

Rural Road Resilient Right-of-Ways Vegetation Assessment

Town of Hyde Park Action Plan and Recommendations

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Introduction

Although strange in shape and character, roadsides are our public places. Most town right-of-ways span 49.5 feet, or just under 25 feet from the center of the road in each direction. While some roads and their associated clear zones (ditched or repeatedly cleared areas next to the road) span almost the entire right-of-way width, others are narrow and forested, creating canopy from trees in 12-foot wide strips of publicly managed land.

While many of us never picture picnicking in these bands of trees, shrubs, grasses or even wetlands, we look at them all the time. Driving, bicycling, or walking by, we take in what they are, and as a community, what we have decided our roadsides should be. Some rural roadsides afford beautiful mountain views, others feature century-old maples. Many are a collection of stick-thin trees and shrubs competing for light in what used to be another New England pasture.

Management of town roads is at the discretion of individual road foremen and their partnering selectboards. As such, it is no surprise that towns handle their municipal right-of-ways differently from each other. Some prioritize safe passage at high speeds on only their main thoroughfares while keeping small, residential roads narrow and with low speed limits. Other towns recognize the increasing width of their road machinery and the corresponding infrastructure and turning radius needs the road crew requires. Roads become wider, straighter, and allow faster traffic – characteristics that some residents enjoy, and others resent.

Statewide, towns are becoming more cognizant of stormwater runoff and the role that backroads play in contributing phosphorous and sediment to streams, rivers, lakes and ponds. Backroad repairs often include (sometimes by regulation) ditching, stone work (stone-line ditches, check dams, or stone turn outs), grass-lining or hydroseeding, and culvert repair or replacement. These often come at the expense of roadside trees whose branches, roots, or trunks lie in the way of road infrastructure or are damaged beyond repair during infrastructure improvements. Towns must accept where some roads must lose their tight, shaded rural character in favor of clean water and safe passage, and advocate for roads that can effectively utilize healthy vegetation as green stormwater infrastructure to slow erosion and improve stormwater infiltration. They must also think creatively about where other roads can retain, or restore, their rural character over the long term.

Rural roadside vegetation shapes our towns. It shades our backroads, livens our landscapes, and grows character in our front yards. Planning for healthy and safe vegetation is a cyclical process – thoughtful vegetation growth and maintenance practices reduce knee-jerk reactions to road-tree conflicts and consider both seasonal changes and emergency responses. Additionally, good communication among town selectboard members, road crews, and residents encourages a long-term vision for municipal roads that incorporates short-term changes or setbacks. With this planning, communication, and overarching vision, towns have the capacity to grow utility, beauty, safety and resilience along their roadsides.

Resilient Right-of-Ways Project Overview

In the spring of 2018, the town of Hyde Park was selected as a partner community to work with the Vermont Urban & Community Forestry program as a case study town in the Rural Roads Resilient Right-of-Ways (ROW) project. Funded by the USDA Forest Service, this project has two broad goals:

1. to connect ten Vermont communities with resources and processes that advance understanding of the role of rural roadside vegetation in supporting local environmental, economic, and cultural values; and
2. to use the collected data and feedback from towns to create updated educational material and technical assistance surrounding rural road vegetation management to be offered state wide beginning in 2019.

The Hyde Park Selectboard agreed to participate in the Resilient Right-of-Ways project as a case study during the April 9, 2018 meeting. The town was then asked to form a Resilient ROW project advisory committee made up of individuals knowledgeable about, and invested in, the future of healthy and resilient roadside vegetation communities. The liaison to Hyde Park's volunteers is town administrator Ron Rodjenski. Members of the committee are:

Susan Bartlett, Selectboard Chair
Ron Rodjenski, Town Administrator
Gary Smith, Town resident and land steward
Paul Trudell, Hyde Park Village resident and architect
Bob Whalen, Hyde Park Tree Warden

Other interested parties include:

Kateri Bisceglia, Watershed Consulting, Water Quality Specialist
Peter Danforth, Lamoille County Conservation District, stormwater project funding and management
Andres Torrizo, Watershed Consulting, town consultant on stormwater issues

Resilient Right-of-Ways project coordinator Joanne Garton and VT UCF summer intern Beth Bannar met with the Resilient Right-of-Ways project advisory committee and visiting attendees on June 19, 2018 to outline the scope the extent of the project and address the town's roadside vegetation practices, concerns, and ideas. Ron Rodjenksi and Joanne Garton completed and signed the Letter of Collaboration on May 14, 2018 (see Appendix A: Letter of Collaboration). The work plan resulting from this project scoping meeting is included in Appendix B: Work Plan. **Project field work collected data that documented common roadside vegetation scenarios in Hyde Park, revealed where conflicting interests may arise, and led to suggestions regarding direct action that the town can take to protect, manage, or restore site-appropriate trees, shrubs, and grasses.**

The roadside vegetation assessments were conducted in July and August of 2018 by Joanne Garton and Beth Bannar. Field routes covered approximately 20 miles of the 39 miles of unpaved roads in Hyde Park. On unpaved backroads, Joanne and Beth assessed 100-foot long roadside vegetation plots on both the left and right sides of the road as travelled south-to-north and west-to-east. Data was recorded using the ESRI ArcCollector app and stored in the Agency of Natural Resources ESRI account. Selected plots conveyed a typical representation of the roadside environment at or near that quarter-mile marker. Itemized data fields are outlined in the Town of Hyde Park Work Plan (Appendix B).

The assessed routes are drawn in red on Maps 1 through 11. All plot locations are displayed on Map 1: Right-of-Way Vegetation Type.

Process Recommendations

So much of road maintenance is guided by the overarching process that the town develops to meet its roadside maintenance goals within its budget. Recognize that vegetation is a pervasive part of road maintenance activities and that clarifying the processes you use to manage roadside vegetation will lead to functional, thoughtful right-of-way corridors.

1. Establish sustainable vegetation that promotes diversity of species, age, structure and density

Roadside forests are not your normal forest. Stressed by vehicle traffic, snow plows, mowers, road maintenance equipment, trash, pedestrians, and cyclists, vegetation in the right-of-way is in a state of perpetual disturbance. In addition, roadsides are largely unnatural – that is, they feature engineered topography and non-standard plant communities. Restoring roadsides to their most natural state, particularly after construction, promotes greater longevity of native plant species and resilience to typical disturbances. Roadsides can be safe while also being visually interesting, ecologically integrated, and engineered to manage stormwater cleanly.

Roadside vegetation management has changed a lot in the last 30 years along both state and town roads. What used to be a rash of herbicide treatment and a bi-annual regrading of the shoulder is now a multi-step process requiring tools including hydroseeders, straw mulch blowers, GPS, and mapping software. Towns consult licensed pesticide applicators, invasive species experts, and erosion control engineers to decide on a yearly course of action. Rural roadside right-of-ways represent over 27,000 acres of land in Vermont – management of this land is no small task. Establishing sustainable, multi-aged and diverse roadside vegetation takes thoughtful planning, appropriate expertise, and patience.

Recommendations

- Be intentional about vegetation clearing. Understand that after clearing, any regrowth of vegetation will be all the same age (called even-age) and, at least initially, will lack the structural diversity that keeps roadsides forests healthy.
 - Roadsides can provide strips of habitat for some species, although generally as temporary cover or food sources rather than as breeding or nesting sites. Some species continue to thrive in the edge habitat created by roadside vegetation, particularly if this vegetation acts as an ecological community not common throughout the region. However, not all wildlife are welcome along rural roads. Many early successional species (birch *Betula spp.*, poplar *Populus spp.* and willow *Salix spp.*) that persist in the continuously disrupted forest edge along roadsides are actually palatable browse for wildlife such as moose. Naturally, safety concerns of road users must be balanced with the risks presented through maintaining roads in rural areas.
- Establish a [pruning](#)¹ and maintenance schedule for existing trees, particularly native trees encroaching on space needed to safe passage of traffic or specimen trees with defects or wounds that should be monitored to prolong the life of the tree. Pruning for plant health helps

¹ Pruning. Vermont Urban & Community Forestry Program. <https://vtcommunityforestry.org/resources/tree-care/pruning>.

a tree establish a dominant leader, reduces resources going into dying, diseased or rubbing branches, and increases a trees resistance to strong winds and winter storms. When done correctly, roadside pruning reduces the number of branches that could fall onto the road, obscure sight lines along roads, or grow into utility lines. Do not prune trees with a flail mower or boom arm mower. [Find a certified arborist](#)² to prune prominent or downtown trees.

- Establish a systematic annual planting schedule – but start small. Many of Hyde Park’s roads are forested and will revegetate themselves (called “forest regeneration”) with common tree species. However, some right-of-ways that border wetlands, fields, or agricultural areas may benefit from bush and native grass planting to protect soil from erosions or from tree planting to create canopy or, particularly as roadside ash trees die. Start small to monitor progress and understand that planting efforts require site preparation, material purchases, monitoring, and possibly replacement of species that die. Ensure that planting efforts do not conflict with planned road construction.
- Take note of existing native plants. Utilize your town’s active citizen scientists and their data recorded on iNaturalist³. Note where invasive plants are *not* present and ensure that native plants remain undisturbed in erosion-prone areas.
- Establish native vegetation in cleared areas, including where invasive plants have been removed. Consider using native seed mixes when planting grass in disturbed roadside areas. [The Vermont Agency of Transportation Technical Landscape Manual](#)⁴ (p. 2-47) recommends several seed mixtures, many of which can be applied with a hydroseeder. However, many contain no native species. As preliminary guidance, towns may consider using the **Sand and Gravel Sites Conservation Mix** (*switchgrass, big bluestem, little bluestem, sand lovegrass, blackeyed susan*) and the **Wet Area Mix** (*Virginia wild rye grass, fox sedge, American mannagrass, giant bur-reed, common three-square, soft-stem bulrush, Canada rush*), paying close attention to the amount of fertilizer and tackifier a site may need for seeds to successfully germinate. Contact seed company distributors such as Catamount Grass Seed, Vermont Wetland Plant Supply, or The Vermont Wildflower Farm to learn more.
- Consult with neighboring towns to find out if planting or seeding initiatives can be shared. By combining missions, town may achieve an economy of scale that makes costs and logistics more palatable.

2. Prepare for emerald ash borer and manage ash tree health

Emerald ash borer (EAB), an invasive beetle that eats and kills all species of ash in North America, was first detected in Vermont in February of 2018. In central Vermont, the insect has been confirmed in Montpelier, Plainfield, Orange, Berlin and Barre Town. In northwestern Vermont, EAB has been confirmed in South Hero. All Vermont towns are encouraged to prepare and manage the impacts of

² International Society of Arboriculture – Find an Arborist. <https://www.treesaregood.org/findanarborist>.

³ More on iNaturalist can be found at <https://www.inaturalist.org/>.

⁴ Seed Mixes. Page 2-47. Vermont Agency of Transportation Technical Landscape Manual. <https://vtrans.vermont.gov/sites/aot/files/highway/documents/environmental/VTrans%20Technical%20Landscape%20Manual.pdf>.

EAB and the upcoming loss of ash trees. Once present, EAB kills over 99% of ash trees (if not chemically treated); those along public roads can then pose a risk to safety when diseased or dying.

Hyde Park is almost equidistant to the two [known infested areas](#)⁵ in Vermont. As of the writing of this report, EAB has not been detected in Hyde Park or within 10 miles of its borders.

The Resilient Right-of-Ways field assessment included a count of ash trees at each plot location that were either in the right-of-way or would affect the right-of-way if diseased or dying. While some roads will be heavily impacted by the removal or death of ash trees in both forested and primarily mowed areas (e.g. McKinstry Hill Road, Centerville Road), other forested or tree-lined roads have a relatively low concentration of roadside ash (e.g. Green River Dam Road, Grimes Road, Barnes Road), at least as evaluated every ¼ mile during this survey. Garfield Road exhibited 14 plots locations with low (1-2 ash trees) ash impact and two locations with medium (3-4 ash tree) ash impact. However, the 2014 survey completed by Lamoille Union High School students tallied over 100 ash stems along Garfield Road.

Recommendations

- Continue to plan for the arrival of emerald ash borer. Work with the Regional Invasive Insect Preparedness Team (RIIPT) and review the recommendations created in the “2015 Emerald Ash Borer Preparedness Plan for Hyde Park Village and Town”. Continue outreach to discourage the movement of firewood, particularly ash firewood.
- In anticipation of EAB in Hyde Park, consider either [pesticide treatment](#)⁶ of the four downtown ash trees in Hyde Park Village or removal and replanting
- Consider if the 2014 Hyde Park Roadside Ash Inventory has enough information to provide Hyde Park with its next steps regarding EAB Management. Review the Urban & Community Forestry Program’s other [on-line resources](#)⁷ regarding EAB management and consider if the town plans to perform any preemptive removals as recommended in the “2015 EAB Preparedness Plan for Hyde Park Village and Town”.
- Ensure that the Hyde Park Road crew or any other contracted service is well-trained in the dangers associated with taking down dead or dying ash trees. Ash trees in the first year of EAB infestation lose a significant portion of their strength. Because EAB may not be detected in a tree for several years, even healthy-looking ash trees may be structurally compromised if EAB is in the area.
- Ensure that any ash tree removal within 10 feet of a utility line and/or within the utility right-of-way is completed by the utility company.
- Encourage the municipality and private landowners to follow the Slow the Spread recommendations issued by Vermont Forests, Parks and Recreation when [moving ash](#) or [processing ash](#)⁸.
- Monitor the health of the four inventoried public ash trees in Hyde Park Village (as noted in the “2017 Hyde Park Public Tree Inventory Summary Report”) and determine if any street trees should or could be treated with insecticide.

⁵ Emerald Ash Borer Infested Area in Vermont, Vermont Agency of Natural Resources.

<http://vtanr.maps.arcgis.com/apps/PublicInformation/index.html?appid=cfd013ad1464b7b9103a3d7806f0cc5>

⁶ Options for Protecting Ash Trees from Emerald Ash Borer with Insecticide Treatments on the Vermont Urban and Community Forestry website: <https://vtcommunityforestry.org/sites/default/files/pictures/eabtreatment.pdf>

⁷ Emerald Ash Borer Management on the Vermont Urban & Community Forestry Website: <https://vtcommunityforestry.org/community-planning/tree-pests>

⁸ Slow the Spread Recommendations. Vermont Invasives. <https://vtinvasives.org/land/emerald-ash-borer-vermont>

3. Address hazard trees with the tree warden

Hyde Park's current tree warden, Bob Whalen, serves as an advocate for trees in the town's public places and right-of-ways, and as a resource for citizens wanting to know more about when to remove, plant, or treat public trees. One of the most important duties of the tree warden in any town is to address public safety concerns resulting from roadside vegetation. Remember that for a tree to be considered a *hazard* tree by the tree warden and be removed without a public hearing, the tree itself must be a hazard, not its placement. If a roadside tree is close to the road edge but not damaged or infected, it cannot be deemed a hazard tree by the tree warden.

During the legislative session of 2018, Vermont Forests, Parks & Recreation participated in introducing [new legislation that would modernize Vermont's tree warden statutes](#)⁹. However, the draft bill did not advance as an official bill and was not considered further that year. The Tree Warden Statute amendments did not go to legislative committee again this year (2019) and no changes are known at the time of writing this report. As such, the original [Vermont Tree Warden Statutes](#)¹⁰ (last amended in 1969) still apply. They are included in this report in Appendix C: Selected Resources for Tree Wardens.

Recommendations

- Consider a yearly “look-up drive” conducted jointly by the tree warden and the road foreman during which all trees along town roads are observed via a drive-by assessment and view into the canopy. This will give the selectboard, conservation commission, and any interested landowners time to provide input on any hazard trees identified by the tree warden. The selectboard will also be able to allocate a budget for tree removal, ensure that road crew members are properly trained, or subcontract the tree removal work.
- Retain an updated map of hazard trees as identified by the road foreman and tree warden. This could be done on paper or electronically – the Vermont Urban & Community Forestry Program can help with electronic resources if desired.
- Consult the Vermont Urban & Community Forestry Program's [Resources for Tree Wardens](#)¹¹ webpage, including the [Guidelines for Public Hearings for Tree Removals](#).

4. Refine the town tree ordinance

Developed and active tree ordinances are effective tools to aid towns in attaining and supporting healthy and well-managed urban and community trees. When well-crafted, tree ordinances define ambiguous terms with language that reflects the goals and perspectives of each town. They clarify processes regarding tree planting, removal, and maintenance that act as a reference for the entire town, often reducing the number of circumstances requiring a public hearing. They can also address management of specific tree or plant species, including invasive species.

⁹ [Proposed Tree Warden Statutes Amendments](https://vtcommunityforestry.org/resources/vermont-tree-wardens-0/proposed-tree-warden-statutes-amendments). Vermont Urban & Community Forestry Program.

¹⁰ <https://vtcommunityforestry.org/resources/vermont-tree-wardens-0/proposed-tree-warden-statutes-amendments>

¹⁰ Vermont Tree Warden Statutes. Title 24, Chapter 033.

http://vtcommunityforestry.org/sites/default/files/pictures/tree_warden_statutes-1.pdf

¹¹ [Resources for Tree Wardens](#). Vermont Urban & Community Forestry Program.

<https://vtcommunityforestry.org/resources/vermont-tree-wardens-0/resources-tree-wardens>

Tree wardens can remove hazardous trees in the right-of-way without a public hearing, but they cannot remove or plant trees on private property. Some communities have enacted tree ordinances that give the municipality the authority to request that the landowner remove a hazard tree that could affect the public right-of-way. The ordinance can also specify that if the landowner does not remove the tree in a certain amount of time – for example, within 60 days – the municipality can remove the tree and seek payment from the landowner. Like any situation regarding private property and public safety, the town can work with the landowner to assess the level of risk posed by private property.

Recommendations:

- Review the 2015 draft Hyde Park Tree Ordinance and consider if definitions of public trees, residential areas, and rural areas remain in accordance with the town’s wishes;
- Review the existing tree warden statutes as listed in section 3, above.
- Revisit the 2015 Hyde Park EAB Preparedness Plan recommendation to develop an Ash Tree Ordinance that allows for the removal of ash trees without having a public hearing prior to each removal. Stay current with other Vermont town efforts and “lessons learned” about preemptive ash tree removal. VT UCF keeps current and publicly available materials on its [Emerald Ash Borer Management](#)¹² webpage, which now includes examples of Requests for Proposals and Provisions related to EAB.
- For urban and village centers, several [new tree selection resources](#)¹³ now exist including an updated [Vermont Tree Selection Guide](#)¹⁴. VT UCF also has many resources about [tree ordinances](#)¹⁵, including guides for municipal tree ordinances.

5. Develop a mowing policy for the clear zone

Hyde Park is already aware of its common roadside invasive plants: Japanese knotweed (*Fallopia japonica*) and honeysuckle (*Lonicera spp.*). Japanese barberry (*Berberis thunbergii*) and wild chervil (*Anthriscus sylvestris*) were recorded in Hyde Park on iNaturalist at singular roadside locations and have the capacity to spread quickly. Purple loosestrife has been detected in Hyde Park Village near Eden Road and along Rte 100.

Common buckthorn (*Rhamus cathartica*) and glossy buckthorn (*Frangula alnus*), wild chervil (*Anthriscus sylvestris*), poison parsnip (*Pastinaca sativa*) and garlic mustard (*Alliaria petiolata*) are common invasive plants along roadsides in other central and northern Vermont towns but they have not been recorded in Hyde Park on iNaturalist. Although not considered invasive, poison ivy (*Toxicodendron radicans*) is becoming problematic along some Vermont roadsides; it has also not been recorded in Hyde Park. However, the prevalence in Hyde Park of active agricultural fields, thin roadside hedgerows, and extensive forest edge creates a landscape prone to spreading invasive species.

¹² [Emerald Ash Borer Management](#). Vermont Urban & Community Forestry Program. <https://vtcommunityforestry.org/community-planning/tree-pests>

¹³ [Tree Selection](#). Vermont Urban & Community Forestry Program. <http://www.vtcommunityforestry.org/resources/tree-selection>

¹⁴ [Vermont Tree Selection Guide](#). Vermont Urban & Community Forestry Program. https://vtcommunityforestry.org/sites/default/files/pictures/complete_vt_tree_selection_guide_2019.pdf

¹⁵ [Public Policy](#) on Vermont Urban & Community Forestry website: <https://vtcommunityforestry.org/resources/public-policy>

Roadside construction, maintenance and mowing can carry invasive plant seeds and fragments to other sections of roads. Developing a mowing policy in tandem with updated and improved mowing procedures can reduce the spread of invasive species along roadsides.

Recommendations

- Do not mow invasive plants after seeds have set. Knowing when invasive plants bloom will let you use mowing to your advantage to reduce the spread of invasive seeds. Follow the invasive plant phenology calendar below to learn when invasive plants bloom in Hyde Park.
- Areas infested with phragmites, Japanese knotweed or purple loosestrife **should not be mowed**. Small root fragments easily resprout in new locations. Chemical treatment is almost always required to eradicate Japanese knotweed. Japanese knotweed is very prevalent in Hyde Park – consider locations where knotweed can be kept at bay enough to establish native trees that ultimately crowd out some knotweed, or where knotweed should be eradicated to preserve sight lines along roads.
- Other common invasive species (buckthorn, honeysuckle) should be cut (or mowed) **before they go to seed in mid-July**. Treatment of these species may also include use of herbicide by a licensed pesticide applicator.
- **Beware of poison ivy**. It is technically not an invasive species but is certainly problematic for road crews, walkers, and bicyclists.
- If detected, poison (wild) parsnip¹⁶ (*Pastinaca sativa*) is most effectively removed by digging out the taproot. This plant is phototoxic; anyone handling it must wear protective clothing. For large infestations, mow after peak bloom but before seeds set (likely early July). Plants will resprout after mowing, so consider a second round of mowing or if chemical treatment is required. Burning is not an effective treatment.
- If detected, areas infested with wild chervil should be mowed **before the plants bolt and produce flowers (late May, early June)**. The plants are low at this time. Focus mowing on known infested areas to monitor changes over time and clean equipment before leaving infested areas.
- Wild chervil and poison (wild) parsnip (neither have been detected in Hyde Park) will flower again after mowing – repeat cutting before the plant seeds again to eradicate the plant population.
- If detected, treatment of garlic mustard (*Alliaria petiolata*) should also occur before it goes to seed beginning **in late June**. However, mowing is not an effective control method. Hand pulling or use of foliar herbicide in the spring (late April, early May) or use of foliar herbicide on the basal rosettes by fall are effective control methods, as is flame weeding. Remember that application of any pesticide must be completed by a licensed pesticide applicator.
- Clean mowing equipment between road segments. Note where there are currently few invasive plant species (Map 8: Invasive Plant Species) and make sure that all mowing equipment is thoroughly cleaned before mowing, digging or ditching in these locations. In Hyde Park, roads with few infestations of invasive plants include Cooper Hill Road, McKinstry Hill Road, Grimes Road, Barnes Road, and Centerville Road.
- During construction, minimize soil disturbances to avoid future weed control and inspect and wash equipment before moving to another site.

¹⁶ Poison Parsnip is described at vtinvasives.org. More thorough management recommendations are outline in [this webpage](#) from Ontario. Note that bloom times may be different than in Vermont.

- Within these mowing parameters, consider allowing vegetation to be 10-12” high by the end of the growing season to protect native plants from winter damage¹⁷.
- For more information on reducing the spread of invasive plants along roadsides, see Appendix D: [Best Management Practices for Roadside Invasive Plants](#)¹⁸, released by The Nature Conservancy.
- For more information on the management of specific invasive terrestrial plants, see the VTinvasives.org website at <https://vtinvasives.org/gallery-of-terrestrial-plants>.

