Town of Irondequoit Landscape Guidelines

Adopted June 20, 2023

Resolution No: 2023-148

The Town of Irondequoit Landscape Guidelines were prepared by the Town of Irondequoit Conservation Board. The guidelines are to be considered a living document and updated, as necessary, to reflect changing conditions or needs of the Town.

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DEFINITIONS

Best Management Practice (BMP) A design or practice employed with the primary objective to minimize adverse water quality impacts, preserve beneficial features on-site, avoid downstream erosion and habitat loss, maintain natural base flows and groundwater recharge, prevent downstream flooding, provide multiple uses of drainage and storm water drainage facilities, and/or provide for the economical, safe and aesthetically pleasing drainage system for development.

Berm An earthen mound designed to provide visual interest, screen undesirable views, and/or decrease noise.

Buffer A combination of physical space and vertical elements, such as plants, berms, fences, or walls; the purpose of which is to separate, and screen incompatible land uses from each other.

Caliper A circumferential measurement of a tree's trunk recorded six inches above grade for those trees having a caliper of four inches or less, and at breast height for those trees with a caliper of above four inches.

Certified Nursery Professional A landscape professional having successfully completed the examination for, and continuously maintains their status in, the Certified Nursery Professional Program administered by the New York State Nursery and Landscape Association.

Critical Root Zone (CRZ) A circle on the ground corresponding to the drip line of the tree. An alternative method of determining the dimension is to measure the diameter of the tree truck in inches at breast height (DBH) such that 1-ft radius of the CRZ for every 1-in of DBH. For example a tree 12-in DBH will have a roughly 12-ft radius CRZ.

Diameter at Breast Height (DBH) The unit of measurement utilized for describing the size of a tree. The diameter of the tree trunk is typically measured at a point approximately 4.5-ft above the ground.

Drip Line The area directly located under the outer circumference of the tree branches.

Invasive Species 1) non-native (or alien) to the ecosystem under consideration, and 2) whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health. Invasive species can be plants, animals, and other organisms (e.g., microbes). Human actions are the primary means of invasive species introductions. Source: http://www.invasivespeciesinfo.gov/whatis.shtml

Licensed Landscape Architect An individual licensed by the New York State Department of Education's Office of Professionals, to perform services further described in Title VIII of the New York State Education Law.

Native Species With respect to a particular ecosystem, a species that, other than as the result of introduction, historically occurred or currently occurs in that ecosystem.

1 INTRODUCTION

1.1 Purpose

The purpose of this publication is to provide landscape guidelines to assist property owners, developers, design professionals, and members of the various Irondequoit review boards a consistent standard for landscape design and installation for development anywhere in the Town of Irondequoit. However, this publication is not intended to be rigid in its requirements to the point of preventing innovative, aesthetically pleasing landscaping. The listed guidelines may be varied, if, in the judgement of the review board, the quality of plantings and site improvements proposed constitute a well thought out and purposely designed plan consistent with the spirit of these guidelines.

1.2 Process

Landscaping associated with development and redevelopment within the Town of Irondequoit should be designed in accordance with the guidelines herein and should be subject to Site Plan approval by the Planning Board with input from the Conservation Board as solicited by the Planning Board, as necessary.

This document is broken into sections that provide different recommendations for the differing types of development typically seen within the Town of Irondequoit. Variations from these guidelines should be approved by the Planning Board, as necessary.

2 GENERAL GUIDELINES

2.1 Soils

The Town of Irondequoit has a diverse mix of land uses and site conditions. Each development should thoughtfully consider the type of use and development on the property and how site conditions should be best managed. Soils in Irondequoit tend to be very sandy, which is typically good for infiltration and can also be poor for certain types of development. Additionally, while some areas of Irondequoit are predominantly flat, there are many areas where the topography is steep with highly erodible soils. Water courses pass through steep ravines and the steep slopes of these areas tend to slough and erode easily. Figure 1 and Figure 2 are excerpts from the Natural Resources Conservation Service (NRCS) Web Soil Survey for Irondequoit. These figures show representations of areas where the soils are highly sandy and areas where the soils are likely highly erodible. These figures are merely representative and do not specify the exact conditions at a project site; however, provide guidance for certain types of investigations that should be conducted when considering development in some of these sensitive areas. The most recent information can be found at the Web Soil Survey website at:

https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

2.2 Environmental Protection Overlay Districts (EPODs)

The Town of Irondequoit has classified certain areas of the Town as designated Environmental Protection Overlay Districts (EPODs). These areas are described in Chapter 235, Article XI of the Town Code. The purpose of these areas is to provide special controls over land development located in sensitive environmental areas within the Town. The regulations are designed to preserve and protect unique environmental features within the Town as much as possible. EPODs are categorized into the following:

- $EPOD_1$ – Wetland Protection District
- $EPOD_2$ – Steep Slope Protection District
- $EPOD_3$ – Woodlot Protection District
- $EPOD_4$ – Floodplain Protection District
- $EPOD_5$ – Watercourse Protection District
- $EPOD_6$ – Coastal Erosion Area Protection District

Figure 1: Sand Percentage in Soils in Irondequoit, New York

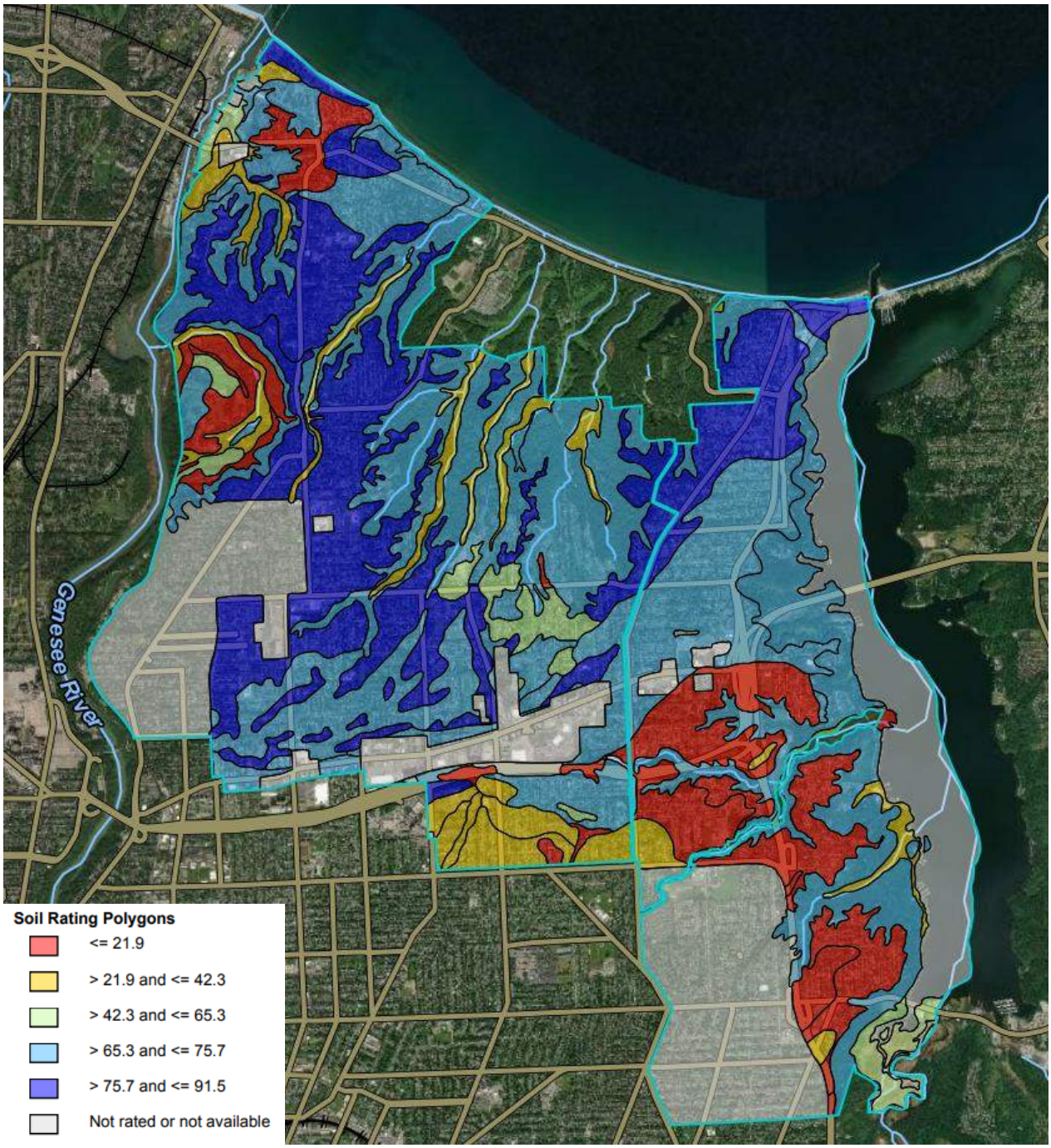
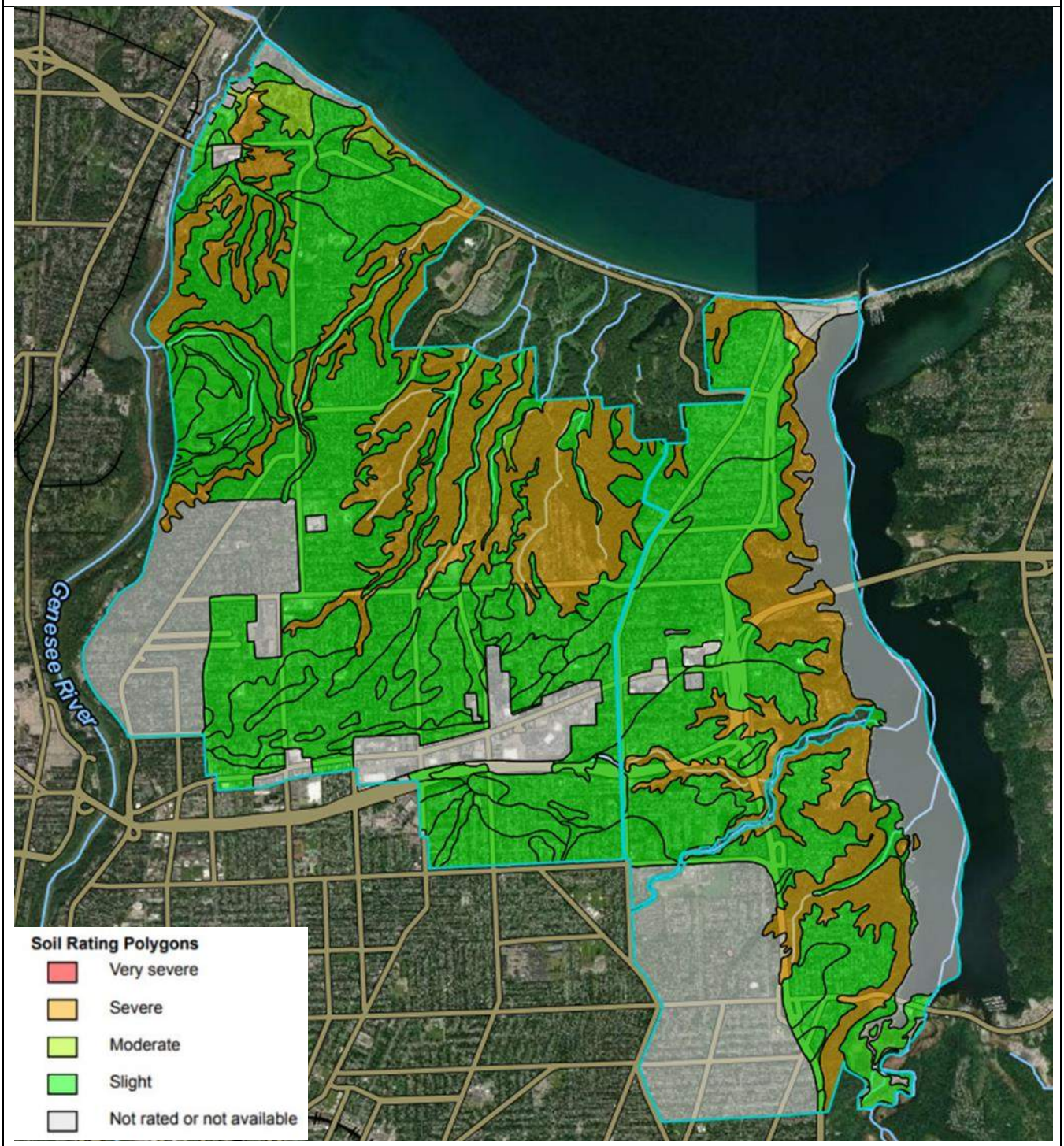


Figure 2: Erosion Hazard Potential for Soils in Irondequoit, New York



The locations and boundaries of all EPODs are delineated on an official set of maps on file in the Town Clerk's office and Town Building Department. The EPOD mapping can also be found online at the Town website: https://irondequoit.maps.arcgis.com/apps/webappviewer/index.html?id=a47d383c4af74b6280dab02d5f0c0a7b

Development in these designated EPODs shall conform to the regulations outlined in the Town Code. Additionally, measures shall be taken to preserve, protect and enhance the natural landscape within these areas. Care should be taken to select appropriate vegetation for the environmental features and site constraints. The Irondequoit Conservation Board shall review all projects proposed in EPODs and will provide additional guidance for landscape planting and natural resource protection.

2.3 Plan Submission

All Site Plans shall be submitted to the Town for review. All Site Plans shall include a Landscape Plan in accordance with these guidelines. The Landscape Plan shall be certified by either a New York State Licensed Landscape Architect or in consultation with a Certified Nursery Professional. Acceptable Landscape Plans shall include:

- Scaled plan that clearly and accurately shows all existing and proposed plant material.
- Limits of existing vegetation (i.e., plants and trees). Existing vegetation should be noted on the plan as "To Remain" or "To Be Removed". Individual trees 6 inch diameter at breast height (DBH) and greater within the project area shall be noted on the plans with size and type of tree.
- Total site acreage.
- Percentage of existing and proposed green space for the whole site.
- Percent of impervious area (i.e., parking lots, rooftops, sidewalks) for the whole site.
- Designation of any EPODs within the site. Boundaries should be verified from Town Code and existing site conditions.
- Designation of all areas with slopes of 10% or greater.
- Designation of all areas with slopes of 25% or greater.
- Designation of all water courses (i.e., streams, wetlands, swales, drainage ditches).
- Minimum of 50 feet vegetated buffer from all water courses.
- Designated snow storage area.
- Tree protection measures for existing vegetation to remain.
- Table of quantities of all new stock keyed to the plant locations on the plan, including symbols, names (common and botanical), container or caliper sizes, heights, and spacing at installation. The planting size of deciduous trees should be indicated in minimum inches of caliper measured at breast height. The planting size of evergreen trees shall be indicated in minimum feet of height above ground. The planting size for shrubs, vines, and groundcovers shall be indicated in the minimum container size in inches or gallons, as appropriate. The manner in which any lawn areas are to the established (e.g., by sodding or seeding) shall be indicated along with the specified seed mixture, fertilization and protection measures, as appropriate.
- Planting notes and installation details.
- The location and description of other landscape improvements, such as earth berms, bioretention areas, walls, fences, screens, sculptures, walkways, benches, lights and courts or paved areas. The heights and materials of walls and fences should be specified. Grading features should be delineated by one-foot contours.

- Preserve mature plant species, hedgerows, woodlots, and other natural areas to the extent reasonable and feasible, and include them as a design element in the landscape plan.
- Preserve existing vegetation along the road frontage to the greatest extent feasible in primarily undeveloped areas. Limit clearing and grading along the road frontage to the minimum necessary for safety, access, and sight distance.
- Make every effort to protect existing trees over 6-inch DBH. Note trees to be saved on the Landscape Plan and outline appropriate measures to protect the tree stock from damage during construction. Flag trees to be protected prior to construction and define a tree's drip line and/or critical root zone to avoid any disturbance near the tree's root system.
- Vegetated buffers should be retained and incorporated into development plans to the maximum extent practical
- Any other information that may impact the landscape design including overhead and underground utilities, or any other information deemed necessary by the Planning Board.
- For sites containing woodlots, the applicant should consult a Certified Arborist as early in the planning process as possible. The Planning Board may require certain existing trees to remain throughout the course of development based on their ecological value or buffering qualities.

Prior to the issuance of a Certificate of Compliance for the premises, developers of commercial, industrial, and multi-family residential sites shall provide to the Town of Irondequoit's Department of Development Services a certification verifying proper installation of landscape areas on the site, in accordance with the Landscape Plan approved by the Planning Board and/or Conservation Board, and in accordance with these guidelines.

