

City of Lake St. Croix Beach
Vegetation Maintenance Guidelines
(Protection of the Scenic Riverway)

Lake St. Croix Beach, Minnesota

July 2024 (V1)

Regulatory Authority

Lake St. Croix Beach is incorporated as a statutory city in Minnesota. The City Council has all legislative and administrative authority, and responsibilities, granted by Minnesota Statutes.

Lake St. Croix Beach is the property owner of all lands marked "Parks" in Warranty Deed recorded on October 16, 1925 in Book 109 of Deeds, page 51 at Washington County.

The City Council may seek assistance from other agencies when it manages the repair and maintenance of infrastructure in its park in the Lower St. Croix Scenic Riverway.

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Vegetation Maintenance Guidelines

Lake St. Croix Beach - Natural Areas

Introduction and Document Purpose

Vegetation Management (VM) is a multifaceted, and dynamic process to control, suppress, or eradicate undesired vegetation. VM should be an ongoing task that varies in size and scale, from controlling small areas of invasive herbaceous plants to large mass clearing of invasive species like clearing buckthorn from the shrub layer of forested areas. The controlling of certain weedy species may require unique or site-specific techniques that may not be covered in these guidelines. The willingness to adapt strategies as site conditions change weekly, monthly, seasonally, and/or annually is the difficulty of creating and completing effective VM.

The purpose of this document is to provide land management practitioners, including City of Lake St. Croix Beach staff, residents, and contractors, a foundation of invasive species management for natural areas, native prairie, and woodlands and to identify appropriate techniques for controlling these species. The guide and recommendations are based on adaptive vegetation management which selects varying management techniques considering goals, field conditions, and environmental or other effects. The following sections provide the land management practitioner an understanding of the VM process and how VM can be implemented in areas throughout the City of Lake St. Croix Beach.

This guide is organized as follows:

Section Number	Title	Purpose
1	Vegetation Management	Provides definition of vegetation management.
2	Prairie Area or Herbaceous Vegetation Management	Describes management techniques for non-woodland areas including guidance on mechanical removal, herbicides, and burning.
3	Woodland Management and Editing	Describes management techniques in woodland areas with a particular emphasis on the management and removal of invasive buckthorn.
4	Restoration Activities	Discussion of restoration techniques to be considered upon completion of VM for undesirable species.
5	Vegetation Management Specific to Lake St. Croix Beach	Discussion of regulatory agency jurisdiction in Lake St. Croix Beach, and definition of five specific VM zones within the City.
6	Supplemental Resources	Provides the user with additional information on VM.

Figures and Appendices referred to in the text are included at the end of the document.

1 Vegetation Management

VM is an adaptive system of treatments and techniques implemented to control undesirable plant species. A VM plan is more about long-term control of a weedy species that could lead to its eradication versus a one-time aggressive approach that generally leads to other problems. While eradication is the ideal goal, it is not realistic. There are many outside factors (winds, floods, birds, etc.) that bring weedy species to the site. Knowledge, patience, and regular monitoring are utilized when forming a VM treatment plan. Treatments are evaluated on anticipated effectiveness, cost of VM technique implementation, potential for adverse environmental impacts, and public safety.

VM planning is the process of selecting and/or combining control techniques to target specific plant species (weeds) that pose a threat to the desired plant community. Each site has unique characteristics that must be evaluated when selecting a VM strategy. Characteristics include soils, plant community, site history, public visibility, and public safety. VM is a dynamic process which requires observation skills, knowledge of plant life cycles, and a willingness to adapt strategies as needed. The stages of VM can be described as follows:

- Define and understand goals for site restoration or natural areas
- Assess field conditions
- Set ecological goals that are achievable
- Develop and prescribe site-specific treatments, within economic constraints
- Monitor treatment effects on target and non-target plants and organisms
- Document and make adjustments as needed

1.1 Biology and Control Definitions

A weed is a plant that is not valued where it is growing¹. For example, a native plant (common milkweed) can be considered a weed in an agricultural field but is considered a desirable plant species in most natural areas. Land management practitioners need to understand the site's goals and determine if the "weed" is truly a critical threat to the site. The land management practitioner needs to understand a plant's classification (grass/broadleaf/woody), life cycle, and how the different VM techniques affect that species to successfully achieve the site goals.

1.1.1 Classification and Life Cycle

Plants can be classified in many ways. For weed control, plants are divided into grasses, herbaceous broadleaf plants, and woody plants. Knowing a plant's classification is critical in understanding the types of herbicide that may be used to control the plant. A beneficial website to identify plants and learn the life cycle and other information is

<https://www.minnesotawildflowers.info/>. This website provides photos, identification assistance, life cycle, native vs invasive status, distribution maps, and bloom dates.

The life cycle or growth habits of the weeds assist in determining the most effective VM technique. The following list identifies several of the common life cycles of plants the land management practitioner will encounter.

¹ www.merriam-webster.com/dictionary/weed

- Annual weeds are plants that develop from seeds, mature, produce seed and die in one growing season. Winter annual plants (yellow mustard, shepherds' purse, etc.) germinate from seeds in the fall, overwinter, mature, produce seed, and die in the spring. Summer annual plants (crabgrass, foxtail, pigweed, and lambs-quarters) germinate from seed in the spring, grow through the summer, produce seed, and die in the fall.
 - Annual weeds are generally controlled by mowing. Herbicide applications should rarely be used for control of annual weeds.
- Biennial weeds (Queen Anne's lace, common mullein, musk thistle, bull thistle, wild parsnip, sweet clover, etc.) complete their life cycle over a two-years or growing seasons. They generally develop from seed and form a rosette (low-growing cluster of leaves) during the first year. Throughout the second year the stem elongates, flowers, develops seeds, and then the plant dies.
 - Biennial weeds are generally controlled by hand weeding (pulling/chopping) and mowing. Herbicide applications are generally not recommended, but occasionally the use of herbicides is needed depending on the densities of the biennial weeds and the development stage of the native species.
- Perennial weeds (dandelion, curly dock, black seed plantain, etc.) live for three or more seasons and reproduce by seed and/or vegetative parts. Perennials can be divided into simple perennials and rhizomatous perennials. Simple perennials generally grow from seed and will occasionally reproduce new plants from root parts when cut. Rhizomatous perennials (Canada thistle, Canada goldenrod, reed canary grass, etc.) spread by lateral extension of roots and/or stems as well as seed. Perennial weeds are often more persistent than annuals or biennials. The type of and aggressiveness of the perennial plants assist in creating the VM plan.
 - Simple perennials can be controlled by hand weeding or mowing when the density levels or persistence of the weed species are less than the native species. Herbicides should be used if the native species onsite are struggling to establish dominance. Simple perennials tend to be shorter lived plants (5 – 8 years) and will generally be out competed by a high-quality native species site.
 - Rhizomatous perennials are difficult to control and will likely require several applications of herbicide and use of multiple VM techniques. Herbicide is generally the first method of control with mowing (spot or complete site) used to limit seed production or spreading via wind. Mowing can also be used to encourage the plant to regrow and extend the ability to apply herbicides.
- Woody plants are generally long lived and include trees, shrubs, and woody vines. Woody plants are broadleaf plants with a structure that allows them to persist above ground and continue to regrow year after year. Woody weeds can include invasive species like buckthorn, but can also include natives like boxelder, cottonwood, and maple. These native species are prolific seed producers that germinate excessively in freshly tilled soils.
 - Woody vegetation is typically controlled by herbicide unless the vegetation is a conifer. Conifers generally do not resprout from the stump or roots.

