Stream and Wetland Buffers Webinar Series
Part 1: Restoration

July 25, 2017
Agenda

- Welcome and Introductions (10 min.)
- Land Protection Grants (20 min.)
- Brief Q&A (5 min.)
- Expanding Riparian Buffers (20 min.)
- Brief Q&A (5 min.)
- Wrap-Up
Webinar Moderator

Kimberly Roth
Environmental Analyst
Wetlands Program
NEIWPCC
kroth@neiwpcc.org
Brian J. Hotz is the Vice President for Land Conservation for the Society for the Protection of New Hampshire Forests. His primary responsibilities for the Forest Society are to oversee the Forest Society’s Land Protection and Conservation Easement Stewardship Departments. Additionally, he is responsible for organizing and implementing the Forest Society’s strategic land protection initiatives including the Quabbin–Cardigan Conservation Initiative, Merrimack River Watershed Program, Lakes Region Plan and the Ashuelot River Land Conservation Plan.
Merrimack Conservation Partnership
A New Approach to Conserving a Watershed

Photo by Jerry Monkman
In 2010 the Merrimack River was identified by the US Forest Service as “one of the most threatened watershed in the nation” in terms of projected loss of private forest land over the next twenty years.
This dire designation inspired a broad partnership of environmental organizations and public agencies in New Hampshire and Massachusetts to embark on an ambitious effort to form an ongoing regional conservation partnership and to develop a conservation plan that would focus and accelerate land conservation in the Merrimack River watershed.

The goal of the partnership is to protect water quality, drinking water supplies, and preserve aquatic and terrestrial ecosystems in the Merrimack River, while conserving the region’s farms and forests, and providing recreational open space to the watershed’s 2.6 million residents.
Regional Conservation Partnerships (RCPs) are a way individual conservation groups and other groups can come together to accomplish much more than if they were to continue to work alone.

In the 1990s, there were just 4 RCPs in New England and today there are 43, covering more than 60 percent of our regional landscape.
Merrimack watershed totals about 2 million acres, divided almost evenly between NH and MA.

From its start in Franklin, NH, the Merrimack River flows through eight of the New Hampshire’s ten largest cities, including Concord, Manchester and Nashua.

The river continues into MA, running through cities like Lowell and Lawrence to its end at Newburyport.

Despite being highly developed, the Merrimack Valley still contains critical terrestrial and aquatic habitats, and contributes greatly to the larger Gulf of Maine marine ecosystem.

Why the Merrimack?
Land Conservation in the Watershed doesn’t compare to other regions in each state

* In 2010 - 29% of all Massachusetts residents live in the MA portion of the Merrimack watershed, but the region only has 17% of the state’s conservation land.

* 57% of all New Hampshire residents live in NH portion of the Merrimack watershed, but the region has only 10% of state’s conservation land.
Watershed Conservation

- 18% of the entire Merrimack watershed is permanently conserved.
- In MA, 18% of the land classified as “source water protection area” by state regulators is in permanent conservation.
- In NH, only 10% of all the land classified as “wellhead protection area” is in permanent conservation.
Working together, the groups developed a science-driven, consensus-based, land conservation plan that integrated the best-available natural resource data with local expertise to prioritize land protection in the Merrimack River valley.

The goal of the plan is to identify the best lands to conserve when trying to protect water quality, habitat, farms and forests, and recreational areas.
The Merrimack Plan and Water

- The Merrimack conservation plan integrates 43 different GIS data sets;

- Of these 15 were water-related, including drinking water and source water protection areas, aquifers, phosphorus and nitrogen loading data, wetlands, stream networks etc.

- Each data set was weighted via “Delphi” voting (18 partners participated)

- Water-related data turned out to be a key driver of the plan.