CALENDAR OF COMMON INVASIVE PLANT SPECIES PHENOLOGY IN VERMONT

Name	Apr	May	Jun	Jul	Aug	Sep	Oct
Common barberry (<i>Berberis vulgaris</i>)		Flowering		Seed Production			
		Mow					
Common buckthorn (<i>Rhamnus cathartica</i>)		Flowering		Seed Production			
		Mow					
Dame's rocket (<i>Hesperis matronalis</i>)		Flower & Seed Production					
		Mow					
Garlic Mustard (<i>Alliaria Petiolata</i>)		Flowering	Seed Production				
		Mow					
Glossy buckthorn (<i>Frangula alnus</i>)		Flowering		Seed Production			
		Mow					
Japanese barberry (<i>Barberis thunbergii</i>)		Flowering		Seed Production			
		Mow					
Japanese knotweed (<i>Fallopia japonica</i>)			Mow		Flower & Seed Production		
Shrub honeysuckle (<i>Lonicera spp.</i>)		Flowering		Seed Production			
		Mow					
Wild chervil or Cow Parsley (<i>Anthriscus sylvestris</i>)		Flowering	Seed Production				
		Mow					
Wild parsnip or poison parsnip (<i>Pastinaca sativa</i>)		Flowering	Seed Production				
		Mow					

6. Understand the vegetation management goals of your utility companies

The Hyde Park town plan does not currently address how existing utilities should or should not impact the scenic and aesthetic qualities of the town’s rural roads. Understanding the vegetation management goals of each utility company operating in Hyde Park and opening dialog with these utilities will help residents understand how to safely manage and plant vegetation on their property and learn how utility line maintenance will affect existing vegetation over time. The Hyde Park road crew can also benefit from knowing the clearing rotation of vegetation in utility right-of-ways and plan accordingly to manage ash trees, hazard trees, invasive species and living snow fences that affect rural roads.

¹⁷ Best Practices Handbook for Roadside Vegetation Management. Minnesota Local Road Research Board. <https://www.lrrb.org/pdf/200820.pdf>

¹⁸ Best Management Practices for Roadside Invasive Plants. The Nature Conservancy. <https://vtinvasives.org/sites/default/files/Best%20Management%20Practices%20for%20Roadside%20Invasive%20Plants.pdf>

Hyde Park is served four electrical utilities, Vermont Electric Cooperative (VEC), Morrisville Water & Light, Hardwick Electric and the Village of Hyde Park Electric Department.

Recommendations

- Review the vegetation management plans of your local utility companies listed below. Consider if the town should enter into discussion regarding clearing practices in the right-of-way.
 - Vermont Electric Coop has a [Vegetation Management Plan for Vermont Electric Cooperative, Inc. Transmission and Distribution Systems](#)¹⁹ available online. Review *Appendix D: Specifications for Vegetation Management on Transmission and Distribution Lines* to understand VEC's practices. This document outlines the basic 10-year maintenance cycle completed by outside contractors on distribution lines and describes right-of-way widths between 30 and 50 feet. Landowners cannot build structures, place obstructions, or change the grade of land within 25 feet of the pole line. The document also specifies that wood from felled trees "remain the property of the landowner and shall be left on site" at the edge of the right-of-way. The Town of Hyde Park may want to notify landowners about the need to keep ash wood local and note whether the utility company is performing work on their road that would result in felled ash. Lastly, the document specifies that some vegetation in the right-of-way is compatible with utility lines, namely "low growing plants and shrubs such as lilac, serviceberry, dogwood, hawthorns, and [native] honeysuckle".
 - According to their [website](#)²⁰, Morrisville Water & Light (MW&L) can help landowners take down trees near a power line or in danger of falling on a power line. The website states that "MW&L crews may be able to take down these trees for you at no cost if you are willing to clean up the debris". The emergency number for MW&L is 802-888-2162. The MW&L Vegetation Management Plan is attached as Appendix E.
 - According to their [website](#)²¹, the Hardwick Electric Department maintains a 15-foot cleared zone between trees and their powerlines. The utility company also removes "woody brush and small trees from beneath power lines"¹⁷ on a seven-year cycle. Collaborative vegetation management in their utility ROWs is encouraged.
 - The Village of Hyde Park Electric Department has a current vegetation management plan and is filing an update to the Public Utilities Commission for a 2019 renewal plan. Correspondence with the utility company is included as Appendix F: Hyde Park Electric Vegetation Management Plan and Draft Updates.

7. Understand updated stormwater regulations and standards

Backroad erosions is recognized as a non-point source of sediment and phosphorous pollution in Vermont's waterways. As part of the state's all-in approach to clean water, municipalities will need to complete a Road Stormwater Management Plan by December 31, 2020 that outlines a multi-year plan to correct drainage patterns along eroding roads that are hydrologically connected to streams, ponds,

¹⁹ [Vegetation Management Plan for Vermont Electric Cooperative, Inc., Transmission and Distribution Systems](#). Prepared by Sara Packer, Vermont Electric Cooperative.

https://www.vermontelectric.coop/images/2014_VECVgtMgmtPlan_Rev03-20-14.pdf

²⁰ Keeping You Out of Harm's Way. Morrisville Water & Light. <https://www.HydeParkelectric.com/about/vegetation-mgt>

²¹ Vegetation Management. Hardwick Electric Department. <http://www.hardwickelectric.com/vegetation>

and other water bodies. More information on the [Municipal Roads General Permit](#)²² can be found on the [Municipal Roads webpage](#)²³ of the Vermont Department of Environmental Conservation.

However, trees and other vegetation play a role in controlling erosion and protecting water quality. Deciduous canopy cover can reduce rainfall intensity by 15-21%²⁴, coniferous canopy by 21-52%²⁵. On rural roads, this translates into a reduced impact of water droplets on dusty roads and less erosive power of running water during rainfall events. Additionally, tree and plant root systems reinforce the shear strength of soil and extract water from the soil for plant growth, reducing soil erosion and its causes. Independent of social and cultural concerns surrounding the desire for or against roadside trees, towns will need to carefully consider whether road widening, straightening and/or ditching at the expense of existing vegetation is the best or most efficient way to reduce the effects of stormwater runoff.

There are many good strategies to direct surface runoff into existing vegetation while retaining trees and plants that may have taken years to establish. Some techniques include stone turnouts (as pictured below from the Better Roads Manual), the filling of incision ditches with gravel and stone armor (also pictured below), the installation of dry wells or French drains to capture or transport runoff, or the use of [bioretention areas](#)²⁶. The new [Town Road and Bridge Standards](#)²⁷ (released June 2019) outline many construction standards that towns may choose to adopt to reduce stormwater runoff and improve the resiliency of town roads.

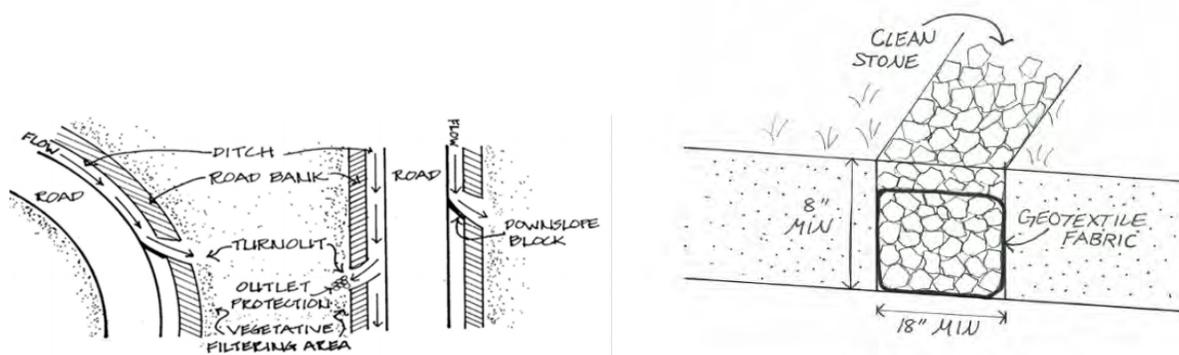


Figure 18: Infiltration Trench

Stone Turnouts and Infiltration Trench. Drawing from p. 33 and p. 21 of the Vermont Better Backroads Manual, 2019. Stone turnouts direct water away from road edges into existing forest cover or other vegetation. Infiltration trenches catch runoff and allow infiltration

²² [Municipal Roads General Permit](#).

²³ https://dec.vermont.gov/sites/dec/files/wsm/stormwater/docs/Permitinformation/MunicipalRoads/sw_FinalMRGP.pdf

²⁴ <https://dec.vermont.gov/watershed/stormwater/permit-information-applications-fees/municipal-roads-program>.

²⁵ Trimble & Weitzman, 1954. [Effect of a hardwood forest canopy on rainfall intensities](#) as referenced in [Give Me the Numbers: How Trees and Urban Forests Really Affect Stormwater Runoff](#). Eric Kuehler, USDA Forest Service.

https://www.fs.fed.us/research/docs/webinars/urban-forests/give-me-the-numbers/UFCFeb2017_KuehlerSlides.pdf

²⁶ Keim and Skaugset, 2003. [Modeling effects of forest canopies on slope stability](#). As referenced in [Give Me the Numbers: How Trees and Urban Forests Really Affect Stormwater Runoff](#). Eric Kuehler, USDA Forest Service.

https://www.fs.fed.us/research/docs/webinars/urban-forests/give-me-the-numbers/UFCFeb2017_KuehlerSlides.pdf

²⁷ The Vermont Rain Garden Manual. Winooski NRC, UVM Extension, Lake Champlain Sea Grant.

<http://winooskinrcd.org/wp-content/uploads/VTRainGardenManual.pdf>

²⁷ [Town Road and Bridge Standards, Municipality of _____, Vermont \(fillable form\)](#). Vermont Agency of Transportation, 2019. <https://www.vlct.org/news/municipal-road-and-bridge-standards-summary>

before the water travels down the road surface. These trenches should be installed with a vegetative filter strip to reduce clogging of the trench.

The Municipal Roads General permit includes some **waivers** where standard permit regulations do not need to be met as prescribed. These include areas where roadside construction would impact significant environmental and historic resources (including historic landscapes) or landscapes or vegetation within 250 feet of a lakeshore. Review the updated recommendations in the [Better Roads Manual](#)²⁸ (January 2019) and look for places where clean water goals can be met through carefully balanced construction and vegetation preservation.

8. Maintain backroads and ditches to their specifications

From farmhouses surrounded with sugar maples-lined to pockets of deep woods, Vermont's unpaved roads take us through the unique areas of the state that make Vermont so attractive. While the view from the road changes around each bend, many of the elements of a good road should not. The crown, slope, radius of curves, cleared zone width, and even speed limits are based on the landscape of the road, the topography it covers, and the traffic it receives. Gravel road construction is an art and science in itself (see the [Vermont Better Roads Manual](#) and the [Vermont State Design Standards for Roads](#)²⁹ offer views of classic Vermont. Grader berms

- If ditching, an increase in line of site, or road widening is the most viable and effective option along a town road, design clearing to occur on only one side of the road, leaving as many mature trees and native plants as possible. Mature trees provide more stormwater reduction (20 ft³ per tree) than newly planted trees (10 ft³ per tree)³⁰.
- Ensure that clearing work occurs when invasive plants are not in seed and that soil containing invasive plant fragments is not moved to a site that is free of invasive plants.
- Once woody vegetation in a roadside ditch becomes large enough, it may begin to pose a safety or vision hazard to drivers. Brush hogging or mowing the ditch itself may be necessary to maintain the ditch shape or to access and replace the stone within a stone-lined ditch, but the backslope, or uphill slope next to a ditch, should not be cleared -- plant roots in this soil keep the slope in place. Additionally, examine what height of stone in a stone-lined ditch is necessary and revegetate any exposed slope above this minimum height.
- Remove grader berms. These mounds of gravel, dirt, leaves and sticks are left behind after the grader passes and ultimately impede the flow of stormwater into naturally vegetated areas.

²⁸ Vermont Better Backroads Manual, January 2019:

<https://vtrans.vermont.gov/sites/aot/files/highway/documents/ltf/Better%20Roads%20Manual%20Final%202019.pdf>

²⁹ Vermont State Design Standards 1997. Vermont Agency of Transportation, 1997.

<http://54.172.27.91/transportation/standards/VermontStateDesignStandards1997.pdf>

³⁰ Stormwater Management Benefits of Trees. Stone Environmental, 2014.

<https://vtcommunityforestry.org/sites/default/files/pictures/waterqualitytreebenefits.pdf>

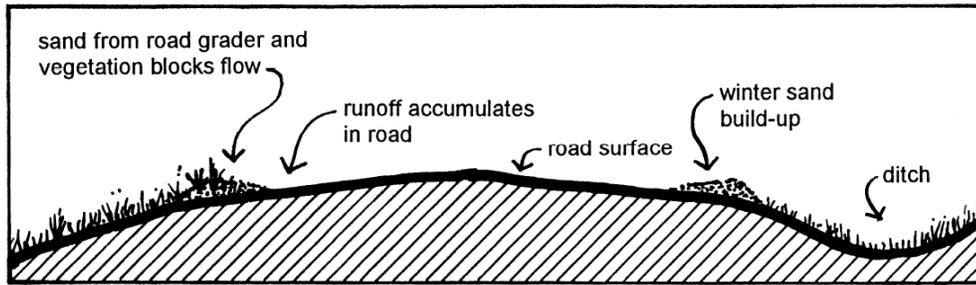


Image from the Gravel Road Maintenance Manual, 2016.

https://www.maine.gov/dep/land/watershed/camp/road/gravel_road_manual.pdf

- Consult the [Vermont State Design Standards](#) for minimum widths of lanes and shoulders for Rural Local Roads, including Table 6.3 from the Standards pictured below. Consider carefully if or why a backroad should have a width greater than the minimum before proceeding to widen a road beyond the designed minimum width.

Table 6.3
Minimum Width of Lanes And Shoulders
for Rural Local Roads

Design Traffic Volume	ADT ^(a) 0-25	ADT 25-50	ADT 50-100	ADT 100-400	ADT 400-1500	ADT 1500-2000	ADT Over 2000
Design Speed (mph)	Width of Lane/Shoulder (ft)						
25	7/0	8/0	9/0	9/2	9/2	10/3	11/3
30	7/0	8/0	9/0	9/2	9/2	10/3	11/3
35	7/0	8/0	9/0	9/2	9/2	10/3	11/3
40	7/0	8/0	9/2	9/2	9/2	10/3	11/3
45	—	—	9/2	9/2	9/2	10/3	11/3
50	—	—	9/2	9/2	10/2	10/3	11/3

(a) Minimum width of 8/0 whenever there is guard rail.

9. Keep abreast of funding opportunities

Grants to support water quality improvements, vegetation planning, road maintenance that benefits water quality, and community and commerce development may benefit Hyde Park as it moves forward with vegetation planning in public spaces including the road right-of-way. Although Unfortunately, the granting organization, due date for applications, and amount of available funding change annually. Below is a list of key grants that may be available to Hyde Park, particularly if it has a roadside vegetation plan already in place.

**KEY GRANTS TO SUPPORT MUNICIPALITIES
ROADSIDE VEGETATION MANAGEMENT, ROAD EROSION CONTROL & WATER QUALITY INITIATIVES**

VERMONT AGENCY OF NATURAL RESOURCES

GRANT PROGRAM	DESCRIPTION	FUNDING DETAILS	DUE DATE
Caring for the Canopy	Support the development of sustainable urban and community forestry programs at the local level. Grants are currently focused on emerald ash borer municipal planning	Awards change each year. 2019 awardees received \$2,000 in cost-share grant money.	Annually, January
Vermont Watershed Grant	Support water-related projects that protect or restore fish and wildlife habitats, protect or restore water quality, and shorelines, reduce phosphorus loading and/or sedimentation as part of DEC's Clean Water Initiative objectives, enhance recreational use and enjoyment, identify and protect historic and cultural resources; educate people about watershed resources, or monitor fish and wildlife populations and/or water quality.	Awards made up to \$10,000, depending on project category type. Category types and the maximum grant amount for each project category type are as follows: <ul style="list-style-type: none"> • Education and outreach – up to \$5,000 • Planning, assessment, inventory, monitoring – up to \$3,500 • On-the-ground implementation – up to \$10,000 	Annually, February
Municipal Roads Grants-in-Aid Pilot*	Road erosion control projects on hydrologically connected road segments currently not meeting draft Municipal Roads General Permit standards	Funding allocated based on towns' hydrologically connected road miles Match Requirement: 20% local cash/in-kind	Annually, July
Ecosystem Restoration Grants*	Design and construction of water pollution abatement and control projects that target nonpoint sources of pollution, including stormwater management, natural resources restoration, road erosion control, and municipal capital equipment projects	Match Requirement: 50% for MS4 stormwater/road projects Capital equipment projects: 50% for large towns (> 5,000 residents) 20% for small towns (< 5,000 residents) Non-MS4/capital equipment projects	Rolling applications with quarterly review
Multi-Sector Clean Water Block Grant	Construction of clean water improvement projects, administered by statewide partner(s), including stormwater management and natural resources restoration projects	Total Funding Available: \$1.5 million Match Requirement: 50% for MS4 stormwater/road projects 20% for non-MS4 projects	Annually, June

VERMONT AGENCY OF TRANSPORTATION

GRANT PROGRAM	DESCRIPTION	FUNDING DETAILS	DUE DATE
Municipal Highway and Stormwater Mitigation*	Environmental mitigation activities, including stormwater and water pollution prevention, management, and control related to highway construction or highway runoff	Max. Award: N/A Match Requirement: 20% local	Annually, late summer
Better Roads*	Municipal roadway improvements that benefit water quality: <ul style="list-style-type: none"> • Inventories of roadway erosion and/or stormwater management issues and capital budget planning (Category A) • Correction of road related erosion and/or construction of stormwater management projects (Category B) • Correction of streambank and/or slope related problems (Category C) 	Max. Award: Category A: \$8,000 Category B: \$20,000 Category C: \$40,000 Category D: \$40,000 Match Requirement: 20% local	Annually, late spring

	<ul style="list-style-type: none"> Roadway structures and culvert upgrades (Category D) 		
Transportation Alternatives Program*	Environmental mitigation activities, including stormwater and water pollution prevention, management, and control related to highway construction or highway runoff	Maximum Award: \$300,000 Match Requirement: 20% for design and construction, 50% for scoping	Annually, fall

VERMONT AGENCY OF COMMERCE AND COMMUNITY DEVELOPMENT

GRANT PROGRAM	DESCRIPTION	FUNDING DETAILS	DUE DATE
Municipal Planning Grant	Encourages and supports planning and revitalization for local municipalities in Vermont. Since 1998, the MPG program has provided over \$12 million to 234 cities and towns across Vermont to help breathe new life into communities, plan for future growth and development, and improve the quality of life.	Maximum Award: \$35,000 in 2019 Match Requirement: 10% local	Annually, October
Downtown Transportation Fund	Funds transportation-related capital improvements within or serving a designated downtown district. Past projects include parking facilities, pedestrian and streetscape improvements and utility relocation. New this year – the DTF has clean water funds to support green stormwater infrastructure improvements in coordination with the transportation project.		Annually, March
Better Connections	The grant program is a partnership between ACCD and VTrans that supports and guides local investments in transportation options through a wide array of planning activities including, downtown and village center master plans, corridor plans and innovative guidelines and bylaws. For a complete list of current and past projects, visit the program’s story map .	Match Requirement: 10% local	Annually, January

OTHER GRANTING ORGANIZATIONS

GRANT PROGRAM	DESCRIPTION	FUNDING DETAILS	DUE DATE
Vermont Community Foundation	The scope of grants managed by the Vermont Community Foundation vary by location. See their website for current available grants.	See applicable grant application.	

* As borrowed from the Vermont Clean Water Funding Opportunities for Municipalities (SFY2018).
http://www.nvda.net/files/sw_MunicipalWQGrants_2017.pdf

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Resilient Right-of-Ways

Field data for the Town of Hyde Park, Vermont
Part of the Resilient Right-of-Ways Stowe Action Plan and Recommendations
Prepared by Joanne Garton, Vermont Urban & Community Forestry Program
July 30, 2019



Resilient Right-of-Ways Project Data Hyde Park, VT

1. Resilient Right-of-Way Community Types

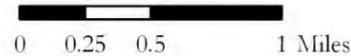


Vermont Department of
Forests, Parks & Recreation

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Cartographer: Elizabeth Bannar
Date: 3/25/2019

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Legend

— 2018 Inventory Roads

Community Type

- Emerging overstory (shrubs & saplings)
- Immature Overstory ($\leq 6''$ dbh)
- Mature Overstory ($> 6''$ dbh)
- Bare
- Mowed
- Wet Area
- Street Trees

Road Surface

- Paved
- Unpaved
- Other



WHAT

Right-of-way vegetation is sometimes indistinguishable from the forests or fields on private land that neighbor rural roads. At other times, however, the transition between this publicly managed land and private property can be quite stark: young beech trees can end abruptly at a private lawn, or a cleared roadside ditch can border mature private trees. Town-managed land can be quite different from surrounding land.

HOW

Within each 100-meter plot, vegetation in the right-of-way was classified into one of four broad categories, each with distinguishing subcategories:



Tree-lined or forested

- **Emerging Overstory:** A shrub or sapling-lined road that exhibits stages of an early forest but does not yet exhibit canopy that shades the road.
- **Immature Overstory:** The tree-lined or forested roadside with overstory composed of mostly immature trees of less than 6" diameter (at breast height, also called "DBH").
- **Mature Overstory:** As above with overstory composed of mostly mature trees of greater than 6" diameter (at breast height, also called "DBH").
- **Street Trees:** Intentionally planted trees are within the ROW that are surrounded by an established herbaceous layer, mowed grass, or predominantly bare ground.



Mowed

- Frequently mowed (like a lawn).
- Seasonally mowed or harvested (like a hayfield or cornfield).



Wet

- Naturally wet due to ponds, rivers or lakes.
- Artificially made wet because of berms or ditches associated with the road.



Bare

- Due to hardscaped landscapes on the roadside, such as stone-lined ditches.
- Due to repeated disturbance such as scraping or trampling.

WHY

Identifying the type of vegetation in the right-of-way tell us:



The level of obligation the town currently has towards tree care, mowing, or effects of ice and roadside erosion due to stagnant or moving water.



How town residents may perceive their rural roadsides, sometimes independent of adjacent private land use.



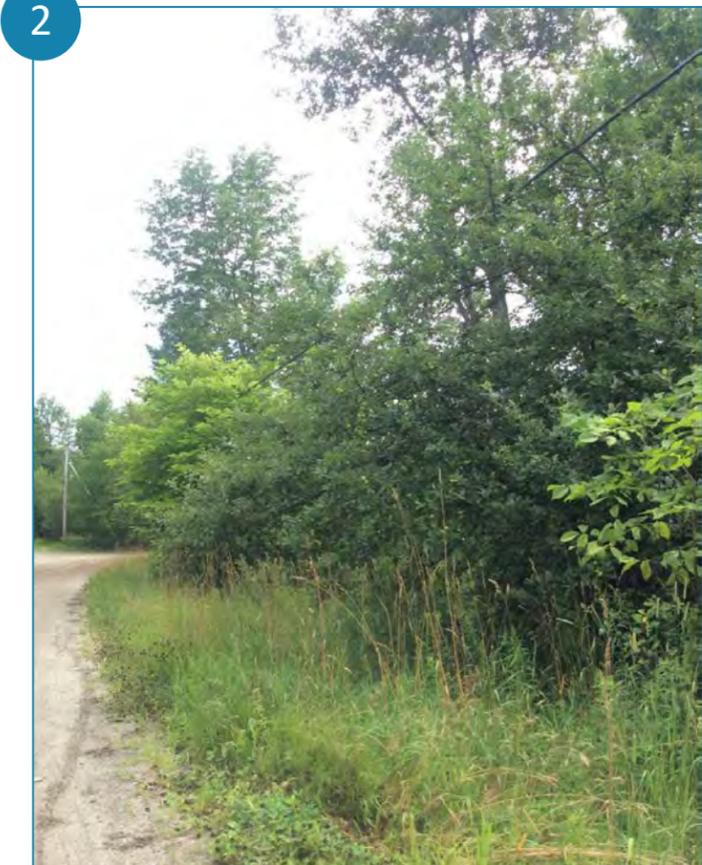
Where immature forests may become mature forests with appropriate forest management, or where mature forests may need yearly monitoring for risk trees.

1



An example of "mature overstory" on McKinstry Hill Road. Here, large trees help delineate the road edge and rich-wood indicator plants comprise the herbaceous cover.