See Appendix A for Control List

See Section 2 (Page 4) for management of situations

2 Prairie Area or Herbaceous Vegetation Management

The sections below describe typical VM strategies and when to use them. A complete VM plan will balance hand pulling, manual or mechanical cutting, and herbicide applications. The techniques are meant to work together to assist the land management practitioner in prescribing the best method for control of the undesired plant species. Examples of this include mowing portions of a site to control seed production of a perennial followed by an herbicide application in fall to control the plant species for the next year. The VM goal should be to control the largest percentage of undesirable plant species in the most cost-effective manner while maintaining ecological soundness. Over time with effective VM the restored or natural area should stabilize and the number of VM techniques implemented annually will decrease.

2.1 Mechanical VM Techniques

Mechanical control of weed species includes the hand-pulling, hoeing, spading, weed whipping, and/or flail mowing of portions or the entirety of a site. These treatments are meant to control seed production and above ground biomass, and/or assist in future VM activities.

2.1.1 Hand Weeding

Hand pulling or chopping small populations of weeds is an effective method of control. Hand weeding is completed by removing the plant from the soil with enough roots intact to the plant to kill the individual plant. Chopping the plant root with a spade (3+ inches below soil surface) can assist in minimizing soil disturbance when pulling the plant by hand. Annual weeds can be hand pulled when in low densities. This technique may not be appropriate for large populations, as disturbing large areas of soil to remove roots can hinder the stabilization of the desired plant community.

Hand weeding works best on biennial and perennial plants with a tap root. Plants that have rhizomatous roots will not be controlled by hand pulling. Regrowth at the location of the rhizomatous root break will commonly sprout many new plants. If the individual rhizomatous plant has flowered and is about to produce viable seed, it is best to cut the plant and haul away the seed heads. The removal of the seed heads limits seed production and prepares the plant for a future herbicide application.

2.1.2 Spot Mowing

Spot mowing is cutting individual or colonies of plants with a weed whip or brush cutter. The purpose of the mowing is to stop seed production, remove or mulch biomass shading native seedlings, and/or setting up the weeds for a future spraying by ensuring their vegetative growth is active and lush ("re-setting" the plant growth).

Spot mowing is a regularly used VM technique. Spot mowing management can be appropriate for all weed species life cycles and is common for re-setting the plant growth stage preparing the areas for a future VM technique to be completed.

2.1.3 Complete Site Mows

Complete site mows are a recommended VM technique for a native prairie planting in its early developing years. Mow the newly seeded site 2 – 3 times the first season and 1 – 2 times the second season. The sites should be mowed with a flail mower to mulch the biomass and limit the possibility of smothering the seedlings with a thick layer (>2 inches) of mowed material. The most important criteria for determining the need for mowing is the weed density. The mow height should be set between 5 – 7 inches and the weeds should be mowed when they reach the height of 12 – 16 inches or when weed growth density is negatively impacting the health of the planting by shading the small seedling plants.

2.2 Herbicide

Herbicides are an essential tool in VM planning. Herbicide use can be a cost efficient and effective method of management. Understanding the herbicide types, method of application, and each herbicide's selectivity is critical when developing a weed control plan. Working with a qualified herbicide representative to stay up to date on new products, application methods, and calibration of spray equipment is highly recommended.

The Minnesota Department of Agriculture issues licenses for Commercial and Noncommercial Pesticide Applicators. Depending on the herbicide and who applies it, it may require a license.

2.2.1 Equipment Calibration

All herbicide application equipment needs to be calibrated to ensure appropriate application rates. Best weed control and minimization of non-target impacts is conducted by understanding the application rates of the equipment.

Herbicide application can appear to be a difficult task, but time spent using with the equipment and learning about nozzle type, flow rates, sprayer pressure, surfactants, and water chemistry will increase the effectiveness of the spraying, provide cost savings, and improve safety for the person applying the herbicide and the general public.

2.2.2 Herbicide Classification

Herbicides are classified as selective or non-selective. Selective herbicides kill some plants and have little to no effect on others. The selectivity can be for grasses or for broadleaf plants. Non-selective herbicides kill all vegetation, regardless of the species. Table 1 below lists some of the common herbicides used in prairie management activities.

Table 1 – Example Herbicide use in VM

Common Name	Trade Name	Selective?	Plant Type Controlled
Clpyralid	Transline	Yes	Broadleaf – Canada thistle control
Diacamba/2,4-D	Banvel, Vanquish	Yes	Broadleaf – Canada goldenrod/General
Glyphosate	Accord, RoundUp	No	Non-selective – Grasses and Broadleaf
Imazapyr	Arsenal	Yes	Broadleaf – brush control
Metsulfuron	Escort	Yes	Broadleaf - Generalist
Sethoxydim	Poast	Yes	Grasses – early season
Triclopyr	Garlon	Yes	Broadleaf – brush control

2.2.3 Herbicide Application Methods

The method of herbicide application for prairie/natural area vegetation management is almost 100 percent to the foliage (leaves) of the weed species as a post-emergence herbicide. The effectiveness of the herbicide application can be impacted by water chemistry, surfactant selection, health of the plant (green growth or impacted by drought). Possible application methods are discussed in the sections below. In general, herbicides are most effective when applied pre-flower stage because the plants are most actively growing prior to flowering. If herbicide cannot be applied prior to flowering, mowing the plant will re-set the plant to begin growing again for a spray application 2 – 3 weeks later.

2.2.3.1 Spot Spray

Spot spraying can be completed by either a low volume backpack sprayer or a mounted pump sprayer. The herbicide is mixed with water at a predetermined amount and applied to individual plants or small colonies. An indicator spray (dye) should be included in tanks to easily identify which plants have been sprayed with herbicide.

2.2.3.2 Broadcast Spray

Broadcast spraying is the practice of applying herbicide over large portions of the site, usually using a vehicle mounted pump tank sprayer. An example of broadcast spraying is for site preparation sprays or cool season overspray during dormant season. This type of herbicide application takes days to translocate throughout the plants for control. Soil leaching can become a problem with consistent application and should be discussed with a chemical herbicide representative.

2.2.3.3 Wicking

Wicking is the application of herbicide via a rope or sponge type applicator. The use of this technique is completed when weed species are taller than the desirable plants and broadcast spraying is not possible. An herbicide-soaked rope or sponge is wiped across the weed species for control.

2.3 Prescribed Burning

Prescribed burning is one of the most beneficial VM techniques a land manager can use for a prairie area. An appropriately timed prairie burn can assist in removing thatch, control invasive weeds and woody plants, release nutrients in the form of ash, and maintain the diversity of a prairie. The first prescribed burn generally occurs in year four or five of establishment. When a site has enough fuel (dry grass material) to carry a fire, the site will benefit. Prescribed burns are often recommended every 5 - 10 years based on the appearance and health of the prairie planting.

