Village of Lyndonville

Community Forest Strategic Action Plan

Prepared and funded by: Vermont Urban & Community Forestry Program

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Lyndonville Community Forest Strategic Action Plan

Town of Lyndon, Vermont

Municipal Administrator: Justin Smith

Planning Commission & Zoning Administrator: Annie Geratowski

Tree Warden: Town Selectboard

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Table of Contents

Project Overview

About the Care of the Urban Forest Project

In 2013 Vermont's Urban and Community Forestry Program (VT UCF) received a multi-year grant from the USDA Forest Service to assist priority VT communities in advancing their public tree programs. The project, *Care of the Urban Forest*, is an effort that supports these communities in three specific ways: (1) conducting a public tree inventory to assess urban forest structure, diversity, and health; (2) developing an urban forest strategic action plan, using information from the inventory; and (3) providing technical training for municipal employees and key volunteers to increase in-house capacity of proper public tree care. Lyndonville's Project was initiated in the spring of 2015 and was coordinated with and approved by the Town of Lyndon's Planning Commission and Zoning Administrator.

Importance of planning

Planning is key to effective management of any program. Good plans make the difference between cost- effective, pro-active management and costly, reactive crisis management. Plans establish focus and direction. They provide the framework for program implementation and a basis for consistent decision making. They are tools for determining budgets and other support needs.

Benefits provided by trees

The trees in our communities offer a wide variety of environmental, social, and economic benefits to the surrounding community, including but not limited to: stormwater mitigation, carbon dioxide (CO_2) sequestration and storage, air quality improvement, shade, wildlife habitat, aesthetic value, and increased tourism. For more information, visit: vtcommunityforestry.org/resources/benefits-trees.

Purpose and scope of Plan

Through the creation of this Plan, VT UCF is satisfying the second Project objective for the Village of Lyndonville. Through the implementation of this Plan, Lyndonville seeks to maximize the benefits of its community forest to steward and promote its ecological integrity and diversity.

Applicability and administration

This plan applies throughout the Village's inventoried 32 municipal managed streets and 8 public greenspaces. It also applies to newly planted public trees. Lyndon's Planning Commission and Zoning Administrator, under the direction of the Village Trustees and Town Selectboard and with assistance from the Public Works Department and the Town Tree Warden are responsible for implementing this Plan and seeing that program provisions are carried out.

Status of Urban Forest

Inventory

A public tree inventory was conducted in the Village of Lyndonville with the goals of accurately locating and assessing health and maintenance of municipally-owned trees within the public right-of-way (ROW), establishing records of all public trees to better coordinate their on-going maintenance, and identifying potential public tree planting (i.e., vacant) locations.

The intent of the public tree inventory was to enable Lyndon to better understand, steward, and manage its public trees more efficiently and cost effectively. The complete public tree inventory was conducted over the course of approximately 200 field hours in September of 2015. Data collected from the inventory informed the recommended management practices detailed in this Plan.

Methods

In total, the inventoried land area was approximately 0.59 square miles, encompassing the most densely populated section of Town. Each inventory team first determined the extent of the public ROW from each street curb, by taking the appropriate measurements and using the following equation: *ROW distance from curb = (ROW width - road width)/2.* Data from each identified public tree was recorded into the Collector for ArcGIS application using an iPad provided by VT UCF. The application is map-based and uses GPS and a base layer map to allow the user to input information about a tree, linking it to a particular geographic location. Data recorded for each public tree in Lyndonville included street name, overall condition, species, diameter class (using a measurement for diameter at breast height, or DBH), a recommendation for monitoring (yes/no), the presence of stem-girdling roots (yes/no), the need for pruning, staking, and/or mulching (yes/no), the need to remove staking and/or mulching (yes/no), additional comments, and the nearest house or building address. In most cases, a picture was also taken of each tree. Potential planting locations or grass strips (recorded as "Vacant") were also identified within the public ROW and in greenspaces during the inventory. Collected data is linked to the publicly accessible VT Agency of Natural Resources (ANR) Atlas online mapping website, which can be accessed here: http://anrmaps.vermont.gov/websites/anra/. Note that ANR's Atlas works best with Internet Explorer, and not Google Chrome.

The data were compiled and subsequently checked for quality, analyzed, and summarized using Microsoft Excel and QGIS, a free and open source geographic information system. Data were also analyzed through i-Tree, a free software suite developed by the USDA Forest Service (www.itreetools.org): i-Tree Streets uses sophisticated models to determine the monetary value and ecological benefits of trees and i- Tree Canopy uses aerial imagery and random point locations to produce

an estimate of land cover of a defined area - including tree canopy cover - that encompasses both public and private property.

Results

VT UFC, VT Department of Forests, Parks, and Recreation staff, and community volunteers completed an inventory of **244 trees** located within the public ROW of **32 streets** and on **8 Town-owned properties** and identified **41 potential tree planting locations**. The 244 inventoried public trees provide an estimated **$16,985 in benefits annually** to the residents and businesses of Lyndonville. In addition to the public trees inventoried, the aerial tree canopy assessment indicated an existing public and private land tree canopy cover of **37%** and an estimated long-term **stored CO_2 value of over $615,800**. Trees could potentially cover an additional **51%** of the land surface within Lyndonville's 0.59 sq. mile inventory area.

Lyndonville's community forest has **36 species** in **20 genera**. The most common species are sugar maple (21% of the community forest) and crabapple (16%), and the most common genera are maple (36%), crabapple (16%), and spruce (9%). 53% of Lyndonville's community forest has a diameter at breast height (DBH) measurement between six and 18 inches. 62% of Lyndonville's community forest is considered to be in "Good" condition, 27% is considered in "Fair" condition, 9% is considered in "Poor" condition, and 1% is dead. 77 (32%) public trees were assessed as in need of monitoring during the inventory.

- For more information on inventory results, refer to the 2015 comprehensive report.

Vision of Community Forest

Lyndonville has a long-term vision of a Town-supported, diverse community forest, efficiently and effectively maintained for good quality and longevity and an increase in urban canopy cover. The Town of Lyndon's future tree program will be supported through the creation of a Town Tree Committee and annual tree budget. In order to reach this vision, the Town has established the following goals:

Short-term action steps

1. Establish a systematic annual tree maintenance and planting schedule.
2. Establish a monitoring program for the 77 trees inventoried as in need of monitoring, which includes all trees that were inventoried as in poor or fair condition.
3. Remove, and replace if appropriate, the 3 dead trees inventoried.
4. Conduct public outreach and education.
5. Establish an annual tree budget.

Long-term goals

1. Develop a Town Tree Committee or Board.

2. Select one interested person to serve as the Town's Tree Warden.
3. Increase genera and species diversity of community forest by strategically choosing native tree species for all future plantings.
4. Increase the Town's capacity to conduct tree care practices in-house through training relevant Town staff in best tree care practices and a stable annual tree program budget.
5. Have a community-supported tree program where public trees are proactively maintained instead of reactively removed.

Updating inventory data

As current public trees within the inventory area of Lyndonville are maintained or removed, and new public trees are planted, the Town/Village Tree Warden is expected to update inventory data. This ensures efficient maintenance and monitoring over the long-term. Data will be updated directly in the Microsoft Excel 2015 inventory megadata file. Regular maintenance records should be maintained in house. The Town/Village will develop an efficient system for maintaining these types of data. For all **tree removals, condition changes, and new tree plantings**, the Tree Warden will send updates **annually by December 31st** to Elise Schadler of VT UCF, at elise.schadler@uvm. Elise will communicate with VT ANR directly to update the data displayed in ANR's online atlas. It is recommended to share updated data files with all invested bodies involved in urban forest management (e.g., the Public Works Department).

Public Tree Maintenance and Planting Plan

Use the timeline table in **Appendix C** to track your progress of implementing the actions steps introduced below.

Note all public tree maintenance and planting should abide by the Tree Care Industry Association (TCIA) best management practices, or the A300 Standards for Tree Care, which are available for purchase and accessible here: http://tcia.org/business/ansi-a300-standards.

Goals

1. Increase genera and species diversity of community forest and overall forest canopy cover by establishing a systematic annual tree planting program.
2. Promote longevity of the community forest by establishing a systematic and routine pruning and maintenance schedule.
3. Increase in-house capacity to efficiently and effectively implement Lyndonville's tree program.

Short-term action steps*

1. Visit and assess the 41 vacant locations potentially suitable for future tree plantings by a Certified Arborist (Appendix B) or the Town's Tree Warden. Eliminate or disregard sites deemed unsuitable for tree plantings.
2. Assess the 77 trees identified as in need of monitoring during the inventory by a Certified Arborist (Appendix B) or the Town's Tree Warden.
3. Meet with Green Mountain Power to inform them of the Town's new plan and specifically the 15 plus trees inventoried as in conflict with power lines.
4. Remove – and replace if appropriate – the 3 inventoried dead trees (doing so would reduce the number of public trees in need of monitoring to 74).
    a. Two (a sugar maple and American elm) of the inventoried dead trees have a DBH between 6" and 12" and are located on **High Street.** The other inventoried dead tree is an unidentified broadleaf deciduous species with a DBH between 3" and 6", and is located in a **greenspace** at the corner of Depot Street and Broad Street.
5. Update data with tree removals, condition changes, and new plantings and send to Elise by **December 31st** each year (**annually**).
6. The Town of Lyndon will appoint one interested and capable staff member or resident to serve as Lyndon's/Lyndonville's active Tree Warden.

* Unless otherwise stated as being an 'annual' or 'ongoing' task, short–term action steps are to be completed within **0 – 5 years** of this Plan's approval.

7. Acquire/purchase set of the Tree Care Industry Association (TCIA) best management practices or the A300 Standards for Tree Care for the use of the Tree Warden and the future Tree Committee.
8. The Town of Lyndon will support one staff member or the Tree Warden to become an ISA Certified Arborist. For more information, visit: http://www.isaarbor.com/certification/becomecertified/commonquestions.aspx or http://www.isaarbor.com/certification/resources/cert_Application_CertifiedArborist.pdf.

Long-term action steps[†]

1. Establish a systematic tree planting schedule, prioritizing plantings in previously identified and assessed vacant locations (planting **ongoing**). Specifically:
    a. Plant **10 trees a year** (preferably native species) to increase the public tree population and ensure age and species diversity using the Tree Selection guide (Appendix D) to choose suitable species.
    b. Should the town add a sidewalk along Route 5, large tree species (e.g., red oak) should be considered for planting.
    c. When selecting trees for plantings, choose species outside of the *Acer* (maple), *Malus* (crabapple), or *Picea* (spruce) genera.
    d. Prioritize plantings on **Westview Street**, **Charland Street**, and **Pinehurst Street** as they require the greatest need for canopy cover.
    e. Avoid consecutive plantings of the same tree species, especially when planting disease-prone trees, such as American elm. Princeton elm or liberty elm are disease-resistant species, and may be preferable elm species to plant.
2. Establish a systematic tree maintenance (e.g., pruning, adding or removing mulch or cables/braces) schedule (maintenance **ongoing**). Specifically:
    a. Visit each public tree every **seven years** to conduct necessary maintenance.
    b. Prioritize maintenance of the **89 trees** considered as in "fair" or "poor" condition during the inventory. Begin efforts in **South Street Park, Bandstand Park,** and **Veterans Park.**
    c. Prioritize pruning, as nearly half of Lyndonville's inventoried were assessed as in need. Most of the trees in need of pruning are **sugar maple** and are located within the Town's inventoried public **greenspaces**, **Park Avenue, Depot Street,** and **Pinehurst Street.** The inventoried **red maples** are the Village's current cohort of trees to mature, and therefore should also take precedence for pruning.

[†] Unless otherwise stated, long-term action steps are to be completed within **6 – 10 years** of this Plan's approval.

d. Prioritize mulch removal or reductions from the inventoried volcano mulched trees planted within **South Street Park**, **Bandstand Park**, and **Veterans Park**.
e. Prioritize adding mulch to trees inventoried as in need on **Main Street**, **Elm Street**, and **Park Avenue.** To reduce costs, use the removed mulch from the inventoried volcano-mulched trees.
f. Stake the **1 tree** identified as in need during the inventory. This tree is a **sugar maple** and is located in **Veterans Park.**
g. Supplement maintenance costs by working with Green Mountain Power to ensure pruning of the over **15 trees** explicitly noted to be in conflict with power lines is done according to the A300 Standards for Tree Care.

3. Revisit the public tree inventory to reassess the condition, structural and species diversity, and maintenance needs of Lyndonville's community forest and ensure data is updated. This should be completed **eleven years post this Plan's approval.**

- Note the Town may consider sourcing tree stock for new plantings from Grime Nursery in Waterford, VT or New England Nursery Sales, Inc. in St. Johnsbury, VT (Appendix B). New England Nursery Sales, Inc., however, does not plant trees, planting their stock would be done by volunteers or town staff.
- Proper mulch depth around the base of a tree is 2-4". Mulch should be applied in a donut shape around the tree, with no mulch directly touching the trunk.

Funding, Partners, and Operations

Goals

1. Identify and secure ways of establishing and maintaining an explicit annual tree program budget.
2. Intentionally increase citizen engagement with Lyndonville's public and private trees.
3. Increase in-house capacity of the Town Tree Warden and relevant municipal departments (e.g., the Dept. of Public Works.) to carry out tree program provisions.

Action steps[‡]

1. Secure funding for Lyndonville to remove dead trees, maintain living trees, and plant new trees. This will be an **ongoing** and **annual** process.
    a. Seek funding from the **Rotary Club** of Lyndonville (Table 3) by attending meetings and initiating dialogue. The Club may be able to donate or match funds provided from the Town.
    b. Establish a relationship with the **Lyndon Area Chamber of Commerce's Economic Outreach Program** (Table 3). Not only can the Chamber of Commerce be a funding source, but it can help coordinate tree program fundraising events and raise awareness.
2. Explore and apply for grant funding opportunities applicable to Lyndonville's community forest needs (Table 1). This will be an **ongoing** and **annual** process.
3. Establish a Town or Village Tree Committee responsible for working with the Tree Warden in ensuring this Plan is implemented and the tree program is supported.
4. Work with Lyndon's public schools to engage students in annual tree planting and maintenance events (**ongoing**).
5. The Town Tree Warden will become familiar with the Vermont Tree Warden Statutes (Appendix A), which details the responsibilities of appointed tree wardens.
6. Collaborate with Paths Along Lyndonville (PAL, Table 3) to secure relevant funding (Table 1) and initiate volunteer tree planting and maintenance projects along the recreational paths in Lyndonville (**ongoing**).

