Vanasse Hangen Brustlin, Inc.

Appendix C

Functional Evaluation Detailed Methodology

Appendix C

C.1 New Hampshire Method: Functional Value 1 – Ecological Integrity

This Functional Value is designed to determine the sites carrying capacity or health associated with the ecosystem. It measures the sites ability to act as a natural buffer to human activity in the upland area surrounding the wetland. Sites with high ecological integrity scores are those that have remained relatively undisturbed from human activity and provide suitable habitat for plant and animal communities. In the NH Method, this Functional and Value is comprised of 12 parameters, not all of which could be answered using GIS. The scoring for this Function and Value follows the NH Method. Below is an overview of the parameters that were evaluated in this study.

C.1.1 Parameter 1 - Percent of candidate site having hydric soils and/or open water

Hydric soils remain wet throughout much of the growing season, and require more resources to develop. Due to this limitation, these wet areas tend to remain undisturbed from human activity. The higher the percentage of hydric soils, the more likely the site will remain undisturbed. A GIS overlay analysis was used to calculate the percentage of the restoration site consisting of hydric soils and/or open water. The percentages are then categorized into 3 groups; more than 50 percent, 25 to 50 percent, and less than 25 percent (Table C-1). The GIS operations associated with this parameter are summarized below.

1. **Intersect** (overlay) the candidates with the hydric soils layer
2. **Calculate** the acreage of the intersected areas
3. **Dissolve** the intersected areas for each candidate site, totaling the acreage.

C.1.2 Parameter 2 - Dominant land use within 500 feet of the candidate site

The land use adjacent to any wetland is a key indicator of any past development and can help determine whether or not any future development will occur. Restoration sites dominated by forested or agricultural land use patterns are likely to remain undisturbed, while sites with land use characterized as residential, commercial, and other urbanized land uses patterns, show signs that the area will eventually lead to future development.

Table C-1. Ecological Integrity, Parameter 1

Model Variable	GID Data Source(s)	Ranking Attribute	Formula	Percent Hydric	Score
Site Area	Restoration Site	Area	Internal GIS Calculation	Hydric Area/Site Area	a. More than 50 percent = 1 b. From 25 to 50 percent = 0.5 c. Less than 25 percent = 0.1
Hydric Soil Area (including open water)	NRCS Soils	Area	Internal GIS Calculation		

The 2001 land cover data from the NH Land Cover Assessment study was the primary data source used in the analysis. Currently, this is the only statewide land cover/use dataset archived in NHGRANIT. A series of GIS overlay analyses were used to determine the dominant land use associated with the wetland. The land use was categorized into the following categories; agricultural, developed, disturbed, forested, and undeveloped. Sites dominated by agricultural or forested areas received the highest score (Table C-2). The GIS operations used in evaluation are summarized below.

1. **Buffer** the restoration site by 500'
2. **Erase** the internal area of the site from the buffer area so that only upland area exists
3. **Intersect** (overlay) the land use data with the upland buffer area
4. **Calculate** the area of each intersected area
5. **Dissolve** the intersected area for each restoration site, summarizing the intersected area by the land use attribute.
6. A series of **selections** were preformed on the attribute table from the result of step 5 to determine the dominant land use. See example below.
   a. Select all sites where Forested Acreage > Disturbed Acreage AND Forested Acreage > Developed Acreage, Score = 1

C.1.3 Parameter 3 - Water quality of the watercourse, pond, or lake associated with the wetland

The intent of this question is to identify sites associated with surface water with good water quality. Since poor water quality is believed to be detrimental to many species of animals and plant communities, sites located in these areas should be given a lower priority score. This question or parameter was evaluated using the NH DES Water Quality Assessment Program's Consolidated Assessment and Listing Methodology (CALM). The CALM is methodology for identifying and listing waters in NH as required by the Clean Water Act (CWA) of 1987.

Table C-2. Ecological Integrity, Parameter 2

GIS Data Source(s)	Model Variable	Source Attribute	Land Use Category	Score If Dominant Land Class
Restoration Site	Buffer Site by 500'	Buffer Overlay		
NH Land Cover Assessment	Land Use Area	110 Residential/Commercial/Industrial	Developed	0.1
		140 Transportation	Developed	0.1
		211 Row Crops	Agricultural	1
		212 Hay/Pasture	Agricultural	1
		221 Fruit Orchards	Agricultural	1
		412 Beech/Oak	Forested	1
		414 Paper Birch/Aspen	Forested	1
		419 Other Hardwood	Forested	1
		421 White/Red Pine	Forested	1
		422 Spruce/Fir	Forested	1
		423 Hemlock	Forested	1
		424 Pitch Pine	Forested	1
		430 Mixed Forest	Forested	1
		440 Alpine	Forested	1
		500 Water	***Open Water***	***1***
		610 Forested Wetland	Wetland	1
		620 Open Wetland	Wetland	1
		630 Tidal Wetland	Wetland	1
		710 Disturbed	Cleared/Disturbed	0.5
		720 Bedrock/Veg.	Undeveloped	1
		730 Sand Dunes	Undeveloped	1
		790 Other Cleared	Cleared/Disturbed	0.5
		800 Tundra	Undeveloped	1

In addition to the CALM database, NH DES maintains an existing GIS file of Assessment Units (AU) or surface water features (lakes, ponds, rivers) for the entire state that can be linked to the CALM database using a unique identifier. A few GIS preprocessing steps were used to link the CALM database to the GIS file for the AU's and create a new GIS representing only the AU classified as not meeting water quality standards (See Table C-3 for a listing of input datasets). For the purposes of this study, the TAG decided that all Assessment Units listed in the CALM under

NHDES Use Category 5-P, would be coded as not meeting water quality standards. A GIS "Select by Location" analysis was used to select out restoration sites that intersected an AU not meeting water quality standards.

