

The Greensboro Bend PLACE Program

Conservation Recommendations

Report Summary

This report presents a series of conservation recommendations arising from the work of the Greensboro Bend Place-based Landscape Analysis and Community Engagement (PLACE) Program. The Greensboro Bend PLACE Program's goal is to expand the community's relationship with their surroundings through concurrent social and landscape analyses. Lauren Sopher completed this work as part of her Master of Science degree in the Field Naturalist and Ecological Planning Program at the University of Vermont; these conservation recommendations represent her findings on opportunities to care for and use the town's natural resources.

The stories of people and the land are intertwined—one cannot be considered without the other. Through public and private conversations with community members and ecological field work, Lauren developed conservation recommendations for Greensboro Bend that fall into three major themes.

In summary:

1. **Street beautification:** use native plant species to enhance Greensboro's natural beauty.
2. **Healthy rivers:** take care of Greensboro's rivers and their adjacent lands.
3. **Forest and farms:** sustain and enhance Greensboro's working forests and farms.

Many of these recommendations apply to Greensboro at large. These practices will maintain and improve human health and safety, economic prosperity, nature and its benefits, and Greensboro's beauty for current and future generations.

Street Beautification

Use native plant species to enhance Greensboro's natural beauty.

Recommendations

1. Prioritize native species when considering new planting projects.
2. Reference the resources below to cross-check future plant purchases.

Background & Justification

Street beautification using native plants will provide aesthetic and ecological value to the community. Native herbs, vines, shrubs, and trees are critical to robust ecosystems [1, 2]. These plants thrive in the local climate and support the food and habitat needs of native wildlife, such as birds, bees, and butterflies. Non-native plant species that become invasive species have a negative impact on ecosystem health, human health, and our wallets; they disrupt forest regeneration, wildlife habitat, and recreational activities and are expensive to manage [3, 4, 5]. Planting native species is a win-win for people and the environment.

Nature, including street trees, positively impacts human health and well-being [6, 7, 8, 9, 10, 11, 12]. One researcher states, "...having natural elements or settings in the view from the window contributes substantially to residents' satisfaction with their neighborhood and with diverse aspects of their sense of well-being" [13]. For example, greenness along Main Street and within "Our Community Park" in Greensboro Bend could help promote neighborhood satisfaction, physical activity, and social cohesion [14, 15, 16].

Resources

- **Native Plants | Background Information**

- [Go Botany](#)
Native Plant Trust
Provides users with a tool to search New England's plant species.
- [Native Plants Species List*](#)
Greensboro Bend Town Analysis Report
Lists native species observed in Greensboro Bend during Lauren Sopher's field work in 2018.
- [New England Native Garden Plants](#)
Native Plant Trust
Enables users to search for native plant species in our ecoregion, the Northeastern Highlands, by characteristics such as "attracts songbirds," "salt tolerant," and "low maintenance."
- [State of New England's Native Plants In Brief](#)
Native Plant Trust
Documents a comprehensive assessment of New England plant communities.

- **Native Plants | Purchase Information**

- [Native Conservation Tree and Shrub Sale](#)
 - [Contact](#)
Orleans County Natural Resources Conservation District
Sarah Damsell, District Manager
802-334-6090 ext.7008 | sarah.damsell@vt.nacdnet.net

- **Invasive Plants**

- Invasive Terrestrial Plants of Vermont: Guide to Identification, Prevention, and Management*
The Nature Conservancy, Vermont
Illustrates herbs, vines, shrubs, and trees that are invasive in Vermont in a durable fold-out guide.
- Vermont Invasives
University of Vermont Extension, the Vermont Department of Forests, Parks and Recreation, the Vermont Department of Environmental Conservation, and the Nature Conservancy, Vermont
Profiles invasive terrestrial plants, forest pests, and aquatic invaders, with resources on identification, biology, management options, and Vermont distribution.

Healthy Rivers

Take care of Greensboro's rivers and their adjacent lands.

