Site Study Groton: Broadmeadow Road

About this site: Broadmeadow Road (1) lies near the center of the town of Groton, connecting Main Street/Rt. 119 (2) with Farmers Row/Rt. 111. It includes a large low-lying section (3), associated with the headwaters of James Brook, that floods periodically causing intermittent road closures. The road in this location was built over a wetland / marsh area so adding fill to raise the road only leads to more settlement. James Brook crosses Broadmeadow Road and the Nashua Rver Rail Trail (4) then continues across Broadmeadow Swamp, then under Old Ayer Road in a culvert and along the east side of Old Ayer Road to the south.

Community concerns about Broadmeadow Road

Flooding of Broadmeadow Road is a top concern in the community as flooding causes closure of this key connecting road. The flooding also impacts the Nashua River Rail Trail, a major recreational feature in the area..

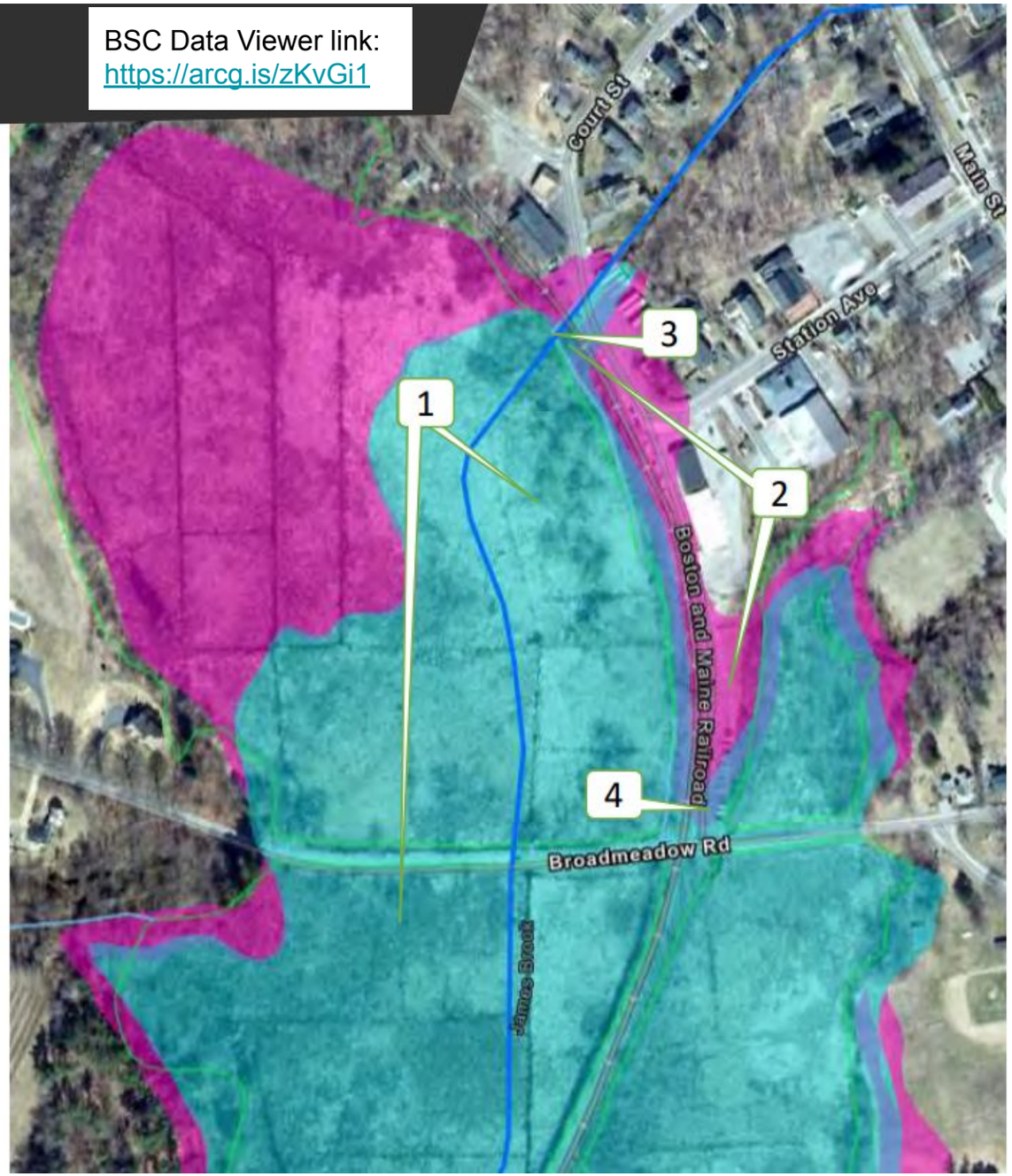
Nature-based Solutions Recommended for Groton: Broadmeadow Road