Table C-3. Ecological Integrity, Parameter 3

Model Variable	Source Provider	Ranking Attribute	GIS Operation Used	Score
Site Boundary	Restoration Site	ID Number	Select all Sites that intersect an AU with NHDES Use Category of 5-P	a. Site associated with AU meeting water quality standards = 1
Assessment Units	NHDES	AU ID Number		b. Site associated with AU Not meeting water quality standards = 0.5

C.1.4 Parameter 4 - Population density (2000 Census) surrounding the site

To evaluate this parameter existing GIS sub-catchments were used from USGS Spatially Referenced Regressions on Watersheds (SPARROW) for NH. The Society for the Protection of NH Forests (SPNHF) recently updated the attributes of the SPARROW catchments for NH to include key data found in the 2000 Census, along with many other useful attributes. Sites were ranked using the following methodology:

1. **Intersect** Restoration Sites and SPARROW Sub-catchment units to determine if a restoration site falls within multiple catchment areas
2. **Calculate** the acreage of the intersected areas for each restoration site
3. For each restoration site, **calculate** the percentage of sub-catchment area located within it
    a. Percentage = Intersected Area/Site Total Area
4. **Calculate** the 2000 population density for each intersected area by multiplying the percentage from step 3, by each sub-catchment unit's 2000 population density. This required for only those sites located within multiple sub-catchments.
    a. [SPARROW_POPDEN2000] * [Percent_Site]
    b. At this stage, it is possible for a site to have multiple population densities.
5. Using the **Summary Statistics** tool, calculate a single population density for each site.
6. Populate the score by running multiple **selection by locations**

a. Example. Score = 1, if 2000 Population Density < 50 persons per square mile

Table C-4. Ecological Integrity, Parameter 4

Model Variable	Source Provider	Ranking Attribute	Score
Site Area	Restoration Site	Area	a. Density < 50 pp square mile = 1 b. Density between 50-100 pp square mile = 0.5 c. Density > 100 pp square mile
SPARROW Sub-Catchment Units	Society for the Protection of NH Forests	Population Density	

C.1.5 Parameter 5 - Percent of the original wetland filled

When a wetland is filled several if not all of the characteristics or functions of the wetland are lost. For example, filling a portion of a wetland might alter the hydrology of the entire wetland affecting the habitat it supports, flood storage protection, and loss of plant community. The key factor used to evaluate this parameter is the NH DES Wetlands Permit Database maintained by the Wetlands Bureau, which is available for the entire State as a GIS point file. In order to determine the percentage of the wetland system filled, each candidate site was buffered by 75 feet, and a GIS Spatial Join was used to select all sites where a wetlands permit had previously been issued. If a single wetlands permit has been issued previously, the site received a score of 0.5; if more than 1 permit was issued on the site, the site received a score of 0.1; otherwise the site was given a score of 1.0 (See Table C-5). An overview of the GIS operations used to evaluate this parameter are summarized below.

1. **Buffer** the restoration sites by 75′
2. Create a **spatial join** between the buffered sites and the NHDES Wetland Permits
   a. The spatial join create a field that counts the number of wetland permits located within each buffered area
3. Use the **summary statistics** tool on the joined layer summarizing the join count for each site
4. Populate the parameter score by executing multiple **select by attributes**
   a. Example. Select all sites whose join count is >1 and give it a score of 0.1

Table C-5. Ecological Integrity, Parameter 5

<table>
<tr><th>Model Variable</th><th>Source Provider</th><th>Ranking Attribute</th><th>Score</th></tr>
<tr><td>Site Area</td><td>Restoration Site</td><td>Proximity</td><td rowspan="2">a. No permits issues = 1
b. 1 permit issued = 0.5
c. More than 1 permit issued = 0.1</td></tr>
<tr><td>Wetland Permit</td><td>NHDES Wetlands Bureau</td><td>Proximity</td></tr>
</table>

C.1.6 Parameter 6 - Percent of wetland edge bordered by a 500 foot buffer of woodland or idle land

Woodland and idle land buffers provide important habitat for many upland and wetland animal species. Buffers also act as a barrier to humans, which prevent noise and other human disturbances from entering the wetland. Parameter 6 was evaluated by looking at the percentage of forested or idle land within the 500′ buffer zone surrounding each restoration site. For the purposes of satisfying this parameter, land use coded as wetlands in the 2001 NHLCA, were considered to be idle land. To calculate the percentages, the restoration sites were buffered by 500′ and then intersected with the 2001 NHLCA. The result is a layer containing the geometric intersection of the two input datasets. A selection set was run on the intersected layer to identify the forested and idle land. Based on the selection set, a calculation was executed to total the amount of forest and idle land for each 500′ buffer. The percentage was calculated by dividing the forest/idle land acreage, by the total acreage of the buffer area. The percentages were then categorized into 3 groups for the purposes of applying a score to each site.

1. **Buffer** restoration sites by 500′
2. **Intersect** the restoration site buffers with the 2001 NHLCA data
3. **Select** out the forested and idle land
4. **Calculate** the acreage of the forested and idle land on each site
5. **Dissolve** the intersected layer, totaling the amount of forested/idle land
6. **Calculate** the percent of forested/idle land by dividing the total acreage of forested/idle land by the total area of the 500′ buffer.

Table C-6. Ecological Integrity, Parameter 6

Model Variable	Source Provider	GIS Operation	Score
500' Buffer Area	Restoration Site	Intersect	a. >80 percent forested/idle =1 b. 20 to 80 percent forested/idle = 0.5 c. <20 percent forested/idle = 0.1
Land Use	2001 NH land Cover Assessment	Select out forested and wetland land uses	

C.1.7 Parameter 9 - Percent of wetland plant community presently being altered by mowing, grazing, farming, or other activity

To satisfy this parameter, the Composite Wetland System (CWS) associated with the restoration site was evaluated. The CWS is created by merging the NRCS poorly drained and very poorly drained soils units with the National Wetlands Inventory (NWI) wetlands. In some instances the CWS is the entire restoration site, however, the majority of the restoration sites are a much smaller unit as illustrated in Figure C1. 2001 NHLCA data was used to identify agricultural areas within the CWS. The scoring for this parameter is based on the percentage of agricultural land in each CWS.