[‡] Unless otherwise stated as being an 'annual' or 'ongoing' task, action steps should be completed within **0 – 5 years** of this Plan's approval.

Funding

Current budget

Lyndonville **does not** currently have an explicit annual budget for tree removals, maintenance, or plantings. However, tree maintenance and planting costs are allocated through the Village and Town Beautification Fund ($5,000, $3,000 of which is designated for park materials and supplies) and the Town landscaping budget ($1,000), making total funds for tree care **$6,000.** Historically, the Town allocates these funds towards mulching trees, repainting park benches, aesthetic improvements, and weed whacking.

Once Lyndonville's tree program becomes more systematic and proactive, we anticipate more efficient and intentional tree care efforts would be more cost effective. As this occurs, we hope to increase funds allocated towards tree maintenance, planting, and professional development.

Grant or funding opportunities

The annual grant programs listed below provide excellent opportunity for Lyndonville to expand their public tree budget, and thus community forest management capacity, without burdening the Town's financial resources. It is recommended these be considered as viable methods of securing necessary funding for desired tree maintenance equipment. planting materials, and community forest management practices.

Table 1. Current funding (i.e., grant) opportunities

Certified Local Government Program
Federal grants available for resource identification and planning, National Register nominations, downtown planning, public education, archeological studies, and building feasibility studies. **Range**: $500 - $25,000 **Eligibility**: Municipalities that are enrolled as Certified Local Governments **Deadline**: Annually in January **Contact**: Devin Colman, (802) 828-3043 devin.colman@state.vt.us **Website**: http://accd.vermont.gov/strong_communities/preservation/planning/clgp
Community Development Block Grant Program
Accessibility Modification Grants – Federal grants to bring existing municipal buildings and non-school libraries into compliance with the Americans with Disabilities Act (ADA). **Implementation Grants** – Federal grants for economic development, housing, public facilities, and public services that will benefit low/moderate income individuals, eliminate slums or blight, or address an urgent need.

Planning Grants – Federal grants for community development planning, downtown planning studies, and project development to benefit people with low to moderate incomes and/or eliminate "slums and blight."
Range: $30,000 - $1,000,000
Eligibility: Municipalities and/or municipalities on behalf of organizations and private owners
Deadline: Open application with funding decisions made throughout the year
Contact: Josh Hanford, (802) 595-1385 josh.hanford@state.vt.us
Website: http://accd.vermont.gov/strong_communities/opportunities/funding/vcdp

Downtown Transportation Fund

State grants for municipalities to finance transportation-related capital improvements in support of economic development, within or serving a Designated Downtown, including construction or alteration of roads and highways, parking facilities, pedestrian and streetscape improvement, rail or bus facilities or equipment, and underground relocation of electric utility, cable and telecommunications lines.
Range: 50% of overall project costs up to maximum of $100,000
Eligibility: Municipalities with a Designated Downtown
Deadline: Annually in March
Contact: Gary Holloway, (802) 828-3220 gary.holloway@state.vt.us
Website:http://accd.vermont.gov/strong_communities/opportunities/funding/downtown_transportation_fund

Municipal Planning Grant Program

State grants for a wide range of municipal planning projects including municipal land use plans, zoning and subdivision bylaws, designated downtown and village planning (including village greens).
Range: $2,500 - $20,000
Eligibility: Municipalities with adopted plans confirmed by their regional planning commission
Deadline: Annually in September
Contact: Annina Seiler, (802) 828-1948 annina.seiler@state.vt.us
Website:http://accd.vermont.gov/strong_communities/opportunities/funding/overview/municipal_planning_grants

Recreational Facilities Grants Program

Matching state grants for capital costs associated with the development and creation of community recreational opportunities.
Range: $1,000 - $25,000
Eligibility: Municipalities and non-profit organizations
Deadline: Annually in October
Contact: Chrissy Gilhuly, (802) 828-3519 mailto:christine.gilhuly@state.vt.us
Website: http://bgs.vermont.gov/home

VTrans Transportation Alternative Program

State 80:20 matching grants for the construction, planning, and design of bike and pedestrian facilities (on or off road), sidewalks, bicycle infrastructure, lighting, and others. Details on website.

Range: $50,000 - $300,000. Local match of 20%.

Eligibility: Municipalities, transit agencies, school district, and regional planning commissions

Deadline: Annually in October

Contact: Scott Robertson, (802) 828-5779 scott.robertson@state.vt.us

Website: http://vtransengineering.vermont.gov/bureaus/mab/local-projects/transportation-alternatives

VTrans Bicycle and Pedestrian Program

State 90:10 matching grants for the scoping, design, and construction of bike and pedestrian facilities, sidewalks, bicycle lanes, crosswalks, shared-use paths, and lighting. Details on website.

Range: No minimum or maximum range. Local match of 10%.

Eligibility: Municipalities, transit agencies, school district, and regional planning commissions **Deadline**: Annually in July

Contact: Jon Kaplan, (802) 828-0059 jon.kaplan@state.vt.us

Website: http://vtransengineering.vermont.gov/bureaus/mab/local-projects/bike-ped

VTrans/ACCD Strong Communities, Better Connections Program

State 90:10 matching grants for planning that align land use planning and community revitalization with transportation investments. Details on website.

Range: No minimum or maximum range. Local match of 10%.

Eligibility: Municipalities, located outside of Chittenden County with a confirmed planning process.

Deadline: Pilot year, future funding to be determined.

Contact: Jackie Cassino, (802) 828-2758 jackie.cassino@state.vt.us or Richard Amore, mailto:richard.amore@state.vt.us

Website: http://vtransplanning.vermont.gov/programs/scbc

ANR Recreational Trails Grant Program

State 80:20 matching grants for the maintenance, restoration, design and construction of recreational trails. Details on website.

Range: Maximum of $20,000. Local match of 20%.

Eligibility: Municipalities, located outside of Chittenden County with a confirmed planning process.

Deadline: Annually in February

Contact: Sherry Winnie, (802) 760-8450 mailto:sherry.winnie@state.vt.us

Website: http://fpr.vermont.gov/recreation/grants/rtp

ANR Ecosystem Restoration Grant Program

State grants for the design and construction projects that target nonpoint sources of pollution that cause or contribute to the state's surface waters. Details on website.

Range: Maximum of $250,000. Local match varies.

Eligibility: Municipalities, regional organizations, non-profits associations, citizen groups, and state agencies.

Deadline: Two rounds annually, varies depending on funding.

Contact: David Pasco, (802) 490-6112 david.pasco@state.vt.us

Website: http://www.watershedmanagement.vt.gov/grants.htm

ANR Caring for Canopy Grant Program

State 50:50 grants to help communities care for tree canopy by taking the necessary actions to developing and sustaining a community-wide tree program, including tree plantings, inventories, maintenance, and planning. Details on website.

Range: $500 - $5,000. Local match of 50%.

Eligibility: Municipalities and non-profits associations.

Deadline: Annually in April

Contact: Danielle Fitzko, (802) 598-9992 mailto:danielle.fitzco@state.vt.us

Website: http://fpr.vermont.gov/forest/community_forests/community_canopy_grants

TD Bank Green Streets Grants Program

Range: up to $20,000

Eligibility: Municipalities recognized as a Tree City USA with low- to moderate income neighborhoods

Deadline: Annually in December

Contact: Arbor Day Foundation, 1-888-448-7337 tdgreenstreets@arborday.org

Website: https://www.arborday.org/programs/tdgreenstreets/

Potential opportunities:

Individual street trees have been recognized as an effective method of municipal stormwater management by the State of Vermont. With new Lake Champlain Total Maximum Daily Loads and VT municipal water quality standards, both funding and collaborative opportunities are likely to arise.

- Sign up for TREEmail to receive regular updates and visit http://dec.vermont.gov/watershed/stormwater for more information.

Operations and partners

Training opportunities

Participating in the following trainings (Table 2) will ensure key stakeholders (Table 3) will follow best management practices in stewarding Lyndonville's community forest. Specifically, Lyndon's Tree Warden and Public Works Department should be regularly trained to increase capacity and efficiency.

Table 2. Professional and volunteer training opportunities pertinent to Lyndonville's tree program

Organization	Training/Workshop	Logistical information	Contact
VT UCF	Annual Tree Stewards Conference	http://vtcommunityforestry.org/get-involved/workshops-webinars	Gwen Kozlowski Email: gwen.kozlowski@uvm.edu Phone: 802-656-6646
	Forest Pest First Detector	http://www.vtinvasives.org	
	SOUL Tree Stewards	http://vtcommunityforestry.org/get-involved/tree-stewards	
TREEage	Subject to change annually, but typically include pruning, tree care, and planting workshops	http://www.treeage.org/Home/about-us	Marie Ambusk Email: marie.ambusk@gmail.com Phone: 802-999-1126
Greenworks Nursery and Landscape Association	Subject to change annually, but typically include: Tree Pruning Basics, Alien Invaders, Smart Landscape Solutions, etc.	http://greenworksvermont.org/vermont-flower-show/workshops/	Contacts vary based on workshop, visit provided website for information
VT Trans: VT Local Roads	Subject to change annually, but typically offer: Game of Logging, Rivers and Roads, Microsoft Excel Tips & Tricks, OSHA Road Safety and a Road Scholar Program	http://localroads.vermont.gov/workshops	Contacts vary based on workshop, visit website for information, or call 802-828-3537
Hivernant Arborists, LLC	Annual tree care and maintenance trainings	http://www.hivernantarborists.com/Training.html	802-343-6905
Northeast Woodland Training	Game of Logging, tree felling and chainsaw safety	http://www.gameoflogging.com/training_organizations.php	John Adler, Dave Birdsall, Al Sands, Mark Saulsgiver Email: info@woodlandtraining.com Phone: 802-681-8249

Community Outreach, Education, and Stewardship

Goals

1. Promote citizen engagement, awareness, fundraising, and stewardship through active and informed community outreach and education.
2. Promote in-house awareness and support of the Town's public tree program.

Action Steps[§]

1. Collaborate with the Chamber of Commerce's Economic Outreach Program to host annual Arbor Day celebrations. Over time, it may be most effective to establish a Town Arbor Day Group, or allocate this responsibility to the future Tree Committee or Board. This annual celebration will increase awareness of the Town's tree program, educate residents on proper tree care, and can serve as a fundraising opportunity. Arbor Day is the first Friday of May (**annually**).
2. Make residents aware of Vermont's local tree sales such as those conducted by TREEage, Branch Out Burlington, the Harford Tree Board, and the Winooski Natural Resources Conservation District (**ongoing**).
3. The Town Tree Warden should visit at least one public school classroom each year to promote Arbor Day Celebrations and/or Lyndonville's community forest (**prior to May annually**).
4. Inform residents of the signs and symptoms of the emerald ash borer and Asian longhorned beetle and encourage them to monitor for these invasive tree pests in their community forest through training in the Forest Pest First Detector Program (Table 2) (**ongoing**).
5. Host one public community meeting or workshop annually, led by the Town Tree Warden to communicate the benefits of Lyndonville's public trees and inform residents of proper tree care practices (**annually**).
6. Work with the future Tree Committee to establish an annual tree planting day where the Committee, interested residents, the Tree Warden, and relevant staff members (e.g., Public Works Highway Foreman) congregate and either plant trees following best practices or maintain (e.g., prune, mulch, remove mulch, etc.) recently planted trees following TCIA best management practices or the A300 Standards for Tree Care. Note, depending on the species being planted, the planting day should take place in the spring or fall (**annually**).
7. Inform key stakeholders (Table 3) of this Plan's creation and their respective responsibilities if applicable.

- Contact Gwen Kozlowski, VT UCF's Forest Outreach Specialist for support and ideas: gwen.kozlowski@uvm.edu.

[§] Unless otherwise stated as being an 'annual' or 'ongoing' task, action steps should be completed within **0 – 5 years** of this Plan's approval.

Informing key stakeholders

Relevant stakeholders should be informed of this Plan's creation and implementation. Reference the table below to contact the key stakeholders in the Town of Lyndon and Village of Lyndonville. Keep track of your communication by checking off stakeholders as they are informed.

