

Vegetation Management Plan (VMP)

City of Haverhill, MA

2023-2027



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1.0 Statement of Goals and Objectives

This Vegetation Management Plan (VMP) is intended to establish criteria for the City of Haverhill to manage vegetation along municipal Rights-of-Way (ROW) in compliance with the Rights-of-Way Management Regulations (333 CMR 11.00) as promulgated by the Massachusetts Department of Agricultural Resources (MDAR).

The primary objective of this VMP is to provide the public with safe and unobstructed ROWs while minimizing reliance upon herbicides. Vegetation maintenance is necessary along public ROWs including: roads; sidewalks; and trails to control unwanted vegetation that may pose a public nuisance, result in safety hazards or cause damage to structures and infrastructure. The City of Haverhill has approximately 250 centerline miles of roadways, intersections, and ROW's including those associated with city facilities. The goal of the program is to manage undesirable vegetation while maximizing environmental protection and minimizing the use of herbicides. Only herbicides listed on the current MDAR ROW Sensitive Areas Materials List will be used. Periodic monitoring and inspection will aid in the success of the VMP which is expected to:

- Manage target vegetation while ensuring the protection of sensitive areas and the environment.
- Reduce the volume of herbicides application over time.
- Reduce the frequency of herbicides application.
- Ensure vegetation management activities are conducted in a safe and effective manner and in compliance with regulations.

This VMP will serve as technical guidance for individuals involved in ROW vegetation management and as an accessible source of information for residents and public officials.

Past Results

Over the past five years since implementing the previous VMP, the City of Haverhill has been able to reduce the amount of herbicide needed to control target vegetation. Based on Haverhill's Daily Vegetation Management Reports, there has been a reduction in herbicide use by 800 gallons between 2019 and 2022. With records indicating a total herbicide use of 1,500 gallons in 2019, 1,000 gallons in 2020, 950 gallons in 2021 and 700 gallons in 2022. This reduction in herbicide use may be partially attributed to increased street sweeping that can help reduce available substrate for vegetation growth along roadways and pavement repair resulting in fewer cracks for vegetation growth. In addition, mechanical control and the effectiveness of the City's treatment program may have aided in the reduction in herbicides use.

2.0 Target Vegetation

Vegetation targeted will be species that fall into the categories described below. The City of Haverhill will submit a Yearly Operational Plan (YOP) for MDAR approval to specify the herbicide(s) to be used, target species and application locations.

Hazard Vegetation

Vegetation considered to be a hazard includes plants or plant species that pose a risk to public safety or that impede movement along public ways. Hazard vegetation may: obscure sightlines, signs and vehicular movement, create windfall hazards, and cause winter shading (causing ice/reduced melting).

Noxious Vegetation

This category includes vegetation that could cause problems to the general public, employees or contractors. Generally, it includes poisonous plant species and those with thorns. Nuisance vegetation poses a risk to safety and health often due to dermal contact with plants that are poisonous, heavily thorned or densely colonized. Target vegetation in this category is primarily poison ivy and other noxious vegetation within 10 feet of the edge of pavement.

Detrimental Vegetation

Detrimental vegetation applies to all vegetation that can destroy or compromise the function of infrastructure by growing in cracks along the roadway, pavement/bridge joints, medians/traffic islands, drainage structures/drainageways, trails and bike paths.

Invasive Vegetation

Invasive plants can aggressively colonize areas along ROWs, blocking site distances and compromising infrastructure. Many invasive plants, such as Japanese knotweed and *Phragmites*, are difficult to control using mechanical means alone. Mechanical methods can also result in spreading these plants to new locations. In addition, invasive plants pose a threat to biodiversity of naturalized areas. Herbicides are the most effective method of treatment for many invasive plants. Invasive plants can include those listed on the Massachusetts Prohibited Plant List located at <https://www.mass.gov/service-details/massachusetts-prohibited-plant-list> and those voted as 'invasive' by the MA Invasive Plants Advisory Group.

3.0 Vegetation Management Methods & Actions to Minimize Herbicides

Vegetation management methods will include both non-chemical techniques and chemical application where necessary. Vegetation management may involve the following methods:

- Physical – street sweeping, sealing cracks, resurfacing.
- Mechanical – hand-cutting, mowing, selective trimming.
- Chemical– foliar herbicide treatments, cut-stump surface treatment.