Broad Meadow

BSC Data Viewer link:
https://arcg.is/zKvGi1

Recommended NbS
NbS #s correspond to Project Templates referenced on pages 3, 6, & 7 of Site Study

1. Wetland Meadow
   - B D F — #4 Wetland management restoration
2. Trail Parking Area
   - D F — #11 Stormwater treatment wetlands
   - DL B — #2 Grassland meadow management restoration
   - D F — #14 Shade-habitat/infiltration tree plantings
   - DL B — #60 Habitat enhancements
3. James Brook Across Broadmeadow
   - D F — #13 Upstream BMPs rain-garden, bio-swale, etc.
   - F — #15 MSCS culvert improvement
   - DL B — #58 Invasive species management
4. Main Entrance to Broad Meadow
   - #24 Outdoor classroom and nature play
   - #30 Pedestrian safety and bike access



Map Key

Bright blue overlay is the FEMA 100 year floodplain

Pink overlay is FEMA 500 year floodplain

Recommended NbS Key

- F Flooding NbS
- D Drought NbS
- RT Rising temps NbS
- DW Degraded water NbS
- DL Degraded landscape NbS
- B Loss of biodiversity NbS

NbS Narrative/NbS Project Templates for Groton: Broadmeadow Road

NbS Recommendations

- Dredging of low-lying areas in Broadmeadow swamp could increase storage to reduce flooding and enhance discharge away from Broadmeadow Road.
- Increasing water-holding capacity here could also reduce flooding downstream on James Brook. We recommend wetlands expansion and building additional storage capacity.
- In areas upgradient of Broadmeadow Road, where the drainage has been improved for agriculture, meanders or small impoundments could be added, increasing flood storage and slowing the flow toward Broadmeadow Road.
- Portions of James Brook have long been buried, including upstream near Court Street. The fact that the James Brook is culverted for long sections under Main Street and Court Street contributes to the overall flooding problem.
- Some of the land in this area is private, adding to the challenge of locating parcels where you can infiltrate and mitigate some of the downstream water.
- Permanent closure of Broadmeadow Road is not recommended as this would cause problems for many people, including emergency vehicles. Broadmeadow Road ends at Farmers Row, and the fire station is nearby. Broadmeadow Road also serves as the main access route to the Groton Public Library. The Highway Department plans to make some improvements in the immediate area of flooding consistent with the above recommendations.

NbS Project Templates for Site Specific NbS Recommendations on previous page

Resource 1 - How to Use Templates

Resource 2 - Next Steps in Planning & Permitting

The following template numbers correspond to the NbS recommendations on the page 2 Map.

#2 Grassland Meadow Management-Restoration

#4 Wetland Management Restoration

#11 Stormwater Treatment Wetlands

#13 Upstream BMP Raingardens and Bioswales

#14 Shade Habitat Infiltration Tree Planting

#15 MSCS Culvert Improvement

#24 Outdoor Classroom- Nature Play

#30 Pedestrian Safety and Bike Access

#58 Invasive Species Management

#60 Habitat Enhancements

View Groton Map Atlas **for maps on land covers, soil function and storage, water resources, ecological priority sites, and more.**

Soils Information for Groton: Broadmeadow Road

Groton

The significant acreage of soil with high regeneration potential that surrounds downtown Groton and drains to the close by Nashua River could act as key demonstration sites for improved soil practices.