Table 3. Contact stakeholders regarding the creation of this Plan

Stakeholder	Main contact and title	Contact info	Informed?
Zoning Administrator and Planning Director	Annie Geratowski	Email: lyndon.zoning@gmail.com Phone: 802-626-1269	✓
Chamber of Commerce	Karen Carey, President	Email: info@lyndonvermont.com Phone: 802-626-9696	✓
Chamber of Commerce	Cheryl McMahon, Secretary	Phone (Library): 802-626-5475 or 802-626-9696	
Chamber of Commerce	Steve Nichols, Lyndon Community Partnerships	Phone: 802-626-9800	
Department of Public Works	Joe Dauphin, Supervisor	Email: lyndonvillewater@yahoo.com Phone: 802-626-5468	✓
Department of Public Works	Robert Nutting, Highway Foreman	Email: lyndonroads@myfairpoint.net Phone: 802-626-5877	
Municipal Offices	Justin Smith, Municipal Administrator	Email: Justin@lyndonvt.org Phone: 802-626-5834	✓
Municipal Offices	Dawn Dwyer, Town and Village Clerk	Email: dawn@lyndonvt.org Phone: 802-626-5785	
Village Trustee	Ron Aiken	Email: raiken51@charter.net Phone: 802-427-3149	✓
Village Trustee	Heather Bollman	Email: hevan418@gmail.com	✓
Village Trustee	Doug Conly	Email: doug.conly@wicor.com Phone: TBD	✓
Village Trustee	Vacant Seat		

Village Trustee	Chris Hunter	Email: chris8794@yahoo.com Phone: 802-535-1509	✓
Town Selectboard	Daniel Daley, Chair	Email: dan.daley@charter.net Phone: 802-793-6292	
Town Tree Warden	Selectboard: Daniel Daley, Marty Feltus, Kermit Fisher	Email | Phone: dan.daley@charter.net | 802-793-6292 marty.feltus@yahoo.com |802-626-9516 kingfisher13@myfairpoint.net |802-626-5179	
Rotary Club of Lyndonville	Joe LeClair, President (2017)	Email: joseph.leclair@edwardjones.com Phone: 802-626-7224	
Local Arborist	Neil Lefebvre	Email: Phone: (802) 535-4752	
Paths Around Lyndonville (PAL)	Cathy Boykin	Email: Cboykkin88@gmail.com Phone: 802-626-9791	✓
Lyndonville Electric Dept.	Ken Mason	Email: kmason@lyndonvilleelectric.com Phone: 802-626-3366	
County Forester	Matthew Langlais	Email: matt.langlais@vermont.gov Phone: 802-751-0111	
District Forester	Neil Monteith	Email: neil.monteith@state.vt.us Phone: 802-751-0118	

Appendices

A. 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.)

B. List of relevant contacts

Representing Role/Responsibility	Name	Contact
Zoning Administrator and Planning Director	Annie Geratowski	802-626-1269 lyndon.zoning@gmail.com
Chamber of Commerce President	Karen Carey	802-626-9696 info@lyndonvermont.com
Chamber of Commerce	Cheryl McMahon, Secretary	Phone (Library): 802-626-5475 or 802-626-9696
Chamber of Commerce Lyndon Community Partnerships	Steve Nichols	802-626-9800
Dept. of Public Works Supervisor	Joe Dauphin	802-626-5468 lyndonvillewater@yahoo.com
Dept. of Public Works Highway Foreman	Robert Nutting	802-626-5877 lynonroads@myfairpoint.net
Town and Village Clerk	Dawn Dwyer	802-626-5785 dawn@lyndonvt.org
Municipal Administrator	Justin Smith	802-626-5785 justin@lyndonvt.org
Village Trustee	Ron Aiken	802-427-3149 raiken51@charter.net
Village Trustee	Heather Bollman	hevan418@gmail.com
Village Trustee	Doug Conly	Phone: TBD doug.conly@wicor.com
Village Trustee	Vacant Seat	
Village Trustee	Chris Hunter	802-535-1509 chris8794@yahoo.com
Tree Warden	Selectboard	Contact the Chair and members below:
Town Selecboard Chair	Daniel Daley	802-793-6292 dan.daley@charter.net
Town Selectboard Member	Martha Feltus	802-626-9516 marty.feltus@yahoo.com
Town Selectboard Member	Kermit Fisher	802-626-5179 kingfisher13@myfairpoint.net
Rotary Club of Lyndonville	Joe LeClair, President (2017)	802-626-7224 joseph.leclair@edwardjones.com

Development Review Board	Jon Prue	802-626-8218 vtjonny5@yahoo.com
Planning Commission Chair	Susan Mills	802-626-3366 smills@lyndonvilleelectric.com
Cemetery Sexton	Brian Coderre	802-829-8862
Village Agent	Peter Morrissette (until 2017)	Morrissette and Young Lawfirm: 802-626-5200
Local ISA Certified Arborists	Jacob or Jessica Bakowski, St. Johnsbury	802-342-6634 jabakowski@gmail.com jessicaloub17@gmail.com
	Michael Marcus, Barton	Asplundh Tree Expert: 802-487-4843 mikemarcus@gaw.com
	Lincoln Earle-Centers, Marshfield	Sylvan Tree Care: 802-279-7818 SylvanTreeCareVT@gmail.com
ISA Arborist Certification information	N/A	1-888-427-8733 isa@isa-arbor.com
Tree City USA Designation information	Arbor Day Foundation	1-888-448-7337 https://www.arborday.org/programs/treecitytusa/index-become.cfm
ISA Certified Arborist Preparatory Course	Heather Leff, New England Chapter	978-844-0441 heather@newenglandisa.org
VT UCF Technical Assistance Coordinator	Elise Schadler	802-656-2657 elise.schadler@uvm.edu
VT UCF Outreach Specialist	Gwen Kozlowski	Gwen.kozlowski@uvm.edu
District Urban Forester, VT FPR	Neil Monteith	802-751-0118 neil.monteith@state.vt.us
County Forester, VT FPR	Matthew Langlais	802-751-0111 matt.langlais@vermont.gov
New England Nursery Sales, Inc.	N/A	800-639-1722 nens@charter.net http://www.newenglandnurserysales.com
Grime Nursery	N/A	802-748-1915 grimenursery@waterfordvt.net http://www.grimenurseryvt.com/home

C. Checklist of action steps and estimated associated costs

Action Step	Targeted time of completion	Estimated associated costs	Date completed	Funds spent ($)	Notes
PUBLIC TREE MAINTENANCE AND PLANTING PLAN					
1. Asses 41 vacant planting locations	Within 0 – 5 years	Staff time			
2. Assess 77 trees in need of monitoring	Within 0 – 5 years	Staff time			
3. Contact Lyndonville Electric and contract pruning of 15 trees in conflict of utility wire	Within 0 – 5 years	$0.00			
4. Remove 3 dead trees	Within 0 – 5 years	Staff time*			
5. Update appropriate tree data	December 31st annually	Staff time			
6. Select 1 Town staff member or volunteer to serve as the active Tree Warden	Within 0 – 5 years	$0.00			
7. Acquire TCIA BMPs or A300 Standards	Within 0 – 5 years	$200.00			
8. ISA arborist certification of 1 Town staff member or the Tree Warden	Within 0 – 5 years	Exam fees: $150-$375 Prep course: $175-$210 Study guide: $85-$125			
9. Establish systematic tree planting schedule, planting 10 trees a year	Within 6 – 10 years, planting ongoing	Nursery stock: $1,750-$3,000/year Labor: $400**			
10. Establish systematic tree maintenance schedule, visiting each tree every 7 years	Within 6 – 10 years, maintenance ongoing	Depends/TBD			
10b. Apply necessary tree care for the 89 trees inventoried as in “fair” or “poor” condition	Within 6 – 10 years	Depends/TBD			
10c. Prune the 108 inventoried as in need	Within 6 – 10 years	Staff time			

10d. Remove mulch from 81 trees inventoried as in need of reductions	Within 6 – 10 years	Staff or volunteer time			
10e. Add mulch to 14 trees inventoried as in need	Within 6 – 10 years	Staff or volunteer time			
11. Reassess condition, structural and species diversity, and maintenance needs of public trees, update inventory data	11 years post Plan's approval	Recommended to apply and use grants, if not, costs are staff time			
FUNDING, PARTNERS, and OPERATIONS					
1. Secure funding for Town tree program	Annually	Staff time			
2. Apply for grant funding	Annually, see Table 1	Staff time			
3. Establish Town Tree Committee	Within 0 – 5 years	Staff time			
4. Public school collaboration for tree fundraising, planting, or maintenance	Ongoing	Staff time			
5. Tree Warden familiarizes with VT Tree Warden Statutes	Within 0 – 5 years	Staff time			
6. Collaborate with PAL	Ongoing	Staff time			
COMMUNITY OUTREACH, EDUCATION, and STEWARDSHIP					
1. Host annual Arbor Day Celebration	Annually in May	Staff time, $100-$500/year optional for event supplies			
2. Increase resident awareness of VT local tree sales	Ongoing	Staff time			
3. Visit 1 public school classroom a year	Prior to May annually	Staff time			
4. Increase residential awareness of and monitoring capacity for EAB and ALB	Ongoing	Staff time			
5. Host 1 community meeting or workshop a year	Annually	Staff time, $100-$500/year optional			
6. Establish an annual tree planting day	Annually	Staff/volunteer time + planting			

		materials ($100-$500)			
7. Inform key stakeholders of this Plan and their involvement (if applicable)	Within 0 – 5 years	Staff time			

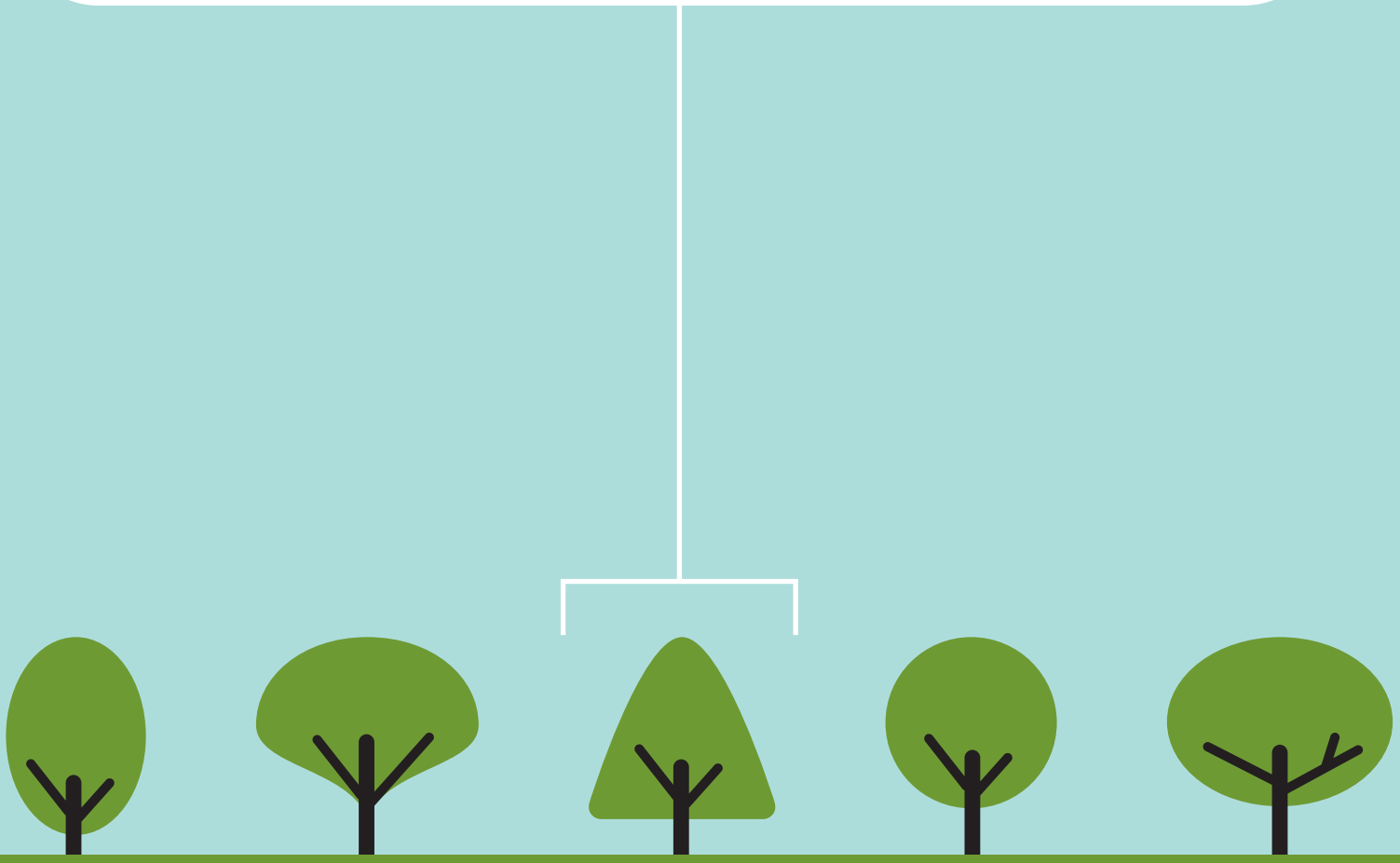
*Because these are relatively young/small trees, it is recommended the Town/Village remove these trees in-house. Contracting these removals to a private company will add costs.

**Excludes costs of additional planting materials such as stakes. Based on an estimated average cost of $175 - $300 per 2.0-3.0" caliper tree. Quotes were supplied from Grime Nursery in Waterford, VT and are subject to change. Note Grime Nursery also installs trees with a labor cost of about $40/tree.

If all action steps are implemented, the **total associated estimated costs** of Lyndonville's community forest management is **$3,060** - **$5,810**. This range is derived from summing the lowest and highest estimated costs in the "estimated associated costs" column. It **does not** include staff/volunteer time, and only estimates costs for one year of management. Since Lyndonville conducts most tree maintenance in-house, staff time will likely significantly increase the total associated estimated costs of Lyndonville's community forest management. Similarly, the associated estimated costs of Lyndonville's tree program will also significantly increase if the Village decides to contract out maintenance work.

D. Tree selection guide

VERMONT TREE SELECTION GUIDE



PLANT **LIVE** GROW

Vermont Urban & Community Forestry Program

part of the Vermont Department of Forests, Parks & Recreation

in partnership with the University of Vermont Extension

Table of Contents

The guide was funded in part by the USDA Forest Service, State and Private Forestry.

Recognition is given to all the people who offered assistance to this project, especially Pamelia Smith, professor, and Elizabeth Clark, graduate, of Vermont Technical College who helped develop the tree list, to David Schneider, Warren Spinner, and Jeff Young for their review, and to Sensible World for the design.

Introduction

Are you getting ready to plant a tree or maybe several trees? Whether you are planning to plant on your own lawn, in a community park, along a street, or in a tree pit, careful tree selection is essential to the tree's long-term success. We have all heard time and time again to plant 'the right tree in the right place'. Our latest Tree Selection Guide for Vermont was developed just for this purpose - to help you match trees to sites to achieve lasting shade.

To use this guide, you should first consider four questions that will help you critically evaluate the planting purpose, the site, future needs and desires. Begin by reviewing the following text 'Questions to Consider when Planting Trees', than fill in the 'Tree Selection Worksheet' on page 8. The completed worksheet can then be compared to the tree list and lead you to selecting the right tree(s) for the right place(s).

We are excited that in addition to this printed version of the tree guide, we also able to offer an online searchable database that allows you the flexibility to filter the tree guide's information for easier tree selection. The searchable database can be accessed from our website at www.vtcommunitytrees.org.

