



Merrimack River Watershed

Wetland Restoration & Protection Strategy

NH Joint Water and Watershed
Conference

November 21, 2009



NH Department of Environmental Services



Vanasse Hangen Brustlin, Inc.



naturesource communications



Society for the Protection of NH Forests

Presentation Objectives

- Review the ARM Fund Program
- Review conceptual model for the WRAM
- Provide details on how the model works including the “Site ID Model” and “Site Prioritization Model”
- Review Model Results
- Discuss upcoming ARM Fund grant opportunities

Aquatic Resource Mitigation Fund - June 2006

- RSA 482-A was amended to provide DES authority to accept mitigation funds.
- Law identified what projects are eligible and establishes the fee structure for a mitigation payment.
- Site Selection Committee formed to evaluate and recommend projects to be funded.
- Assigned NH Wetlands Council and Army Corps of Engineers the task to approve disbursements.

ARM Fund

- An additional mitigation option for projects that have met avoidance and minimization.
- An option for projects proposing > 10,000 square feet of impact.
- Process of providing a payment into a fund that pools money together to be spent in the “watershed” where impacts occurred.
- Funds go toward wetland restoration, preservation of land adjacent to aquatic resources, wetland creation or aquatic resource improvements.

Projects that should apply for ARM funds

- Development and construction of wetland restoration projects.
- Acquisition of land and cost for protection in perpetuity; acquisition of conservation easements.
- Fees associated with protection of land, surveys, appraisals, transaction costs, stewardship fees, etc.
- Other: dam removal and/or stream restoration projects, or culvert replacement work to provide habitat improvement.
- The key to success is the long-term protection of those wetland functions that are restored or enhanced.

NHDES Grant to Study Restoration

- Objective: Develop a method for identifying and prioritizing wetland restoration opportunities
- EPA PPG Funding: \$56,000
- One year schedule
- NHDES hired outside contractor: VHB

