

Sample Wetland Evaluation - Foss Meadow, Deerfield, NH

Updated November 2015

Red Text shows information inserted for Foss Meadow, derived from the *NH Wetlands Mapper and other sources*

Appendix B (NH Method)

QUESTIONS TO ANSWER BEFORE THE FIELD VISIT: USING THE NH WETLANDS MAPPER AND OTHER SOURCES

(Remaining questions are answered during field checking)

Each of the questions in the table on the following page requires using the **NH Wetlands Mapper**, unless otherwise noted. **Record answers on the NH Method Data Sheets** (can be done online using the **NH Wetlands Mapper**).

BEFORE USING THE NH WETLANDS MAPPER:

- Go to the [NH Wetlands Mapper](http://NHWetlandsMapper.org) web site home page (**NHWetlandsMapper.org**). Click on the **Welcome tab** (upper left) for instructions on using the Wetlands Mapper.
- Review the tools available in the NH Wetlands Mapper by clicking on the **Help tab** (upper left) and learning how the mapping tools work and the content of the tabs (layers, legend, wetland tools, zoom, download, print). Try each function on a sample wetland and become familiar with the Mapper's capacity and limitations before using it in conjunction with the NH Method evaluation forms

Question #	Feature	Get answers using the NH Wetlands Mapper online tools and Printed Maps
1 - Ecological Integrity		
Question 1	Sources of water quality degradation in the watershed <i>Logging and associated stream/wet area crossings following the 2008 tornado have probably created sources of sediment on one side of the wetland.</i>	From NH Wetlands Mapper: <ul style="list-style-type: none">• Display Imagery > USGS 7.5 min. Topos (topographic map).• Display Water and Watersheds > Watersheds (HUC 12).• Read Appendix G in the NH Method to learn how to delineate a watershed boundary using a topographic map.• Go to "Wetlands & Watersheds" > User Defined Wetlands" and use the drawing tool to draw the watershed boundary on the topographic background. In many cases, the "HUC 12" Watersheds will include a portion of your wetland's watershed boundary, so you can use the HUC 12 Watersheds' boundaries as part of your wetland watershed boundaries, tracing over them with the Drawing Tool.• With the drawn watershed displayed in the Watersheds Tab, click on the watershed boundary line and the acreage will be displayed on the right, in the bar at the bottom of the screen. (This measurement will stay displayed until you click a different feature.)• Review the watershed together with the aerial photo to determine potential sources of contamination. Print the map, choosing "print pdf map" from the print menu and save a copy of the pdf of the map.

Question #	Feature	Get answers using the NH Wetlands Mapper online tools and Printed Maps
Question 7	Road, railroad or driveway crossings within 500 ft. of the wetland <i>A logging road crosses the stream entering the wetland just upstream of the wetland and Logging trails/roads were extensive on the east side of the wetland following the 2008 tornado.</i>	From NH Wetlands Mapper: <ul style="list-style-type: none"> Review the target wetland with the most recent Aerial Photo background available for your region of the state (it varies). Use the Transportation/Railroads or Topographic map layers to identify road crossings. Confirm road crossings with <i>field checking</i>.
Question 8	Level of human activity in the upland within 500 feet of the wetland edge (land disturbance, clearing, logging, trails, roads, etc.) <i>Little human activity is in the 500 ft. zone. The dominant land use is forested, but Griffin Road runs just outside the 500 ft. zone around the wetland.</i>	From NH Wetlands Mapper <ul style="list-style-type: none"> With the most recent Aerial Photo background turned on, go to Wetlands & Watersheds > User Defined Wetlands and select a wetland you've defined (step 6, above), then choose "Edit". You can then enter a "buffer interval" in feet. After doing so & clicking "OK", the map will be redrawn showing a semi-transparent zone around the wetland that's the width you specified (500 ft. for this question). Record any signs of human activity observable in the photo. (Keep this map open for the next question) Confirm human activity with <i>field checking</i>.
Question 9	Percent of impervious surface area within 500 ft. of the wetland edge <i>None, though there are several buildings within 700 ft.</i>	From NH Wetlands Mapper <ul style="list-style-type: none"> Use the same map with a 500 ft. "buffer" zone around the wetland in question 8, above, and measure the area of buildings and other impervious areas within 500 ft of the wetland. Confirm the number of extent of impervious surfaces with <i>field checking</i>.
2 - Wetland-Dependent Wildlife Habitat		
Question 1	Wetland size (acres, including upland "islands") <i>61 acres (drawn wetland polygon from NH Wetlands Mapper).</i>	From NH Wetlands Mapper <ul style="list-style-type: none"> Turn on either the NHDES Wetlands Base Map or the NWI (National Wetlands Inventory) layer & the Hydric Soils layer, in the Water and Watersheds layers. Turn the legend on. Areas shown as Palustrine are freshwater wetlands. Left click your mouse on the Identify Tool ("i" icon) to activate it. Click on each wetland vegetation type polygon to access the data, including acreage. Alternatively, draw the wetland boundary as described in the NH Wetlands Mapper Help Tab and Wetlands Tab (Create New Wetland button) Field checking is necessary to calculate the final wetland size.
Question 4	Area of shallow, permanent open water and streams (less than 6.6 ft deep) <i>7.9 acres of PUB (NH Wetlands Mapper) Round to 8 acres to include stream channel.</i>	Click on the Identify Tool to activate it. Use it to get the acreage of all PAB and PUB wetland vegetation classes by clicking on them. A window will appear with the acreage.. <ul style="list-style-type: none"> Click on the Measure Line tool to activate it. Use the tool to measure stream length. Click on the start of the stream at the wetland edge, then along its length as needed to approximate its curves. Double click on the last point. You will