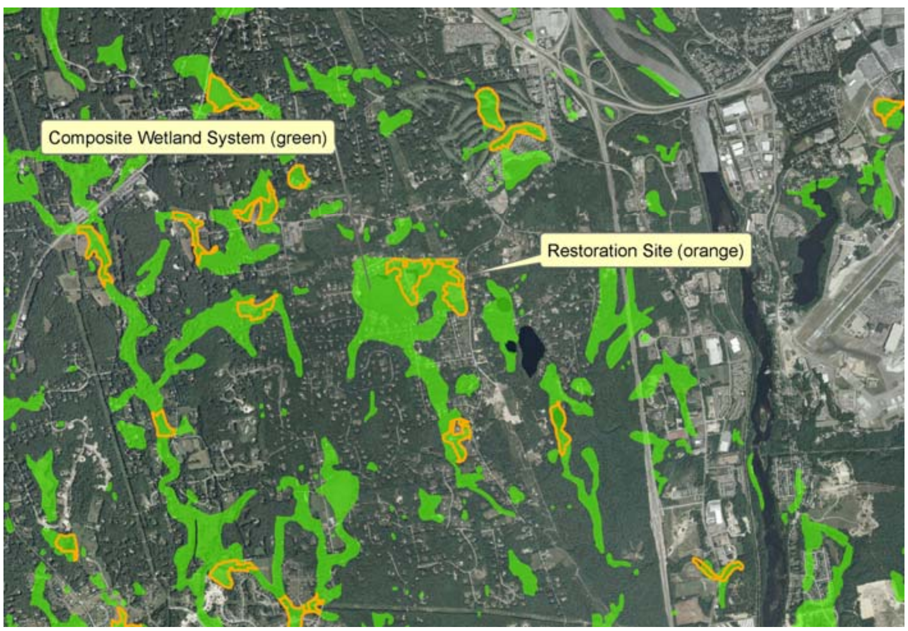

Figure C1. Ecological Integrity, Parameter 6

1. Create a temporary layer by selecting agricultural land uses from the 2001 NHLCA

    a. Agricultural areas = hay/pasture, orchards, and row crops

2. Intersect the temporary agricultural lands layer with the CWS layer

3. Use the intersected layer to calculate the acreage of agricultural land in each CWS

4. Calculate the percentage of agricultural land in each composite wetland system by dividing the acreage of agricultural land by the total area of the composite wetland system.

5. Join the CWS layer to the restoration sites and score the site accordingly

    a. The CWS layer contains a field summarizing the percentage of agricultural land in each CWS

Table C-7. Ecological Integrity, Parameter 9

Model Variable	Source Provider	GID Operation	Score
Restoration Site	Site Identification Model	Join Layer	a. < 10 percent = 1
Land Use	2001 NH Land Cover Assessment	Select out agricultural areas (hay/pasture, orchards, row crops)	b. 10 to 50 percent = 0.5
Composite Wetland System (CWS)	Site Identification Model	Intersect	c. > 50 percent = 0.1

C.1.8 Parameter 10 - Percent of wetland actively being drained for agricultural or other purposes

Within the NWI wetlands mapping data, a wetland code is available for each wetland. This code can be used to identify wetland systems that have a special modifier associated with them. The special modifier identifies if a wetland has been altered from its natural state. To access this information the last digit in the wetland code was evaluated. To satisfy this parameter any NWI wetland containing an "x" (wetland has been excavated), or a "d" (wetland has been partially drained/ditched) in the last digit of the wetland code was selected for analysis. The modified wetlands were then overlaid on top the CWS associated with each restoration site and a calculation was made to determine the percentage of modified wetlands in each CWS.

1. Using the NWI wetlands layer, **select** out wetlands with an 'x' or 'd' special modifier

    a. Example, NWI Code = PUBH**x** or NWI Code = PEM1E**d**

2. **Intersect** the wetlands with special modifiers from step 1 with the CWS layer

3. **Calculate** the acreage of modified wetlands in each CWS

4. **Calculate** the percentage of special modifiers in CWS by dividing the modified area by the total area of the CWS.

5. **Join** the CWS layer to the restoration sites layer and score accordingly

    a. The CWS layer contains a field summarizing the percentage of NWI special modifiers in each CWS

Table C-8. Ecological Integrity, Parameter 10

Model Variable	Source Provider	Ranking Attribute	Score
Restoration Site	Site Identification Model	Join Layer	a. < 10 percent = 1 b. 10 to 50 percent = 0.5 c. > 50 percent = 0.1
NWI Special Modifiers ‘x’ & ‘d’	National Wetlands Inventory (NWI)	NWICODE (last digit = ‘x’ or ‘d’)	
Composite Wetland System (CWS)	Site Identification Model	Intersect	

C.1.9 Parameter 11 - Number of road and/or railroad crossing per 500 feet of wetland

Before calculating the number of crossings, the NH Method requires that the long axis of each restoration site be determined. To accomplish this, a preprocessing step is required using an ArcView 3.x GIS script. The script evaluates the polygon of each restoration site, and determines the longest axis (straight line). The output is GIS shapefile represented as a polyline for each restoration site that can be used to calculate the long axis length measured in feet. Once the long axis is determined for each site, a series of GIS procedures and calculations is performed on multiple data layers. A list of input layers and the scoring scheme can be found in Table C-9. Below is an overview of the GIS procedures used to evaluate this parameter:

1. **Intersect** streams, roads, railroads with the restoration sites

2. Use the **summary statistics** tool to summarize the road and railroad crossings for each restoration site

    a. The result is a table containing a count of the number crossings by restoration site

3. **Add a new field** to the long axis layer

    a. Field is used to store the crossing length

4. Use the attribute table **field calculator** to populate the field created in step 3

    a. Expression = Long Axis Length/500

    b. The result is used to calculate the number of crossing per 500′ of wetland

5. **Merge** the resulting tables from step 2 into a single table

    a. The table contains a field with the total number of crossing

6. **Join** the table from step 5 to the long axis layer

7. **Calculate** the number of crossing per 500′ using the expression below

    a. Crossing per 500′ of wetland = Number of crossings/crossing length

Table C-10. Ecological Integrity, Parameter 11

Model Variable	Source Provider	Ranking Attribute	Scoring
Restoration Site	Site Identification Model	Intersect	a. 0 road crossing = 1 b. 1 or fewer road crossing = 0.5 c. More than 1 road crossing = 0.1
Long Axis	Preprocessing step using ArcView 3.3 Script	Long Axis Length	
Streams	USGS National Hydrography Dataset (NHD)	Intersect	
Roads	NH GRANIT	Intersect	
Railroads	NH GRANIT	Intersect	

C.1.10 Parameter 12 - Long-term stability of the site

To assess the long-term stability of each restoration site, special modifiers found in NWI mapping are combined with an active dam's layer provided by NHDES. Restoration sites associated with a wetland that has been identified as being diked/impounded 'h', excavated 'x', or impacted by beavers 'b', were selected out to be evaluated. In addition, all restoration sites located within 100′ of an active dam were selected. Table C-11 provides a listing of the input data layers and the scoring scheme used in the evaluation. An overview of the GIS operations is listed below:

1. **Select** all NWI wetlands with the following special modifiers:

    i. 'h' diked/impounded

    ii. 'x' excavated

    iii. 'b' beaver

2. Execute a **select by location** on the NWI wetlands identified in step1 with the restoration sites layer

    a. If a restoration site touches the boundary of a 'h', 'x' or 'b' NWI wetland, set the score to 0.5

3. Execute a second **select by location** on the active dams layer with the restoration sites

a. Select all restoration sites that are within a distance of 100′ of an active dam and set the score to 0.5

4. For all other restoration sites, set the score to 1

Table C-11. Ecological Integrity, Parameter 12

Model Variable	Source Provider	Raking Attribute	Scoring
Restoration Site	Site Identification Model	Proximity	a. Wetland appears to be naturally occurring, not impounded by a dam or dike = 1 b. Wetland appears to be somewhat dependent on artificial diking by a dam or dike = 0.5
NWI Wetlands with Special Modifiers 'h', 'x', or 'b'	National Wetlands Inventory (NWI)	NWI Code	
Active Dams	NHDES	Proximity	

C.1.11 Calculation of the Ecological Integrity Functional Value Index (FVI)

To calculate the FVI for Functional Value Ecological Integrity, the scores from the 10 parameters evaluated are summarized and averaged together to generate a single Ecological Integrity FVI score. The FVI score was then averaged with the remaining four functional evaluations to generate an overall FVI comprising 70% of the prioritization score.