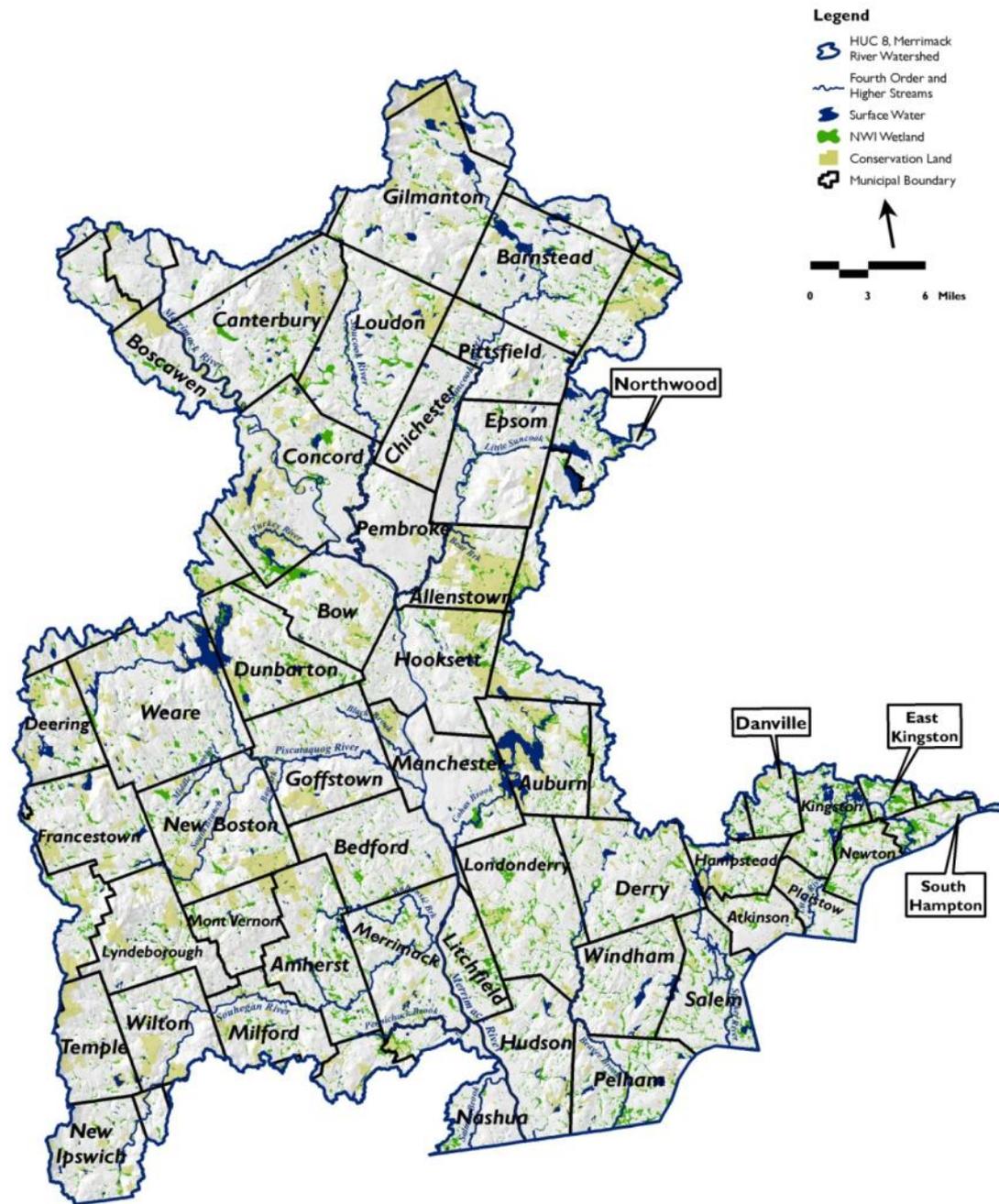
Merrimack River Watershed

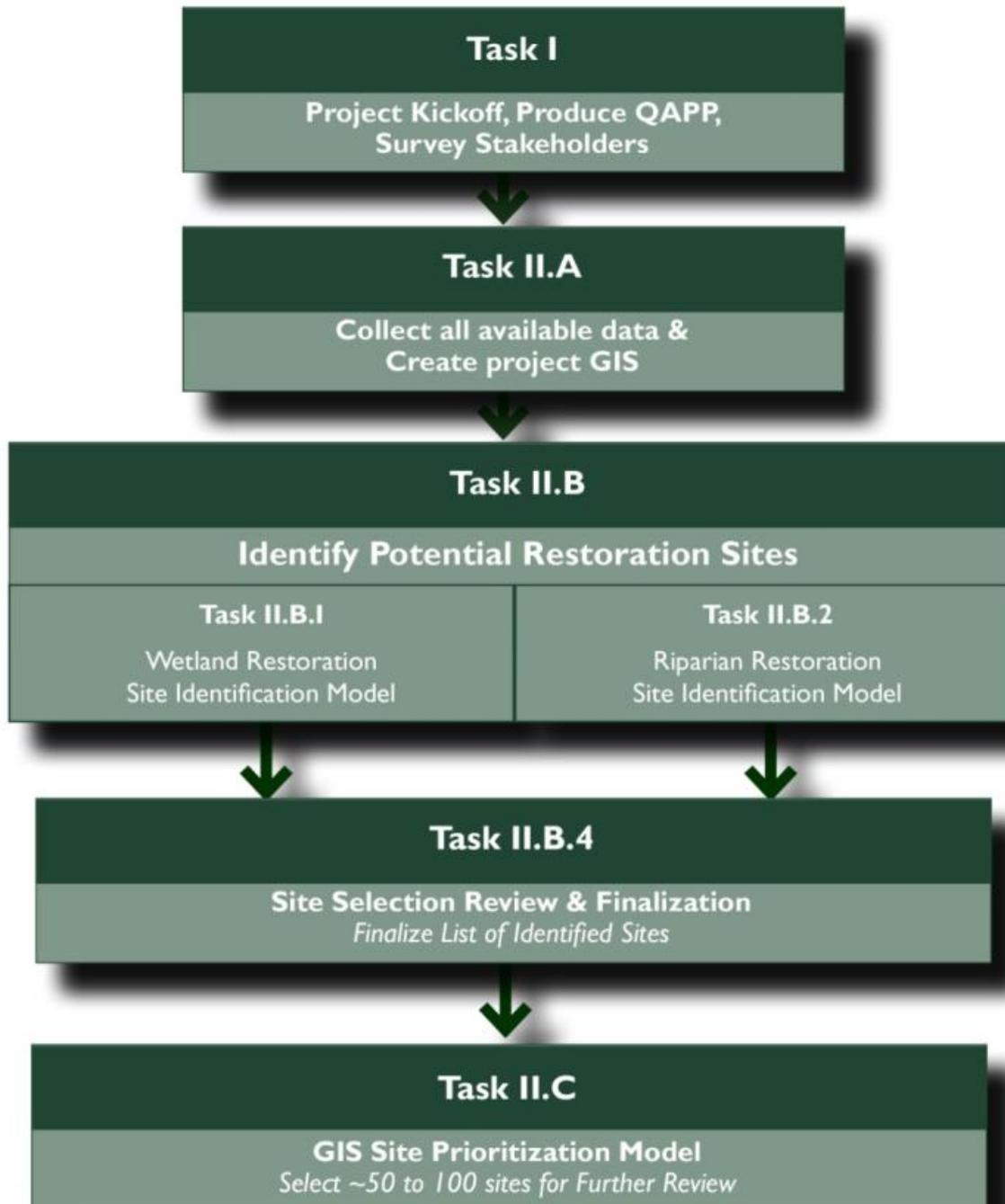
Mainstem

Confluence of Pemi & Winni
73 towns and cities

Major Tributaries

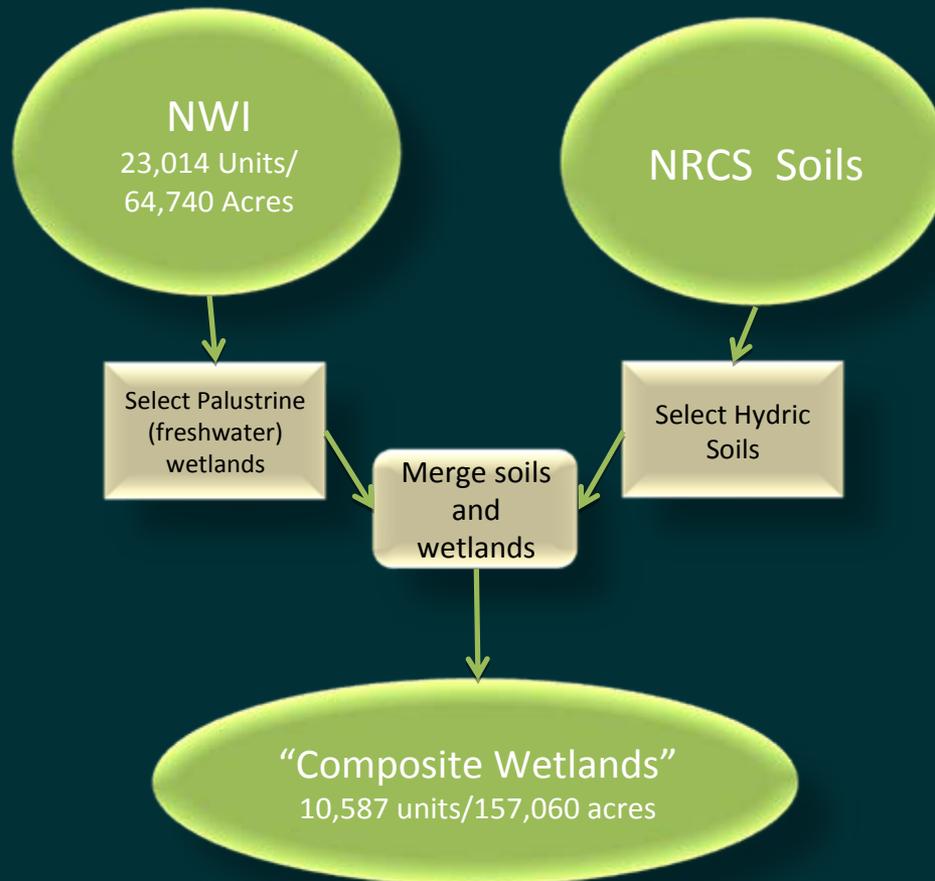
Suncook River
Soucook River
Turkey River
Piscataquog River
Souhegan River
Cohas Brook
Salmon Brook
Pennichuck Brook
Little River
Beaver Brook
Spicket River