Timing of the controlled burn is important. Cool season grasses can be controlled by burning the prairie in mid-May or later. The burn may not burn the site clean, but the control of cool season grasses such as Kentucky bluegrass could be significantly improved with the combination of prescribed fire and herbicides. A drawback of a late burn is the amount of smoke, which is a concern for neighboring homes or roadway traffic. Rotating the season of burns can influence success of wildflowers versus grasses. For example, a spring burn may favor grasses and fall may favor wildflowers. When feasible, burn portions of a site to assist in limiting the impacts to certain insects that may be using the duff layer of the burn area.

2.4 Dormant Mowing

Dormant mowing includes mowing the complete site after snowmelt, but prior to significant plant growth or just prior to snowfall if mowing in the fall. The dormant mowing mulches up the dry biomass, gives the site a clean look for the public, and allows for easier herbicide application in the spring.

3 Woodland Management and Editing

In the past, woodland management was only truly discussed as logging or cutting trees for firewood. In the last 30 years, land managers have noticed that native woodlands have been encroached by multiple weedy species such as common and glossy buckthorn. These buckthorns are invasive shrubs from Europe that migrated from yard landscaping areas into the natural woodlands.

Buckthorn has a longer growing season which can choke out native woodland vegetation by shading out the existing understory. These thick shrubs impact the ability of native trees to create new seedling or native replacement trees. Over a lifetime, the large trees die and are only replaced by the buckthorn species.



Buckthorn growth in natural woodlands

3.1 Buckthorn Removal

Buckthorn removal is the process of removing the existing buckthorn by one of the VM techniques listed below. The removal method may differ from one area to another on the same site. Buckthorn is often quantified in terms of density or the amount of buckthorn biomass on the forest floor. The goal of VM for buckthorn is to allow native plants, shrubs, and tree seedlings to grow through the material on the forest floor. One large, branched buckthorn with a 3-inch diameter shrub may have more biomass or density than 100 small ½-inch buckthorn plants. This limits the ability of natives to thrive beneath it. Follow up control of the buckthorn seedling flushes that will occur for the next several years must then take place. The buckthorn removal technique and seedling control technique selected should be site specific and must consider cost.

A typical buckthorn removal process includes the following:

1. Use a brush cutter to clear all small (less than 1-inch diameter) buckthorn shrubs. This allows easier movement through the project site.



2. Cut larger buckthorn shrubs with appropriately sized equipment.



3. Drag, stack, burn, and/or chip buckthorn based on the desired control method.
4. Spray the stumps with an herbicide.

Buckthorn removal can be completed in a wide variety of methods and every site will be different. Buckthorn can be effectively managed with equipment such as a chainsaw, weed whipper, or hand sprayer.

3.1.1 Cut and Slash

Cut/Slash occurs within the project area by cutting the larger (> 1-inch) buckthorn with a chainsaw and slashing the trunk and branches into small enough pieces so that the plant material touches the ground. Soil contact assists in breaking down the woody biomass, which can take 1-2 years for the branches and 3 to 5 years for the trunks. This technique is best used when the cut buckthorn woody biomass left on the ground surface will not be extremely thick and potentially shade out regeneration of the native plants or inhibit restoration plans. One of the difficulties with this method is the ability to complete stump treatment (Section 3.1.4). The slash can cover many of the stumps prior to treatment. Another alternative is to treat stumps immediately after cutting. This increases the success rate of the stump treatment but slows the daily progress.



3.1.2 Cut and Burn

Cut and burn refers to cutting the larger (> 1-inch) buckthorn with chainsaws and burning the material in smaller brush piles throughout the site. When planning to burn, care should be taken to limit the concern of wildfires. The number and size of piles shall be minimized and local fire departments, city offices, and/or MNDNR should be contacted as burning permits may be required.



3.1.3 Cut and Chip or Forestry Mow

Cut and chip is when the biomass is brought to a woodchipper. Depending on the density of the buckthorn, the chips could be hauled away off site or broadcast through the woods in a thin layer. It is generally recommended to haul the chips away for other use.

Extremely dense buckthorn in areas of relatively flat topography could allow the use of a forestry mower on the site. This is commonly done for oak savanna restorations where distantly spaced mature trees allows for the use of skid steer type equipment with a forestry mower mounted on the front.



3.1.4 Herbicide Stump/Basal Bark Treatment

Treatment of the buckthorn stumps is necessary to stop re-sprouting. A common stump treatment herbicide is 20 percent Garlon 4 Ultra with 80 percent Bark Oil Blue. This herbicide mixture is applied to the sapwood and cambium (outer ring) on the cut surface of the stump. The Bark Oil Blue acts as an antifreeze and a bark penetrant dragging the herbicide to the roots of the buckthorn to kill the stump. This treatment can also be used on standing trees by spraying the bottom 8 inches of the tree. This basal bark application is useful to kill female (berried) buckthorn. Read and understand the manufacturer's recommendations for applications and rates as the rates change based on the exact type and concentration of herbicide utilized.

- See Table 1 for more information.

3.2 Buckthorn Seedling Management

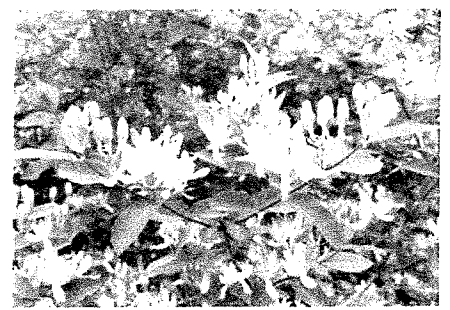
The most common buckthorn seedling management is an herbicide application. A common foliar treatment is 5 quarts of Garlon 4 Ultra per acre. The preferred surfactant is Weathergard Complete, which includes a water conditioner as well. Read manufacturer's recommendations for rates and application methods. All herbicide equipment should be calibrated to ensure application rate.

VM for buckthorn seedlings is site specific. Usually, the use of herbicide is the easiest and best option. Herbicides provide consistent and predictable control while other techniques including prescribed burning or use of goats to eat seedlings is less predictable in control. There are companies that will bring goats to a site, set up fences, and care for the goats for a timeframe (dependent on densities and size) to eat the seedlings a couple of times a year. The practitioner should investigate the benefits of these and other VM methods based on the plant community desired.

3.3 Other Invasive Woodland Species

Buckthorn is not the only woodland invasive plant. Garlic mustard is an herbaceous plant that invades woodlands. Garlic mustard blooms in early spring and can compete with spring ephemeral native plants. Mowing the plant at soil surface when the plant is at 95 percent flowering stage has shown best results in overall control.

Prickly ash, Amur maple, Tartarian honeysuckle are woody invasive shrubs. These species are generally controlled by herbicide applications. Invasive insects are often the most impactful and difficult invasive species to manage. Examples include emerald ash borer and gypsy moth. The Minnesota Department of Agriculture should be contacted regarding these species.



From Left to Right: Garlic Mustard, Prickly Ash, and Tartarian Honeysuckle

3.4 Woodland Editing

Woodland editing is defined as the removal of hazardous trees, removal of poor-quality (deformed, diseased, damaged, hazardous, or defective) trees, and/or thinning of undesirable native species. The purpose of woodland editing is to provide habitat for wildlife, increase species diversity, and provide safe areas for park users.

