Wetland Name/Code: *Sample Wetland, Deerfield NH* Evaluation Date: *July 2, 2010* Evaluator: *Frank Mitchell*

Summary of Scores

FUNCTION	SCORE
1. Ecological Integrity	8.5
2. Wetland-Dependent Wildlife Habitat	7.5
3. Fish & Aquatic Habitat	6.1
4. Scenic Quality	9.3
5. Educational Potential	6.4
6. Wetland-Based Recreation	5.5
7. Floodwater Storage	5.7
8. Groundwater	1.0
9. Sediment Trapping	5.4
10. Nutrient Removal / Retention / Transformation	5.7
11. Shoreline Anchoring	7.5
12. Noteworthiness	40.0

Narrative Description

Foss Meadow is a marsh & shrub wetland of approximately 57 acres. It is located in the upper part of the Little Suncook River Watershed, at the eastern base of Nottingham Mountain in Deerfield. The wetland's watershed is 750 acres and is largely forested and undeveloped.

The wetland is influenced by beaver activity and was in the path of the July, 2008 tornado, which has had an impact in the 500 ft. zone around approximately half the wetland. Wetland vegetation classes observed in the wetland include: Palustrine Emergent (PEM1Eb and PEM1Fb), Palustrine Emergent/Scrub-shrub (PEM/PSS1E and PEM/SS1Eb), Palustrine Unconsolidated Open Bottom – Open Water (PUBFb), and Palustrine Forested (PFO1 & PFO5b). Dominant plant species observed in the wetland included a variety of herbaceous emergent plants. The soils in the wetland were mapped by NRCS as 97 - Greenwood and Ossipee, ponded water. One stream (Griffin Brook) flows through the wetland (approximately 9 acres of open water)

ECOLOGICAL INTEGRITY

The ecological integrity of Foss Meadows is moderately high. Water quality in the wetland appears high, and there is no evidence of fill or other human disturbance. However, logging in the upland adjacent to the wetland and in parts of the wetland) following the 2008 tornado has created some potential short term erosion. Within 500 ft of the wetland, the upland is largely undisturbed (one town road and no buildings). The wetland's outlet is an abandoned beaver dam, resulting in lower water levels than in recent years.

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WETLAND-DEPENDENT WILDLIFE HABITAT

The fifth largest wetland in town, Foss Meadow has significant wildlife habitat value. Approximately 10% of the wetland is open water, supporting species such as waterfowl. A stream flows through the wetland and there are four dominant wetland vegetation classes (PEM, PSS, PUB, PFO). Other wetlands nearby increase the value of wetland habitats in the area.

FISH AND AQUATIC HABITAT

Habitat for fish and aquatic life is favored by the extensive marsh & shrub habitats but is limited by the amount of open water and perennial stream habitat. Contributing to habitat value are a largely forested watershed, high water quality a diversity of substrate types in the wetland and associated stream, abundant cover (wood and large rocks) and the absence of artificial barriers. Blanding's turtle, an endangered species in NH, has been reported in the vicinity of Foss Meadow (personal communication with a local resident and Phil Auger, UNHCE).

SCENIC QUALITY

Foss Meadow is a particularly scenic wetland with an open view across to Nottingham Mountain from Griffin Road. This view from the road is temporary, however, resulting from logging following the 2008 tornado. A similar view will remain available from other parts of the wetland edge after the logged area re-grows. Much of the wetland's open marsh and shrub habitat is presently visible from the road. Nottingham Mountain creates a high degree of landscape contrast. Diversity of vegetation in and around the wetland and its generally natural appearance enhance its scenic value.

EDUCATIONAL POTENTIAL

Foss Meadow has moderate educational potential. Favoring educational use are the wetland's unspoiled character, wildlife habitat and scenic values, several wetland vegetation types, open water and a stream. Public access is not formally guaranteed (such as through a conservation easement), but the land is not posted against entry and physical access is not difficult. The wetland is close to a public road with modest parking. There is no disabled access.

WETLAND-BASED RECREATION

Foss Meadow has opportunities for wildlife observation, access to a stream and the wetland's scenic quality. Limited parking, lack of disabled access and no guaranteed public access are limiting factors.