<table>
<thead>
<tr>
<th>New Hampshire Data Factor</th>
<th>Mean Value</th>
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<tbody>
<tr>
<td>Source water protection areas</td>
<td>6.5</td>
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<tr>
<td>Drinking water protection areas (community wellheads)</td>
<td>5.7</td>
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<tr>
<td>WAP Tier 1: Best in State</td>
<td>5.4</td>
</tr>
<tr>
<td>Prime 1, 2, &amp; 3 soils combined</td>
<td>5.0</td>
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<tr>
<td>Unprotected gaps in existing rail trails</td>
<td>5.0</td>
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<tr>
<td>Resilience: Highest from All Perspectives</td>
<td>4.6</td>
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<tr>
<td>WAP Tier 2: Best in Bio-Region</td>
<td>3.9</td>
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<tr>
<td>Unprotected gaps in existing hiking trails</td>
<td>3.9</td>
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<tr>
<td>Blocks 50 - 500 acres</td>
<td>3.4</td>
</tr>
<tr>
<td>Blocks &gt; 5,000 acres</td>
<td>3.4</td>
</tr>
<tr>
<td>Prime agricultural soils &amp; soils of statewide significance</td>
<td>3.4</td>
</tr>
<tr>
<td>Phosphorus Loading (best 1/3)</td>
<td>3.1</td>
</tr>
<tr>
<td>Phosphorus Loading (middle 1/3)</td>
<td>3.1</td>
</tr>
<tr>
<td>1/4 mile NHDES designated buffer</td>
<td>2.9</td>
</tr>
</tbody>
</table>
Plan Priorities

- Tier 1 Conservation Focus Area (CFA) = “best of the best” highest scoring acres;
- Tier 2 CFA = “next best” still very high scoring;
- Tier 3 = “supporting landscape” that buffers and connects CFAs.

Conservation Priority Areas
Current Protection Status - NH

- Tier 1: 25% Conserved, 76% Not Conserved
- Tier 2: 18% Conserved, 82% Not Conserved
- Tier 3: 14% Conserved, 86% Not Conserved

Conservation Priority Areas
Current Protection Status - MA

- Tier 1: 52% Conserved, 48% Not Conserved
- Tier 2: 31% Conserved, 69% Not Conserved
- Tier 3: 21% Conserved, 80% Not Conserved
Land Use if ALL Tier 1 Acres Conserved (+86K)

NH Merrimack Watershed If ALL Tier 1 Acres Conserved

- Conserved land: 67%
- Developed land: 22%
- Other land: 11%
Land Use if all Tier 1 AND Tier 2 Acres Conserved (+244K)

NH Merrimack Watershed
If ALL Tier 1 and 2 Acres Conserved

- 45% Conserved land
- 44% Developed land
- 11% Other land
Partnership Activities

- In 2014 the Partnership released the conservation plan to the public.

- Conducted outreach to towns in NH & MA, conservation groups and others.

- The Partnership uses the plan for case-making purposes for additional conservation funding and in support of Partner’s grant applications;

- Established a website in 2015 (delivery of map and data) (http://merrimackconservationpartnership.org/)
Merrimack Conservation Plan

A Conservation Plan for the Merrimack River Valley in New Hampshire and Massachusetts

Completed in 2014, the Merrimack Conservation Plan is the product of two years of effort by a dedicated group of conservation and planning professionals representing 33 private organizations and public agencies in New Hampshire and Massachusetts. Working together, the group has developed a science-driven, consensus based, land conservation plan that integrates the best-available natural resource data with expert judgment to prioritize land protection to protect water quality (especially drinking water supplies), preserve aquatic and terrestrial ecosystems, conserve the region’s working farms and forests, and provide recreational open space. The Merrimack plan identifies 1.3 million acres of land, representing about 54% of the watershed’s total land area, as a priority for conservation. As of the completion of the plan, only 23% of these priority acres are permanently conserved.

Conservation Focus Areas Map

The Conservation Focus Areas Map is intended to assist local conservation commissions and land trusts in the Merrimack River Valley in making decisions on land conservation projects. The map is the compilation of 45 different natural resource GIS data sets covering the two watershed states. These layers were grouped into 4 themes, although the water-related data was a key driver of the focus areas:

Wildlife Habitat – The Wildlife Co-occurrence map depicts the highest ranked habitats in each state, seven critical habitats types, and the habitats that provide the most connectivity for wildlife movement and which will be most resilient in the face of climate change.

Why the Merrimack?

The Merrimack watershed is home to more than 2.6 million people - 1.87 million in Massachusetts and 748,000 in New Hampshire. This represents 57% of the total NH population, and 29% of the MA population. The 2010 U.S. Forest Service report, Forests on the Edge, identified the Merrimack River watershed as the most threatened in the nation in terms of projected loss of private forest land over the next twenty years.