The management methods selected will be chosen based on a variety of factors and with the goal to achieve a long-term, vegetation management program.

Physical

Physical management methods will rely primarily on pavement maintenance. Pavement maintenance will consist of sealing cracks and general ROW repairs including resurfacing and installing new sidewalks. This helps to eliminate weeds by preventing seeds from imbedding in pavement cracks. The City also completes routine street sweeping. The build-up of sediment and other material can provide a medium for plant growth. Regular street sweeping helps eliminate this material from accumulating as a base for weed establishment.

Mechanical

Mechanical management methods may include hand-cutting, mowing, and/or selective trimming.

Hand-Cutting

Hand-cutting consists of the mechanical cutting of target species using chainsaws and brush saws. Target species are cut as close to the ground as practical. Hand-cutting is used to protect environmentally sensitive sites. It is also used on target vegetation greater than twelve feet in height. Hand-cutting is used on those restricted sites where terrain, site size, or environmental sensitivity renders mowing impossible or impractical. Hand-cutting may be practiced at any time during the year.

Mowing

Mowing consists of the mechanical cutting of target vegetation using push mowers, large rider mowers, rear deck mowers, brush mowers, brush cutters, pole-saws, edgers and line trimmers. Selection of specific equipment is based on terrain, target vegetation species, size and density of target vegetation area, and equipment availability. Mowing will be used in areas where terrain and target stem size permit safe and efficient use of the above machinery. Mowing will be the principal method for vegetation management along road shoulders and where herbicide use is prohibited. Mowing will be conducted seasonally when weather conditions allow.

Selective Trimming

Selective trimming consists of the mechanical pruning of encroaching limbs of tall trees that may block roadway, sidewalk, and trail and bike path access. Trimming will be accomplished using aerial lifts via trucks or tractors, or by climbing crews if terrain or obstruction prevents equipment access.

Chemical

Chemical management may include foliar treatment and/or cut stump surface treatments. Selected chemicals are limited to those listed on the MDAR Rights-of-Way Sensitive Area Materials List.

Foliar Treatment

Foliar treatments involve the selective application of an herbicide, in accordance with manufacturers' directions, to the foliage. Several types of equipment for foliar treatments may be used. These could include: backpack sprayers, hand-held pump sprayers, or a motorized truck-mounted sprayer. Foliar treatments with backpack and hand-held pump sprayers are used on low-density target vegetation. No more than the minimum labeled rate of the herbicide for the appropriate site, pest, and application method shall be applied. Motorized application equipment may be used for foliar treatment on areas where the vegetation density is high and the use of a backpack sprayer may not be as effective.

These foliar applications will take place when plants are in full leaf and actively growing, and in accordance with the product label. When used according to the label, foliar treatments are an effective and efficient method to manage the whole target plant. Managing the whole target plant reduces the potential of resprout from root systems.

Cut-Stem Treatment

Cut-stem treatments consist of mechanical cutting of target species using chainsaws immediately followed by herbicide treatment applied with a squirt bottle, a hand-held pump sprayer, or painted on the freshly cut surface of the stump. Treatment will include spraying the root collar area, sides of the stump, and the outer portion of the cut surface, including the cambium, until thoroughly wet, but not to the point of runoff. Cut-stump application can be effective during the dormant period, however, it may not be effective during times of sap flow (i.e., maple and birches during the months of February through early April), as flowing sap will limit the herbicide from being absorbed into the stump down to the roots. All herbicides are to be applied to freshly cut stems to be effective.

Monitoring

All roadsides proposed for chemical management will be visually surveyed by the City of Haverhill Department of Public Works (DPW) prior to any scheduled treatment program. Monitoring will be conducted by the DPW on foot and/or by vehicle. Monitoring of areas may result from requests from the public. All monitoring records will be maintained by the DPW.

Record Keeping

A log of areas surveyed will be maintained by the City for future planning and reference. Areas maintained either through physical repair, mechanical or chemical management will be recorded.

Management Tactics

The decision to use one or a combination of vegetation management techniques will depend on the site-specific situation. The management techniques selected will control target vegetation in the most environmentally sensitive and efficient manner.