Step 1: Creating a Composite Wetland Layer





To Site Prioritization Model

↑
Altered Wetland Subunits,
≥5 Acres
10 units | 138 acres

↑
Altered Systems ≥5 Acres
33 systems | 649 acres

↑
Human-altered Systems
271 systems | 799 acres

↑
All NWI Palustrine Systems
1,526 wetlands | 5,316 acres

Restoration Site ID Model Example: Suncook River (HUC 10)

1. At least one component of the wetland system is identified by the **National Wetlands Inventory** as having one or more of the following Special Modifiers (Cowardin *et al.* 1979) :

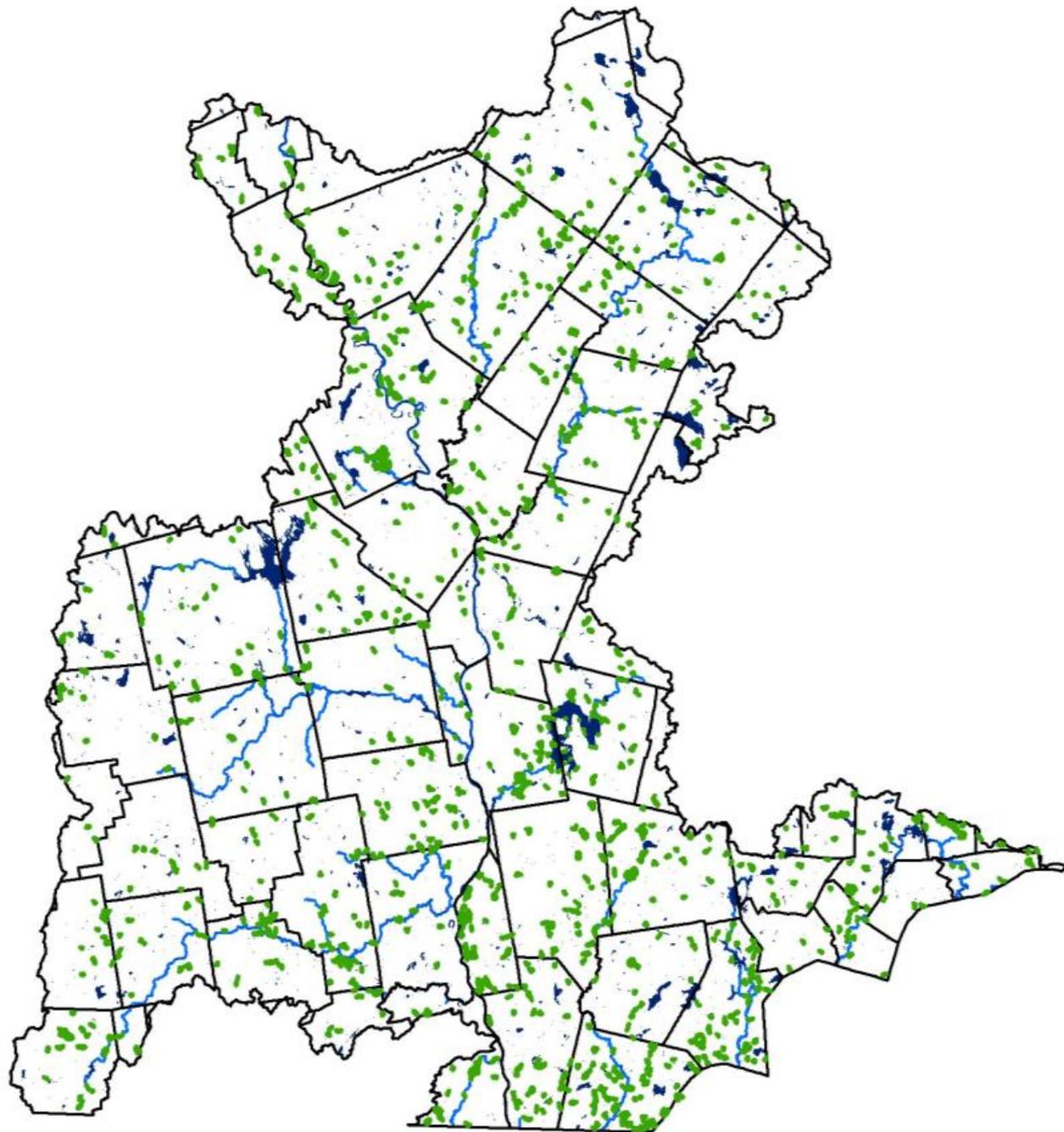
- “d” = partially drained/ditched;
- “h” = diked/impounded; or
- “x” = excavated; or

2. Any portion of the wetland intersects an area mapped as “Agricultural” or “Other/Disturbed” land cover classifications using the most recent **NH Land Cover Classification** coverage (Justice, et al. 2001); and