Recommendations

1. Sustain and enhance vegetated riparian buffers, ideally 100 feet wide, on either side of the Lamoille River.
2. Maintain and improve brook trout habitat in the Lamoille River and its tributaries by providing naturally stable, shaded banks and minimizing silt deposition.
3. Consider partnering with the Vermont Fish & Wildlife Department or the Vermont River Conservancy to improve public access for fishing and paddling and education about the Lamoille River.
4. Consider working with the Vermont Department of Environmental Conservation to determine if bridge upgrades along the mainstem of the Lamoille River would minimize constriction of the river and promote its natural flows.

Background & Justification

Healthy rivers support healthy people and the places they live. Flood protection, fish and wildlife habitat, clean water, and river bank stability are made possible by riparian buffers—vegetated areas that border rivers, lakes, and wetlands. Intact riparian areas help prepare us for severe storms and summer droughts, which are predicted to become more frequent and severe as a result of climate change [17]. Community planting projects, whether for street beautification or riparian buffers, present an opportunity for folks to work together on common goals.

Greensboro Bend is in the headwaters of the Upper Lamoille River. The Lamoille Tactical Basin Plan highlights three prominent stressors to the overall health of the Upper Lamoille [18], which directly impact its values to Greensboro Bend and the entire

706 square mile drainage basin of the Lake Champlain Basin. The first is flow alteration, defined as any human-induced change in the natural flow of the river, stream, lake, or reservoir levels, including Caspian and Hardwick Lakes [19]. The second is encroachment by structures, roads, railroads, improved paths, utilities, and other development into natural areas such as floodplains, river corridors, wetlands, lakes and ponds, and the buffers around these areas [20]. The third is excessive channel erosion, defined as excessive erosion that occurs in some channel locations, while excessive deposition occurs in other locations, up and down the length of a stream [21].

East Hardwick, Greensboro Bend, and Stannard have close cultural and ecological ties. The confluence of Stannard Brook and the Lamoille River is in East Hardwick, immediately downstream of the Lamoille River in Greensboro Bend. In the Lamoille River Tactical Basin Plan, Stannard Brook is highlighted as a priority sub-basin for remediation, due to encroachment, channel erosion, and land erosion. The plan proposes the following actions to address these issues: develop a stormwater management project for the town sand storage area, complete a Stream Geomorphic Assessment and river corridor plan to identify stressors and prioritize projects, and monitor. Additionally, many bridges along the Lamoille River mainstem and major tributaries are currently undersized, according to the *The Upper Lamoille River Stream Geomorphic Assessment, Phase 2 Report, Greensboro and Hardwick*, published in 2009. Addressing the remediation of Stannard Brook and the Lamoille River through a partnership between communities would bring economic and ecological benefits to the area.

An influx of recreationists in Greensboro Bend will likely follow the impending construction of the “Morristown to Greensboro” section of the Lamoille Valley Rail Trail. In south Greensboro Bend, a portion of the west bank of the Lamoille River is managed by the Vermont Fish and Wildlife Department for the purpose of public access, especially fishing.

Brook trout in particular hold cultural, recreational, and ecological value in Greensboro. The upland streams of the Lamoille River Watershed supply cold water to the mainstem. These small streams provide habitat for self-sustaining native brook trout, as well as blacknose and longnose dace, creek chubs, longnose suckers, and slimy sculpins [22]. There is an opportunity for private landowners, the Fish & Wildlife Department, and a partnering organization, such as the Orleans County Natural Resources Conservation District, to work together on a restoration project that supports healthy rivers and a healthy community.

Resources

- **Riparian Buffer Restoration Projects**

- Native Conservation Tree and Shrub Sale

Enables people to purchase plants that are native to Vermont.

- Contact

Orleans County Natural Resources Conservation District

Sarah Damsell, District Manager

802-334-6090 ext.7008 | sarah.damsell@vt.nacdnet.net

- **Quick Guide for Waterfront Landowners***

Vermont Fish & Wildlife Department, Vermont Agency of Natural Resources

Provides background information about the importance of riparian areas—ideal for landowners with properties adjacent to a stream, lake, or wetland.