The priority removal order for woodland management and editing could be as follows:

1. Common buckthorn and glossy buckthorn are removed and stumps treated with herbicide.
2. Non-native honeysuckle's (*Lonicera tatarica*, *L. morrowii*, *L. x bella* and *L. maackii*) are removed and stumps treated with herbicide.
3. Hazardous trees that may cause property damage, personal injury, or de-stabilized riverbanks are cut and branches/trunk removed from site.
4. Poor quality trees, including deformed, diseased, and damaged trees, are removed or improved.
5. Undesirable native species (ex. box elder) are thinned.

4 Restoration Activities

Restoration activities may be necessary following the completion of years of VM. The restoration needs and methods are as diverse as the VM techniques. The following is general information for the establishment of a final plant community where weedy species are within tolerable densities.

4.1 Seed Selection

Seeding is a common and cost-effective method of establishing stable habitat communities. Typically, grass is seeded after soil disturbances to stabilize land from erosion, improve aesthetics, and provide competition for undesirable plants. Seed mix selection can be complicated depending on site conditions. Some general guidelines are listed below.

- Select species adapted to the site conditions: seasonal and total available moisture, soil restrictions (wet, dry, sandy, loamy), and climate.
- Choose seed that is available, and of good quality based on purity and viability of seeds.
- Use of a mixture of species to promote diversity and improve revegetation success.
- Choose seed mixes free of noxious weeds.

Seeding is a critical step in the success of controlling erosion and minimizing the needs of long-term vegetation management. Listed below are some typical seeding methods.

- Broadcast seeding – Any method that mechanically or physically scatters seed directly on the soil surface with or without soil coverage. Uniform coverage of the seed mix is important. After broadcasting the seed should be harrowed in lightly to cover it with soil and allow for germination.
- Hydroseeding – A mechanical system that uses a slurry to apply seed, mulch, and a tackifier in a water suspension. The slurry is sprayed onto the prepared soil with a pump and hose/gun tower. This method has the advantage of installing erosion control with seed and is often used on slopes.

- Drilling – A drill seeder uses a calibrated seed box to deliver appropriate amounts of seed into a furrow drilled in the soil. Discs cut furrows in the soil, allowing the seed to be drilled to a specific planting depth. The furrow is then covered and packed with a packer assembly attached to the back of the drill seeder. This method is most frequently used with native vegetation.
- Interseeding – A process of using a specialized seed drill to inter-seed a site with additional grass/flower species. This method is used where desirable existing vegetation is present, but increased diversity is desired.

4.2 Potted Plant Material

Potted plants including forbs (flowers), grasses, shrubs, and trees provide immediate plant material for an area and can increase diversity. Potted material is more expensive than seed, but if areas requiring reestablishment of vegetation are smaller, it is an option to be considered.

5 Vegetation Management Specific to Lake St. Croix Beach

5.1 Regulatory Protections

The City of Lake St. Croix Beach falls within various regulatory protection areas as described herein.

5.1.1 Lower St. Croix National Scenic Riverway

The Lower St. Croix National Scenic Riverway was established by Congress through the Federal Lower Saint Croix River Act of 1972. Land use activities in this corridor are protected through standards in Minnesota Rules, Chapter 6105. In particular, vegetation management activities that occur within 100 feet of the normal high-water mark of scenic rivers or within 100 feet landward of the bluffline of scenic rivers are subject to conditions set forth in Minnesota Rules, Part 6105.0150. <https://www.revisor.state.mn.us/rules/part/6105.0150>

5.1.2 Shoreland Management

The DNR uses a model shoreland ordinance to regulate land use to help protect surface water quality, shoreland habitat, and shoreland aesthetics. This model shoreland ordinance is described in Minnesota Rules, Parts 6120.2500 to 6120.3900. Local governments with shoreland must have a shoreland ordinance that complies with these rules. Vegetation management activities in shoreland may be subject to conditions of the state's model shoreland ordinance and/or the local government's shoreland ordinance.

5.1.3 Bluff and Slope Protection Areas

Minnesota's shoreland and river-related land use programs, such as the Scenic Riverway, regulate vegetation management activities on and near bluffs. These standards help minimize aesthetic impacts as well as provide slope protection to minimize erosion. The State has minimum bluff protection standards as part of the model shoreland ordinance and the scenic river designation, e.g. the Scenic Riverway. Vegetation management activities within shoreland, particularly within the shore and bluff impact zones, on steep slopes, and within 30 feet of blufflines are subject to regulations.

5.2 City-Specific Vegetation Management Zones

For the purpose of VM planning specific to the City of Lake St. Croix Beach, the City was divided into five distinct zones. Each of these zones has unique vegetative, topographic, and ownership characteristics and the management practices described throughout Sections 2-4 of this document should be utilized in conjunction with the recommendations provided below. VM steps include:

- Identify the weed species using sources like <https://www.minnesotawildflowers.info/>
- Understand the weed species life cycle (annual, biennial, or perennial)
- Determine recommended best control method and implementation process
- Monitor control method and follow up treatments as necessary over next several years

The City's vegetation management zones are shown in **Figures 2-1 to 2-2**. These zones are informal designations used to identify areas that have different vegetation management needs, ongoing vegetation management activities, and/or land ownership. Vegetation management activities in these zones are within shoreland and the Scenic Riverway. **City staff shall be consulted whenever VM are being executed on public or City-owned land.**

5.2.1 Zone 1 - "South Beach"

This zone is generally located between 20th Street South and 21st Street South. Most of this zone was stabilized with rip rap as the distance between the St. Croix River and Riviera Avenue South is narrow and prone to erosion. The purpose of the rip rap is to prevent future loss of shoreland in this area.

Vegetation of rip rap can be encouraged depending on the rip rap placement methods. *(Test Site (WMO) If space is available between the rocks for native plants or shrubs to establish, vegetation assists in tying the rock and soil together within the rip rap area).* Noxious species (Appendix A) should be managed to allow for inspections of the rip rap area and to ensure that continued erosion is controlled.

General vegetation management guidelines for Zone 1 are as follows:

- ❖ Maintain rip-rap areas clear of any woody vegetation . Clear the woody vegetation via chainsaw or weed whip, unless it is possible to mow the area with larger equipment. (WMO (Matt Downing)/City Responsibility)
- ❖ Herbaceous (non-woody) plant cover is allowable and could be encouraged.
- ❖ Noxious/invasive plant species should be positively identified; be treated according to the best management practices for the given species; and setting a long term goal to limit or prevent further spread.
- ❖ Clear-cutting of woodland areas should be avoided.
- ❖ Keep 6 ft clearing of vegetation around stairs

- ❖ Woodland editing of hazardous trees, buckthorn species control, and vegetation under the tree canopy should be prioritized.
- ❖ Site-specific management of a native plant community should be reviewed with a natural resource professional.
 - ❖ Sentence to Serve (STS) volunteer work done with expert
 - ❖ Washington Conservation District <https://www.mnwcd.org/>

5.2.2 Zone 2 - City Beach

The formal City Beach is located between 19th and 20th Street South. This zone has a combination of rip rap and a mix of mature trees. This is a zone of high public use.