2



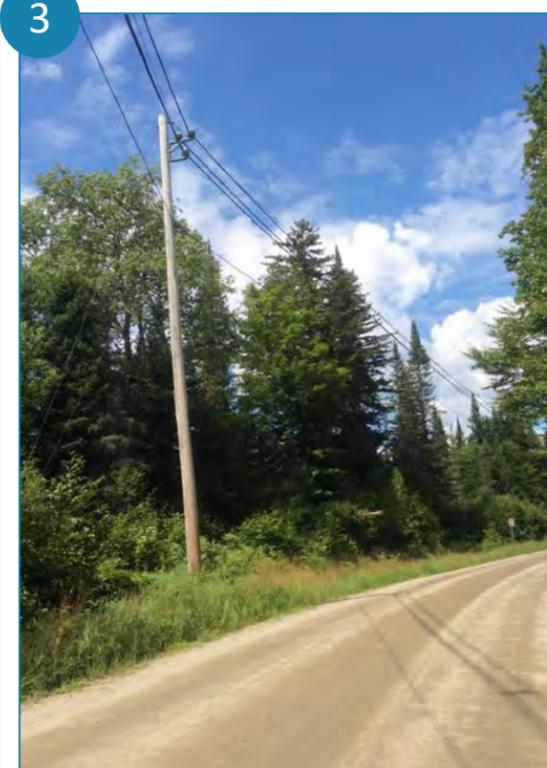
An example of a roadside forest dominated by immature (<6" DBH) tree overstory trees in the right-of-way along Garfield Road.

STATISTICS IN HYDE PARK

The right-of-way vegetation types on the **approximately 20 miles** of surveyed rural routes in Hyde Park exhibited the following general characteristics:

- 68%** Tree-lined, forested, or future forest: (105 / 154)
 - Emerging overstory: **12%** (18 / 154)
 - Immature overstory: **12%** (19 / 154)
 - Mature overstory: **42%** (65 / 154)
 - Street Trees: **2%** (3 / 154)
- 31%** Mowed: (47 / 154)
 - Frequently: **9%** (13 / 154)
 - Seasonally: **22%** (34 / 154)
- <1%** Wet areas: (1 / 154)
 - Riparian area, pond, lake edge, wetland: **0%** (0 / 154)
 - Wet ditch: **<1%** (1 / 154)
- <1%** Bare: **<1%** (1 / 154)

3



Right-of-way vegetation is dominated by shrubs and saplings that will "emerge" into overstory if left uncut.

Resilient Right-of-Ways Project Data Hyde Park, VT

1. Resilient Right-of-Way Community Types

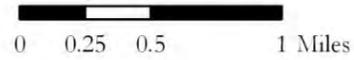


Vermont Department of
Forests, Parks & Recreation

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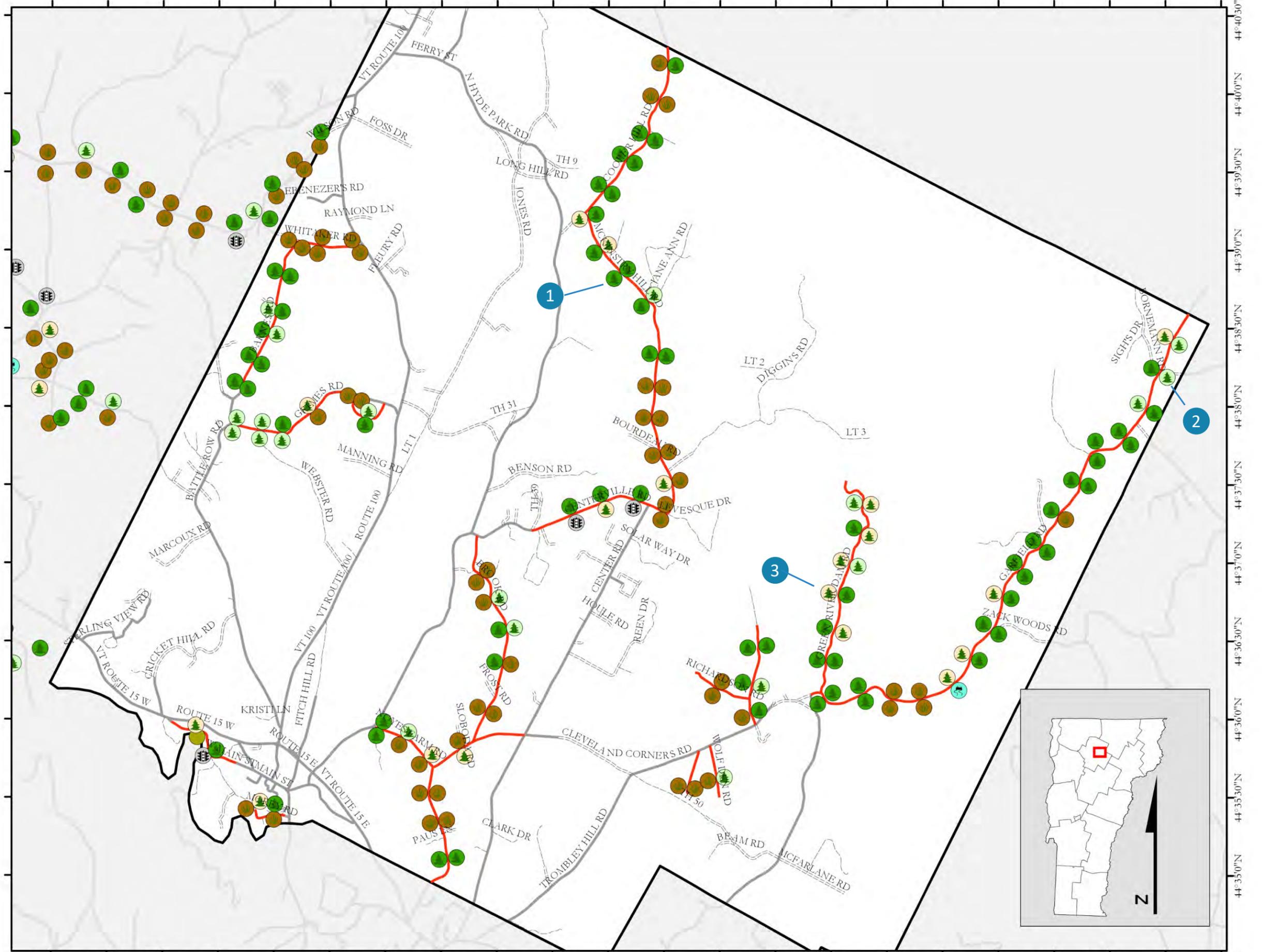
Cartographer: Elizabeth Bannar
Date: 3/25/2019

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Legend

- 2018 Inventory Roads
- Community Type**
- Emerging overstory (shrubs & saplings)
- Immature Overstory ($\leq 6''$ dbh)
- Mature Overstory ($> 6''$ dbh)
- Bare
- Mowed
- Wet Area
- Street Trees
- Road Surface**
- Paved
- Unpaved
- Other



Resilient Right-of-Ways Project Data Hyde Park, VT

2. Manageable Vegetation Width



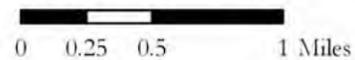
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Legend

— 2018 Inventory Roads

Vegetation Width (ft)

- 0
- 1 - 3
- 4 - 6
- 7 - 9
- 10 - 12
- 13 - 15

Road Surface

- Paved
- Unpaved
- Other



WHAT

In most towns, the right-of-way spans 49.5 feet, or 24.25' in each direction from the centerline of the road. The travelled width of an unpaved road and the clear zone adjacent to the road can vary depending on topography, road erosion, road entrenchment, or neighboring land features. As such, the actual width of vegetation that the town can manage alongside its roads is often what is “leftover” after consideration of the width of the road and its associated infrastructure.

HOW

In this study, manageable vegetation width was calculated through a three-step process.



1. The road width was measured from travelled edge to travelled edge using a 25' tape measure.
2. The cleared zone (whether mowed, ditched, or bare) was measured on each side of the road using the same tape measure.
3. The manageable vegetation width was calculated for each side of the road by subtracting half the road width and the side-specific clear zone width from half of the right-of-way width, or, manageable vegetation width = $(ROW\ width/2) - (Road\ width/2) - clear\ zone\ width$.

WHY

Measuring the width of the road, the width of the clear zone on each side, and calculating the manageable vegetation width on each side of a rural road tells us:



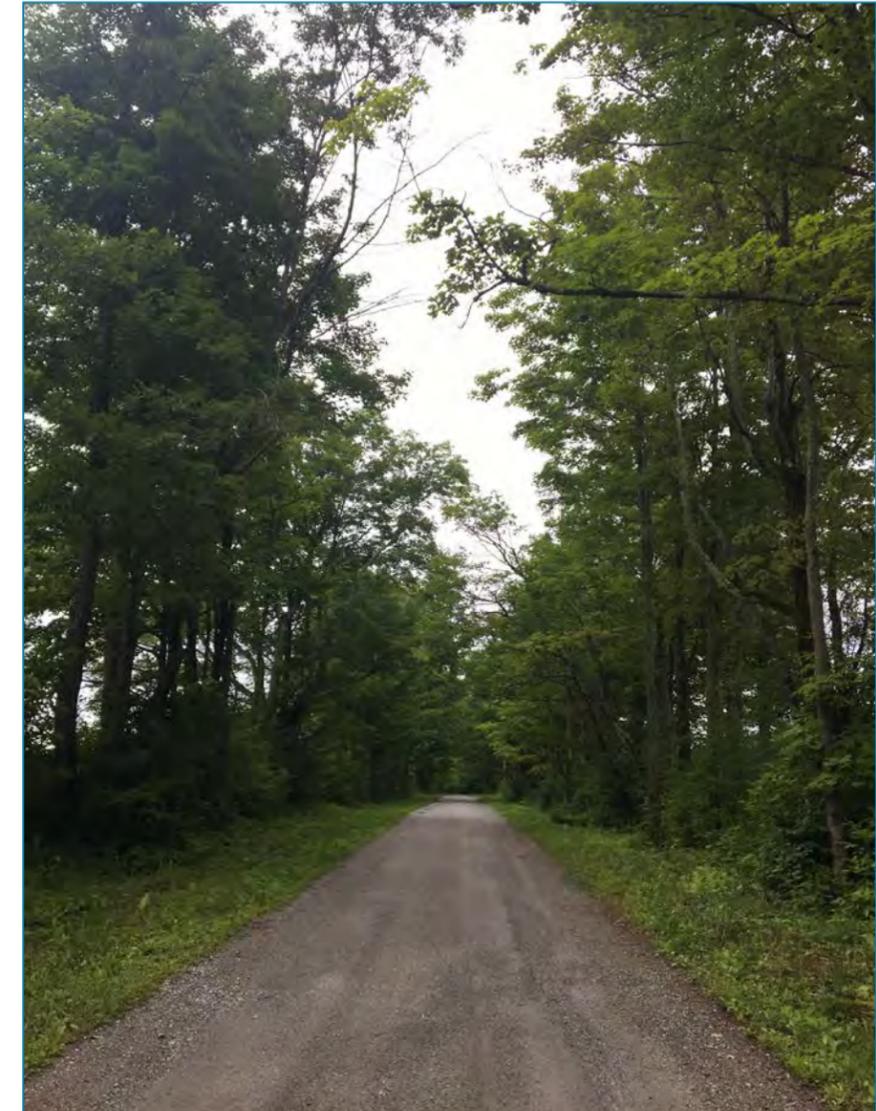
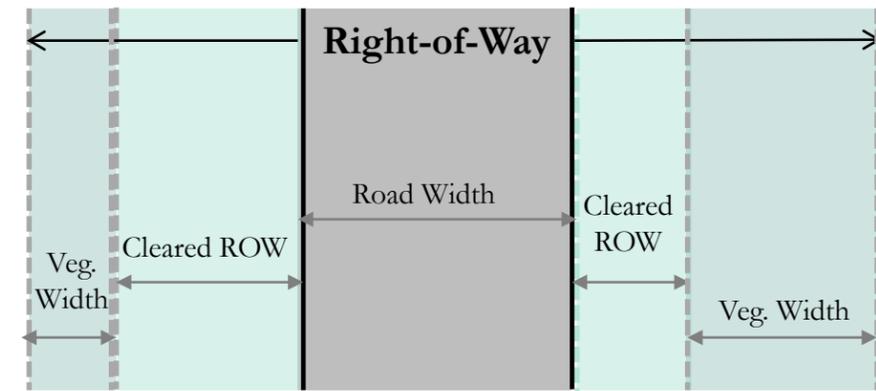
Where opportunities exist to perform recommended silvicultural practices on significant swaths of publicly managed roadside forest.



Where wide roads and ditches or clear zones are impacting right-of-way vegetation, allowing the town to evaluate if these road widths are necessary or desired.



Where forest regeneration or replanting may be helpful to demarcate road edges, improve tree canopy to reduce dust, or increase a desired aesthetic (more trees, more fields, or selected trees) along designated scenic routes.



STATISTICS IN HYDE PARK

The manageable vegetation width in the on the **approximately 20 miles** of surveyed rural routes in Hyde Park exhibited the following general characteristics:

Road width (ft)

- Range: 16 – 33
- Average: 21.4
- Median (or, middle value): 21
- Mode (or, most frequent value): 22

Clear zone width (ft)

- Range: 0 – 17
- Average: 8.5
- Median (or, middle value): 8
- Mode (or, most frequent value): 7

Manageable vegetation width (ft)

- Range: 0 – 15
- Average: 5.7
- Median (or, middle value): 6
- Mode (or, most frequent value): 0

Resilient Right-of-Ways Project Data Hyde Park, VT

2. Manageable Vegetation Width



Vermont Department of
Forests, Parks & Recreation

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Cartographer: Elizabeth Bannar

Date: 3/25/2019

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Legend

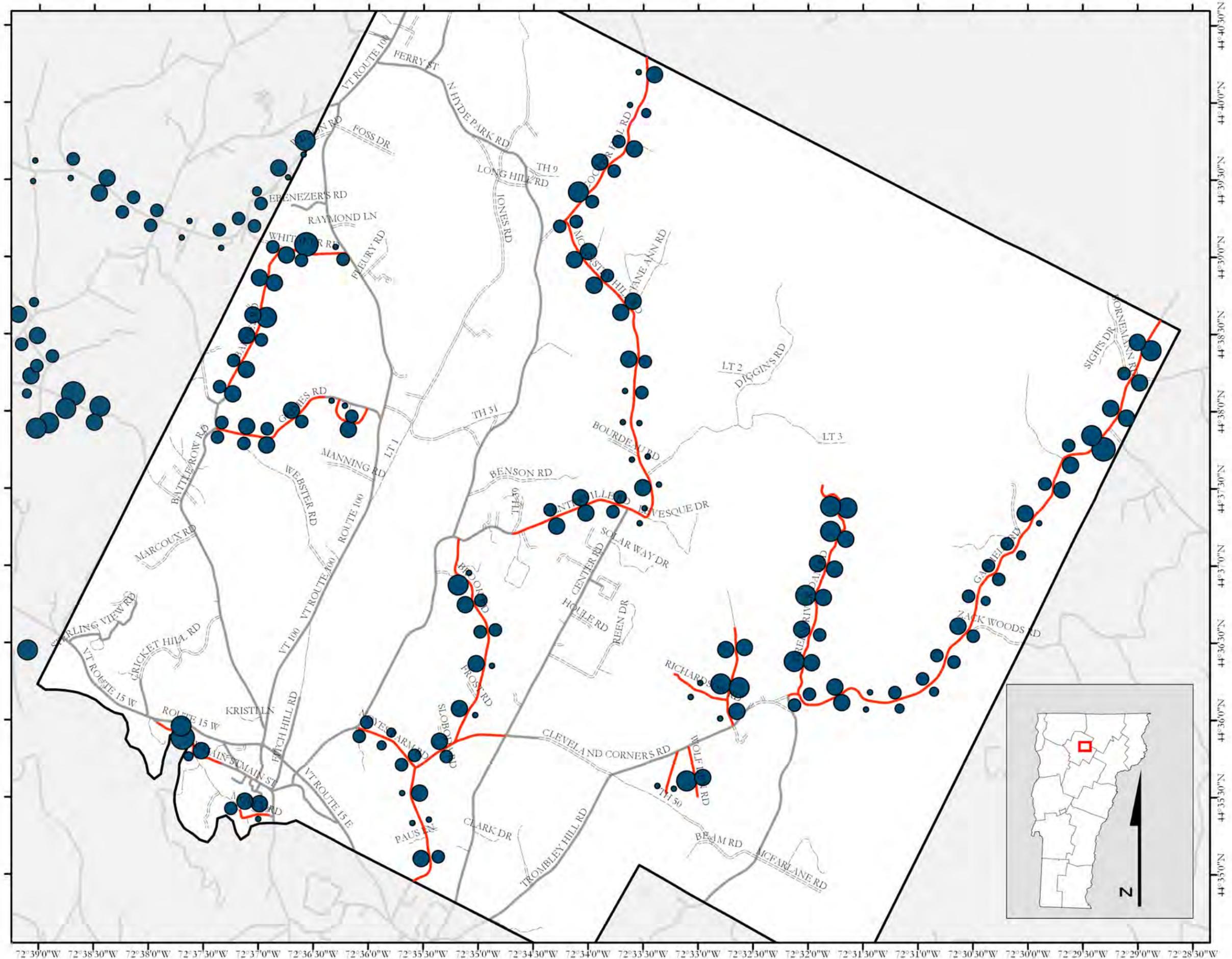
— 2018 Inventory Roads

Vegetation Width (ft)

- 0
- 1 - 3
- 4 - 6
- 7 - 9
- 10 - 12
- 13 - 15

Road Surface

- Paved
- Unpaved
- Other



Resilient Right-of-Ways Project Data Hyde Park, VT

3. Roadside Ash Impact

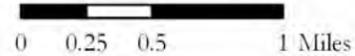


Vermont Department of
Forests, Parks & Recreation

1:44,200

Cartographer: Elizabeth Bannar
Date: 3/25/2019

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Legend

— 2018 Inventory Roads

Roadside Ash Count

- ▲ None (0)
- ▲ Low (1-2)
- ▲ Med (3-4)
- ▲ High (5+)

Road Surface

- Paved
- ===== Unpaved

RESOURCES

[Ash Tree Inventories](https://vtcommunityforestry.org/ash-inventory) on the Vermont Urban & Community Forestry Website:
<https://vtcommunityforestry.org/ash-inventory>

[Emerald Ash Borer Management](https://vtcommunityforestry.org/community-planning/tree-pests) on the Vermont Urban & Community Forestry Website:
<https://vtcommunityforestry.org/community-planning/tree-pests>

WHAT

Ash tree health is currently threatened by the arrival of emerald ash borer, a non-native and invasive insect that attacks all species of ash trees. Once infested, most ash trees will die within 3-5 years, posing a risk to all road users.

HOW

In this study, field staff tallied ash trees over 4" diameter at breast height (DBH) that would affect the road if portions or all of the tree weakened and fell. Tallies were counted within the right-of-way of each 100-meter plot and within adjacent areas on private land that host ash trees tall enough to fall on the road.

WHY

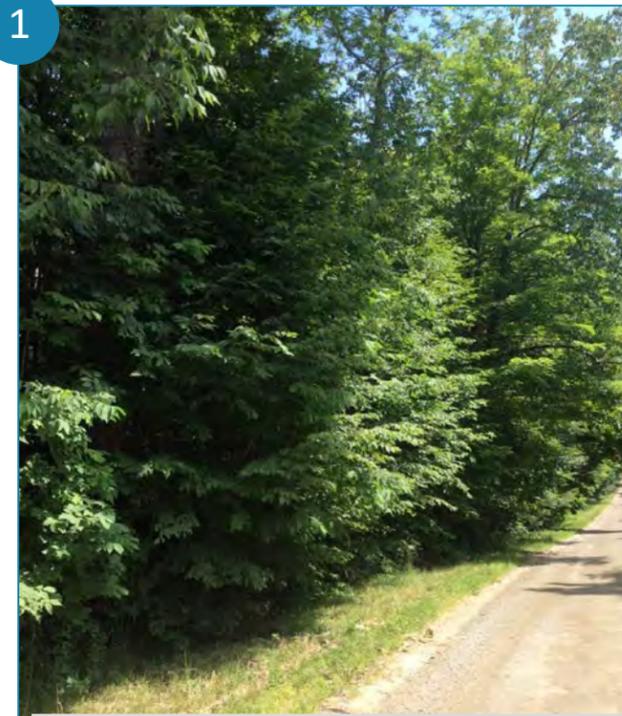
Identifying the presence and ash trees that may affect the road helps us:

- Understand how ash trees are distributed on the landscape surrounding survey roads.
- Estimate how many ash the town will need to manage when emerald ash borer is present.
- Identify where opportunities for replanting or forest regeneration may exist after ash die or are removed.

RECOMMENDATIONS

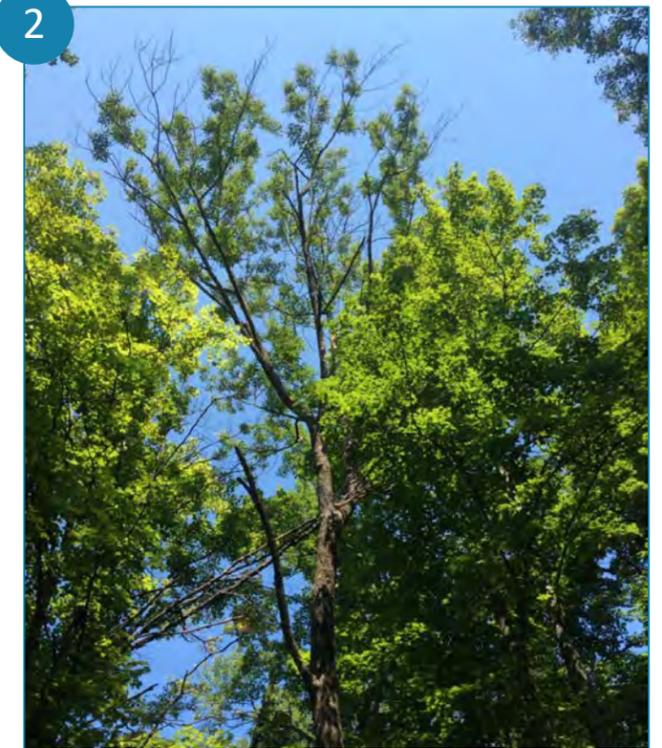
- Conduct an [ash tree inventory](#) to determine the location, distribution and size of ash trees along your rural roads. Note whether ash trees are located upslope or downslope of a road that crosses a steep slope.
- Plan to manage ash along rural roads as part of a [town-wide EAB Management Plan](#). Consider how to remove at risk or dead trees, or select trees for treatment. Plan to use ash wood locally.
- Work with neighboring landowners to anticipate the death or removal of roadside ash trees. Consider targeted planting efforts to improve roadside canopy, reduce road erosion, protect water quality, and increase landowner privacy, particularly where right-of-way vegetation is bordered by agricultural fields or lawn. The Urban & Community Forestry Program has several examples of in-state and out-of-state partnership documents between towns and private landowners that arrange funding and care of planted trees planted where right-of-way planting alone is challenging.
- Note the timing of invasive plant flowering and seed set when planning tree removal work. Monitor ash removal sites for invasive plants that often thrive on disturbed soil and with the increased sunlight resulting the new canopy breaks.

1



In addition to a high ash count, this stretch of Centerville Road also has historic trees in poor health and trees affected by utility lines. Monitor ash tree health yearly, look for dead branches in the canopy, and work with landowners to promote other tree species in important hedgerows.

2



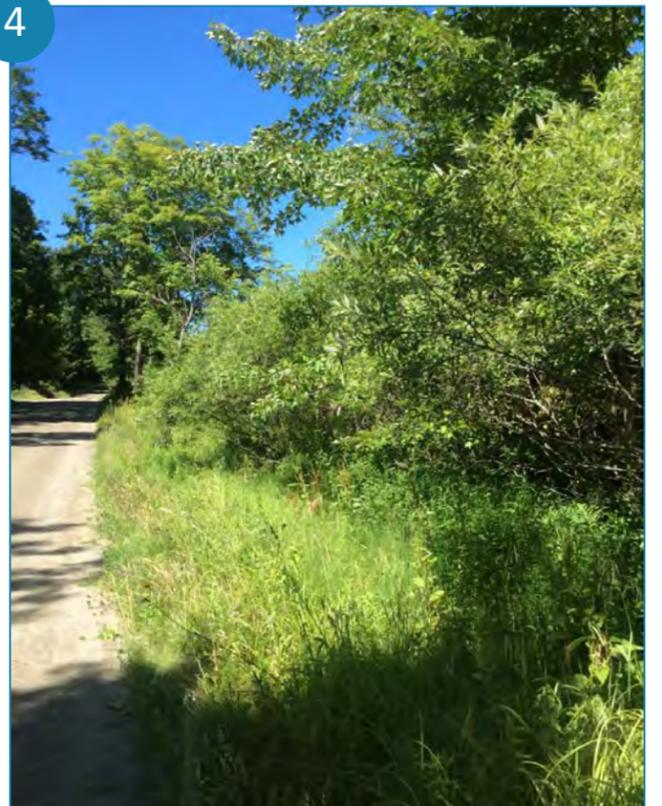
Mature ash and damaged maples along this section of Cooper Hill Road will require attention as ash trees die. Consider thinning of structurally weak trees and promote of the next generation of tree canopy.