2.4 Maintenance

Maintenance of landscape plantings should be ongoing throughout the life of the development. The owner of the property is ultimately responsible for all maintenance of the property. The selection of native plantings and the consideration of site conditions will greatly reduce maintenance requirements.

- Maintain all plant material in a healthy, growing condition at all times. The property owner is responsible for regular weeding, watering, fertilizing, pruning, mowing, and other maintenance of all plantings as needed.
- Appropriately treat plant materials that exhibit evidence of insect pests, disease, and/or damage. Whenever necessary, remove dead or diseased plant materials and replace them with living plant materials to ensure continued compliance with applicable landscaping, buffering, and screening requirements.
- Permanently maintain all required fences and walls in good condition and, whenever necessary, repair or replace them.
- The property owner of land abutting a constructed public right-of-way is responsible for landscaping and maintenance of any right-of-way area between his or her property line and the curb line, with the exception of trees, which are maintained by the Town.
- Keep all landscaped areas free of refuse, debris and weeds.
- All plantings may be subject to periodic inspections by local agents and maintenance may be subject to a performance bond by the Planning Board as a condition of approval.

2.5 Street Trees

The Town of Irondequoit is proud of the tree-lined streets the Town is known for. In 2018 the Town began proceedings to be designated a "Tree City USA" by the Arbor Day Foundation. The designation became official on

Arbor Day 2019. Street trees provide any number of added benefits to the community including making sidewalks more welcoming and walkable, providing shade, helping to calm traffic and increasing property values. The Town wishes to continue replenishing the stock of street trees throughout each of its neighborhoods. All proposed development within the Town should include the installation of street trees within the Town right-of-way. The right-of-way is typically offset from the edge of pavement to include the sidewalks on many streets. The right-of-way width varies from street to street and should be confirmed with the Town's Department of Public Works.

- Street trees should be included in all Landscape Plans subject to the Planning Board and/or Conservation Board approval.
- Street trees should be located between the sidewalk and the curb / edge of roadway within the Town owned right-of-way to form a protective row that makes pedestrians feel safely separated from traffic.
- On streets without sidewalks, the street trees shall be placed in a row, consistent with other street trees within the Town owned right-of-way.
- Provide street trees along each side of all Town streets, existing or proposed. In locations where healthy and mature shade trees currently exist, the requirements for new trees may be waived or modified.
- Street trees should be of the approved species list included in **Appendix A**. The Town, in conjunction with the Conservation Board and Tree Board may update this list of approved trees periodically.
- Street trees should have a minimum caliper of 2½-inch and preferably 3-inch measured at breast height at the time of planting and should be spaced a maximum of 25 to 30-feet on center, with exact spacing to be evaluated on a site-specific basis.
- No more than 30% of the street trees should be of one species. The particular species of trees should be determined upon specific location requirements and will be subject to the Town Arborist's approval.
- Street trees should be grown to at least American Nursery Association Standards, should be balled and burlap or crated nursery stock, and should be irrigated and fertilized for a minimum of two years after installation. Any tree that dies within two years of planting or any tree that is removed should be replaced with the same species and size, unless approved by the Planning Board and/or Conservation Board.

In 2022, the Town conducted a town-wide street tree risk assessment. All of the street trees within the town were located, identified, and additional information was collected to help the Town prioritize maintenance and planting schedules. The Town maintains a GIS database of the street trees. Any project with street trees will need to be coordinated with the Town Arborist to ensure that the trees are added to the GIS database. The web-based GIS platform to view street tree information for the Town is located at: https://irondequoitny.treekeepersoftware.com

3 COMMERCIAL / MIXED USE COMMERCIAL (MUC) DEVELOPMENT

Commercial and mixed use commercial (MUC) development are important to the residents of Irondequoit. It benefits everyone to have local stores and businesses to provide goods and services as well as places of employment. However, as the development of these areas continues, it is important to consider smart, attractive design that can bring compatible land uses closer together, provide pedestrian friendly access, and provide appropriate character to the surrounding neighborhood. Landscaped areas should be designed as an integral part of the site development. There are many guidance documents and design plans to optimizing the space of these valuable parcels while providing a compact, efficient use of the land resources. This section provides some of the recommendations for landscaping and site layout within these areas.

3.1 Best Management Practices

The following general recommendations should be considered when designing commercial and/or MUC development:

- At least 30% of new or redeveloped commercial/MUC sites should be devoted to landscaped areas.
- No less than 5% of continuous impervious surface areas (i.e., parking lots) should be designed to contain green space islands or stormwater management gardens. For example, a 1,000 square feet parking lot should dedicate at least 50 square feet to green space islands or stormwater management gardens.
- Disturbed areas on a site that are designated for future development should be planted with a clover cover or cottage meadow mix and maintained as such until future development, unless otherwise permitted or required by the Planning Board.
- Existing and natural features and vegetation should be preserved and incorporated in the landscaped area whenever possible. Designs should take into consideration the critical root zone of existing vegetation to ensure maximum retention of existing vegetation after construction.

3.1.1 Parking Lot Landscape Guidelines

Parking areas shall be suitably landscaped to minimize noise, glare, and other nuisance characteristics as well as to improve the appearance of the site and surrounding area. Large parking lots shall be divided into sections of landscaping as appropriate for the type and size of development. Sections shall be separated by landscaped dividing strips, berms, and similar landscaping elements. The following recommendations shall apply:

Amount

- If the parking area contains no more than 50 parking spaces, at least 17.5-square feet of landscaping shall be provided for each parking space proposed.
- If the parking area contains more than 99 parking spaces, at least 35-square feet of landscaping shall be provided for each parking space proposed.
- If the parking area contains more than 50 parking spaces and less than 99 parking spaces, the Planning Board shall interpolate between the standards of 17.5- and 35-square feet for each parking space provided.
- If the development is considered redevelopment utilizing an existing parking area, effort should be made to reduce the parking area to the minimum necessary size, converting extraneous impervious area to landscaped areas and green space.

Layout

- Reduce visual impacts by breaking up large parking lots into smaller parking groves or courts, with a significant number of shade trees surrounded by low hedges, stonewalls, or attractive fencing. Avoid more than 15 parking spaces in a continuous row and more than 60 spaces in any single parking area defined by landscaping.
- Each section of landscaping shall contain at least 100-square feet in area and must be at least 4-feet in any direction. The area shall contain at least one tree at least 6-feet in height and with a minimum size of 2½-inch in caliper at breast height if deciduous. The remaining ground area shall be landscaped with appropriate plant materials.
- A section of landscaping shall be placed at the end of each parking row in a multiple lane parking area. This area shall be at least 4-feet wide and shall extend the length of the adjacent parking stall.

- Up to 100% of trees proposed for the parking area may be deciduous. When divider medians and mid-row islands have a width of 10-feet or greater, evergreen trees may be provided in addition to large deciduous trees. Evergreen trees should be spaced a maximum of 10-feet on center.
- In addition to trees, all landscaped islands and divider medians shall be landscaped with grass, groundcover, shrubs, or other landscape material as approved by the Planning Board.
- Care shall be taken when selecting and laying out plant materials in parking areas that future growth will not impede traffic, cause dangerous site line conditions, inhibit pedestrian traffic, or block pedestrians from view of motor vehicles.
- When a parking lot is located adjacent to a public right-of-way, provide a landscape strip between the parking lot and the right-of-way. The landscape strip should be at least 8-feet in width, and should not include any paved area except a 5-foot wide pedestrian sidewalk or trail that crosses the landscape strip.

Specific Requirements

- One shade tree with an average crown of 15-feet and having a trunk free of branches up to 5-feet above grade shall be planted within off-street parking areas for every 10 parking spaces.
- Screen planting of a dense evergreen material not less than 6-feet high and of sufficient width shall be provided in any location where lights from vehicles within the off-street parking area may shine directly into adjacent residential areas.
- Plant materials selected for use in parking areas should be able to tolerate salt and fumes from automobile emissions.
- Use landscaping to delineate vehicular and pedestrian patterns. Clear and legible signs, different color and texture paving materials, raised or inverted areas, and other techniques should be used to further direct the flow of both vehicular and pedestrian traffic within the lot.

3.1.2 Site Landscaping

Landscaping should provide visual interest throughout all four seasons and should complement the surroundings. It is also important to select appropriate vegetation for the climate, site conditions, and adjacent land use.

- Devote a minimum of 30% of the site to landscaped areas.
- Include appropriate plants in the landscaping plan to provide an attractive visual landscape throughout the year.
- Use a variety of tree species to provide visual interest and to protect against same species die-out or disease.
- Plant new landscaping in clusters using varied plant material to create a natural appearance.
- Select vegetation, particularly trees, carefully based on adjacent uses. Fruit or berry producing trees should be carefully considered and placed where the falling fruit does not create an unwanted mess (i.e., sidewalks) or invite unwanted animals. Consideration of where children may be playing, or other public uses should be taken into account for selection.
- Salt tolerant species should be selected near parking areas, driveway entrances, and the snow storage area.
- Be sure to consider sight distances, blind spot areas, and visual disturbances around sidewalks and other areas where vegetation may hinder the ability to see pedestrians.

- Consider plant locations to increase energy conservation. Properly placed shade trees can help to reduce southern and southwestern sun exposures during the summer. Evergreens planted on the northerly and northwesterly exposures help break cold, northerly winds in the winter.
- Native plant materials are strongly recommended as a means to reduce maintenance.
- Berms, if used, should emulate natural landforms.
- Steep slopes should be planted with trees appropriate for helping to control grade and have a quick growth rate and thick ground cover to reduce erosion.
- Establish public open spaces with pedestrian amenities to encourage social interaction, as part of the Landscape Plan.
- Meadows/naturalized landscapes on commercial properties should have their site plans certified by a nursery professional or landscape architect prior to installation. (see Section 4.1.3 Cottage Meadows / Naturalized Landscapes for further design guidance)
- The meadow/naturalized landscape should be recertified after 3 years as conforming to the site plan and to ensure that maintenance is being performed.

3.1.3 Buffering

Landscaping can be used to create boundaries and transitions between neighborhoods, differing commercial areas, and particularly between commercial and residential land use areas. Buffers can take many shapes and forms. When residential uses are adjacent to commercial or MUC uses, they should be separated by a visual buffer that protects the residential activities while providing a pleasant visual experience when viewed from the public right-of-way.

- Buffers may be opaque, depending on the appropriate use at the site and may consist of any one or a combination of the following to a minimum height of 6-feet:
    - Berm
    - Fence
    - Masonry Wall
    - Vegetation Screen
- Provide at least a 30-foot wide landscape buffer between an industrial or manufacturing use and any residential use or district.
- Provide a 20-foot wide landscape buffer between a commercial or MUC use and any residential use or district.
- Provide a minimum of 50-foot wide vegetated buffer along any water course within the site. Additional water quality and stream protection requirements may be required depending on the type of water course.
- Include a variety of local species that have low maintenance requirements. Their appearance should be natural, and clustering is preferred over planting in rows.

3.1.4 Screening

Screening helps to reduce the visual impact of outdoor storage and loading areas, refuse facilities, and mechanical equipment. The following are recommended screening guidelines:

- Screen all outdoor storage and loading areas from residential districts or uses and from view of any public right-of-way with a berm, wall, fence, and/or plant material as follows:
    - Screening should be a minimum of 6-feet high.

  - Walls or fences should be solid or visually impervious and made of natural material such as masonry or wood. The Planning Board will avoid approval of chain link or razor wire unless absolutely necessary due to unusual security needs.
  - Plant materials, if used alone, should be evergreen and should be at least 3-feet wide.
  - The Planning Board may require that walls or fences be softened with plant materials such as vines and shrubs.
- Screen all refuse facilities and mechanical equipment from all adjoining uses and from view of any public right-of-way with a solid wall or fence and/or plant material as follows:
  - Screening should be no less than the height of the facilities or equipment.
  - Plant materials, if used alone, should be evergreen.
  - Roof mounted mechanical equipment should be set back from the building façade so as to not be seen from any public right-of-way, or should be completely screened by building parapets.

4 RESIDENTIAL LANDSCAPING

The majority of the Town of Irondequoit is devoted to residential housing. Our homes come in a wide variety of designs, sizes, lot sizes, and layouts. While much of the Town is currently built out, there are always opportunities for expanding or rebuilding. These guidelines should be used with regard to residential development.

4.1 Best Practices

The following general recommendations should be considered when designing residential development:

- At least 40% of a single family residential site should be devoted to green space for landscaping.
- At least 50% of a multi-family residential site should be devoted to green space for landscaping.
- No less than 5% of continuous impervious surface areas (i.e., parking areas in a cluster development) should be designed to contain green space islands or stormwater management gardens. For example, a 1,000-square foot parking area should dedicate at least 50-square feet to green space islands or stormwater management gardens.
- Disturbed areas on a site that are designated for future development should be planted with a clover cover or cottage meadow mix and maintained as such until future development, unless otherwise permitted or required by the Planning Board
- Residential development subject to the approval of the Planning Board should provide a Landscape Plan, similar to that required in
- Residential development within an EPOD area shall provide a Landscape Plan, similar to that required in Section 2.3 of this document with their Site Plan submission, and shall be reviewed by the Conservation Board.

4.1.1 Site Layout

Residential landscaping is highly dependent on the property owner. However, these guidelines are recommended for general consideration during development.

- Consider shade tree placement to maximize energy efficiency. Shade trees placed to block summer sun can help reduce energy costs.
- Consider the use of fences or natural borders of shrubs and hedgerows along property lines to define boundaries.

- Consider the placement of rain gardens, rain barrels, or other stormwater features near gutter downspouts to best reuse or infiltrate stormwater (see also Section 6 Stormwater Management / Green Infrastructure for more recommendations)
- Consider the proximity of utilities, both above and below ground, when planting trees. When planting near above ground power lines, select smaller trees whose maximum height will reduce interference. Trees should be planted a minimum of 10-feet from any utility.

4.1.2 Plant Selection

These are general recommendations for selecting residential landscaping plantings.

- Certain areas of Irondequoit are highly affected by the deer population. Deer resistant shrubs and ground covers should be selected in these areas. Deer fencing may be required to maintain landscaped areas or to allow initial establishment.
- Native species should be selected to minimize the spread of invasive species. These native species will also be easier to maintain and be better suited for the climate in this region.
- Additional non-native species are becoming more widely available and tolerant of our local climate and site conditions. Non-native species may be considered; however, a good understanding of the additional maintenance requirements, and impacts to from the species should be considered. Invasive species are not permitted.
- Plant mixtures should be selected to provide visual interest throughout all four seasons. Plants with a hardiness zone of 6a to 6b are recommended for this area.
- Consider the amount of maintenance required for the property. Some plants require more continued maintenance than others. It is ultimately the responsibility of the property owner to maintain all plantings on the property.
- Consider low ground covers, turf, or small flowering plants near walkways and sidewalks. Large, overgrown plants crowding sidewalks can be dangerous or inhibitive to the public and can reduce the ability for the driving public to see pedestrians crossing driveways and cross walks.

4.1.3 Cottage Meadows / Naturalized Landscapes

Some property owners are interested in pursuing alternative design elements rather than the traditional turf lawn. In this instance, the cottage meadow or naturalized landscape guidelines should apply. Unlike the easily defined, traditional turf lawn, meadows and/or naturalized landscapes are by definition individualistic habitats encompassing a diversity of plant life and aesthetics. It is not an unintended landscape. It has design elements. Meadows/naturalized landscapes will have the following characteristics in common in order to differentiate them from unkempt lawns:

- There should be clearly visible design elements as understood by certified nursery professionals and/or landscape architects.
- They should contain a variety of plant species.
- The plant species may not be considered invasive.
- Native plantings should be used in order to encourage local habitat and biodiversity. Non-native plantings must be considered carefully as they can often quickly spread, outcompeting the local flora.
- Grasses may be grown above a height of 6-inches and should be part of a clearly defined planting plan, not an un-mowed lawn.

- There should be mowed pathways and/or clearly delineated pathways of some sort using stone, pavers, etc.
- Bare ground without plantings, turf, or landscaping (mulch, stone, etc.) will not be permitted.
- The meadows/naturalized landscapes should be clearly maintained with the addition, subtraction, and pruning of plant materials.

5 ENVIRONMENTAL PROTECTION OVERLAY DISTRICTS (EPODS)

As described in Section 2.2, the Town has delineated environmentally sensitive areas of the Town by establishing Environmental Protection Overlay Districts (EPODs). In addition to the standard guidelines, development in these environmentally sensitive areas should meet additional best management practices.