General vegetation management guidelines for Zone 2 are as follows:

- ❖ Maintain rip-rap areas clear of any woody vegetation". Clear the woody vegetation via chainsaw or weed whip, unless it is possible to mow the area with larger equipment.
- ❖ Herbaceous cover is allowable and could be encouraged.
- ❖ Clear-cutting of woodland areas should be avoided.
- ❖ Woodland editing of hazardous trees, buckthorn species control, and vegetation under the tree canopy should be prioritized.
- ❖ Noxious/invasive plant species should be positively identified; be treated according to the best management practices for the given species; and setting a long-term goal to limit or prevent further spread
- ❖ VM should be limited to mechanical clearing. Herbicides should be avoided due to the area being of high public use.
- ❖ Keep 6 ft clearing of vegetation around stairs
- ❖ Site-specific management of a native plant community should be reviewed with a natural resource professional.

5.2.3 Zone 3 - Levee

The levee adjacent to the St. Croix River is located between 17th and 19th Street South. Another levee within the City is located south of Ramada Avenue South to the southern limit of the City. The levees are regulated by the U.S. Army Corps of Engineers (USACE). USACE requirements related to levees are described in *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures* document published May 2019.

In general, the USACE prefers levees to be mowed on a semi-regular basis keeping the vegetation to 8-inches or less height for regular inspections. It is recommended that all trees and shrubs be removed from the top and side slopes of the levee, and within 15' of the toe of the levee to assist in ensuring the integrity of the structure. Pollinator friendly seed mixes that are either low growing or mowed prior to inspections could produce desirable vegetation for the levee surface.

General vegetation management guidelines for Zone 3 are as follows:

- ❖ Mow on a semi-regular basis keeping the vegetation to 8-inches or less height for regular inspections.
- ❖ Herbaceous cover is allowable and could be encouraged with pollinator-friendly seed mixes.
- ❖ Noxious/invasive plant species should be positively identified; be treated according to the best management practices for the given species; and setting a long term goal to limit or prevent further spread
- ❖ Trees and shrubs should be removed from the top and side slopes of the levee, and within 15' of the toe of the levee to assist in ensuring the integrity of the structure.
- ❖ Keep 6 ft clearing of vegetation around stairs
- ❖ Site-specific management of a native plant community should be reviewed with a natural resource professional.

5.2.4 Zone 4 – City Owned and Four Private Parcels

This zone extends from 17th Street north to St. Francis of Assissi. It transitions from the levee of Zone 3 to a bluff. The remainder of the zone is comprised of City-owned property that is wooded.

General vegetation management guidelines for Zone 4 are as follows:

- ❖ Clear-cutting of woodland areas should be avoided.
- ❖ Maintain rip-rap areas clear of any woody vegetation. Clear the woody vegetation via chainsaw or weed whip, unless it is possible to mow the area with larger equipment.
- ❖ Noxious/invasive plant species should be positively identified; be treated according to the best management practices for the given species; and setting a long term goal to limit or prevent further spread
- ❖ Woodland editing of hazardous trees, buckthorn species control, and vegetation under the tree canopy should be prioritized.
- ❖ Site-specific management of a native plant community should be reviewed with a natural resource professional.
- ❖ Keep 6 ft clearing of vegetation around stairs
- ❖ Herbaceous cover is allowable and could be encouraged with pollinator-friendly seed mixes.
 - ❖ Sentence to Serve (STS) volunteer work done with expert
 - ❖ Washington Conservation District <https://www.mnwcd.org/>
 - ❖ Natural Shores <https://www.naturalshore.com/>

5.2.5 Zone 5 – Privately Owned

This zone extends from the northern border of St. Francis of Assissi to the City's northern border. It is comprised of private property that is wooded and extends to the water.

General vegetation management guidelines for Zone 5 are as follows:

- Clear-cutting of woodland areas should be avoided.
- Woodland editing of hazardous trees, buckthorn species control, and vegetation under the tree canopy should be prioritized.
- Noxious/invasive plant species should be positively identified; be treated according to the best management practices for the given species; and setting a long term goal to limit or prevent further spread
- Site-specific management of a native plant community should be reviewed with a natural resource professional.

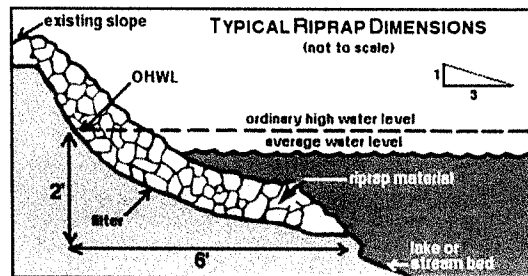
5.2.6 Vertical Bluff (Shoreline to top) Zone Responsibility/Contractor

(City LSCB is to appropriate budget dollars towards the upkeep and maintenance of Zones)

A=Top/Middle Bluff

B=Rip Rap

C=Shoreline



• Zone 1

Annual City Budget for Zone \$

- A – Washington Conservation District \$5000 Even Year (ex. 2026,28,,budget)
- B – Washington Conservation District \$0 Odd Year (ex. 2025, 27 budget.)
- C – City (Budget, Volunteers)

• Zone 2

Annual City Budget for Zone \$

- A –Park Manager (Bob) \$ 0 outside Standard
- B – Park Manager (Bob)
- C – Park Manager (Bob)

• Zone 3

Annual City Budget for Zone \$

- A – Lawn Barbers \$5000 Even Year (Not Lawn)
- B –Lawn Barbers \$0 Odd Year
- C – City (Budget, Volunteers)

• Zone 4

Annual City Budget for Zone \$

- A – Lawn Barbers mowing, Natural Shores \$0 Even Year (Not lawn,NS)
- B – Washington Conservation District \$7500 Odd Year
- C – City (Budget, Volunteers)

- Zone 5 Annual City Budget for Zone \$

- A – N/A \$0 Even Year

- B – N/A \$0 Odd Year

- C – City (Budget, Volunteers)

- ❖ Sentence to Serve (STS) volunteer work done with expert

- ❖ Washington Conservation District <https://www.mnwcd.org/>

- ❖ Natural Shores <https://www.naturalshore.com/>

6 Supplemental Resources

The following is a list of websites for land management practitioners and landowners for continued education.

