

MassDOT District 3

Vegetation Management Plan

2026 – 2030



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MASSDOT DISTRICT 3 VEGETATION MANAGEMENT PLAN

I. INTRODUCTION

This Vegetation Management Plan (VMP) for MassDOT District 3 is designed to establish a five-year program to manage vegetation along rights-of ways (ROW) in compliance with the Rights-of-Way management regulations (333 CMR 11.00) as promulgated by the Massachusetts Department of Agricultural Resources (MDAR). ROWs, according to CMR 333 11.02, include any “roadway or thoroughfare on which public passage is made, and any corridor of land over which facilities such as railroads, power lines, pipelines, conduits, channels, or communication lines or bicycle paths are located”. This VMP will seek to implement a set of standards and criteria to achieve vegetation management along the District’s roadways and facilities in an effective, safe, and environmentally responsible manner.

District 3 encompasses 78 municipalities in central MA and manages approximately 7,764 centerline miles of roadway in addition to 23 depots (see **Appendix A**). District 3 is responsible for keeping guardrails, medians, sidewalks, and curbs clear of vegetation; maintaining sight distances; keeping signage and guardrails visible; and keeping fences, bridges, and other structures clear of vegetation.

In 2010, District 3 initiated a program to target invasive plants, primarily focusing on Japanese knotweed and Asian bittersweet. Except for a five-year hiatus, District 3 has treated knotweed along select routes since 2010. Since 2010, District 3 has expanded its invasive program and in 2025 conducted treatment of knotweed and bittersweet in select locations along routes in 16 towns.

From 2012 – 2016, under the MassDOT statewide VMP for ROWs, District 3 treated medians and guardrails along select routes in Worcester (I-290, I-90, 146), Framingham and Natick (Route 9). These routes will again be prioritized and additional routes added as resources and personnel are available (see list of Towns in **Appendix B**).

The following VMP includes goals and objectives, a description of management zones specific to roadways, proposed methods, recommended Integrated Vegetation Management practices, and information as required by 333 CMR 11.00, including identifying sensitive areas, herbicide application guidelines, and contact information for the relevant entities.

II. STATEMENT OF GOALS

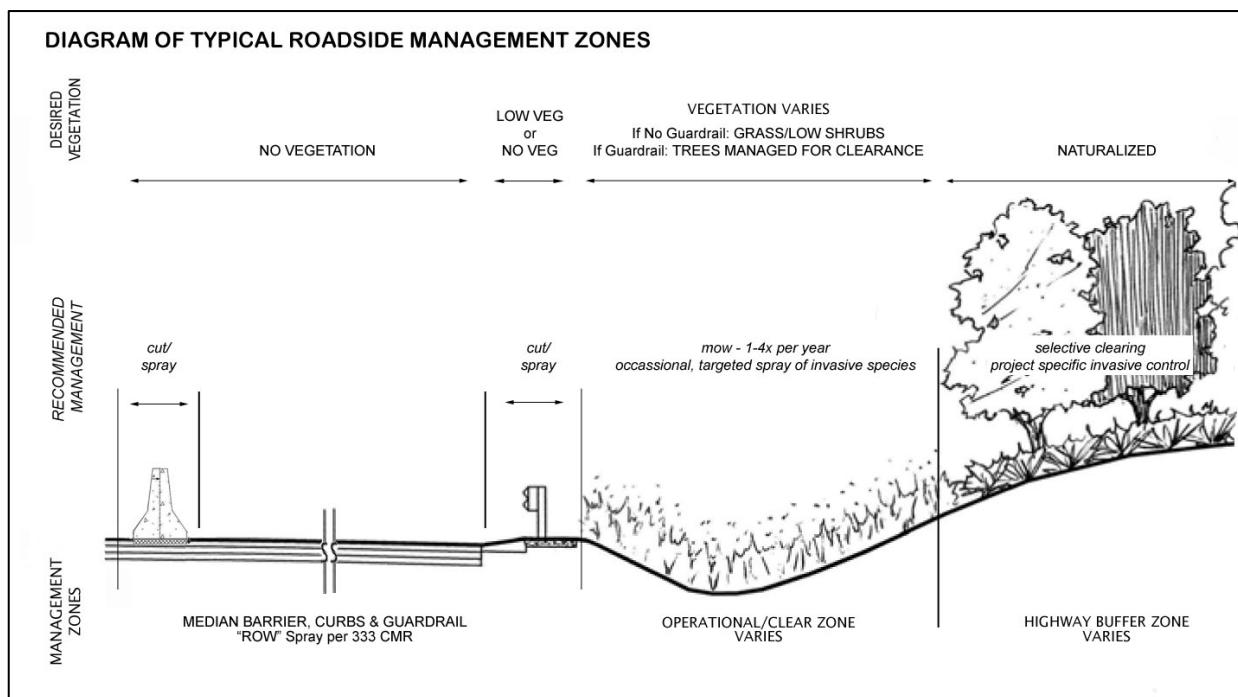
This VMP is intended to establish criteria for District 3 to manage vegetation in compliance with the Rights of Way Management Regulations (333 CMR 11.00) while achieving the goal of providing safe use of and access to roadways, sidewalks and facilities, and of preserving the integrity of highway infrastructure. Uncontrolled roadside vegetation can impede normal maintenance operations, obstruct motorists’ line of vision, block safe access to roadways and sidewalks, and cause damage to structures such as median barriers, pavements, shoulders, guard posts, drainage lines, and waterways. Uncontrolled invasive species exacerbate maintenance problems, impede restoration and limited mow efforts, and cause degradation of both right of way and abutting land.