C.2 Functional Evaluation for Significant Habitat

The NH Method uses two functional valuations to assess significant habitat; Wetland Wildlife Habitat, and Finfish Habitat. It should be noted that the NH Method does not evaluate habitat for any particular species, instead it associates a set of habitat characteristics for a broad range of species known to occupy wetland areas. The TAG reviewed each of the parameters associated with two functional evaluations and determined which ones could be assessed using GIS. In addition, the TAG identified two additional sources of information that should be included; Natural Heritage Bureau, plant species with low ranking exemplary natural communities, and habitat information from the 2006 Wildlife Action Plan (WAP). To be consistent with the NH Method the evaluation of significant habitat does not evaluate habitat for any particular species, instead it associates a set of habitat characteristics for a broad range of species known to occupy wetland areas.

C.2.1 Component 1 - NH Method Functional Value 2 – Wetland Wildlife Habitat

Of the 10 parameters associated with the NH Method FV2, 7 were evaluated in this study. The first parameter is the average FVI from Functional Value1 Ecological Integrity. An overview of the remaining steps and data layers used to complete evaluation is discussed below.

C.2.1.1 Parameter 2 - Area of permanent shallow open water (less than 6.6 feet deep) associated with the wetland

The NWI mapping data was used to select littoral wetlands and palustrine wetlands classified has having an unconsolidated bottom, aquatic bed, or unconsolidated shoreline, which are characteristic of wetlands with permanent shallow open water. With the shallow water systems identified, a GIS overlay analysis was used to determine if a restoration site contains any shallow open water and the amount. Table C-12, lists the critical data layers and the scoring used in this parameter. Below is summary of the GIS operations used to generate the scores:

1. From the NWI wetlands layer, **select** all sites associated with permanent shallow open water
   a. Littoral Lacustrine wetland systems
   b. Palustrine wetlands systems with an NWI code containing the following identifiers:
      i. UB – Unconsolidated Bottom
      ii. AB – Aquatic Bed
      iii. US – Unconsolidated Shoreline
2. **Intersect** the selected set of wetlands from step 1 with the restoration sites
3. **Calculate** the acreage of each intersected area
4. Use the **summary statistics** tool on the intersected layer from step 2 to summarize the total amount of permanent shallow water on each site
5. Complete the analysis by executing multiple **select by attributes** and field calculations to score each site
   a. Example. If the amount of shallow open water > 3 ac, score = 1

Table C-12. Significant Habitat, NH Method FV2 Parameter 2

Model Variable	Source Provider	Ranking Attribute	Scoring
Restoration Site	Site Identification Model	Area	a. More than 3 acres = 1
Permanent Shallow Open	National Wetlands	NWI Code	b. 0.5 to 3 acres = 0.5
Water	Inventory		c. Less than 0.5 acres = 0.1

C.2.1.2 Parameter 3 - Water quality associated with the watercourse, lake or pond associated with the wetland

See Ecological Integrity, Parameter 3.

C.2.1.3 Parameter 4 - Wetland diversity found on the site

Parameters 4, 5, and 6 from the NH Method were assessed primarily using the NWI wetlands mapping data and the acreage of each restoration site. For parameter 4; Wetland Diversity, the total number of wetlands classes (each of which should occupy > 20% of the total restoration site) were evaluated. A GIS overlay analysis is used to intersect the NWI wetlands with the restoration sites, and then a series of selections is completed on the intersected layer to determine how many wetland classes exist on each site.

1. **Intersect** NWI wetlands and restoration sites
2. **Calculate** the acreage of each intersected area
3. **Dissolve** the intersected layer for each restoration site and summarize the acreage from step 2
4. **Calculate** the wetland class ratio for each restoration site in a new field
    a. Ratio = wetland class acreage/restoration site acreage
5. **Select** out wetland classes that occupy more than 20% the restoration site
6. Use the **Summary Statistics** tool to generate a table listing number of wetland classes for a given restoration site
    a. The statistics tool creates a table with a frequency field. The frequency field contains the count of wetland classes for each restoration site.
7. **Join** table from step 6 to the restoration sites layer and score according to the NH Method

Table C-13. Significant Habitat, NH Method FV2 Parameter 4

Model Variable	Source Provider	Ranking Attribute	Score
Restoration Site	Site Identification Model	Area	a. Three or more wetland classes present = 1 b. Two wetland classes present = 0.5 c. One wetland class present = 0.1
Wetland Classes	USFWS National Wetlands Inventory	Area & NWI Code	

C.2.1.4 Parameter 5 - Dominant wetland class found on the site

To determine the dominant wetland class, the resulting layer from the intersection of the NWI wetlands mapping and the restoration sites was used. The intersected areas were dissolved for each restoration site by wetland class, and the acreage was then calculated. The dominant class for each restoration site by finding the wetland class with largest acreage. The restoration site was then scored depending on the type of wetland class.

Not all restoration sites overlay with an NWI wetland because some restoration sites consist only of NRCS hydric soils and were not included in the NWI mapping. These restoration sites tend to be located in scrub/shrub forested areas. In addition, any restoration site whose dominant wetland class is less than 2 acres in size is coded as scrub/shrub forested. The reason for this is that a restoration site could be located in an area primarily of forested hydric soils, with only a small portion of NWI mapping. Without the 2 acre threshold the NWI wetland mapping would take precedence.