FLOODWATER STORAGE

Foss Meadow's floodwater capacity is moderate to high. The wetland is relatively large in relation to its watershed (about 7.5%) enabling it to hold a large amount of water produced by the watershed during times of high flow.

GROUNDWATER

This function scored low for Foss Meadow. There is no stratified drift aquifer near the wetland, no potential public water supply area nearby and limited groundwater recharge potential (dominant soil types within 500 ft of the wetland are Chatfield-Hollis-Canton Complex (140 C&D) and they are not highly permeable).

SEDIMENT TRAPPING

The sediment trapping function of Foss Meadow is moderate, due to a moderate to high Wetland Flood Storage capability, an outlet that is not constricted or blocked, a relatively straight stream channel and some ponded open water with limited sediment removal capacity. Contributing to the sediment trapping function are the moderate gradient of the wetland's watershed, dense emergent wetland vegetation and relatively shallow water depth.

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NUTRIENT REMOVAL/ RETENTION/TRANSFORMATION

The wetland has a moderate ability to attenuate nutrients. Contributing to this function are the Wetland Flood Storage, dense emergent wetland vegetation and sediment trapping capacity. Other factors are a seasonally saturated/flooded and semi-permanently flooded hydrology and very poorly drained wetland soils that support year-round nutrient attenuation. The relatively shallow water depth adds to the wetland's capacity for this function.

SHORELINE ANCHORING

Foss Meadow has a moderate shoreline anchoring capacity, a function of two wetland vegetation types along the shoreline (emergent & shrub), high vegetation density and a wide wetland area bordering the stream.

NOTEWORTHINESS

Foss Meadows has several noteworthy feature, including 1) a Critical Habitat (Marsh & Shrub Wetland) and Highest Ranked Habitat in about half the wetland (state and regional significance), as described in the NH Wildlife Action Plan, 2) local significance because it is the 5th largest wetland in town, and 3) regional significance because it is located in a priority area in Bear-Paw Regional Greenways Conservation Plan and is one of the larger wetlands in the region

Foss Meadow, Deerfield, looking southwest

In the foreground is upland vegetation that is regenerating following the July, 2008 tornado which struck the area and subsequent cutting and removal of trees from the site. Edging the open water area (PUBFb) on both sides is an emergent marsh (PEM1Eb and PEM1FEb), mixing with scrub/shrub vegetation (PEM/PSS1E) on the far side of the wetland. Note the small "island" of pines in the top center of the photo is not shown on NWI maps, apparently too small for the scale of the data. In the background is upland forest, with Nottingham Mountain, the upper part of Foss Meadow's watershed, as the highest feature.

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Foss Meadow

A closer view of the small "island" area in Foss Meadows shows sprouting tree stumps in the foreground (from tree cutting)and the emergent marsh vegetation (PEM1Eb) around the pines (note their poor condition). The far side of the wetland is classified by the NWI as PEM/SS1E. In the actual wetland, there's a mix of emergent herbaceous vegetation, small shrubs and some open water/unconsolidated bottom (PUB) not shown on NWI. Note also the remains of a few dead trees (there had been more standing trees before the tornado)*. They show that the wetland's hydrology has changed over time, formerly being drier and capable of supporting trees. The NWI modifier "b" indicates there has been beaver activity.

* See aerial imagery post-2008 to view the dead downed trees in the wetland following the tornado

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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?	*Logging and associated stream/wet area crossings following the 2008 tornado have created sources of sediment on one side of 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?	*One stream crossing at south end of 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?	*None*	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?	*See note for question 1*	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.)?	*None evident*	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?	*None observed but clearing noted in question 1 could lead to introduction of invasives. Should be monitored annually.*	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 or railroads crossing or adjacent to the wetland or within 500 ft. of the wetland?	*A logging road crosses the stream entering the wetland just upstream of the wetland and Logging trails/roads are extensive on the east side*	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?	*Little human activity in the 500 ft. zone. Dominant land use is forested, but Griffin Road runs just outside the 500 ft. zone*	a. Little 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?	*None, though there are several buildings within 700 ft.*	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