District 3's VMP will be based on the principles of Integrated Vegetation Management (IVM) which are discussed further in Section III. The basic premise of IVM is:

- Define the management objectives.
- Through a combination of methods (preventative, mechanical, and chemical) effectively control undesirable vegetation.
- Where appropriate and feasible, promote desirable vegetation (cultural control).
- Reduce herbicide use over time by using a combination of methods, monitoring the effectiveness of those methods, and adjusting future applications and/or methods in response to effectiveness.

III. ROADSIDE ZONES AND MANAGEMENT OBJECTIVES

Roadside vegetation management covers three primary zones: Zone I includes the roadway, curbs, medians, and guardrail; Zone II consists primarily of the required Clear Zone adjacent to the roadway; and Zone III, which is the naturalized edge of the ROW layout, and which serves as a screen and buffer for the roadway. The diagram below illustrates the three zones and the typical recommended management to achieve the desired vegetation. Herbicide application in these zones for the purpose of routine maintenance of the roadway and associated structures is subject to 333 CMR 11.00 regulations and all requirements listed in this VMP and in the YOPs.



A. Zone I

Zone I is the primary zone targeted for routine herbicide applications due to the difficulty in removing weeds from paved areas and traffic safety concerns. This Zone consists of roadside edge, guardrail, curb, barriers, medians, fences, bridge abutments, and other roadway infrastructure. In suburban and urban

areas, it includes sidewalks and multi-use trails. The objective of vegetation management is to maintain the infrastructure, have unimpeded access, maintain safety, and preserve visibility of signs and guardrail.

The management objective for hard or paved surfaces (i.e., curb, sidewalk, median barriers) is a vegetation free zone to meet the requirements for sight distance, to allow safe vehicle and pedestrian access, to preserve infrastructure, and to allow for proper stormwater drainage.

The management objective for under and behind the guardrail is to maintain visibility of the guardrail and roadway signage and to preserve the integrity of the infrastructure. Vegetation that is low-growing or contained such that it does not interfere with visibility and is not unsightly is acceptable. Guardrail vegetation is typically cut low or would be sprayed up to three feet back from the curb. For double-faced guardrail in the median, spraying would typically be a four-foot swath, two feet on each side.

Problematic plants in Zone I consist primarily of annual and perennial weeds growing in pavement cracks, along curbs, and in median barriers, and a variety of species behind the guardrail. Mugwort is particularly problematic along the guardrail as it is highly prevalent, difficult to eradicate, blocks visibility and is unsightly (Photos 1 and 2). Invasive species that re-sprout or spread following cutting, such as bittersweet, knotweed, black locust, and tree of heaven, are problematic along or behind the guardrail (Photo 2). Bittersweet is particularly problematic on bridge abutments, fences, and utility poles, and along structures where access for cutting can be difficult. Poison ivy is problematic on guardrails and when it blocks accessibility of sidewalks forcing pedestrians into the roadway (Photo 3).