1. **Intersect** NWI wetlands and restoration sites
2. **Calculate** the acreage for each intersected area in a new field
    a. Dissolve the intersected layer, totaling the acreage field from step 2
3. **Dissolve** field = restoration site ID number, and NWI Code
4. Use the **Summary Statistics** tool to identify the largest NWI class based on acreage for a given site
    a. Output is a table containing a record for each restoration site
5. **Join** output table from step 4 to the dissolved layer created in step 3 to identify the dominant wetland class for each site
6. Score the sites according to the NH method

Table C-13. Significant Habitat, NH Method FV2 Parameter 5

Model Variable	Source Provider	Ranking Attribute	Score
Restoration Site	Site Identification Model	Area	a. Emergent Marsh and/or shallow open water = 1 b. Forested and/or scrub-shrub wetland = 0.5 c. Scrub-shrub saturated)bog) or wet meadow = 0.1
Wetland Classes	USFWS National Wetlands Inventory	Area & NWI Code	

C.2.1.5 Parameter 6 - Interspersion of vegetation classes found on the site

In order to determine the amount of interspersion of vegetation classes for a given restoration site a ratio was used. The ratio is expressed as the number of NWI wetland classes located on each site, divided by the maximum number of NWI wetland classes found within the study set, which for this study equals 14. Below is an overview of the GIS procedures used to evaluate this parameter.

1. **Intersect** NWI wetlands and restoration sites
2. Use the **Frequency Statistics** to list all of the unique wetland classes that exist on each restoration site
    a. Output is table listing every wetland class located on a given site based on the NWI Code
3. Use the **Summary Statistics** tool on the resulting table from step 2 to summarize the total number of wetland classes on a given site
    a. The output is a table containing a single record for each restoration site
4. Run a second **Summary Statistics** analysis on the table from step 2, but choose the option to return the maximum value
    a. The output is a Table C-ontaining a single value equaling the maximum number of NWI wetland classes for the 951 restoration sites
5. **Join** the table from Step 4 to the output table in Step 3 to calculate the interspersion ratio
    a. Interspersion Ration = Step 3 output/Step 4 output

The scores for this parameter are continuous, 0 to 1.

C.2.1.6 Parameter 7 - Wetland Juxtaposition

In order to evaluate a sites juxtaposition in relation to other wetlands, a series of proximity analyses were used. Sites were scored based on their connectivity to other wetlands by a perennial stream or lake. Connectivity was evaluated using radiuses of 1 mile, 1 to 3 miles, and 3 miles. The steps below summarize the GIS procedures used in this evaluation.

1. **Select** all Sites within 1 mile of an NWI wetland
    a. Sites meeting this criteria are given an initial score of 0.1
2. **Select** all Sites within 50'of a stream and within 3 miles of an NWI wetland
    a. Sites meeting this criteria are given a score of 0.5
3. **Select** all sites within 50' of a stream and within 1 mile of an NWI wetland
    a. Sites meeting this criteria are given a score of 1.0

Parameter 10) Percent of the wetland edge bordered by upland wildlife habitat (brush, woodland, active farmland, or idle land)

This parameter is similar to FV1 Ecological Integrity parameter 6, where the ratio of wildlife habitat in the upland 500' is evaluated. The general steps outlined previously in FV1 parameter 6 are used to calculate the ratio, except active farmland (orchards, row crops, and hay/pasture) is considered wildlife habitat. The restoration sites are buffered by 500' and then a series of overlay analyses are used to calculate the percentage of wildlife habitat. The percentages were then classified into three categories for scoring.

1. **Buffer** restoration sites by 500 feet
2. **Intersect** 2001 land use data with the 500' buffer areas
3. **Select** out wildlife habitat from the intersected layer
    a. Wildlife habitat = forest land, hay/pasture land, row crops, orchards, tundra, sand dunes, and bedrock/vegetation land
4. Use the **field calculator** to calculate the acreage of the wildlife habitat
5. **Dissolve** the intersected layer, summarizing the total acreage of wildlife habitat on each site
6. **Calculate** the ratio of wildlife habitat on each site using the expression below
    a. Wildlife habitat ratio = acres of wildlife habitat/500' Buffer Area

7. Use the **select by attributes** function to score each site based on the wildlife habitat ratio

Table C-14. Significant Habitat, NH Method FV2 Parameter 10

Model Variable	Source Provider	Ranking Attribute	Score
Upland Area	500' Buffer of restoration sites	Area	a. More than 40 percent wildlife habitat = 1 b. 10 to 40 percent wildlife habitat = 0.5 c. Less than 10 percent wildlife habitat = 0.1
Land use	2001 NHLCA	Land use type	

C.2.2 Component 2 - NH Method FV 3 - Finfish Habitat

C.2.2.1 Parameter 1 - Amount of forested land in watershed above the restoration site

To evaluate this question, the upslope watershed for each restoration site is required. This was accomplished using ArcHydro software, which is a free extension for ArcGIS. A USGS Digital Elevation Model (DEM) is the primary data source used to generate the watersheds. Before the watersheds can be generated, several preprocessing steps are required for DEM. The steps for ArcHydro DEM conditioning include burning in a hydrologic network layer (streams), filling DEM sinks, calculating flow direction and flow accumulation in order to automate watershed delineation and are included in the ArcHydro online documentation. Once the DEM is processed the user can delineate upslope watersheds for the potential restoration sites automatically. Once the watersheds have been created, an overlay analysis is used to identify forested land within the watersheds.

1. Using the 2001 land use layer, **create a new selection set** by selecting out forested areas and wetlands
2. **Intersect** selection set from step 1 with the upslope watersheds
    a. The result is a polygon file representing upslope forested areas on a given restoration site
3. **Calculate** the forested acreage of each intersected area in a new field
4. **Dissolve** the intersected areas for each site, summarizing the acreage
5. **Join** the resulting layer from step 4 to the upslope watersheds layer
6. **Calculate** the ratio of forested area on each site by dividing forested acreage by the total area of the upslope watershed

7. Use the **select by attributes** function to score each site based on the ratio of forested area

Table C-15. Fin Fish Habitat, Parameter 1

Model Variable	Source Provider	Ranking Attribute	Scoring
Upslope Watershed	Created using ArcHydro Extension	Area	a. More than 80 percent forested = 1 b. 40 to 80 percent forested = 0.5
Forest Land	2001 NHLCA	Area	c.< 40 percent forested = 0.1

C.2.2.2 Parameter 2 - Water Quality of the watercourse associated with wetland

See FV1, Parameter 3

C.2.2.3 Parameter 3 - Barrier(s) to anadromous fish (such as dams, beaver dams, and road crossings) along the stream associated with the wetland

To determine if a barrier exists on a given restoration site, a series of proximity analyses were conducted. The creation of a culverts layer is needed to complete part of the evaluation. In order to create the culverts layer, several preprocessing steps are needed prior to running the model. The culvert layer is created by intersecting the NHD flowline (streams) layer with the most recent transportation network available in NHGRANIT. The result is a point file representing the intersected locations. The final preprocessing step is to eliminate any points that represent bridges. Using aerial photography and a bridge layer provided by the NH Department of Transportation (NHDOT) each point is reviewed to ensure that only culverts are represented in the dataset.