RIGHT TREE - RIGHT PLACE

When we plant trees, they are often located in sites that are much less suitable than native forests for tree growth. Trees within developed communities are often exposed to human caused stresses such as air pollution, elevated temperatures, compacted soils, and confined spaces. Because healthy community trees are the foundation of healthy forests, proper selection of tree species and planting site is crucial. Careful planning should ensure that the "right tree" is established in the "right place", or the plants can outgrow a site, damage roads, foundations and sidewalks, or be susceptible to diseases and insect infestations.

Consider the following four questions before establishing trees for long-term growth and health:

- What is the purpose and use of the planting?
- What are the site conditions above and below ground?
- What type of maintenance will be required?
- What is the best tree species for long-term success?

City Hall Park, Burlington, VT

PURPOSE OF PLANTING

Tree species and varieties vary tremendously in the services and benefits that they can provide. To achieve desired outcomes, it is necessary to identify the purposes for the planting. For example, specific tree species and varieties can be chosen for one or more of the following characteristics:

Aesthetics

- Provide color, flowers or fruit
- Compliments a building or beautifies a street, park, home, institution or neighborhood

Environmental Improvement

- Reduce soil erosion and manage stormwater
- Improve air and water quality
- Offer shade in the summer and reduce winds in the winter
- Provide wildlife habitat and food
- Reduce noise and create buffers
- Increase plant diversity

Social Benefits

- Instill community pride
- Provide a quiet, peaceful oasis
- Offer outdoor recreation such as bird watching

Economic Advantages

- Increase property values
- Encourage patronage to downtown retails and tourism
- Reduce energy costs

Despite the numerous advantages that trees provide, there are also potential problems that must be considered. Trees can contribute to:

- Litter with messy fruit, branches or large leaves
- Damage to pavement and utilities
- Costs for establishment, maintenance, and removal

This planting meets several indented purposes: screening, traffic calming, gateway, fall color and shade .Leddy Park, Burlington, VT.

Site Conditions

BELOW GROUND ASSESSMENT

Roughly 80 percent of urban tree health problems originate from conditions below ground. A tree is supported both structurally and nutritionally by its roots, and any limitations placed thereon will result, directly or indirectly, in future health problems.

Soil Texture, defined by the soil's relative amounts of sand, silt and clay, influences moisture holding capacity, drainage rate, and nutrient availability. Clay soils retain moisture and nutrients but are prone to compaction.

Understanding a site's limitations and potentials is necessary for successful plantings and involves analyzing above and below ground conditions.

Sandy soils drain well and resist compaction, but can be nutrient poor and moisture deficient. Soil texture can be approximately evaluated by rubbing moistened soil between your fingers. Sandy soils feel gritty, clay soils feel smooth, and loam soils are a combination of both gritty and smooth.

Soil Structure is determined by the arrangement of soil particles (sand, silt and clay) and their associated pore spaces. Land development and use often degrades soil by increasing compaction, adding pollutants, excavating and removing topsoil, and fostering runoff and erosion. Accordingly, soil assessment and requiring best management practices for soil conservation is necessary for a successful community forestry program. The dominant soil constraint in urban areas is soil compaction, which destroys the soil structure by reducing pore spaces needed for air, water and roots. Depending upon the degree of compaction, plant health and survival can be severely reduced. Although plant species vary in tolerance, no plant is immune to the negative impacts of severely compacted soils. The addition of soil amendments, selecting more tolerant species and tillage are some options. The measurement of the soil's bulk density, the weight of the dry soil per unit volume, is an alternative useful measurement; as bulk density increases, compaction increases. Another helpful indicator of soil health is the presence or absence of earthworms. In more favorable soil conditions, earthworms will be plentiful throughout the soil upper horizon.

Drainage is the soil's ability to intercept and remove surface or groundwater and is influenced by soil texture and structure. Clay soils which are easily compacted often lack poor spaces to allow water to drain freely limiting the availability of oxygen to the roots. Sandy soils with large pore hold little water and are often too dry for many trees. Soil compaction and obstacles such as bedrock and other impermeable objects beneath the soil can also inhibit drainage. To determine your sites drainage, observe the site, especially after a rain event. Is the water draining or is it standing on the surface? A day or so after a rain event, dig into the soil, is it wet or dry. If you want a more accurate drainage rate (fast, moderate, slow), dig a hole one foot deep and fill it with water. Fast drains more than 6 inches in an hour; moderate drains 1 – 6 inches per hour, and slow less than 6 inches per hour. The addition of organic matter or choosing drought tolerant species is recommended for dry soils and installing supplemental drains or choosing species that can tolerate intermittent flooding is recommended for wet soils.

Soil pH and plant nutrients are important for determinants of a site's suitability for plant growth. The successful growth of most plants requires 10 to 14 essential nutrients in an appropriate balance. Although plants may tolerate extreme conditions, symptoms of nutrient deficiencies or toxicities affect the quality of the foliage, rate of growth, and susceptibility to pests and diseases. The availability of these elements is affected by soil pH and organic matter content. Most plants prefer soils within a pH range between 5.5-7.0. Soils in Vermont tend to be acidic, although, areas surrounded by sidewalks, foundations and roads tend to have higher alkalinity, with pH above 7.5 due to limestone-based

ingredients. Soil fertility, pH and organic matter can be evaluated using standard soil tests and is recommended before planting. Soil testing is available through the University of Vermont's Soil Testing Lab for a nominal charge per sample. Materials and instructions needed for sampling soils can be obtained at Vermont Cooperative Extension offices located throughout the state.

For more information on UVM's Soil Testing Laboratory Contact: University of Vermont Soil Testing Laboratory, Room 219 Hills Building, Burlington, VT 05405
phone 802-656-3030
web site www.uvm.edu/pss/ag_testing/

Road Salt is frequently used to deice roads and sidewalks during winter months. The use of salts, most commonly sodium chloride (NaCl), can reduce water absorption, nutrient uptake, root growth and long-term plant growth. Therefore, locations that will receive frequent salting should be noted and salt tolerant plants should be planted. Salt damage to soils is usually most severe within 25 ft. of a road. Planting tolerant species further away from or above the grade of the roadway can help reduce problems associated with de-icing salts. Pay close attention to the typical speed of the traffic moving adjacent to the planting site. Faster moving traffic increases the area of salt spray and may require you to plant further from the road. Plants in these areas near roads are also often exposed to air pollutants such as ozone that also can cause stress. If high salts are a problem at the site, extensive watering to leach the salts out of the soil can help as long as the soil is well-drained.

Rooting Space is the volume of soil available for root growth. Inadequate rooting space will limit water, nutrient uptake, and oxygen exchange necessary for successful plant growth. Common barriers to rooting space include sidewalks, roads, underground obstacles, soil compaction, and containers.

Heavily compacted soils can also be an obstacle for expanding tree roots and, although some species may be more tolerant to this, it is a good idea to include only uncompacted soils in your determination of available rooting space or usable soil volume. This is the amount of soil available for tree root growth. When determining usable soil volume, take into account that tree roots grow near the surface, primarily in the top 2 to 3 feet of soil. For this reason soil below 3 feet would not be considered in soil volume calculations.

In this guide we list the recommended soil volume for each species. These recommendations are under ideal circumstances, and in many cases you will be forced to plant in much tighter areas. Compensating for this by planting in longer, narrow strips are generally acceptable; however be certain root system can spread far enough in all directions to keep the tree windfirm when fully grown.

Where soil volumes are restricted select smaller species, those known to have limited root systems, or those that are especially heat and drought tolerant. The use of engineered soils or root cells can be incorporated to increase soil volume available for tree roots and meet load-bearing requirement for structurally sound pavement installation. Another preventative method is to guide roots away by installing root barriers made of either rigid plastic or herbicide treated polypropylene.

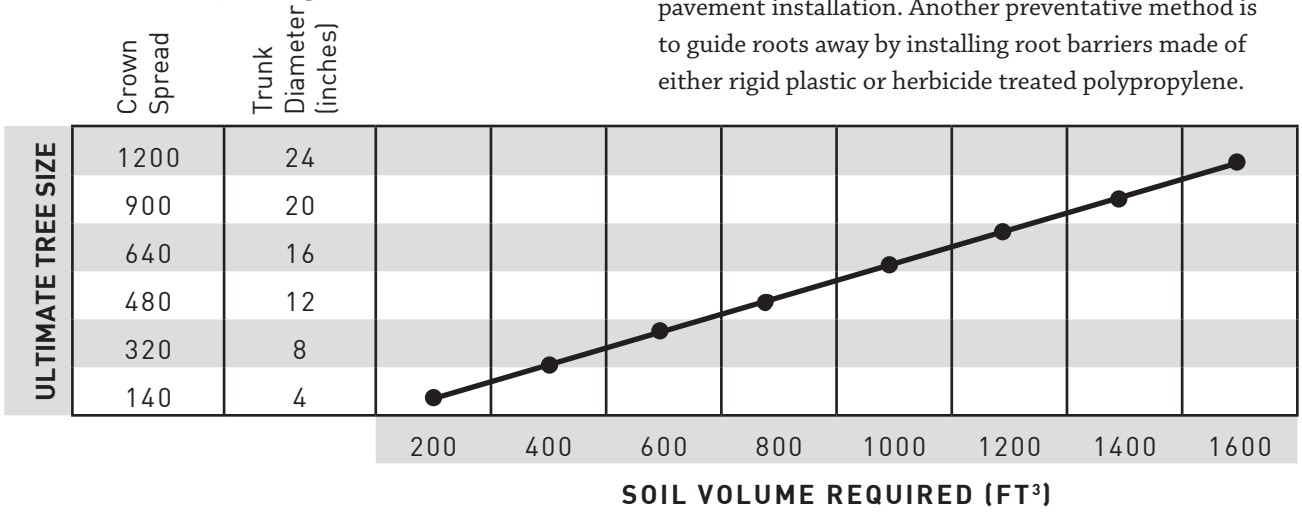


Figure 1. Soil volume & ultimate tree size relationship. James Urban, Urban Trees + Soils, Annapolis, MD

ABOVE GROUND CONDITIONS

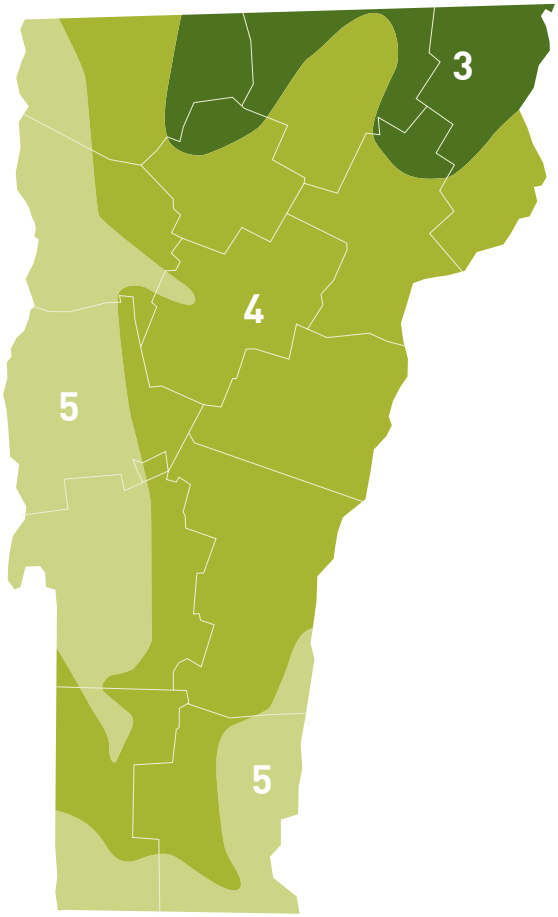
Just as trees require a healthy root system, they need a healthy stem and crown. The ability of a tree's crown to capture sunlight and manufacture food for the tree dictates the overall success of that tree, as long as the roots are able to support the crown with water and nutrients. Once you have identified all potential limitations below ground, look at the above ground conditions to make sure that nothing will prevent your trees from developing full, healthy crowns.

Exposure is important as plants differ in there adaptations to temperature and ability to withstand cold. Plant Hardiness Zones have been developed by the USDA to assist in selecting plants adapted to the climate of a particular region. Plant rating for hardiness zone is based on a plant's ability to survive over winter at a specified average minimum winter temperatures. The lower the temperature, the lower the zone number. Vermont's USDA hardiness zones ranges from 5b – 3A. Furthermore, microclimates exist within communities that are influenced by the gray infrastructures from different amounts of light (natural or artificial), wind exposure, participation patterns to temperature extremes.

Overhead Space is the available growing space above the ground to accommodate plant growth. Planting plans should recognize the size and shape of the tree throughout its life, and allow enough overhead space for the mature crown size. Major problems and costs caused by trees planted too close to buildings, power lines, streetlights, and traffic signs can be avoided by selecting species that will not require repetitive pruning, grow roots that will disrupt underground utilities or building foundations, or develop limbs that will grow into utility lines or reduce traffic safety. To avoid overhead utility conflicts select small trees with a maximum mature height of 25 ft. for locations under overhead power lines, medium trees with a maximum height of 45 ft. for locations 20 – 40 ft. away and larger trees for locations greater than 40 ft. away. Other street tree standards includes locating trees at least 5 ft. from water mains, gas boxes and inlets or manholes, 10 ft. from fire hydrants and 15 ft. from a street lights.

Hardiness Zone Map

Zone 3 -30º F to -40º F | **Zone 4** -20º F to -30º F
Zone 5 -10º F to -20º F



Legal Concerns Always check on ownership or easement locations as well as historical or landmark status that may prohibit you from planting in a certain area. Check local ordinances that may prohibit the planting of certain species.

Special Considerations

TREE MAINTENANCE

Maintenance needs and arboriculture practices for urban forests depend on their function, site condition, species and age compositions. Some trees will require intensive maintenance and considering the available manpower and maintenance needs will aid in effective tree species selection. The advantages and disadvantages of tree species should be weighed against each other in the selection process. Regardless of species selected, all plantings require maintenance during the early stages of establishment, most importantly watering. Investing in tree care and maintenance, especially in the establishment years will result in healthy long-lived trees.

Properly pruned trees are not only more aesthetically pleasing, but stronger. Pruning young trees can significantly reduce the likelihood of limb or structural trunk failure as the tree matures. This means a longer life span for the tree and a better return on your investment. Before you prune, always have an objective in mind. Consider the following reason to prune your tree:

Safety Remove branches that could fall and cause injury or interfere with utility lines, roads.