5.1 Best Practices

5.1.1 EPOD$_1$ – Wetland Protection District

- Development within a wetland protection district shall be limited. Federal and State regulations regarding fill within wetlands shall be followed.
- Wetlands shall be provided a minimum of 100-feet vegetated buffer from any proposed development. The vegetated buffer shall be dense grasses, shrubs, or other wet-tolerant species. The wetland buffer area should not be maintained as lawn.
- Fertilizers and pesticides shall not be applied within the wetland protection district.
- Appropriate erosion and sediment control measures shall be implemented during construction to minimize sediment laden runoff from reaching a wetland area.
- Concentrated storm runoff shall not drain directly into a wetland buffer or wetland. Every effort should be taken to spread runoff out into sheet flow prior to entering the buffer zone and reduce erosion into or near the wetland and wetland buffer.

5.1.2 EPOD$_2$ – Steep Slope Protection District

- Drainage shall be controlled, both during and after construction, to minimize the amount of erosion from concentrated drainage.
- To the maximum extent possible, removal of existing vegetation shall be avoided. The removal of any trees greater than 6-inch DBH shall be replaced at a minimum ratio of 1:1, at the discretion of the Planning Board.
- Steep slope tolerant trees shall be included in the landscape design to provide root density within the slope.
- Ground cover plants suitable for steep slopes with a fast growth rate shall be part of the Landscape Plan.
- Extensive consideration shall be made to the temporary erosion control measures and site sequencing during construction. Phased erosion and sediment control plans may be required to depict key phases in ground disturbance. Features such as drainage diversions, silt fence, slope drains, and rock protection may be required to temporarily stabilize a disturbed steep slope during construction.

- Temporary seeding and mulching will be required on all steep slopes during construction, as per the New York State Specifications for Erosion and Sediment Control. The temporary seeding and mulching shall be implemented for areas where activity has temporarily ceased, as well as for temporary ground cover until more permanent vegetation can be established. The temporary seeding shall be a rapid growth ground cover mix appropriate for steep slopes.
- Erosion control blankets shall be implemented on all disturbed slopes 3H:1V or steeper.
- Landscaped areas within the steep slope protection district shall not be maintained as lawn.

5.1.3 $EPOD_3$ – Woodlot Protection District

- To the maximum extent possible, removal of existing vegetation shall be avoided. The removal of any trees greater than 6-inch DBH shall be replaced at a minimum ratio of 1:1, at the discretion of the Planning Board.
- Replacement trees shall be consistent with the general composition of the surrounding woodlot, or as approved by the Planning Board.
- Understory and groundcover landscaping should also be included in the landscaping plan. The materials shall be suitable for the site and consistent with the surrounding natural community.
- Disturbance within a woodlot shall take care to limit the impact to the critical root zone of the remaining trees. Critical root zones shall be protected during construction to avoid unintended loss of trees.

5.1.4 $EPOD_4$ – Floodplain Protection District

- Areas within floodplains should be landscaped with plants suitable for wet or partially wet conditions, depending on their location and proximity to the water source.
- Stream channels should have a minimum of 50-feet vegetated buffer comprised of dense grasses, shrubs, and trees to protect the streambank, reduce runoff velocities, limit sediment laden runoff, and provide habitat. These areas should not be maintained as lawn.
- Vegetation near waterway infrastructure, such as culverts, bridges, storm drain outfalls, etc. should be carefully considered to not cause long-term maintenance issues or drainage blocking in the future. Consideration should also be given to erosion protection measures such as riprap or geotextile to limit the amount of erosion from concentrated flows in these areas.
- Care shall be taken that the development, including landscaping, shall not result in an adverse hydraulic impact to adjacent properties. (i.e., removal of dense grasses and forested areas will increase stream velocities that could negatively impact adjacent properties).

5.1.5 $EPOD_5$ – Watercourse Protection District

- All required Federal and State regulations for development and protection within a stream channel shall be followed.
- Stream channels should have a minimum of 50-feet vegetated buffer comprised of dense grasses, shrubs, and trees to protect the streambank, reduce runoff velocities, limit sediment laden runoff, and provide habitat.
- Areas within the stream buffer should be landscaped with plants suitable for wet conditions. These areas should not be maintained as lawn.
- Vegetation near waterway infrastructure, such as culverts, bridges, storm drain outfalls, etc. should be carefully considered to not cause long-term maintenance issues or drainage blocking in the future.

Consideration should also be given to erosion protection measures such as riprap or geotextile to limit the amount of erosion from concentrated flows in these areas.

- Appropriate erosion and sediment control measures shall be implemented during construction to minimize sediment laden runoff from reaching a watercourse.

5.1.6 EPOD$_6$ – Coastal Erosion Area Protection District

- All Federal and State regulations for development within a coastal area shall be followed.
- Removal of existing vegetation shall be avoided unless shown to be having a negative impact to the surrounding property (i.e., damaged/leaning tree that if falls will cause significant loss of shoreline can be removed to implement shoreline protection measures).
- Vegetation shall be suitable for location. Dense, long, and tall grasses should be used along shorelines. These areas should not be maintained as lawn.
- Placement of trees shall be carefully considered in areas with long term erosion potential.
- Shrubs and grasses with dense, fast growing root systems should be considered for high erosion areas.
- Drainage shall be controlled to limit erosion. Areas with concentrated drainage shall be modified to provide sheet flow and/or more stable outfall protection to minimize future erosion.
- Appropriate erosion and sediment control measures shall be implemented during construction to minimize sediment laden runoff from reaching a watercourse.

6 STORMWATER MANAGEMENT / GREEN INFRASTRUCTURE

Irondequoit has already shown its dedication and desire to be a sustainable community. The purpose of establishing consistent landscaping design and installations standards is intended to further this commitment by preserving natural drainage systems, keeping our waters healthy, lessen the stress on our infrastructure, and reduce the spread of invasive species.

By giving careful consideration to where development occurs, our community can plan projects that will protect sensitive areas and direct growth and development more thoughtfully.

Following the suggested landscape guidelines, property owners and developers can help protect natural resources, provide the foundation for more cost-effective infrastructure, and point the Town of Irondequoit to a more sustainable future.

As Irondequoit developed, we constructed roads, parking lots, and driveways that disrupt the natural flow of water. When rain lands on these hard, impervious surfaces, it is not able to seep into the ground and instead becomes stormwater runoff. The runoff flows into the gutter, enters the storm drain system and travels through a network of pipes and eventually discharges into a nearby waterway. This network of gutters, drains, and pipes is known as the storm drain system and is intended to keep our roadways clear of water during rain events and to get water to streams and rivers as fast as possible.

In Irondequoit the storm drain system is a separate system of pipes and ditches and is not part of the sanitary sewer system. This is a very important concept to understand. Water that enters the storm drain system, which as full of pollutants like oils from roadways, fertilizers from lawns and general debris, is transported to our nearby waterways and ultimately Lake Ontario, without being treated by a wastewater treatment plant. Therefore, our best method to clean our runoff is through natural infiltration.

While these systems are important, we have also come to learn that getting runoff to the streams and rivers as fast as possible is not always the best option. These systems tend to increase the amount of flow in streams and rivers that can cause erosion and damage to our streams and may cause unintentional flooding in other areas. This also prevents the natural cleaning and filtering of water when it is allowed to infiltrate into the ground. Infiltrated water also helps to slow the time the runoff takes to get to a stream, thereby reducing the flooding and high quantities of water that damage stream systems.

6.1 Best Practices

New York State has stormwater regulations in place for development and all land development with the Town shall follow the State regulations. These guidelines are additional recommendations to consider during site design.

- Treat drainage features as an element of the site's landscape plan and model them on the characteristics of naturally occurring water features.
- Ensure that drainage features have extensive landscaping and/or fencing around them.
- Use native plant materials suited to the conditions (drought tolerant, salt tolerant, wet tolerant) to control erosion and create a natural appearance.
- Rain gardens placed to capture and treat runoff are excellent methods for small quantities of runoff. Typically, these are placed where roof drains can discharge into the rain garden. It is important to consider appropriate plants that can survive drought as well as periodic inundation. Irondequoit's sandy soils tend to provide high enough infiltration rates for these to be effective; however, it is important to make sure the soil in the proposed rain garden location meets the necessary requirements.
- Rain barrels are an excellent measure to use on residential properties or small commercial structures. Rain barrels are generally inexpensive to build and are designed to capture roof runoff from a single roof drain. It is important to ensure the rain barrel is elevated slightly to allow the outflow of water. It is also important to ensure the water is used or drained periodically to minimize mosquito infestation. Covering the rain barrel helps to keep out debris and other unwanted elements. These should also be "winterized" to prevent damage during the colder months.
- Roof drain disconnection is a simple method to reducing runoff. Many older homes were designed where the roof drains connect directly into the storm drain or sanitary system. Disconnecting these roof drains and allowing them to discharge onto the yard or into a rain barrel can reduce the amount of runoff into the storm drain system. Additionally, considering the placement of roof drains to provide the longest flow path over grassed areas can increase the potential for infiltration.
- Pervious pavement should be considered in commercial/MUC development or larger residential development plans. There are a variety of options in this area that allow water to infiltrate through these typically impervious surfaces. The runoff is then stored in an underground stone layer, which eventually infiltrates into the soil. These systems can be more costly than regular impervious surfaces and will require on-going maintenance; however, are highly effective at reducing runoff.
- Cottage meadows and naturalized landscapes, as described in Section 4.1.3, tend to allow for more absorption of runoff than traditional turf lawns.

6.1.1 Additional Resources

Stormwater and the protection of our waterways is a highly diverse topic and has numerous additional regulations associated with it. Options are also very site specific. The following is a list of suggested resources for consideration when designing stormwater measures or in and around water resources.

- New York State Stormwater Management Design Manual (January 2015), (http://www.dec.ny.gov/chemical/29072.html)
- New York State Standards and Specifications for Erosion and Sediment Control, November 2016, (http://www.dec.ny.gov/docs/water_pdf/2016nysstanec.pdf)
- City of Rochester & Monroe County Green Infrastructure Retrofit Manual (http://www.cityofrochester.gov/giretrofitmanual.aspx)
- Low Impact Development Center (https://lowimpactdevelopment.org)
- Center for Watershed Protection (https://www.cwp.org/)
- Streambank and Shoreline Protection Manual (https://www.lrc.usace.army.mil/Portals/36/docs/regulatory/pdf/StrmManual.pdf)
- New York Invasive Species (IS) Information https://nyis.info/

7 LANDSCAPE TECHNICAL REQUIREMENTS

The following technical specifications should be followed when preparing landscaping plans.

7.1 Plant Selection

- Plant selection should be determined in consultation with a Licensed Landscape Architect or Certified Nursery Professional.
- Lists of recommended plants for use in the Town are provided in **Appendix A** and **Appendix B**.
- Invasive species which are prohibited or otherwise regulated under 6 NYCRR Part 575 (see **Appendix C**) shall not be included in landscape plans approved by the Town of Irondequoit.
- The use of native plant species and locally produced landscape material (soil, much, etc.) is strongly encouraged. A list of plants native to New York State, compiled by the New York State Department of Environmental Conservation (NYSDEC), is included in **Appendix D**.
- Road salt is a common factor in the demise of landscape plantings. Plantings near roadways, parking lots, snow storage areas, and areas that receive drainage from these areas should be selected based on their salt tolerance.
- Large shrubs or trees with shallow root structures are not suited for planting on slopes or berms. Alternate choices in plant materials should be made.

7.2 Suitable Nursery Stock

- Nursery stock should meet or exceed quality standards established in the current edition of American Standard for Nursery Stock, published by the American Association of Nurserymen, Washington D.C.
- Nursery stock should be transported, staged, and otherwise handled in accordance with standards established in the American Standard for Nursery Stock.
- Nursery stock should be obtained from a reputable nursery within Hardiness zone 4, 5, or 6 as defined by the USDA.

7.3 Plant Size

- Deciduous shade trees and ornamental trees should have a caliper of at least 1.75-inch upon installation, unless otherwise stated in a specific recommendation.
- Multiple trunk trees should have a minimum of 3 trunks, which average 6-feet in height upon installation.
- Coniferous trees should have a minimum height of 5-feet upon planting.
- Shrubs should have a minimum of 18-inch in height or width upon planting.

7.4 Site Layout

- Planting material should be spaced so as to allow for full potential growth of the particular species.
- Plantings should not be placed where they will obviously interfere with site drainage, paved surfaces or sidewalks, underground utilities or overhead utilities, or any associated easements.
- Snow storage areas should always be provided.
- Landscape islands and/or stormwater gardens should be provided in parking areas and extensive impervious surfaces to channel traffic flow, create a visual relief, and provide for more practical on-site stormwater management.

7.5 Tree Planting Requirements

Proper tree planting is essential for the long-term viability of the plant. The following are recommendations for the planting of trees:

7.5.1 Timing

Trees should be planted in the dormant season, such as in the fall after leaf drop and the spring prior to bud break. Be sure the weather conditions are cool and allow time for new plants to establish roots prior to soaking rain and summer heat stimulate growth. Healthy bailed and burlapped or container trees can be planted throughout the growing season if additional landscape support (i.e., watering and monitoring) is provided.

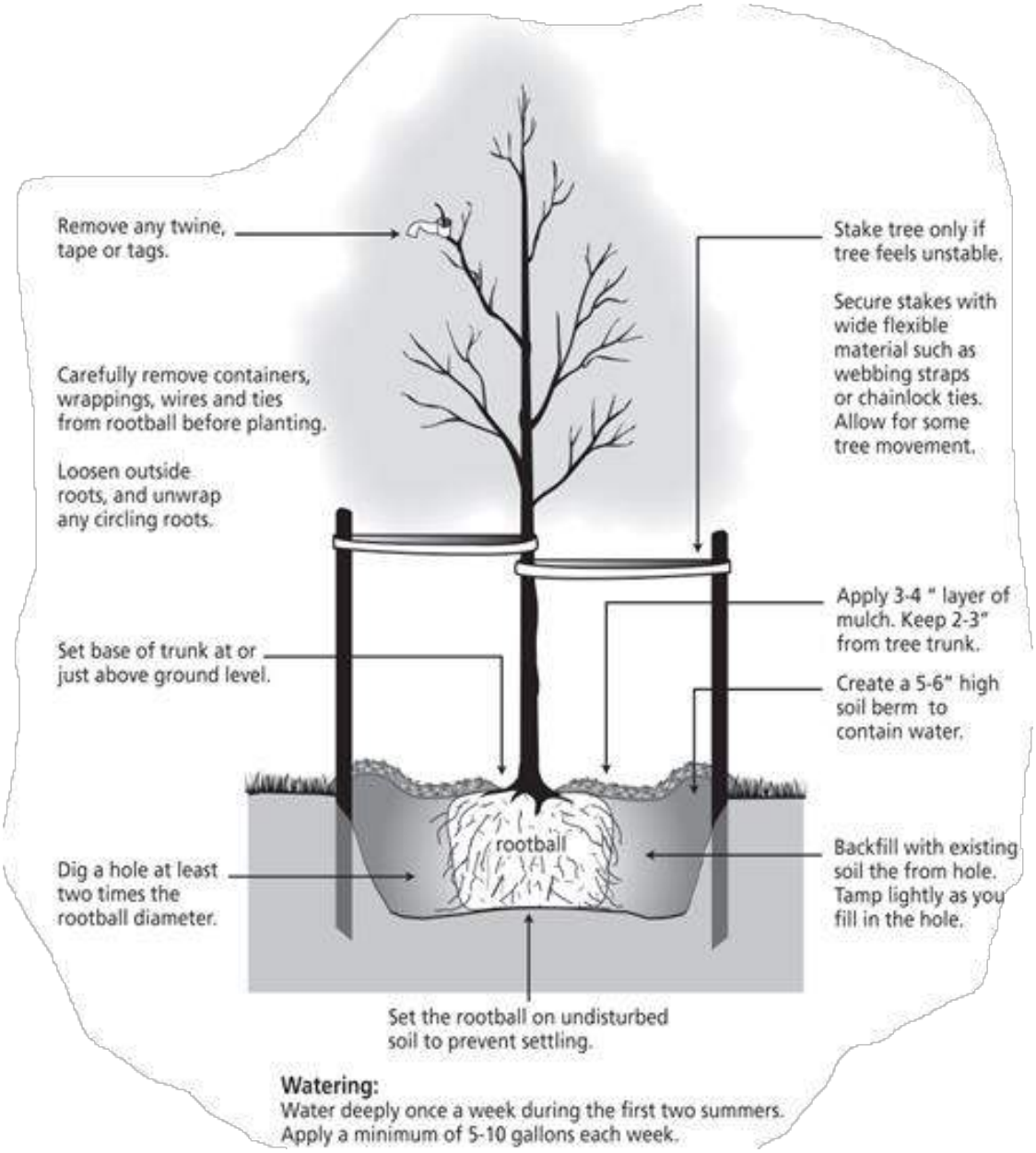
7.5.2 Steps for Planting

The following outlines the suggested sequence for properly planting a tree. Figure 3 provides a schematic of the properly planted tree.