3



Damaged roadside maples and mature ash stand side-by-side along Garfield Road. The slope will need reinforcement when trees are removed or fall. Consider planting in conjunction with the neighboring landowner.

4



As ash die, existing forest regeneration will fill canopy gaps along this section of Davis Hill Road. Ensure that invasive plants are not brought in during road or tree work.

Resilient Right-of-Ways Project Data Hyde Park, VT

3. Roadside Ash Impact

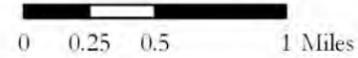


Vermont Department of
Forests, Parks & Recreation

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Legend

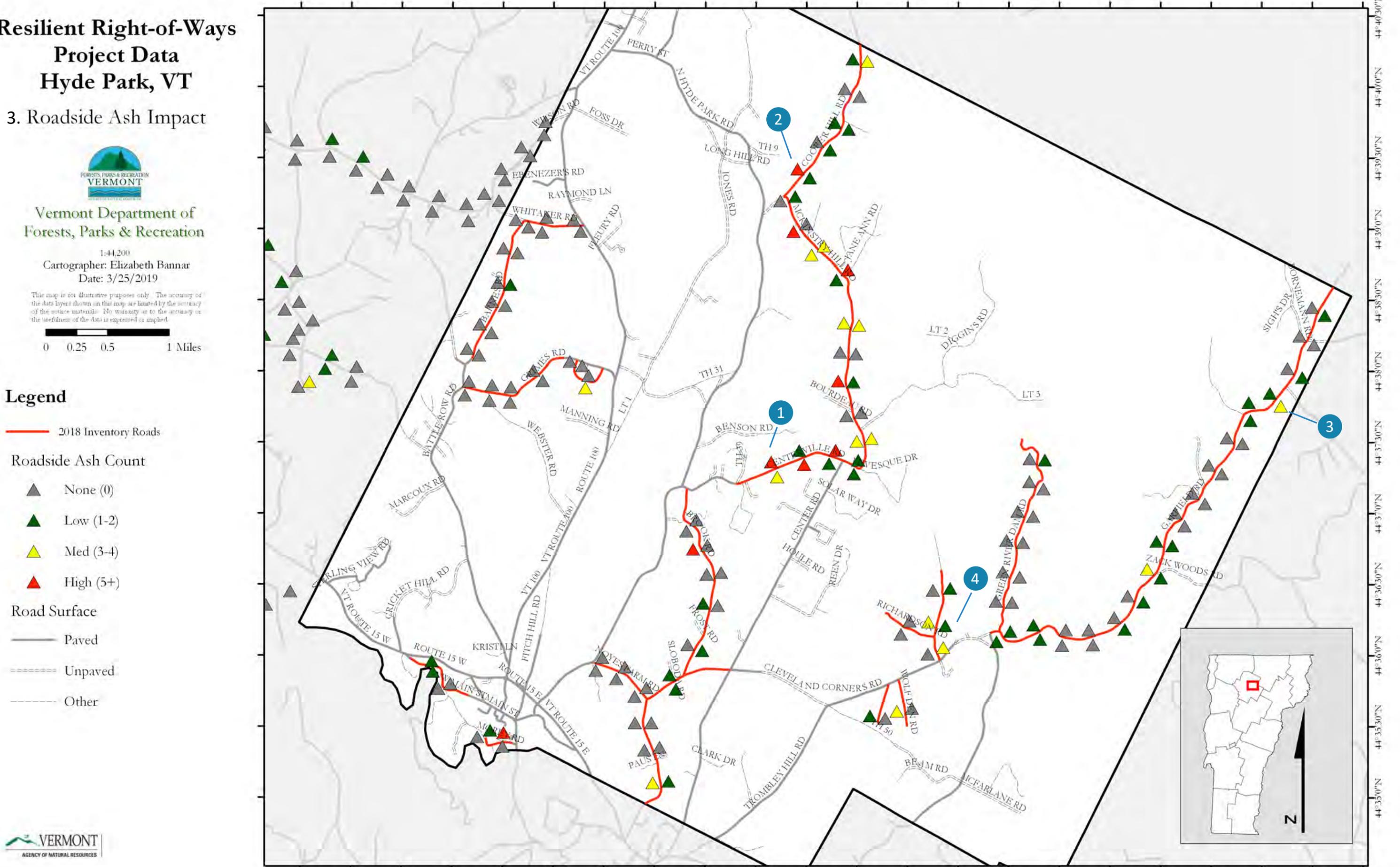
— 2018 Inventory Roads

Roadside Ash Count

- ▲ None (0)
- ▲ Low (1-2)
- ▲ Med (3-4)
- ▲ High (5+)

Road Surface

- Paved
- Unpaved
- Other



Resilient Right-of-Ways Project Data Hyde Park, VT

4. Overhead Utility & Vegetation Regeneration Opportunities

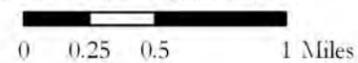


Vermont Department of
Forests, Parks & Recreation

1:44,200

Cartographer: Elizabeth Bannar
Date: 3/25/2019

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Legend

- 2018 Inventory Roads
- Utility Wire
- Promote Regen
- Road Surface
 - Paved
 - Unpaved
 - Other

WHAT

Utility companies play a large role in deciding the composition and health of roadside vegetation. Understanding where your utility companies work and how they structure their roadside pruning and clearing rotations will help town residents plan for changes in their roadside vegetation structure and not be surprised by sudden pruning, clearing, or mowing.

HOW



In this study, the impact of an overhead utility on the right-of-way was recorded after visual assessment of the 100-meter plot. Recording a “yes” for a utility impact indicated the presence of the utility within the town’s 49.5-foot right-of-way or an impact on the town’s right-of-way vegetation if the utility was located outside of the town’s 49.5-foot right-of-way. Also noted are locations where the town can consider promoting regeneration of vegetation within the guidelines of the utility company.

WHY

Identifying the presence or impact of overhead utilities within the right-of-way tells us:



Where towns can partner with utility companies to manage unique vegetation that is hindered by the utility company’s standard procedure.



Where landowners can be alerted to the practices implemented by the utility company servicing their road.



Where the town should rely on the utility company for assistance removing downed trees.



Where there are roads not impacted by overhead utilities, offering more opportunity for established forestry practices.

RECOMMENDATIONS



Work with the local utility companies to understand their clearing rotation. Identify where town and utility company priorities overlap. Preserve some structurally sound trees near utility lines, including woody shrubs and small trees such as dogwoods or hophornbeam. Ensure that site-lines remain clear as understory become dense.



Promote vegetated buffers of grasses and ensure that disturbed areas are revegetated with native seed mixtures.

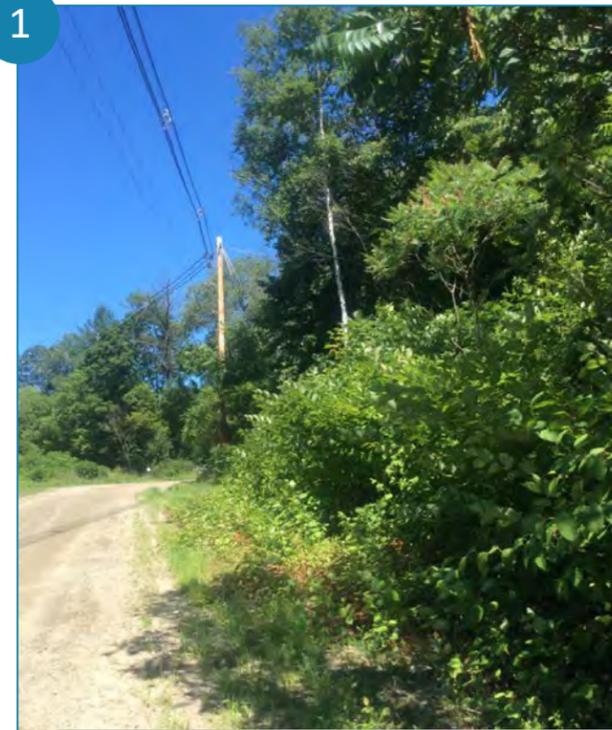


Keep yourself and your equipment at least 10-feet away from overhead utility lines. Treat all power lines as energized. Never cut or prune trees within 10 feet of an overhead utility and never attempt to remove trees or limbs from a utility line.



Call 888-DIG-SAFE at least 48 hours before you dig. Dig Safe a free and legally-required service that alerts you of any underground utilities in the area you may need to dig.

1



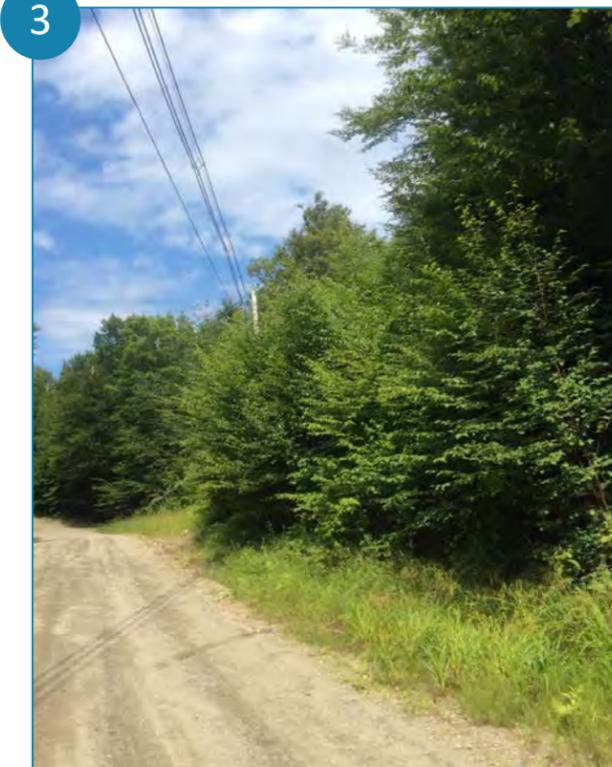
Japanese knotweed underlies much of the utility corridor along Morey Road. Understand how utility companies will reduce and mitigate the spread of this plant when moving to other work sites.

2



Repeated mowing keeps hazards away from the overhead lines. However, allowing for higher grass growth or regeneration of other native roadside plants will filter runoff from the road into the field.

3



Previous vegetation clearing resulted in an even-aged regeneration of densely packed pin cherry. Although the utility company will continue clearing this section of Green River Dam Road, the town can note which species grow quickly after clearing and preserve tree species diversity whenever possible to avoid monocultures.

4



The utility corridor along Garfield defines the edge of this section of Garfield Road. While the town may monitor tree health along this road, the utility company will be largely responsible for managing hazard trees. Monitor for invasive plants and ensure that the utility company’s equipment before line clearing.

RESOURCES

- [Safety Guide](https://greenmountainpower.com/learn/safety-guide/) on the Green Mountain Power website.
- [Trees & Utilities: Cooperative Management Strategies for Success](https://njaes.rutgers.edu/pubs/publication.php?pid=FS1006). Rutgers University website.

Resilient Right-of-Ways Project Data Hyde Park, VT

4. Overhead Utility & Vegetation Reeneration Opportunities

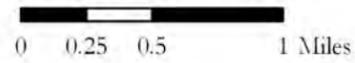


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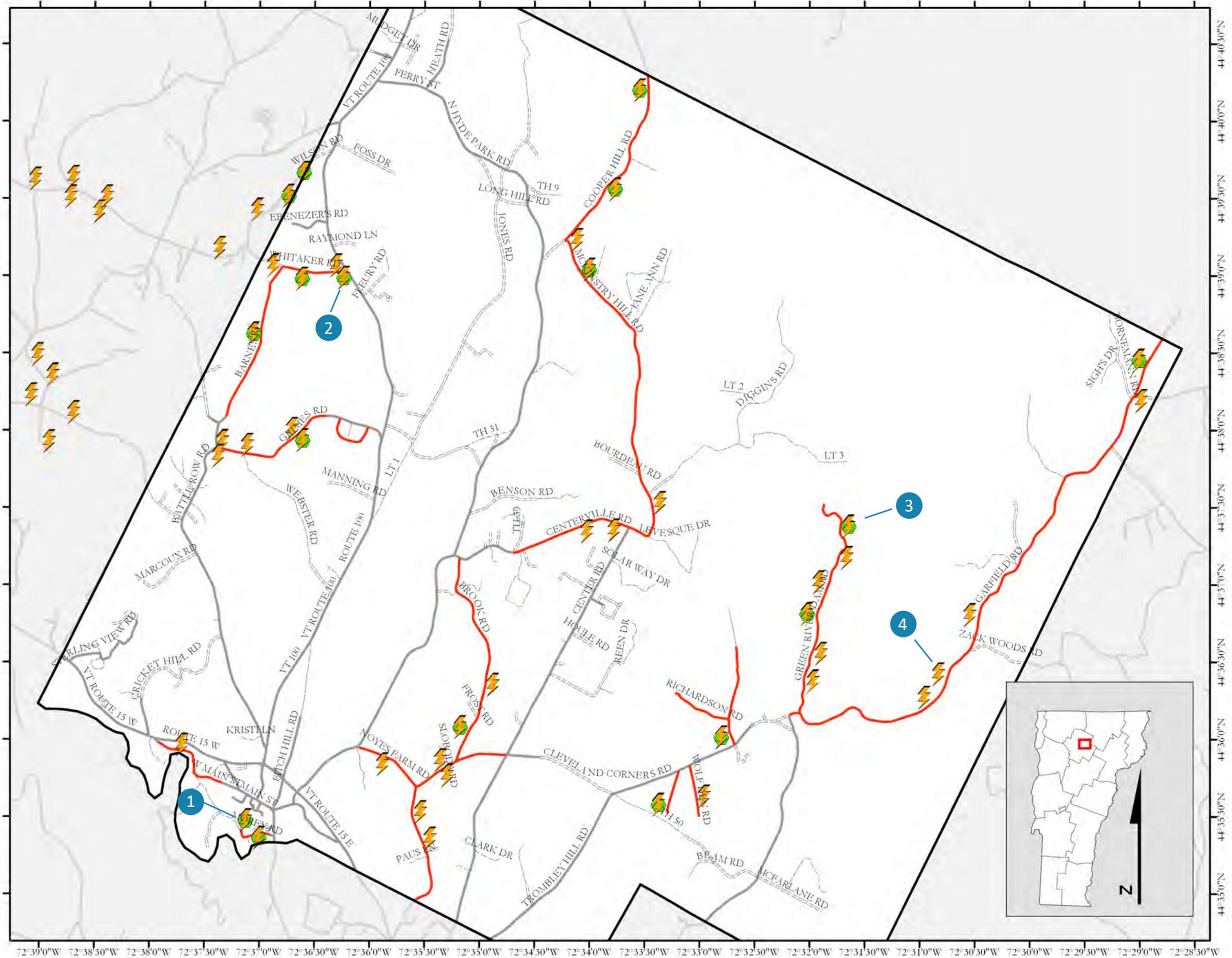
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Legend

- 2018 Inventory Roads
- Utility Wire
- Promote Regen
- Road Surface
- Paved
- Unpaved
- Other



72°39'0"W 72°38'50"W 72°38'0"W 72°37'50"W 72°37'0"W 72°36'50"W 72°36'0"W 72°35'50"W 72°35'0"W 72°34'0"W 72°33'50"W 72°33'0"W 72°32'30"W 72°32'0"W 72°31'50"W 72°31'0"W 72°30'30"W 72°30'0"W 72°29'50"W 72°29'0"W 72°28'50"W

Resilient Right-of-Ways Project Data Hyde Park, VT

5. Agriculture in the Right-of-Way

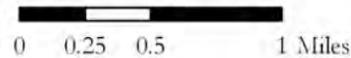


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Legend

2018 Inventory Roads

Agriculture

Road Surface

Paved

Unpaved

Other

WHAT

In many towns, corn, hay, or even livestock sometimes extend to within a few feet of the road, likely as result of a historical precedent or a handshake agreement between the landowner and the town.

Acknowledging the opportunities for trees or perennial shrubs in the town's right-of-way may improve road conditions, tree health, water quality and traffic patterns for all road users. However, operating farms have many requests, restrictions, and expectations that should be addressed by both the landowner and the town before any changes are proposed. Additionally, landowners should be aware that trees in the right-of-way should not be removed without approval of the tree warden and, if necessary, a public hearing held by the tree warden.

HOW



In this study, the presence of agriculture in the right-of-way was determined by noting the land use in the right-of-way width that remained after subtracting half of the road width and the width of the clear zone one each side of the road. The study assumed a right-of-way width of 49.5 feet.

WHY

Identifying agriculture in the right-of-way helps us:



Identify if this is a common practice in a town.



Consider how different forms of agriculture (corn, hay, livestock) affect the right-of-way and identify any proposed changes to best practices.

RECOMMENDATIONS



Consult the road crew to understand and advantages or disadvantages posed by agriculture in the right-of-way in your town. Similarly, consult landowners if the town would like to propose changes in the right-of-way or establish best practices for the town right-of-way.



When mowing the clear zone, particularly if the clear zone includes hay fields, consider leaving vegetation at a height of at least 6". Tall grasses act as a natural buffer between the road and agricultural field, infiltrating stormwater runoff, slowing its velocity, and filtering some of the sediment and pollutants in the runoff before it reaches the agricultural field.



Current [Required Agricultural Practices](#) issued by the State of Vermont require 10' of non-tillable vegetated buffers between agriculture and ditches. This buffer helps filter and slow stormwater runoff before it reaches ditches. As such, consider a 10' buffer between roads and agricultural fields to allow a place for stormwater from the road to slow before reaching fields.



If snow drift is a problem, consider designing a living snow fence in conjunction with the landowner.

- Understand the seasonal changes in the ROW and how planted vegetation height will change throughout the year.
- Snow fences immediately adjacent to the road (i.e. within the municipal ROW) can serve to make the problem worse because of the leeward pattern of snow deposits.
- Living snow fences work best when planted at least 100 feet from the centerline of the road. However, this distance places the snow fence on private property.
- Standing corn rows can act as a snow fence. Minnesota DOT pays farmers to leave 12-16 rows of standing corn set back at least 100 feet from the right-of-way.

1



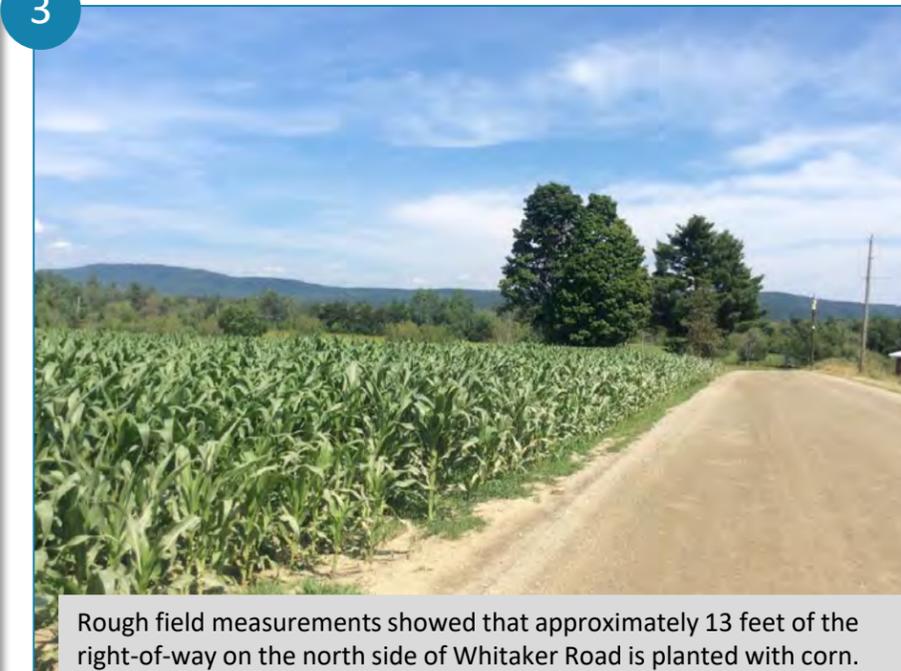
Fenceposts delineate the extent of agriculture practices along this portion of Book Road. Consider if the right-of-way vegetation can or should be anything else along this road.

2



Seasonal mowing of this field has eliminated any substantial buffer between Garfield Road and a field. Evaluate snow drift here, consider planting living snow fences or other native species, and adopt AMPs for agriculture in the right-of-way, including reduced mowing height.

3



Rough field measurements showed that approximately 13 feet of the right-of-way on the north side of Whitaker Road is planted with corn. Evaluate the help or hinderance this has on the road and right-of-way and consider best practices to reduce road erosion, protect the field, and reduce snow drift.

RESOURCES

- [Better Roads Manual](https://vtrans.vermont.gov/sites/aot/files/highway/documents/ltf/Better%20Roads%20Manual%20Final%202019.pdf). Northern Vermont & George D. Aiken Resource Conservation and Development Councils, updated January 2019.

Resilient Right-of-Ways Project Data Hyde Park, VT

5. Agriculture in the Right-of-Way

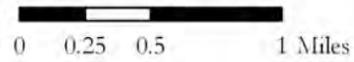


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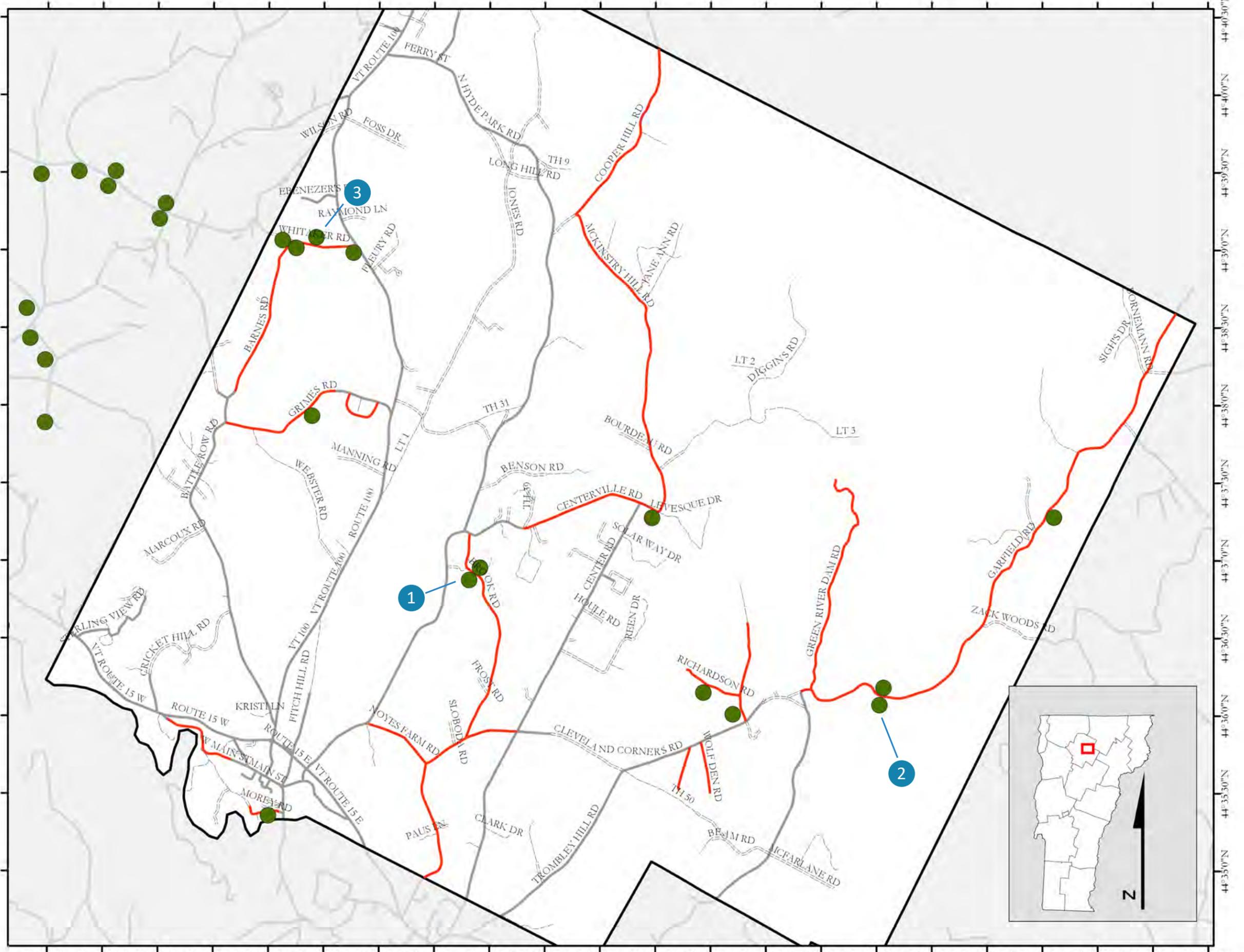
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Legend

- 2018 Inventory Roads
- Agriculture
- Road Surface
 - Paved
 - Unpaved
 - Other



Resilient Right-of-Ways Project Data Hyde Park, VT

6. Hedgerow Locations

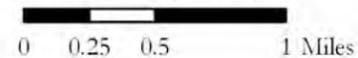


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Legend

— 2018 Inventory Roads

● Hedgerow

Road Surface

— Paved

==== Unpaved

— Other

WHAT

For the purposes of this study, hedgerows are defined as narrow strips of trees and shrubs that border a road on one side and a field, lawn, or body of water on the other. For a traveler on the road, hedgerow trees create defining characteristics of the road's environment, demarcate the road edge, provide canopy cover for small mammals and birds, create a wind breaks and shade, filter stormwater, and provide beauty and enjoyment.