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		<p>see a line between your click points and the total distance will appear in the bar near the bottom of the screen. Distance will show in feet if under a mile in and miles if more. Multiply the resulting stream length by the stream channel width (observe in the field and on aerial photo) to get the stream area in square feet, and then convert to acres.</p> <ul style="list-style-type: none"> • Add the stream acreage to the acreage of shallow permanent open water (PUB and PAB codes).
<p>Question 5</p>	<p>Deepwater habitat associated with the wetland (lake, pond or river) deeper than 6.6ft.</p> <p>No (small stream only)</p>	<p>From NH Wetlands Mapper</p> <ul style="list-style-type: none"> • Turn on the NHDES Wetlands Base Map or the NWI layers in the Water and Watersheds layers. Turn the legend on. Areas shown as Lacustrine are lakes and ponds • Use the Identify Tool to get the acreage of lakes and ponds. • Check the NH DES List of 4th Order and Higher Streams at http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-08-9.pdf to identify any 4th order or higher streams. You can also determine the stream order of a stream on the map by activating the identify button and clicking on the stream channel. • Use the Measure Line tool to measure the length of the 4th order or higher stream associated with the wetland.
<p>Question 6</p>	<p>Wetland vegetation class diversity, including upland “islands” (NWI codes)</p> <p>4 classes: PUB, PEM, PSS, PFO (NH Wetlands Mapper)</p>	<p>From NH Wetlands Mapper</p> <ul style="list-style-type: none"> • Turn on the NHDES Wetlands Base Map or the NWI layer in the Water and Watersheds layers and choose “Labels on” to label the NWI classes. • Use the Identify Tool to get the acreage of NWI wetland vegetation classes. <p>Confirm this information with field checking.</p>
<p>Question 7</p>	<p>Other wetlands in close proximity to the study wetland</p> <p>One larger (16.6 acres) wetland & one smaller (0.2 acres) one are within 0.25 miles.</p>	<p>From NH Wetlands Mapper</p> <ul style="list-style-type: none"> • With the most recent Aerial Photo background and the NHDES Wetlands Base Map or the NWI layer & the Hydric Soils layer and Hydric soils layer(s) turned on, use the Measure Line tool to determine distance to nearby wetlands. • Confirm this information with field checking.
<p>Question 8</p>	<p>Wildlife access to other wetlands.</p> <p>Griffin Rd. James Rd & houses along them constitute barriers to animal movement.</p>	<p>From NH Wetlands Mapper</p> <ul style="list-style-type: none"> • With the most recent Aerial Photo and the NHDES Wetlands Base Map or the NWI layer turned on, identify areas of apparently natural vegetation between wetlands that could function as wildlife travel routes. • Confirm this information with field checking.
<p>Question 9</p>	<p>Percent of wetland edge bordered by upland wildlife habitat</p> <p>Estimated > 90% is bordered by natural land cover, within 500 ft., though about half the wetland edge was cleared following the 2008 tornado.</p>	<p>From NH Wetlands Mapper</p> <ul style="list-style-type: none"> • With the most recent Aerial Photo and the NHDES Wetlands Base Map or the NWI layer turned on, use the buffer tool to identify areas of apparently natural vegetation within 500 ft of the wetland edge. (See Section 1, Question 8 for instructions on the buffer tool.) • Estimate the percentage of 500 ft. buffer area that is undisturbed upland habitat. • Confirm this information with field checking.