- **Riparian Buffers and Corridors Technical Papers**

Vermont Agency of Natural Resources

Explains the function and value of 100-foot buffers.

- **The Lake Champlain Basin Atlas**

Provides resources about the Lake Champlain Basin, including interactive maps and educational fact sheets.

- **The Lamoille River Tactical Basin Plan**

Assesses the health of the Lamoille River Basin and outlines current and future actions and strategies to address its major stressors.

- **Trees for Streams**

Supports people in planting vegetated buffers along streams—ideal for landowners with riverside property.

- Contact

Orleans County Natural Resources Conservation District

Sarah Damsell, District Manager

802-334-6090 ext.7008 | sarah.damsell@vt.nacdnet.net

- **Bridge Upgrades**

- **The Upper Lamoille River Stream Geomorphic Assessment, Phase 2 Report, Greensboro and Hardwick**

Caledonia County Natural Resources Conservation District

Outlines recommendations for the section of the Lamoille River in Greensboro Bend, including a Bridge and Culvert Assessment of the Upper Lamoille River.

- Contact

Department of Environmental Conservation, Vermont Agency of Natural Resources

Danielle Owczarski, Watershed Coordinator

802-490-6176 | danielle.owczarski@vermont.gov

- **Brook Trout Habitat**

- **The Vermont Partners Program**

Helps to restore wetland, riparian, in-stream, and upland habitats.

- Contact

U.S. Fish and Wildlife Service

Lake Champlain Fish and Wildlife Conservation Office

Chris Smith, Fish and Wildlife Biologist

802-662-5303 | chris_e_smith@fws.gov

- Vermont Trout in the Classroom

Supports students in raising brook trout from eggs in their classroom and releasing them into a state-approved stream.

- Contact

Trout Unlimited

Joe Mark, Lead Facilitator

802-236-3816 | joe.mark@castleton.edu

- **Public Access and Education**

- Contact

Vermont Fish & Wildlife Department, Vermont Agency of Natural Resources

Will Eldridge, Aquatic Habitat Biologist

802-585-4499 | william.eldridge@vermont.gov

- Contact

Vermont River Conservancy

Richarda Ericson, Development and Outreach Director

802-229-0820 | vrc@vermontriverconservancy.org

Forests & Farms

Sustain and enhance Greensboro's working forests and farms.

Forests | Recommendations

1. Community initiatives work with the priorities of individual landowners.
2. Community initiatives support landowners who are interested in maintaining and improving the ecological value of their property.
3. Consider forest blocks and wildlife connectivity in town planning decisions.
4. Support residents' stated value of Greensboro Bend's undeveloped character by considering the creation of a town forest.

Farms | Recommendations

1. Community initiatives work with the priorities of individual landowners.
2. Community initiatives support efforts to integrate ecological considerations into farm management decisions, such as planting riparian buffers.

Background & Justification

Forests and farms define Vermont's landscape—this also is true for Greensboro. The forested section of northeast Greensboro Bend and the fields of south Greensboro Bend were consistently identified as areas that folks valued for their undeveloped character. There are voluntary opportunities for private landowners to manage their land in an undeveloped state, with the support of local, state, and federal resources.

Greensboro Bend is located in the biophysical region of Vermont known as the Northern Vermont Piedmont. The region is characterized by hills and rivers, a moderate climate—cooler and moister than the Champlain Valley and warmer and drier than the Northern Green Mountains—and fertile soils derived from calcium-rich bedrock. These factors influence the assemblage of plants and animals found in Greensboro Bend [23].