1. **Select** all restoration sites that are within 100′ of a stream

2. **Select** all restoration sites that **intersect** with an NWI wetland with a special modifier of beaver or diked/impounded

3. Repeat step 1

4. **Select** all restoration sites that are located within 500′ of a culvert

5. Repeat step 1

6. **Select** all restoration sites that are located within 500′ of a dam

7. Any site selected in steps 2, 4, or 5 is given a score of 0.1

Table C-16. Fin Fish Habitat, Parameter 3

Model Variable	Source Provider	Ranking Attribute	Scoring
Restoration Site	Site Identification Model	Proximity	a. No barriers exist to fish passage = 1
Dams	NH DES	Proximity	
Culverts	National Hydrography Dataset and GRANIT Road Network	Proximity	b. Barriers exist preventing fish passage = 0.1
Wetlands with special modifiers 'b' or 'h'	National Wetlands Inventory (NWI)	Proximity	

C.2.2.4 Parameter 4 - Stream Bank Width

To evaluate the stream bank width associated on a given site, the Strahler stream order classification contained within the NHD flowline database is used. Sites associated with smaller streams received a lower score than sites associated with a large stream. To complete the analysis, the NHD flowline network was intersected with the restoration sites. If a site contained multiple streams with different stream orders, the larger one was selected.

1. **Buffer** NHD flowline by 100 feet
2. **Intersect** 100'buffer of NHD flowline with restoration sites
3. **Dissolve** the intersected area for each restoration site and summarize the data by selecting the highest stream order
   a. Case field = Identification number of the restoration site
   b. Statistics = Stream order (maximum value)
4. **Join** the dissolve layer to the restoration sites
5. Run multiple **select by attributes** to score each site based on the largest stream order
   a. Example. If stream order = 3 then site score = 0.5

Table C-17. Fin Fish Habitat, Parameter 4

Model Variable	Source Provider	Ranking Attribute	Scoring
Stream Order	NHD Flowline	Intersect	a. Stream Order >3, score = 1 b. Stream order = 3, score = 0.5
Restoration Site	Site Identification Model	Intersect	c. Stream order < 3, score = 0.1

C.2.3 Component 3 - Natural Heritage Bureau Exemplary Natural Plant Communities

The NH Natural Heritage Bureau provided a database in GIS format, of exemplary natural plant communities to include in the analysis of important habitat. A proximity analysis is used to select all sites that intersect such a plant community and are given a score of 1.0. All other sites receive a score of 0.5.

1. Use the **select by location** function to select all restoration sites that intersect an NHB exemplary natural plant community
2. All sites selected in step are given a score of 1.0, else other sites = 0.5

C.2.4 Component 4 - NH Fish and Game Wildlife Action Plan Data

C.2.4.1 Parameter 1 - Sites located in a high ranking habitat

The 2006 NH Fish and Game Wildlife Action Plan (WAP) identified 19 unique habitat types located in the State of New Hampshire. In addition to the habitat types, the plan identifies locations of high ranking habitat available in GIS format. The habitat was ranked into 4 categories; Tier 1, highest ranked habitat in ecological region, Tier 2 highest ranked habitat in biological region, Tier 3 supporting landscapes, and habitat not top ranked. To identify sites located within high ranking habitat areas, the composite wetland system (CWS) for each site is overlaid with the ranked habitat. Wetland systems located in multiple ranked habitats are classified with the higher of the highest tier. A preliminary score is applied to each site based on the composite wetland system the site is located within. A second overlay analysis is executed using the site boundary and the ranked habitat to code individual sites that are located within an area of ranked habitat.

1. **Intersect** Composite Wetland System (CWS) with Significant Habitat
2. **Add a new field** 'TierScore' to the intersected layer
   a. This field is used to identify the highest ranked habitat associated with each CWS
3. Using a series of **select by attributes**, populate the field 'TierScore' with the appropriate attributes
4. **Join** the intersected layer to a ID layer that contains the restoration site identification number and the CWS identification number
   a. A preprocessing step is used to create the layer with the identification numbers, which is then used an input to the model.

5. Using the **field calculator**, score the ID layer based on the 'TierScore' field found in the joined layer
    a. The scores reflect the highest ranked habitat in the CWS that a given site is located in
6. Using a series of **select by locations**, restoration sites located in high ranking habitat areas are selected and scored
    a. Example. Select all restoration sites located in Tier 1 habitat and give it a score of 1.0
    b. Example. Select all restoration sits located in Tier 2 habitat and give it a score of 0.5

Table C-18. Fin Fish Habitat, Ranked Habitat

Model Variable	Source Provider	Ranking Attribute	Scoring
Ranked Habitat	NH Fish & Game	Intersect	a. Tier 1 Habitat = 1
Restoration Site	Site Identification Model	Intersect	b. Tier 2 Habitat = 0.5
Composite Wetland system (CWS)	Site Identification Model	Intersect	c. Tier 3, or not top ranked = 0.1

C.2.4.2 Parameter 2 - Sites located within an unfragmented landscape

In the process of identifying important habitat areas, the NHFG created an unfragmented landscapes data layer. The layer was created using the 2001 NHCLA data in combination with the NH DOT roads layer. Areas of development and road surfaces were removed to create a contiguous area of land cover. For additional information, see the 2006 WAP documentation on unfragmented land. The restoration sites were intersected with the unfragmented landscape data layer, and the size of the unfragmented block was used as the ranking attribute. Sites located on a large (> 5,000 ac) unfragmented block are given a higher score than those located in a small (<1,000 ac) unfragmented block.

1. **Intersect** NHFG unfragmented blocks with restoration sites
2. **Dissolve** the intersected area for each restoration site and summarize the unfragmented block size
    a. The unfragmented block size exists as an attribute provided by NHFG
3. **Join** the dissolved layer to the restoration sites

4. Using a series of **select by attributes**, the score for each site was calculated
    a. Example. If unfragmented block size is between 1,000 and 5,000 ac, then the score = 0.5

Table C-19. Fin Fish Habitat, Unfragmented Landscapes

Model Variable	Source Provider	Ranking Attribute	Scoring
Unfragmented Landscapes	NH Fish & Game	Intersect	a. Block size >5,000 ac = 1.0 b. Block size 1,000 to 5,000 ac = 0.5 c. Block size <1,000 ac = 0.1
Restoration Site	Site Identification Model	Intersect	

C.2.5 Calculation of Significant Habitat Score

To calculate the FVI for Functional Value Significant Habitat, the parameters from the NH Method were average together and combined with the average scores from NHB and WAP evaluations. The FVI score will then be averaged with the remaining 3 functional evaluations to generate an overall FVI comprising 70% of the prioritization score.