- Dig a shallow, broad planting hole. The hole should typically be 2 to 3 times wider than the root ball, but only as deep as the root ball itself.
- Place the tree in the hole. Lift the tree by the root ball, not the trunk. The tree should be placed such that the tree flare will remain partially visible after backfilling. Placing the tree too deep will be harmful to the long-term health of the tree.
- If wrapped, remove any cover from around the root ball and trunk to facilitate root growth. Remove the wire basket or cut 1 or 2 rings off to lower the profile and to minimize the interference with future root growth. Inspect the root ball for circling roots and straighten, cut, or remove them. Expose the trunk flare (the area where the tree truck expands at the base of the tree), if necessary.
- Straighten the tree in the hole. Examine the tree from multiple angles to ensure the trunk is straight.
- Fill the hole gently but firmly with the excavated material. Pack soil around the base of the root ball to stabilize it. Fill the hole firmly to eliminate air pockets. Further reduce air pockets by watering periodically while backfilling. Avoid fertilizing at the time of planting.

- If staking is necessary, three stakes or underground supports provide optimum support. Remove stakes after 1 to 2 years of growth.
- Mulch the base of the tree. Place a 2 to 3-inch layer of mulch around the tree base in the exposed earth area. Be sure not to pile the much right against the trunk. A mulch free area of 1 to 2-inches wide at the base of the tree will reduce moist bark and prevent decay. The trunk flare should remain visible.
- Provide follow up care. Keep the soil moist by watering at least once a week, barring rain, and more frequently during hot, windy weather. Continue until mid-fall, tapering off as lower temperature required less frequent watering.

Figure 3: How to Plant a Tree



8 REFERENCES

Landscape Guidelines. Village of New Paltz, Ulster County, New York. 2003.

Landscape Guidelines for Development. Town of Greece. November 2013.

Landscape Guidelines. Town of Irondequoit. July 2012.

Arboricultural Standards and Specifications. Town of Brighton. 2005.

City of Rochester & Monroe County Green Infrastructure Retrofit Manual. 2018.

Commercial and Mixed-Use Development Code Handbook. Oregon Transportation and Growth Management Program.

Streambank and Shoreline Protection Manual. Lake County Planning, Building and Development Department, USDA/NRCS. January 2002.

New York State Stormwater Design Manual. NYSDEC. January 2015.

New York State Standards and Specifications for Erosion and Sediment Control. NYSDEC. November 2016.

Appendix A

Suggested Street Tree Planting List

Recommended Tree Species for Street Trees

Common Name	Botanical Name	Family	Height (ft)	Spread (ft)	Shape	Recommended Lawn Width	Comments	Transplant
Autumn Blaze Maple / Freeman Maple	Acer x freemanii	Maple	50	40	Wide	8 feet or greater	Fast grower, red/orange fall color	Spring/Fall
Sugar Maple	Acer saccharum	Maple	60-70	40-45	Narrowly conical	8 feet or greater	Avoid tree lawns less than 6', Vigorous bright fall colors	Spring/Fall
Red Maple	Acer rubrum	Maple	75	50	Wide	8 feet or greater	Red/orange fall color	Spring
Japanese Zelkova	Zelkova serrata	Elm	55	50	Wide	8 feet or greater	Vase shaped - like a small American Elm	Spring
Tulip Tree	Liriodendron tulipifera	Magnolia	70	40	Very Wide	8 feet or greater	Showy flowers in June	Spring
Ginkgo	Ginkgo biloba - order fruitless variety - male only	Ginkgo	70	40	Upright	8 feet or greater	Disease and pest free - survives city streets and pollution - slow grower	Spring/Fall
Northern Red Oak	Quercus rubra	Beech	60-75	45	Rounded	8 feet or greater	Fast grower, dark red fall color, good shade tree	Spring
English Oak	Quercus robur	Beech	65	60	Rounded	8 feet or greater	Good residential and urban street tree	Spring
Washington Hawthorn	Crataegus phaenopyrum	Rose	20-30	20-30	Broad	4 to 6 feet wide, or under power lines	Develops thorns on branches	Spring
Eastern Redbud	Cercis canadensis	Legume	20-30	25-35	Rounded, vase	4 to 6 feet wide, or under power lines	Heart shaped leaves with pink flowers	Spring/Fall
London Plane Tree	Platanus x acerifolia (bloodgood)	Sycamore	70	50	Wide	8 feet or greater	Cross of an American and Oriental	Spring
Silver Linden	Tilia tomentosa	Linden	60	40	Wide	8 feet or greater	Dense crown - attractive silvery underside of leaf	Spring

Appendix B

Suggested Site Planting List

Shade Trees

Common Name	Botanical Name	Height	Spread	Shape	Salt Spray	Salt Soil	Acidic Soil	Basic Soil	Steep Slopes?	Growth Rate	Drought Tolerant?
Black Maple	Acer nigrum	60 - 75	40 - 50	Round	Intolerant	Intolerant	Prefers	Tolerant		Moderate	Tolerant
Hedge Maple	Acer campestre	25 - 35	25 - 35	Oval	Tolerant	Intolerant	Tolerant	Prefer		Moderate	Tolerant
Red Maple	Acer rubrum	40 - 60	35 - 45	Broad	Intolerant	Intolerant	Prefers	Tolerant	Yes	Moderate	Tolerant
Sugar Maple	Acer saccharum	60 - 75	40- 50	Round	Intolerant	Intolerant	Tolerant	Tolerant	Yes	Moderate	Intolerant
Freeman Maple	Acer x Freemannii	40 - 60	20 - 40	Various	Moderate	Intolerant	Tolerant	Tolerant		Fast	Tolerant
Striped Maple	Acer Pennsylvanicum	20 - 30	20 - 30	Oval	Intolerant	Intolerant	Tolerant	Tolerant		Slow	Intolerant
Common Horsechestnut	Aesculus hippocastanum	50 -75	40 - 65	Oval	Tolerant	Moderate	Tolerant	Tolerant		Moderate	Intolerant
Ruby Red Horsechestnut	Aesculus x Carnea	30 - 40	30 - 40	Round	Tolerant	Intolerant	Tolerant	Tolerant		Moderate	Intolerant
River Birch	Betula nigra	30 - 40	20 - 30	Round	Moderate	Moderate	Prefers	Intolerant		Fast	Intolerant
Shagbark Hickory	Carya ovata	60 - 80	30 - 50	Irregular	Tolerant	Intolerant	Tolerant	Tolerant	Yes	Slow	Tolerant
Hackberry	Celtis occidentalis	40 - 60	40 - 50	Oval	Moderate	Moderate	Tolerant	Prefer		Fast	Tolerant
Katsura Tree	Cercidiphyllum japonicum	41 - 60	20 - 30	Round	Tolerant	Moderate	Tolerant	Intolerant		Fast	Intolerant
Cockspur Hawthorn	Crataegus crusgalli	20 -30	20 - 35	Round	Intolerant	Intolerant	Tolerant	Tolerant		Moderate	Tolerant
Ginkgo Autumn Gold	Ginkgo biloba -Autumn Gold	50 - 80	Variable	Broad	Moderate	Moderate	Tolerant	Tolerant		Slow	Tolerant
Ginkgo Princeton Sentry	Ginkgo biloba -Sentry	50 - 80	Variable	Columnar	Moderate	Moderate	Tolerant	Tolerant		Slow	Tolerant
Thornless Honeylocust	Gleditsia tricanthos inermis	30 - 70	30 - 50	Pyramidal	Tolerant	Tolerant	Tolerant	Tolerant		Fast	Tolerant
Thornless Honeylocust	Gleditsia tricanthos inermis Shademaster	30 - 70	40 - 70	Broad	Tolerant	Tolerant	Tolerant	Tolerant		Fast	Tolerant
Kentucky Coffeetree	Gymnocladis dioicus	60 - 75	40 - 50	Irregular	Tolerant	Tolerant	Tolerant	Tolerant		Slow	Tolerant
Carolina Silverbell	Halesia carolina	30 - 40	20 - 35	Round	Intolerant	Intolerant	Prefers	Intolerant		Moderate	Intolerant
Goldenraintree	Koelreuteria paniculata	30 - 40	31 - 40	Round	Moderate	Moderate	Tolerant	Tolerant		Moderate	Tolerant
Yellow Poplar	Lyriodendron tulipifera	70 - 90	35 - 50	Variable	Intolerant	Intolerant	Tolerant	Tolerant		Fast	Intolerant
Sweetgum	Liquidambar styraciflua	60 - 75	40 - 75	Variable	Tolerant	Tolerant	Prefers	Tolerant		Fast	Tolerant
Bigleaf Magnolia	Magnolia macrophylla	45 - 60	30 - 40	Round	Tolerant	Tolerant	Tolerant	Tolerant		Slow	Moderate
Sweetbay Magnolia	Magnolia virginiana	15 - 25	10 - 25'	Irregular	Moderate	Intolerant	Required	Intolerant		Moderate	Intolerant
Dawn Redwood	Metasequoia glyptostroibes	70 - 100	25'	Pyramidal	Moderate	Intolerant	Prefers	Intolerant		Fasr	Tolerant
Sourwood	Oxydendrum arboreum	25 - 30	20 - 25	Oval	Moderate	Moderate	Required	Intolerant		Slow	Moderate
London Plane Tree	Platanus x acerifolia	70 -100	65 -80	Broad	Moderate	Intolerant	Tolerant	Tolerant		Fast	Tolerant
Pin Cherry	Prunus pennsylvanica	25 - 40	18 - 25	Variable	Tolerant	Tolerant	Tolerant	Tolerant	Yes	Fast	Moderate

Shade Trees

Common Name	Botanical Name	Height	Spread	Shape	Salt Spray	Salt Soil	Acidic Soil	Basic Soil	Steep Slopes?	Growth Rate	Drought Tolerant?
Sawtooth Oak	Quercus acutissima	40 - 60	40 - 60	Pyramidal	Moderate	Moderate	Tolerant	Tolerant		Slow	Tolerant
White Oak	Quercus alba	50 - 80	100	Broad	Intolerant	Intolerant	Tolerant	Intolerant	Yes	Slow	Tolerant
Swamp White Oak	Quercus bicolor	50 - 60	50 - 60	Broad	Intolerant	Moderate	Tolerant	Moderate	Yes	Slow	Tolerant
Shingle Oak	Quercus imbricaria	50 - 60	50 - 60	Oval	Intolerant	Intolerant	Tolerant	Moderate	Yes	Slow	Tolerant
Willow Oak	Quercus phelios	60 - 70	60 - 70	Broad	Tolerant	Tolerant	Prefers	Intolerant		Moderate	Tolerant
English Oak	Quercus robur	75 - 100	76 - 100	Broad	Moderate	Intolerant	Tolerant	Tolerant		Slow	Moderate
Northern Red Oak	Quercus rubra	60 - 75	61 - 75	Round	Intolerant	Tolerant	Tolerant	Moderate		Moderate	Moderate
Sassafrass	Sassafrass albidum	20 - 30	25 - 40	Irregular	Moderate	Intolerant	Prefers	Tolerant		Fast	Tolerant
Scholar Tree	Styphnolobium japonicum	50 - 75	51 - 75	Round	Moderate	Tolerant	Tolerant	Tolerant		Moderate	Tolerant
Basswood	Tilia Americana	60 - 80	30 - 60	Oval	Intolerant	Intolerant	Tolerant	Tolerant		Moderate	Tolerant
Littleleaf Linden	Tilia cordata	60 - 70	30 - 40	Pyramidal	Intolerant	Moderate	Tolerant	Tolerant		Moderate	Tolerant
Lacebark Elm	Ulmus parvifolia	40 - 50	41 - 50	Round	Tolerant	Tolerant	Tolerant	Tolerant		Moderate	Tolerant
Hybrid Elm	Ulmus x spp.			Round	Tolerant	Tolerant	Tolerant	Tolerant		Fast	Tolerant
Japanese Zelkova	Zelkova serrata "Village Green"	50 - 80	50 - 75	Round	Moderate	Tolerant	Tolerant	Moderate		Moderate	Tolerant
Japanese Zelkova	Zelkova serrata "Musashino"	51 - 80	15 - 40	Columnar	Moderate	Tolerant	Tolerant	Moderate		Moderate	Tolerant
Black Walnut	Juglans nigro	50 - 75	30 - 50	Round	Tolerant	Intolerant	Intolerant	Moderate	Yes	Moderate	Moderate
Black Cherry	Prunus serotina	50 - 60	20 - 30	Pyramidal	tolerant	Tolerant	Tolerant	Tolerant	Yes	Fast	Moderate

Ornamental Trees

Common Name	Botanical Name	Height	Spread	Shape	Salt Spray	Salt Soil	Acidic Soil	Basic Soil	Growth Rate	Drought Tolerant?
Downy Serviceberry	Amelanchier arborea	15 - 25	Variable	Narrow	Moderate	Intolerant	Prefers	Moderate	Moderate	Tolerant
Serviceberry Robin Hill	grandiflora	20 - 25	21 - 25	Upright	Tolerant	Intolerant	Tolerant	Moderate	Moderate	Tolerant
Eastern Redbud	Cercis canadensis	20 - 30	25 - 35	Irregular	Intolerant	Intolerant	Tolerant	Tolerant	Moderate	Intolerant
Alternate leaf Dogwood	Cornus alternifolia	15 - 25	20 - 32	Irregular	Intolerant	Intolerant	Prefers	Moderate	Moderate	Intolerant
Cornelian Cherry	Cornus mas	20 - 25	15 - 20	Round	Moderate	Intolerant	Tolerant	Tolerant	Slow	Intolerant
Hawthorn Winter King	Crataegus spp.	20 - 35	21 - 35	Round	Intolerant	Intolerant	Tolerant	Tolerant	Slow	Tolerant
Maakia	Maakia amurensis	20 - 30	20 - 35	Round	Intolerant	Intolerant	Tolerant	Tolerant	Moderate	Moderate
Crabapple Harvest Gold	Malus spp.	15 - 20	Variable	Upright	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Crabapple Prairie Fire	Malus spp.	16 - 20	Variable	Round	Intolerant	Intolerant	Moderate	Moderate	Moderate	Moderate
Kwanzan Cherry	Prunus serrulatya	15 - 20	15 - 20	Round	Tolerant	Tolerant	Tolerant	Tolerant	Moderate	Intolerant
Choke Cherry Schubert	Prunus virginiana	15 - 25	Variable	Irregular	Moderate	Moderate	Moderate	Prefers	Moderate	Tolerant
Sargent Cherry Accolade	Prunus sargentii x sub.	40 - 50	40 - 50	Round	Moderate	Tolerant	Tolerant	Moderate	Moderate	Intolerant
Japanese Tree Lilac	Syringa reticulata	20 - 30	15 - 25	Upright	Tolerant	Tolerant	Tolerant	Tolerant	Moderate	Intolerant
Nannyberry	Viburnum litago	15 - 25	15 - 25	Irregular	Moderate	Moderate	Moderate	Prefers	Moderate	Intolerant
Blackhaw	Viburnum prunifolium	16 - 25	16 - 25	Round	Tolerant	Moderate	Tolerant	Tolerant	Slow	Moderate
Japanese Maple	Acer palmatum var. atr	15 - 20	20	Round	Intolerant	Intolerant	Tolerant	Moderate	Slow	Moderate

Notes:

1. This list is by no means exhaustive. Selection of ornamental trees should be carefully considered based on site conditions.
2. All fruit bearing trees should be carefully considered for appropriate location where falling fruit will not create a nusiance or maintenance issue.

