as % of Watershed (P) from Table 2	Watershed Area Factor (A) Table 2	Location in Watershed (L) (1.0/0.8/0.6)	Water Storage Depth feet (D) 1.0 = default	Wetland Storage Volume acre feet (D) acre feet	Wetland Storage Volume Factor (F) Table 1	Flood Index
1	0.25	25	1.00	0.55	0.8	0.5	0.125	0.03	**0.132**
2	0.75	15	5.00	0.75	1	1	0.75	0.19	**1.425**
3	2	50	4.00	0.7	0.8	2.5	5	0.46	**2.576**
4	10	100	10.00	1	1	3	30	0.72	**7.200**
5	10	1000	1.00	1	1	4	40	0.77	**7.700**
6	3	47	6.38	0.81	0.8	2	6	0.48	**3.110**
7	0.1	3	3.33	0.42	0.6	0.5	0.05	0.016	**0.040**
8	0.75	20	3.75	0.68	0.6	0.15	0.1125	0.027	**0.110**
9	1	50	2.00	0.6	1	2.5	2.5	0.35	**2.100**
10	50	400	12.50	1	0.8	3	150	0.95	**7.600**
W1	283	19548	1.45	0.57	1	1	283	1	**5.700**
W3	33	17937	0.18	0.5	1	1	33	0.73	**3.650**
W4	54	17291	0.31	0.5	1	1	54	0.73	**3.650**
W5	202	16619	1.22	0.56	1	1	202	1	**5.600**
W6	175	2664	6.57	0.82	1	1	175	0.95	**7.790**
W7	40	446	8.97	0.94	1	1	40	0.78	**7.332**
W8	24	380	6.32	0.51	1	1	24	0.69	**3.519**
W9	43	679	6.33	0.51	1	1	43	0.77	**3.927**
W10	116	2161	5.37	0.77	1	1	116	0.92	**7.084**
W11	63	880	7.16	0.86	1	1	63	0.83	**7.138**
W12	24	3302	0.73	0.86	1	1	24	0.69	**5.934**
ND1	93.7	5169	1.81	0.57	1	1	93.7	0.88	**5.016**
ND2	50	3741	1.34	0.57	1	1	50	0.8	**4.560**
ND3	37	258	14.34	1	1	1	37	0.75	**7.500**
ND4	101	2700	3.74	0.68	1	1	101	0.9	**6.120**
ND5	110.5	562	19.66	1	1	1	110.5	0.92	**9.200**
ND6	99	1753	5.65	0.77	1	1	99	0.9	**6.930**

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

8 – GROUNDWATER

Note that this function does not require any field work

Evaluation Questions	Observations & Notes	Answers	Score
1. Does the wetland overlie a stratified drift aquifer?		a. Wetland overlies **a** stratified drift aquifer b. Wetland is within ¼ mile of a stratified drift aquifer c. Wetland is more than ¼ mile from **a** stratified drift aquifer	10 5 1
2. Is the wetland in a potential public water supply area?		a. Wetland is in an area identified by Favorable Gravel Well Analysis b. Wetland is within ¼ mile of an area identified by Favorable Gravel Well Analysis c. Wetland is more than ¼ mile from an area identified by Favorable Gravel Well Analysis	10 5 1
3. Is the wetland within a public wellhead protection area?		a. More than 75% of the wellhead protection area includes the wetland b. 25%-75% of the wellhead protection area includes the wetland c. Less than 25% of the wellhead protection area includes the wetland	10 5 1
4. What is the percent coverage of highly permeable soils within 100 ft of the wetland? *Refer to Table 3 to answer this question*		a. More than 50% of the soil types within 100 ft of the wetland are on the list in Table 3. b. 25-50% of the soil types within 100 ft of the wetland listed in Table 3 c. Less than 25% of soil types within 100 ft of the wetland are listed in Table 3	10 5 1
5. What is the percent coverage of the highly permeable soil types listed in Table 4 within the wetland? *Refer to Table 4 to answer this question*		a. More than 50% of the soil types within the wetland are on the list in Table 4 b. 25-50% of the soil types within the wetland listed in Table 4 c. Less than 25% of the soil types within the wetland are listed in Table 4	10 5 1

AVERAGE SCORE FOR GROUND WATER
(Add scores for each question and divide by 5) _____

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

Table 3: SAND & GRAVEL SOIL TYPES

***Note**: This list of soils was prepared for the purpose of providing an additional data layer for consideration under the groundwater function – i.e. to include areas that are not mapped as aquifer recharge areas yet contain surface soils with coarse particle sizes which enhance infiltration.*