C.3 NH Method: Functional Value 7 – Flood Control Potential

This Functional Value is designed to determine the potential for a given site to act as a natural flood control buffer. In the NH Method, the two main factors used to determine the flood control potential are storage (e.g. the amount of water that the wetland can hold) and the outlet flow rate. In addition to these two factors, the percentage of the site located within a FEMA floodplain, and the dominant wetland class was also evaluated.

In order to determine the values flood control potential of a given site two ratios need to be calculated; The storage ratio, expressed as the area of watershed for the potential site (WA) divided by the site area (SA) and the flow ratio expressed as the area of the watershed for the site divided by the wetland control length (WCL).

The flood control potential of restoration site was also evaluated based on its proximity to FEMA mapped flood zones and the dominant wetland class located within the floodplain. An overlay analysis was used to calculate the ratio of the FEMA mapped flood zone (FAREA) on each site. The ratio is expressed as the FAREA/SA using internal area calculations. The process was for determining the dominant wetland class was repeated from the steps outlined in FV2 Significant Habitat (parameter 5) outlined above.

In order to calculate the required ratios, a series of calculations and processing steps are performed in GIS to generate the numbers. The critical data sources are outlined below in Table C-20. Several preprocessing steps are needed to before calculation of the ratios. This includes the generation of upslope drainage areas for the potential restoration sites. For this model the ArcHydro extension was used to process a digital elevation model (DEM) of the MRW. The steps for ArcHydro DEM conditioning include burning in a hydrologic network layer (streams), filling DEM sinks, calculating flow direction and flow accumulation in order to automate watershed delineation and are included in the ArcHydro online documentation. Once the DEM is processed the user can delineate upslope watersheds for the potential restoration sites automatically. The WA/SA ratio is then calculated using the internal area calculations.

Table C-20. Flood Control Potential

Model Variable	GIS Data Sources(s)	Ranking Attribute	Formula and Ranking
Site Area (SA)	Restoration Site	Area	Internal GIS Calculation
Upslope Watershed Area (WA)	DEM Restoration Site	Area	Internal GIS Calculation
Wetland Control Length (WCL)	Bridge Dam Road Surface Waters	Proximity	Internal GIS Calculation
Flood Zone	FEMA/GRANIT	Area	Internal GIS Calculation

The WCL is estimated based on a series of proximity analyses based on the assumption that proximity to bridges, dams and roads will restrict the outlet flow potential at restoration sites as well as the proximity to New Hampshire surface waters. Based on the above proximity tests, the WCL length is then calculated as percentage of the perimeter of the restoration site. For sites with a large rating the WCL is equal to the perimeter of the site, medium rated sites the WCL is equal to 1/10th of the perimeter and sites rated low the WCL is equal to 1/100th of the perimeter. Table C-21 below summarizes the WCL ratings for restoration sites in the MRW.

Table C-21. Wetland Control Length Rating

Barrier Type	Outlet Type		
	No Outlet	NHD Water Body	NHD Flowline
No Barrier	Large	Medium	Medium
Dam	Large	Small	Small
Road	Medium	Small	Small
Bridge	Medium	Small	Small

Once the calculations for SA, WA and WCL are completed the flow and storage ratios can be calculated and used to determine the flood control potential score. The table below provides a matrix for determining the appropriate score. When using matrix the Site Area and Watershed Area should be calculated in acres and the wetland control length should be calculated in feet.

Table C-22. Determining Flood Control Potential Score

Ratio B - Flow = Watershed Area / Wetland C. Length	Ratio A - Storage = Watershed Area / Site Area				
	Ratio A < 10 FVI	10<Ratio A<20 FVI	20<Ratio A<50 FVI	50<Ratio A<100 FVI	Ratio A> 100
0.1	0.0	0.0	0.0	0.0	0.0
0.2	0.1	0.0	0.0	0.0	0.0
0.4	0.3	0.0	0.0	0.0	0.0
0.8	0.5	0.3	0.0	0.0	0.0
1.0	0.6	0.3	0.0	0.0	0.0
2.0	0.8	0.5	0.1	0.0	0.0
4.0	1.0	0.7	0.3	0.1	0.0
8.0	1.0	0.9	0.5	0.2	0.0
16.0	1.0	1.0	0.7	0.3	0.1
32.0	1.0	1.0	0.9	0.6	0.2
64.0	1.0	1.0	1.0	0.8	0.4
128.0	1.0	1.0	1.0	0.9	0.7
256.0	1.0	1.0	1.0	1.0	1.0

To evaluate a sites flood control potential based on its proximity to FEMA mapped 100-year flood zone, an overlay analysis was used to calculate the ratio of the FEMA mapped flood zone (FAREA) on each site. The ratio is expressed as the FAREA/SA using internal area calculations. The steps for completing the overlay analysis are as follows:

1. **Intersect** the FEMA mapped 100-year flood zone with each site
2. Use the **Field Calculator** to calculate the FAREA on each site
3. **Join** the table from step 2 to the candidate sites layer and calculate the flood plain ration by dividing the floodplain area (FAREA)/Total area of the site
4. The scores are continuous, 0 - 1

Dominant Wetland Class

The process was for determining the dominant wetland class was repeated from the steps outlined in FV2 Significant Habitat (Parameter 5) outlined above. However, the scoring scheme has been modified:

- All sites dominated by a forested and littoral wetland system received a score of 1.0. Sites dominated by scrub/shrub wetlands were given a score of 0.5, and sites with emergent wetlands systems representing the dominant class received a score of 0.1.

C.4 New Hampshire Method: Functional Value 8– Ground Water Use Potential

This functional value is intended to evaluate the potential impact on ground water for each of the restoration sites. According to the New Hampshire method wetlands tend to have a purifying effect on water quality and the following method identifies those sites with most ground water use potential. The following parameters are evaluated in order to asses FVI 8; distance from existing public or private water supply wells, distance from potential public or private water supply and the ground water quality of the water supply. In addition to the NH Method, a sites proximity to a mapped NHDES potential contamination site (CSITE/CAREA) was evaluated.

Each parameter is evaluated using existing GIS data (Listed in Table C-23 below) to calculate values for FVI 8. Each distance parameter is evaluated as follows; sites with wells (public or private) or stratified drift aquifers less than <0.5 mile downstream are rated highest (1), sites with the features of interest between 0.5 and 1 mile downstream score in the mid range (0.5) and sites with no features within 1 mile downstream scored lowest (0.1). Since well locations are shown as points the total distance to wells was used as a surrogate to the downstream distance.