HOW



When a survey plot included trees, field staff evaluated whether or not the trees were part of a hedgerow located either within the right-of-way or spreading from the right-of-way onto private property. Locations on the map marked with green squares mark where trees were part of hedgerow.

WHY

Identifying the presence of hedgerows helps us:



Evaluate where wildlife may be traveling through otherwise unforested landscapes.



Highlight areas where landowners may be particularly sensitive to roadside tree cutting (hedgerows create a privacy screen that many homeowners value).



Highlight areas where hedgerows bordering agricultural fields may conflict with the goals of the farmer.



Address whether scenic views are being impeded by hedgerows.

RECOMMENDATIONS



Identify where ash trees make up a large portion of the trees in a hedgerow. Consider targeted replanting or interplanting in these areas to mitigate canopy loss when ash trees die.



Identify landowners who may be willing to monitor for invasive species in hedgerows border their property.

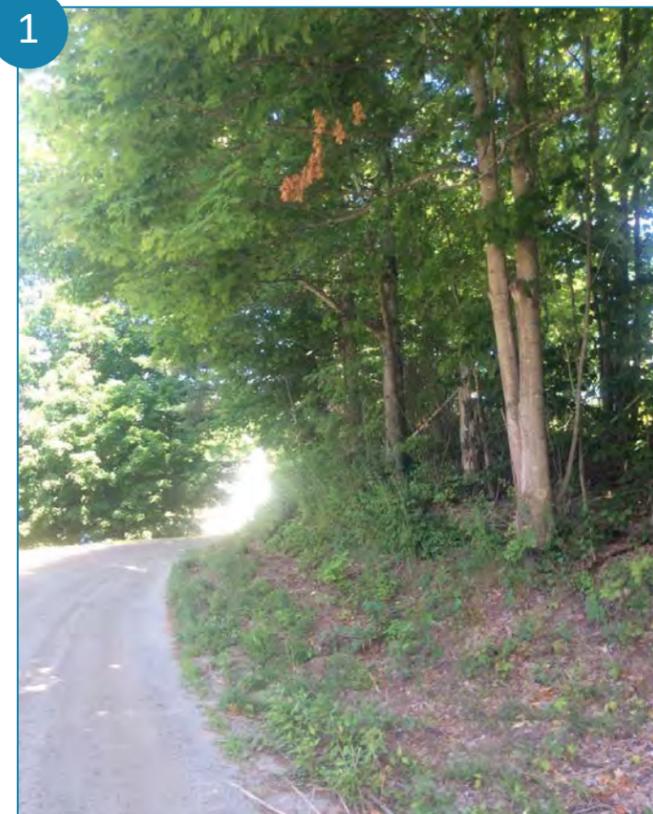


Identify where hedgerows may be unintentional. Some hedgerow trees and shrubs grow only when animals stop grazing fields or land use changes. Utilize the expertise of the tree warden or another forester to plan for targeted and thoughtful tree pruning and/or removal of some trees according to recommended best practices.



To mitigate road erosion without cutting trees, utilize best management practices outlined in the recently updated [Better Roads Manual](#) to direct surface runoff off the road in either directed outlets or through ditching that extends into the existing travel lane. Recommendations about construction of turnouts is included in the Better Roads Manual on page 33.

1



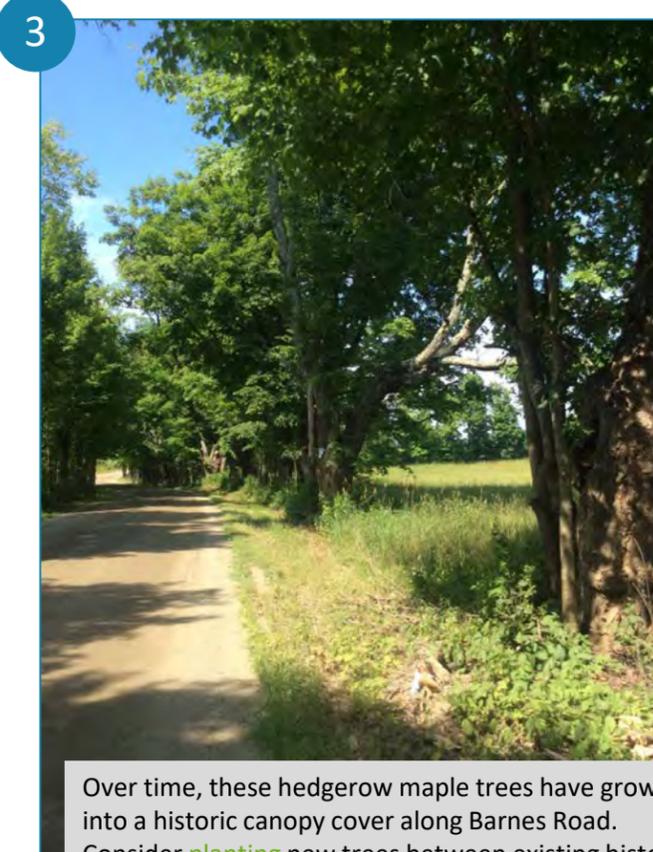
Trees and grasses create a visual break between the road and a field while also reducing erosion of the uphill bank along Black Farm Road.

2



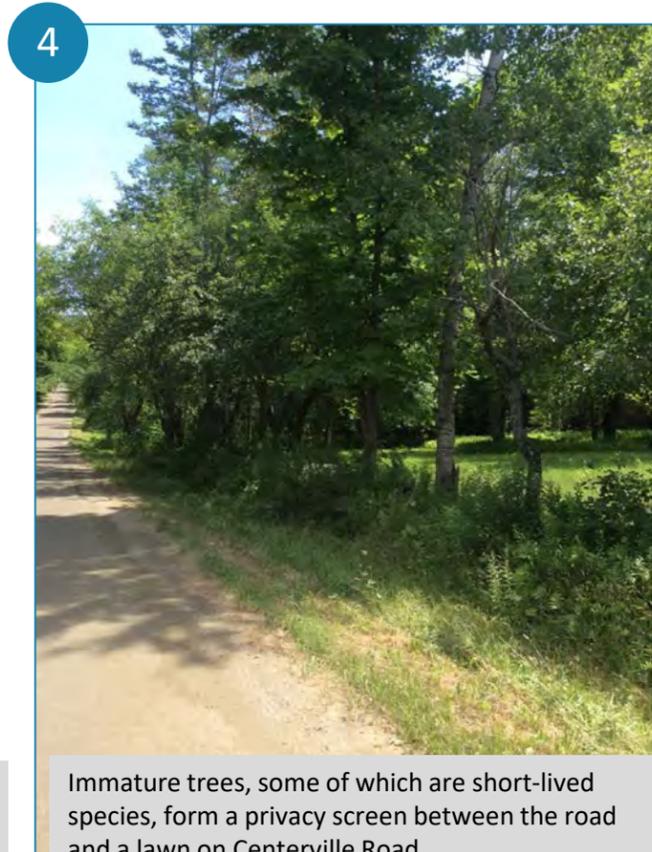
An even-aged and uniform tree-line creates a hedgerow between the road and utility and a neighboring agricultural field.

3



Over time, these hedgerow maple trees have grown into a historic canopy cover along Barnes Road. Consider [planting](#) new trees between existing historic trees. Sometimes called "interplanting", this technique will grow a new generation of intentionally managed trees.

4



Immature trees, some of which are short-lived species, form a privacy screen between the road and a lawn on Centerville Road.

RESOURCES

[Better Roads Manual](https://vtrans.vermont.gov/sites/aot/files/highway/documents/ltf/Better%20Roads%20Manual%20Final%202019.pdf). Northern Vermont & George D. Aiken Resource Conservation and Development Councils, updated January 2019.

[Tree Planting on the Vermont Urban & Community Forestry website](https://vtcommunityforestry.org/sites/default/files/pictures/protecting_your_investment_tree_planting_maintenance.pdf):
https://vtcommunityforestry.org/sites/default/files/pictures/protecting_your_investment_tree_planting_maintenance.pdf

Resilient Right-of-Ways Project Data Hyde Park, VT

6. Hedgerow Locations



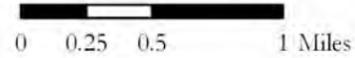
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Cartographer: Elizabeth Bannar

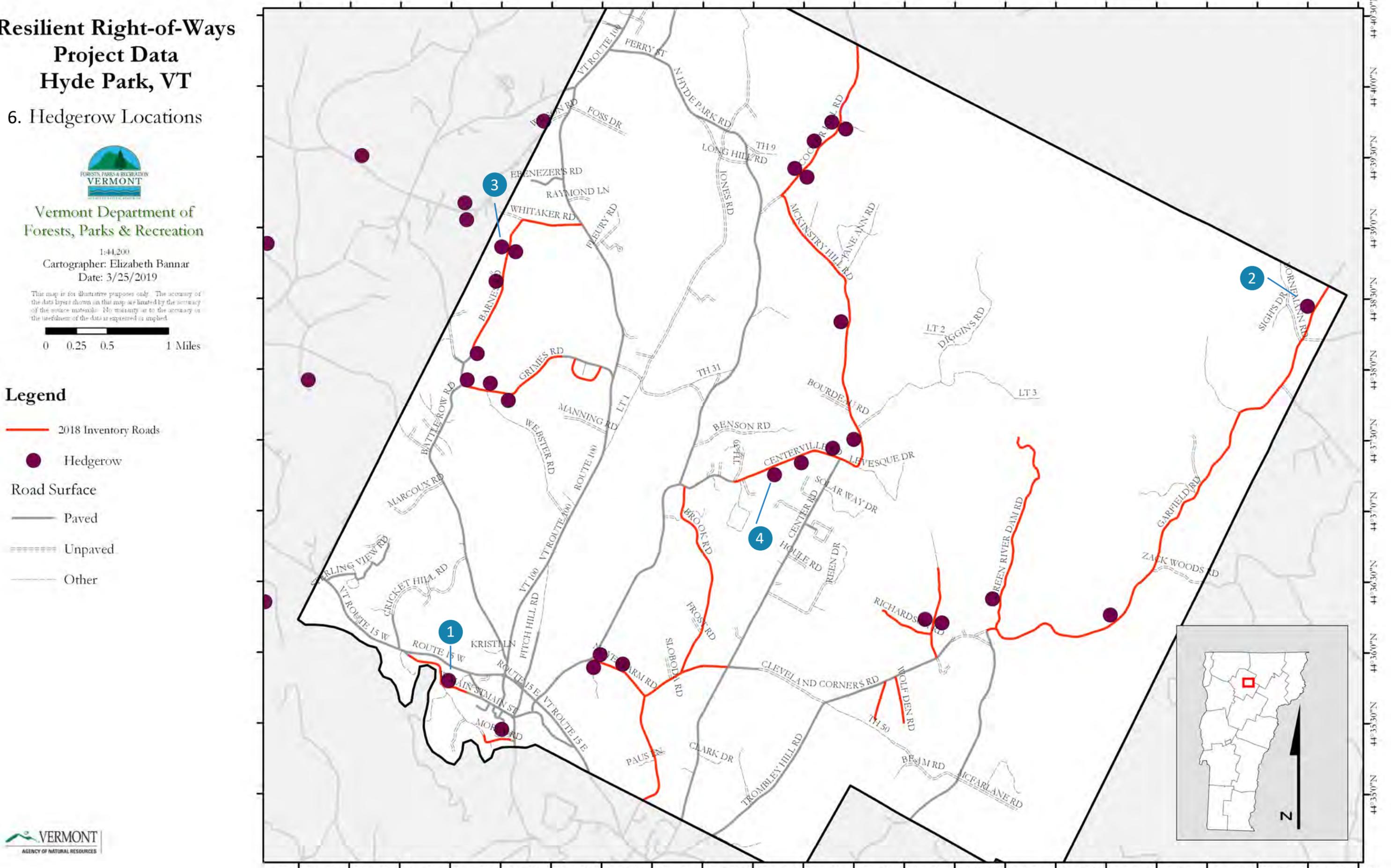
Date: 3/25/2019

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Legend

- 2018 Inventory Roads
- Hedgerow
- Road Surface
- Paved
- Unpaved
- Other



72°39'0"W 72°38'30"W 72°38'0"W 72°37'30"W 72°37'0"W 72°36'30"W 72°36'0"W 72°35'30"W 72°35'0"W 72°34'30"W 72°34'0"W 72°33'30"W 72°33'0"W 72°32'30"W 72°32'0"W 72°31'30"W 72°31'0"W 72°30'30"W 72°30'0"W 72°29'30"W 72°29'0"W 72°28'30"W

Resilient Right-of-Ways Project Data Hyde Park, VT

7. Overstory Health & Mechanical Damage

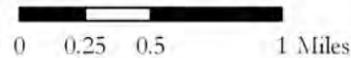


Vermont Department of
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1:44,200

Cartographer: Elizabeth Bannar
Date: 3/25/2019

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Legend

— 2018 Inventory Roads

Health + Damage

- Poor health, high damage
- Poor health, low damage
- Fair health, high damage
- Fair health, low damage

Road Surface

RESOURCES

Tree Characteristics: The Vermont Tree Inventory Guide (p.16-18). Created by the Vermont Urban & Community Forestry Program.
http://vtcommunityforestry.org/sites/default/files/pictures/vt_inventory_guide_2014_0.pdf

Municipal Roads General Permit (MRGP): A Guide for Lakeshore Roads. Lake Wise Program, Vermont Department of Environmental Conservation.
https://dec.vermont.gov/sites/dec/files/wsm/lakes/Lakewise/docs/lp_MRGP_GuidelinesForLakeRoads.pdf

WHAT

Yearly visual examination of the health of overstory trees in the right-of-way is an efficient and low-tech field method to help towns form their roadside forest management priorities. Trees may be in decline because of their age, surrounding soil conditions, disease, or pests. However, some roadside trees decline because of repeated damage from equipment strikes by mowers and plows or from acute damage inflicted during ditching, a vehicle collision, or branch clearing with a raised flail mower. Any trees with documented fair or poor overstory health that also exhibit mechanical damage may be particularly susceptible to breaking or falling.

HOW



Overstory health of trees within the right-of-way was assessed visually in the field using reference guides such as [The Vermont Tree Inventory Guide](#) (p. 16-18). The level of mechanical damage to trees within the right-of-way was also assessed visually in the field. This map displays co-locations rated with “fair” or “poor” overstory health and “high” or “low” mechanical damage.

WHY

Identifying locations exhibiting declining tree health and notable mechanical damage helps us:



Describe sample locations where roadside forest management can be proactive, promoting healthy canopy trees and reducing possible risk posed by dead or dying trees.



Identify locations where road-tree conflicts exist, then determine if road crews should use narrower or alternate road maintenance equipment, or if a tree should be removed.



Identify where trees may be in decline due to environmental stressors, allowing towns to prioritize replanting, interplanting, or forest regeneration.



Determine if future road construction sites should also involve roadside forest management.

RECOMMENDATIONS



Note roads where the road foreman expresses concerns about using the plow or grader. Work with the tree warden, conservation commission, and/or neighboring landowners to address tree preservation or removal.

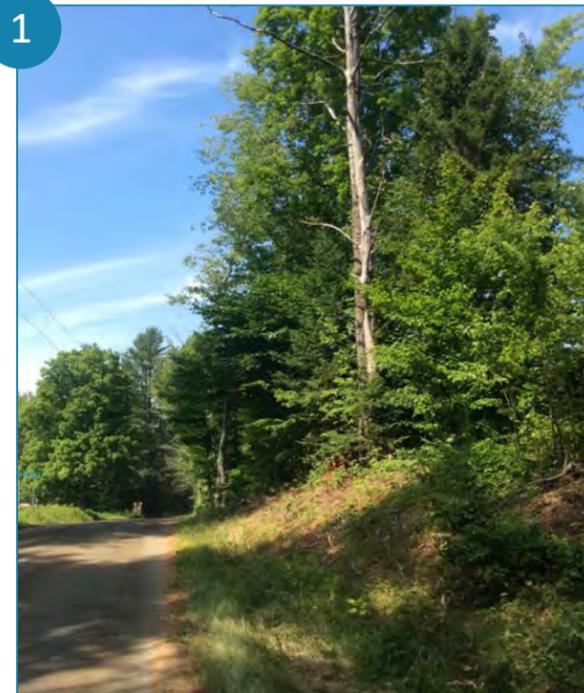


Where roadside trees border lakes and ponds, consult the [Municipal Roads General Permit: A Guide for Lakeshore Roads](#) to understand best practices for managing vegetation along lakeshores and important exemptions to the Municipal Roads General Permit.



Where road-tree conflicts occur on steep banks, review the **Bank Stabilization Section** in the [Vermont Better Roads Manual](#) (p. 36 – 45).

1



Recent upslope clearing damaged mature vegetation along Barnes Road. Regenerating shrubs and saplings should be selectively thinned to promote future canopy trees. Preserve herbaceous cover to reduce erosion.

2



Repeated damage from road equipment or vehicles has contributed to the “fair health” rating of the canopy along this section of Garfield Road.

3



Damage to trees, shrubs and grasses may be the result of both roadwork and erosion along Garfield Road. Consider the connection of this road to the downslope stream and how both road reinforcements and planting could protect this roadside.

4



Historic trees along Barnes Road have been damaged by time and equipment. Hyde Park is already undertaking tree management along this section of road.

Resilient Right-of-Ways Project Data Hyde Park, VT

7. Overstory Health & Mechanical Damage

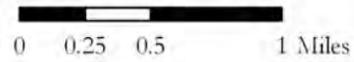


Vermont Department of
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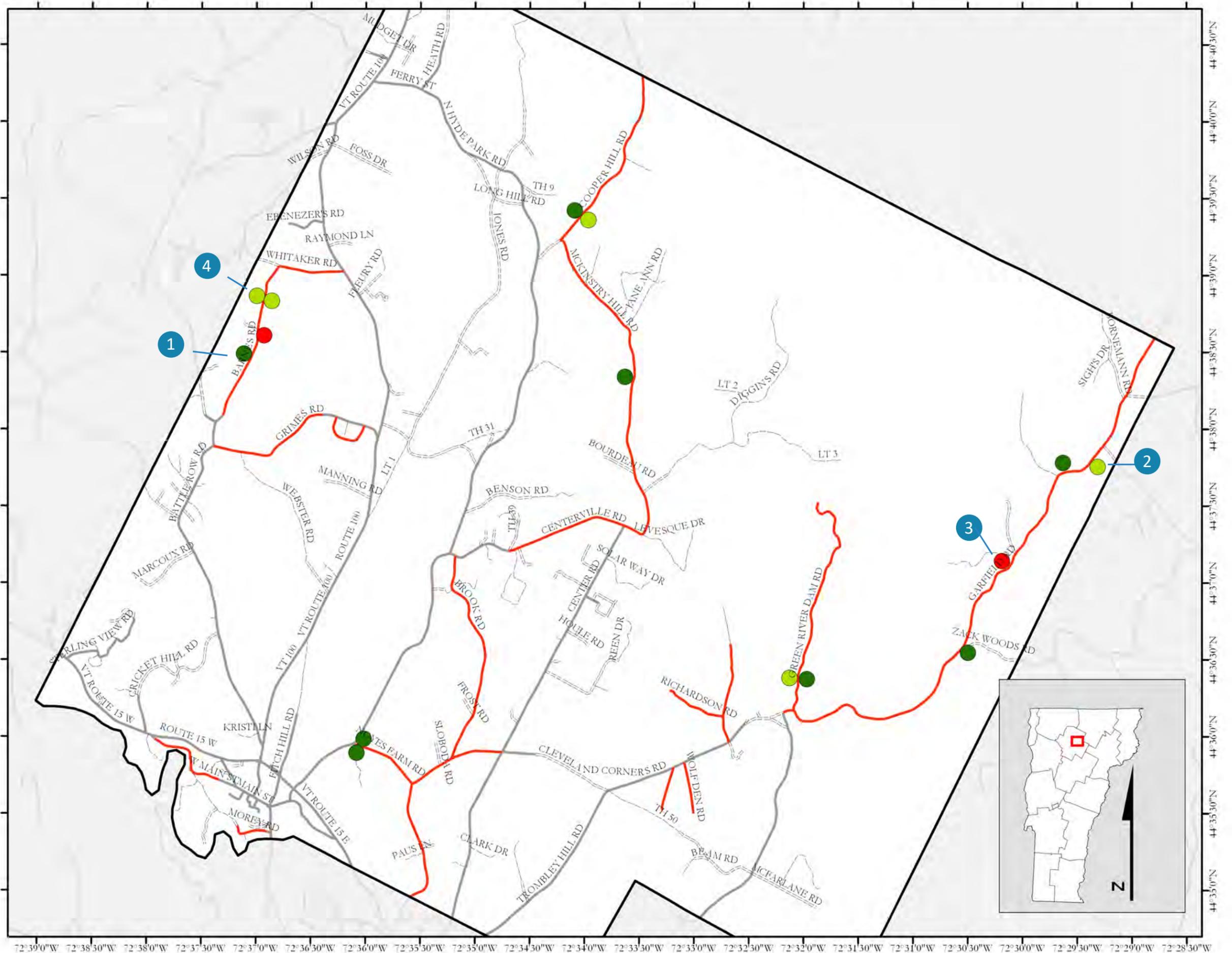
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Legend

- 2018 Inventory Roads
- Health + Damage**
- Poor health, high damage
- Poor health, low damage
- Fair health, high damage
- Fair health, low damage
- Road Surface**
- Paved
- Unpaved
- Other



72°39'0"W 72°38'50"W 72°38'0"W 72°37'50"W 72°37'0"W 72°36'50"W 72°36'0"W 72°35'50"W 72°35'0"W 72°34'50"W 72°34'0"W 72°33'50"W 72°33'0"W 72°32'50"W 72°32'0"W 72°31'50"W 72°31'0"W 72°30'50"W 72°30'0"W 72°29'50"W 72°29'0"W 72°28'50"W

Resilient Right-of-Ways Project Data Hyde Park, VT

8. Invasive Species Locations (data source: iNaturalist)



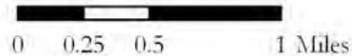
Vermont Department of
Forests, Parks & Recreation

1:44,054

Cartographer: Elizabeth Bannar

Date: 3/25/2019 updated 5/13/2019

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Legend

Invasive Plant Species

- Japanese barberry
- Japanese knotweed
- Honeysuckle spp.
- Purple loosestrife

— 2018 Inventory Roads

— Roads

WHAT

The consistent disturbance to the roadside edge provides ample space for invasive species to take root, flower, and spread. Additionally, road construction equipment, mowers, car tires, and even pedestrians and bicyclists can easily carry the seeds or root fragments of invasive plants down the road.

Because the roadsides are public spaces, no one person may feel entirely responsible for the management and control of these roadside plants. As such, slowing the spread of invasive roadside plants must be a persistent effort requiring consistent monitoring, management, and public outreach.

HOW



In this study, observations of invasive plant species were recorded on iNaturalist, a citizen science data collection application. The Resilient Right-of-Way map displays invasive plant species locations as noted by the Resilient ROW field staff in addition to other iNaturalist users. It does not offer a comprehensive picture of all invasive plants. More on iNaturalist can be found at <https://www.inaturalist.org/>.