Number & Slope Classes[1]	Map Unit name & Particle Size Groups[2]	Drainage Class[3]	Record % of 100-ft. wetland buffer
12 B,C,D	Hinckley gravelly LS	ED	
21 B,C,D	Colton, gravelly LS	ED	
22 B,C,D	Colton LS	ED	
24 B,C	Agawam FSL & LS	WD	
25 B,C,D	Ninigret-Windsor complex LS	MWD/WD	
26 B,C,D	Windsor LS	ED	
35 B,C,D	Champlain LS	SED	
36 B,C,D	Adams LFS	SED	
22 A,B,E	Colton S&G	ED	
212 B,C	Hinckley, very gravelly LS	ED	
222 B,C,D	Colton, very stony LS	ED	
236 B,C,D	Adams, very stony FLS	SED	
300	Udipsamments	SED	
313	Deerfield, LS	MWD	
350	Udipsamments	SED	
400	Udorthents, S	ED	
526 B,C	Caesar LS	ED	

1. SLOPE CLASSES

A, B = 0 – 8% (includes 'A' on older maps) C = 8 – 15% D = 15 – 25% E = > 25%

2. PARTICLE SIZE GROUPS

F = fine L = loam S = sand LS = loamy sand SL = sandy loam G = gravel

3. DRAINAGE CLASSES

WD = well drained SED = somewhat excessively drained ED = excessively drained MWD = moderately well drained

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

Table 4: HIGHLY PERMEABLE WETLAND SOIL TYPES THAT POTENTIALLY CONTRIBUTE TO RECHARGE DURING DRY SEASONS.

Map Symbol	Soil Name	Drainage Class			
		Somewhat Poorly Drained	Poorly Drained	Very Poorly Drained	Record % of wetland area
15	Searsport			X	
34	Wareham		X		
115	Scarboro			X	
125	Scarboro, very stony			X	
214	Naumberg		X		
314	Pipestone		X		
315	Mashpee		X		
325	Scarboro variant			X	
326	Scarboro variant, very stony			X	
393	Timakwa			X	
394	Chocorua variant			X	
395	Chocorua			X	
433	Grange		X		
546	Walpole		X		
547	Walpole, stony		X		
614	Kinsman		X		
615	Augres		X		
900	Endoaquents, sandy		X	X	
913	Sudbury variant	X			
914	Duane variant	X			
915	Deerfield variant	X			
916	Croghan variant	X			
918	Madawaska variant	X			
992	Pondicherry			X	
				Total percent	_____%

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

9 – SEDIMENT TRAPPING

Evaluation Questions	Observations &Notes	Answers	Score
1. What is the wetland's Flood Storage value?		Average score from 7 – Flood Water Storage.	____
2. Does the wetland lack outlet or have a constricted outlet?		a. Wetland has no outlet or has a constricted outlet or is ponded above the outlet b. Wetland has an outlet but flow path through wetland is primarily sheet flow c. Wetland outlet not constricted or flow primarily within stream channel.	10 5 1
3. What is the character of water flow through the wetland? $\frac{\textit{Channel Length}}{\textit{Straight line distance of stream}}$ = *Sinuosity Ratio*		a. At least one of the following situations apply: • No stream channel OR • Inlet present but no outlet OR • Outlet is im pounded and standing water present in downstream end of wetland OR • Inlet and outlet present and channel sinuosity is $\geq$ 1.5 b. Inlet and outlet present, and sinuosity of channel is >1.0 and <1.5 c. Channel is straight (sinuosity=1.0) and no impoundments within wetland or at wetland outlet	10 5 1
4. What is the ratio of the wetland's size to the size of its watershed? $\frac{\textit{Acres of Wetland}}{\textit{Area of watershed above wetland outlet}} \times 100$		a. Wetland is more than 10% of its watershed b. Wetland is between 1-10% of its watershed. c. Wetland is less than 1% of its watershed.	10 5 1
5. What is the gradient within the wetland?		a. Wetland has gradient < 0.5% or no outlet b. Wetland gradient is 0.5% to 3% c. Wetland has gradient greater than 3%.	10 5 1
6. What is the areal extent (% coverage) all vegetation types that will most likely trap sediments? (e.g. forested swamps, scrub shrub swamps, and persistent emergent marshes) *Refer to Appendix F for more information about wetland vegetation classes.*		a. Persistent emergent plants (stems above surface of water /wetland throughout the year), trees and/or shrubs cover at least 90% of the surface area of the wetland. b. Persistent emergent, trees and/or shrubs, and/or non-persistent emergents (stems fall below the surface of water/wetland during fall and winter) cover 50-90% of the wetland's surface area. c. Persistent emergent, trees and/or shrubs, and/or non-persistent emergents (stems fall below the surface of water/wetland during fall and winter) cover <50% of the wetland's surface area.	10 5 1
7. What is the average water depth in the wetland during growing season?		a. Average water depth is < 1 ft or there is no open water b. Average water depth > 1 ft and < 6.6 ft. c. Average water depth is greater than 6.6 ft	10 5 1

