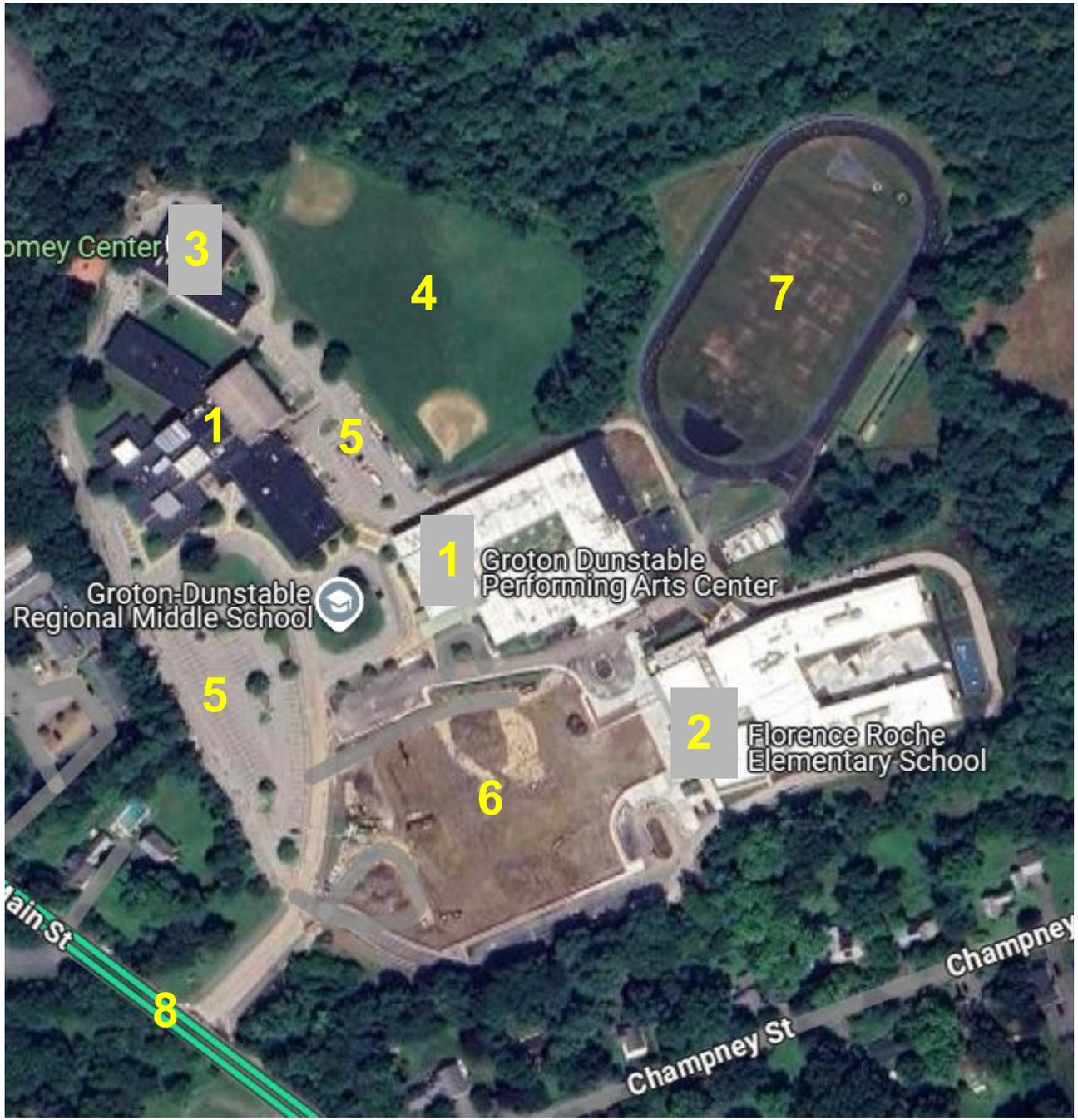
Site Study Groton: Groton-Dunstable Middle School Parking



About this site: The Groton-Dunstable Middle School campus area consists of two buildings housing middle school students (1-North and Marion Stoddart buildings), the Florence Roche Elementary School (2) and the Twomey Center (3), as well as extensive playing fields (4) and impervious parking areas (5). The Florence Roche building is newly constructed on what was previously a track and field facility. The old FloRo building was demolished. It was sited in what now shows as empty land in front of the new building (6). A new track and field facility has been constructed on what was open playing field (7). The campus sits uphill from Main Street/Rt. 119 (8) at the western side of the town.

Community concerns about Groton-Dunstable Middle School

The vast expanse of treeless parking areas and recreational fields put this site at risk for high island effects.

Extensive impervious surfaces allow for stormwater runoff rather than infiltration.

The campus has very little natural space or native habitat which negatively impacts biodiversity in the area.

Nature-based Solutions Recommended for Groton: Groton-Dunstable Middle School Parking

Middle School Parking

Map Link
https://arcg.is/18Tr0C1

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

1. Groton Middle School Forest
   - #24 Outdoor classroom/nature-play
   - #27 Soft trail

   DL #29 Soil protection-puncheon-boardwalk
2. Edge of the Baseball Field

   DL **B** #58 Invasive species management
3. Edge of Baseball Field

   D **F** **RT** #14 Shade-habitat/ Infiltration Tree Plantings
   - #25 Food production and forage

   B #8 Pollinator hedgerow buffer
4. Groton Middle School Rooftop and Parking Lot

   F #11 Stormwater treatment wetlands

   F #17 Pervious parking and walking areas

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

NOTE: The BSC Data Viewer map at left does not reflect the current configuration of the school campus area (see page 1), but the NbS recommendations for the parking areas reflected here remain the same.