Evergreen Trees

Common Name	Botanical Name	Height	Spread	Shape	Salt Spray	Salt Soil	Acidic Soil	Basic Soil	Steep Slopes ?	Growth Rate	Drought Tolerant?
Eastern Red Cedar	Juniperus Virginiana	40 - 50	8 - 20	Narrow	Tolerant	Tolerant	Prefers	Tolerant		Moderate	Tolerant
Eastern White Pine	Pinus strobus	50 - 80	20 - 40	Irregular	Intolerant	Intolerant	Prefers	Tolerant		Moderate	Intolerant
Northern White Cedar	Thuja occidentalis	40 -60	20 - 25	Variable	Tolerant	Tolerant	Tolerant	Prefers		Slow	Moderate
Eastern Hemlock[1]	Tsuga canadensis	40 - 70	25 - 35	Pyramidal	Intolerant	Intolerant	Tolerant	Tolerant	Yes	Moderate	Moderate
Carolina Hemlock	Tsuga Caoliniana	40 - 60	20 - 25	Pyramidal	Intolerant	Intolerant	Tolerant	Intolerant	Yes	Slow	Intolerant
Austrian Pine	Pinus nigra	50 - 80	20 - 40	Pyramidal	Intolerant	Intolerant	Tolerant	Intolerant		Moderate	Moderate
Red Pine	Pinus resinosa	50 - 80	30 - 40	Round	Intolerant	Intolerant	Tolerant	Intolerant		Moderate	Tolerant
Scotch Pine	Pinus sylvestris	30 - 60	20 - 40	Round	Intolerant	Intolerant	Tolerant	Intolerant		Moderate	Moderate
Red Spruce	Pincea rubens	59 - 131		Pyramidal	Intolerant	Intolerant	Tolerant	Intolerant		Slow	Intolerant
Norway Spruce	Picea abies	60 - 100	30 - 50	Conical	Intolerant	Intolerant	Tolerant	Intolerant		Fast	Moderate
White Spruce	Picea glauca	40 - 60	15 - 20	Pyramidal	Intolerant	Intolerant	Tolerant	Intolerant		Moderate	Tolerant
Balsam Fir	Abies balsamea	40 - 70	20 - 30	Conical	Intolerant	Moderate	Tolerant	Intolerant		Slow	Intolerant
Concolor Fir	Abies concolor	30 - 50	20	Pyramidal	Intolerant	Intolerant	Tolerant	Intolerant		Slow	Moderate
Douglas Fir	Pseudotsuga menziesii	40 - 80	20 - 40	Conical	Intolerant	Intolerant	Tolerant	Intolerant	Yes	Moderate	Intolerant
Bluepoint Juniper	Juniperus chinensis 'Blue Point'	4 - 12	2 - 8	Pyramidal	Tolerant	Tolerant	Tolerant	Tolerant	Yes	Moderate	Moderate

[1] The Eastern Hemlock population in this area is known to be impacted by the wooly adelgid. Planting of this species may not be advised if proper care and management of the trees can be assured.

Native Shrubs[1]

Common Name	Botanical Name Cultivar	Height	Spread	Shape	Salt Tolerance	Soil	Steep slopes	Hardiness Zone	Light Required	Growth Rate	Comments
Winterberry	Ilex verticillata	3' to 8'		Variable	Yes	Acid, moist		Zone 3 - 9	Full sun	Moderate	
Virginia Sweet Spire	Itea virginica	up to 8'	3' - 5'	Mound	Yes	Acid, moist		Zone 5	Part shade	Moderate	Deer resistant
Horizontal Juniper	Juniperus horizontalis	6" - 2'	up to 8'	Low, flat	Yes	v. tolerant	Yes	Zone 3 - 9	Full sun	Fast	Many varieties available, mildly deer resistant
Mountain Laurel	Kamia latifolia	5'- 15'	5' to 15'	Spreading	No	Acid, moist	Yes	Zone 4 - 9	Part shade	Slow	Deer resistant
Spicebush	Lindera benzoin	6' - 12'	6' - 12'	Rounded	Yes	Acid, moist	Yes	Zone 4 - 10	Full sun	Moderate	
Northern Bayberry	Myrica pensylvanica	5' -8'		Upright	Yes	Acid, moist	Yes	Zone 4 - 9	Full or partial sun	Moderate	Deer resistant
Eastern Ninebark	Physocarpus opulifolius	5'- 10	6' -10	Variable	Yes	Tolerant	Yes	Zone 2 - 7	Full or partial sun	Moderate	
Red Chokeberry	Prunus virginiana	5' - 8'	3' - 5'	Variable	Yes	Tolerant	Yes	Zone 4 - 9	Full or partial sun	Slow	
Hoptree	Ptelea trifoliata	15' - 20'	15' - 20'	Rounded	No	Tolerant	Unknown	Zone 4 - 10	Full or partial shade	Slow	Deer resistant
Flame Azalea	Rhododendron calendulace	4' - 10'		Upright	No	Acid, moist	Yes	Zone 5 - 7	Full or partial shade	Fast	
Rosebay rhododendron	Rhododendron maximum	4' - 15'	5' - 12'	Branching	No	Acid, moist	Yes	Zone 3 - 7	Partial shade	Slow	
Fragrant Sumac	Rhus aromatica	2' - 6'	6' - 10'	Variable	Yes	Tolerant	Yes	Zone 3 - 9	Full or partial sun	Fast	Deer resistant
Winged Sumac	Rhus copallina	12' - 18'	12' '18	Upright	Unknown	Tolerant	Yes	Zone 5 - 10	Full or partial sun	Fast	Deer resistant
Highbush Blueberry	Vaccinium corymbosum	6' - 12'	6' - 12'	Upright	Yes	Acid	Yes	Zone 4 - 7	Full sun	Slow	Mildly deer resistant
Witherod Viburnum	Viburnum cassinoides	6' - 15'	6' - 15'	Rounded	Yes	Acid	Yes	Zone 3 - 8	Full or partial sun	Moderate	
Bottlebrush Buckeye	Aesulus parvifolia	6' - 12'	12' -15'	Mounded	Yes	Tolerant	Yes	Zone 4 - 8	Part shade	Slow	Deer resistant
Devils Walkingstick	Aralia spinosa	10' - 20'+	10' - 20	Úpright	Yes	Tolerant	Yes	Zone 4 - 9	Full or partial sun	Fast	Deer resistant
Bearberry .	Arctostaphylosuva-ursi	1'	3' - 6'	Creeping	Yes	acid, non-clay	Yes	Zone 2 - 6	Full or partial sun	Fast	
Red Chokeberry	Aronia arbutifolia	6' -12'	3' - 12'	Leggy	Yes	Tolerant	Yes	Zone 4 - 9	Full or partial sun	Slow	Mildly deer resistant
Buttonbush	Cornus canadensis	6' -12'	12' - 18'	Upright arching	Low	Moist	Yes	Zone 4 - 8	Full or partial sun	Moderate	
Fringtetree .	Chionanthus virginicus	12' - 20'	12' - 20'	Variable	Low	Acid	Yes	Zone 3 - 9	Full or partial sun	Slow	Deer resistant
Summersweet Clethra	Clethra alnifolia	6' - 8'	4' - 6'	Rounded	Yes	Moist, acid	Yes	Zone 4 - 9	Full or partial sun	Moderate	
Bunchberry	Cornus canadensis	3" - 6"		Spreading	No	Moist	Yes	Zone 2 - 6	Part shade	Moderate	Deer resistant
Roundleaf dogwood	Cornus rugosa	10' - 15'	8' - 12'	Upright	Unknown	Tolerant	Yes	Zone 3 - 6	Shade tolerant	Moderate	Mildly deer resistant
Red-Osier Dogwood	Cornus sericea	6' - 9'	8' - 12'	Rounded	No	Tolerant	Yes	Zone 3 - 8	Full or partial sun	Fast	Mildly deer resistant
Dwarf Fothergilla	Fothergilla gardenii	2' - 3'	2' - 3'	Mounded	No	Tolerant	Yes	Zone 5 - 8	Full or partial sun	Slow	Deer resistant
Teaberry	Gaultheria procumbens	2" - 6'		Creeping	No	Acid	Yes	Zone 3 - 8	Partial shade	Slow	Deer resistant
Witch-Hazel	Hamamelis virginiana	15' - 20'	15' -20'	Irregular	Yes	Tolerant	Yes	Zone 3 - 8	Full or partial sun	Fast	Mildly deer resistant
Smooth Hydrangea	Hydrangea arborescens	3' - 6'	3' - 6'	Mound	Yes	Acid /Neutral	Yes	Zone 3 - 9	Full or partial sun	Moderate	Mildly deer resistant
Oakleaf Hydrangea	Hydrangea quercifolia	4' -8'	4' - 8'	Round mound	Yes	Acid	Yes	Zone 5 - 9	Full or partial sun	Moderate	Mildly deer resistant
Inkberry	Ilex glabra	5' - 8'	5' - 8'	Round thicket	Yes	Moist, acid	Yes	Zone 4 - 9	Full or partial sun	Slow	Deer resistant

1: This list is by no means exhaustive. Designer is to perform due diligence to select appropriate trees, shrubs, and ground cover suitable for the site with preference to native species.

Appendix C

Invasive Species List

New York State
Prohibited and Regulated
Invasive Plants

September 10, 2014




NYS DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

NYS DEPARTMENT OF
AGRICULTURE AND MARKETS

New York State Department of Environmental Conservation
NYCRR Part 575 Invasive Species Regulations
Questions and Answers

http://www.dec.ny.gov/regulations/2359.html

What are invasive species?

Invasive species means a species that is nonnative to a particular ecosystem, and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

Why are invasive species a problem?

Invasive species can harm natural communities and systems (plants and animals found in particular physical environments) by out-competing native species, reducing biological diversity, altering community structure and, in some cases, changing ecosystems. Invasive species threaten New York's food supply, not only agriculture but also harvested wildlife, fish and shellfish; our landscaping, parks, gardens, and pets; and our recreation resources and even animal and human health. All New Yorkers have a stake in the invasive species issue.

How will these regulations help?

These regulations are to help control invasive species by reducing the introduction and spread of them by limiting commerce in such species. By preventing introduction of new invasive species, New York will save time, effort, and money in the future.

How were the lists included in the regulations developed?

The lists of prohibited and regulated species were developed using the species assessment and listing process outlined in the 2010 report "A Regulatory System for Non-native Species," which can be found at http://www.dec.ny.gov/animals/63402.html.

When will the regulations be implemented?

The final regulations (or a summary) were published in the State Register September 10, 2014, they become effective 6 months thereafter.

What is the difference between prohibited and regulated invasive species?

Prohibited invasive species cannot be knowingly possessed with the intent to sell, import, purchase, transport or introduce. In addition, no person shall sell, import, purchase, transport, introduce or propagate prohibited invasive species. Regulated invasive species, on the other hand, are species which cannot be knowingly introduced into a free-living state, or introduced by a means that one should have known would lead to such an introduction, although such species shall be legal to possess, sell, buy, propagate and transport.

What species have grace periods established in the regulations?

A one-year grace period is included in the regulations for Japanese Barberry (*Berberis thunbergii*), during which existing stock of this species may be sold.

Who will enforce the regulations?

The regulations will be enforced by the Department of Environmental Conservation, with assistance from the Department of Agriculture and Markets.

TERRESTRIAL PLANTS

PROHIBITED

Amur Cork Tree *Phellodendron amurense*

PROHIBITED

Amur Honeysuckle *Lonicera maackii*

PROHIBITED

Autumn Olive *Elaeagnus umbellata*

PROHIBITED

Beach Vitex *Vitex rotundifolia*

PROHIBITED

Black Swallow-wort *Cynanchum louiseae*
(C. nigrum, Vincetoxicum nigrum)

PROHIBITED

Bohemian Knotweed *Reynoutria x bohemica*
(Fallopia x bohemica, Polygonum x bohemica)

PROHIBITED

Border Privet *Ligustrum obtusifolium*

PROHIBITED

Broad-leaved Pepper-grass
Lepidium latifolium

PROHIBITED

Canada Thistle *Cirsium arvense*
(C. setosum, C. incanum, Serratula arvensis)

TERRESTRIAL PLANTS

PROHIBITED

Chinese Lespedeza *Lespedeza cuneata*

PROHIBITED

Chinese Yam *Dioscorea polystachya (D. batatas)*

PROHIBITED

Cogon Grass *Imperata cylindrica (I. arundinacea, Lagurus cylindricus)*

PROHIBITED

Common Buckthorn *Rhamnus cathartica*

PROHIBITED

Cup-plant *Silphium perfoliatum*

PROHIBITED

Cut-leaf Teasel *Dipsacus laciniatus*

PROHIBITED

Cypress Spurge *Euphorbia cyparissias*

PROHIBITED

Fly Honeysuckle *Lonicera x bella*

PROHIBITED

Garden Loosestrife *Lysimachia vulgaris*

TERRESTRIAL PLANTS

PROHIBITED

Garlic Mustard *Alliaria petiolata*

PROHIBITED

Giant Hogweed *Heracleum mantegazzianum*

PROHIBITED

Giant Knotweed *Reynoutria sachalinensis*
(Fallopia sachalinensis, Polygonum sachalinensis)

PROHIBITED

Golden Bamboo *Phyllostachys aurea*

PROHIBITED

Gray Florist's Willow *Salix atrocinerea*

PROHIBITED

Japanese Angelica Tree *Aralia elata*

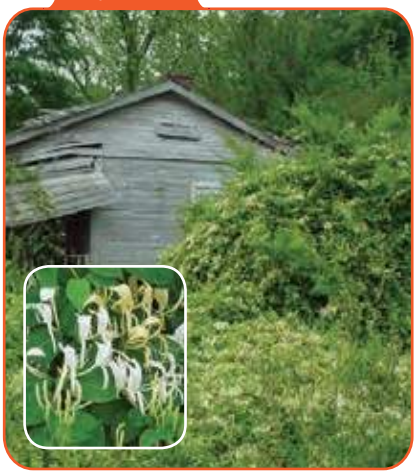
PROHIBITED

Japanese Barberry *Berberis thunbergii*

PROHIBITED

Japanese Chaff Flower
Achyranthes japonica

PROHIBITED



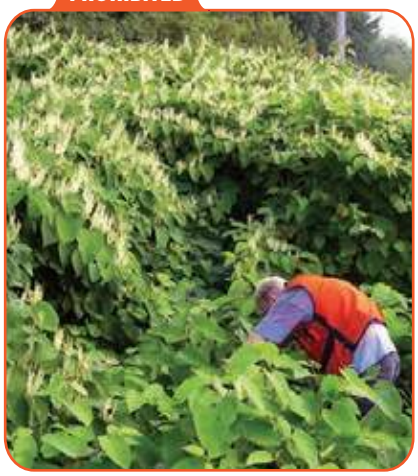
Japanese Honeysuckle *Lonicera japonica*

TERRESTRIAL PLANTS

PROHIBITED

Japanese Hops *Humulus japonicus*

PROHIBITED



Japanese Knotweed *Reynoutria japonica*
(Fallopia japonica, Polygonum cuspidatum)

PROHIBITED

Japanese Stilt Grass *Microstegium vimineum*

PROHIBITED

Kudzu *Pueraria montana*

PROHIBITED

Leafy Spurge *Euphorbia esula*

PROHIBITED

Lesser Celandine *Ficaria verna*
(Ranunculus ficaria)

PROHIBITED

Mile-a-minute Weed *Persicaria perfoliata*
(Polygonum perfoliatum)

PROHIBITED

Morrow's Honeysuckle
Lonicera morrowii

PROHIBITED

Mugwort *Artemisia vulgaris*

TERRESTRIAL PLANTS

PROHIBITED

Multiflora Rose *Rosa multiflora*

PROHIBITED

Narrowleaf Bittercress *Cardamine impatiens*

PROHIBITED

Oriental Bittersweet *Celastrus orbiculatus*

PROHIBITED

Pale Swallow-wort *Cynanchum rossicum*
(C. medium, Vincetoxicum medium, V. rossicum)

PROHIBITED

Porcelain Berry *Ampelopsis brevipedunculata*

PROHIBITED

Slender False Brome
Brachypodium sylvaticum

PROHIBITED

Small Carpetgrass *Arthraxon hispidus*

PROHIBITED

Spotted Knapweed *Centaurea stoebe*
(C. biebersteinii, C. diffusa, C. maculosa misapplied, *C. xpsammogena)*

PROHIBITED

Sycamore Maple *Acer pseudoplatanus*

TERRESTRIAL PLANTS

PROHIBITED

Tartarian Honeysuckle *Lonicera tatarica*

PROHIBITED

Wavyleaf Basketgrass *Oplismenus hirtellus*

PROHIBITED

Wild Chervil *Anthriscus sylvestris*

PROHIBITED

Wineberry *Rubus phoenicolasius*

PROHIBITED

Yellow Groove Bamboo
Phyllostachys aureosulcata

TERRESTRIAL PLANTS

REGULATED

Black Locust *Robinia pseudoacacia*

REGULATED

Burning Bush *Euonymus alatus*

REGULATED

Chinese Silver Grass *Miscanthus sinensis*

REGULATED

Japanese Virgin's Bower
Clematis terniflora

REGULATED

Norway Maple *Acer platanoides*

REGULATED

Winter Creeper *Euonymus fortunei*

WETLAND PLANTS

PROHIBITED

Common Reed Grass *Phragmites australis*

PROHIBITED

Marsh Dewflower *Murdannia keisak*

PROHIBITED

Purple Loosestrife *Lythrum salicaria*

PROHIBITED

Reed Manna Grass *Glyceria maxima*

PROHIBITED

Smooth Buckthorn *Frangula alnus (Rhamnus frangula)*

PROHIBITED

Yellow Iris *Iris pseudacorus*

AQUATIC PLANTS

PROHIBITED

Brazilian Waterweed *Egeria densa*

PROHIBITED

Broadleaf Water-milfoil Hybrid
Myriophyllum heterophyllum x M. laxum

PROHIBITED

Curly Pondweed *Potamogeton crispus*

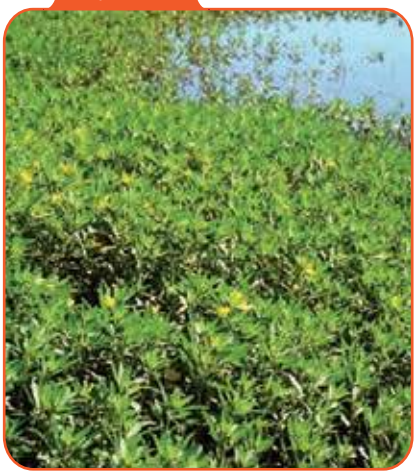
PROHIBITED

Eurasian Water-milfoil
Myriophyllum spicatum

PROHIBITED

Fanwort *Cabomba caroliniana*

PROHIBITED



Floating Primrose Willow
Ludwigia peploides

PROHIBITED

Frogbit *Hydrocharis morsus-ranae*

PROHIBITED

Hydrilla/Water Thyme *Hydrilla verticillata*

PROHIBITED

Parrot-feather *Myriophyllum aquaticum*

AQUATIC PLANTS

PROHIBITED

Uruguayan Primrose Willow

Ludwigia hexapetala (L. grandiflora)

PROHIBITED

Water Chestnut *Trapa natans*

PROHIBITED

Yellow Floating Heart *Nymphoides peltata*

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Index by Common Name

Index by Scientific Name

Sea Grant New York

Cornell University Cooperative Extension

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Appendix D

New York State Native Species

NATIVE FLOWERS

For Gardening and Landscaping

NEW YORK STATE OF OPPORTUNITY | Division of Lands and Forests

Smooth White Beardtongue (*Penstemon digitalis*)

Also known as foxglove beardtongue. Beautiful addition to pollinator garden or perennial border. Long blooming period in early summer. “Husker Red” is popular cultivar with dark red leaves.