4.0 Justification of Herbicide Use

Vegetation management along public ways is necessary to (based on the goals and objectives stated in this VMP (page 1)):

- Manage target vegetation while ensuring the protection of sensitive areas and the environment.
- Reduce the volume of herbicides application over time.
- Reduce the frequency of herbicides application.
- Ensure vegetation management activities are conducted in a safe and effective manner and in compliance with regulations.

As discussed in this VMP, physical and mechanical methods are sufficient to manage most plants that interfere with traffic, visibility and safety. Chemical treatment is necessary where topography, access, growth and reproduction characteristics or concerns regarding worker safety limit the potential for management by physical or mechanical methods.

Chemical management is the preferred method or only method of management for plants that pose a health hazard for the technician in the field. Poison ivy, for example, is extremely hazardous to handle and resprouts after cutting, making it difficult to achieve cost-effective management using mechanical methods. In addition, manual and mechanical management along roadsides can put worker safety at risk due to high-speed traffic. Moreover, the climbing characteristics of Poison Ivy over stone walls, up tree trunks, and around guardrails/guiderails, make mechanical management impractical for safety and economic reasons.

Mowing will manage most herbaceous species. Herbicide applications, however, are used where mechanical management is not feasible due to location, stem density, and/or height. Although herbaceous species are more often a desirable vegetative cover along public ways, in areas where it is difficult and sometimes dangerous to remove by mechanical treatment methods, herbicide is used. These areas include, but are not limited to, cracks in asphalt, along guardrails/guiderails, paved traffic islands, sidewalks, and curbs. In these instances, herbaceous species are considered target vegetation.

Woody vegetation growing along the ROW that interfere with pedestrian or vehicle safety is managed by a variety of techniques. Pruning or ground cutting using hand tools or chainsaws is typically sufficient to manage large woody vegetation. Depending upon the species of plant removed and its proximity to other vegetation, these stumps may be treated with an herbicide to prevent resprouting.

Small woody plants that are growing along the road shoulder in an accessible location will usually be mowed along with the roadside grass. Woody plants that are growing over obstacles that would impede the mower or have a viney growth habit and are not practical to hand-cut or chip, or that grow very rapidly can be managed with foliar application of herbicides.

Finally, invasive plant management is usually required along ROWs for sight distances and to prevent destruction of infrastructure. Treatment can allow native, more stable vegetation to establish. Managing invasive plants via mechanical means can be ineffective and depending on the species, may encourage the spread of an existing population or inadvertently result in the introduction of a new population. In these situations, the use of an herbicide can be the most effective method of managing

invasive plants. Working in conjunction with the Conservation Commission, the City may treat invasive plants to encourage the growth of native species.

5.0 Identification of Sensitive Areas

Sensitive areas are defined within 333 CMR 11.00 as areas within ROWs in which public health and environmental concerns warrant special protection to further minimize risks of unreasonable adverse effects of herbicides. These include public groundwater sources, Class A public surface water sources, associated surface water bodies, tributaries, Class B drinking water intakes, private wells, state listed species habitat, wetlands, waters over wetlands, riverfront areas, certified vernal pools, inhabited areas and agricultural areas. Sensitive areas will be identified through the use of existing data and verified, when necessary, in the field.

Sensitive Areas Basemap

There are several readily available sources of information that can be used to develop a draft sensitive areas basemap. These sources include:

- Massachusetts Department of Environmental Protection (MassDEP) Water Supply Maps (1:25,000).
- Aerial Photographs.
- MassDEP Wetlands Conservancy Maps (scale 1:1,000).
- Municipal maps and records including those from the Haverhill Health Department to identify private water supplies.
- Regional Planning Agency maps and records.
- U.S. Fish and Wildlife Service National Wetlands Inventory Maps.
- Ortho Photo Information – MassDEP (1:5,000).
- Massachusetts Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (NHESP).
- Available MassGIS maps.

Identification of Sensitive Areas

With the sensitive areas basemap complete, the Haverhill DPW staff will identify and mark the proposed treatment zones on the basemap. Haverhill DPW staff will visually survey treatment zones in the field for any additional sensitive areas not already on the basemap. Sensitive areas identified in the field that are not already on the basemap will be added or adjusted as needed. Similarly, treatment zones located within sensitive areas will be adjusted according to the Sensitive Areas Restrictions listed in Table 1. An updated basemap will be developed, as needed.