Photo 1 – Mugwort in difficult to access median blocks sight distances and leads to structural degradation.



Photo 2 – Rapid re-growth or re-sprouting of mugwort and tree of heaven in median guardrail creates visibility and structural problems and is unsightly.

B. Zone II

Zone II consists primarily of the Clear Zone which is a 20 to 30-foot setback from the edge of road. The setback is required for errant vehicle recovery, sight distance at intersections, visibility of signage, and other operational or safety functions. The width of the required Clear Zone varies and is determined by the roadway setting (rural or urban), whether there is guardrail or not, and the posted speed. The typical requirement in the Clear Zone is no trees greater than 4-inch caliper. Zone II may include stormwater treatment basins and swales, restoration planting areas, and more formally planted areas.

The general management objective in Zone II is to prevent the growth of trees, maintain visibility of signage, allow for stormwater drainage and infiltration, and to ensure successful restoration of native species when applicable. These objectives are typically achieved with mowing, brush cutting, and tree removal.

Desirable vegetation in Zone II is a stable plant community that resists invasion by trees and invasive weeds. An example of a stable plant community is the little bluestem grasslands that are typical along many Massachusetts roadsides when not mowed (see Photo 4). Creating and preserving stable roadside vegetation will not only reduce maintenance over time, but will also improve stormwater infiltration and control, provide better habitat, and result in a more scenic roadside appearance. For most Zone II locations grass, non-invasive herbaceous species, and low shrub groundcovers are the desired vegetation.

Invasive perennials (i.e., knotweed, spotted knapweed, common reed) and invasive woody plants (i.e., black locust, autumn olive, buckthorn, bittersweet) are common problematic plants in this zone. While all trees are considered undesirable in the Clear Zone, trees that re-sprout, including native species, are particularly problematic as they require frequent cutting or grubbing. Structures within Zone II such as fences and utility poles create conditions where plants, particularly vines, are difficult to reach and control solely by cutting. Mature vines will damage fences and structures, block access and visibility, and easily spread into adjacent areas.

C. Zone III

Zone III extends from the edge of the required Clear Zone to the right-of-way limit or fence line. Vegetation is typically a variety of plant types and species and varies throughout the state from consisting of primarily native plants to being highly infested with invasive plants such as bittersweet, knotweed, autumn olive, multiflora rose, buckthorn, and tree of heaven.

The management objective in this zone is to maintain and preserve a self-sustaining plant community that provides: screening and a physical buffer of the roadway for abutters, a continuous green corridor for roadway users; a protective buffer for rivers, wetlands and water bodies; a natural means of managing stormwater; and habitat for wildlife.

Management is necessary to remove trees that pose a fall hazard and to prevent the spread of invasive species into Zones I and II and onto abutting properties. Addressing invasive plants adjacent to resource



Photo 3 – Poison ivy, Japanese knotweed and other weeds block accessibility and visibility along a sidewalk.



Photo 4: Little bluestem grassland provides a low-growing stable plant community. Vegetation management strategies should seek to promote this vegetation.

areas and priority habitats should also be a priority. In some instances, District 3 may work with the Conservation Commissions, Natural Heritage, or other environmental organizations to address invasive plants within the ROW.

IV. IDENTIFICATION OF TARGET PLANTS

While all vegetation that is incompatible with the goals of the VMP will be targeted, some plants are more prevalent and more problematic along the roadside. These plants will be the priority target plants. Mugwort and sweet clover are particularly problematic herbaceous weeds along the guardrail as they grow tall and drape over the guardrail and into the roadway blocking visibility. Black locust, bittersweet, tree of heaven, Japanese knotweed, catalpa, and common reed are highly problematic species found growing between and behind the guardrail and along fences. These plants block visibility of sight distances and signage and can cause structural damage. They re-sprout and spread more vigorously when cut, becoming even more problematic and difficult to control.