3. Candidate site must be > 5 acres.

Site Identification Model - Results

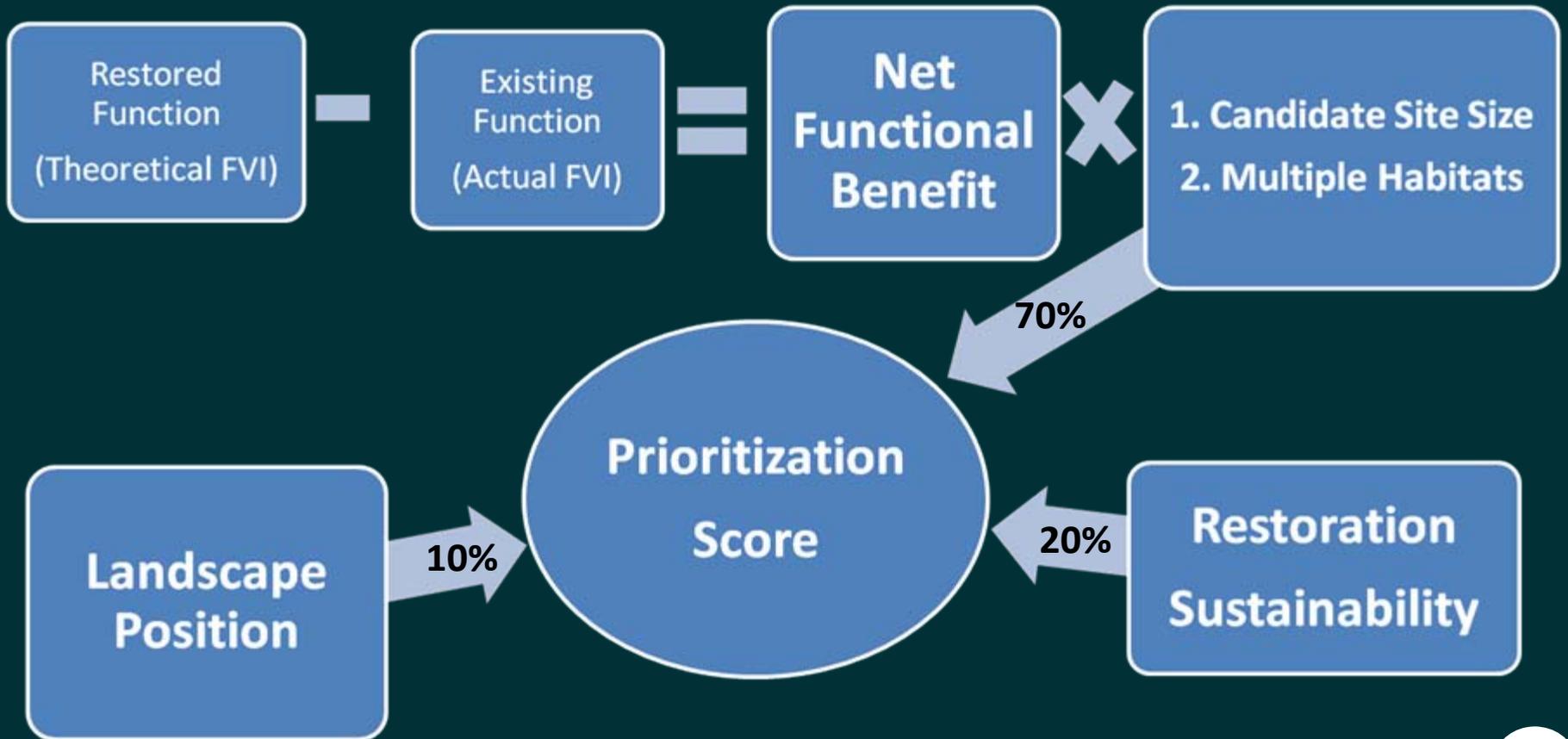
- 906 Candidate Sites
- 45 NHNHB sites added to Site ID
- Total Sites = **951**
- Total Area: **10,111 Acres**
- Mean Size: **10.6 Acres**
- 5 to 101.6 Acres in size
- Candidate sites located within **64 of 73 Towns**