AVERAGE SCORE FOR SEDIMENT TRAPPING:
(Add scores for each question and divide by 7) _____

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

10 – NUTRIENT REMOVAL/RETENTION/TRANSFORMATION

Evaluation Questions	Observations &Notes	Answers	Score
1. What is the wetland's Flood Storage value?		Average score from **7 – Flood Storage.**	_____
2. What is the wetland's ability to trap sediments?		Average score from **9 – Sediment Trapping.**	_____
3. **What is the extent (percent cover) of persistent emergent vegetation, trees and/or shrubs within the wetland?**		Record answer from **9 – Sediment Trapping**, Question 6	_____
4. What hydroperiod occurs over more than 50% of the wetland?		a. Semi-permanently flooded, seasonally flooded/saturated, or saturated b. Seasonally flooded, seasonally flooded/well-drained or temporarily flooded c. Permanently flooded or intermittently exposed	10 5 1
5. What hydric soils cover the greatest percentage of the wetland?		a. Wetland is dominated by fine textured soils (refer to Table A, Appendix D) b. Wetland is dominated by organic and/or peat soils (refer to Table B, Appendix 3) c. Wetland is dominated by sands and gravels (refer to Table C, Appendix D)	10 5 1

AVERAGE SCORE FOR NUTRIENT TRANSFORMATION
(Add scores for each question and divide by 5) _____

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

11 – SHORELINE ANCHORING

If there is no stream, river, lake or pond within or adjacent to the wetland, leave this Function out of the evaluation.

Evaluation Questions	Observations & Notes	Answers	Score
1. What is the gradation of wetland vegetation types along the shoreline?		a. Three or more wetland vegetation types present (PAB, PEM, PSS or PFO) b. Two wetland vegetation types present c. One wetland vegetation type present	10 5 1
2. What is the vegetation density in the wetland bordering watercourse, lake or pond?		a. High: More than 90% woody or persistent vegetation cover b. Moderate: From 70-90% woody or persistent vegetation cover c. Low: Less than 70% woody or persistent vegetation cover	10 5 1
3. How wide is the wetland bordering the watercourse, lake or pond?		a. More than 20 feet b. From 10-20 feet c. Less than 10 feet	10 5 1
4. How "rough" is the substrate of the wetland at the shoreline of the waterbody?		a. Wetland substrate characterized by many boulders, stones or cobbles and woody material b. Wetland substrate has few boulders, stones or cobbles, or substrate is mostly gravel or coarse sands and little woody material c. Wetland substrate is uniformly smooth and is comprises of clays, silts or very fine sands or organic materials and no woody material	10 5 1

AVERAGE SCORE FOR SHORELINE ANCHORING
(Add scores for each question and divide by 4) _____

Wetland Name/Code:_____ Evaluation Date:_____ Evaluator:_____

12 – NOTEWORTHINESS

Describe noteworthy features in the wetland narrative

Note that the scores for this function are totaled and NOT averaged

Evaluation Questions	Observations & Notes	Answers	Score
1. Is the wetland located in or within 500 ft of an area of Highest Ranked Habitat (state or regional level), as identified on the NH Wildlife Action Plan Highest Ranked Habitat Condition map?		a. Yes	10
2. Does the wetland have local significance because has consistently high scores for all functions and/or is among the top ten largest wetlands in town?		a. Yes	10
3. Does the wetland have local, regional or statewide significance because it is it located in a priority area, is documented in a local or regional conservation plan, or it has been recognized as having regional importance in the state?		a. Yes	10
4. Does the wetland have known biological, geological, or other elements that are rare or unique as documented by the NH Natural Heritage Bureau or as determined by a professional?		a. Yes	10
5. Is the wetland known to contain a documented historical or archaeological site?	*Reference the documentation here:*	a. Yes	10
6. Is the wetland hydrologically connected to a state or federally designated river within ¼ mile of the wetland's outlet?		a. Yes	10
7. Is the wetland one of just a few left in an urban setting?		a. Yes	10

TOTAL SCORE FOR NOTEWORTHINESS _____

Add up the scores for all questions which received a YES answer.
The total score is the score for this function (**note that this score is not averaged).**
For example, if you answered YES to four questions, the score would be 40.
If you answered YES to only one question, the score is 10