Light	Soil	Height (in)	Zone
Full sun - partial shade	Dry - moist, well drained	12 - 36″	3-9

Canada Anemone (*Anemone canadensis*)

Dense clusters of bright green leaves topped by classic 1” white anemone flowers. Makes splendid tall groundcover for open damp areas. Long bloom period in late spring.

Light	Soil	Height (in)	Zone
Full sun - partial shade	Dry - wet, flood tolerant	12 - 24″	2-9

Northern Blueflag (*Iris versicolor*)

Narrow sword-shaped leaves stay attractive all season. Spring bloomer with several blue-violet flowers per stem.

Light	Soil	Height (in)	Zone
Full sun - partial shade	Moist - wet, tolerant of standing water	24 - 36″	3-9

Joe-Pye Weed (*Eutrochium spp.*)

Several similar species with tall leafy stems and flat to rounded heads of small pink flowers. Butterfly magnet in mid-late summer. Shorter cultivars now widely available. An essential plant for butterfly and pollinator gardens.

Light	Soil	Height (in)	Zone
Full sun - partial shade	Moist, flood tolerant	36 - 72″	4-8

Common Milkweed (*Asclepias syriaca*)

Essential food plant for eastern monarch caterpillars. Bold, handsome foliage and baseball-sized spheres of fragrant pink flowers. Spreading roots can be controlled with simple root barrier.

Light	Soil	Height (in)	Zone
Full sun	Dry - moist, flood toelrant	36 - 60″	4-9

Swamp Milkweed (*Asclepias incarnata*)

Clumping milkweed, popular for rain and butterfly gardens. Easy to grow with adequate moisture. Smaller and less assertive than common milkweed. Valuable monarch resource.

Light	Soil	Height (in)	Zone
Full sun - light shade	Moist - wet, flood tolerant	24 - 48″	3-9

Great Blue Lobelia (*Lobelia siphilitica*)

Late summer beauty with sturdy spire of blue flowers on leafy stem. Easier to grow than related cardinal flower. May last for decades in garden as long as no competition. Will self-sow on bare disturbed soil. A bumblebee favorite.

Light	Soil	Height (in)	Zone
Full sun - shade	Moist - wet, flood tolerant	24 - 36″	3-9

Wild Bergamot (*Monarda fistulosa*)

Grows in clumps, less spreading than many related bee-balms. Late summer lavender flowers draw bees and butterflies. Aromatic foliage. May get powdery mildew in damp weather.

Light	Soil	Height (in)	Zone
Full sun	Dry - moist, flood and drought tolerant	36 - 48″	3-9

Sneezeweed (*Helenium autumnale*)

This popular garden perennial with its many cultivars is actually a native wildflower often found on prairies and open fields. Valuable butterfly and pollinator plant. Long blooming period in late summer. Wild plants are tall with yellow flowers, but garden cultivars, available in many colors, are shorter and more compact. The common name comes from historic use of dried leaves as snuff.

Light	Soil	Height (in)	Zone
Full sun - partial shade	Moist to wet, tolerant of standing water	36 - 60″	3-8

Smooth Blue Aster (*Symphyotrichum laeve*)

Native asters are a valuable late summer resource for butterflies and pollinators. Smooth blue aster has numerous ¾ inch blue flowers and is a mainstay for a native aster garden. Combine with purple New England aster and heath aster with its tiny white flowers.

Light	Soil	Height (in)	Zone
Full sun - partial shade	Dry - moist	12 - 36″	3-9

Bluets (*Houstonia caerulea*)

Tiny spring wildflower that can form delicate carpets of pale blue on dry sunny sites. A classic rock garden plant and groundcover.

Light	Soil	Height (in)	Zone
Full sun - light shade	Moist to dry. Drought tolerant	2 - 6″	3-9

CONTACT INFORMATION

Division of Lands & Forests

New York State Department of Environmental Conservation
625 Broadway, Albany, NY 12233
1-866-640-0652 | landsforests@dec.ny.gov
www.dec.ny.gov

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NATIVE GRASSES, FERNS & GROUNDCOVERS

NEW YORK STATE OF OPPORTUNITY | Division of Lands and Forests

For Gardening and Landscaping

Big Bluestem (*Andropogon gerardii*)


Famous prairie grass, grows in tall clumps with distinctive “turkey foot” seed heads. Turns shades of copper and gold in fall.

Light	Soil	Height (ft)	Zone
Full sun	Dry - moist	4 - 8′	3-9

Broad-leaf Sedge (*Carex platyphylla*)


Clump-forming sedge with soft blue-green leaves which are up to an inch wide. Does well in dry shade, often stays green all winter.

Light	Soil	Height (in)	Zone
Part shade – shade	Dry – moist	4 - 12″	4-9

Little Bluestem (*Schizachyrium scoparium*)


Short clumps of green to blue-green leaves, topped by flowering stems. Shades of red, gold, orange and copper in fall. Small, fluffy, white seed heads along stems. Often found on dry exposed sites, such as rocky ridges or dry sand plains. Many cultivars available. Drought tolerant.

Light	Soil	Height (ft)	Zone
Full sun	Dry - moist, well drained	1 - 3′	3-9

Bottlebrush grass (*Elymus hystrix*)


Clump-forming cool season grass with airy three-dimensional seed heads. Decorative grass for light shade. Tolerates dry soil, clay soil, limestone soils. Grows on rock outcrops.

Light	Soil	Height (ft)	Zone
Partial shade – light shade	Dry - moist	1 - 4′	5-9

Northern Prairie Dropseed (*Sporobolus heterolepis*)


Dense clumps of long thin leaves resemble shaggy heads of hair. Easily grown decorative grass. Can be used as groundcover on dry sunny sites. Delicate-looking open seed heads. Gold fall color.

Light	Soil	Height (ft)	Zone
Full sun	Dry - moist, well drained	1 - 3′	3-8

Pennsylvania Sedge (*Carex pensylvanica*)


Sometimes used for lawns, this low-growing sedge is often found growing under oak trees. Forms a delicate wispy groundcover layer in shade, becomes heavier and clump-forming in sun.

Light	Soil	Height (in)	Zone
Full sun - shade	Dry - moist, well drained	4 - 8″	4-8

Wild Ginger (*Asarum canadense*)


Heart-shaped leaves 3 inches across make this a beautiful groundcover for shade, especially under deciduous trees.

Light	Soil	Height (in)	Zone
Partial shade - shade	Moist, well drained	4 - 8″	4-8

Appalachian Barren Strawberry (*Waldsteinia fragarioides*)


A little-known native groundcover with glossy dark green leaves which even thrives in dry shade. Semi evergreen. Yellow flowers in spring.

Light	Soil	Height (in)	Zone
Full sun - shade	Dry - moist	3 - 6″	3-8

Bearberry (*Arctostaphylos uva-ursi*)


Creeping evergreen groundcover with small shiny leaves and red berries. Forms dense mat on rock outcrops or acidic sandy soil.

Light	Soil	Height (in)	Zone
Full sun - partial sun	Dry - moist, well drained	3 - 9″	2-6

Christmas Fern (*Polystichum acrostichoides*)


Wonderfully durable evergreen fern for shade.

Light	Soil	Height (in)	Zone
Partial shade - shade	Moist - dry	12 - 18″	3-8

CONTACT INFORMATION

Division of Lands & Forests

New York State Department of Environmental Conservation
625 Broadway, Albany, NY 12233
1-866-640-0652 | landsforests@dec.ny.gov
www.dec.ny.gov

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PHOTO CREDITS
T. Potterfield, All Things Plants; K. Verschoor, NYS DEC; C. Evans, Illinois Wildlife Action Plan, Bugwood.org; J. Sturner, Morton Arboretum; H.F. Schwartz, Colorado State University, Bugwood.org; K.A. Rawlins, University of Georgia, Bugwood.org; R. Routledge, Sault College, Bugwood.org; M. Harte, Bugwood.org; D. Stephens, Bugwood.org; J.H. Miller, USDA Forest Service, Bugwood.org; Prairie Nursery; B. Harvath, American Nurseryman

NATIVE SHRUBS

For Gardening and Landscaping

NEW YORK STATE OF OPPORTUNITY | Division of Lands and Forests

Highbush Blueberry (*Vaccinium corymbosum*)


Bell-like white flowers. Clusters of delicious blue berries. Fall color is a range of reds. Striking in winter with colorful young branches and peeling multicolored bark on older stems. Tolerates flooding, needs acidic soil.

Light	Soil	Height/Spread (ft)	Zone
Full sun - light shade	Dry - wet	10′/8′	3-7

American Elderberry (*Sambucus nigra ssp. canadensis*)


Large compound leaves and plate-sized clusters of small white flowers. Small purple berries used in making preserves, pies, and elderberry wine.

Light	Soil	Height/Spread (ft)	Zone
Full sun - light shade	Moist, well drained	8′/8′	4-9

Virginia Rose (*Rosa virginiana*)


Versatile with glossy leaves and large, pink flowers. Spectacular fall colors. Salt tolerant, somewhat drought tolerant. Does well in sandy soil.

Light	Soil	Height/Spread (ft)	Zone
Full sun	Dry - moist	5′/10′	4-8

Buttonbush (*Cephalanthus occidentalis*)


Fragrant spheres of white flowers attract butterflies, hummingbirds and native bees. Top wildlife species. Good for rain gardens.

Light	Soil	Height/Spread (ft)	Zone
Full sun	Moist - wet	8′/8′	5-11

Maple-leaved Viburnum (*Viburnum acerifolium*)


Understory shrub with soft maple-shaped leaves. Clusters of small white flowers. Dark-blue berries. Unusual pale, bluish-pink fall colors.

Light	Soil	Height/Spread (ft)	Zone
Partial - full shade	Dry-moist, well drained	5′/5′	4-8

American Hazelnut (*Corylus americana*)


Dense, vase-shaped clumps of supple stems with large rough leaves and edible nuts. Important grouse food. Shades of orange, gold and red in fall.

Light	Soil	Height/Spread (ft)	Zone
Full sun - full shade	Dry - wet	10′/10′	4-9

Nannyberry (*Viburnum lentago*)


Large multi-stemmed shrub. Can be trained into small single-stemmed tree. Glossy foliage, clusters of small white flowers. Resistant to viburnum leaf beetle. Dark-blue berries persist into winter. Good fall color.

Light	Soil	Height/Spread (ft)	Zone
Full sun - light shade	Moist - wet	25′/15′	3-7

Northern Bush-honeysuckle (*Diervilla lonicera*)


Not a true honeysuckle. Slender stems with large finely toothed, glossy leaves, yellow flowers. New leaves typically reddish bronze. Orange, gold and red fall colors. Spreads easily, good ground cover. Drought-resistant.

Light	Soil	Height/Spread (ft)	Zone
Full sun - partial shade	Dry - moist	3′/3′	3-7

Bayberry (*Morella caroliniensis* (*formerly Myrica pensylvanica*))


Coastal species well adapted to sandy soil and occasional flooding. Fine urban shrub because of high salt tolerance and resistance to insects and diseases. Glossy, aromatic foliage, semi-evergreen. Tolerates pruning.

Light	Soil	Height/Spread (ft)	Zone
Full sun - partial shade	Dry - wet	10′/10′	3-6

Flowering Raspberry (*Rubus odoratus*)


Large fuzzy leaves with pointed lobes on thorn-less, arching canes. Single pink flowers are an inch across and resemble wild rose flowers. Small raspberry fruits. Wonderful shrub for edge areas. Shade tolerant.

Light	Soil	Height/Spread (ft)	Zone
Full sun - full shade	Moist	5′/3′	4-6

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K. Verschoor, NYS DEC; G. Edinger, NY Natural Heritage Program; S. Young, NY Natural Heritage Program; J.H. Miller, USDA Forest Service, Bugwood.org; R.D. Wallace, University of Georgia, Bugwood.org; Dow Gardens Archive, Dow Gardens, Bugwood.org; K. Kanoti, Maine Forest Service, Bugwood.org; W.M. Ciesla, Forest Health Management International, Bugwood.org; R. Routledge, Sault College, Bugwood.org; R. Webb, Self-employed horticulturist, Bugwood.org; S. Katovich, USDA Forest Service, Bugwood.org; Ohio State Weed Lab Archive, OSU, Bugwood.org; D. Powell, USDA Forest Service (retired), Bugwood.org; T. Evans, Great Smoky Mountains National Park, Bugwood.org

NATIVE TREES

For Gardening and Landscaping

NEW YORK STATE OF OPPORTUNITY | Division of Lands and Forests

White Spruce (*Picea glauca*)


Classic conical Christmas tree shape. Short stiff needles are bluish green. Most adaptable native spruce for landscape planting. Many cultivars.

Light	Soil	Height/Spread (ft)	Zone
Full sun - partial shade	Moist, well drained	50′/20′	2-6

Alternate-leaved Dogwood (*Cornus alternifolia*)


Also known as “Pagoda Dogwood” because of unusual horizontal branch structure. Excellent small tree for partial shade. Clusters of small white flowers, good fall color. Shade tolerant.

Light	Soil	Height/Spread (ft)	Zone
Full sun - full shade	Moist, well drained	20′/10′	3-7

Bur Oak (*Quercus macrocarpa*)


Rangy oak with shaggy-capped acorns and big dark glossy leaves, often with distinctive deep lobe in middle. Very adaptable and tough, will grow on both acidic and alkaline soils. Flood tolerant and somewhat drought tolerant.

Light	Soil	Height/Spread (ft)	Zone
Full sun - partial shade	Dry - wet	80′/60′	3-8

Red Maple (*Acer rubrum*)


Red flowers followed by red seeds in spring. Red-stemmed leaves with whitish undersides in summer. Red and yellow leaves in fall. Well-known as a swamp tree, but also grows well on upland sites. Most versatile native maple for landscapes. Many cultivars. Flood tolerant.

Light	Soil	Height/Spread (ft)	Zone
Full sun - light shade	Dry - wet	50′/30′	3-9

Eastern Red Cedar (*Juniperus virginiana*)


Young trees narrow, columnar. Older trees more conical form. Small, blue, berry-like cones on female trees are eaten by many birds. Tough tree which thrives on dry, harsh, rocky sites. Grows well on limestone, and also on more acidic sites. Very drought tolerant. Must have full sun.

Light	Soil	Height/Spread (ft)	Zone
Full sun	Dry - moist, well drained	40′/15′	3-9

Serviceberry, Shadbush (*Amelanchier arborea*)


Graceful small tree. Has delicate white flowers in early spring. Flowers followed by oval leaves and edible berries in summer. Vivid fall colors.