6.1 Minnesota Department of Natural Resources

www.dnr.state.mn.us/treecare/index.html

www.dnr.state.mn.us/rys/index.html

www.dnr.state.mn.us/waters/watermgmt_section/shoreland/innovative-standards.html

www.dnr.state.mn.us/lakescaping/maintaining-and-restoring-natural-shorelines.html

6.2 Minnesota Extension Agency and Department of Agriculture

www.extension.umn.edu/shoreland-properties/importance-your-shoreland-trees

www.extension.umn.edu/find-plants/trees-and-shrubs

www.mda.state.mn.us/plants-insects/minnesota-noxious-weed-list

www.mda.state.mn.us/pesticide-fertilizer/pesticide-best-management-practices

[Noxious Weed List \(state.mn.us\)](http://NoxiousWeedList.state.mn.us)

6.3 Other Resources

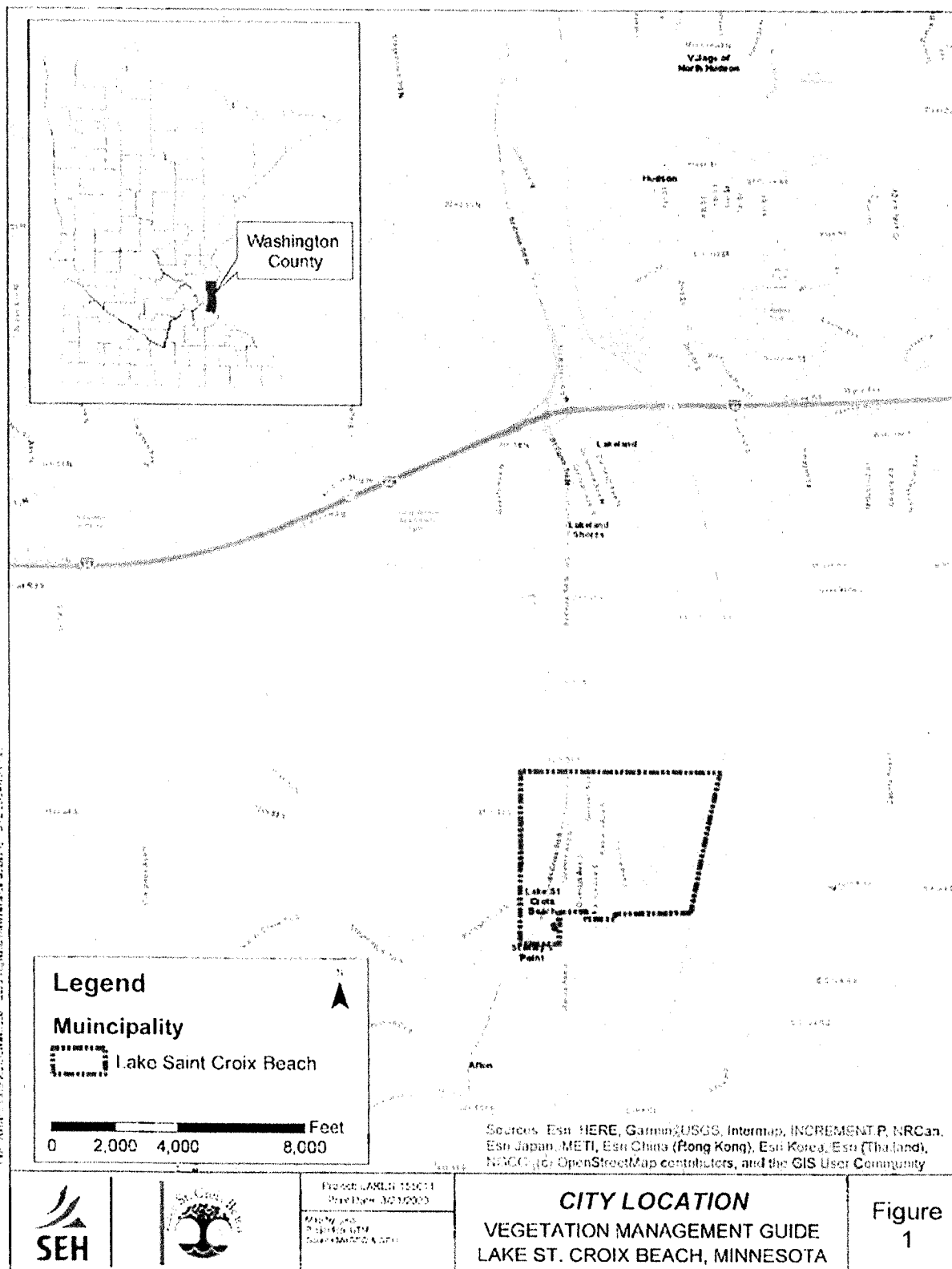
<https://www.minnesotawildflowers.info/>