NbS Narrative/NbS Project Templates for Groton: Groton-Dunstable Middle School Parking

NbS Recommendations

- Behind the Groton-Dunstable Regional Middle School, to the northeast, there are possibilities for nature-based outdoor education, trail creation, invasive plant education, and edible foraging areas.
- Configuration changes to this large, paved parking lot could include rain gardens and bioswales for water and snowmelt infiltration.
- We recommend planting shade trees.
- The soils in the area of this parking lot are highly degraded. The interventions described in the Healthy Soils Report would restore soil health.

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.

#8 Pollinator Hedgerow Buffer

#11 Stormwater Treatment Wetlands

#14 Shade Habitat Infiltration Tree Planting

#17 Pervious Parking-Walking Areas

#24 Outdoor Classroom-Nature Play

#25 Food Production and Forage

#27 Soft Trail

#29 Soil Protection Puncheon Boardwalk

#58 Invasive Species Management

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

Soils Information for Groton: Groton-Dunstable Middle School Parking

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

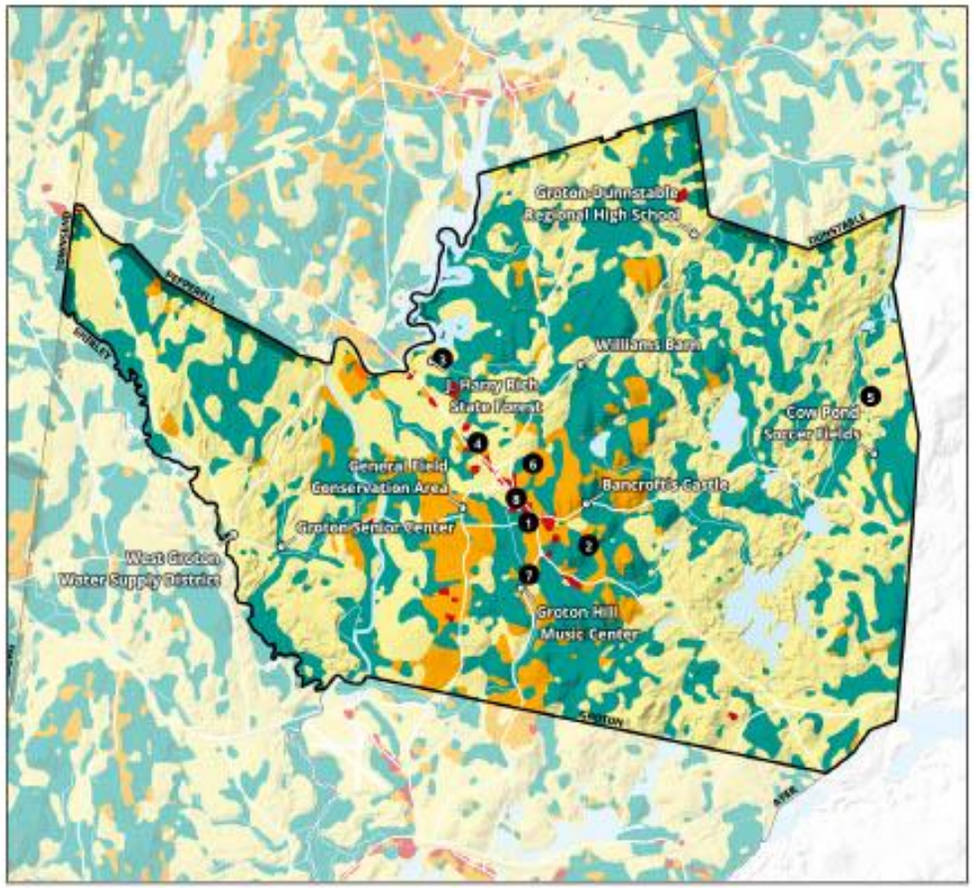
Better management of turf, lawns, gardens, and farms.

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

❶ Sites Considered for Nature-based Solutions

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

Nature-based Solutions Opportunity Table Groton: Groton-Dunstable Middle School Parking

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	Middle School Parking
	Natural Environment Restructuring	
1	River / pond bank revegetation	**low**
2	Grassland meadow management restoration	
3	Forest / shrubland heath management or restoration	
4	Wetland management restoration	
5	New wetland or floodplain construction / expansion	
6	Pond creation/ elimination / alteration	
7	Stream flow alteration	**high**
8	Pollinator hedgerow buffer	
10	Soil management or restoration	

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

* see Healthy Soils Report

Nature-based Solutions Opportunity Table: Groton-Dunstable Middle School Parking, 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	Middle School Parking
	Ecological Awareness & Access Projects	
24	Outdoor classroom/ Nature-play	**high**
25	Food production and forage	**high**
26	Apply Indigenous knowledge	**mid**
27	Soft trail	**mid**
29	Soil protection-puncheon-boardwalk	**mid**
30	Pedestrian safety and bike access	
	Architectural Projects to Consider	
49	Nature-based recreational opportunities	**mid**

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

Groton-Dunstable Middle School parking MVP project site visit.

Photo by Ralph Baker

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