Field Verification of Sensitive Areas

With the draft sensitive areas basemap complete, Haverhill DPW staff will deploy in advance of treatment crews to identify the treatment areas in the field. All treatment areas will be identified and marked on the sensitive areas maps. Sensitive areas in the vicinity of the treatment areas will be confirmed during this field effort, if possible, and any additional sensitive areas identified in the field or corrections will be applied to the basemap. Treatment areas located within limited spray areas will be adjusted according to the Sensitive Areas Restrictions listed in Table 1.

Table 1. Sensitive Area Restrictions

Sensitive Area	No Spray Areas	Limited Spray Areas	Where Identified
Wetlands and Water Over Wetlands	Within 10 feet (unless provisions of 333 CMR 11.04(4)(c) are followed)	10 – 100 feet; 12 months must elapse between applications; Selective low pressure, using foliar techniques or cut-stem applications	YOP Maps and identify on site
Certified Vernal Pool	Within 10 feet	10 feet to the outer boundary of any Certified Vernal Pool Habitat; 12 months must elapse between applications; Selective low pressure, using directed spray or cut-stem applications	YOP Maps and identify on site
Public Ground Water Supply	Within 400 feet (Zone I)	Zone II or IWPA (Interim Wellhead Protection Area which is the Primary Recharge Area); 24 months must elapse between applications; Selective chemical, using directed spray or cut-stem applications	YOP Maps
Public Surface Water Supply	Within 100 feet of any Class A public surface water source	100 feet to the outer boundary of the Zone A; 24 months must elapse between applications; Selective chemical, using directed spray or cut-stem applications	YOP Maps
	Within 10 feet of any tributary or associated surface water body located outside of the Zone A	10 feet to the outer boundary of the Zone A; 24 months must elapse between applications; Selective chemical, using directed spray or cut-stem applications	
	Within 100 feet of any tributary or associated surface water body located within the Zone A of a Class A public surface water source		
	Within a lateral distance of 100 feet for 400 feet upstream of any Class B Drinking Water Intake	Within a lateral distance of between 100 - 200 feet for 400 feet upstream of intake; 24 months must elapse between applications; Selective chemical, using directed spray or basal or cut-stem applications	
Private Water Supply	Within 50 feet	50 – 100 feet; 24 months must elapse between applications; Selective chemical, using directed spray or cut-stem applications	In YOP will list and identify on site

Surface Waters	Within 10 feet from mean annual high-water line	10 feet from the mean annual high-water line and the outer boundary of the Riverfront Area; 12 months must elapse between applications; Selective chemical, using directed spray or cut-stem applications	YOP Maps and identify on site
Agricultural and Inhabited Areas	N/A	0 – 100 feet; 12 months must elapse between application; Selective chemical, using directed spray or cut-stem applications.	Identify on site
State-listed Species Habitat	No application within habitat area except in accordance with a YOP approved in writing by the Division of Fisheries and Wildlife		YOP Maps ¹

¹Includes Estimated Habitats of Rare Wildlife and the Priority Habitats for State-Listed Species as shown on the most recent edition of the Massachusetts Natural Heritage Atlas prepared by the NHESP

6.0 Operational Guidelines for Applicators Relative to Herbicide Use

As required by regulations, application to roadside ROWs must hold a valid Category 40 pesticide certification from MDAR. The applicator(s) will be City staff and/or a certified contractor working under the supervision of the City of Haverhill. All applicators and their supervisors will have a copy of the VMP and YOP with them at all times for reference during the herbicide application. A Daily Vegetation Management Report form will be filed at the end of each day with the individual supervising the YOP. This will include the following information:

- Applicator or contractor name
- Weather conditions during application
- Identification of site/work area
- Type of equipment and hours used
- Method of application
- Target vegetation
- Herbicide (amount/concentration used)
- Identification of adjuvants or dilutants and amount/concentration used
- Unusual conditions or incidents noted
- Public inquiries noted
- Recording/verification of sensitive areas
- Lane miles treated
- Total amount of herbicide used
- Man hours (actual spray hours) vs. total herbicide used.

In addition to the applicable rules and regulations, applicators will adhere to the following operational guidelines.