www.mn.gov/frc/programs/forest/guidelines

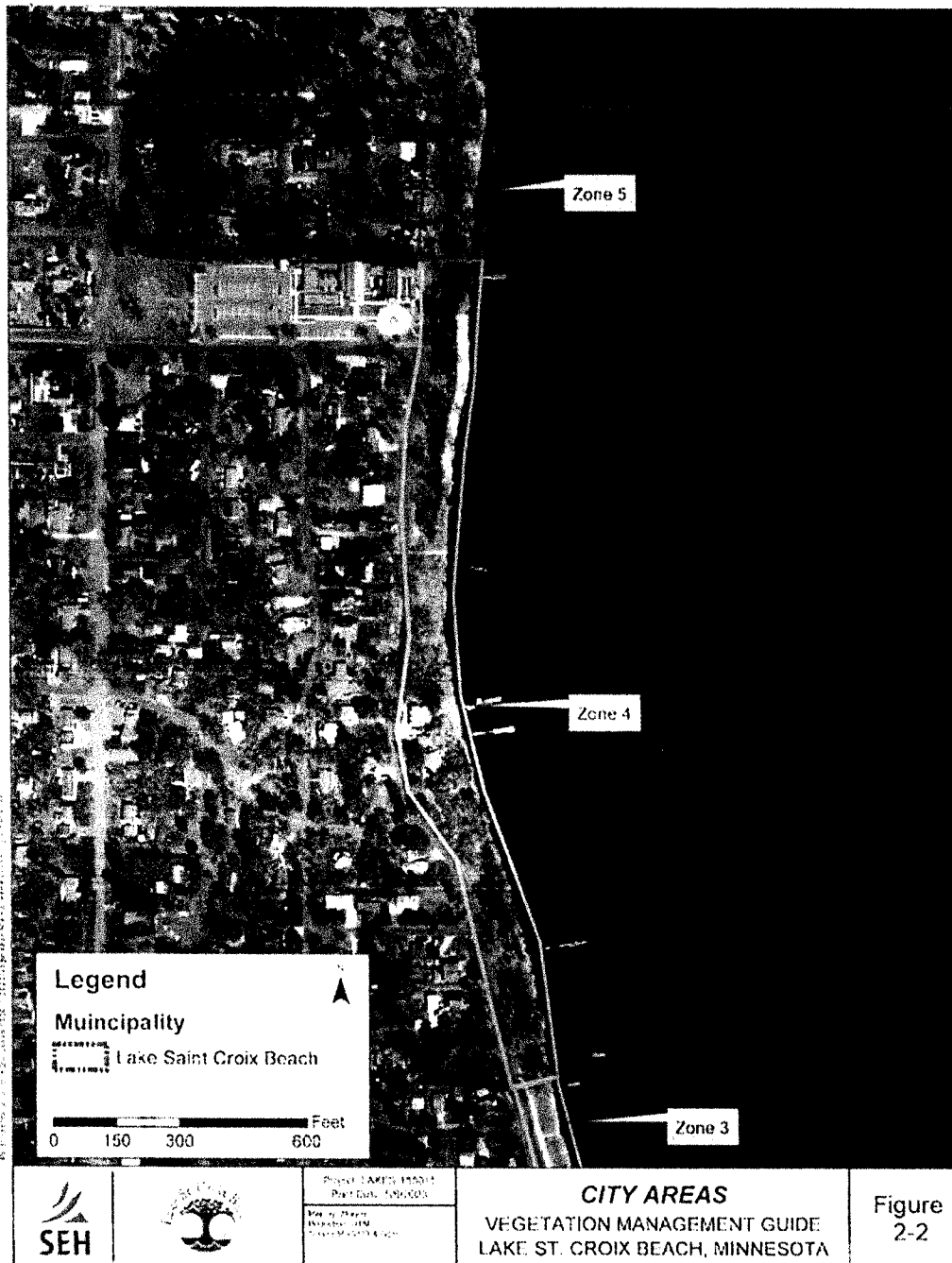
Figures

Figure 1 – Site Location Map - USGS 7.5-Minute Quadrangle

Figure 2 – Project Area Map







Appendix A

Minnesota Noxious Weed List

Noxious Weed List

The Minnesota Noxious Weed Law (Minnesota Statutes 18.75-18.91) defines a noxious weed as an annual, biennial, or perennial plant that the Commissioner of Agriculture designates to be injurious to public health, the environment, public roads, crops, livestock, or other property. The law protects residents of the state from the injurious effects of noxious weeds. Links to the online lists and species pages can be found at this link: [Minnesota Noxious Weed List](#)

Prohibited Noxious Weeds

Attempts must be made by all landowners to control or eradicate species on these lists. These species cannot be transported illegally, propagated, or sold in Minnesota. There are two Prohibited categories: Eradicate and Control.

Prohibited Eradicate – Must be eradicated by killing the above and below-ground parts of the plant.

	Common name	Scientific name	Year added
1.	Black swallow-wort	<i>Cynanchum louiseae</i> Kartesz & Gandhi	2013
2.	Brown knapweed	<i>Centaurea jacea</i> L.	2013
3.	Common teasel	<i>Dipsacus fullonum</i> L.	2012
4.	Cutleaf teasel	<i>Dipsacus laciniatus</i> L.	2012
5.	Dalmatian toadflax	<i>Linaria dalmatica</i> (L.) Mill.	2012
6.	Diffuse knapweed	<i>Centaurea diffusa</i> L.	2017
7.	Giant hogweed*	<i>Heracleum mantegazzianum</i> Sommier & Levier	2012
8.	Grecian foxglove	<i>Digitalis lanata</i> Ehrh.	2010
9.	Japanese honeysuckle	<i>Lonicera japonica</i> Thunb.	2020
10.	Japanese hops	<i>Humulus japonicus</i> Siebold & Zucc.	2012
11.	Johnsongrass*	<i>Sorghum halepense</i> L.	2023
12.	Pale swallow-wort	<i>Cynanchum rossicum</i> Kleopow	2023
13.	Palmer amaranth	<i>Amaranthus palmeri</i> S. Watson	2015
14.	Red hailstone/goldencreeper	<i>Thladiantha dubia</i> Bunge	2023
15.	Tree of heaven	<i>Ailanthus altissima</i> (Mill.) Swingle	2017
16.	Yellow starthistle*	<i>Centaurea solstitialis</i> L.	2010

*Species not known to be in Minnesota but have been determined to be a threat to invade the state.

Prohibited Control – Must be controlled to prevent the maturation and spread of propagating parts.

1.	Bohemian knotweed	<i>Polygonum x bohemicum</i> (J. Chrtek & Chrtkova) Zika & Jacobson	2020
2.	Canada thistle	<i>Cirsium arvense</i> (L.) Scop.	1872
3.	Common barberry	<i>Berberis vulgaris</i> L.	2017
4.	Common tansy	<i>Tanacetum vulgare</i> L.	2010
5.	Giant knotweed	<i>Polygonum sachalinense</i> F. Schmidt ex Maxim	2014
6.	Japanese knotweed	<i>Polygonum cuspidatum</i> Siebold & Zucc.	2014
7.	Leafy spurge	<i>Euphorbia esula</i> L.	1992
8.	Meadow knapweed	<i>Centaurea x moncktonii</i> C.E. Britton	2013
9.	Narrowleaf bittercress	<i>Cardamine impatiens</i> L.	2012
10.	Non-native phragmites	<i>Phragmites australis</i> (Cav.) Trin ex Steud. ssp. <i>australis</i>	2013
11.	Plumeless thistle	<i>Carduus acanthoides</i> L.	1975
12.	Poison hemlock	<i>Conium maculatum</i> L.	2018
13.	Purple loosestrife	<i>Lythrum salicaria</i> (L.)	1992
14.	Round leaf bittersweet	<i>Celastrus orbiculatus</i> Thunb.	2011

In accordance with the Americans with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651-201-5600. TTY users can call the Minnesota Relay Service at 711. The MDA is an equal opportunity employer and provider.

15.	Spotted knapweed	<i>Centurea stoebe</i> L. ssp. <i>micranthos</i> (Gugler) Hayek	2001
16.	Wild parsnip	<i>Pastinaca sativa</i> L. (except for non-wild cultivated varieties)	2010

Restricted Noxious Weeds – May not be sold or transported illegally in Minnesota.

1.	Amur honeysuckle	<i>Lonicera mackii</i> (Rupr.) Herder	2017
2.	Amur silvergrass	<i>Miscanthus sacchariflorus</i> (Maxim.) Franch.	2023
3.	Bell's honeysuckle	<i>Lonicera x bella</i> Zabel	2017
4.	Black locust	<i>Robinia pseudoacacia</i> L.	2017
5.	Common or European buckthorn	<i>Rhamnus cathartica</i> L.	1999
6.	Crown vetch	<i>Securigera varia</i> (L.) Lassen – Formerly named <i>Coronilla varia</i> L.	2017
7.	European alder	<i>Alnus glutinosa</i> (L.) Gaertn.	2020
8.	Garlic mustard	<i>Alliaria petiolata</i> (M. Bieb.) Cavara & Grande	2013
9.	Glossy buckthorn (all cultivars)	<i>Frangula alnus</i> Mill.	1999
10.	Japanese barberry cultivars**	<i>Berberis thunbergii</i> DC.	2015
11.	Lesser celandine	<i>Ficaria verna</i> L.	2023
12.	Morrow's honeysuckle	<i>Lonicera morrowii</i> A. Gray	2017
13.	Multiflora rose	<i>Rosa multiflora</i> Thunb.	2012
14.	Porcelain berry	<i>Ampelopsis brevipedunculata</i> (Maxim.) Trautv.	2017
15.	Saltcedar	<i>Tamarix ramossima</i> Ledeb.	2023
16.	Siberian peashrub	<i>Caragana arborescens</i> Lam. (exemption for Green Spires® Caragana - Caragana 'Jefarb')	2020
17.	Tatarian honeysuckle	<i>Lonicera tatarica</i> L.	2017
18.	Wild carrot/Queen Anne's lace	<i>Daucus carota</i> L.	2017
19.	Winged burning bush (and all cultivars)	<i>Euonymus alatus</i> Thunb.	2020

** Japanese Barberry Cultivars Regulated as Restricted Noxious Weeds in Minnesota. Please visit the Japanese barberry species page for a list of the restricted cultivars.