The Nashua River flows northward towards Pepperell on the west side of Groton. A major watershed boundary splits the town, with a large area draining to the Nashua River and another to the Merrimack River. The side of town that drains to the Nashua River contains the community's most significant acreage of farmland and residential neighborhoods as well as most of downtown Groton. These areas are where Groton's acres of "high regeneration potential" soil are found. A key objective for stewarding healthy soils in Groton should be encouraging better management of these degraded lands through education and demonstration projects. Of the five focus communities, Groton has the lowest percentage of "high function/high carbon" soils and the highest percentage of "moderate-low function" soil.

Sites Considered for Nature-based Solutions

Several sites near downtown Groton are being considered for green infrastructure to improve stormwater management. These sites are in areas with "high regeneration potential" soils and could be key demonstration sites for better soil practices. Flooding has been identified at sites throughout the town. Regenerating water holding capacity on soils within the same sub-basins as these flood prone areas is an important planning approach to mitigate these issues.

Priority Actions for Protecting/Enhancing Soil Health in Groton

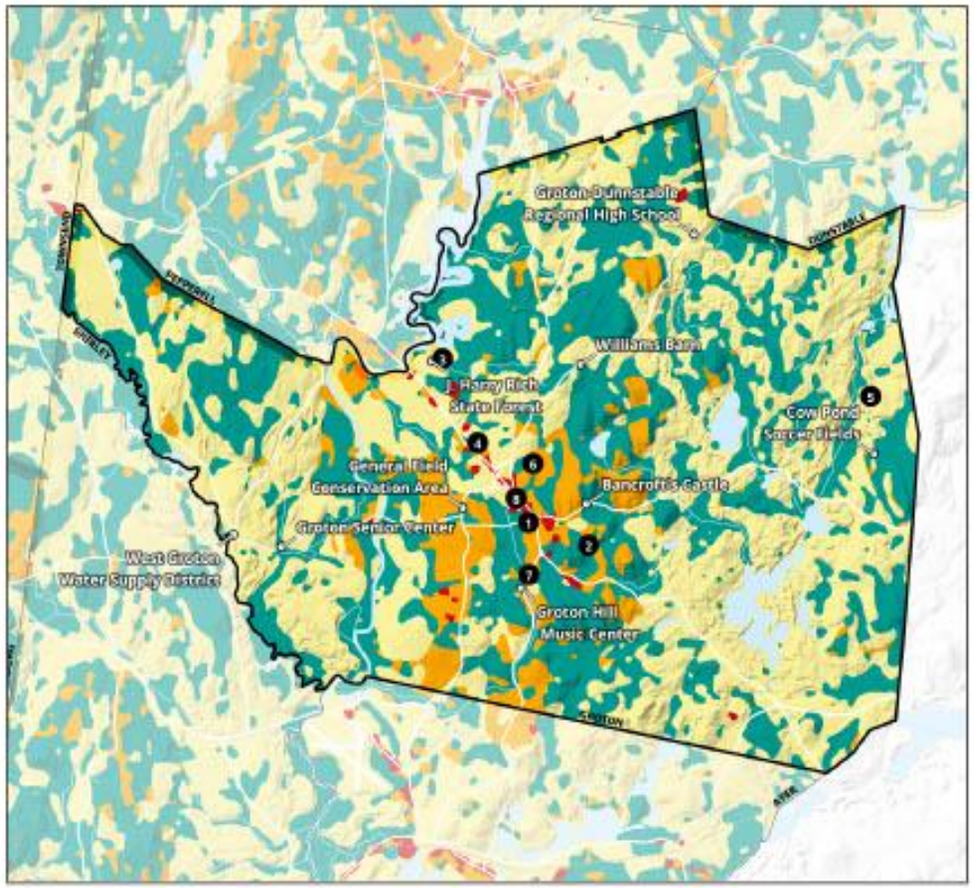
Better management of turf, lawns, gardens, and farms.