Photo: The Merrimack River in Canterbury, NH. Jerry and Marcy Monkman, Ecophotography

Water Resources – The Water Resources Co-occurrence Map displays the co-occurrence of 15 different water related data factors, including, but not limited to the watersheds of drinking water sources, high water quality areas, wetlands, aquifers, and outstanding river corridors.

Agriculture & Forests – The Agriculture & Forests Co-occurrence Map shows the co-occurrence of areas of intact forest classified by size, as well as prime forest soils, prime agricultural soils, and lands in active agricultural use.

Recreation & Trails – The Recreation and Trails Co-occurrence Map is based on unprotected gaps in existing rail trails, hiking trails, and Heritage trails, as well as abandoned rail rights-of-way which may serve as potential linkages. In addition, historic sites, scenic resources, and distinctive cultural resources were included.

Important Natural Resources

What are Conservation Focus Areas (CFA)? They are geographic areas where undeveloped land provides a combination of three core natural values: clean water, wildlife habitat, and good soils for growing food and forests. The Highest Scoring CFAs are the “Best of the best” and Higher Scoring CFAs are the “next best.” Lastly, the High Scoring CFAs would be conserved a supporting landscape that buffers and connects the areas.

The map also shows Conservation & Public Lands and Developed Land

For More Information: Contact Brian Hotz, Vice President for Land Conservation at the Society for the Protection of NH Forests at (603) 224-9945 or bhotz@forestsociety.org

Visit the Merrimack Conservation Partnership website at http://merrimackconservationpartnership.org/
Merrimack Map

A template, consistent looking map

Scalable to your project

Includes data for both NH & MA
To further increase the pace of land conservation activity the Partnership pursued public and private funding to establish a land transaction grants program tied to plan implementation.
Partner organizations can apply for grants to cover transaction related expenses on projects that permanently protect the land through acquisition of fee interest or conservation easement or conservation restriction.

The projects must protect land that has been identified as “Tier 1 Conservation Focus Areas (CFA)” and/or “Tier 2 Conservation Focus Areas (CFA)” in the Merrimack Conservation Plan”.

Grants can be used pay for surveys, appraisals, legal fees, title searches, closing services, deed preparation and negotiation, baseline document preparation, easement and land recording, and other professional services.
In the first two years the Partnership has awarded $215,000 to 22 projects. In 2017 we will award another $90,000.

The projects will conserve 3,900 acres of land, 94% of it will be within Tier 1 or 2 focus area land.

Grant awards have leveraged $7.8 million in project value match, mostly in the form of donated land or easement value.
The Partnership is already increasing the pace of protection of lands with wetlands and riparian areas targeted at preserving or improving water quality of the Merrimack River.

The partner’s cannot take full advantage of new funding opportunities working individually, thus the Partnership gives them that opportunity.

“Business as usual – acting individually” will simply take too long to achieve significant impact on our land protection objectives in the dynamic economic and ownership environment of the Merrimack River Watershed.
Thank You - Questions?
Questions?

Contact Brian:
BHotz@forestsoociety.org
Alex Krofta joined the MRWC team in April of 2016. He studied economics and environmental science and policy at Clark University before serving for many years as a wildlife field-technician in the swamps and streams of upstate New York. Upon moving back to Massachusetts in 2009, he worked as a conservation lands steward at the Mount Grace Land Conservation Trust and as a habitat management planner and practitioner with Polatin Ecological Services, a consulting firm. He recently received an M.S. in sustainable landscape planning and design at the Conway School in Conway, Mass.
Prioritizing, Protecting, and Restoring Riparian Buffers in the Merrimack River Watershed

Alex Krofta
Merrimack River Watershed Council
Purpose:
to prioritize subwatersheds for riparian buffer protection, advocacy and restoration

Funders:

Partners:
MRWC, Nashua River Watershed Association, UNH Cooperative Extension, MassDCR

Phases:
1) analysis 2) outreach 3) implementation
Why riparian buffers?