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9. Is there a human-made structure that regulates the flow of water through the wetland?	*No, but the beaver dam that controlled the water level for decades has been unmaintained recently and water level is somewhat lower.*	a. No human made structures present in the wetland b. One or more human made structures present in the wetland but hydrologic modification is slight c. One or more human made structures present 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) *8.5*

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2 – WETLAND-DEPENDENT WILDLIFE HABITAT

Evaluation Questions	Observations & Notes	Answers	Score
1. What is the wetland acreage?	*61 acres (drawn wetland polygon from NH Wetlands Mapper).*	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?	*Logging and associated stream/wet area crossings following the 2008 tornado have created sources of sediment on one side of the wetland.*	Average score for **Ecological Integrity**	*8.5* ---
3. Has water quality in the wetland been degraded by land use in the watershed?		Record Answer from **Ecological Integrity**, Question 1	*5* ___
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?	*7.9 acres of PUB (NH Wetlands Mapper) Round to 8 acres to include stream channel.*	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?	*No (small steam only)*	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?	*4 classes: PUB, PEM, PSS, PFO (NH Wetlands Mapper)*	a. Three or more wetland classes (including islands) present b. Two wetland classes (including islands) present c. One wetland class present	(10) 5 1
7. Are other wetlands in close proximity to the study wetland?	*Yes, one larger (16.6 acres) & one smaller (0.2) acres) one are within 0.25 miles.*	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

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2 – WETLAND-DEPENDENT WILDLIFE HABITAT (continued)

Evaluation Questions	Observations & Notes	Answers	Score
8. Are there wildlife travel corridors allowing access to other wetlands?	*Griffin Rd. James Rd & houses along them constitute barriers to animal movement.*	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?	*Estimated > 90% is bordered by natural land cover, within 500 ft., though about half the wetland edge was cleared following the 2008 tornado. Griffin Rd. is within 500 ft. of the wetland at one point, hence the >90% estimate.*	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?	*None observed.*	Record Answer from **Ecological Integrity**, Question 6	*10*

AVERAGE SCORE FOR WILDLIFE HABITAT

(Add scores for each question and divide by 10) *7.5*

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3 – FISH AND AQUATIC HABITAT

Evaluation Questions	Observations & Notes	Answers	Score
1. What is the dominant land use in the watershed above wetland?	*Mostly wooded*	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?	*Logging and associated stream/wet area crossings following the 2008 tornado have created sources of sediment on one side of the wetland.*	Record Answer from **Ecological Integrity**, Question 1	*5* ------
3. What is the area of shallow permanent open water less than 6.6 ft deep, including streams and ponds within the wetland?	*7.9 acres of PUB (NH Wetlands Mapper)*	Record Answer from **Wetland-Dependent Wildlife Habitat**, Question 4	*10* -----
4. What is the acreage of deepwater habitats deeper than 6.6 feet (pond or lake) associated with the wetland?	*None*	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 associated with the wetland?	*Est. 20 ft. average.*	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?	*Channel appears natural*	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 in the area(s) occupied by open water for the non-growing season?	*Difficult to observe directly. Observations done from location on near beaver dam. This is mostly an informed guess.*	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?	*Tornado caused many dead tree trunks to fall, so downed logs are abundant in parts of the wetland.*	a. Moderately Abundant to Abundant: More than 10% of water area contains cover objects such as logs, stumps, branches and rocks b. Scarce: Less than 10% of the water	(10) 5

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Evaluation Questions	Observations & Notes	Answers	Score
		area contains cover objects c. No visible woody materials or rocks	1
9. What is the abundance of floating & submerged vegetation?	Date of Observation: *May 15. Need to recheck during growing season*	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 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 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	(10) 5 1
11. Are rare or endangered fish or aquatic life present?	*Blanding's turtle reported from vicinity (personal communication with nearby landowner and Phil Auger, UNHCE.*	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) *6.1*