Poison ivy is highly prevalent along roadways and sidewalks, presenting a safety hazard to both workers and the public. District 3 receives frequent complaint calls from the public regarding poison ivy. Poison ivy also presents a problem for bridge inspections and when accessing utilities. Herbicide is the safest method for personnel to address poison ivy, and because poison ivy resprouts after cutting, it is the most effective method for eradication or containment. Treatment limits are 10 feet back from roadways, multi-use trails, and sidewalks. Treatment will be applied as required for safe operations, access to utilities and structures, and when requested by municipalities or the public.

V. METHODS OF MANAGEMENT

The following practices are the primary method of management for the Zones described above. In addition, MassDOT Guidance for Roadside Invasive Plant Management may be found in **Appendix D**.

A. Preventative Practices

The following preventative measures are taken to reduce weed infestation:

- i. ***Street sweeping*** to remove the build-up of sediment and other material which can provide a medium for plant growth. District 3 performs sweeping in the spring and as staff are available throughout the year. High volume routes that have concrete median and/or shoulder barriers are prioritized for sweeping. Routes for sweeping are generally the routes proposed for herbicide treatment and which contain barriers that are difficult to manage mechanically (i.e., I-290, I-190, I-90, Routes 2, 9, and 146).
- ii. ***Milling mulch*** in combination with geotextile fabric is applied under the guard rail as part of roadway construction projects to provide weed management. Milling mulch is effective for several years but is not a permanent solution to weed growth.
- iii. ***Repairing pavement*** such as sealing cracks and resurfacing of roadways prevents the buildup of sediments that accumulate in the cracks and which may serve as a growing medium. District 3 has own crack sealing machine and performs repair work as staff and time permit.

- iv. *An invasive plant management strategy* is implemented on select construction projects to prevent the spread of invasive plants through soil and construction operations. This is very effective in reducing the burden of future management for maintenance staff.

B. Mechanical Methods

Mechanical methods are the primary means of vegetation management on MassDOT roadsides. The following methods are used:

- i. ***Mowing***: Mowing consists of the mechanical cutting of vegetation using mowers, brush cutters, zero turn mowers, line trimmers, and track skid steers with brush heads. Mowing and line trimming are the principal vegetation control methods used by MassDOT as part of routine maintenance in Zone I and II. Mowing typically takes place one to four times per year, depending on location and district scheduling. Work is done by in-house personnel and with contractors.

A limited mow program has been established along some roadways. Limited mow areas are typically cut once a year in late fall or early spring with the roadside edges cut on a normal routine schedule. Limited mow zones are posted with signage to inform both the mowers and the public of the intent.

- ii. ***Tree and Brush Cutting***: Trees and brush are controlled for safety purposes which include establishing roadside clear zones, maintaining adequate sight distances at curves and intersections, ensuring advance visibility of signs, and removing trees that pose an immediate hazard. Work is typically done with chainsaws, brush saws and cutters, mini excavators with brush heads, and over-the-guardrail mowers. Work is done by in-house personnel and with contractors.

Prioritization for tree removal is for those trees that present the most immediate hazard. Trees considered to be hazardous include those that are dead, diseased, leaning, structurally damaged or unsound, and that pose an imminent threat of falling on the roadway, pedestrians, homes or property. Following that, removal and trimming is done in instances where trees may be damaging infrastructure and where foliage obscures sightlines to traffic, pedestrian movement, or signs and signals. In some cases, trees cause shading and create excessive frost problems on the roadway. To allow for solar warming and reduce the risk of localized ice formation, the tree canopy may be thinned, or trees may be selectively removed.

In certain instances, cutting trees or vines may be done in conjunction with a cut-stump herbicide application. This would be used for species that re-sprout following cutting, such as autumn olive and black locust, or native species that re-sprout and are problematic in achieving the goals of the VMP.

Contractors and in-house personnel are expected to follow proper pruning practices. As with all vegetation management, knowledge of plants characteristics and the ability to identify different species is critical so that staff can make sound decisions, reduce environmental impacts, minimize visual impact, and ensure that work is cost effective.