Weather

Herbicide applications will be restricted during certain adverse weather conditions, such as rain or wind. Herbicide applications will not be conducted during periods of moderate or heavy rainfall. Foliar applications can be effective in light mist situations; however, any measurable rainfall that creates leaf runoff will wash the herbicide off target vegetation. If foliar applications are interrupted by unexpected rainfall, the treatment will not resume until the rain ends and active leaf runoff has ceased.

To minimize off-target drift, the applicator will comply with the following restrictions:

- During periods of wind, which are strong enough to bend the tops of the main stems of trees on the roadside, the applicator will periodically observe the application of the foliar treatment to ensure that there is no significant movement of the herbicide. If the applicator can see the herbicide moving off target, the application will immediately stop until the wind has subsided enough to permit further applications.
- Herbicide solution to be used for a foliage application may contain low drift agents. Low drift agents may be added to the foliage herbicide solutions as per the low drift agent label. In moderate wind conditions, as per label recommendations, more low drift agent may be added, at the discretion of the applicator to manage increased drift.

- Foliar treatment will not be made to target vegetation that exceeds twelve feet in height.

Equipment Calibration

Foliar application equipment will be calibrated prior to application and in accordance with manufacturer's recommendations. Applicator nozzles will be adjusted to apply a coarse spray pattern.

Equipment will be adjusted to deliver an herbicide solution that minimizes herbicide overspray or drift.

Sensitive Area Restrictions

In defined sensitive areas, there exists a no-spray area where herbicide use is prohibited and a limited spray area where herbicide use is allowed under certain conditions. In places around sensitive areas where herbicide use is allowed, only the minimum labeled rate of application for the management of target species can be applied.

7.0 Alternative Land Use Options

Every effort will be given for alternative land use options. However, there are specific criteria to be met for adoption of alternative land use options. The alternative land use option must effectively manage vegetation as required for ROW access and safety and must not cause a negative impact to the environment.

8.0 Remedial Plan to Address Spills and Related Accidents

All mixing and loading of herbicides will be conducted at the facility where the herbicides are stored. This will be a City facility if the application is completed by a City employee, or offsite, if the application is being completed by an outside contractor. Only the amount of herbicide necessary to carry out the vegetation management, based on monitoring results, will be mixed daily to ensure that there will be no waste and will minimize potential problems. The vehicles carrying out the spray operations will be equipped with a bag of absorbent, activated charcoal, leak-proof containers, a broom and a shovel, in case of minor spills. A log of the herbicides on the vehicle will be kept in the vehicle. Herbicide labels and fact sheets will be carried on-site by the applicator.

Spills requiring action, include but are not limited to: herbicides, fuels, oils and other motor/hydraulic fluids. As soon as any spill is observed, immediate action will be taken to contain the spill and protect the spill area. The cause of the spill must be identified and secured. Spill containment will be accomplished by covering the spill with absorptive clay or other absorptive material or, for large spills, building clay or soil dikes to impede spill progress. Until completely remediated, the spill area will be protected by the placement of barriers and by the delineation of the spill area by crew members. If a fire is involved, care will be taken to avoid breathing fumes from any burning chemicals.

Minor spills of liquid herbicide will be remedied by soaking up the spill with adsorption clay or other adsorptive material and placing it in leak-proof containers, removed from the site and disposed of properly. Minor spills involving dry herbicides, such as granulars, will be swept up or shoveled up directly in leak proof containers, removed from the site and disposed of properly. All contaminated soil will be placed in leak-proof containers, removed from the site and disposed of properly. Any minor spill will be reported to the MDAR, Division of Crop & Pest Services.

Major spills will be handled in a similar manner as minor spills, except in cases where the spill cannot be contained and/or removed by the crew. In this case, the MassDEP Emergency Response Unit and the MDAR, Division of Crop & Pest Services must be contacted.

Emergency first responders (including, but not limited to, fire and police) should be immediately notified of a major spill and/or any size incident deemed a possible risk to public health, safety and the environment.

MassDEP will be contacted when there is a spill of a reportable quantity, regardless of major or minor spill status and in accordance with 310 CMR 40.0000 Massachusetts Contingency Plan.

In the event of a spill, information on safety precautions and clean up procedures may be gathered from (but not limited to) the sources listed in Table 2.