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4 – SCENIC QUALITY

Evaluation Questions	Observations & Notes	Answers	Score
1. How many wetland vegetation classes are visible from the primary viewing location(s)?	*4 classes: PUB, PEM, PSS, PFO (NH Wetlands Mapper)*	a. Three or more classes b. Two classes c. One class	(10) 5 1
2. Is there public access at the viewing site?	*Not posted against access but public access not guaranteed. Road view is a result of clearing following 2008 tornado and view will disappear over time as trees re-grow.*	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?	*See note for previous question.*	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?	*Estimated10 acres including stream*	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 surrounding landforms?	*Yes - Nottingham Mountain is the backdrop to the west.*	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 diversity of vegetation types in the viewshed that flower or provide fall color?	*Grassy vegetation, aquatic plants, shrubs and some red maple on wetland edge provide visual contrast throughout most of the year.*	a. High level of visual diversity b. Moderate level of visual diversity c. Low level or no visual diversity	(10) 5 1
7. What is the general appearance of the wetland and surrounding land use(s) visible from primary viewing location(s)?	*Logging effects remain - ruts, stumps. etc.*	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 7) *9.3*

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5 – EDUCATIONAL POTENTIAL

Evaluation Questions	Observations & Notes	Answers	Score
1. What is the Ecological Integrity of the wetland?		Average Score from **1- Ecological Integrity**	*8.5* -----
2. Does the wetland have high value wildlife habitat?		Average Score from **2 – Wetland-Dependent Wildlife Habitat**	*7.5* -----
3. Does the wetland have high value fish and aquatic life habitat?	*Limited open/deepwater habitats, small stream size.*	Average Score from **2 – Fish & Aquatic Life Habitat**	*6.1* -----
4. Is all or part of the wetland on public or private property that has public access?	*Not posted against access but public access not guaranteed.* *Road view is a result of clearing following 2008 tornado and view will disappear over time as trees re-grow.*	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 have public 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?	*But not formally open to the public.*	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?	*4 classes: PUB, PEM, PSS, PFO* *(NH Wetlands Mapper)*	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?	*Stream present, though difficult to access due to wetland around it.*	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**	*9.3* -----
9. Is the educational site accessible to the disabled?	*No*	a. Yes b. No	10 (0)

AVERAGE SCORE FOR EDUCATIONAL POTENTIAL

(Add scores for each question and divide by 9) *6.4*

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

Evaluation Questions	Observations & Notes	Answers	Score
1. Are there opportunities for wildlife observation?	*Yes.*	Average score for **2 – Wetland-Dependent Wildlife Habitat**	*7.5* ---
2. Is there access to suitable open water for canoes and kayaks?	*Limited open water & difficult access*	a. Open water is present, with easy access b. Open water is present, but site is not easily accessed for canoes/kayaks. c. No open water and no access	10 (5) 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 (e.g. open water or undisturbed buffer)?	*Half the wetland edge was salvage cut following the 2008 tornado. It's "natural" but not forested or "undisturbed".* *Wetland has 7.9 acres of open waster (PUB) habitat..*	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%	10 (5) 1
5. Is there off-road public parking at the potential recreation site for at least two cars?	*Yes, but not formally open to the public.*	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.	10 (5) 1
6. What is the scenic quality of the potential recreational site?		Average score from **4 – Scenic Quality**	*9.3* ---

AVERAGE SCORE FOR WATER-BASED RECREATION

(Add scores for each question and divide by 6) *5.5*

Wetland Name/Code: *Sample Wetland, Deerfield NH* Evaluation Date: *July 2, 2010* Evaluator: *Frank Mitchell*

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 (http://nhmethod.org/manual.htm) 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)?	*Watershed size is from drawn watershed in NH Wetlands Mapper*	*57* acres	
2. What is the Watershed Acreage (S)?	*From drawn wetland boundary in NH Wetlands Mapper.*	*750* acres	
3. What is the Water Storage Depth in the wetland (D)?	*Default*	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 A = V	**V** = *57* acre feet
5. Wetland Storage Volume Factor (F)	*Interpolated value*	Insert value from Table 1	**F**= *0.81*
6. Watershed Area Factor (A)	*57/750 x 100 = 7.6%* *Interpolated value = 0.88*	Insert value from Table 2	**A**=*0.88*
7. Location of wetland within the watershed (L)	*The wetland has a first order perennial stream entering and discharging from it. It becomes second order within 1000 ft. of leaving the wetland.*	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 *0.81 x 0.88 x 0.8 x 10 =* ***5.7*** *(Mod - High Flood Value)*