C. Herbicide Control

The goal of herbicide treatment is to eliminate unwanted vegetation and, where appropriate, promote naturally occurring native vegetation or planted/seeded vegetation to replace it. All herbicide work outside of paved areas should be done with this goal in mind.

Herbicide will be used to meet the objectives for the different zones as described above. Priority areas would typically be locations where traffic and/or difficult access create dangerous conditions for mechanical control, where vegetation is particularly problematic, or where poison ivy puts the public or workers at risk.

In Zone I, as noted above, herbicide will be applied to eliminate all vegetation in paved surfaces, barriers, as required under guardrails, and as necessary for access to utilities or for safe operations.

In Zone II, herbicide application as part of targeted treatment of undesirable plants, particularly invasive plants, will be used. Examples include treatment to prevent the spread of knotweed through mowing or other roadside operations; treatment of invasive plants threatening native seeding efforts; targeted treatment of trees that resprout (native and non-native) in order to promote low-growing vegetation where required, such as in Limited Mow Zones.

To the extent feasible, treatment of invasive plants shall be during the optimum treatment window as shown in **Appendix D**, MassDOT General Recommendations for Invasive Plant Management on Roadway Construction Projects

Herbicides used shall be from the MDAR Rights of Way Sensitive Materials List and shall be lowest label rate. The Sensitive Materials List is available online: <https://www.mass.gov/info-details/rights-of-way-sensitive-area-materials-list>.

The following methods may be used:

- i. ***Foliar Application:*** Routine guardrail treatment will be a foliar application done with a truck-mounted spray boom, hose and handgun equipped with a low-pressure nozzle. For median barriers, hard to reach areas, around signposts, and in sensitive areas, treatment may be with a backpack sprayer.

For targeting specific plants or treating localized populations, either hose or backpack application be used, depending on plant species, terrain, and traffic safety. To facilitate application and improve effectiveness of treatment, targeted vegetation, such as knotweed, may be cut earlier in the season and the re-growth sprayed in August-September.

Application requirements for foliar treatment are as described below under Operational Guidelines for Herbicide Application.

- ii. ***Cut Stump Application:*** Cut stump treatment may be used to prevent sprouting or re-growth of woody species such as Norway maple, black locust, tree of heaven, autumn olive, and for bittersweet that is climbing desirable vegetation. Application of herbicide is

applied to the stump immediately following cutting. Time of application is late spring through winter. Treatment in the spring during period of heavy upward sap flows should be avoided.

- iii. ***Frilling or Basal Bark Application:*** For frilling or basal bark application, cuts are made around the entire circumference of the lower 12 to 18 inches of the tree trunk with an axe or hatchet and herbicide is immediately applied into the cuts. Herbicide may be mixed with oil and applied until the bark is saturated. Treatment is from early spring to mid-fall. Some species may be treated during winter. Application during heavy upward sap flow in the spring should be avoided. This method is effective on trees of all sizes. Basal bark treatment would only be used where dead trees would not present a fall hazard.

VI. IMPLEMENTING INTEGRATED VEGETATION MANAGEMENT (IVM)

As part of its treatment strategy, District 3 will incorporate IVM principles. IVM is typically defined as the practice of controlling vegetation and, where appropriate, promoting desirable, stable plant communities through a combination of methods that take into consideration the need for control, cost-effectiveness, environmental protection, and regulatory compliance. For roadside management, each Zone has a different objective and therefore a different approach to IVM may be used in each Zone.

In **Zone I**, where no vegetation is the objective, preventative measures such as sweeping and crack sealing will be used in addition to herbicide to reduce seed sources and help prevent the buildup of sediments that serve as a medium for plant growth. Cutting plant growth in paved areas achieves the objective of temporarily clearing passage or sight lines but does not kill the root zones in order to reduce or eliminate vegetative growth over time as proper application of herbicide will.

For guardrails, which require low or no vegetation, the typical management will be cutting or line trimming. Where vegetation is low or stable, targeting sporadic woody or problematic plants using grubbing or herbicide can eliminate the need for a full guardrail spray thereby reducing herbicide output. See Photo 5 as an example. Sections of guardrail infested with tall, aggressive perennial weeds, herbicide will be the priority target locations.