Light	Soil	Height/Spread (ft)	Zone
Full sun - partial shade	Moist, well drained	20′/15′	4-9

Black Gum (*Nyssa sylvatica*)


Great fall color. Fruit attracts many birds and mammals, good nectar source for honey bees. Salt and shade tolerant.

Light	Soil	Height/Spread (ft)	Zone
Full sun - full shade	Dry - wet	50′/30′	4-9

Swamp White Oak (*Quercus bicolor*)


Dark green leaves with white undersides. Tolerates compacted soils and drought. Also good for wet areas, flood tolerant.

Light	Soil	Height/Spread (ft)	Zone
Full sun - full shade	Dry - wet	80′/50′	4-8

Tamarack (*Larix laricina*)


Deciduous conifer with soft bluish-green needles, small round cones. A northern species which does well on cool, wet sites. Bright yellow fall color.

Light	Soil	Height/Spread (ft)	Zone
Full sun	Moist - wet	50′/15′	2-4

River Birch (*Betula nigra*)


Young trees have spectacular, multi-colored, peeling bark in warm shades of tan, brown, pink and cream. Popular birch for landscape use because of heat tolerance and disease resistance. Flood tolerant.

Light	Soil	Height/Spread (ft)	Zone
Full sun - partial shade	Moist - wet	60′/30′	3-9

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1-866-640-0652 | landsforests@dec.ny.gov
www.dec.ny.gov

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PHOTO CREDITS
K. Verschoor, NYS DEC; B. Cook, Michigan State University, Bugwood.org; P. Wray, Iowa State University, Bugwood.org; T.D. Sydnor, The Ohio State University, Bugwood.org; J. Sharman, Vitalitree, Bugwood.org; R. Webb, Self-employed horticulurist, Bugwood.org; J. Ruter, University of Georgia, Bugwood.org; Dow Gardens Archive, Dow Gardens, Bugwood.org; S. Katovich, USDA Forest Service, Bugwood.org; C. Evans, Illinois Wildlife Action Plan, Bugwood.org; K.A. Rawlins, University of Georgia, Bugwood.org; J.H. Miller, USDA Forest Service, Bugwood.org; F. Bonner, USFS (ret.), Bugwood.org

NATIVE VINES

For Gardening and Landscaping

NEW YORK STATE OF OPPORTUNITY | Division of Lands and Forests

Virginia Creeper (*Parthenocissus quinquefolia*)


High-climbing vine with graceful five-leaflet leaves and glorious red fall color. Can cling to almost any surface with adhesive-tipped tendrils. Splendid vine for covering walls. Can also climb wire fences and trellises by coiling tendrils. Dark-blue berries valuable food for birds. Several cultivars available.

Light	Soil	Height (ft)	Zone
Full sun - shade	Dry - moist	Up to 70′	4-9

Woodbine (*Parthenocissus inserta*)


A “non-stick” version of Virginia creeper, this species climbs with coiling tendrils like a grape. It does not form adhesive disks and cannot cling to walls. Same five-leaflet leaves and red fall color as Virginia creeper. Climbs trellises or fences, also excellent groundcover. Very tolerant of road salt.

Light	Soil	Height (ft)	Zone
Full sun - partial shade	Dry - moist	Up to 50′	4-8

American Groundnut (*Apios americana*)


Slender twining vine with compound leaves and clusters of wisteria-like pink flowers in late summer. Non-woody perennial which dies back to ground each fall. Has small edible tubers spaced along thin roots like beads in a necklace. Excellent in containers.

Light	Soil	Height (ft)	Zone
Full sun - partial shade	Moist - wet, flood tolerant	10 – 15′	5-9

Summer Grape (*Vitis aestivalis*)


Vigorous climber with small tangy fruit. Large leaves are dark green above and silvery white beneath. Young tendrils often bright red. Parent of several wine grape hybrids. Needs regular pruning.

Light	Soil	Height (ft)	Zone
Full sun	Moist -dry	50 – 75′	5-9

Trumpet Honeysuckle (*Lonicera sempervirens*)


Twining stems with opposite leaves topped by clusters of slender, 2 inch long, red trumpet-shaped flowers. Many cultivars and hybrids. Flowers attract hummingbirds.

Light	Soil	Height (ft)	Zone
Full sun - partial shade	Moist, well drained	Up to 25′	4-9

Virginia Virgin's Bower (*Clematis virginiana*)


Vigorous clematis with small white flowers, blooming in late summer. Climbs with twining leaflet stems. Fall color often burgundy to purple. Clouds of fluffy, swirled seed heads make eye-catching display. Easy to grow and eager to climb.

Light	Soil	Height (ft)	Zone
Full sun - partial sun	Moist, well drained	Up to 25′	4-8

Wild Yam (*Dioscorea villosa*)


Graceful twining vine with strongly veined, heart-shaped leaves. Does not have edible root. Non-woody, dies back to perennial rhizome in late fall. Interesting winged seedpods. Native substitute for invasive cinnamon vine.

Light	Soil	Height (ft)	Zone
Full sun - partial shade	Moist, well drained	10 - 15′	4-8

Hops (*Humulus lupulus*)


Common hop vine grown for flowers used to flavor beer. Vigorous twining vine with handsome multi-lobed leaves. Dies back to perennial rhizome in fall. Fast-growing vine great for shade coverage.

Light	Soil	Height (ft)	Zone
Full sun	Moist, well drained	Up to 30′	4-8

Limber Honeysuckle (*Lonicera dioica*)


Very hardy small vine with large oblong opposite leaves on twining stems. Early spring flowers yellow, red or purplish, held above "cup" of fused pair of leaves. Flowers valuable for bumblebees. Undersides of leaves are bright silvery white.

Light	Soil	Height (ft)	Zone
Full sun - partial shade	Dry - wet	Up to 15′	3-8

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K. Verschoor, NYS DEC; J. Samanek, State Phytosanitary Administration, Bugwood.org; James H. Miller & Ted Bodner, Southern Weed Science Society, Bugwood.org; W. VanDyk Evans, Bugwood.org; J.D. Byrd, Mississippi State University, Bugwood.org; D.G Smith, delawarewildflowers.org; D. Gent, USDA Agricultural Research Service, Bugwood.org; R. Routledge, Sault College, Bugwood.org; R. Mathews, wildflower.org

Appendix E

How to Build a Rain Barrel

Cornell University Cooperative Extension of Onondaga County

How to Build A Rain Barrel

A step-by-step guide for building and installing a homemade rain barrel

Cornell University
Cooperative Extension
Onondaga County

Funding provided by the City of Syracuse Department of Water and the Onondaga County Environmental Health Council. With proper installation, maintenance and use, your rain barrel should function properly. Cornell Cooperative Extension assumes no liability for the installation, maintenance, or use of your rain barrel. We are not responsible for any rain barrel malfunction, property damage or injury associated with your rain barrel or contents.

The Benefits of Rain Barrels

Rain barrels are a simple way to capture and recycle the rain washing off your roof. Building a rain barrel is an easy way to save money, and personalize the look and utility of the barrel to match your own taste. This guide is intended to give you a basic overview of the tools, supplies, and steps needed to construct a basic rain barrel, as well as some tips on installation and maintenance. For more information about rain barrels, rain water harvesting, or other green-living projects, contact Cornell Cooperative Extension of Onondaga County. See the back cover for additional resources and contact information.

Help Reduce Pollution and Flooding in Local Streams & Lakes

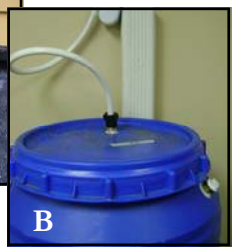
When water flows over the land during a rainstorm or snowmelt, it can pick up eroded soil, bacteria, chemicals, and even trash. When these materials are washed downhill or into ditches and storm drains, they end up in nearby streams and lakes. Heavy rains can also cause other problems, such as property erosion, flash flooding, and overwhelmed drainage systems. Rain barrels capture and store rainwater, preventing it from carrying pollutants into local waterways.

You can recycle the water you catch!

- Fill watering cans
- Water gardens or lawns
- Connect a soaker hose to automatically empty the barrel
- Wash cars/pets
- Empty the barrel when full
- Use two barrels: Keep one full for watering needs, and one empty ready to catch the next rain!
- Catch rainwater so that it does not drain into already overwhelmed sewer systems and contribute to sewage overflows in nearby creeks.

Conserve Water for a Sunny Day

Rain Barrel Basics



The Rain Water Inlet

This is where the rain water enters the barrel. The inlet can be constructed in one of two ways. One style of barrel, known as an **"open-top" barrel (A)** allows rainwater to enter the barrel through a multiple holes in the lid of the barrel. The second style of barrel, known as a **"closed-top" barrel (B)**, receives rainwater through a single hole or port that is fitted with tubing connected to a special diverter on the gutter.

The Overflow Mechanism

Every rain barrel needs a means of handling excess water once the barrel is full, otherwise the water could just spill over the top of the barrel and flood the area around it (possibly soaking into the basement or weakening the building's foundation). The type of overflow mechanism you choose will depend upon your choice of inlet. Open-top barrels need an overflow portal near the top of the barrel that is fitted with a hose that carries excess water away from the foundation of your house. Closed-top barrels require the purchase of a specialized downspout diverter that automatically handles excess water by diverting it back into the existing gutter.

The Outlet

An outlet allows you to empty and utilize the water collected in your rain barrel. This is accomplished with a spigot at the bottom of the barrel. The spigot can be used to fill watering cans or can be connected to a garden or soaker hose.

The Linking Port

The final component of a rain barrel is a linking port that allows two rain barrels to be connected together. The port can be placed near the top of the barrel so that, once the barrel is full, the overflow water will be directed through a short section of hose to a second barrel. Alternatively, a linking port and connective hose could be placed near the bottom of the barrel so that the connected barrels fill at the same rate. This guide gives instructions for installing a linking port at the top of the barrel.

Decide on a Rain Barrel Style

Rain Barrel Building Decision Tree

The style of rain barrel you should build depends on what kind of downspout you have, if you have one. This determines what kind of lid you should build for your rain barrel, how water will enter your barrel and how overflow water will be handled.

Do you have a downspout?

Yes

The downspout extends from the roof to the ground

Purchase a downspout diverter to transport water to the barrel and handle overflow

Water will enter the barrel through a portal on the otherwise solid lid

FOLLOW STEPS FOR "CLOSED-TOP" BARREL

The downspout is cut a few feet above the ground

Purchase a plastic, flexible gutter extension or elbow to transport water to barrel

Water will enter the barrel though the screened, open lid

FOLLOW STEPS FOR "OPEN-TOP" BARREL

No

Purchase a rain chain to hang from the roof and direct water into the barrel

Water will enter the barrel though the screened, open lid

FOLLOW STEPS FOR "OPEN-TOP" BARREL

Design Your Barrel

Once you have decided whether to build an open- or closed-top rain barrel, follow the instructions in the steps outlined below for the barrel of choice.

Choose a Rain Barrel Style

	"OPEN-TOP" BARREL	"CLOSED-TOP" BARREL WITH DOWNSPOUT DIVERTER
		
Select a Barrel *p.7*	Step A	Step A
Build the Lid *p.8*	Step B	Step C
Build the Linking Port *p.9*	Step D	Step D
Build the Overflow *p.10*	Step E	x
Build the Outlet *p.11*	Step F	Step F
Select a Diverter *p.13*	x	Step G
Installation *p.14-15*	Step H	Step I

Tools and Materials


A


C

D


B

E


F


G


I


H


J


K


L

* pictures not to scale

Materials	Qty. for Open - Topped Barrel	Qty. for Closed-Topped Barrel
A. One 50-90 gallon food-grade container with a removable lid	1	1
B. 3/4 inch male threaded boiler drain	1	1
C. Roll of Teflon tape	1	1
D. Plumbing Goop TM	1	1
E. Package of gasket rubber	1	1
F. 1-inch x 3/4-inch reducing washers	6	4
G. 3/4 inch steel conduit locknuts	3	2
H. 3/4 brass male pipe to female garden	2	2
I. 3/4 inch PVC plug	1	1
J. 3/4 female hose coupling/mender	x	1
K. Downspout Diverter *(see page 13 for options)*	x	1
L. Mesh Screen	1	x

OTHER

- 2 - 4 cinder blocks
- 1 garden or soaker hose

TOOLS

- Electric or cordless drill
- 15/16 inch spade bit
- Utility knife
- Groove jointed pliers
- Scissors
- Hacksaw or tin snips
- Screwdriver
- Pencil
- 3/4" Pipe tap (optional)

Drilling Tips for Water-Tight Fittings

A Smooth Shave Counts!

Every hole drilled into the barrel will be the exact size of the parts that need to be screwed into the holes, so use the utility knife to shave away about 1/16 inch of plastic. **Try to shave away the plastic in one fluid motion.** You want to avoid making any gashes in the plastic. Alternate shaving the plastic with trying to screw in the hardware. You'll be able to see and feel when the threads of the hardware are catching. Shave away where the threads are not catching until it can be screwed in straight, but don't shave too much!

Hint

Shave away just enough plastic so that the threads catch. It should still be difficult to turn the hardware completely in by hand. (Later, you will use pliers to help you tighten the fitting all the way).
If you have a plumber's tap, it can be used to thread the finished hole.

Using Teflon Tape

Teflon Tape is used to fill in the spaces between the threads of the hardware to create a water-tight seal. When instructed, start wrapping at the end of each piece by holding the tape down with your thumb and wrapping the tape clockwise around the threads (while holding the threads towards you). Wrapping the tape clockwise will prevent it from coming undone when the adapter is screwed into the hole. Once all the threads are covered, gently rip off the end of the tape and press the tape down into the threads.

Steps for Building a Rain Barrel

Step A: Selecting a Barrel

- **Purchase a Food-Grade Container**

Recycled food-grade containers make great rain barrels because no harmful chemicals can leach into the water held inside. The container should hold at least 50 gallons and have a fully removable lid. (You may find containers that have a sealed lid with bungholes, but these lids can not be removed.) Food grade containers can be purchased locally from:

The Syracuse Barrel Company	317 Burnet Ave	Syracuse 13206	479-7249
Bronstein Container Company	1313 Rams Gulch Road	Jamesville 13078	469-6191
Mulcorr Container, Co.	2 Willey Street	Auburn 13021	252-2765

Look for a container that has a removable or screw-top lid. This is very important so that you can clean out the inside of the barrel! The barrel will be black or bright blue, but can be painted to better match your house. Directions for painting are on page 18.

The resources listed in this guide are for informational purposes only.
The products, services, and companies listed does not imply an endorsement by Cornell Cooperative Extension.

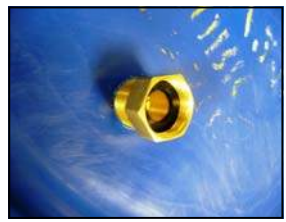
You can catch even more rain when you connect multiple barrels together! See page 18 for directions.

Step B:
Building a Lid for an Open–Top Rain Barrel

Place the lid on top of the barrel. It is not necessary to screw it fully on. This will make it easier to drill the holes in the lid. Drill 20-30 holes into the lid using the 15/16-inch spade bit. Trace the shape of the barrel lid onto the mesh screen (L) with a pencil. Use scissors to cut out the mesh screen. Glue it down to the top of the lid with the Plumbing Goop™ (D) and let stand overnight to dry.

Step C:
Building a Lid for a Closed–Top Rain Barrel

Place the lid on top of the barrel. It is not necessary to screw it fully on. This will make it easier to drill the holes in the lid. Using the 15/16-inch spade bit, drill a hole 2-3 inches in from the edge of the lid. Shave away some plastic in the hole until the adapter can be screwed in straight. **Remember, a smooth shave counts!** Adjust the size of the hole by shaving a tiny bit of plastic from the hole with the utility knife. Screw the ¾ inch male hose adapter (H) so that the threads will be sticking up through the top of the lid. Spread Plumbing Goop™ (D) around the hose adapter where it meets the plastic. ***Note: The lip around the rim of the lid may trap standing water when rain falls directly onto the barrel. If you observe this, you may want to drill several small (size) drain holes in the lid. The holes should not be large enough to allow insects to enter the barrel, or so large that they will prevent pressure from building up inside the barrel to the point that the diverter will not function properly.*



View from underside of lid

View from topside of lid

Steps for Building a Rain Barrel

Step D: Building the Linking Port
(for both open-top and closed-top barrels)

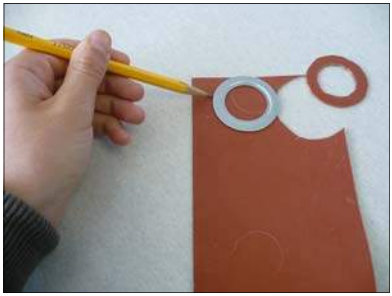
Drill a hole here.
Make sure that the spot where you drill is not on a curved part of the barrel.