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

Wetland Name/Code: *Sample Wetland, Deerfield NH* Evaluation Date: *July 2, 2010* Evaluator: *Frank Mitchell*

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

EXAMPLES OF WETLAND FLOOD INDEX CALCULATION:

Example 1: *(See Wetland I.D. 1 in 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 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 ValueType = 0.73 x 0.5 x 1.0 = 3.65 **Flood Value = Moderate Flood Value**

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Table 3: Example of Flood Index Worksheet for Multiple Wetlands

Use the Excel spreadsheet on the NH Method Webiste (http://nhmethod.org/manual.htm) 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
Maxiumum 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		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**

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8 – GROUNDWATER

Note that this function does not require any field work

Evaluation Questions	Observations & Notes	Answers	Score
1. Does the wetland overlie stratified drift aquifer?		a. Wetland overlies stratified drift aquifer b. Wetland is adjacent to stratified drift aquifer c. Wetland is not located over or adjacent to 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 directly adjacent to an area identified by Favorable Gravel Well Analysis c. Wetland is not located in or adjacent to an area identified by Favorable Gravel Well Analysis	10 5 (1)
3. Is the wetland within a public wellhead protection area?	*No*	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 dominant soil type within 100 ft of the wetland? *Refer to Table 3 to answer this question*	*447B & 547B are dominant soil types around wetland (NH Wetlands Mapper) 547 B is a potential recharge soil. It occupies < 25% of the 100 ft. zone.*	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. < 25% of the soil types within 100 ft of the wetland are listed in Table 3	10 5 (1)
5. What are the dominant soil types WITHIN the wetland? *Refer to Table 3 to answer this question*	*97 (Greenwood & Ossipee, Ponded) - organic soils - not recharge soils*	a. More than 50% of the soil types **within** the wetland are listed in Table 4. b. 25 – 50% of the soil types **within** the wetland are 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) *1.0*

Wetland Name/Code: *Sample Wetland, Deerfield NH* Evaluation Date: *July 2, 2010* Evaluator: *Frank Mitchell*

9 – SEDIMENT TRAPPING

Evaluation Questions	Observations &Notes	Answers	Score
1. What is the wetland's Flood Storage value?		Wetland Flood Index score from 7 – Flood Storage.	5.7 -----
2. Does the wetland lack outlet or have a constricted outlet?	*There is an outlet, subject to beaver dams*	a. Wetland has no outlet or has a constricted outlet. b. Wetland has an outlet but flow path through wetland is primarily sheet flow or ponded in a shallow basin. c. Wetland outlet not constricted or flow primarily within stream channel.	10 5 (1)
3. What is the shape of the stream channel through the wetland?	*Stream channel is relatively straight, though appearing natural.*	a. No stream channel evident in wetland b. Sinuous channel, where the length of the channel is GREATER THAN 1.5 times the length of the wetland along the stream. c. Channel where the length of the channel is LESS than 1.5 times the length of the wetland along the stream.	10 5 (1)
4. What is the ratio of the wetland's size to the size of its watershed? _ Acres of Wetland / Area of watershed above wetland outlet x 100	*57 acres / 750 acres = 7.6%*	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?	*730 ft – 724 ft = 6 ft (Google Earth)* *6 / 3,888 ft wetland length = **0.15%***	a. Wetland has gradient less than 0.5% or has 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)	*Persistent Emergent (PEM) classes occupy about 75% of the wetland.*	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. Open Water or Aquatic Bed vegetation covers < 50% of the surface area of the wetland	10 (5) 1
7. What is the average water depth in the wetland during growing season?	*This is an estimate based on observation and vegetation.*	a. Average water depth is less than 1 foot or there is no open water b. Average water depth greater than 1 foot and less than 6.6 feet. c. Average water depth is greater than 6.6 feet	(10) 5 1

AVERAGE SCORE FOR SEDIMENT TRAPPING:
(Add scores for each question and divide by 7) 5.4