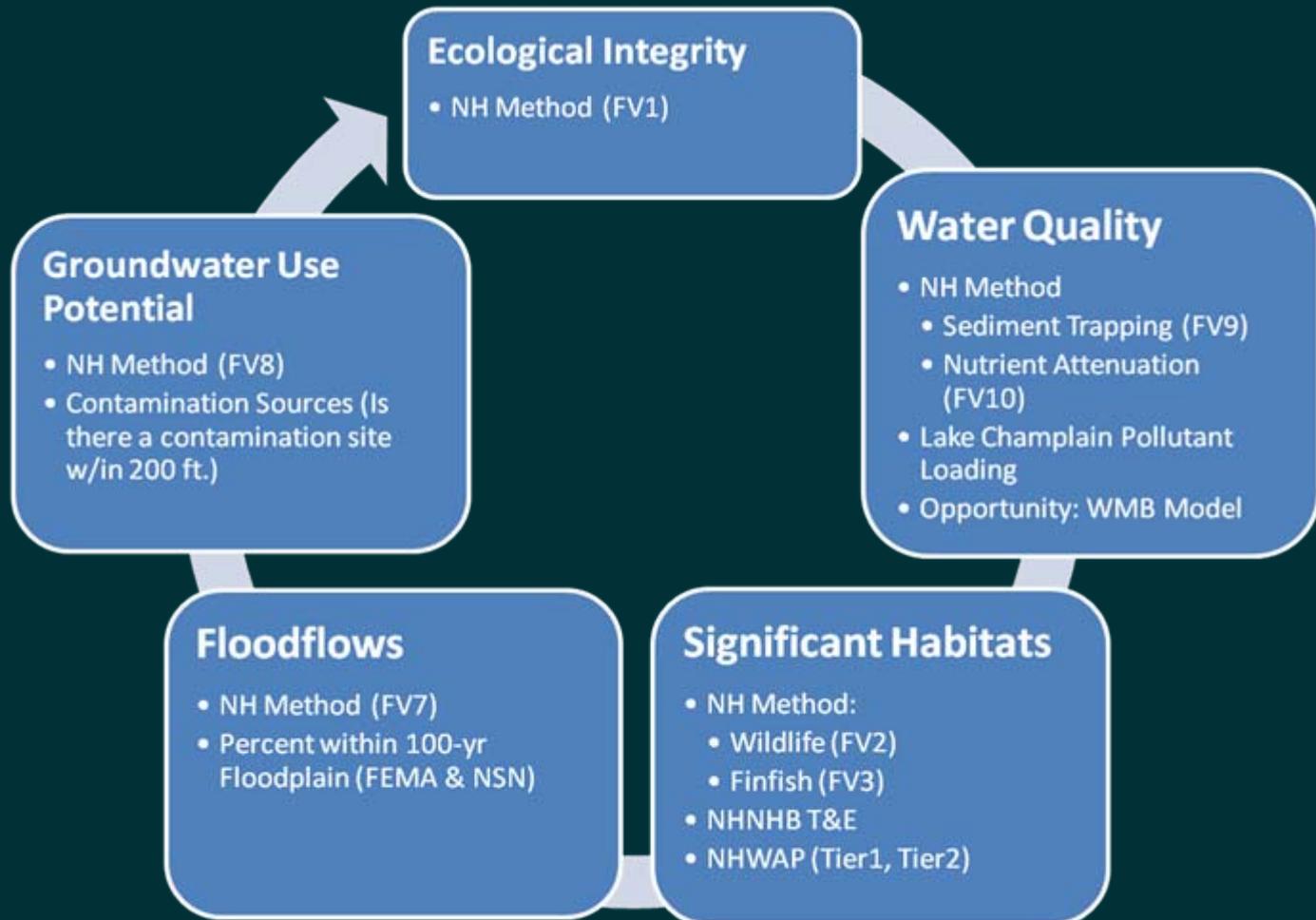
Site Prioritization Concept

Ranking of 951 candidate restoration sites





Functional Evaluation



Ecological Integrity

- Scoring followed the NH Method:
 - Each of the 10 questions were analyzed in GIS
 - Answer to each question placed into one of three categories according to the NH Method
 - Scores (0.1, 0.5 or 1.0) were assigned depending on the category
 - Average of scores for 10 questions was taken = Functional Value Index, scale = 0.1 to 1

Significant Habitats – Revised Method

- Scored “Wildlife Habitat,” NH Method FV2+
 - Scored Unfragmented Block
 - <1000 acres = 0.1; 1,000 – 5,000 = 0.5; >5,000 = 1.0
- Scored NHNHB Data
 - Presence vs. Absence, 0 or 1
- Scored NH WAP
 - Tier 1 = 1, Tier 2 = 0.5, Others = 0.1
- Scored “Finfish Habitat,” NH FV3 (Partial)
- Averaged FV2+, NHNHB, NHWAP and FV3 to derive score (0 to 1)

Floodflow Control Potential

- Scored “Floodflow Control Potential (NH Method FV7)
- Scored Percentage of Candidate Site w/in FEMA Floodplain or NSN Floodplain
- Dominant NWI Class: Prioritize Forested Wetlands
- Averaged FV7 + Floodplain % + NWI Score

Groundwater Use Potential

- Scored NH Method FV8
- Scored Presence vs. Absence of NHDES Groundwater Hazard Sites (csites, 0 or 1)
- Averaged FV8 + csites

Water Quality

- Scored FV 9+ (Sediment Trapping)
 - Erosion Risk Score, Lake Champlain
 - WMB Level 1 Assessment Score
- Scored FV10+ (Nutrient Attenuation)
 - Nutrient Loading, Lake Champlain
 - WMB Level 1 Assessment Score
- Averaged FV9+ and FV10+

Calculating “Restored Functional Value”

- Biologist examined each of the questions for each of the five functions/values
- Determined which parameters are subject to restoration, e.g.,
 - Percent of wetland mowed,
 - Percent 500 ft buffer,
 - Wetland diversity, etc.
- Not restorable: e.g., Position relative to aquifer, Adjacent land use, etc.

Calculating “Net Functional Benefit”

- For each “restorable” parameter, set score to 1
- Recalculate Average FVI for each of the 5 functions
- Subtract “Existing FVI” from “Restored FVI”
- Weighted by:
 - Site size
 - Number NWI cover types
- Final score = 70% of Total Prioritization Score

Ecological Integrity (NH Method FV1)

Question 1) Percent of candidate site having very poorly drained soils and/or open water. (NRCS Soils)

Question 2) Dominant land use of the candidate site. (NHLCC 2001)

Question 3) Water Quality of the watercourse, pond, or lake associated with the wetland. (NHDES CALM + NHDES AU)

Question 4) Ratio of the number of occupied buildings within 500 feet of the wetland edge. (US Census Bureau)

Question 5) Percent of original wetland filled (NHDES Wetlands Permits)

Question 6) Percent of wetland edge bordered by a buffer of woodland or idle land at least 500 feet in width. (NHLCC, 2001; Area of forest/idle w/in 500')

Restoration Sustainability

- Unfragmented Landscapes (Percent of Site, Continuous 0 to 100%)
- HUMAN2 Score (NHWAP, 0 to 100%)
- Conservation Lands Layer (Cons Gap, 1-3A, Presence vs. Absence, 0 or 1)
- Averaged three scores
- Weight: 20% of total Prioritization Score

Restoration Sustainability

- High Score – Sites tended to be functioning wetlands (i.e., No opportunity for restoration)
- Med score – Sites were in need of restoration and moderately sustainable.
- Low score – Sites were in need of restoration but physical constraints would prevent sustainability