View from outside of barrel

Try to screw the ¾ inch brass garden hose adapter (H) into the hole with the threads going inside the barrel. You will notice that the adapter is exactly the same size as the hole, but it won't easily screw in. Shave away some plastic in the hole until the adapter can be screwed in straight. **Remember, a smooth shave counts!** Adjust the size of the hole by shaving a tiny bit of plastic from the hole with the utility knife.

Once you know the adapter can be screwed into the hole, remove the adapter so that you can wrap the threads of the adapter with Teflon tape (C). Refer to page 6 for details. **Remember to wrap clockwise!**

Set the adapter aside. You will now make rubber washers.



Take one reducing washer (F) and one sheet of gasket rubber (E). Using a pencil, trace the shape of the reducing washer onto the rubber. **Remember to trace and cut out the inside circle!** Cut out the rubber washers with the scissors or with the utility knife. If you are building a closed-topped barrel, cut out four rubber washers. If you are building an open-topped barrel, cut out six rubber washers.

Push one reducing washer (F) onto the threads of the adapter (H), followed by the rubber washer. Screw in the adapter, using pliers if necessary to tighten.



View from outside of the barrel

On the inside of the barrel, push on the second rubber washer and reducing washer (F). Screw on the locknut (G) with your fingers. Fully tighten the locknut by grabbing the grooves of the locknut with the jaws of the pliers.



View from inside of the barrel

Once the linking port hardware is installed, screw in the PVC plug (L) until you are ready to connect a second rain barrel.

View from outside of barrel

Step E: Building the Overflow (for an open-top barrel)

Drill a hole here. →

Make sure that the spot where you drill is not on a curved part of the barrel.

Follow the directions given in Step D for the linking port. (You do not need to make any more rubber washers.) The overflow will have exactly the same hardware and technique, with the exception of being on the opposite side of the barrel. Your open-top barrel, will have the overflow on one side of the barrel and the linking port on the other side. Do not plug the overflow as you did in Step D. Instead leave it open for the later attachment of the overflow hose.

Steps for Building a Rain Barrel

Step F: Building the Outlet / Spigot
(for both open-top and closed-top barrels)

The spigot will be installed on the front of the barrel. There is usually a rim around the barrel a few inches up from the bottom. Below the rim the barrel will be slightly curved, but above the rim the barrel's side will be flat.

Drill a hole using the spade bit just above the rim (but not on the rim) so that the hole is a few inches up the side from the bottom. To drill the hole, sit on the barrel or stand with the barrel between your legs.

Use the utility knife to shave away about 1/16 inch of plastic. **It is especially important to get a tight fit when installing the spigot,** so try to avoid making any gashes in the plastic. Alternate shaving the plastic with screwing in the boiler drain (B). You'll be able to see and feel when the threads of the boiler drain are catching. Shave away where the threads are not catching until it can be screwed in straight, but don't shave too much! **Shave away just enough plastic so that the threads catch, but so that it is still difficult to turn the boiler drain by hand.** (Later, you will use pliers to help you tighten the drain all the way). When it is clear that the boiler drain can be screwed straight into the hole, remove the boiler drain to wrap the threads with Teflon Tape (C).

Next, push the reducing washer (F) onto the boiler drain (B). Push a rubber washer (constructed in step D) onto the threads of the boiler drain. The rubber washer will be flush with the side of the barrel when the boiler drain is screwed in. Apply a bead of Plumbing Goop™ around the hole on the barrel. Use the pliers to tightly screw on the boiler drain until it is tightened and oriented so that a hose can be attached. One rubber washer, one reducing washer (F) and one locknut (G) will now be screwed on to the threads of the boiler drain on the inside of the barrel. Looking at the locknut (G), you will notice it is slightly curved. When it is screwed onto the threads inside the barrel, make sure that it is curved toward the barrel.

Do The Rain Barrel Crawl or the Rain Barrel Dive!

Hint

Your arms will probably be too short to reach all the way inside the barrel, so you'll have to "crawl" or "dive" inside the barrel. It helps to have two people for this step. Turn the barrel on its side so that the spigot is close to the ground.

Partner 1: With the second rubber washer, second reducing washer (F), and the conduit locknut (G) in hand, crawl inside the barrel. If it is really dark inside, bring a flashlight with you.
Partner 2: Standing on the outside of the barrel, hold the spigot in place to keep it from spinning. Use the pliers or a pair of gloves to get a really good grip on the spigot.
Partner 1: First push the rubber washer onto the threads of the boiler drain, followed by the second reducing washer (F). Next, screw on the locknut (G). **Make sure the locknut is curved toward the barrel when it is screwed on.** Tighten the locknut with the pliers.

View from inside of barrel

If you don't want to crawl inside the barrel…
"Dive" into the barrel while standing. Have a partner help you tilt the barrel at an angle until you can bend over and reach far enough inside the barrel to reach the threads of the boiler drain near the bottom of the barrel. Follow the same steps for each partner above.

Before **Partner 1** gets out of the barrel, **Partner 2** should check that the boiler drain is tightened from the outside of the barrel. Try to turn the faucet on; the boiler drain is fully tightened when only the colored handle spins and not the entire boiler drain. If the entire boiler drain spins, keep tightening the locknut on the inside. Spread Plumbing Goop™ on the inside of the barrel around the rubber washer.

Steps for Building a Rain Barrel

Step G: Selecting a Diverter
(for a closed-top barrel)

Closed-topped rain barrels require the purchase and installation of a downspout diverter. A downspout diverter is a special attachment for your gutter downspout that is used to create a seamless flow of water from the downspout into the rain barrel. Using a downspout diverter saves you from having to remove the bottom half of the gutter downspout because it keeps the downspout intact. When the rain barrel is not in use during the winter, the downspout is able to function normally.

The GardenWater Saver™
www.gardenwatersaver.com

The RainReserve™
www.outdoordecor.com

Gardner's Supply Diverter
www.gardeners.com

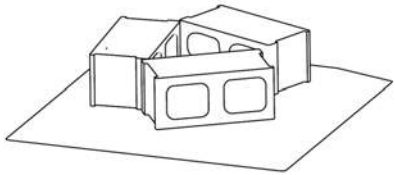
The resources listed in this guide are for informational purposes only.
The products, services, and companies listed does not imply an endorsement by Cornell Cooperative Extension.

Diverters range in price from $25-$45. Shop online by searching for the term "downspout diverter" or check with gardening and rain barrel retailers. If you don't' want to use a downspout diverter, refer to the instruction for an open-topped rain barrel.

Installing Your Barrel

- **Roll Out the Barrel in Spring** Wait until after the last frost (usually in mid-May for Central New York) to install your rain barrel.
- **Find the Right Rooftop and Downspout** Choose a downspout that is close to the area where you want to use the water.
- **Remember Gravity** Your rain barrel will work best if it is slightly uphill of the area where you want to use the water. It is recommended that your barrel be elevated off the ground with cinder blocks to ensure good water pressure from the barrel.
- **Know Your Ground** Make sure the ground beneath the selected downspout is solid and level. When filled, the rain barrel will weigh about 400 pounds and you don't want it to tip over. Gravel, wooden boards or concrete slabs can be used to create a firm base beneath the rain barrel.

Step H: Installing an open-top barrel



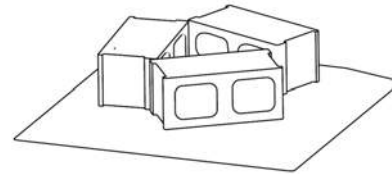
Remove any plastic shavings or debris from your barrel, to avoid future clogging of the outlets and hoses. Level the ground beneath the downspout, using gravel, wooden boards or concrete. Elevate the rain barrel on cinder blocks, using 2-4 concrete blocks as necessary, to raise the barrel.

If the downspout ends above the lid of the rain barrel, installation is complete! If the downspout empties below the lid of the rain barrel when the barrel is raised on the cinder blocks, use a hacksaw or tin snips to cut the downspout so that it empties above the rain barrels lid.

If there is not much clearance or room for the barrel right beneath the downspout, use a flexible, plastic elbow to send the water over the lid of the rain barrel. The elbow slips over the end of the downspout and can be secured with screws. If you do not have a gutter or would prefer a different look, a rain chain may hung from the roof or the upper gutter to direct the flow of water into the barrel. Connect a garden hose to the overflow port on the side of the barrel to handle excess water. Direct this hose out so that it empties in the area where you want to divert the overflow water.

Installing Your Barrel (cont.)

Step I: Installing a closed-top barrel



Remove any plastic shavings or debris from your barrel, to avoid future clogging of the outlets and hoses. Level the ground beneath the downspout using gravel, wooden boards or concrete. Elevate the rain barrel on cinder blocks, using 2-4 blocks as necessary, to raise the barrel.

With the barrel in place, mark the barrel's height on the downspout with a pencil. Put the barrel aside. Remove the downspout by unscrewing the clincher straps that attach the downspout to the house so that it's easier to work with. Lay the downspout on the ground. Cut the gutter to accommodate your style of diverter, according to the instructions included with your diverter. Reattach the downspout to the house (two sets of hands helps here!). Align the barrel against the house next to the downspout. Connect the hose (included in the diverter kit) to the spout on the diverter. Attach a hose mender (J) to the end of the diverter hose so that it can be screwed on to the inlet on the lid of the barrel.

Using Your Rain Barrel

After it rains, let it drain!

- Having an empty rain barrel will allow you to catch even more rain in the next rain storm. If your rain barrel is already filled to capacity when it rains, all of the new rain will overflow out of the barrel. Although having a full rain barrel at the start of a new rain storm is not a problem, you'll be able to capture a greater proportion of the rainwater that falls on the rooftop and make good use of it around your lawn and garden if you have emptied your rain barrel ahead of time.
- Only keep your rain barrel filled when a period of dry weather is expected.

Let the water soak in.

- Attach a soaker hose to the outlet spigot at the bottom of your barrel. Soaker hoses have tiny holes that slowly release water. This is a great way to gradually empty your rain barrel while watering your garden when you know you will be away from home for a few days. Soaker hoses can be purchased at local hardware or garden supply stores.

Do not drink rain barrel water.

- The water you catch in your rain barrel should not be consumed by humans or pets and should only be used to water lawns and gardens. Although your rain barrel is made of food-grade plastic, bacteria and other chemicals may still enter from the rooftop into the water. While rain barrels are used in other countries as a source of drinking water, they are equipped with filtration devices to make the water safe for human consumption.

Use caution when using rain water in vegetable gardens.

- Studies have shown that harmful chemicals may leach from the following rooftop materials:

  - Treated cedar shakes
  - Asphalt shingles
  - New wood shingles
  - Copper
  - Rooftops treated with chemicals to prevent algae/lichen/moss growth
  - Rooftops treated with chromate copper arsenate
  - Gutters containing lead solder or lead-based paint.

  Check your rooftop materials before watering your vegetable garden with water collected in a rain barrel.

Rain Barrel Maintenance

☑ Lid: Make sure the lid is always tightly secured so that no mosquitoes, rodents or debris gets inside. Make sure there are no holes in the mesh screen. Patch any holes with mesh screen.

If you find mosquitoes or other insects inside your rain barrel:

Hint

Pour a few tablespoons of vegetable oil into the barrel. This will create an impenetrable film on the water's surface to keep the bugs away.

☑ Look inside the barrel: Algae growth and pollen deposits inside the barrel are normal. If the algae or pollen are bothersome to you, clean out the barrel.

☑ Cleaning: Unless a lot of debris is collecting inside your rain barrel or there is bothersome algae growth, a rain barrel really only needs to cleaned when it is brought inside for the winter or before it is reinstalled in the spring. To clean your rain barrel, use vinegar or soap and water and spray it out with a hose.

☑ Overflow: If you are home during a storm, go outside to check that water is being diverted away from the house and that the barrel is not overflowing out its lid. If you notice your rain barrel is always overflowing, it may be a sign that the rooftop being drained from the downspout is yielding too much water for the barrel to handle. If the overflowing barrel becomes a problem, reinstall the barrel onto a smaller section of rooftop or add a second or third rain barrel.

☑ Leaks: Check all hose and spigot connections for leaks. Use Plumbing Goop™ to seal any leaks from the hardware on the barrel.

☑ WINTER STORAGE: The first frost in Central New York is in early to mid-October, so disconnecting the barrel in late September can prevent any water from freezing inside. The barrel must be disconnected over the wintertime so that ice doesn't form inside where it could expand and crack the barrel. If possible, store the barrel indoors. If you must leave the barrel outside, remove the hoses, open the spigots and turn it upside down to allow any water to drain out.

Additions to Your Rain Barrel

A Second Rain Barrel (or more!)

Plastic (A) or brass (B) hose mender kits are available.

Catch even more rain by connecting a second rain barrel (or more) in series. When the first barrel is filled, it will overflow into the second barrel. Having two rain barrels allows you to keep one filled with water to use in your lawn and garden and one barrel ready to catch the next rain!

The cut end of the connective hose should be fitted with the male coupling.

Both ends of the connective hose can then be screwed into the linking ports.

1. Using the same directions, construct a second barrel that has its overflow aligned with the overflow on the first barrel.
2. Connect the barrels together with a short piece of hose. With the barrels in place, measure and cut the length of hose needed to join the two barrels at their linking ports. Use a hose-mender kit to re-attach a 3/4 inch male coupling (you will need to purchase this additional hardware) to the end of the hose that was cut. When finished, both ends of the linking hose will be fitted with male couplings and can screw onto linking ports. Make sure the linking hose is relatively level and has no kinks or twists. See page 7 for picture of linked barrels.

A Paint Job

To paint your rain barrel a solid color, use a spray paint that will adhere to plastic. Try Krylon Fusion™ or Rustoleum™ specialty plastic paint—neither require the barrel to be sanded or primed. They come in many colors. Just spray on! To hand-paint your rain barrel, use a spray primer that will adhere to plastic. After spraying it on the barrel, let dry for the period of time specified on the can. Use acrylic water based craft paint to paint or stencil a design on the rain barrel. Protect your rain barrel art by spraying a clear waterproof gloss that adheres to plastic.

Rain Barrel Resources

Fact Sheets

- "Features to Look for When Purchasing A Rain Barrel"
- "Downspout Diverters"
- "Types of Rain Barrel Lids and Diverters: Getting Water Into Your Rain Barrel"
- "An Introduction to Rain Gardens"
- " A Plant List for Rain Gardens"

Want to capture even more rain water? A rain garden is designed to soak up water from your downspout! Learn more by contacting Cornell Cooperative Extension or by referring to the rain garden resources at the left.

FAQ

Should my rain barrel always be filled with water?
Keep your rain barrel filled when you know dry weather is on the way. Otherwise, it's best to have your barrel emptied so that it will be ready to capture rain in the next storm. However, keeping the barrel empty all of the time is harder than it sounds. A good idea is to connect two rain barrels together so that one can be full with water and the other is standing by ready to catch the next rain. Having a soaker hose attached to the spigot at the bottom of the barrel is a good way to slowly release water from the barrel.

How much rain will my rain barrel capture?
Your rain barrel will fill quickly during a rainstorm. One inch of rain falling on 1000 square feet of roof-top will yield 623 gallons of water! As a result, a typical 55-gallon rain barrel will fill up quickly, even when connected to a modest-sized rooftop. To harvest more water, consider linking several rain barrels together or adding a rain garden. Be sure to monitor your rain barrel in action and ensure that the overflow water is being directed as planned.

I already have a lot of mosquitoes in my backyard. Will a rain barrel attract more?
As long as the lid on the rain barrel remains secured, mosquitoes and other pests should not be able to get inside. You can also try adding a few drops of vegetable oil to the water inside the barrel so that a thin film forms on the water's surface.

Who is using rain barrels? What other kinds of techniques are being used to recycle rainwater?
Many residents use rain barrels for their plants and gardens. Because rain water is usually soft and free of dissolved minerals, the water is great for indoor plants, as well as your lawn and garden. An increasing number of homes are using rain barrels, as well as rain gardens, as an environmentally-friendly way reduce stormwater pollution and protect local streams and lakes. To learn more about rain barrels or rain gardens in Onondaga County, visit **www.ongov.net/savetherain**

Cornell Cooperative Extension
Onondaga County
Phone: (315) 424-9485
Web: www.extendonondaga.org

Finished Your Barrel? Send us a Picture!

We'd love to see a photograph of your finished rain barrel, as well as hear any comments you have about this guide and instructions!