Health Remove disease or insect infected wood, improve structure, reduce likelihood of damage during storms.

Fruit Production Increase light and air circulation.

Appearance Control plant size and form, enhance views.

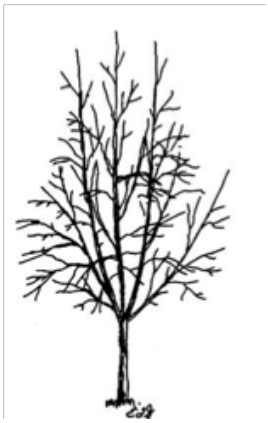
Whether you are pruning to establish good form and branch structure on a young tree or pruning to maintain a healthy mature tree, pruning is a multi-year endeavor. Here are some steps to guide you as your tree grows:

Pruning three years after planting

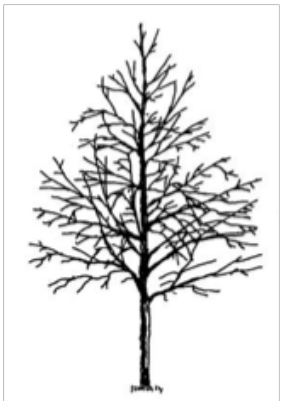
- Select a central leader (single trunk) and remove or shorten co-dominant leaders or competing leaders.
- Promote strong branch unions with the main stem structure. Look for "U" shaped unions and the branch bark ridge. Remove or reduce branches with weak or a "V" shaped union.

Pruning as the tree grows

- Thin the crown. Remove rubbing branches and continue to promote one central leader. Reduce or remove competing leaders.
- Raise crown to provide clearance for sidewalks, vehicles and buildings. Check local ordinances for minimum branch height mandates (e.g. 8' over sidewalks).
- Reduce the height and spread of the crown as necessary. Always bring the branch back to a lateral branch at least 1/3 the size of the stem removed.



Before



After

TREE SPECIES SELECTION

Based on the purpose, site conditions and maintenance requirements develop a set of criteria that will be used to select the most suitable plants. Certain criteria should hold more weight than others. Choose plants based on its' ability to withstand environment conditions, prevention of infrastructure conflicts and for the long-term sustainability of the community forest. Rarely will you find the perfect tree that will fit an entire list of selected criteria, yet answering these important questions can avoid many unforeseen pitfalls. The green infrastructure is the only infrastructure that will increase in value over time if the "right tree" is put in the "right place".

SPECIES DIVERSITY

Maintaining a high level of species diversity in our urban ecosystems is important. Besides providing the aesthetic appeal of a variety of shapes and sizes along streets or in town greens and parks, increasing diversity can also help safeguard against species-specific insect or disease outbreaks. Simply selecting the right tree for every site should in itself create diversity, yet we often rely far too heavily on one seemingly ideal species, as was the case with the American elm.

It is important to recognize that species diversity is not only a function of how many species are present, but also depends on the proportion of each species relative to others and their overall spatial distribution. In other words, planting a single tree of one species for every hundred trees of another species scarcely improves your diversity. Similarly, diversity is only improved significantly if all species are growing together, intermingled over an entire area as opposed to having each species in a separate area. Maintaining a predetermined level of diversity, such as specifying that no one species should comprise more than 5 percent of the community tree population is a good way to help prevent some of these situations from occurring.

PEST AWARENESS

Two potential insect pests are threatening Vermont's trees and for this very reason increasing species diversity is important. The emerald ash borer has already destroyed millions of ash trees. Ash trees are a popular urban tree for its tolerance to tough growing conditions and have already been used in large quantities in many communities. Caution should be used when selecting ash trees, especially if large numbers of the tree already exists.

Asian long-horned beetle is another pest of great concern. This beetle has a larger tree appetite range and feasts on a variety of trees including maple, elm, horsechestnut, ash, birch, poplar, willow and many more. If any trees in the landscape are showing signs of infestation, take action by learning more and calling for assistance.

More information on Vermont invasive tree pests, visit our website at www.vtcommunityforestry.org, or www.emeraldashborer.info/ or www.uvm.edu/albeetle/

If you suspect an non-detected invasive pest occurs in your area or for more information, contact the Forest Biology Lab at 802-241-3606.

POTENTIALLY INVASIVE TREES

We have been planting non-native trees in the landscape for hundreds of years and have enjoyed the diversity and beauty they bring. However, we are now more aware of a few that have aggressive growth habits that result in their invasion into wild, unmanaged areas such as wetlands and woodlands. Once established, these invasive exotic trees can significantly disrupt habitats. Thus, we all need to be aware of these few species and avoid or use caution when planting.

For this publication, we have removed any species that appears on the 'Invasive Species Watch List' produced by the Vermont Invasive Plant Council. These non-native plants have the potential to become invasive in Vermont based on their behavior in other northeastern states. Tree species of interest on this list include: amur maple (Acer ginnala), Norway maple, (Acer platanoides), and black locust (Robinia pseudoacacia).

There are a few other non-native tree species commonly used in the landscape that have begun to cause some concern of their potential to become invasive. Currently, these species are not on the Vermont quarantine or watch list, but we should keep a close eye on them and we advise not planting them near natural settings where they could invade. These species include: Catalpa (Catalpa speciosa), Goldenrain Tree (Koelreuteria paniculata), amur corktree (Phellodendron amurense), and japanese tree lilac (Syringa reticulate).

For more information on invasive plants visit the Vermont Invasive Plant Council's website at www.vermontinvasiveplants.org

Tree Selection Worksheet

Complete the following worksheet to help identify appropriate trees for the site.

Tree Site & Space

Site location/Description: _____

Desired mature height: _____ Desired mature spread: _____

Desired Tree Characteristics

Form

☐ Spreading ☐ Columnar ☐ Round

☐ Upright Oval ☐ Pyramidal ☐ Vase

Hardiness Zone

☐ 5a (-15° to -20°) ☐ 4b (-20° to -25°) ☐ 4a (-25° to -30°) ☐ 3b (-30° to -35°)

Does Well In

☐ Drought ☐ Poor Drainage ☐ Alkaline Soil ☐ Salt ☐ Shade ☐ Air Pollution

Features of Interest

☐ Flowers ☐ Fruits ☐ Wildlife ☐ Fall Foliage ☐ Winter Interest

☐ Native to VT ☐ Evergreen ☐ Fits Under Power Lines

Rooting Space

☐ **Small**
Planting sites with limited soil volume, such as narrow greenbelts and pits less than 6 feet wide. Depths should be 3 feet. Planting should not occur in less than 4 by 4 feet spaces.

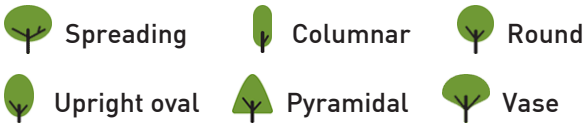
☐ **Medium**
Planting sites with an intermediate amount of soil volume. Green belts greater than 6 feet wide, but still limited in the amount of below ground growing space.

☐ **Large**
Planting that are large soil volume such as parks and open space.

Note: On the tree species list, the smallest planting rooting space is listed.

Key to Tree Species List

Form. Indicates the natural shape of the tree.



Tolerances. Indicates the species ability to withstand drought, poor drainage, alkaline soil, salt, air pollution and shade.

Mature. The total height of a typical species at maturity.

Crown Spread. The total width of a typical species crown at maturity.

Rooting Space. Lists the recommended soil volume for the species/cultivar assuming a square area that is 3 feet deep (e.g. 25' corresponds to a volume of 25'x25'x3'). Rooting space is calculated by taking half of a trees mature crown spread.

Planting Area

Small Indicates planting sites with limited soil volume, such as narrow greenbelts and pits less than 6 feet wide. Depths should be 3 feet. Planting should not occur in less than 4 by 4 feet spaces.

Medium Indicates planting sites with an intermediate amount of soil volume. Green belts greater than 6 feet wide, but still limited in the amount of below ground growing space.

Large Indicates planting that are large soil volume such as parks and open space.

Hardiness. The lowest zone rating for each species.

2a -45° to -50°
2b -40° to -45°
3a -35° to -40°
3b -30° to -35°
4a -25° to -30°
4b -20° to -25°
5a -15° to -20°

Limitations. Problems you might encounter with a specific tree planted in Vermont.

1. Weak wood and/or branch structure making it susceptible to breakage during ice or snow accumulation and strong winds.
2. Fruit and/or leaves can be a litter problem.
3. Sensitive to insect/disease pests.
4. Limited availability, making it different to locate at local nurseries.
5. Prone to excessive sucker growth from roots or lower stem and may require regular pruning.
6. Indicates tree should be planted only during the spring.

Features. Indicates which species and cultivars have the following features.

Flower Indicates which species have notable flowers.

Fruit Indicates which species have notable fruits.

Fall Foliage Indicates which species have notable fall foliage.

Winter Interest Indicates which species have notable winter interest.

Native to Vermont Indicates which species that are inherent and original to New England.

Under Power Lines Indicates which species can be planted underneath power lines (<25 ft. in height).

Invasive Alert Indicates which species should be kept under cultivation & not planted in a wild environment.

Evergreen Indicates which species have evergreen leaves or needles.

Wildlife Refers to whether a tree's fruit has wildlife value.

Key to Scientific Names

Common Name	Scientific Name
Amur Corktree	*Phellodendron*
Apple	*Malus*
Ash	*Fraxinus*
Baldcypress	*Taxodium*
Beech	*Fagus*
Birch	*Betula*
Black Gum, Tupelo	*Nyssa*
Buckeye, horeschestnut	*Aesculus*
Cedar	*Thuja*
Cherry	*Prunus*
Dawn Redwood	*Metasequoia*
Dogwood	*Cornus*
Elm	*Ulmus*
Filbert, Hazel	*Corylus*
Fir	*Abies*
Fringetree	*Chionanthus*
Hackberry	*Celtis*
Hawthorn	*Crataegus*
Hemlock	*Tsuga*
Hickory	*Carya*
Honeylocust	*Gledistsia*
Hophornbeam	*Ostrya*
Katsura	*Cercidiphyllum*
Kentucky Coffeetree	*Gymnocladus*
Lilac	*Syringa*
Linden	*Tilia*
Maple	*Acer*
Musclewood, Ironwood	*Carpinus*
Oak	*Quercus*
Pear	*Pyrus*
Pine	*Pinus*
Redbud	*Cercis*
Shadbush, Serviceberry	*Amelanchier*
Silverbell	*Halesia*
Spruce	*Picea*
Sycamore, Planetree	*Plantanus*
Walnut	*Juglans*
Witchhazel	*Hamamellis*
Yellowwood	*Cladrastis*

BUYING A TREE

Purchasing a tree is an investment. Like buying a car, you'll want to inspect the trees at the nursery to ensure you are purchasing the highest quality. The quality of the planting stock you purchase is one of the most important factors when it comes to survival and long-term health of new trees. High quality trees will establish themselves more quickly than less healthy trees and require less pruning and maintenance in subsequent years.

Checklist for purchasing a tree

- Purchase stock from a reputable nursery. For a list of nurseries affiliated with GreenWorks - Vermont Nursery and Landscape Association go to greenworksvermont.org/members/
- Select the appropriate stock for your planting needs: Bare root, container or balled and Burlapped (B&B)
- Inspect the roots.
- Inspect the trunk for signs of damage or weakness in the bark.
- Inspect the crown for a leader.

Resources for More Information

PUBLICATIONS

Bassuk, Nina. 2009. Recommended Urban Trees. Urban Horticultural Institute, Cornell University. Ithaca, NY. ***www.hort.cornell.edu/uhi/outreach/recurbtree/index.html.***

Dirr, Michael A., 2009. Manual of Woody Landscape Plants—Their Identification Ornamental Characteristics, Culture, Propagation and Uses. Stipes Publishing Company. Champaign, IL.

Dirr, Michael A. Dirr's Hardy Trees and Shrubs: An Illustrated Encyclopedia. Timber Press. Portland.

Pellet, Norman E. and Mark Starrett. 2002. Landscape Plants for Vermont. The University of Vermont Extension. Burlington, VT. *www.uvm.edu/mastergardener/LPV2002/LPV.htm*

Watson, Gary W. and E. B. Himelick. 1997. Principles and Practice of Planting Trees and Shrubs. International Society of Arboriculture. Savoy, IL.