Question #	Feature	Get answers using the NH Wetlands Mapper online tools and Printed Maps
	Griffin Rd. is within 500 ft. of the wetland at one point, hence the >90% estimate.	
3 – Fish & Aquatic Life Habitat		
Question 1	Dominant land use in watershed Mostly wooded	<p>From NH Wetlands Mapper</p> <ul style="list-style-type: none"> Go to “Wetlands & Watersheds” > User Defined Wetlands” and use the drawing tool to draw the watershed boundary on the topographic background. In many cases, the “HUC 12” Watersheds will include a portion of your wetland’s watershed boundary, so you can use the HUC 12 Watersheds’ boundaries as part of your wetland watershed boundaries, tracing over them with the Drawing Tool. With the most recent Aerial Photo background turned on, and the watershed of your wetland of interest showing (Go to “Wetlands & Watersheds” > User Defined Wetlands”), observe the land uses in the watershed and determine the dominant category in the question. Confirm this information with <i>field checking</i>.
Question 4	Acres of deepwater habitats (deeper than 6.6ft) None	<p>From NH Wetlands Mapper</p> <p>Similar to Section 2, Question 5:</p> <ul style="list-style-type: none"> Turn on the NHDES Wetlands Base Map or the NWI layer in the Water and Watersheds layers. Turn the legend on. Areas shown as Lacustrine are lakes and ponds Use the Identify Tool to get the acreage of lakes and ponds.
Question 6	Does the stream channel appear to have been recently altered? No	<p>From NH Wetlands Mapper</p> <ul style="list-style-type: none"> With the most recent Aerial Photo turned on, identify any stream sections that appear straightened and note them for field observation. Confirm this information with <i>field checking</i>.
Question 11	Rare or endangered wildlife present? None documented, but Blanding’s and Spotted turtles have been documented in the town and could occur in this wetland habitat.	See the NH Natural Heritage web site at, http://www.nhdfi.org/about-forests-and-lands/bureaus/natural-heritage-bureau/about-us/rare-plants.aspx and select the town in question (listed in alphabetical order). See if any species that use wetlands are listed and determine their habitat type(s). Use this as a guide for possible observations of rare species in those habitats.
4 – Scenic Quality		
Question 2	Public access Not posted against access but public access not guaranteed.	<p>From NH Wetlands Mapper</p> <ul style="list-style-type: none"> Using the Conservation&Public Lands layer with the wetland displayed, Using the Identify Tool, determine if the wetland is on a property that has public access (public land). This may require Public access is not specifically indicated in the NH Wetlands Mapper, so this may require further research to determine access for some conservation properties. This might include checking deeds and asking the town Conservation Commission). Confirm this information with <i>field checking</i>.

Question #	Feature	Get answers using the NH Wetlands Mapper online tools and Printed Maps
Question 4	Open water visible Estimated 10 acres including stream.	From NH Wetlands Mapper: <ul style="list-style-type: none"> Use the Identify Tool to get the acreage of all PAB and PUB wetland vegetation classes and any pond or lake (Lacustrine) acreage. Estimate size of large open river areas (Measure Line tool may be useful). The question is broad: Is the open water area less than one acre, more than three acres, or somewhere in between? Confirm this information with field checking.
5 – Educational Potential		
Question 4	Public or private property with public access Not posted against access but public access not guaranteed.	From NH Wetlands Mapper (Same as Section 4, Question 2) <ul style="list-style-type: none"> Using the Conservation&Public Lands layer with the wetland displayed, Use the Identify Tool to determine if the wetland is on a property that has public access (public land). This may require Public access is not specifically indicated in the NH Wetlands Mapper, so this may require further research to determine access for some conservation properties. This might include checking deeds and asking the town Conservation Commission). Confirm this information with field checking.
Question 6	Number and accessibility of wetland classes accessible or potentially accessible for study at educational site 4 classes: PUB, PEM, PSS, PFO (NH Wetlands Mapper)	Similar to Section 2, Wetland Dependent Wildlife Habitat, Question 6, but only for areas from which the wetland is likely to be viewed: <ul style="list-style-type: none"> Turn on the NHDES Wetlands Base Map or the NWI layer in the Water and Watersheds layers and choose “Labels on” to label the NWI classes Identify those that would be visible from the wetland’s primary viewing location(s). Use the most recent Aerial Photo imagery to refine your observation of the NWI map. Confirm this information with field checking.
6 – Wetland-based recreation - NO DATA NEEDED FROM NH WETLANDS MAPPER		
7 – Floodwater Storage		
Question 1	Wetland acres, not including upland “islands” 53.32 acres (drawn wetland polygon from NH Wetlands Mapper).	From NH Wetlands Mapper: <ul style="list-style-type: none"> Using the same instructions from Section 2, Wetland Dependent Wildlife Habitat, Question 1, calculate Wetland acreage, excluding the area of any upland islands. Subtract the acreage of any upland islands from the total wetland acreage and use this adjusted acreage in this calculation.
Question 2	Watershed acres 839.01 acres (drawn watershed in NH Wetlands Mapper)	From NH Wetlands Mapper: The watershed will have been drawn already for Question 1.1. To get the watershed size: <ul style="list-style-type: none"> With the drawn watershed displayed in the Watersheds Tab, click on the watershed boundary line and the acreage will be displayed on the right, in the bar at the bottom of the screen. (This measurement will stay displayed until you click a different feature.) Print the map, choosing “print pdf map” from the print menu and save a copy of the pdf of the map.