Water Quality:
- surface and groundwater filtration
- in-stream filtration
- wider buffer = more filtration
- temperature - shade and groundwater

Flooding, Erosion:
- more infiltration, less sheet flow over soils
- root structures stabilize banks
- floodplain vegetation dissipates energy
- intact floodplains store water and sediment

Wildlife:
- upland/riverine/wetland interface – diversity
- flows of energy, materials, and species (along the stream and into/out of the stream)
Phase 1: prioritizing subwatersheds

Impervious Surfaces:
- 5-7% in a watershed leads to impairment
- declines in water quality, ecology, and increases in flashiness (droughts AND floods)
  ➞ ➞ we’re focused on this threshold... not pristine, but not yet highly degraded

Impervious Surface in the HUC12:
- first analysis: which HUC12 subwatersheds are around the threshold of 5-7% impervious?

Imperv Surface in the 100m buffer:
- second analysis: which HUC12 subwatersheds are around the threshold of 5-7% impervious WITHIN THE CRITICAL BUFFER AREA?
Phase 1: prioritizing subwatersheds

Other Criteria:
these metrics were used to score the subwatersheds

Water Quality Indicators:
- Impaired Waters (303(d) listings), Designated Waters (NH DES), Outstanding Resource Waters (MA DFW), Cold Water Fisheries (Eastern Brook Trout Joint Venture), TNC Freshwater Resilience, Phosphorus and Nitrogen (USGS SPARROW)

Development Pressure:
- Population Projections (Donahue Institute and NH OEP), Forests Importance, and Threats To, Surface Drinking Water (USFS)

Rare Species and Habitat:
- MA and NH Natural Heritage & Endangered Species Programs) Priority Habitat (NH F&G), Important Forest Blocks (TNC), Forest Action Plan: Urban Forests (NH F&G), Forest Action Plan: Protecting Forests (NH F&G), Tier 1 Priority Forests (SPNF)
Phase 1: prioritizing subwatersheds

New Hampshire subwatersheds

- Lower Piscataquog River
- Merrimack River Drainage

- South Branch Piscataquog River
- Powwow River (Mass and NH)
Phase 1: prioritizing subwatersheds

Massachusetts subwatersheds

Whitman River

Squannacook River

Nashua River

Catacoomanug Brook to Squannacook River
Phase 1: selecting sites

Finding sites using GIS:
- creating a buffer around streams
- using the impervious surface layer and Appalachian LCC Riparian Tool to find 0% forest canopy
- looking at topography and wetland layers
- corroborating with aerial photos

Ground-truthing:
- driving out to sites and taking photos

Outreach to community stakeholders:
- Piscataquog Local AC, Lower Merrimack River LAC, Piscataquog Land Conservancy, Southern New Hampshire Planning Commission, Rockingham Planning Commission, Merrimack Valley Planning Commission
Phase 1: selecting sites

REALITY – who owns it?
- municipal, commercial, agricultural, and residential landowners have different constraints

REALITY – why is it unvegetated?
- some high-value uses may preclude revegetation

REALITY – GIS plus local knowledge and connection is key:
- GIS may identify an ideal but unfeasible site
- GIS may miss opportunities
- Phase 2 (outreach) and the network our partners had developed over years of work locally were crucial to Phase 3 (implementation)
## Buffer Restoration Sites