ONLINE

- Vermont Urban and Community Forestry Program www.vtcommunityforestry.org
- Green Works: Vermont Nursery and Landscape Association www.greenworksvt.org
- Urban Horticulture Institute, Cornell University www.hort.cornell.edu/uhi/index.html
- USDA Forest Service, Urban and Community Forestry Program www.fs.fed.us/ucf/

SEARCHABLE TREE DATABASES

- Vermont Tree Selection Guide www.vtcommunitytrees.org
- Northern Trees http://orb.at.ufl.edu/TREES/index.html
- UConn Plant Database www.hort.uconn.edu/Plants/

TREE CARE INFORMATION

- International Society of Arboriculture www.treesaregood.com

SEARCHABLE URBAN FORESTRY & ARBORICULTURE RESOURCES

- UFind: Urban Forestry Index www.urbanforestryindex.net/
- Urban Forestry South www.urbanforestrysouth.org/

TREE SPECIES LIST

Scientific Name	Cultivar	Common Name [Flower Color]	Form	Hardiness Zone	Mature Height	Crown Spread	Soil Volume	Planting Area	Tolerances: Drought	Poor Drainage	Alkaline Soil	Salt	Air Pollution	Shade	Limitations	Features
Abies concolor	—	White Fir		3a	50	25	15	L							6	
Specimen tree. Most tolerant spruce and good replacement for disease sensitive Colorado blue spruce.																
Abies fraseri	—	Fraser Fir		4a	40	25	15	L							6	
Specimen or accent tree. Avoid hot and dry conditions, and high pH.																
Acer campestre	—	Hedge Maple		5	30	30	15	S								
Possibly a zone 4. Extremely adaptable and tolerates severe pruning. Prune early for structure and may need to be limbed up for clearance. Slow grower. Primary host of Asian Longhorned Beetle.																
Acer x freemanii	'Armstrong'	Freeman Maple		4a	60	20	20	M							1,6	
Fastigiate. Cross between a red and silver maple. Fast grower, early structural pruning needed. Primary host of Asian Longhorned Beetle.																
A. x freemanii	Autumn Blaze® 'Jeffersred'	Freeman Maple		4a	50	40	20	M							1,6	
Cross between a red and silver maple. Fast grower, early structural pruning needed, concern over branch breakage as it ages. Excellent orange to red fall color. Primary host of Asian Longhorned Beetle.																
A. x freemanii	'Sienna'	Freeman Maple		4a	40	40	20	M							1,6	
Cross between a red and silver maple. Strong central leader for species, early structural pruning needed. Deep orange to red fall color. Primary host of Asian Longhorned Beetle.																
A. x freemanii	'Red Pointe'	Freeman Maple		4a	45	30	20	L							1,6	
Cross between a red (75%) and silver (25%) maple. Early structural pruning needed. Excellent fall red color and heat tolerance. Primary host of Asian Longhorned Beetle.																
Acer griseum	'Ginzam' Gingerbread™	Paperbark Maple		5	25	25	13	S							4,6	
Specimen tree. Potentially zone 4 in protected sites. Trifoliate leaves and beautiful peeling bark. Finer bark and faster growth than species. Primary host of Asian Longhorned Beetle.																
Acer miyabei	'Morton' State Street™	Miyabe Maple		4	40	40	20	S							4	
Specimen tree. More cold hardy alternative to A. Campestre. Corky bark. Primary host of Asian Longhorned Beetle.																
Acer rubrum	—	Red Maple		3	75	40	20	M							1,6	
Fast grower and easy to transplant Chlorosis can occur in alkaline soils. Somewhat weakened wooded, prune for structure. Thin bark can easily be damages. Fall color and intensity varies. Primary host of Asian Longhorned Beetle.																
A. rubrum	'Autumn Flame'	Red Maple		3b	50	30	20	M							1,6	
Excellent and early red fall color that last longer than species. Notable for its young round habit. Primary host of Asian Longhorned Beetle.																
A. rubrum	'Bowhall'	Red Maple		4	50	15	20	M							1,6	
Upright form with broad columnar head. Yellow to red fall color. Primary host of Asian Longhorned Beetle.																
A. rubrum	Northwood®	Red Maple		3b	50	35	20	M							1,6	
Selected for tolerance to harsh winter conditions. Orange to red fall color. Branches ascent upward. Primary host of Asian Longhorned Beetle.																

Scientific Name	Cultivar	Common Name [Flower Color]	Form	Hardiness Zone	Mature Height	Crown Spread	Soil Volume	Planting Area	Tolerances: Drought	Poor Drainage	Alkaline Soil	Salt	Air Pollution	Shade	Limitations	Features
A. rubrum	October Glory®	**Red Maple**		5a	50	35	20	M							1,6	
Dependable orange to red fall color which starts later than others. Dark green summer leaves. Limitations due to cold hardiness. Primary host of Asian Longhorned Beetle.																
A. rubrum	'Red Sunset'	**Red Maple**		4b	50	40	20	M							1,6	
Dependable orange to red fall color. Colors earlier than October Glory and more cold tolerant. Primary host of Asian Longhorned Beetle.																
Acer saccharinum	—	**Silver Maple**		3	70	50	35	L							1,5	
Fast grower, with fairly weak wood. Shallow rooting system can cause sidewalk damage and can clog drain pipes. Useful for wet areas . Transplants well.																
Acer saccharum	—	**Sugar Maple**		3	75	50	25	M								
Does not perform well in tight, compacted situations. Primary host of Asian Longhorned Beetle.																
A. saccharum	'Bonfire'	**Sugar Maple**		3	65	50	25	M								
Does not perform well in tight, compacted situations. Orange to red fall color. Primary host of Asian Longhorned Beetle.																
A. saccharum	Fall Fiesta®	**Sugar Maple**		3	75	50	25	M								
Does not perform well in tight, compacted situations. Fast grower. Yellow, orange and red fall color. Primary host of Asian Longhorned Beetle.																
A. saccharum	Green Mountain®	**Sugar Maple**		3	70	45	25	M								
Dark green summer foliage. Variable. Performs better than species in dry, tight conditions. Primary host of Asian Longhorned Beetle.																
A. saccharum	'Legacy'	**Sugar Maple**		3	50	35	25	M								
Red to orange fall color, dark, lustrous summer leaves. Performs better than species in dry, tight conditions. Primary host of Asian Longhorned Beetle.																
Acer triflorum	—	**Three-flower Maple**		5	30	30	15	M							4	
Specimen tree. Primary host of Asian Longhorned Beetle.																
Acer truncatum	—	**Purpleblow Maple**		4	25	30	15	S							4	
Adaptable and hardy. Future selection, 'Main Street.' Primary host of Asian Longhorned Beetle.																
Aesculus x carnea	'Briotii'	**Ruby Red Horsechestnut** (RED)		5a	40	40	20	M							2,6	
Specimen tree. Sometimes listed as zone 4. Primary host of Asian Longhorned Beetle.																
Aesculus glabra	—	**Ohio Buckeye** (YELLOW)		3	60	40	20	L							2,3 4,6	
Reserve for large areas. Can be messy with little ornamental value. Primary host of Asian Longhorned Beetle.																
Aesculus hippocastanum	'Baumanii'	**Horsechestnut** (WHITE)		4a	75	70	35	L							1,3,6	
Double white flowers and fruitless. Prune in spring, avoid extremely dry condition. Leaf scorch, leaf blotch and powdery mildew can be a problem. Primary host of Asian Longhorned Beetle.																

Scientific Name	Cultivar	Common Name [Flower Color]	Form	Hardiness Zone	Mature Height	Crown Spread	Soil Volume	Planting Area	Tolerances: Drought	Poor Drainage	Alkaline Soil	Salt	Air Pollution	Shade	Limitations	Features
Amelanchier arborea	'JFS-Arb' Spring Flurry®	**Downy Serviceberry** (WHITE)		4	35	20	10	S								
Not reliable under high stress conditions. Good tree form. Orange fall color.																
Amelanchier laevis	'Snowcloud', 'Majestic'	**Allegheny Serviceberry** (WHITE)		4	25	15	10	S								
Not reliable under high stress conditions. Fastigiate form. Scarlet fall color. Vigorous grower.																
Amelanchier canadensis	'Trazam' Traditional®	**Shadblow Serviceberry** (WHITE)		3	30	20	10	S							5	
Not reliable under high stress conditions. Strong central leader and good branch habit. Orange fall color. Heavy fruiting.																
A. canadensis	'Sprizam' Spring Glory®	**Shadblow Serviceberry** (WHITE)		3	12	10	10	S							5	
Not reliable under high stress. Small compact form. Orange to yellow fall color.																
Amelanchier x grandiflora	'Autumn Brilliance'	**Apple Serviceberry** (WHITE)		4a	25	25	13	S							3	
Not reliable under high stress conditions. Red fall color.																
A. grandiflora	'Autumn Sunset'	**Apple Serviceberry** (WHITE)		4a	30	25	13	S							3	
Not reliable under high stress conditions. Rich orange fall color. Strong central leader. Perhaps better drought tolerance.																
A. grandiflora	'Ballerina'	**Apple Serviceberry** (WHITE)		4a	20	15	13	S							3	
Not reliable under high stress conditions. Shrub or small tree. Red fall color.																
A. grandiflora	'Princess Diana'	**Apple Serviceberry** (WHITE)		4a	25	15	13	S							3	
Not reliable under high stress conditions. Red fall color. Can be multi or single stemmed.																
Betula nigra	'Moonshine' Dura Heat®	**River Birch**		4a	45	35	18	S							1,6	
Exfoliating bark. Develops chlorosis in high pH. Leaf spot in wet years. Most adaptable birch.																
B. nigra	'Little King' Fow Valley®	**River Birch**		4a	15	15	10	S							1,6	
Exfoliating bark. Develops chlorosis in high pH. Leaf spot in wet years. Most adaptable birch. Small form.																
B. nigra	'Cully' Heritage®	**River Birch**		4a	50	35	18	S							1,6	
Exfoliating bark. Develops chlorosis in high pH. Leaf spot in wet years. Most adaptable birch.																
B. nigra	'Dickinson' Northern Tribute™	**River Birch**		3	40	35	18	S							1,6	
Exfoliating bark. Develops chlorosis in high pH. Leaf spot in wet years. Most adaptable birch.																
Carpinus betulus	'Fastigiata'	**European Hornbeam**		5a	35	20	10	S							4,6	
Cultivar name misleading as plant develops oval shape. Tolerates heavy pruning. Urban tolerant. Good for screens, hedges, groupings, planter boxes, around buildings.																
Carpinus caroliniana	—	**American Hornbeam/ Musclewood**		3a	30	25	13	S							4,6	
Slow to recover from transplanting. Tolerates pruning for hedge or screen.																

Scientific Name	Cultivar	Common Name [Flower Color]	Form	Hardiness Zone	Mature Height	Crown Spread	Soil Volume	Planting Area	Tolerances: Drought	Poor Drainage	Alkaline Soil	Salt	Air Pollution	Shade	Limitations	Features
C. caroliniana	'JN Globe' Ball O' Fire™	**American Hornbeam/ Musclewood**		3a	30	25	10	S							4,6	
Slow to recover from transplanting. Red fall color. Tolerates pruning for hedge or screen.																
C. caroliniana	'JN Upright' Firespire™	**American Hornbeam/ Musclewood**		3	30	15	10	S							4,6	
Slow to recover from transplanting. Orange to red fall color. Tolerates pruning for hedge or screen.																
C. caroliniana	'CCSQU' Palisade™	**American Hornbeam/ Musclewood**		3a	30	15	10	S							4,6	
Slow to recover from transplanting. Yellow fall color. Tolerates pruning for hedge or screen.																
Carya glabra	—	**Pignut Hickory**		4	65	40	20	L							~~2,4~~6	
Golden yellow fall color. Difficult to transplant.																
Carya ovata	—	**Shagbark Hickory**		4	80	35	28	L							~~2,4~~6	
Yellow to brown fall color. Difficult to transplant. Beautiful 'shaggy' bark.																
Catalpa speciosa	—	**Northern Catalpa [WHITE]**		4a	60	40	20	L							2,4	
Coarse large leaves. Tough tree for large landscapes.																
Celtis laevigata	'All Seasons'	**Sugar Hackberry**		5a	80	50	25	M							1,6	
Smooth gray bark like beech. Yellow fall color. Good tolerance to tough conditions. Does respond well to injury.																
Celtis occidentalis	—	**Common Hackberry**		3a	60	50	25	M							1,6	
Good tolerance to tough conditions. Affected by several pests that do not kill the tree, but can make it unattractive.																
C. occidentalis	'Prairie Pride'	**Common Hackberry**		3	55	50	25	M							1,6	
Good tolerance to tough conditions. Affected by several pests that do not kill the tree, but can make it unattractive. Lighter fruit crop and does not develop witches broom.																
C. occidentalis x C. laevigata	'Magnifica'	**Magnifica Sugar Hackberry**		5	50	40	25	M							1,6	
Cross between Sugar and Common Hackberry. Less hardy, but withstands drought, salt and compacted soil better.																
Cercidphyllum japonicum	—	**Katsuratree**		4b	60	35	18	M							1,6	
Difficult to transplant, water is needed during establishment.																
C. japonicum	'Rotfuchs' 'Red Fox'	**Katsuratree**		4b	60	35	18	M							1,6	
Difficult to transplant, water is needed during establishment. Red foliage and slower grower than species.																
Cercis canadensis	—	**Eastern Redbud** (PINK)		4	25	25	13	S							1	
Avoid wet soils. Suffers when stressed.																
C. canadensis	'Alba'	**Eastern Redbud** (WHITE)		4b	25	25	13	S							1	
Avoid wet soils. Suffers when stressed.																
C. canadensis	'Forest Pansy'	**Eastern Redbud** (ROSE-PURPLE)		5b	25	25	13	S							1	
Avoid wet soils. Suffers when stressed. Purple foliage.																