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Question 7	Location within the watershed The wetland has a first order perennial stream entering and discharging from it. It becomes second order within 1000 ft. of leaving the wetland.	From NH Wetlands Mapper: <ul style="list-style-type: none"> Use the buffer function in the Wetlands Tab to determine the wetland's location in the watershed To determine stream order, see: NH DES List of Fourth Order and Higher Streams NH Statewide Map Atlas "Fourth Order and Higher Streams"
8 – Groundwater Recharge		
Question 1	Does the wetland overlie a stratified drift aquifer? No	From NH Wetlands Mapper: <ul style="list-style-type: none"> Display the Aquifer layer and determine if the wetland overlies stratified drift aquifer.
Question 2	Is the wetland in a potential public water supply area? No	Use Forest Society Website: http://clca.forestsociety.org/nhcl/fgwa.asp <ul style="list-style-type: none"> Using the Favorable Gravel Well map provided on this website, zoom to the town, and locate the area with the wetland. Once you have located the town, you will need to zoom in to at least 600%. Determine if the wetland overlies or is immediately adjacent to a Favorable Gravel Well area.
Question 3	Public wellhead protection area? No	<ul style="list-style-type: none"> See instructions in the NH Method, Section 3. (To get a paper map showing the data for your town, or for GIS users wanting to obtain the data set, contact Pierce Rigrod, NH DES Drinking Water and Groundwater Bureau, at pierce.rigrod@des.nh.gov or 603-271-0688.)
Question 4	Percent coverage of highly permeable soils within 100 ft. of the wetland 447B, 547B, 140C and 140D are the principal soil types within 100 ft. of the wetland (NH Wetlands Mapper) 547 B is the only potential recharge soil. It occupies approximately 18% of the 100 ft. zone.	From NH Wetlands Mapper: <ul style="list-style-type: none"> Display the Soils (All Soils) layer with soil polygons labeled. Create a 100 ft. "buffer" area around the wetland, following the instructions for Section 1, Ecological Integrity, Question 8. Visually determine the dominant soil type within 100 ft of the wetland. Determine whether the dominant soil type is on the list of sand and gravel soil types in Table 3 on p. 27 of the NH Method.
.	Percent coverage of highly permeable soils within the wetland 97 (Greenwood & Ossipee, Ponded) comprise almost all the wetland and are organic, non-recharge soils.	<ul style="list-style-type: none"> Display the Soils (All Soils) layer with soil polygons labeled. Visually determine the dominant soil type within the wetland. Determine whether the dominant soil type is on the list of "recharge" soil types in Table 4 on p. XX of Section 3, NH Method.
9 - Sediment Trapping		
Question 2	Character of outlet There is an outlet, subject to beaver dams. .	From NH Wetlands Mapper: <ul style="list-style-type: none"> Display Imagery > USGS 7.5 min. Topos (topographic map) and use it to locate any outlet/s or lack of. (May not be evident on the map) Confirm this information with field checking, and check the degree of constriction of the outlet in the field.