Forests

Two forest types, Lowland Spruce-Fir Forest [24] and Northern Conifer Floodplain Forest (or Boreal Floodplain Forest) [25], are highlighted in these recommendations for the following reasons:

- These forests are distinctive upland (Lowland Spruce-Fir Forest) and wetland (Northern Conifer Floodplain Forest) communities in Greensboro Bend.
- These forests are either large in area (Lowland Spruce-Fir Forest) or readily visible to the public via the Lamoille Valley Rail Trail, Vermont Route 16, and Main Street.
- The Northern Conifer Floodplain Forest has large restoration potential.
- The Northern Conifer Floodplain Forest has an S2 state rank—defined by the Vermont Natural Heritage Inventory as rare in the state, occurring at a small number of sites or occupying a small total area in the state [26].

Lowland Spruce-Fir Forest

This forest is characterized by the following plants:

Trees	
Abundant Species	Occasional Species
<ul style="list-style-type: none">– Balsam fir– Red spruce	<ul style="list-style-type: none">– Black spruce– Northern white cedar– Paper birch– Red maple– Tamarack– White pine– White spruce– Yellow birch

Herbs	
Abundant Species	Occasional Species
<ul style="list-style-type: none"> – Bluebead lily – Bunchberry – Common wood sorrel – Intermediate wood fern – Shining clubmoss – Whorled aster 	<ul style="list-style-type: none"> – Canada mayflower – Goldthread – Pink lady's slipper – Twinflower

This forest is associated with the following animals:

Animals	
Mammals	Birds
<ul style="list-style-type: none"> – Deer mouse – Fisher – Moose – Porcupine – Red fox – Red squirrel – Southern red-backed vole – White-tailed deer 	<ul style="list-style-type: none"> – Blackpoll warbler – Red-breasted nuthatch – Ruby-crowned kinglet – Swainson's thrush – Yellow-bellied flycatcher – Yellow-rumped warbler

Northern Conifer Floodplain Forest (or Boreal Floodplain Forest)

This forest is characterized by the following trees:

Trees	
Abundant Species	Occasional Species
<ul style="list-style-type: none"> – Balsam fir – Balsam poplar – Black ash – Black cherry – Northern white cedar – White spruce – Yellow birch 	<ul style="list-style-type: none"> – Red maple – Silver maple
Herbs	

Abundant Species

- Ostrich fern
- Sensitive fern

This forest is associated with the following animals:

Animals

Mammals	Birds
<ul style="list-style-type: none">– American beaver– Mink– Raccoon– River otter	<ul style="list-style-type: none">– American woodcock– Canada warbler– Common merganser– Hooded merganser– Ruffed grouse– Yellow warbler– Wood duck

Alluvial Shrub Swamp

This community is related to the Northern Conifer Floodplain Forest. It is distinguished by the dominance of shrubs.

This community is characterized by the following plants:

Trees

Abundant Species

- Black willow
- Boxelder

Shrubs

Abundant Species

- Speckled alder

Herbs

Abundant Species

- Ostrich fern

This community is associated with the following animals:

Animals	
Mammals	Birds
<ul style="list-style-type: none">– American beaver– Mink– Muskrat– River otter	<ul style="list-style-type: none">– Alder flycatcher– Common yellowthroat– Gray catbird– Veery– Yellow warbler

Birds are significant indicators of ecosystem health. The Birder's Dozen represents 12 of the 40 forest birds that the Audubon Vermont Forest Bird Initiative is working to protect. Five of the Birder's Dozen were seen or heard in Greensboro Bend during Lauren Sopher's field season in 2018: black-throated green warbler, chestnut-sided warbler, veery, white-throated sparrow, and wood thrush. These birds are easy to identify by sight or sound, use a variety of forest types for feeding and breeding, and in one case—the wood thrush—show long-term declines in their global populations.

Forest blocks, wildlife connectivity blocks, and riparian networks in Greensboro Bend are locally and regionally important. Forest blocks, defined as areas of contiguous forest that are unfragmented by roads, development, or agriculture, support ecological functions, such as air and water quality and predator-prey relationships. Wildlife connectivity blocks are a network of forest blocks that provide terrestrial connectivity across Vermont, adjacent states, and Canada; they support the ability of wide-ranging animals to move across their range and supply suitable habitat for plants and animals in the face of climate change. Riparian networks, defined as lakes, rivers, streams, and ponds and their associated corridors, allow species to travel along corridors to find suitable habitat and provide habitat for wildlife that heavily rely on riparian areas for survival, including beaver, otter, and mink [27].