<table>
<thead>
<tr>
<th>site name</th>
<th>date</th>
<th>location</th>
<th>trees/shrubs</th>
<th>length (linear ft)</th>
<th>area (square ft)</th>
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<tbody>
<tr>
<td>Bertozzi CA</td>
<td>6/7/2016</td>
<td>Groton, MA</td>
<td>15</td>
<td>60</td>
<td>300</td>
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<td>Parker Charter</td>
<td>6/16/2016</td>
<td>Devens, MA</td>
<td>30</td>
<td>200</td>
<td>4700</td>
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<td>Lunenburg DPW</td>
<td>6/20/2016</td>
<td>Lunenburg, MA</td>
<td>40</td>
<td>150</td>
<td>2300</td>
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<tr>
<td>H&amp;V</td>
<td>9/26/2016</td>
<td>Groton, MA</td>
<td>45</td>
<td>300</td>
<td>3000</td>
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<tr>
<td>Muni Lot</td>
<td>10/11/2016</td>
<td>Townsend, MA</td>
<td>30</td>
<td>100</td>
<td>1300</td>
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<td>VFW Pond</td>
<td>10/12/2016</td>
<td>Townsend, MA</td>
<td>40</td>
<td>250</td>
<td>2600</td>
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<tr>
<td>Rivercourt</td>
<td>11/1/2016</td>
<td>Groton, MA</td>
<td>60</td>
<td>280</td>
<td>10200</td>
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<tr>
<td>Willow Brook</td>
<td>11/2/2016</td>
<td>Devens, MA</td>
<td>55</td>
<td>480</td>
<td>20000</td>
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<tr>
<td>Sebring/Wotkowitz</td>
<td>12/1/2016</td>
<td>Townsend, MA</td>
<td>30</td>
<td>100</td>
<td>1200</td>
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<tr>
<td>Concord</td>
<td>5/9/2017</td>
<td>Concord, NH</td>
<td>300</td>
<td>700</td>
<td>23000</td>
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<tr>
<td>Rossbach</td>
<td>5/11/2017</td>
<td>Townsend, MA</td>
<td>250</td>
<td>1300</td>
<td>45550</td>
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<tr>
<td>Caruastar</td>
<td>5/23/2017</td>
<td>Fitchburg, MA</td>
<td>16</td>
<td>380</td>
<td>15500</td>
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<tr>
<td>Memorial Field</td>
<td>6/7/2017</td>
<td>Pembroke, NH</td>
<td>50</td>
<td>300</td>
<td>4000</td>
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## Progress to date

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<tr>
<th>sites</th>
<th>plants</th>
<th>miles</th>
<th>acres</th>
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<tr>
<td>13</td>
<td>961</td>
<td>0.87</td>
<td>3.07</td>
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</table>
Progress to date

- Lots of sites in the Squannacook, some in the Whitman and Nashua
- Some sites in the Merrimack Drainage around Concord
- Nothing planted yet in South Branch and Lower Piscataquog...
- and nothing yet in the Powwow River
Municipal sites:

**Lunenburg DPW**
- great support and resources from staff, integrated with recent stormwater improvements

**Townsend Municipal Lot**
- unused edge of overflow parking area

**Willow Brook/Parker Charter**
- add-on to existing restoration project
- charter school site, education potential

**FAIL: un-named Mass. park**
- miscommunication... plantings were removed
Conservation/recreational sites:

Bertozzi Conservation Area
- balance swimming access with erosion control

Memorial Park
- balance fishing/regatta views with buffer expansion

DFW/VFW Pond
- balance fishing and ice skating with revegetation
Commercial sites:
Hollingsworth and Vose
- easy approval from on-site sustainability coordinator
- provided their landscaping staff at no cost (to us!)

Caraustar Fitchburg Paperboard
- able to tie-in with MassDCR program for free trees

Rivercourt Residences
- undisturbed, unused field on edge of property

FAIL: unnamed propane facility
- site manager is supportive, corporate has no interest
“Agricultural” sites

West Concord – City owned
- expansion of buffers on city conservation land
- existing erosion problems

Rossbach – DFW owned
- rare species on site, wildlife habitat is top priority

Residential site

Lawn along beaver swamp
- land owner engagement, regular maintenance
What kind of plants?

1” caliper trees
gallon-pot saplings
bare-root seedlings
grass/wildflower plugs

Trees: oaks, maples, pines, sycamores, birches, elm, Amelanchier, cherry
Shrubs: elderberry, dogwoods, Spirea, button bush, alders, Viburnums, native rose, hazelnut
Herbaceous: milkweed, bluestem, wild rye, bee balm, Penstamon, path rush, asters
Future planting sites?

- Lower Piscataquog River
- South Branch Piscataquog River
- Powwow River (Mass and NH)

Get in touch if you know of some!
Thanks!
Questions?

Contact Alex:
AKrofta@merrimack.org
Thank you

Next Webinar

August 22, 2017
Featuring Todd Menees, Vermont DEC
How the Vermont Rivers & Roads Trainings are Communicating the Importance of Buffers to Municipalities and DOT Workers

Missed an episode?
Visit: neiwpcc.org/wetlands/webinars

Questions and Comments?
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