Scientific Name	Cultivar	Common Name [Flower Color]	Form	Hardiness Zone	Mature Height	Crown Spread	Soil Volume	Planting Area	Tolerances: Drought	Poor Drainage	Alkaline Soil	Salt	Air Pollution	Shade	Limitations	Features
C. canadensis	'Royal White'	**Eastern Redbud** (WHITE)		4	25	25	13	S							1	
Avoid wet soils. Suffers when stressed. May be more cold hardy than 'Alba' the other white flowered form.																
C. canadensis	'Northern Strain'	**Eastern Redbud** (ROSE)		4	25	25	13	S							1	
Avoid wet soils. Suffers when stressed. More cold hardy species.																
Chionanthus virginicus	—	**White Fringtree**		4	25	25	13	S								
Specimen small tree. Very adaptable.																
Cladrastis kentukea (lutea)	—	**Yellowwood** (WHITE)		4a	50	55	25	L							1,6	
Structural pruning is necessary for poor branch attachment. Prune in summer to avoid bleeding.																
Cornus mas	'Golden Glory'	**Corneliancherry Dogwood** (YELLOW)		4b	20	20	10	S							2,5	
Can be pruned to raise crown for more tree like form and expose exfoliating bark. Relatively adaptable, but may slow to reestablish. Heavy bloomer, but may be less cold hardy.																
C. mas	'Redstone'	**Corneliancherry Dogwood** (YELLOW)		4b	25	20	10	S							2,5	
Can pruned to raise crown for more tree like form and expose exfoliating bark. Relatively adaptable, but may slow to reestablish. Heavy fruit set.																
Corylus colurna	—	**Turkish Fildert**		4	50	30	15	S							2	
Tolerant of tough conditions, but will require watering for establishment.																
Crataegus crus-galli var. inermis	'Cruzam' Crusader™	**Thornless Cockspur Hawthorn** (WHITE)		4a	25	25	13	S							3,6	
Thornless cultivar.																
Crataegus laevigata	'Crimson Cloud'	**English Hawthorn** (RED)		4	25	20	10	S							3,6	
Adaptable and tolerant of many conditions. Pruning lower limbs may be necessary if planted as street tree. Thorns.																
C. laevigata	'Paulii'	**English Hawthorn** (RED)		4	25	20	10	S							3,6	
Adaptable and tolerant of many conditions. Pruning lower limbs may be necessary if planted as street tree. Thorns. Double flowers.																
Crateagus phaenopyrum	'Fastigiata'	**Washington Hawthorn** (WHITE)		4a	30	25	13	S							3,6	
Adaptable and tolerant of many conditions. Pruning lower limbs may be necessary if planted as street tree. Thorns. Columnar with flowers and fruit smaller than species.																
C. phaenopyrum	'Princeton Sentry'	**Washington Hawthorn** (WHITE)		4a	30	20	10	S							3,6	
Adaptable and tolerant of many conditions. Pruning lower limbs may be necessary if planted as street tree. Almost thornless, can be grown to single trunk for street tree.																
C. phaenopyrum	Presidential™	**Washington Hawthorn** (WHITE)		4a	15	15	10	S							3,6	
Adaptable and tolerant of many conditions. Pruning lower limbs may be necessary if planted as street tree. Thorns. Tree form.																
C. phaenopyrum	Washington Lustre®	**Washington Hawthorn** (WHITE)		4a	25	25	13	S							3,6	

Scientific Name	Cultivar	Common Name [Flower Color]	Form	Hardiness Zone	Mature Height	Crown Spread	Soil Volume	Planting Area	Tolerances						Limitations	Features
									Drought	Poor Drainage	Alkaline Soil	Salt	Air Pollution	Shade		
Adaptable and tolerant of many conditions. Pruning lower limbs may be necessary if planted as street tree. Good vigor and fewer thorns.																
Crataegus viridis	'Winter King'	**Winter King Hawthorn** (WHITE)		4a	25	25	13	S							3,6	
Adaptable and tolerant of many conditions. Pruning lower limbs may be necessary if planted as street tree. Thorns. Good fall color and showy winter/fall fruit.																
Fagus sylvatica	'Riversii'	**European Beech**		4a	50	40	20	L							6	
More tolerant of urban soil conditions than American Beech - avoid wet soils. Many cultivars exist, this one has deep purple leaves.																
Fraxinus americana	—	**White Ash**		3	70	60	30	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Purple fall color.																
F. americana	'Autumn Purple®'	**White Ash**		4	45	60	30	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Reddish to purple fall color. Seedless																
F. americana	'Empire'	**White Ash**		3	50	25	13	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Strong central leader. Red to purple fall color.																
F. americana	'Greenspire'	**White Ash**		3	40	30	15	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Upright form. Orange fall color.																
F. americana	Northern Blaze® (Jefnor)	**White Ash**		3	60	30	15	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Seedless. Purple fall color.																
Fraxinus pennsylvanica	—	**Green Ash**		2	60	30	15	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure.																
F. pennsylvanica	'Bergeson'	**Green Ash**		3	50	35	18	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Seedless. Yellow in fall. One of the most cold hardy.																
F. pennsylvanica	'Cimmzam' Cimmaron®	**Green Ash**		4	60	30	15	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure, but noted for a central leader and good branching. Red to yellow fall color.																
F. pennsylvanica	'Marshall's Seedless'	**Green Ash**		3a	50	40	20	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Seedless. Yellow fall color.																
F. pennsylvanica	'Patmore'	**Green Ash**		3a	60	35	18	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Seedless.																
F. pennsylvanica	'Summit'	**Green Ash**		3b	45	25	13	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. One of the most cold hardy. Uniform crown.																
Ginkgo biloba	'Autumn Gold'	**Ginkgo**		4	50	30	15	S							6	

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Adaptable and tolerant. Golden yellow fall color. Fruitless. Prune in spring. Symmetrical, broad and rounded crown.																
G. biloba	'Magyar'	**Ginkgo**		4	50	25	13	S							6	
Adaptable and tolerant. Yellow fall color. Fruitless. Prune in spring. Upright, ascending branching.																
G. biloba	'Princeton Sentry'	**Ginkgo**		4	60	25	13	S							6	
Adaptable and tolerant. Yellow fall color. Fruitless. Prune in spring. Upright habit that tapers to a point.																
Gleditsia triacanthos var. inermis	'Halka'	**Honey Locust**		4a	40	40	20	M							3,6	
Adaptable and tolerant. Prune in fall. Fruitless. Round head with less dropping branches.																
G. triacanthos var. inermis	'Imperial'	**Honey Locust**		4a	30	35	18	M							3,6	
Adaptable and tolerant. Prune in fall. Seedless. Essentially fruitless. Most compact and formal form.																
G. triacanthos var. inermis	'Moraine'	**Honey Locust**		4a	40	50	25	M							3,6	
Adaptable and tolerant. Prune in the fall. Fruitless. Golden yellow fall color. Wide spreading crown.																
G. triacanthos var. inermis	'Shademaster'	**Honey Locust**		4a	45	35	18	M							3,6	
Adaptable and tolerant. Prune in the fall. Essentially fruitless. Upright, symmetrical habit.																
G. triacanthos var. inermis	'Skyline'	**Honey Locust**		4a	45	35	18	M							3,6	
Adaptable and tolerant. Prune in the fall. Essentially fruitless. Ascending branches. Bright golden yellow fall color. One of the most cold hardy.																
G. triacanthos var. inermis	'Sunburst'	**Honey Locust**		5	35	30	15	M							3,6	
Adaptable and tolerant. Prune in the fall. Fruitless. Golden leaves on new growth changing to bright green. More susceptible to canker disease.																
Gymnocladus dioicus	—	**Kentucky Coffeetree**		3b	70	50	25	L							2	
Adaptable and tolerant to urban conditions. Good for large areas.																
Halesia carolina	—	**Carolina Silverbell** (WHITE)		4	35	25	13	S							6	
Difficult to transplant. Chloratic in high pH soils.																
Hamamelis virginana	—	**Whitchhazel** (YELLOW)		3	25	20	10	S								
Prefers a moist soil. Moderate tolerance. Attractive yellow fall color. Flowers in the fall.																
Hydrangea paniculata	—	**Panicle Hydrangea**		3	20	20	10	S								
Very adaptable, hardy, urban tolerant plant. Over 70 cultivars.																
Juglans nigra	—	**Black Walnut**		4	75	60	30	L							2,6	
Tolerates drier soils, but prefers moist soils. Open crown. Difficult to transplant.																
Juniperus virginiana	—	**Eastern Red Cedar**		4	50	20	10	S							6	
Tolerant of tough conditions. Good as specimen, in groupings, hedges or screens.																

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Koelreuteria paniculata	—	Panicled Golden-raintree (YELLOW)		5	40	40	20	S							6	
Tolerant and adaptable. Prune in the winter. Somewhat weak wooded. Yellow flowers in summer.																
Larix decidua	—	European/ Common Larch		2	75	30	15	L							6	
Needs moisture, well-drained and sunny conditions. Deciduous conifer with yellow fall color. More tolerant of cultivation than native Eastern Larch.																
Liquidambar styraciflua	'Moraine'	American Sweetgum		5	60	35	18	M							2,6	
Slow to reestablish. Not tolerant of urban conditions. Prune during winter. Most vigorous on wet site. Red fall color.																
Liriodendron tulipfera	—	Tuliptree (GREEN-YELLOW)		5	90	50	25	L							6	
Reserve for large areas. Prune in winter. Develops scorch in poor, tight growing conditions. Yellow fall color.																
Maackia amurensis	—	Amur Maackia (WHITE)		4a	25	25	13	S								
Adaptable. Summer white flowers. Attractive bronze colored bark.																
Magnolia acuminata	—	Cucumbertree Magnolia (GREEN-YELLOW)		4a	80	60	30	L							6	
Slow to reestablish and not tolerant of tough conditions. Reserve for large areas. Prune after flowering. Thin barked, easily damaged.																
Magnolia stellata	—	Star Magnolia (WHITE)		4a	25	15	8	S							1,6	
Avoid extreme sites and areas that heat up early in the spring to protect flower buds.																
M. stellata	'Centennial'	Star Magnolia (WHITE)		4a	25	15	8	S							1,6	
Avoid extreme sites and areas that heat up early in the spring to protect flower buds. Slight pink on the flower, good upright form.																
M. stellata	'Royal Star'	Star Magnolia (WHITE)		4a	10	15	8	S							1,6	
Avoid extreme sites and areas that heat up early in the spring to protect flower buds. Pink buds, white flowers. Densely branched.																
Malus baccata	'Jackii'	Siberian Crabapple (WHITE)		3	30	15	8	S							2	
Deep green foliage. Highly resistant to scale and Japanese beetle. Low branching prune for clearance.																
Malus sargentii	—	Sargent Crabapple (WHITE)		4	15	12	6	S							2,3	
Tolerant, small, dense tree. Relatively resistant to most crabapple diseases and insect problems.																
Malus spp.	'Adams'	Crabapple (PINK)		4	25	25	13	S							2	
Rounded, dense crown. Reddish foliage in youth turning purple with age.																
M. spp.	Brandywine® 'Branzam'	Crabapple (ROSE-PINK)		3	20	20	10	S							2	
Double flowers. Reddish to purple fall color.																
M. spp.	'Cardinal'	Crabapple (SCARLET)		4	20	20	10	S							2	
Few fruits. Spreading, flat-topped. Purple-red foliage.																

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M. spp.	'Centzam' Centurion®	**Crabapple** (ROSE-RED)		4	25	20	10	S							2	
Upright branching. Dark reddish green leaves.																
M. spp.	'Dolgo'	**Crabapple** (WHITE)		3	40	25	13	S							2	
Flowers well in alternate years. Open habit.																
M. spp.	'Donald Wyman'	**Crabapple** (RED-PINK)		4	20	25	13	S							2	
Spreading form, dark green foliage. Fruit persistent in winter.																
M. spp.	Golden Raindrops™	**Crabapple** (WHITE)		4	15	20	10	S							2	
Golden yellow fruit. Small, slender, horizontal spreading.																
M. spp.	'Hargozam' Harvest Gold ®	**Crabapple** (WHITE)		4	30	20	10	S							2	
Flowers one week later than most crabs. Gold fruit that persist through winter. Moderately columnar to vase-shaped.																
M. spp.	'Indian Magic'	**Crabapple** (DEEP PINK)		4	20	20	10	S							2	
Small, red, persisting fruit. Rounded habit. Orange to red fall color.																
M. spp.	'Indian Summer'	**Crabapple** (ROSE-RED)		4	18	25	13	S							2	
Purple green foliage. Broad globe-shaped.																
M. spp.	'Prairifire'	**Crabapple** (RED)		4	20	20	10	S							2	
Red-purple, persistent fruit. Upright when young turning round. New leaf growth maroon turning green.																
M. spp.	'Red Jewel'	**Crabapple** (WHITE)		4	15	12	10	S							2	
Rounded habit with horizontal branches. Dark green foliage.																
M. spp.	'x robusta'	**Crabapple** (WHITE)		4	40	25	13	S							2	
Oval, dense branching.																
M. spp.	'Selkirk'	**Crabapple** (ROSE-RED)		4	25	25	13	S							2	
Glossy fruits. Open, upright. Foliage opens reddish green turning to dark green.																
M. spp.	Sugar Tyme™	**Crabapple** (WHITE)		4	18	15	7.5	S							2	
Persistent red fruit. Upright oval. Dark green foliage.																
M. spp.	'Thunderchild'	**Crabapple** (PINK)		3	20	20	10	S							2	
Compact, upright-spreading. Deep purple leaves.																
M. spp.	'x zumi'	**Crabapple** (WHITE)		4	20	20	10	S							2	
Pyramidal habit, may become rounded.																
Metasequoia glyptostroboides	—	**Dawn Redwood**		5	100	50	25	L							4	
Performs best in moist, deep, well-drained, slightly acidic soils. Avoid frost pockets which may affect fall foliage.																
M. glyptostroboides	'Sheridan Spire'	**Dawn Redwood**		5	60	30	15	L							4	
Performs best in moist, deep, well-drained, slightly acidic soils. Avoid frost pockets which may affect fall foliage. More upright.																
Nyssa sylvatica	—	**Black Tupelo**		4b	50	35	18	M							4,6	

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Difficult to transplant. Fall pruning. Great summer foliage and brilliant red fall color. Not for the most tough urban sites, but could make a nice street tree.																
Ostrya virginiana	—	Hophornbeam		3b	45	30	15	S							4,6	
Slow to reestablish. Performs best in cool, moist, well-drained slightly acidic soils.																
Phellodendron amurense	His Majesty™	Amur Corktree		3b	45	30	15	L							6	
Tolerant and adaptable. Prune in winter. Reserve for large areas. Interesting bark. Yellow fall color. Male, so will not produce fruit, but can pollinate.																
P. amurense	'Macho'	Amur Corktree		4	45	45	23	L							6	
Tolerant and adaptable. Prune in winter. Reserve for large areas. Interesting bark. Yellow fall color. Male, so will not produce fruit, but can pollinate.																
Picea abies	—	Norway Spruce		2	60	30	15	L							2,3	
Reserve for large areas. Performs best in well-drained, sandy soils. Prune in spring. Consider P. orientalis and P. omorika.																
Picea glauca	—	White Spruce		2	60	20	10	L							3	
Adaptable and tolerant. Reserve for large areas. Prune in spring. Consider P. orientalis and P. omorika.																
Picea omorika	—	Serbian Spruce		4	60	25	30	M								
Noted for excellent foliage. One of the most adaptable spruces.																
Picea orientalis	—	Oriental Spruce		5a	60	25	30	L							4	
Noted for excellent foliage.																
Pinus cembra	—	Swiss Stone Pine		3	40	20	10	M							4	
Small, dense pine. Requires well-drained, loamy soils in full sun. Slow grower.																
Pinus nigra	—	Austrian Pine		4	60	30	15	M							3	
Adaptable and tolerant. Stiff, dark green needles. With age, becomes flat topped and umbrella like.																
Pinus strobus	—	Eastern White Pine		3	80	40	20	L							1,3	
Easily transplanted and grown. Prefers moist, well-drained, acidic soils. Susceptible to white pine blister rust. Choose certified rust resistant plants. Also susceptible to white pine weevil. Prone to breakage from strong winds, ice and heavy snow.																
Platanus x acerifolia	'Bloodgood'	London Planetree		5	85	70	35	L							2,3	
Adaptable and tolerant. Attractive bark. Cold injury in harsh winters. Tolerates severe pruning. Drops twigs and leaves.																
P. acerifolia	'Morton Thornhill' Exclamation™	London Planetree		5	60	45	23	L							2,3	
Adaptable and tolerant. Attractive bark. Cold injury in harsh winters. Tolerates severe pruning. Drops twigs and leaves.																