In **Zone II**, the objective is to establish a stable plant community and, where required, have no trees. Little bluestem, purple lovegrass, ferns, low bush blueberry, and sweet fern are examples of common native low growing plants typical along MA roadsides. Using limited mowing in combination with herbicide to target only trees or invasive plants in grassland or low shrub areas is an example of integrated management that encourages conversion to low growing vegetation over time, and thus a reduction in the need for herbicide. Staff trained in plant identification and plant growth characteristics are required for managing vegetation with the goal of promoting stable, low growing roadside vegetation.



Photo 5- Switchgrass behind guardrail in this location does not require management as it does not pose a safety concern. Targeted herbicide treatment could be used to eradicate problematic plants such as black locust.

Along with trained staff, essential to IVM is an established procedure to evaluate the methods being implemented and to respond accordingly to achieve the goal of effective management while reducing herbicide use over time. To achieve this an IVM plan requires:

1. Determining the management objective
2. Identifying the target vegetation and most cost-effective management with minimal use of herbicide
3. Implementing recommended practices to achieve the objective
4. Evaluating work annually to assess whether methods used are achieving the objective
5. Based on those evaluations, adjusting treatment and methods to reduce the frequency and amount of herbicide used while achieving maximum effectiveness.

VII. MONITORING AND RECORD KEEPING

Monitoring herbicide treatment and evaluating the effectiveness of that treatment will be conducted by the appropriate Area Foremen in coordination with District Environmental staff knowledgeable about plant identification. Treatment will be adjusted as necessary with the goal of minimizing herbicide use while still achieving effective control.

Planning and evaluation requirements will include the following:

- 1) Prior to treatment, roadways shall be inspected to assess locations and target vegetation. Foremen will work with trained Environmental staff to identify priority locations and routes. Locations requiring treatment specific to targeting invasive species (i.e., knotweed, phragmites, black locust) will be noted.
- 2) Oversight of Contractors shall be coordinated by the Area Foreman and appropriately trained staff to ensure herbicide application follows the appropriate regulatory requirements and the Yearly Operational Plan.
- 3) MassDOT Herbicide Use Reports shall be submitted by the contractor within 2 weeks after treatment. Herbicide Use Reports will be kept on file by District 3.
- 4) Following a sufficient period after herbicide treatment, target routes will be evaluated by the Area Foreman or designated individual as to the effectiveness of treatment. Written evaluations will include a general description of the overall management of target routes and/or species, effectiveness of herbicides used, and observations of nearby sensitive resource areas, noting impacts if any. These notes will be incorporated into the Annual Vegetation Management Evaluation Summary described below.
- 5) District 3 will hold an annual YOP evaluation meeting which will include the Assistant Maintenance Engineer, Area Foremen, and Environmental staff to assess their Vegetation Management Program. The evaluation meeting shall take place after a sufficient period following completion of all herbicide treatment activities for that year and will evaluate and assess the overall management of target species or plants in each treatment area or route for both types of program treatment. It will assess the ROW (Zone 1) treatments to determine if chemicals need to be modified for effectiveness, reduced, or other actions taken, and it will assess management of targeted invasive species to determine a treatment plan for the following year based on effectiveness of treatment and priorities.

In addition, the meeting will evaluate and assess:

- a. Amount of herbicide applied and recommended changes
- b. Impacts related to weather
- c. Sensitive area impacts
- d. Comments received from the public
- e. Overall program implementation including suggested changes

As part of the annual evaluation, District 3 will ensure that the work implemented is in line with the VMP goals and objectives, including the following:

- Target vegetation is being effectively managed while ensuring the protection of sensitive areas and the environment.
- Herbicide applied is being reduced (amount and frequency) to the extent feasible while maintaining effective and necessary management.
- Vegetation management activities are conducted in a safe and effective manner and in compliance with regulations.

This annual evaluation of this vegetation management program will result in the development of an Annual Vegetation Management Evaluation Summary. This document will be used to inform the next YOP, and the results of the yearly evaluations shall be summarized for the next VMP, should one be developed for MDAR approval.

Meeting minutes will include the above information, data and discussion points, and will include comparisons to previous years' information. Recommendations on location and use will be reflected in next year's YOP as applicable. All documentation and evaluation will be completed by District 3 where it will be retained for a minimum of five years.