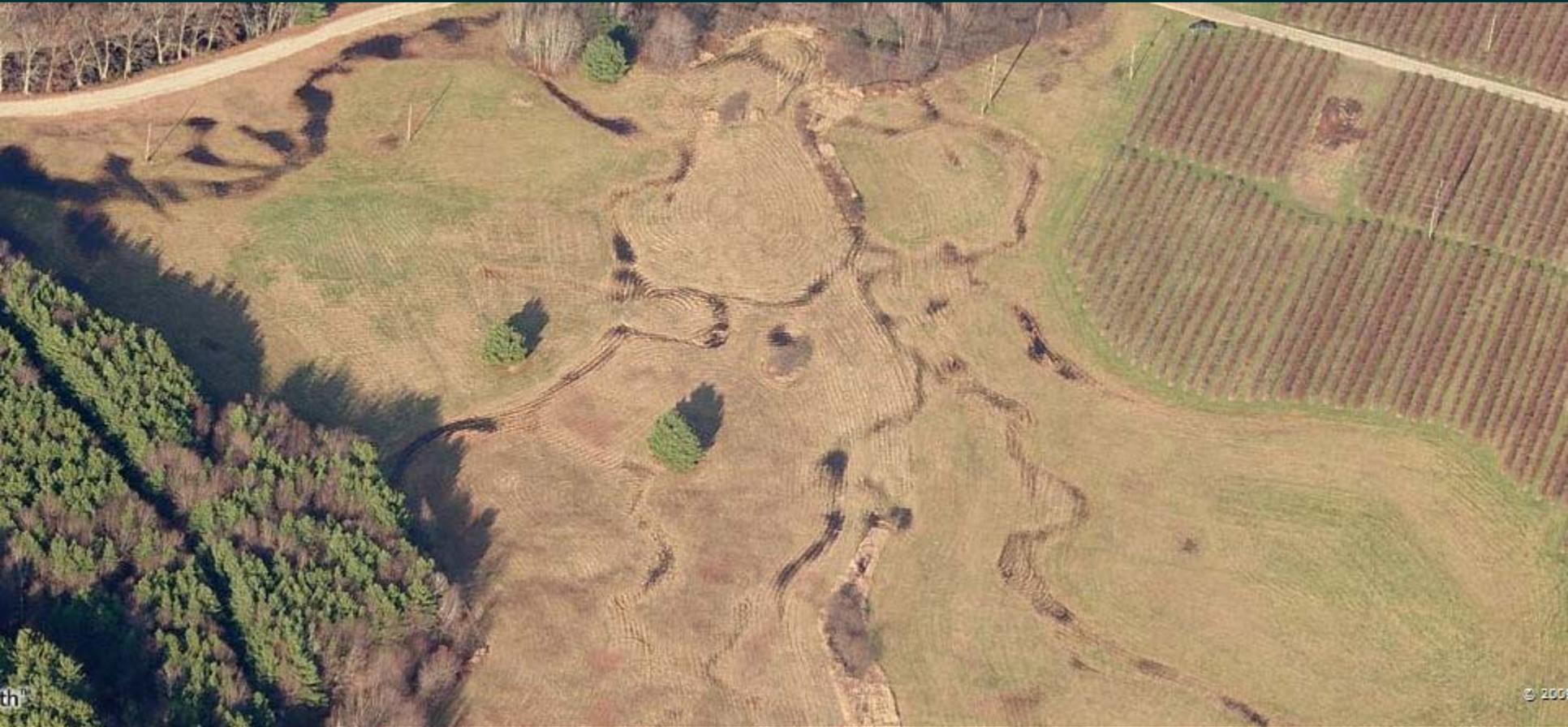
Landscape Position

- Sites w/in 1,000 ft of public lands or private conservation lands given 5 pts
- Headwater wetlands given 5 pts based on literature review and to ensure that such wetlands were represented in the final study set

Prioritization Model – Top 50 Sites

- Prioritization Score Range 25 - 75.7
- Mean Score = 30.44
- Mean Size = 26.1 Acres
- Minimum Size = 5.5 Acres
- Maximum Size = 101.6 Acres
- Sites located within 23 of 73 Towns in Study Area





Upcoming Model Refinements

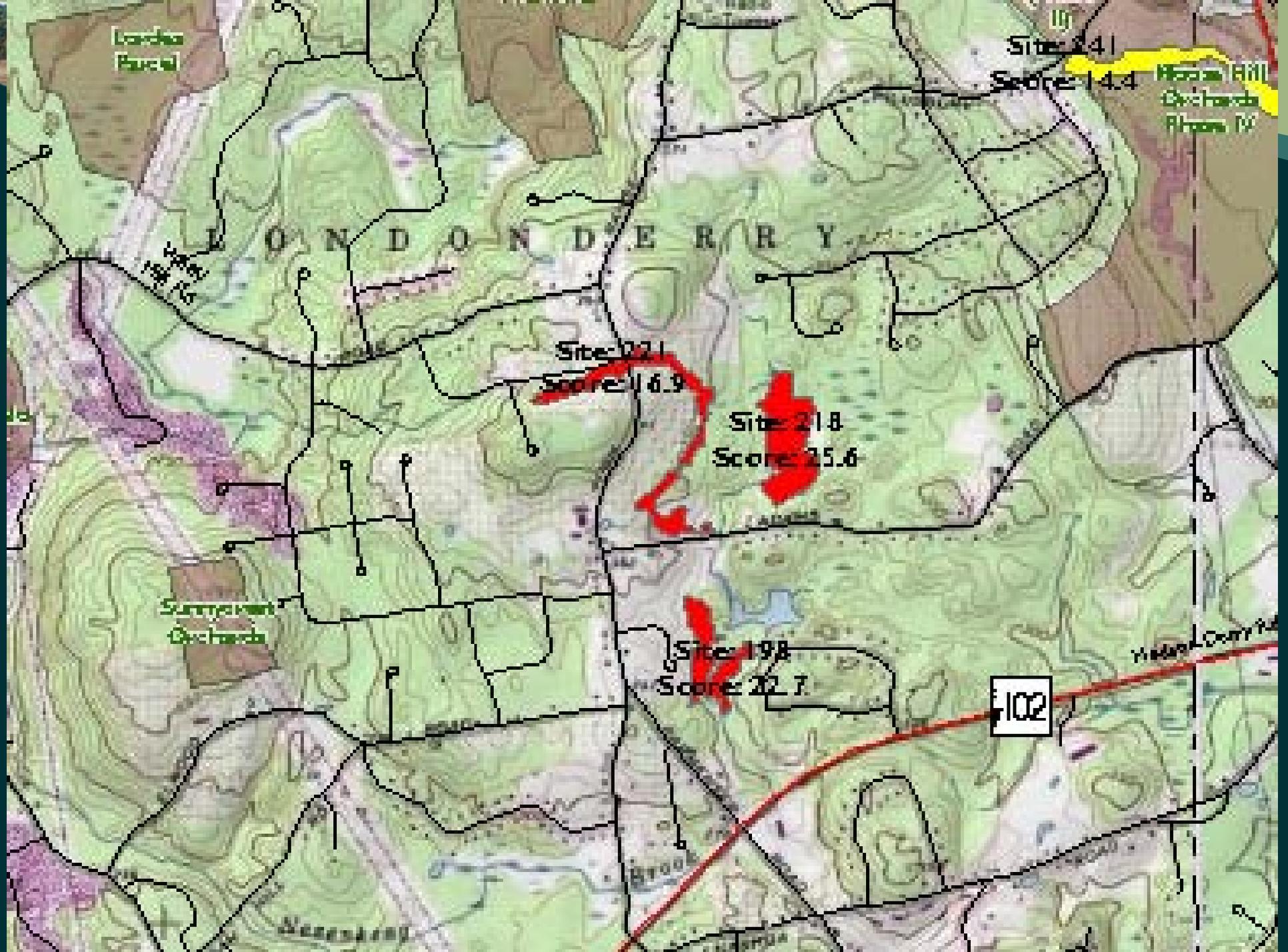
- Incorporate conservation focus area concept, rather than just existing conservation areas.
- Refine the Site ID Model to exclude impoundments, except in special cases.
- Categorize candidate sites rather than rank them in a linear fashion.
- Incorporate the “Phase 1 Water Quality Assessment” developed by the NHDES Watershed Management Bureau.
- Re-weighted Landscape Position and Sustainability to prioritize sites in unaltered landscapes