Example Nature-based Solutions:

- Education and outreach to key landowners and farmers about smart soil practices
- Pocket forests to transform biodiversity
- Planting and earthworks to restore connectivity and hydrology
- Front yard pollinator meadows
- Dual use solar
- Planning and zoning to preserve and enhance ecosystem function

#	SITE	PREDOMINANT SOIL FUNCTIONS FOR RESILIENCE			
		Highly Degraded	High Regeneration Potential	Moderate-Low Function	High Function
1	Broad Meadow		◆	◆	
2	Groton Country Club	◆	◆	◆	
3	Nod Road			◆	
4	Middle School Parking	◆			
5	Cow Pond Brook/Playing Fields & Highway Dept.			◆	
6	Willowdale		◆	◆	◆
7	James Brook				◆
8	Groton Town Hall	◆			

Soil Functions for Resilience



	Groton
High Performance Soils & High Carbon Soils	8,314 ac (38.5%)
Average Function Soils	11,315 ac (52.3%)
Degraded Soils with High Regeneration Potential	1,849 ac (8.6%)
Highly Degraded Soils	138 ac (0.6%)

○ Landmarks

1 Sites Considered for Nature-based Solutions

[Read full Nashua River Watershed-wide Healthy Soils Report](#) (PDF 25MB)

Nature-based Solutions Opportunity Table Groton: Broadmeadow Road

Value	BEST	BETTER	GOOD
Feasibility	high	mid	low
Ownership	Municipal		

Best Value = An improvement to a resource that provides significant lasting resiliency and strengthens or serves related resources

Better Value = Makes significant improvements to resiliency with long lasting effect

Good Value= Improves the habitat value, or resiliency of a site or feature

Feasibility is based on property ownership or technical access

NbS Template#	Nature-based Solution Description	Broadmeadow Road
	Natural Environment Restructuring	
1	River / pond bank revegetation	
2	Grassland meadow management restoration	**low**
3	Forest / shrubland heath management or restoration	
4	Wetland management restoration	**high**
5	New wetland or floodplain construction / expansion	
6	Pond creation/ elimination / alteration	
7	Stream flow alteration	
8	Pollinator hedgerow buffer	**high**
10	Soil management or restoration	**mid***

* see Healthy Soils Report

NbS Template#	Nature-based Solution Description	Broadmeadow Road
	Built Environment Restructuring	
11	Stormwater treatment wetlands	**mid**
12	Daylighting of streams	
13	Upstream BMPs rain-garden, bio-swale, etc.	**mid**
14	Shade-habitat/ Infiltration tree plantings	**low**
15	MSCS culvert improvement	**mid**
16	Dam modification / controls	
17	Pervious parking walking areas	**mid**
19	Lighting modifications / upgrades	**low**
20	Species crossing protections	
22	High-performance soil specifications	
23	PV Parking Awnings + Rooftops	

Nature-based Solutions Opportunity Table: Broadmeadow Road, cont'd.

Value	BEST	BETTER	GOOD
Feasibility	high	mid	low
Ownership	Municipal		

Best Value = An improvement to a resource that provides significant lasting resiliency and strengthens or serves related resources

Better Value = Makes significant improvements to resiliency with long lasting effect

Good Value= Improves the habitat value, or resiliency of a site or feature

Feasibility is based on property ownership or technical access

NbS Template#	Nature-based Solution Description	Broadmeadow Road
	Ecological Awareness & Access Projects	
24	Outdoor classroom/ Nature-play	**mid**
25	Food production and forage	**low**
26	Apply Indigenous knowledge	**mid**
27	Soft trail	**mid**
29	Soil protection-puncheon-boardwalk	**mid**
30	Pedestrian safety and bike access	**mid**
	Architectural Projects to Consider	
49	Nature-based recreational opportunities	**low**

NbS Template#	Nature-based Solution Description	Broadmeadow Road
	Value Added Features on Projects	
50	Analysis and study projects	
52	Educational interpretation	
56	Volunteer opportunities	**mid**
58	Invasive species management	**high**
59	Species monitoring protocol	**mid**
60	Habitat enhancements	**mid**

Flooding on Broadmeadow Road

Photos by Nancy Lebedzinksi

Broadmeadow Road MVP site visit

Left photo by Ralph Baker
Right photo by Nancy Lebedzinski

This "Building Community Climate Resilience: Nashua River Watershed-wide Nature-based Solutions Plan" is funded by a Municipal Vulnerability Preparedness grant awarded to the City of Fitchburg by the Healey-Driscoll Administration's Municipal Vulnerability Preparedness (MVP) program, which is administered by the Executive Office of Energy and Environmental Affairs (EEA). NRWA was the lead coordinator for this project.

To view the interactive online Plan, please visit nashuariverwatershed.org/Climate Resilience