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P. acerifolia	Ovation™	**London Planetree**		5	50	60	30	L							2,3	
Adaptable and tolerant. Attractive bark. Cold injury in harsh winters. Tolerates severe pruning. Drops twigs and leaves.																
Platanus occidentalis	—	**Sycamore**		4b	100	80	40	L							2,3	
Prefers deep, rich, moist soils. Cold injury in harsh winters. Attractive bark. Drops twigs and leaves.																
Prunus maackii	—	**Amur Chokecherry** (WHITE)		2b	35	35	28	S							3,6	
Attractive bark. Dense round canopy. Prune to maintain tree shape.																
Prunus sargentii	'Columnaris'	**Sargent Cherry** (PINK)		5a	35	15	8	S							6	
Good yellow, orange to red fall color - develops early. Attractive bark. With age, becomes vase shaped. Short-lived.																
Prunus sargentii x P. subhirtella	'Accolade'	**Accolade Flowering Cherry** (PINK)		5a	35	20	10	S							6	
Good yellow, orange to red fall color - develops early. Attractive bark. Short-lived. Open habit.																
Pyrus calleryana	'Aristocrat'	**Callery Pear** (WHITE)		4	45	20	10	S							1,6	
Adaptable and tolerant. Prune for structure to avoid branch splitting, but much better than 'Bradford'. Blooms later.																
P. calleryana	'Chanticleer'	**Callery Pear** (WHITE)		4	30	15	10	S							1,6	
Adaptable and tolerant. Prune for structure to avoid branch splitting, but much better than 'Bradford', also narrow, longer-lived and hardier.																
P. calleryana	'Jaczam' Jack™	**Callery Pear** (WHITE)		4	15	10	10	S							1,6	
Adaptable and tolerant. Prune for structure. Yellow fall color. Good where space is limited.																
P. calleryana	'Jilzam' Jill™	**Callery Pear** (WHITE)		4	15	15	10	S							1,6	
Adaptable and tolerant. Prune for structure. Yellow fall color. Good where space is limited.																
Pyrus ussuriensis	—	**Ussurian Pear** (WHITE)		3	35	50	25	S							4	
Hardy pear with dense, rounded habit. Dark green, glossy leaves turn red to purplish in fall.																
Quercus alba	—	**White Oak**		3b	60	60	30	L							2,6	
Attractive bark. Growth is slow, transplant at a small size. Reserve for large areas.																
Quercus bicolor	—	**Swamp White Oak**		4a	60	60	30	M							2,6	
Attractive bark. Easier to transplant than Q. alba. Likes acid soils. Yellow to red fall color.																
Quercus imbricata	—	**Shingle Oak**		4	60	60	30	M							2,6	
Adaptable. Reserve for large areas. Transplants easier than most oaks.																
Quercus macrocarpa	—	**Bur Oak**		3a	80	90	45	L							2,6	

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Adaptable. Reserve for large areas. Difficult to transplant. More tolerant of urban conditions than most oaks.																
Quercus muehlenbergii	—	Chinkapin Oak		4	50	55	28	M							2,6	
Adaptable. Slow grower and difficult to transplant. Red, yellow to brown fall color.																
Quercus palustris	—	Pin Oak		4a	70	50	25	M							2,6	
Adaptable. Moderate tolerance, but very intolerant of high pH soils. Strongly pyramidal habit.																
Quercus robur	'Fastigiata'	English Oak		5a	50	15	25	M							2,6	
Adaptable and tolerant. Twig dieback in harsh winters.																
Q. robur	'Pyramich' Skymaster®	English Oak		5a	50	25	13	M							2,6	
Adaptable and tolerant. Twig dieback in harsh winters. Mildew resistant. Tighter than 'Fasitgiata'.																
Quercus rubra	—	Northern Red Oak		3b	75	60	30	L							2	
Adaptable and tolerant expect for high pH. Transplants easily and grows fast for an oak.																
Sassafras albidum	—	Common Sassafras (YELLOW)		5a	60	40	20	M							4,5,6	
Difficult to transplant. Prefers a moist, acid, well-drained soil.																
Styphnolobium japonicum	'Princeton Upright'	Scholar-tree (WHITE)		5a	40	50	25	M							1,2	
Also known as Sophora japonica. Adaptable and tolerant once established after transplanting. Twig dieback in harsh winters. Summer flowers. More upright.																
S. japonicum	'Regent'	Scholar-tree (WHITE)		5a	50	45	23	M							1,2	
Also known as Sophora japonica. Adaptable and tolerant once established after transplanting. Twig dieback in harsh winters. Summer flowers, blooms earlier.																
Syringa reticulata	—	Japanese Tree Lilac (WHITE)		3	30	25	13	S								
Adaptable and tolerant. Blooms in summer. Prune after flowering. Attractive bark. A couple of reported sites where the tree has reseeded.																
S. reticulata	'Ivory Silk'	Japanese Tree Lilac (WHITE)		3a	25	15	13	S								
Adaptable and tolerant. Heavy blooms in summer. Prune after flowering. Attractive bark.																
S. reticulata	'Summer Snow'	Japanese Tree Lilac (WHITE)		3a	20	15	13	S								
Adaptable and tolerant. Heavy blooms in summer. Prune after flowering. Attractive bark. Small tree with compact crown.																
Taxodium distichum	—	Baldcypress		5a	70	30	15	L							6	
Adaptable and tolerant expect for high pH. Can handle extensive flooding. A deciduous conifer.																
Thuja occidentalis	—	White Cedar		3	60	15	8	S							1	
Adaptable and tolerant, but prefers moist, rich soils. Tolerates pruning. Heavy snow can cause damage.																

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T. occidentalis	'Nigra'	**White Cedar**		3	20	8	8	S							1	
Adaptable and tolerant, but prefers moist, rich soils. Tolerates pruning. Heavy snow can cause damage. Good dark green foliage.																
T. occidentalis	'Smaragd,' 'Emerald'	**White Cedar**		3	15	4	8	S							1	
Adaptable and tolerant, but prefers moist, rich soils. Tolerates pruning. Heavy snow can cause damage. Bright emerald green foliage.																
T. occidentalis	'Techny'	**White Cedar**		3	15	10	8	S							1	
Adaptable and tolerant, but prefers moist, rich soils. Tolerates pruning. Heavy snow can cause damage. Good dark green foliage. Slow grower.																
T. occidentalis	'Bailyard' Frontyard®	**American Linden , Basswood** (YELLOW)		4	75	40	20	M							1,3,5	
Adaptable and tolerant. Prune for structure. Symmetrical, pyramidal habit with denser branching.																
T. occidentalis	'Continental Appeal'	**American Linden , Basswood** (YELLOW)		4	60	40	20	M							1,3,5	
Adaptable and tolerant. Prune for structure. Wide, dense crown with narrow ascending branches.																
Tilia americana	Legend™	**American Linden , Basswood** (YELLOW)		4	55	35	28	M							1,3,5	
Adaptable and tolerant. Prune for structure. Distinctly pyramidal with a central leader and better branching than species.																
T. americana	'Redmond'	**American Linden , Basswood** (YELLOW)		4	60	30	15	M							1,3,5	
Adaptable and tolerant. Prune for structure. Uniform, pyramidal habit.																
Tilia cordata	'Baileyi' Shamrock®	**Littleleaf Linden** (YELLOW)		3	45	30	15	M							1,3,5	
Adaptable and tolerant. Prune for structure. More open crown. Quick grower.																
T. cordata	'Chancole' Chancellor®	**Littleleaf Linden** (YELLOW)		3	35	20	10	M							1,3,5	
Adaptable and tolerant. Prune for structure. Narrow upright habit. Better branch angles.																
T. cordata	'Glenleven'	**Littleleaf Linden** (YELLOW)		3	50	35	28	M							1,3,5	
Adaptable and tolerant. Prune for structure. Open habit. Quick grower.																
T. cordata	'Greenspire'	**Littleleaf Linden** (YELLOW)		3	45	30	15	M							3	
Adaptable and tolerant. Prune for structure. Uniform branching, straight trunk and dark green leaves.																
Tilia x euchlora	—	**Crimean Linden** (YELLOW-WHITE)		3	60	30	15	M							5	
Adaptable and tolerant. Graceful habit with branches touching ground.																
Tilia tomentosa	—	**Sliver Linden** (YELLOW)		4b	70	55	28	M							5,6	
Adaptable and tolerant. Most drought tolerant of the lindens. Silver underside of leaves.																
T. tomentosa	'Green Mountain'	**Silver Linden** (YELLOW)		4b	60	40	20	M							5,6	
Adaptable and tolerant. Most drought tolerant of the lindens. Silver underside of leaves. Fast grower with dense crown.																
T. tomentosa	'Sashazam' Satin Shadow®	**Silver Linden** (YELLOW)		4b	50	40	20	M							5,6	
Adaptable and tolerant. Most drought tolerant of the lindens. Silver underside of leaves. Uniform, symmetrical growth. Dark green leaves with silver undersides.																

Scientific Name	Cultivar	Common Name [Flower Color]	Form	Hardiness Zone	Mature Height	Crown Spread	Soil Volume	Planting Area	Tolerances: Drought	Poor Drainage	Alkaline Soil	Salt	Air Pollution	Shade	Limitations	Features
Tsuga canadensis	—	**Eastern Hemlock**		3	70	35	28	L							3,6	
Avoid hot, dry and windy locations. Tolerates shade and severe pruning. Host to invasive insect pest, hemlock wooly adelgid.																
Ulmus americana	'Jefferson'	**American Elm**		3b	50	50	25	S							3	
Adaptable and tolerant. Prune in the fall. Vase shape with arching limbs. Good DED resistance. Primary host of Asian Longhorned Beetle.																
U. americana	'Delaware #2'	**American Elm**		3b	70	80	40	S							3	
Adaptable and tolerant. Prune in the fall. Broad spreading crown. Good resistance to DED. Primary host of Asian Longhorned Beetle.																
U. americana	'New Harmony'	**American Elm**		4	50	50	25	S							3	
Adaptable and tolerant. Prune in the fall. Good form, DED tolerance is less than other cultivars. Primary host of Asian Longhorned Beetle.																
U. americana	'Princeton'	**American Elm**		3b	60	40	20	S							3	
Adaptable and tolerant. Prune in the fall. Good form and DED resistance. Long-history, developed before DED. Primary host of Asian Longhorned Beetle.																
U. americana	'Valley Forge'	**American Elm**		5	70	70	35	S							3	
Adaptable and tolerant. Prune in the fall. Classic elm form with excellent DED resistance. Not as cold hardy. Primary host of Asian Longhorned Beetle.																
Ulmus x spp.	'Morton' Accolade™	**Elm**		4	70	50	25	S								
Adaptable and tolerant. Prune in the fall. American elm-like habit. Glossy dark green foliage. Golden yellow fall color. Good DED resistance. Primary host of Asian Longhorned Beetle.																
U. x spp.	'Discovery'	**Elm**		3b	45	35	18	S								
Adaptable and tolerant. Prune in the fall. Upright, compact, oval to vase-like habit. Good DED resistance. Primary host of Asian Longhorned Beetle.																
U. x spp.	'Frontier'	**Elm**		5	35	25	13	S								
Adaptable and tolerant. Prune in the fall. Dark green foliage, red fall color. Case shaped habit. Primary host of Asian Longhorned Beetle.																
U. x spp.	'New Horizon'	**Elm**		3b	50	25	13	S								
Adaptable and tolerant. Prune in the fall. Upright and full crown. Good DED resistance. Primary host of Asian Longhorned Beetle.																
U. x spp.	'Patriot'	**Elm**		5	70	50	25	S								
Adaptable and tolerant. Prune in the fall. Upright, stiffly vase-shaped. Narrower than most elms. Good DED resistance. Primary host of Asian Longhorned Beetle.																
U. x spp.	'Prospector'	**Elm**		4	70	60	30	S								
Adaptable and tolerant. Prune in the fall. American elm-like habit. Great vigor. Primary host of Asian Longhorned Beetle.																
Viburnum prunifolium	—	**Blackhaw Viburnum** (WHITE)		3	30	15	8	S								
Adaptable. Transplants well. Small tree.																
Zelkova serrata	'Green Vase'	**Japanese Zelkova**		5a	70	50	25	S							1	

Scientific Name	Cultivar	Common Name [Flower Color]	Form	Hardiness Zone	Mature Height	Crown Spread	Soil Volume	Planting Area	Tolerances: Drought	Poor Drainage	Alkaline Soil	Salt	Air Pollution	Shade	Limitations	Features
Adaptable. Attractive bark. Young trees susceptible to frost. Prune in the fall. Vase shape with upright branching. Bronze to red fall color.																
Z. serrata	'Green Veil'	**Japanese Zelkova**		5a	70	55	28	S							1	
Adaptable. Attractive bark. Young trees susceptible to frost. Prune in the fall. Upright narrow vase shaped.																
Z. serrata	'Halka'	**Japanese Zelkova**		5a	50	30	15	S							1	
Adaptable. Attractive bark. Young trees susceptible to frost. Prune in the fall. More open and less uniform crown. Yellow fall color.																
Z. serrata	'Musashino'	**Japanese Zelkova**		5a	45	15	8	S							1	
Adaptable. Attractive bark. Young trees susceptible to frost. Prune in the fall. Upright, tight, narrow crown. Yellow fall color.																
Z. serrata	Village Green™	**Japanese Zelkova**		5a	40	40	20	S							1	
Adaptable. Attractive bark. Young trees susceptible to frost. Prune in the fall. Straight trunk. Wide and dense canopy. Red fall color.																