ARM Fund Update

- Review results of 2009 Merrimack Watershed Grants
- Discuss upcoming grant RFPs in three new watersheds

2009 Merrimack Watershed ARM Fund Awards

- St. Anselm's College/Town of Franconia, Stewart Farm
- Forest Society, Concord Regional Solid Waste Resource Recovery Center, Canterbury
- Bearpaw Regional Greenways/Town of Hooksett, Clay Pond Headwaters
- Town of Londonderry, Nesenkeag Brook Project



Londonderry

L O N D O N D E R R Y

Site: 241
Score: 14.4

Londonderry Hill
Orchard
Phase IV

Site: 221
Score: 16.9

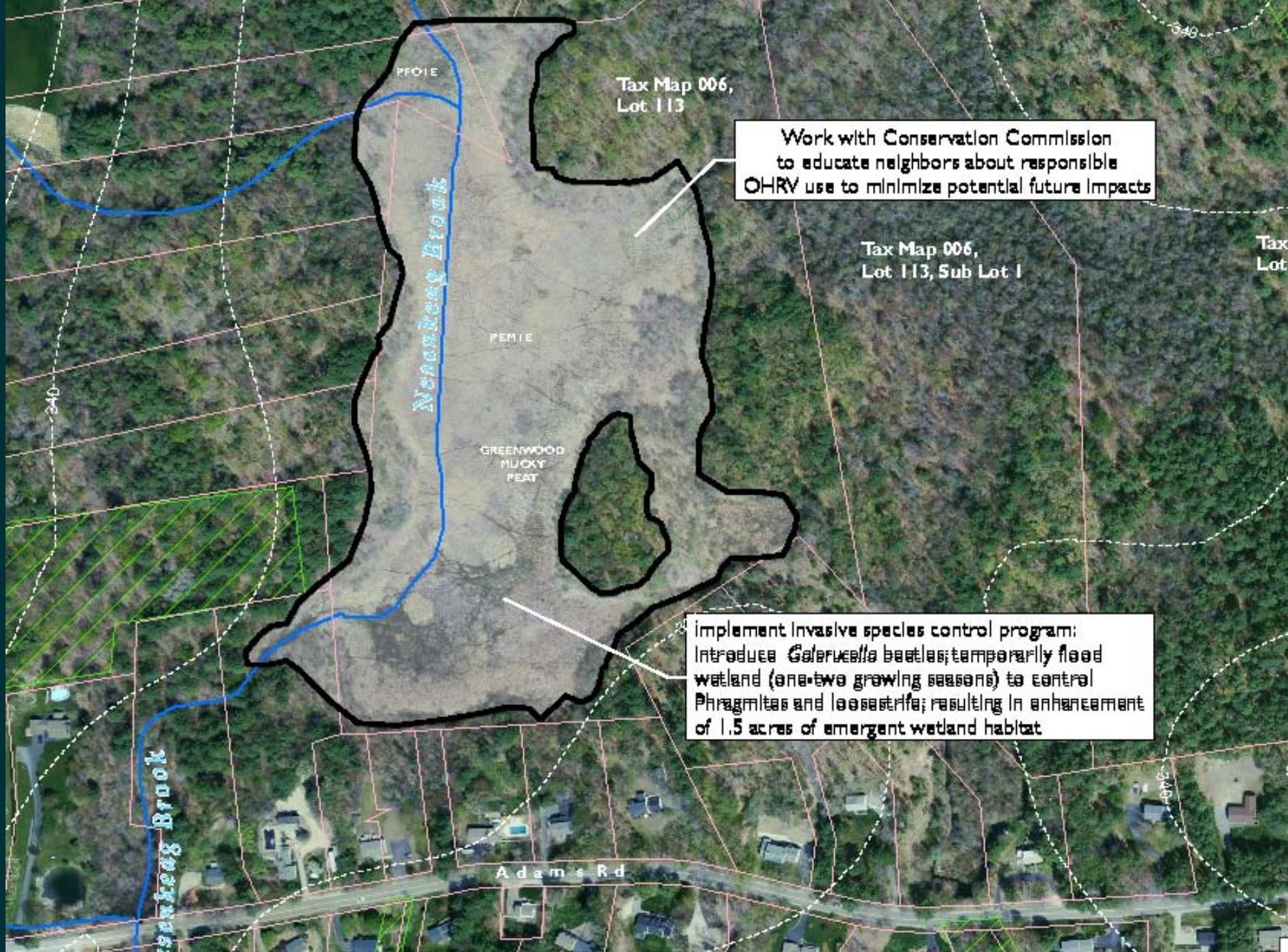
Site: 218
Score: 25.6

Sunnyside
Orchard

Site: 198
Score: 22.7

102

Medford Dairy Farm



PFO1E

Tax Map 006,
Lot 113

Work with Conservation Commission
to educate neighbors about responsible
OHRV use to minimize potential future impacts