Question #	Feature	Get answers using the NH Wetlands Mapper online tools and Printed Maps
Question 3	Character of water flow through the wetland Stream channel is relatively straight, though appearing natural.	From NH Wetlands Mapper: <ul style="list-style-type: none"> Use the most recent Aerial Photo imagery and the Water Resources layers to determine the shape of the stream channel in the wetland, if any. Confirm this information with field checking.
Question 5	Gradient of Wetland 731.2(inlet) - 721.2 (outlet) = 10 ft 10 ÷ 3,888 ft. wetland length = 0.25 % gradient	From the printed map or NH Wetlands Mapper: <ul style="list-style-type: none"> Using the Elevation > DEM (digital elevation model) layer, determine the highest and lowest elevation of the wetland along its longest axis by clicking on the inlet and outlet ends of the wetland. Zoom in closely to do this, or the Mapper may display more than one elevation value. Click on the wetland inlet with the Identify Tool. A window will appear containing the elevations of the point clicked. Repeat for the outlet. Subtract the two elevations to get the elevation difference. Alternatively, you can use Google Earth. As you hold the cursor over a point on a map, the elevation will be displayed in the lower left part of the screen. Determine the elevation at the highest and lowest ends of the wetland on the Google Earth map.
Question 6	Percentage cover of persistent, sediment trapping vegetation in the wetland Persistent Emergent (PEM) classes occupy about 75% of the wetland.	From the printed map or NH Wetlands Mapper: <ul style="list-style-type: none"> With a wetland layer on, use the identify tool to find acreages of vegetation classes PFO, PSS & PEM. Add the acreage of these types. Confirm this information with field checking.
10 - Nutrient Trapping/Retention/Transformation – NO DATA NEEDED FROM NH WETLANDS MAPPER		
Question 3	Percent cover of wetland vegetation classes Persistent Emergent (PEM) classes occupy about 75% of the wetland.	<ul style="list-style-type: none"> Same procedures as for Section 9, Sediment Trapping, Question 6. Transfer your answer. Confirm this information with field checking.
Question 4	Hydroperiod of wetland Hydroperiods E & F (NWI codes) apply to about half the wetland each. E = Seasonally saturated/flooded F = Semi-permanently Flooded	From NH Wetlands Mapper <ul style="list-style-type: none"> Turn on the NHDES Wetlands Base Map or the NWI layer & the Hydric Soils layer in the Water and Watersheds layers and choose “Labels on” to label the NWI classes. Identify the hydroperiod code for the NWI polygons and record this information. Determine the acreage of each hydric soil polygon using the Identify Tool and record this information. Determine which hydrologic regime dominates the wetland (> 50% of NWI polygons acreage). Confirm this information with field checking.
Question 5	Wetland soils Dominant wetland soil type is 97 (Greenwood & Osspiee, Poned) - Organic soil types	From NH Wetlands Mapper: <ul style="list-style-type: none"> Display the Hydric Soils layer with soil polygons labeled. Determine the acreage of each hydric soil polygon using the Identify Tool and record this information. Using Appendix D in the NH Method, determine whether the wetland is dominated (>50%) by fine textured soils, organic soils, or sands & gravels.

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11 - Shoreline Anchoring		
Question 1	Gradation of vegetation types <i>Almost all trees were removed by logging on the east side of the wetland following the tornado in July, 2008. There is a narrow shrub edge on most of the rest of the wetland.</i>	<ul style="list-style-type: none"> Same instructions as for Section 2, Wetland-Dependent Wildlife Habitat, Question 9. Determine the number of wetland classes <i>along the shoreline.</i>
Question 3	How wide is the wetland bordering the watercourse, lake or pond? <i>Est. 500 ft.</i>	<p>From NH Wetlands Mapper or Printed Maps:</p> <ul style="list-style-type: none"> Use the Measure Line Tool, a wetland layer and aerial photography in the NH Wetlands Mapper to estimate the average wetland width. Confirm with field checking. Confirm this information with field checking.
12. Noteworthiness		
Question 1	Is wetland within 500 ft. of Highest Ranked Habitats? <i>Yes, Marsh and shrub wetland shown on WAP Habitat Map.</i>	<p>From NH Wetlands Mapper or Printed Maps:</p> <ul style="list-style-type: none"> Using the Wildlife Action Plan Highest Ranked Habitat data, identify any highest ranked habitat (statewide significance – pink; or regional significance – green) in or near the wetland
Question 6	Connection to a state designated river <i>Not connected.</i>	<p>Refer to the list of rivers in the NH Rivers Management and Protection Program</p> <p>From NH Wetlands Mapper:</p> <ul style="list-style-type: none"> Use the Measure Line tool to determine distance to the nearest state designated river, if applicable.
Question 8	Is the wetland one of just a few left in an urban setting? <i>Not applicable</i>	<p>From NH Wetlands Mapper:</p> <ul style="list-style-type: none"> In an urban area, use one or more of the wetland layers to determine the local significance of the subject wetland and if other wetlands are present.