Farms

The undeveloped character of Greensboro's agricultural land reflects its rural traditions. Productive, affordable agricultural land can go hand-in-hand with the protection of its ecological value.

Two Important Farmland soil types, Prime Farmland (Prime) and Additional Farmland of Statewide Importance (Statewide), defined by the USDA Natural Resources Conservation Service, Vermont, predominate in Greensboro Bend [28]. These soils are the foundation for the community's fertile croplands and pastures.

The farms of Greensboro present numerous voluntary opportunities for landowners to sustain and enhance their land. Recognition of ecological functions, paired with what folks value—the undeveloped character of the land—enables landowners and the community to make informed decisions about their natural resources for current and future generations.

Forests | Resources

- [Backyard Woods Program](#)

Vermont Urban & Community Forestry

Helps landowners who own between 5 and 25 acres understand why their backyard woods matter in a six-week online program that incorporates activities, discussion forums, videos, webinars, and field walks.

- [Foresters for the Birds](#)

Audubon Vermont and the Vermont Department of Forests, Parks and Recreation

Assists voluntary landowners to integrate the practices of timber and songbird habitat management.

- Contact

Jared Nunery, Orleans County Forester

802-586-7711 ext.169 | jared.nunery@vermont.gov

- [Use Value Appraisal Program—“Current Use”](#)

Vermont Department of Forests, Parks and Recreation, Vermont Agency of Natural Resources

Enables eligible private lands where owners practice long-term forestry or agriculture to be appraised based on the property's value of production of wood or food rather than its residential or commercial development value.

- Contact

Jared Nunery, Orleans County Forester

802-586-7711 ext.169 | jared.nunery@vermont.gov

- [Vermont Conservation Design](#)

Vermont Fish & Wildlife Department, Vermont Agency of Natural Resources

Identifies areas of ecological priority across Vermont's landscape at different scales.

- [BioFinder](#)

Vermont Fish & Wildlife Department, Vermont Agency of Natural Resources

Displays the Vermont Conservation Design data via an online mapping tool.

- Contact

Jens Hawkins-Hilke, Conservation Planner

802-461-6791 | jens.hilke@vermont.gov

- [Vermont Coverts](#)

Nonprofit

Enables landowners to make well-informed decisions that meet their forest management goals and enhance diverse wildlife habitat and healthy ecosystems.

- Contact
802-877-2777 | info@vtcoverts.org
- **Vermont Woodlands Association**
Nonprofit
Advocates for the management, sustainability, perpetuation, and enjoyment of forests through the practice of excellent forestry.

Farms | Resources

- **Conservation Reserve Enhancement Program (CREP)**
Helps voluntary landowners retire cropland into protective vegetation.
 - Contact
Vermont Agency of Agriculture, Food & Markets
Ben Gabos, CREP Coordinator
802-461-3814 | ben.gabos@vermont.gov
- **Environmental Quality Incentives Program (EQIP)**
Supports voluntary agricultural producers in a manner that promotes agricultural production and environmental quality as compatible goals.
 - Contact
U.S. Department of Agriculture
Natural Resources Conservation Service (NRCS) Vermont
Newport Service Center
Sarah Damsell, District Manager
802-334-6090 ext.7008 | sarah.damsell@vt.nacdnet.net
- **Farmland Access Program**
Connects farmers with affordable farmland.
 - Contact
Vermont Land Trust
Jon Ramsay, Director of Farmland Access Program
802-533-7705 | jramsay@vlt.org
- **The Vermont Farmland Conservation Program**
Focuses on retaining quality agricultural land in strong farming regions of the state.
 - Contact
Vermont Housing and Conservation Board
Nancy Everhart, Farmland Conservation Director
802-828-5066 | nancy@vhcb.org

* Hard copies available at the Greensboro Free Library