Tax Map 006,
Lot 113, Sub Lot 1

Tax
Lot

Neenah Brook

PEM1E

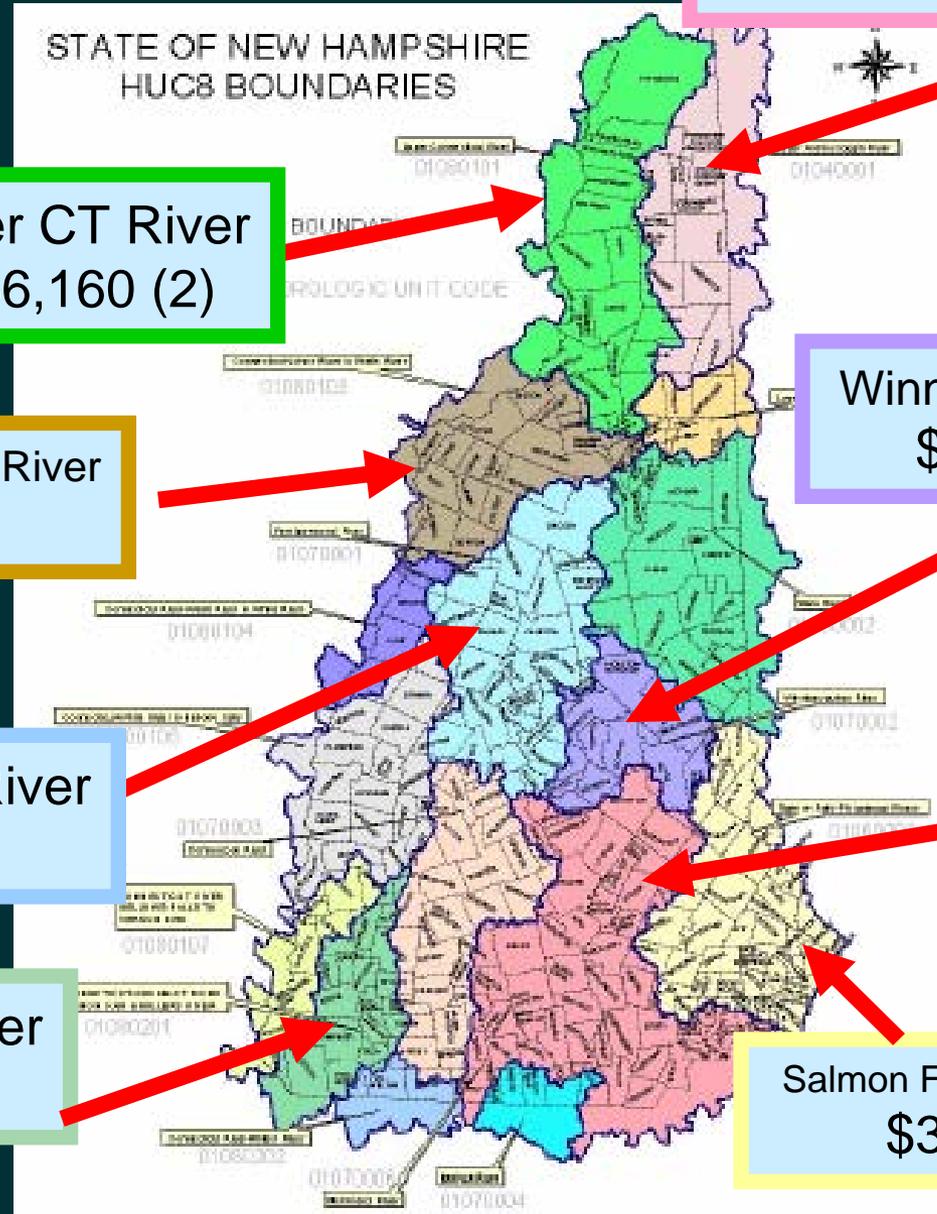
GREENWOOD
MUCKY
FEAT

Implement Invasive species control program;
Introduce *Galerucella* beetles; temporarily flood
wetland (one-two growing seasons) to control
Phragmites and *Loosetrife*; resulting in enhancement
of 1.5 acres of emergent wetland habitat

Adams Rd

Neenah Brook

ARM Funds Collected



Upper Androscooggin River
\$63,111 (1)

Upper CT River
\$156,160 (2)

CT River- Johns to Waits River
\$198,175 (6)

Winnepesaukee River
\$161,466 (2)

Merrimack River
\$20,000

Pemigewassett River
\$147,044 (4)

CT - Ashuelot River
\$113,033 (1)

Salmon Falls-Piscatqua Rivers
\$374,600 (6)



2009 ARM Fund - Request for Proposals

- Up to \$153,000 – Winnepesaukee River Watershed
DEADLINE – December 31, 2009
- Up to \$148,000 – Upper Connecticut River Watershed
DEADLINE – March 26, 2010
- Up to \$185,000 – CT River from the Johns River drainage down to the Ammonoosuc River drainage to confluence of Waits River
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*Watershed
Strategy
for Wetlands
Restoration*

Merrimack River Watershed Wetland Restoration Strategy

- ▶ [Restoration Plan Home](#)
- ▶ [Summary and Plan Elements](#)
- ▶ [Interactive GIS](#)
- ▶ [Wetland Restoration Maps](#)
- ▶ [Reports/Documents](#)
- ▶ [Study Team Contacts](#)
- ▶ [NHDES Wetlands Bureau Home](#)

Why Restore Wetlands?

Wetlands are widely known to be effective in protecting water quality, providing wildlife habitat, mitigating floods, and providing many other functions. Although New Hampshire has been relatively successful in protecting wetland resources, many have been degraded by past and current land uses. Restoration of these degraded areas holds great potential to help improve New Hampshire's water quality, wildlife habitat and general quality of life.

What is the ARM Fund?

The recent development of the "Aquatic Resource Mitigation Fund" (ARM Fund) has provided a promising new source of funds to help with the effort. These funds are available to NH cities and towns to implement programs to restore, protect or create aquatic habitats. The fund accepts payments made by applicants for wetland dredge and fill permits, who pay into the fund to help offset the impacts of their proposed projects. These funds are then pooled on a watershed basis and managed by NHDES and a Site Selection Committee made up of watershed stakeholders. The intent of the fund is to provide grants to environmental and community organizations to conduct worthwhile restoration projects.



How does the Merrimack River Watershed Wetland Restoration Strategy fit into the Picture?



For More Information

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