WHY

Identifying the location and species of common invasive plants along rural roads tells us:



Where we should implement specific treatment practices found on vtinvasives.org.



How to educate landowners about the spread of invasive species, including from and to their private property.



How to help road crews identify new infestations of invasive plants, particularly if the small plants can be treated.



Where to exercise extreme caution when performing roadwork or mowing so as to avoid spreading invasive plant seeds or roots on equipment or in fill.

RESOURCES



[Gallery of Terrestrial Invasive Plants](https://vtinvasives.org/gallery-of-terrestrial-plants) on the Vermont Invasives website:



[Best Management Practices for the Prevention and Treatment of Terrestrial Invasive Plants in Vermont Woodlands](http://www.vermontwoodlands.org/documents/FinalBMPinvasivesmanual.pdf). The Vermont Chapter of the Nature Conservancy:



Morrow's Honeysuckle (*Lonicera morrowii*)



Wild Chervil (*Anthriscus sylvestris*)



Purple Loosestrife (*Lythrum salicaria*)



Japanese Barberry (*Berberis thunbergii*)



Japanese Knotweed (*Fallopia japonica*)

RECOMMENDATIONS



Follow all BMPs related to roadside invasive plants, making sure to clean equipment before and after roadside work. The "Best Management Practices for Roadside Invasive Plants" from the Nature Conservancy is included in this report in Appendix D.



As you are able, treat isolated existing patches of invasive species in roadside ditches by mechanical or chemical means (as appropriate).



Preserve trees and shrubs that provide shade on roadsides. Invasive plants, like many plants, are less likely to thrive in shady areas.



Know where your invasive species are... and where they aren't. Mow first in areas without invasive species, then mow area with known infestations (except for knotweed, phragmites, or purple loosestrife). Follow best practices to keep mowing and ditching equipment clear of invasive plant fragments and seeds.



Do not mow invasive plants after seeds have set. Knowing when invasive plants bloom will let you use mowing to your advantage to reduce the spread of invasive seeds.

Resilient Right-of-Ways Project Data Hyde Park, VT

8. Invasive Species Locations (data source: iNaturalist)



Vermont Department of
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1:44,054

Cartographer: Elizabeth Bannar
Date: 3/25/2019 updated 5/13/2019

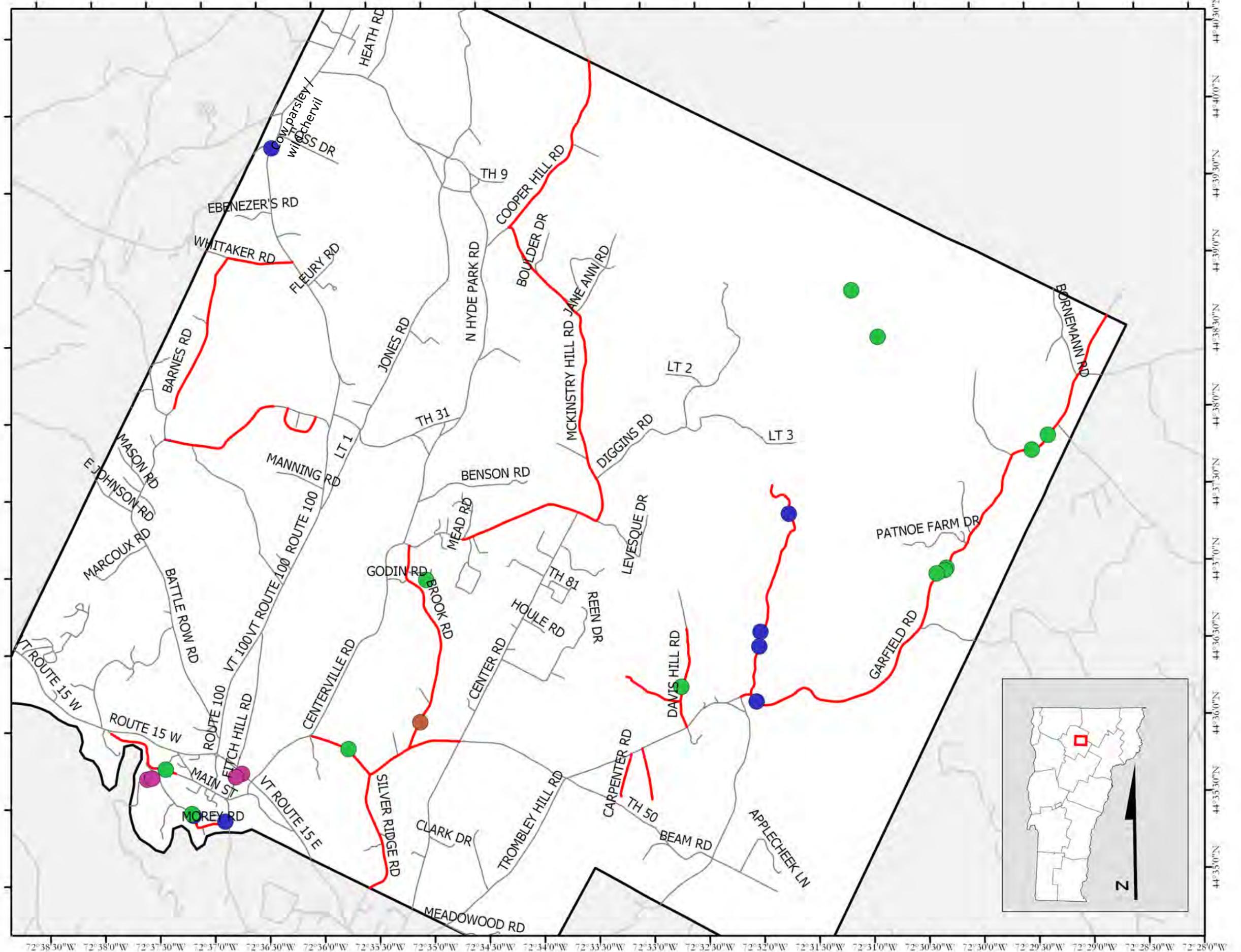
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Legend

Invasive Plant Species

- Japanese barberry
- Japanese knotweed
- Honeysuckle spp.
- Purple loosestrife
- 2018 Inventory Roads
- Roads



Resilient Right-of-Ways Project Data Hyde Park, VT

9. Vegetation Preservation Opportunities

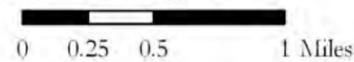


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Legend

2018 Inventory Roads

Steep Slope

Down

Up

Preservation Opportunities

Preserve herbaceous buffer

No cut (trees)

Road Surface

Paved

Unpaved

Other



WHAT

Preserving trees, shrubs, or other herbaceous vegetation can reduce soil erosion, demarcate the edge of the road, create visual interest and beauty, and provide privacy for homeowners. In particular, preserved [tree canopy](#) helps intercept rainfall that would otherwise damage road surfaces, provide shade that reduces road dust on hot days, promote infiltration of rainwater into the soil, and reduce pollutants in stormwater that heads downstream.

HOW



While conducting field assessments, the Resilient ROW team made recommendations regarding opportunities to preserve existing vegetation, including “No cut” recommendations where trees should remain (often for the purposes of controlling erosion on slopes) and “Preserve herbaceous buffer” recommendations where grasses, herbaceous plants, or low shrubs should not be cleared. Field teams also noted if the land in or immediately adjacent to the right-of-way exhibited a significant slope up or down and may therefore be more susceptible to erosion if vegetation is cleared.

WHY

Identifying where trees and herbaceous (grassy) cover should be preserved helps us:



Describe sample locations where trees, shrubs, or other herbaceous vegetation are helping maintain safe and passable roads.



Plan to protect trees during future road construction events, particularly near steep slopes or water bodies.



Balance the need to remove trees in some places with the ability to preserve trees in other places.



Plan tree removal and preservation priorities from a town-wide perspective and avoid “knee-jerk” reactions when some trees are marked for removal.

RESOURCES



Trees and Stormwater. Vermont Urban & Community Forestry Program.
https://vtcommunityforestry.org/sites/default/files/pictures/trees_and_stormwaterv2.pdf



Bank Stabilization: Vegetation – Shrubs and Trees (p.40), [Live Stakes](#) (p. 41), and [Buffer Zone](#) (p. 45), Vermont Better Roads Manual, 2019.
<https://vtrans.vermont.gov/sites/aot/files/highway/documents/ltf/Better%20Roads%20Manual%20Final%202019.pdf>



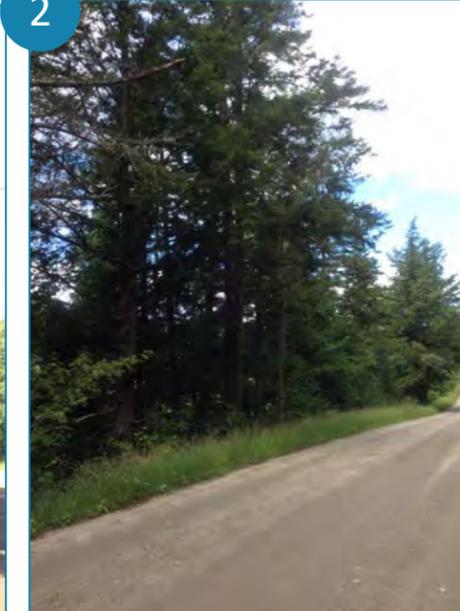
[River Corridor Protection](#) on the Vermont Department of Environmental Conservation website:
<https://dec.vermont.gov/watershed/rivers/river-corridor-and-floodplain-protection/protection>

1



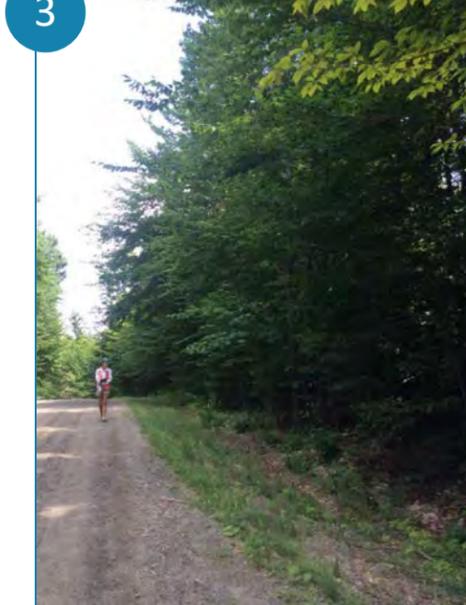
“No cut” recommendation: This section of McKinstry Hill Road is erosive and can see heavy traffic.

2



Trees cover at least 9 feet of steeply sloped right-of-way bordering a wet area along Green River Dam Road.

3



Preserve and regenerate the herbaceous buffer along this low-traffic portion of Windy Knob Road. The road could likely be made narrower – currently, loose gravel covers some of the right-of-way.

RECOMMENDATIONS



In mature forests with an established understory, avoid cutting trees that do not pose a risk to travelers. In particular, note where roadside vegetation is stabilizing steep slopes. Have a forester evaluate whether a tree lean occurred recently (and may pose a risk of falling) or if it occurred many years ago and has been self-corrected. Remember that hardwood trees are “phototropic” and can lean naturally to grow towards the light. Softwood trees, however, are “geotropic” and grow straight up, leaning only when tilted at ground level.



Preserve herbaceous buffer along roads in heavily forested areas. Do not increase the clear zone without specific reason. Consider hydroseeding or planting [live stakes](#) (Vermont Better Roads Manual, p. 41) on bare soil that borders ditches.



Review the best practices of road maintenance through wet areas, particularly where [bank stabilization](#) (Vermont Better Roads Manual, p. 36) is needed between the base of a slope and a wet area. Retain [buffer zones](#) (Vermont Better Roads Manual, p. 45) between roads and sensitive areas such as streams, wetlands and lakes.



When mowing the clear zone, consider leaving vegetation at a height of at least 6 inches. Tall grasses act as a natural buffer between the road and agricultural field, infiltrating stormwater runoff, slowing its velocity, and filtering some of the sediment and pollutants in the runoff before it reaches the agricultural field.



The [Vermont Rivers Program](#) recommends a 50-foot wide buffer of native woody vegetation surrounding streams. Ensure that woody buffers extend to roadsides.

Resilient Right-of-Ways Project Data Hyde Park, VT

9. Vegetation Preservation Opportunities

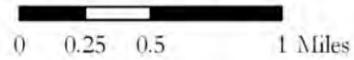


Vermont Department of
Forests, Parks & Recreation

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Cartographer: Elizabeth Bannar
Date: 3/25/2019

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Legend

— 2018 Inventory Roads

Steep Slope

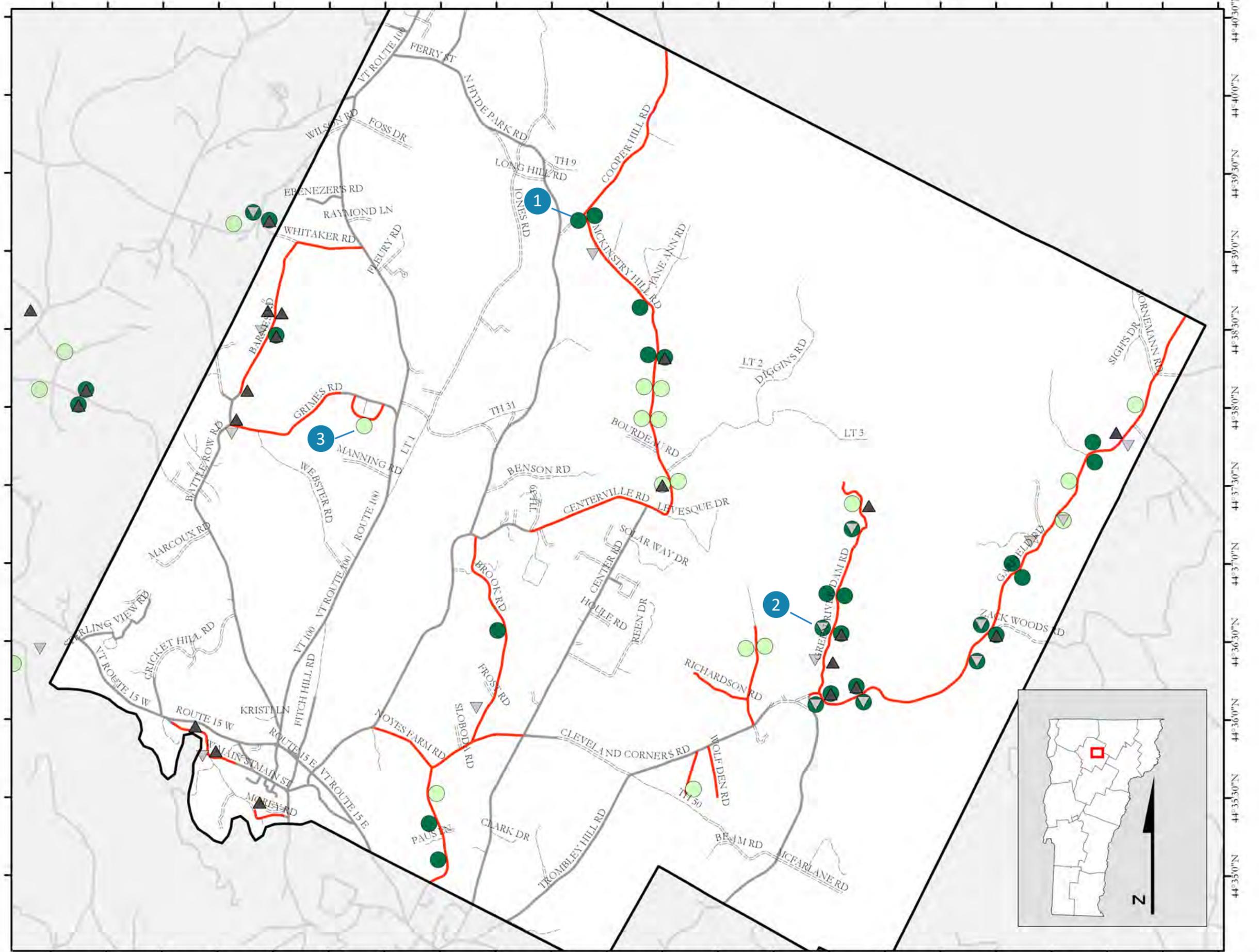
- ▽ Down
- ▲ Up

Preservation Opportunities

- Preserve herbaceous buffer
- No cut (trees)

Road Surface

- Paved
- - - Unpaved
- Other



72°39'0"W 72°38'30"W 72°38'0"W 72°37'30"W 72°37'0"W 72°36'30"W 72°36'0"W 72°35'30"W 72°35'0"W 72°34'30"W 72°34'0"W 72°33'30"W 72°33'0"W 72°32'30"W 72°32'0"W 72°31'30"W 72°31'0"W 72°30'30"W 72°30'0"W 72°29'30"W 72°29'0"W 72°28'30"W

Resilient Right-of-Ways Project Data Hyde Park, VT

10. Planting & Regeneration Opportunities in Roadside Communities

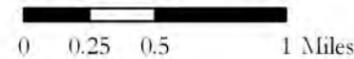


Vermont Department of
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Cartographer: Elizabeth Bannar
Date: 3/25/2019

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Legend

- 2018 Inventory Roads
- Promote Regeneration

Planting Opportunities

- Other
- Trees

Roadside Community

- Forest
- Tree Plantation
- Hedgerow to Field/Water
- Hay Field
- Agriculture Field
- Street Trees/Lawn
- Lawn
- Water Edge
- Wetland
- Riparian Zone
- Other



WHAT

In many towns, corn, hay, or even livestock sometimes extend to within a few feet of the road, likely as result of a historical precedent or a handshake agreement between the landowner and the town. Sometimes private landowners mow their lawns all the way to the road edge to keep their property neat or because they thought they were responsible for managing this corridor of land.

Acknowledging the opportunities for more vegetation in the town's right-of-ways may improve road conditions, tree health, water quality and traffic patterns for all road users. However, anyone wishing to change current land use practices in the right-of-way must certainly consider the relationship of the town's governing board with its private landowners (a.k.a. its constituents) and reflect on the "way things are done" over time in your town.

HOW



In this study, the land use adjacent to the right-of-way was classified into one of 11 categories. Field staff visually assessed whether there was opportunity for tree planting, shrub or grass planting, or forest regeneration. Opportunities were identified based on physical landscape characteristics only, not based on landowner or town willingness to participate.

WHY

Identifying the neighboring land use and opportunities for new vegetation in or near the right-of-way helps us:



Identify patterns in the landscape where vegetation has been eliminated.



Identify common roadside scenarios that may benefit from targeted revegetation and weigh this opportunity against road safety and maintenance concerns and the preferences of town residents.



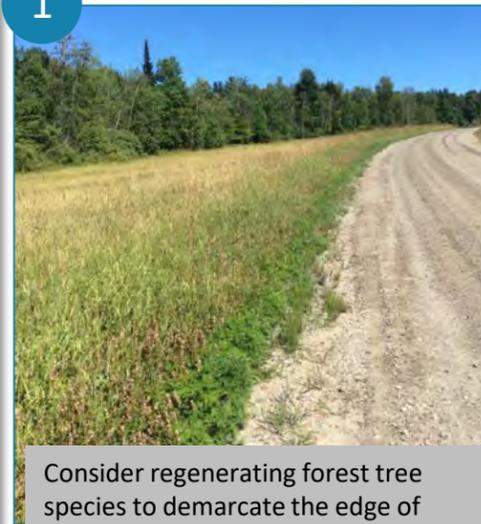
Create a statewide picture of how land uses next to the public right-of-way complement or conflict with vegetation in the right-of-way.

RESOURCES



[Living Snow Fences Control Blowing and Drifting Snow.](http://www.dot.state.mn.us/environment/livingsnowfence/)
Minnesota's Best Practices Handbook for Roadside Vegetation Management.
<http://www.dot.state.mn.us/environment/livingsnowfence/>

1



Consider regenerating forest tree species to demarcate the edge of Richardson Road.

2



Overhead utility lines require special attention if any shrub, grass or thin tree is planted in or near the right-of-way in this location on Carpenter Road.

3



Consider if tree planting on private or right-of-way land along Garfield Road would provide a public benefit to stormwater mitigation, create wind or snow break, or add to the scenic quality of town roads.

4



Intentional planting in the right-of-way on this section of Windy Knob Road may enhance scenic views while intercepting rainfall and reducing road erosion.

RECOMMENDATIONS

- Consider what type of planting may best fit a roadside: trees to form future canopy, a mixture of low trees and bushes, native grasses, or a wildflower mix.
- Identify opportunities to promote regeneration of vegetation through reduced mowing or other forestry practices that encourage resilient tree growth.
- Identify places where a landowner may be open to planting or promoting more vegetation on private land adjacent to the right-of-way. Consult with the Urban & Community Forestry Program for examples of public-private collaboration for roadside planting.
- To determine locations where planting or regeneration may be well-received by landowners and road users, identify if existing vegetation on private land is non-native, at risk from pests or disease, or is declining due to old age.
- Consult the road foreman and neighboring landowner to understand concerns or expectations regarding mowing grass into the right-of-way. Share these expectations through the town's public relations outlets.
- Where seasonal changes in the right-of-way (such as harvesting of agricultural fields) impact wind and snow drift, design or manage [living snow fences](#).

Resilient Right-of-Ways Project Data Hyde Park, VT

10. Planting & Regeneration Opportunities in Roadside Communities

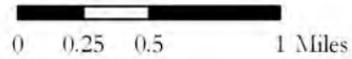


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Forests, Parks & Recreation

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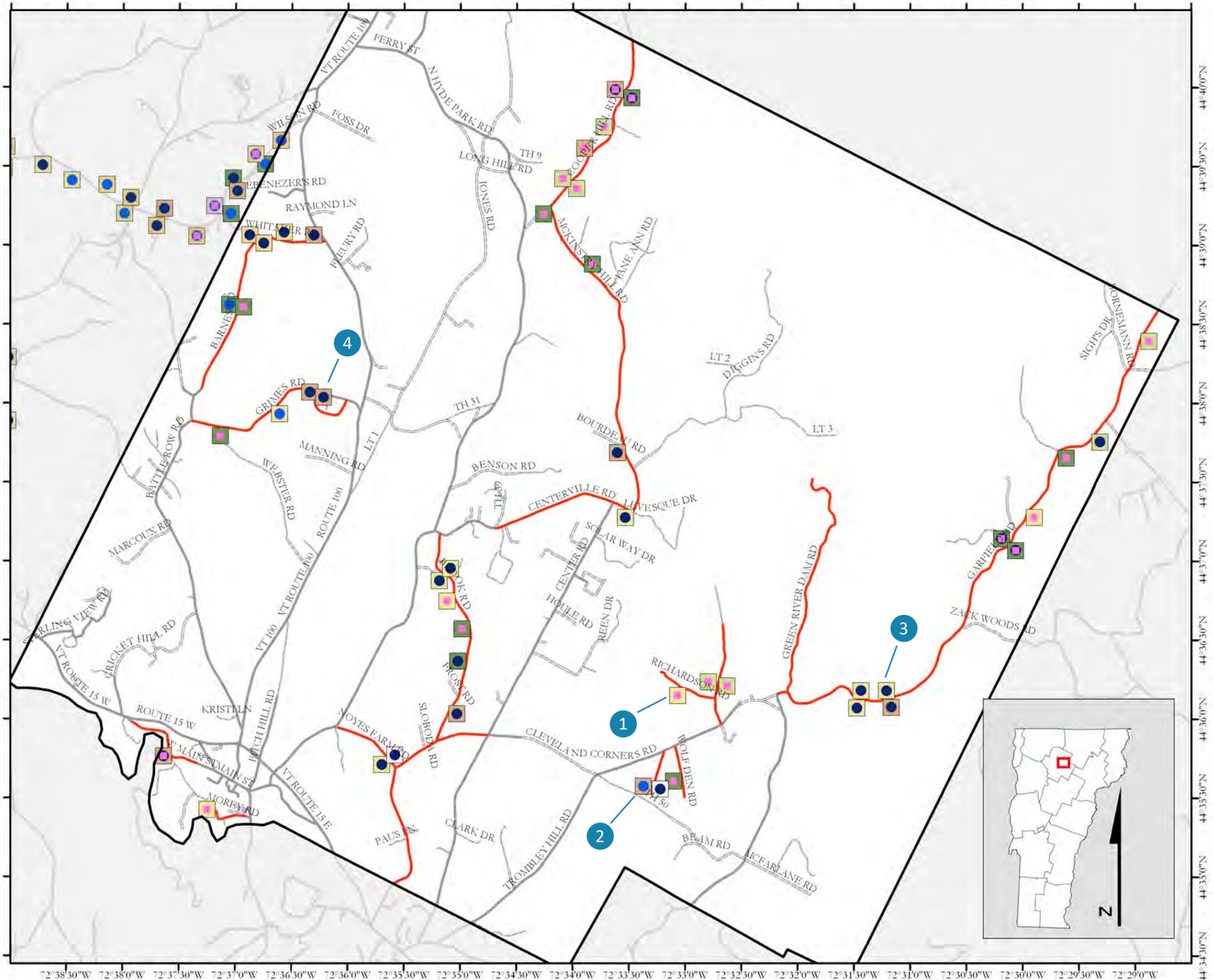
Cartographer: Elizabeth Bannar
Date: 3/25/2019

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Legend

- 2018 Inventory Roads
- Promote Regeneration
- Planting Opportunities**
 - Other
 - Trees
- Roadside Community**
 - Forest
 - Tree Plantation
 - Hedgerow to Field/Water
 - Hay Field
 - Agriculture Field
 - Street Trees/Lawn
 - Lawn
 - Water Edge
 - Wetland
 - Riparian Zone
 - Other



Resilient Right-of-Ways Project Data Hyde Park, VT

11. Thinning Opportunities & Mature Short-lived Trees

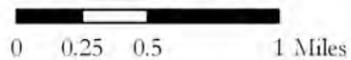


Vermont Department of
Forests, Parks & Recreation

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Cartographer: Elizabeth Bannar
Date: 3/25/2019

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Legend

- 2018 Inventory Roads
- Mature Short-lived Trees

Thinning

- Other
- Trees

Road Surface

- Paved
- Unpaved
- Other

RESOURCES

[Treescaping \(p. 11-13\) in The Roadside Vegetation Management Manual for Rural Road Crews. Harry Chandler, Vermont Woodlands Association. 2000.](https://vtcommunityforestry.org/sites/default/files/pictures/roadside_vegetation_management_manual_for_rural_road_crews.pdf)
https://vtcommunityforestry.org/sites/default/files/pictures/roadside_vegetation_management_manual_for_rural_road_crews.pdf

WHAT

Many of our roadsides were pasture only a generation ago. As such, some roadside forests can be crowded with thin trees and unstable forest “pioneers” such as boxelder, pin cherry, and poplar. When done properly, tree removal may encourage growth of selected trees by reducing competition for sunlight, water, and nutrients. Selecting for windfirm and long-lived roadside canopy trees lays the groundwork for a resilient and functional roadside forest in the future.