Table 2. Emergency Resources	
Resource	Location/Phone #
Herbicide Label	Approved YOP
Herbicide Safety Data Sheet (SDS)	Approved YOP
Herbicide Manufacturer <ul style="list-style-type: none"> • Corteva Agriscience (formerly Dow/Dupont) • NuFarm • Bayer 	(800) 992-5994 (877) 325-1840 (866)-99-BAYER
MDAR, Division of Crop & Pest Services Clayton Edwards	(617) 626-1700
Massachusetts Department of Environmental Protection Emergency Response	(888) 304-1133
Department of Public Health Environmental Toxicology Program	(617) 624-5286
Massachusetts Poison Control Center 24-Hour Hotline	(800) 222-1222
City of Haverhill Public Works Department	(978) 374-2360
Haverhill Fire Department	(978) 373-8460 – non-emergency or 911
Haverhill Police Department	(978) 373-1212 – non-emergency or 911
Haverhill Health Department	(978) 374-2338
Chem-Trec	(800) 262-8200
National Pesticide Information Center	(800) 858-7378
National Animal Poison Control Center	(800) 426-4435

9.0 Notification Procedures

Once approved, a copy of the VMP will be provided to the Mayor of Haverhill, Board of Health and Conservation Commission. Upon approval of the VMP and YOP and 21-days in advance of the application of herbicide to a ROW, the City will notify the MDAR, Board of Health, water supplier, Mayor of Haverhill and Conservation Commission of the application. Notification will include: method and location of application, herbicide fact sheet, U.S. EPA registration number for herbicide and applicator contact information. Additionally, at least 48-hours prior to a ROW herbicide application, the applicant will publish in a local newspaper the following information: methods and location of herbicide application, approximate dates of herbicide application, name of herbicide(s) to be used, description/purpose of application and contact information for the designated individual representing the City whom citizens can contact. Section 9.0 was developed per 333 CMR 11.00.

10.0 Monitoring Plan

On an annual basis, the Haverhill DPW will evaluate the success of this Vegetation Management Program based on the goals and objectives stated in this VMP (page 1) which include:

- Manage target vegetation while ensuring the protection of sensitive areas and the environment.
- Reduce the volume of herbicides application over time.
- Reduce the frequency of herbicides application.
- Ensure vegetation management activities are conducted in a safe and effective manner and in compliance with regulations.

This monitoring plan will evaluate the relative success of the VMP. Plan success constitutes achievement of the above goals and objectives. Monitoring plan and assessment activities will include the following:

1. Pre-application assessment of each primary treatment area to include estimated area of treatment and identification of target species. Primary treatment areas will be mapped for future assessment.
2. Recording of volume of herbicide used during treatment for each area.
3. Post-evaluation of each primary treatment area to include a description of the overall management of target species and observation of nearby sensitive resource areas, noting impacts if any.
4. The Haverhill DPW will hold an annual VMP evaluation meeting to take place after a sufficient period of time after completion of all herbicide application activities. This meeting will evaluate efficacy and assess the following issues:
 - a. Overall management of target species in each primary treatment area
 - b. Volume of herbicide applied
 - c. Impacts related to weather
 - d. Sensitive area impacts
 - e. Comments received from the public
 - f. Overall program implementation including suggested changes

This meeting will result in the development of documentation needed to summarize the program annually for inclusion in the next VMP, should one be developed for MDAR approval.

5. Meeting minutes will include the above information, data and discussion points and will include comparisons to previous years' information, if available. Recommendations on location and use will be reflected in the next year's YOP as applicable.

11.0 Qualifications of Individuals Developing & Submitting the Plan

Mr. Michael Arpino is the Haverhill Public Works Highway Superintendent with over 20 years of public works experience. Mr. Arpino has been serving as Highway Superintendent for the City of Haverhill since 2021 and for the City of Newton for the 10 years prior. He will oversee the implementation of the VMP and YOP for the City of Haverhill.

Comprehensive Environmental Inc. (CEI) is a civil engineering and environmental science firm that has served municipal, state, and Federal agencies throughout the New England area for over 30 years. CEI staff have worked with municipalities to develop MDAR approved Vegetation Management Plans and Yearly Operations Plans for over 15 years. Technical staff are experienced in the areas of wetlands, water resources, stormwater, environmental permitting, and resource area protection.