Table C-23. Ground Water Use Potential

Parameter	GIS Data Source(s)	Calculation
Site Location	Restoration Site	Location
Water Supply Existing	Well	Distance from site (Downstream)
Water Supply Potential	Groundwater Drift Aquifer	
Downstream Distance	New Hampshire Surface Water	Hydro Network And Routing
Potential Contamination	NHDES CSITE/CAREA Layer	Distance from Site

The ESRI Network Analyst extension is used to determine the downstream distance from each site to groundwater drift aquifers. The network analyst is used to create network from the New Hampshire hydrology layer. Point locations are added to the network that represented the restoration sites and the groundwater drift aquifers.

With the network layer and locations it is possible to calculate the downstream distance between the potential restoration sites and the aquifers. Table C-24 below summarizes the scoring procedure used to generate FVI 8 scores.

Table C-24. FVI 8 Score

Distance from well or stratified drift aquifer	FVI 8 Score	Water Quality of Stratified Drift Aquifer
Coincident	1	
< 0.5 Miles	1	Meets NHDES Standards
Between 0.5 and 1 mile	0.5	Requires Treatment
> 1 mile	0.1	Classified as unusable for drinking water
Neither upstream of or overlaying an aquifer	N/A	
Within 200' of a potential contamination site	0.5	
> than 200' of a potential contamination site	1.0	

The final step in calculating FVI 8 to include the water quality of the watercourse, pond or lake associated with the wetland. This score was calculated in FVI 1 and can be used again here. The five calculated scores are averaged to come up with a single FVI 7 value.

An example functional value 7 calculation is provided for site 8 above. Site x is located within 0.5 miles of a well (score 1), it is 1.5 miles upstream of a stratified drift aquifer (score 0.1), needs treatment (score 0.5) and has an FVI 1 V1.3 score of 0.2. The FVI 8 score for this site would be 0.45.

C.5 New Hampshire Method: Functional Value 9 & 10 – Sediment Trapping and Nutrient Attenuation

Sediment trapping and nutrient attenuation are measures of the potential for a site to capture and store pollutants from surface runoff in the upslope watershed. Each site is rated for the opportunity and potential for capturing the pollutants. The opportunity for capture is based on the average slope of the contributing watershed and the potential sources for sediment or nutrients. The potential for capture of sediment is based on the floodwater storage potential, the riparian buffer width of the site, the dominant wetland class, and the area of impounded open water on each site. The potential for nutrient attenuation is based on the potential for sediment trapping, dominant wetland class, and the Level 1 Assessment Unit (AU) score completed by NHDES.

Land use and soil erodibility of the upslope drainage area are used to calculate the sediment loading potential. The assumption is that certain combinations of land use soil erosion classes would provide different potential for sediment. The ESRI Spatial Analyst extension is used to convert the land use and soils data into two grids ranked according to Table C-25 below. The two grids are then multiplied together using the map algebra function to determine the sediment potential. Then the average sediment potential for each of the site's upslope drainage areas (generated during FVI 7 above) is calculated using the spatial statistics tool (Hawth's tools for overlapping polygons).

Table C-25. Sediment Potential for Upslope Drainage

Land Use	Factor (LU)	Highly Erodible Soils (HEL)	Sediment Potential
Water Forest Wetland	0	Not highly erodible = 0.2	Average of Erosion Risk = LI * HEL
Beech/Oak Forested Wetlands Other Hardwoods White/Red Pine Spruce/fir Hemlock Pitch Pine Mixed Forest Alpine Tidal Wetlands Sand Dune	0.1	Not Rated = 0.5 Potentially Highly erodible = 0.7 Highly Erodible = 1	Where For upslope drainage area
Orchards Tundra	0.2		
Non-Forested Wetlands Hay/Pasture	0.4		
Residential Commercial Industrial Transportation/Utilities Other Cleared Disturbed	0.8		
Row Crop	1.2		

Nutrient attenuation is calculated by generating a grid from the land use layer based on the values in Table C-26 below. The average Nutrient Attenuation score is then calculated for each watershed using the method described for sediment potential.

Table C-26. Nutrient Attenuation Potential for Upslope Drainage

Land Use	Factor (LU)	Nutrient Attenuation
Water	0	
Forested Wetland Beech/Oak Forested Wetlands Non-Forested Wetlands Other Hardwoods White/Red Pine Spruce/fir Hemlock Pitch Pine Mixed Forest Alpine Tidal Wetlands Tundra Sand Dunes	0.04	Average LU Factor for Contributing Watershed (LU x K ≥ 1 : 1)
Orchards Other Cleared Hay/Pasture Row Crop Disturbed Residential Commercial Industrial Transportation	0.42 1.5	

To calculate the riparian buffer width, the sites location to an intermittent or perennial lake or stream, two internal buffers (20′ and 50′) are applied to each restoration site. If the site provides a buffer of 50′ between stream/lake and upland, the site receives a score of 1.0. If the site provides a buffer of 20′ between stream/lake and upland, the site receives a score of 0.5. Otherwise the site receives a score of 0.1.

1. **Buffer** each restoration site by -50 feet and -20 feet creating two new files
   a. Internal-50
   b. Internal-20
2. Using the **select by location** function, each internal buffer is evaluated to see if it intersects with a stream
3. **Calculate** score for Internal buffers intersecting with a stream
   a. If Internal-50 layer intersects with a stream, then score = 1.0
   b. If Internal-20 layer intersects with a stream, then score = 0.5

4. Using the **select by location** function, select all restoration sites that are within 50 of a lake, pond, or river
   a. Sites meeting this criteria are given a score of 1.0

The dominant class associated with each restoration site was calculated in the Significant Habitat evaluation. However, the scoring for the dominant class is now based on wetlands ability to reduce storm flow, which in turn increases the amount of sediment trapping on the site. Sites dominated by scrub/shrub wetlands receive the highest score.

To determine the amount of impounded open water on each site, an overlay analysis using NWI wetlands and the restoration sites is required.

1. **Intersect** NWI wetlands and restoration sites
2. **Calculate** the intersected areas on each restoration site
3. Using the NWI code, **select** out areas of impounded open water
   a. Special modifiers 'b' and 'h'
   b. NWI codes with an 'OW' or 'L' classification
4. **Dissolve** the selected set of records from step 3 for each restoration site, summarizing the total acreage of open water.
5. Using a series of **select by attributes**, score each site based on the amount of open water
   a. Example. If Open Water Ac > 5, site score = 1

The FVI scores for sediment trapping and nutrient attenuation were averaged into a single water quality score, representing the fifth component of the Functional Evaluation. The 5 FVI scores were average together to generate a single functional evaluation score representing 70% of total score. This score will be combined with the sustainability and feasibility scores to generate total prioritization score for each wetland.