HOW



The Resilient Right-of-Ways field staff identified plot locations during field assessments where tree removal may encourage growth of selected trees by reducing competition from less desirable species or species prone to structural problems. Also recorded was the presence of mature short-lived trees (such as paper birch or poplars) within a survey plot.

WHY

Identifying locations that may benefit from tree thinning, the removal of mature, short-lived trees, or thinning of understory brush helps us:



Learn about how established silvicultural practices (like selective thinning, also called “treescaping”) can benefit our roadside forests.



Identify species of trees that can become weak within a short time frame (decades) and select for long-lived species for mature roadside canopy trees.

RECOMMENDATIONS



Consult a forester to identify scenarios where the removal of some trees may benefit the growth of others. Consider performing this work while addressing road construction.



Identify immature tree canopy dominated by small, thin beech trees (often called beech “thickets”). Work with the neighboring landowner and a forester to identify trees for thinning and trees for preservation.



Note where mature, short-lived trees are located along steep road curves. Monitor their health and/or plan for removal. Simultaneously, consider thinning around emerging canopy trees to promote regeneration and to select for the next generation of tree canopy.

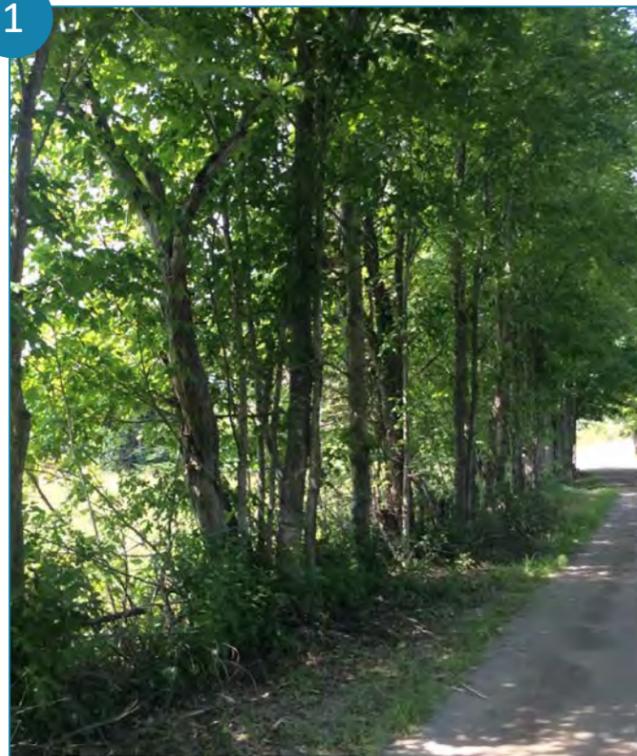


Ensure that trees do not block a clear line of sight for drivers utilizing the road at the posted speed limit.



Consider creating a municipal tree ordinance that specifies which trees can be removed without a hearing, particularly with regard to tree diameter, health, and placement on the road.

1



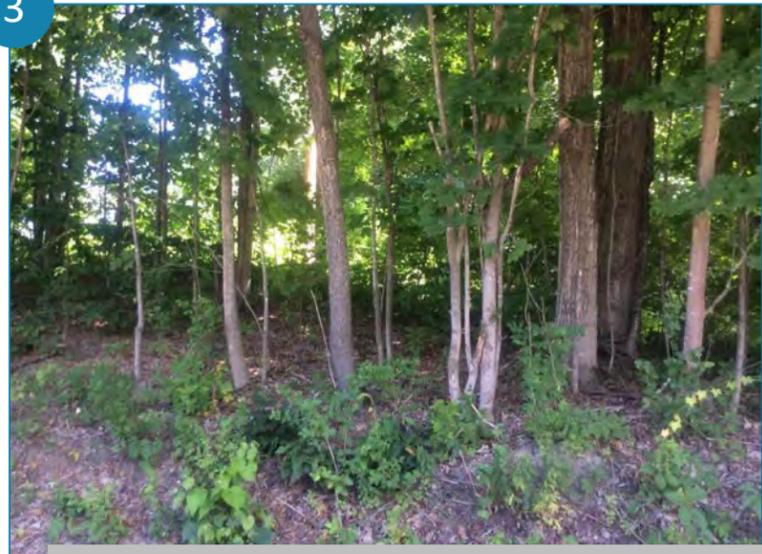
Tree thinning along this stretch of Barnes Road will select trees for future canopy cover while maintaining an important hedgerow.

2



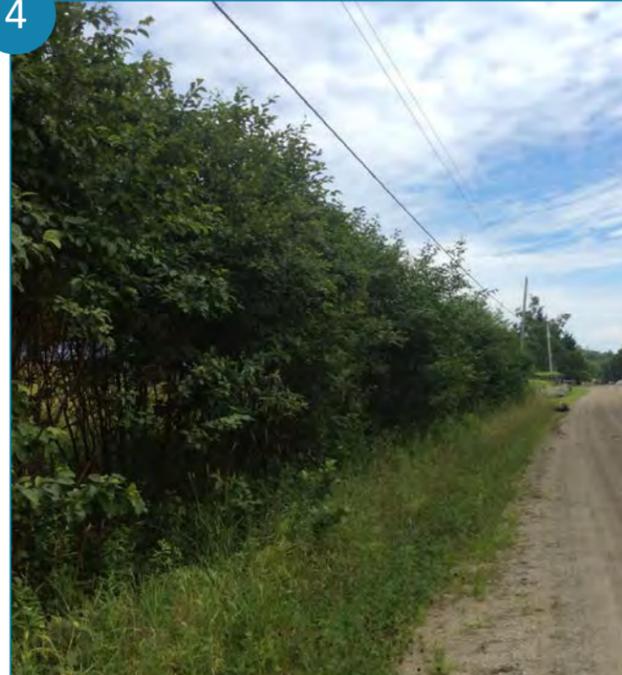
Historic trees along this beautiful, canopy-covered section of McKinstry Hill Road are in fair condition. Consider selectively thinning some trees to promote the next generation of roadside trees that delineate the road edge.

3



Selective thinning along Black Farm Road will improve future tree canopy along this well-traveled road.

4



Uniform regeneration under this utility line will likely be cleared within a 7-year rotation. Work with the utility company and neighboring landowner to determine if any other vegetation, including select trees, may benefit both the neighboring landowner and the roadside without interfering with the utility.

Resilient Right-of-Ways Project Data Hyde Park, VT

11. Thinning Opportunities & Mature Short-lived Trees

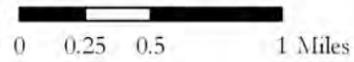


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Forests, Parks & Recreation

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Legend

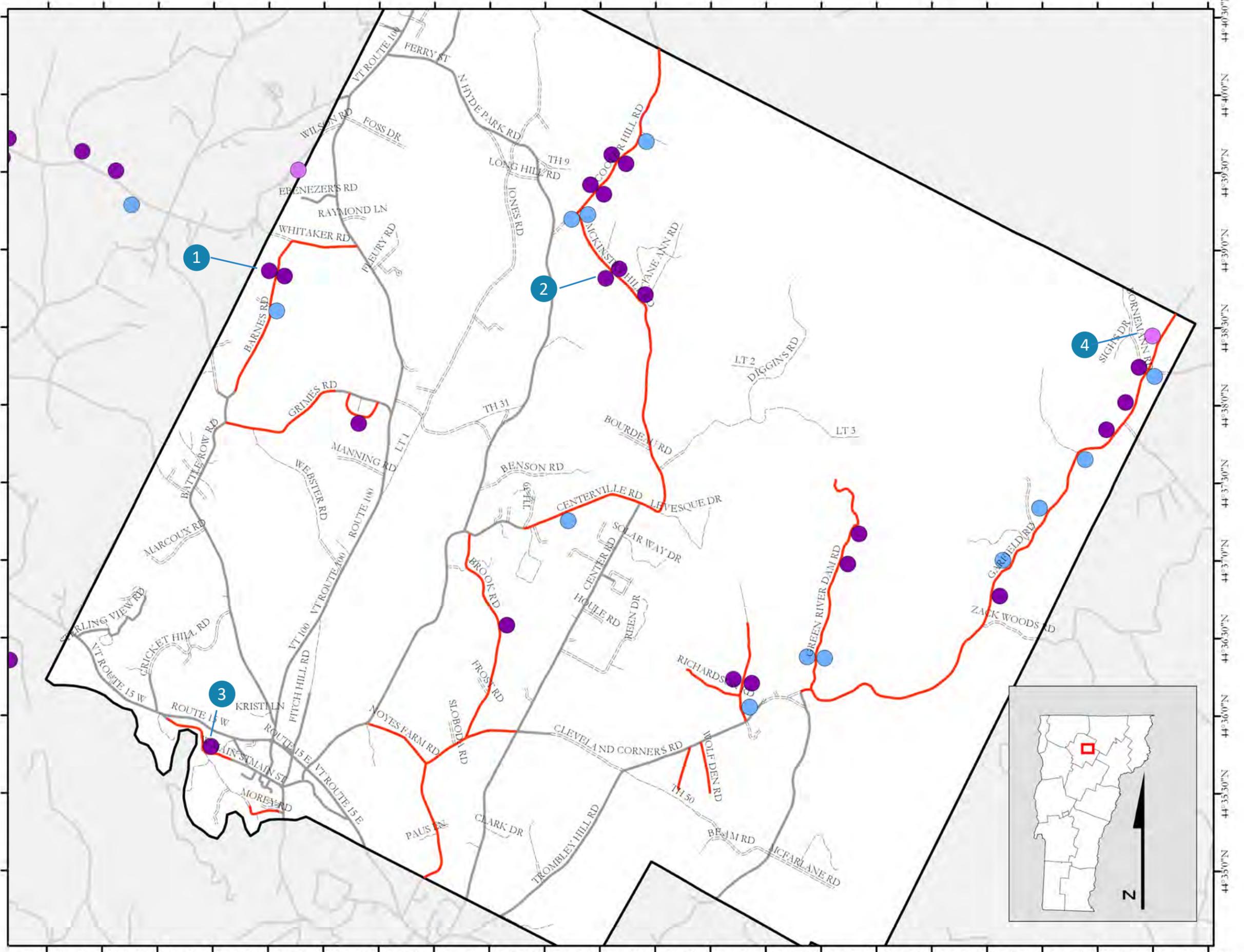
- 2018 Inventory Roads
- Mature Short-lived Trees

Thinning

- Other
- Trees

Road Surface

- Paved
- Unpaved
- Other



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Conclusion

Roadside vegetation management requires a thoughtful, cooperative, and integrated approach. In most towns, there are dozens of stakeholders in rural road vegetation management: road foreman, road crews, selectboard members, conservation commission members, outdoor enthusiasts, landowners, truck and school bus drivers, new residents wishing to build, and farmers, to name a few.

There are also tens of miles of unpaved road in even the smallest Vermont towns that are often maintained by three- or four-person crews. Town highway budgets remain limited and towns must keep financial reserves for managing emergency weather events. Furthermore, populations in some small towns are shrinking, limiting towns' tax base to fund important infrastructure changes. Executing and building on existing rural road maintenance practices is no small job.

As such, towns should view vegetation management as an iterative process and take a step-by-step approach to identify, and act upon, roadside vegetation priorities. After reading this report and reviewing the accompanying maps, decide which action items someone in your town may wish to pioneer. Like any community process, timing is everything, and some initiatives make take more time to come to fruition. The Vermont Urban & Community Forestry Program and Vermont Forests, Parks & Recreation can provide resources that help you plan to accomplish your town's top priorities, one piece at a time.

For more information on any topic in this report, contact:

Joanne Garton, Resilient Right-of-Ways Project Coordinator
Vermont Urban & Community Forestry Program
1 National Life Drive, Dewey 1
Montpelier, VT 05620
(802) 249-4217
joanne.garton@vermont.gov

Additionally, visit our website, vtcommunityforestry.org for resources, ideas, and many examples of urban and community forestry in action.

Appendix A:

Rural Road Resilient Right-of-Ways Project
Town of Hyde Park Letter of Collaboration
May 14, 2018

RESILIENT RIGHT-OF-WAYS

PLANNING FOR SAFE AND HEALTHY RURAL ROADSIDE VEGETATION

LETTER OF COLLABORATION

This letter summarizes the collaborative work to be completed by the Urban and Community Forestry Program of the Vermont Department of Forests, Parks and Recreation (FPR) and the Town of HYDE PARK.

PROJECT DESCRIPTION

The Resilient Right-of-Way projects connects ten communities in Vermont with resources and processes that advance understanding of the role of rural roadside vegetation in supporting local environmental, economic, and cultural values. Through an on-the-ground vegetation assessment and analysis of town priorities, Vermont FPR staff will work alongside the Town of HYDE PARK to develop recommendations for long-term resilience of its roadside forests, hedgerows, and other vegetated landscapes. Work will focus on the role of vegetation to manage stormwater runoff, provide wildlife habitat, and create scenic and cultural roads that preserve the rural nature of Vermont's backroads. The Resilient Right-of-Ways project also prioritizes the necessary physical requirements of safe and well-maintained roads and the importance of cost-efficient and effective solutions that maximize road safety, comply with new stormwater regulations, maintain scenic sections of canopy roads, and are sensitive to the environmental concerns of landowners in each town. Funded by the US Forest Service, this research and outreach initiative will also feed into updated educational material and technical assistance to be offered state wide beginning in 2018.

DELIVERABLES

Deliverables will be tailored to the town of HYDE PARK's specific needs and may include, but are not limited to:

- 1) a roadside vegetation assessment (both desk- and field-based) of at least 50% of the unpaved roads;
- 2) a report, interactive tool, or map summarizing assessment results;
- 3) identification of best practices and management priorities that maximize public benefits from safe and healthy roadside vegetation; and
- 4) facilitation of a public meeting to share results of the assessment.

PARTNER AGREEMENT

The Town of HYDE PARK will:

- Determine membership of a Project Advisory Committee.
- Provide a point of contact responsible for communication between FPR and the town.

- Convene meetings of the Project Advisory Committee with FPR staff and any interested members of the public to:
 - outline the project scope;
 - review assessment results;
 - review the draft vegetation management recommendations; and
 - receive a final presentation on the results and facilitate discussion about how to advance resilient roadside vegetation management.
- Notify the public of key steps in the project development and invite and manage public comment.

FPR will:

- Meet with the HYDE PARK Project Advisory Committee to develop a tentative schedule for the roadside vegetation assessment, management recommendation development, and any public meeting(s).
- Conduct the roadside vegetation assessment.
- Work with the HYDE PARK Project Advisory Committee and other key stakeholders to develop integrated recommendations and best practices to care and plan for HYDE PARK's rural roadside vegetation.
- Provide agreed upon deliverables including the vegetation assessment summary report.

REPRESENTATIVES

- Joanne Garton will be the primary point of contact for FPR.
 - (802) 249 - 4217; joanne.garton@vermont.gov
- Ron Rodjenski will be the primary contact for the Town of the HYDE PARK.
 - Contact information.

MONETARY OUTLINE

No money will be exchanged during this project.

TERMINATION CLAUSE

Either party may terminate this working relationship at any time, seven days after notifying the other party in writing.

EFFECTIVE DATE AND SIGNATURES

This scope of work will be effective from _____ to the end of the grant period in September 2019.

Both parties agree to the conditions as described above.

[Signature] 6/18/2018
Signature Date

Ron Rodjenski 05/14/2018
Signature Date

Jeanne Gaston
Name

RON RODJENSKI
Name

Town of HYDE PARK

Address

Vermont Department of Forests, Parks and
Recreation
1 National Life Drive
Montpelier, VT 05620

Appendix B:

Rural Road Resilient Right-of-Ways Project
Town of Hyde Park Work Plan
July 12, 2018

Rural Road Resilient Right-of-Ways Vegetation Assessment

Town of Hyde Park Work Plan

July 12, 2018

Town priorities

Maintain healthy forests and roadside vegetation along Hyde Park's rural roads by planning for vegetation management practices appropriate to the types of right-of-way roadside communities found in the town. Through this rural roadside vegetation assessment and resulting action plan, the town will examine:

- management of roadside forests to promote healthy and long-lasting tree canopies;
- areas that merit preservation of vegetation for environmental or cultural reasons;
- areas that are relatively free of invasive plant species;
- assess areas at higher risk from storm damage that causes trees to fall on or across the road (including areas with high concentrations of ash trees);
- areas affected by utility lines; and
- areas in conflict with road maintenance equipment.

Additional deliverables will explore ways to:

- promote relevant communication between the road foreman and Hyde Park Tree Warden;
- reduce the spread of roadside invasive species, specifically by addressing mowing practices that may facilitate migration and/or reproduction of these species;
- inform decision-making around potentially conflicting laws, rules, recommendations or funding requirements for rural road maintenance and water quality protection;
- provide outreach and education regarding emerald ash borer and ash tree management;
- inform the drafting of a municipal tree ordinance; and
- establish best practices regarding town communication with utility companies and land developers.

In addition, Vermont Forests, Parks and Recreation staff will facilitate exploration of a **field walk** that outlines on-the-ground management techniques recommended for a specific road segment within the town. This may include marking of trees to be preserved or cut within the right-of-way, and/or location of potential locations for forest regeneration or planting. The pilot project will serve to highlight site-appropriate species composition for improved forest health in roadside environments. If the town of Hyde Park would like to pursue this, the location will be chosen at the completion of the road assessment.

Priority Roads

The road assessment will likely begin the week of July 16th, 2018 and continue throughout the July. The assessed routes aim to cover at least half of Hyde Park's 39 unpaved road miles, or approximately 20 miles of unpaved roads.

Currently, the roadside vegetation assessment focuses on 100-foot long road plots assessed approximately every quarter mile of road. Plots register data for both the left- and right-hand side of the roads as travelled S-N and W-E. Selected plots will convey a typical representation of the roadside environment at or near that quarter-mile marker.

Route 1 – Approx. 5 miles

Centerville Road (W-E) – McKinstry Hill Road – Cooper Hill Road

Route 2 – Approx. 3.5 miles

Brook Road – Cleveland Corner Road – Silver Ridge Road to town border – return to Noyes Farm Road

Route 3 – Approx. 1.25 miles

Black Farm Road – Morey Road (do these really connect?)

Route 4 – Approx. 3.5 miles

Windy Knob Drive – Will Grimes Road – Barnes Road – Whitaker Road west to town line – Whitaker Road east to Rte 100.

Route 5 – Approx. 5 miles

Garfield Road

Route 6 – Approx. 2.5 miles

Carpenter Road - Wolf Den Road – Davis Hill Road – Richardson Road – Green River Dam Road

Data Collection

Collected data consists of:

- Survey Data
- Direction of Travel
- Road side
- Road width and cleared or mowed ROW width
- Width of municipally managed vegetation in ROW
- ROW community type (Forest or forest edge, Street Trees, Wet Areas, Mowed, Bare)
- ROW community sub-type (further defines community type listed above, e.g. mature forest with established understory, seasonally mowed area, pond)
- Roadside community (e.g. lawn, forest, water body, street trees, hay field, agriculture)

- Roadside ash > 6' dbh (0, Low = 1-2 trees, Medium = 3-4 trees, High = 5+ trees)
- Overstory Health (Good, Fair, Poor)
- Mechanical damage to trees (None, Low, High)
- Steep slope in ROW (Up, Down, None)
- Utility Present?
- Softwood > 25% canopy cover?
- Trees are part of a hedgerow?
- Historic Trees?
 - Historic Tree Health (Good, Fair, Poor, Dead)
- Agriculture in ROW?
- Field Recommendation
 - No cut?
 - Preserve herbaceous buffer?
 - Promote regeneration?
 - Watch for mature short-lived trees?
 - Planting opportunity (trees or other)?
 - Thinning opportunity (trees or other)?
- Comments

Also, representative data of invasive species present along roadsides recorded as point data using the Mapping for Healthy Forests Vermont Project in iNaturalist.

Appendix C:

Rural Road Resilient Right-of-Ways Project
Selected Resources for Tree Wardens



Guidelines for Public Hearings for Tree Removals

In each Vermont town, a tree warden shall be appointed by the selectboard to be responsible for the protection, care, planting, and removal of public shade and ornamental trees on town property and along the public right-of-ways. Tree wardens evaluate whether and when aging or damaged trees need to be removed, and also approve requests for removal of trees on town property by town officials. The public has the right to appeal tree warden decisions for public tree removal. According to the Vermont Tree Warden Statutes:

A public shade tree within the residential part of a municipality shall not be felled without a public hearing by the tree warden, except that when it is infested with or infected by a recognized tree pest, or when it constitutes a hazard to public safety, no hearing shall be required. In all cases the decision of the tree warden shall be final except that when the tree warden is an interested party or when a party in nterest so requests in writing, such final decision shall be made by the legislative body of the municipality.
 (Amended 1969, No. 238 (Adj. Sess.), § 6.)

It is therefore the responsibility of the tree warden to hold a public hearing prior to the removal of a public ornamental or shade tree, unless the tree is diseased or dying or constitutes a hazard to public safety. Failure to hold a public hearing means that the tree warden acted outside the scope of their authority and, as seen in the example of the Holland Case below, could lead to legal action if pursued by landowners.

WHEN IS A PUBLIC HEARING NECESSARY?

Tree Warden's Decision to Remove a Public Tree.

Is the tree diseased, infected with a pest, or a hazard to public safety?

YES

A public hearing is **NOT** necessary.

No

Is the tree located in the **residential* part of town?

YES

A public hearing is **necessary**.

No

A public hearing is **not** necessary.

THE LAW IN ACTION: The Holland Case



In 2001, the Town of Holland sought to widen a Class 3 Town Highway in a residential area to accommodate large vehicles. The plan for the road expansion called for removal of approximately 30 trees and additional tree cutting, among other things.

Before the work began, an adjoining landowner brought suit in Orleans Superior Court to prevent the Town from cutting down the trees. The Town filed for summary judgment, arguing that the tree warden was not required to hold a public hearing prior to felling the trees because they contributed to the narrowness of the road, and thus created a public safety hazard.