Specially Regulated Plants – Shall be handled, controlled or eradicated according to specified regulations.

1. Amur corktree (*Phellodendron amurense* Rupr.) 2023. Only sales of named male cultivars permitted. Sales of all other *Phellodendron amurense* are prohibited. All existing planted and escaped fruit producing trees must be controlled, by tree removal or other means, such that no seed is disseminated.
2. Amur maple (*Acer ginnala* Maxim.) 2017. Sellers shall affix a label directly to the plant or container packaging that is being sold that advises buyers to only plant Amur maple and its cultivars in landscapes where the seedlings will be controlled by mowing or other means. Amur maple seed is wind dispersed and trees should be planted at least 100 yards from natural areas.
3. Callery pear (*Pyrus calleryana* Decne.) 2023. Three-year production phase-out period, after which sale of this species will be prohibited and the species will be designated as Restricted in 2026.
4. Norway maple (and all cultivars) (*Acer platanoides* L.) 2020. Sellers shall affix a label directly to the plant or container packaging that is being sold that advises buyers to only plant Norway maple and its cultivars in landscapes where the seedlings will be controlled by mowing or other means. Norway maple seed is wind dispersed and trees should be planted at least 100 yards from natural areas.
5. Poison ivy including eastern poison ivy (*Toxicodendron radicans* L.Kuntze) and western poison ivy (*T. rydbergii* Small ex Rhdb Greene) 2010. Must be eradicated or controlled for public safety along rights-of-ways, trails, public accesses, business properties open to the public or on parts of lands where public access for business or commerce is granted. Must also be eradicated or controlled along property borders when requested by adjoining landowners.
6. Tatarian maple (*Acer tataricum* L.) 2023. Sellers shall affix a label that advises "Tatarian maple should only be planted in areas where the seedlings will be controlled or eradicated by mowing or other means. Tatarian maple seed is wind dispersed so trees should not be planted closer than 100 yards from natural areas".

County Noxious Weeds

M.S. 18.771(e.) County Noxious Weeds are plants designated by county boards to be enforced as prohibited control noxious weeds within the county's jurisdiction and must be approved by the Commissioner of Agriculture. Counties are solely responsible for enforcement. Contact your local County Agricultural Inspector or Designated Employee for more information on County Noxious Weeds and the process for adding species to a County Noxious Weed List. Please visit the County Approved Noxious Weeds page for a list of counties with designated county noxious weeds.

Local Ordinances

Townships and municipalities can also use their local ordinance process to regulate plant species that are not listed by the county or state. Enforcement of species listed via a municipal ordinance is the responsibility of municipal authorities and cannot be regulated under or associated with the Minnesota Noxious Weed Law M.S. 18.75 – 18.91.

Additional resources

MDA Website - www.mda.state.mn.us/plants-insects/noxious-and-invasive-weed-program

MN DOT Website - www.dot.state.mn.us/roadsides/vegetation/pdf/noxiousweeds.pdf

MN DNR Website - www.dnr.state.mn.us/invasives/terrestrialplants/index.html

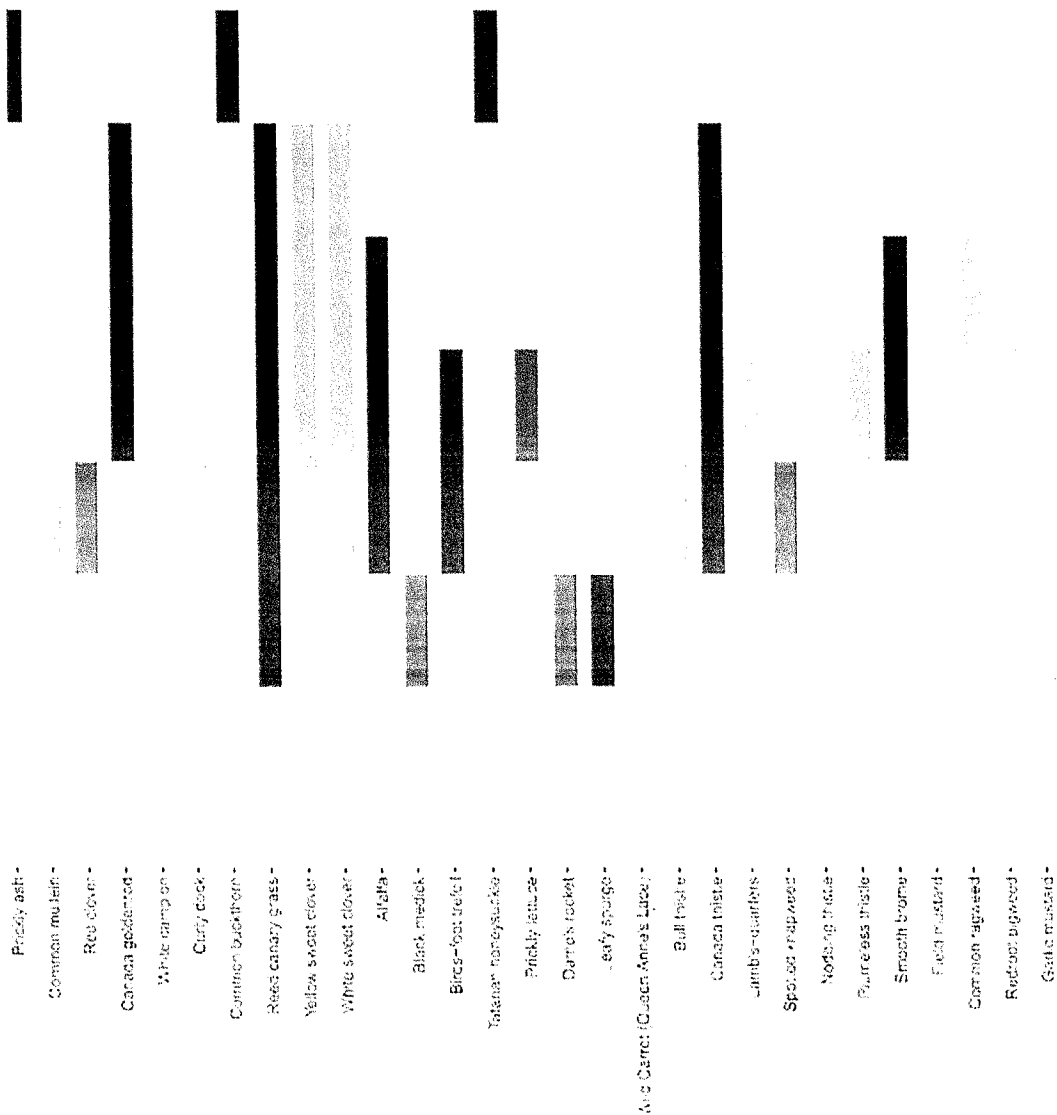
MN BWSR Cooperative Weed Management Areas - <http://www.bwsr.state.mn.us/grants/cwma/CWMA.html>

Appendix B

Vegetation Management Timing Chart

Management Activity

- Mow
- Mow, Spray
- Put Chop, Mow
- Spray



Appendix C

Species Recommended Control Technique