Wetland Name/Code: *Sample Wetland, Deerfield NH* Evaluation Date: *July 2, 2010* Evaluator: *Frank Mitchell*

10 – NUTRIENT REMOVAL/RETENTION/TRANSFORMATION

Evaluation Questions	Observations &Notes	Answers	Score
1. What is the wetland's Flood Storage value?		Flood Index Score from **7 – Flood Storage.**	*5.7* ---
2. What is the wetland's ability to trap sediments?		Average score from **9 – Sediment Trapping.**	*5.4* ---
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	*5* ---
4. What hydroperiod occurs over more than 50% of the wetland?	*Hydroperiods E & F (NWI codes) apply to approximately equal acreages.* *E = Seasonally saturated/flooded* *F = Semi-permanently Flooded*	a. Semi-permanently flooded, seasonally flooded/saturated, or saturated b. Seasonally flooded or temporarily flooded c. Permanently flooded; intermittently exposed	10 *7.5* 5 1
5. What soils cover the greatest percentage of the wetland?	*Dominant wetland soil type is 97 (Greenwood & Ossipee, Ponded)*	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 D) 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) *5.7*

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11 – SHORELINE ANCHORING

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

Evaluation Questions	Observations & Notes	Answers	Score
1. What is the gradation of wetland vegetation types along the shoreline?	*Many trees recently removed by logging following tornado, July, 2008. There is a narrow shrub edge on most of the rest of the wetland.*	a. Three or more wetland vegation 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?	*Almost 100% (Observation)*	a. High: More than 90% vegetation cover b. Moderate: From 70-90% vegetation cover c. Low: Less than 70% vegetation cover	(10) 5 1
3. How wide is the wetland bordering the watercourse, lake or pond?	*Estimated 500ft. average, using NH Wetlands Mapper Distance Measuring Tool.*	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?	*Based on remote observation, not sampling.*	a. Wetland substrate characterized by many boulders, stones or cobbles b. Wetland susbstrate has few boulders, stones or cobbles, or substrate is mostly gravel or coarse sands c. Wetland substrate is uniformly smooth and is comprises of clays, silts or very fine sands or organic materials.	10 (5) 1

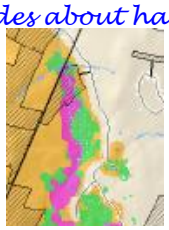
AVERAGE SCORE FOR SHORELINE ANCHORING

(Add scores for each question and divide by 4) *7.5*

Wetland Name/Code: *Sample Wetland, Deerfield NH* Evaluation Date: *July 2, 2010* Evaluator: *Frank Mitchell*

12 – NOTEWORTHINESS

Describe noteworthy features in the wetland narrative

Evaluation Questions	Observations & Notes	Answers	Score
1. Does the wetland contain Critical Habitat as listed in the NH Wildlife Action Plan? (marsh and shrub wetland, floodplain forest and peatland).	*Marsh and shrub wetland shown on WAP Habitat Map.*	a. (Yes)	(10)
2. 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?	*Area of Highest Ranked Habitat t includes about half the wetland.* 	a. (Yes)	(10)
3. Does the wetland have local significance because has consistently high scores for all functions and/or is among the top 10 largest wetlands in town?	*This wetland was evaluated alone as a sample, but it was evaluated in 1992 and scored a "yes" for this question when compared with other wetlands in town.*	a. (Yes)	(10)
4. Does the wetland have local or regional significance, e.g. is it located in a priority area in a local or regional conservation plan, or it is one of the largest in the region?	*Is a prioity in the Bear-Paw Regional Greenways and NH Coastal Conservation Plans*	a. (Yes)	(10)
5. Does the wetland have biological, geological, or other features that are locally rare or unique locally or on a regional or statewide scale?	*Blanding's turtle observed in vicinity historically, but no current records*	a. Yes	10
6. Is the wetland known to contain an important historical or archaeological site?		a. Yes	10
7. Is the wetland hydrologically connected to a state or federally designated river within ¼ mile of the wetland's outlet?		a. Yes	10
8. Is the wetland one of just a few left in an urban setting?	*Not applicable*	a. Yes	10

TOTAL SCORE FOR NOTEWORTHINESS *40*

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