In the end, the Court agreed with the landowner. The tree warden had no authority to remove the trees without first holding a public hearing. The public hearing must be warned by the tree warden for the discrete purposes of considering the removal of the tree.

EIGHT STEPS TO HOLDING PUBLIC HEARING FOR TREE REMOVAL*

Step 1: Determine where and when the public hearing will take place. The tree warden should provide direct notification by mail to the affected property owner(s), as well as posting a public notice in a minimum of three public places in town, at least 15 days before the hearing. The public notice should include the time, date, location, and purpose of the hearing.

Step 2: Before the hearing begins, make sure that someone is designated to take good notes and, if possible, record the proceedings of the hearing.

Step 3: At the beginning of the hearing, identify the parties that will be involved in the proceedings. Only those affected are parties: i.e., the landowner, the neighbors, town officials. Inform others in attendance that they have no official role in the hearing.

Step 4: At the public hearing, a notary, clerk, assistant clerk, or Justice of the Peace affirms everyone who will speak before the evidence is taken. An example of an affirmation used is: "Do you solemnly affirm, in the cause now under consideration before the tree warden, to tell the whole truth and nothing but the truth under the pains and penalties of perjury?"

WHAT DOES A WRITTEN DECISION LOOK LIKE?

After the public hearing, the tree warden needs to write up a brief decision along these lines and send a copy to each of the parties who attended the hearing:

On _____, 2014, at ___ p.m., I, _____, Tree Warden for the Town of _____, held a hearing at the _____ Town Office to consider removal of trees from a portion of the right-of-way for Town Highway No. __, also known as _____ Road. Present at the hearing were _____, Road Foreman for the Town of _____. Also present were _____, and _____ (list all attendees).

The parties offered the following testimony: _____

Based on the testimony provided at the hearing, authority is (or is not) granted to _____, Road Foreman for the Town of _____ to remove trees from the following portion of the right-of-way for Town Highway No. __: _____ for the following reasons: _____

In accordance with 24 V.S.A. 2509, Persons interested in this decision may appeal the decision in writing within ___ days from the date of the decision to the _____ select board.

Signed,
_____, Tree Warden for the Town of _____

Step 5: Ask the party requesting that the tree be removed to speak first and to describe the details and their views on the removal, in as logical an order as possible. Make sure everyone who speaks gives his or her name first, every time, to make a clean transcript later on if one is needed.

Step 6: Allow the other parties to ask questions of the first speaker and those called to assist the first speaker.

Step 7: Repeat steps 5 and 6 for the other parties, one at a time, allowing them to give their reasons, and allowing them to be questioned by the other parties.

Step 8. Adjourn, and then issue a written decision (see example at left) within a reasonable period of time, starting with findings of fact, then applying the facts to the law, then a decision, and finally a notice of a right to appeal. Send copies by certified mail to each party, and have one copy for the town clerk for public record.

ADDITIONAL RESOURCES

Vermont Urban & Community Forestry Program's Tree Warden Resources: www.vtfrp.org/urban/tree_wardens.cfm
Vermont League of Cities & Towns, Municipal Assistance Center: www.vlct.org/municipal-assistance-center/overview/
The Law of Trees, compiled by Paul Gillies, Vermont Attorney: www.uvm.edu/crs/resources/citizens/trees.pdf

* Based on recommendations provided by Vermont Attorney Paul Gilles.

Vermont Tree Warden Statutes

TITLE 24: Municipal and County Government

CHAPTER 033: MUNICIPAL OFFICERS GENERALLY

§ 871. Organization of selectmen; appointments

Forthwith after their election and qualification, the selectmen shall organize and elect a chairman and, if so voted, a clerk from among their number, and file a certificate of such election for record in the office of the town clerk. Such selectmen shall thereupon appoint from among the legally qualified voters the following officers who shall serve until their successors are appointed and qualified, and shall certify such appointments to the town clerk who shall record the same:

1. Three fence viewers;
 2. A poundkeeper, for each pound; voting residence in the town need not be a qualification for this office provided appointee gives his consent to the appointment;
 3. One or more inspectors of lumber, shingles and wood;
 4. One or more weighers of coal; and
 5. A tree warden. (Amended 1963, No. 74, § 2.)
-

TITLE 24: Municipal and County Government

CHAPTER 067: PARKS AND SHADE TREES

§ 2502. Tree wardens and preservation of shade trees

Shade and ornamental trees within the limits of public ways and places shall be under the control of the tree warden. The tree warden may plan and implement a town or community shade tree preservation program for the purpose of shading and beautifying public ways and places by planting new trees and shrubs; by maintaining the health, appearance and safety of existing trees through feeding, pruning and protecting them from noxious insect and disease pests and by removing diseased, dying or dead trees which create a hazard to public safety or threaten the effectiveness of disease or insect control programs. (Amended 1969, No. 238 (Adj. Sess.), § 1.)

§ 2503. Appropriations

A municipality may appropriate a sum of money to be expended by the tree warden, or if one is not appointed, by the mayor, aldermen, selectmen or trustees for the purpose of carrying out this chapter. (Amended 1969, No. 238 (Adj. Sess.), § 2.)

§ 2504. Removal of trees, exception

The tree warden may remove or cause to be removed from the public ways or places all trees and other plants upon which noxious insects or tree diseases naturally breed. However, where an owner or lessee of abutting real estate shall annually, to the satisfaction of such warden, control all insect pests or tree diseases upon the trees and other plants within the limits of a highway or place abutting such real estate, such trees and plants shall not be removed. (Amended 1969, No. 238 (Adj. Sess.), § 3.)

§ 2505. Deputy tree wardens

A tree warden may appoint deputy tree wardens and dismiss them at pleasure.

§ 2506. Regulations for protection of trees

A tree warden shall enforce all laws relating to public shade trees and may prescribe such rules and regulations for the planting, protection, care or removal of public shade trees as he deems expedient. Such regulations shall become effective pursuant to the provisions of chapter 59 of this title. (Amended 1969, No. 238 (Adj. Sess.), § 4.)

§ 2507. Cooperation

The tree warden may enter into financial or other agreements with the owners of land adjoining or facing public ways and places for the purpose of encouraging and effecting a community wide shade tree planting and preservation program. He may cooperate with federal, state, county or other municipal governments, agencies or other public or private organizations or individuals and may accept such funds, equipment, supplies or services from organizations and individuals, or others, as deemed appropriate for use in carrying out the purposes of this chapter. (Amended 1969, No. 238 Adj. Sess.), § 5.)

§ 2508. Cutting shade trees; regulations

Unless otherwise provided, a public shade tree shall not be cut or removed, in whole or in part, except by a tree warden or his deputy or by a person having the written permission of a tree warden.

§ 2509. - Hearing

A public shade tree within the residential part of a municipality shall not be felled without a public hearing by the tree warden, except that when it is infested with or infected by a recognized tree pest, or when it constitutes a hazard to public safety, no hearing shall be required. In all cases the decision of the tree warden shall be final except that when the tree warden is an interested party or when a party in interest so requests in writing, such final decision shall be made by the legislative body of the municipality. (Amended 1969, No. 238 (Adj. Sess.), § 6.)

§ 2510. - Penalty

Whoever shall, willfully, mar or deface a public shade tree without the written permission of a tree warden or legislative body of the municipality shall be fined not more than \$50.00 for the use of the municipality. Any person who, willfully, critically injures or cuts down a public shade tree without written permission of the tree warden, or the legislative body of the municipality shall be fined not more than \$500.00 for each tree so injured or cut, for the use of the municipality. (Amended 1969, No. 238 (Adj. Sess.), § 7.)

§ 2511. Control of infestations

When an insect or disease pest infestation upon or in public or private shade trees threatens other public or private trees, is considered detrimental to a community shade tree preservation program or threatens the public safety, the tree warden may request surveys and recommendations for control action from the commissioner of agriculture, food and markets. On recommendation of the commissioner of agriculture, food and markets, the tree warden may designate areas threatened or affected in which control measures are to be applied and shall publish notice of the proposal in one or more newspapers having a general circulation in the area in which control measures are to be undertaken. On recommendation of the commissioner, the tree warden may apply measures of infestation control on public and private land to any trees, shrubs or plants thereon harboring or which may harbor the threatening insect or disease pest. He may enter into agreements with owners of such lands covering the control work on their lands, but the failure of the tree warden to negotiate with any owner shall not impair his right to enter on the lands of said owner to conduct recommended control measures, the cost of which shall be paid by the municipality. (Amended 1969, No. 238 (Adj. Sess.), § 8.)

§ 2512. Repealed. 1969, No. 238 (Adj. Sess.), § 9.

TITLE 32: Taxation and Finance

CHAPTER 017: FEES AND COSTS

§ 1680. Tree warden

When a town or incorporated village fails to fix the compensation of a tree warden or his deputies, they shall receive such compensation as the selectmen or trustees determine.



Other Statutes Related to Trees

TITLE 30: Public Service

CHAPTER 071: TELEGRAPH, TELEPHONE AND ELECTRIC WIRES

§ 2506. Trees not to be injured; exception; penalty

A tree within a street or highway shall not be cut or injured in constructing, maintaining or repairing a line of wires, without the written consent of the adjoining owner or occupant, unless the transportation board or the selectmen of the town in which the tree is situated, after due notice to the parties and upon hearing, shall decide that such cutting or injury is necessary. A person or corporation cutting or injuring such trees shall pay the damages, if any, awarded on such hearing, before cutting or injuring the trees. A person or corporation that violates a provision of this section shall be fined not more than \$50.00 nor less than \$5.00 for each tree so cut or injured. (Amended 1989, No. 246 (Adj. Sess.), § 31.)

TITLE 13: Crimes and Criminal Procedure

CHAPTER 077: TREES AND PLANTS

§ 3606. Treble damages for conversion of trees or defacing marks on logs

If a person cuts down, destroys or carries away any tree or trees placed or growing for any use or purpose whatsoever, or timber, wood, or underwood standing, lying or growing belonging to another person, without leave from the owner of such trees, timber, wood, or underwood, or cuts out, alters or defaces the mark of a log or other valuable timber, in a river or other place, the party injured may recover of such person treble damages in an action on this statute. However, if it appears on trial that the defendant acted through mistake, or had good reason to believe that the trees, timber, wood, or underwood belonged to him, or that he had a legal right to perform the acts complained of, the plaintiff shall recover single damages only, with costs. (Amended 1959, No. 61, eff. March 26, 1959.)

TITLE 19: Highways

CHAPTER 009: REPAIRS, MAINTENANCE AND IMPROVEMENTS

§ 901. Removal of roadside growth

A person, other than the abutting landowner, shall not cut, trim, remove or otherwise damage any grasses, shrubs, vines, or trees growing within the limits of a state or town highway, without first having obtained the consent of the agency for state highways or the board of selectmen for town highways. (Added 1985, No. 269 (Adj. Sess.), § 1.)

§ 902. Penalty for removal

A person who willfully or maliciously cuts, trims, removes or otherwise damages grasses, shrubs, vines or trees within highway limits in violation of section 901 of this title shall be fined not more than \$100.00 nor less than \$10.00, for each offense. (Added 1985, No. 269 (Adj. Sess.), § 1.)

§ 903. Agreements for planting

The agency or the board of selectmen may enter into agreements with individuals or organizations who wish to plant grasses, shrubs, vines, trees or flowers within highway limits. (Added 1985, No. 269 (Adj. Sess.), § 1.)

§ 904. Brush removal

The selectmen of a town, if necessary, shall cause to be cut and burned, or removed from within the limits of the highways under their care, trees and bushes which obstruct the view of the highway ahead or that cause damage to the highway or that are objectionable from a material or scenic standpoint. Shade and fruit trees that have been set out or marked by the abutting landowners shall be preserved if the usefulness or safety of the highway is not impaired. Young trees standing at a proper distance from the roadbed and from each other, and banks and hedges of bushes that serve as a protection to the highway or add beauty to the roadside, shall be preserved. On state highways, the secretary shall have the same authority as the selectmen. (Added 1985, No. 269 (Adj. Sess.), § 1.)

Appendix D:

Rural Road Resilient Right-of-Ways Project
Best Management Practices for Roadside Invasive Plants
The Nature Conservancy

Best Management Practices for Roadside Invasive Plants

SOIL DISTURBANCE & STABILIZATION	MOVEMENT & MAINTENANCE OF EQUIPMENT
<ol style="list-style-type: none"> 1. Minimize soil disturbance. Monitor recent work sites for the emergence of invasive plants for a minimum of 2 years after project completion. 2. Stabilize disturbed soil as soon as possible. <ul style="list-style-type: none"> • Use clean mulch, hay, rip-rap, or gravel • Seed with native species where possible 3. Avoid using fill from invaded sites. When in doubt about the quality of fill, monitor work sites for the emergence of invasive plants for a minimum of 2 years. 	<ol style="list-style-type: none"> 1. When equipment needs to be moved, plan work flow so that equipment is moved from unaffected sites to affected sites. This is especially important during ditch cleaning and shoulder scraping. 2. Staging areas should be free of invasive plants 3. All equipment and tools should be cleaned of visible dirt and plant material before leaving affected project sites. Cleaning methods can include portable wash stations, high pressure air, brush, broom, or other hand tools. 4. If equipment will be used in infested areas, remove above-ground invasive plant materials such as purple loosestrife, phragmites, and Japanese knotweed prior to the start of work.
MOWING	HANDLING EXCAVATED MATERIAL & INVASIVE PLANT MATERIAL
<ol style="list-style-type: none"> 1. Avoid mowing areas infested with purple loosestrife, phragmites, and Japanese knotweed, as these can sprout from stem and root fragments. Stake roadside populations with “Do Not Mow”. 2. If mowing is necessary, mow these areas BEFORE seed maturation (approximately August 1st). 3. Clean mowing equipment daily, and prior to transport. This is particularly important if mowing is after seed maturation (August 1st) 	<ol style="list-style-type: none"> 1. Destroy removed plant material. Methods include: <ul style="list-style-type: none"> • Drying/Liquefying: <i>place on impervious surface and cover</i> • Brush piles: <i>not for plants with fruit or seed</i> • Burying: <i>minimum of 3 feet below grade</i> • Burning: <i>have a designated burn pile for invasive plants</i> • Herbicide: requires a <i>licensed applicator (VT Department of Agriculture)</i> 2. Cover invasive plant material when transporting. 3. Excavated materials taken from infested areas should only be used onsite, unless all plant material has been destroyed. Only use within exact limits of infestation. 4. Stockpile unused excavated materials on impervious surface, or bury a minimum of 3 feet below grade (5 feet for Japanese knotweed). 5. Excavation should be avoided in areas containing purple loosestrife, phragmites, and Japanese knotweed. 6. Cover soil from infested areas when transporting.

*Adapted from New Hampshire Department of Transportation's Best Management Practices for Roadside Invasive Plants
<http://www.nh.gov/dot/org/projectdevelopment/environment/units/technicalservices/documents/BMPsforRoadsideInvasivePlants.pdf>*

Vermont Chapter of The Nature Conservancy
 Montpelier, Vermont
 (802) 229-4425



For more information, go to www.vtinvasives.org.

Appendix E:

Rural Road Resilient Right-of-Ways Project
Morrisville Water & Light Vegetation Management Plan

Morrisville Water & Light Department: Vegetation Trimming and Cutting Plan

Vegetation in close proximity to the electric facilities and power lines is not only the leading cause of power outages, but also represents a safety risk to utility workers and the general public. The Morrisville Water & Light Department (MW&L) takes the responsibility to reduce the risks to both safety and reliability very seriously.

To promote sustainable plant communities which are compatible with the electric facilities and discourage incompatible plants (i.e. plant species which at maturity will attain a height of greater than 15 feet) that may pose concerns including safety, access, fire hazard, electric service reliability, emergency restoration, visibility, regulatory compliance, environmental and other specific concerns.

Important benefits of vegetation management include:

- Increased visibility and access along rights-of-way
- Timelier and less costly outage restoration
- Safer working conditions for line workers and line clearance contractors
- Long-term control

Cutting & Trimming Maintenance Cycle

MW&L aims to establish a target of attaining a five-year vegetation maintenance cycle on transmission rights-of-way and a seven to ten-year maintenance cycle on distribution rights-of-way.

Undesirable Vs. Desirable Vegetation

Essentially, all of the commercial tree species found in the forest types identified within MW&L's rights-of-way are classified as incompatible with electric utility lines. They are generally moderate to fast growing species, reaching mature heights in excess of 15 feet tall. Immature trees (less than 4 inches in diameter at breast height and with the capability to exceed 15 feet in height) are defined as incompatible target brush.

Although immature target brush does not pose an immediate threat to system reliability or safety, allowing it to mature can increase maintenance costs and impede or prevent accessibility to electric facilities. Aggressive incompatible target brush species control is crucial in limiting MW&L's future vegetation control workload and cost increases.

While individual healthy trees existing within rights-of-way may be pruned and maintained in order to avoid contact with conductors, the majority will be eliminated when economically feasible, and planting of these tree species within the rights-of-way is strongly discouraged.

The most common reason for pruning an incompatible tree rather than removing it is landowner request. This may be because of the aesthetic value, or because of its value as a shade tree or as a screen from a highway or

neighbors. Apple trees, due to their value as wildlife feed, will be pruned for maximum clearance without jeopardizing their survival and removed only when necessary.

Not all vegetation found in MW&L rights-of-way is undesirable. There are many low-growing plants and shrubs such as lilac, serviceberry, dogwood, hawthorns, honeysuckle, etc., which can be compatible with utility lines. In wetlands and boggy areas, species such as speckled alder and pussy willows, as well as cattails, ferns and many other low growing plants and shrubs are quite compatible.

Retaining or encouraging the growth of low-growing desirable vegetation will help to suppress the growth and density of less desirable species. While shrub growth will not eliminate the encroachment of tree species, it will compete with the other species for nutrients, light, and space.

Significant shrub growth is not retained in the area immediately surrounding pole locations or directly under the conductors. These areas must be kept free of obstruction to facilitate access to the poles and create an open climbing space. This is especially important for any plant species bearing briars or thorns, as they could cause a puncture hole in a lineman's rubber gloves, thereby creating the risk of electric shock.

Line Maintenance

Generally involves the cutting of all brush (up to 25 ft. on each side of the center of the pole line for distribution lines and up to 50 ft. on each side for transmission lines) to ground level, as well as proper pruning of all branches growing towards conductors and removal of any/all trees, which cannot be properly pruned to provide adequate clearance.

Hazard Tree Removal

Involves the removal of trees, which due to size, location and/or condition, have a potential for damaging the conductors or structures now or within the next ten years. These trees will be removed regardless of distance from the center of the pole line.

Minimum Tree-to-Conductor Clearances

Distribution System - A minimum of 10 feet of clearance on each side of the outside conductor and 20 feet of clearance for all branches that overhang the conductors must be achieved. Additional clearance is necessary on branches that could bend (due to snow or ice loading) or break and contact the conductors below.

Transmission System - A minimum of 15 feet of clearance on each side of the outside conductor must be achieved. No branches shall be left overhanging the conductors.

These are the minimum required clearances. Individual tree location, health, species, and growth rate must be considered when determining appropriate/acceptable clearances.

Disposal Procedures

Brush, branches and woody debris from pruning and removal operations along roadsides and within 100 feet of house sites will be chipped. In all other areas, brush will be moved away from the poles, out from under the conductors and windrowed (placed in a long, low heap or pile) off to the side.

Trees, which have been cut remain the property of the landowner and will be left on site. Trees that appear to contain log products will be left in long lengths (except when it is necessary to cut them into smaller sections) and all other wood will be left in manageable lengths, unless directed otherwise by the owner.

Customer Notification

The trimming contractor has the primary responsibility for contacting property owners prior to the commencement of vegetation management work. MW&L trimming notification door hangers will be left at all residences along the section of power line scheduled for maintenance activities. The same information contained in the flyer may also be detailed on Front Porch Forum posts and/or posted on the MW&L web page. <http://www.mwlv.com/>

Where personal notification has not been made, maintenance activities will not take place for a minimum of 5 days following the placement of a MW&L door hanger. If 5 days have passed and the customer has not made contact with the foreperson identified on the hanger, maintenance activities will take place without further notification.

A reasonable effort will be made to identify property owners at locations where there is not a nearby residence.

Program Principles

- *Cost effective vegetation management requires a long-term, consistent approach.*
- *Proactive vegetation management operations are more efficient and effective than reactive operations.*
- *Proper arboricultural practices are essential to minimizing costs and maximizing the effectiveness of tree maintenance operations.*
- *Programs based on Integrated Vegetation Management (IVM) techniques are both the most efficient and environmentally sound.*
- *Proper record keeping and productivity measurement are critical to long-term success.*
- *Professional supervision and sufficient technical expertise are essential to ensuring that a program is successful and cost-effective.*

Appendix F:

Rural Road Resilient Right-of-Ways Project
Correspondence regarding the Hyde Park Electric Vegetation Management Plan
and Draft Updates

From: [Carol Robertson](#)
To: [Garton, Joanne](#)
Subject: RE: Vegetation Management Plan
Date: Friday, April 12, 2019 3:39:01 PM
Attachments: [image001.png](#)

Q8. *A detailed description of the system's vegetative management plan.*

VOHP's distribution system is relatively small and compact, making it easier to control and manage. VOHP has a very simple and effective vegetation management plan. It does not apply any herbicide and most likely will not in the future. VOHP budgets \$15,000 to \$20,000 every year for contract and in-house line clearance. The transmission line from the Johnson substation to the VOHP substation is trimmed every ten years. The trimming program has been very effective in reducing customer disturbances.

Joanne,

Our written plan is provided to the PUC and subject to their approval. Q8 is taken from the most recent Hyde Park electric Integrated Resource Plan approved by the Public Utilities Commission. July, 2019, Hyde Park Electric will file a renewal plan for review and approval by the PUC. The applicable draft for that new filing is as follows:

Explain why it's a "least cost program" including details on tree species, annual growth rates of these species, and vegetation techniques, including when, where, and how herbicides are used.

"HPE's distribution system is relatively small and compact, making it easier to control and manage an effective vegetation management plan. HPE does not apply any herbicide, and typically budgets an average of \$27,000 each year for contract crews and in-house line clearance. \$23,460 is the four-year average annual amount actually expended. The distribution right-way clearing and trimming program has been very effective in reducing customer disturbances. HPE line staff is now skilled and equipped to create and maintain a computerized database of right-of-way activity to assure best practices and least cost. The Town of Hyde Park does not offer a detailed system wide tree inventory with information to assist us in species evaluation relative to the right-of-way program. The Town Tree Warden is available for guidance, as needed in special cases. HPE establishes and maintains fifty feet of right-of-way on distribution and 100 feet on transmission and trims with least disturbance possible up to the ROW. Right-of-way trimming within the Village is sensitive to property owner's desire for a spacious tree canopy. In addition to its vegetative and brush management program, HPE routinely identifies danger trees within its rights-of-way, and then either "trims-to-safe-condition" or removes the trees. Danger trees are identified by utility personnel while patrolling the lines, reading meters, working on or inspecting the system. In many instances, the public reports danger trees. A danger tree is removed if found within HPE right-of-way. For danger trees outside of the right-of-way, HPE contacts the property owner, explains the hazard, and with the owner's permission removes them. Where permission not granted, HPE periodically communicates with the property owner to attempt to obtain permission. In many cases, the Town will assist in debris removal if the Town determines that a danger tree may also endanger to a Town road."

Please note that is information is a DRAFT, subject to minor changes and PUC direction. I hope this satisfies your request.

Best,
Carol

From: Garton, Joanne [mailto:Joanne.Garton@vermont.gov]
Sent: Friday, April 12, 2019 1:24 PM
To: Carol Robertson
Subject: Vegetation Management Plan

Hello Ms. Robertson,

I am compiling some information for Hyde Park on rural road vegetation management and want to include specifics from the utility companies that serve the town and village regarding roadside vegetation management. Does Hyde Park Village Water & Light have a printed vegetation management plan? If so, I would like to read it and share it with some members of the town who are part of a roadside vegetation study piloted by the Vermont Urban & Community Forestry Program.

Thank you,

Joanne

JOANNE GARTON | *Resilient Right-of-Ways Project Coordinator*
VT Urban & Community Forestry Program
Department of Forests, Parks and Recreation
802-249-4217 | www.vtcommunityforestry.org
[Facebook](#) | [Twitter](#) | [YouTube](#) | [LinkedIn](#)

Join us on Thursday, May 2nd for the [Vermont Arbor Day Conference!](#)