VIII. JUSTIFICATION OF USE OF HERBICIDES

The primary need for herbicide application along roadways is to ensure the safety of workers and for cost-effective management.

Vegetation in the medians, curbs, guardrails, and sidewalks must be controlled for the safe operation of roadways and for the protection of infrastructure. Weed whacking median barriers and guardrails adjacent to high volume and high-speed traffic puts workers at risk and often requires lane closures. Cutting poison ivy is time consuming and puts workers at risk due to the toxicity of the plant. Herbicide application, particularly if from a truck, reduces worker exposure to hazardous conditions and is much faster. As it is a more effective and lasting treatment, it greatly reduces the need for repeat treatment.

One of the primary advantages of herbicide is that it kills plant root systems. Unless done with high frequency, cutting of perennials and many woody species will not kill the root systems. Plants eventually regrow. In areas that are difficult to access and for vegetation that resprouts and grows rapidly, the long-term control achieved by killing the root system is much more cost-effective. It reduces the frequency of control needed for the same location, which in turn saves time and money, reduces personnel time in hazardous conditions, and results in less traffic interruption.

Herbicide control of invasive species that spread by rhizome or root fragments is a key method of preventing spread along the roadway corridor and to new locations through routine maintenance operations. Species such as Japanese knotweed, tree of heaven, black locust, and autumn olive grow rapidly, blocking sight lines and access. This results in frequent complaint calls and necessitates frequent cutting to keep growth in check. Cutting of these species can encourage them to re-sprout more vigorously and/or send out new shoots, thereby exacerbating the problem. Mowing often results in fragments of viable parts being moved along the corridor, thus expanding the plant population, which in turn increases the problem and the maintenance costs and needs.

IX. IDENTIFICATION OF SENSITIVE AREAS

Per the regulations for all Right-of-Way herbicide use, herbicides shall be subject to the restrictions and setbacks from natural resources and water supplies as described in 333 CMR 11.00 and listed on **Appendix C**, Sensitive Area Restriction Guide, of this VMP.

Herbicide used shall be restricted to those on the MDAR Sensitive Area Materials List.

Sensitive Areas defined in 333 CMR 11.04 include public groundwater supplies, public surface water supplies, private drinking water supplies, surface waters, wetlands, vernal pools, inhabited areas and agricultural areas. For the purpose of identification, sensitive areas can be separated into two categories: areas not readily identifiable in the field and areas that are readily identifiable in the field. (See Appendix C).

Sensitive Areas not readily identifiable in the field include public groundwater supplies, private water supplies, public surface water supplies, and some wetlands.

Sensitive Areas readily identifiable in the field include surface waters, residential areas, agricultural areas, and certain wetlands not identified on source materials (e.g. bordering vegetated wetlands).

All Sensitive Areas that can be mapped using reference sources shall be mapped to show locations. Maps and field delineations shall be confirmed by the Conservation Commissions.

Sources

Map sources for identifying sensitive areas not readily identifiable in the field include USGS maps, municipal maps and records, boards of health, conservation commissions, and MassGIS data layers, which include Massachusetts Department of Environmental Protection (DEP) Watershed Maps (delineates the perimeter of public watersheds and the locations of public wells) and Massachusetts DEP Wetland Conservancy Maps.

In addition, for endangered species and habitat protection, MassDOT funds a position at the Executive Office of Energy and Environmental Affairs (EOEEA) Natural Heritage and Endangered Species Program (NHESP) specifically for the review of MassDOT projects, including its Vegetation Management Program.

All delineated wetlands will be officially confirmed by town Conservation Commissions during the YOP permitting process.

Field Delineation

Sensitive areas requiring delineation in the field will either have steel reflective delineators bolted to the guardrail beam face to mark locations or reflectors glued to the top of the guardrail or median barrier. The colors of the delineators will be as described in the YOP.

Field Confirmation for Application Operations

Prior to commencement of herbicide application operation, the treatment crew will be provided with the YOP maps with which to confirm the boundaries of No Spray or Limited Spray Areas. The treatment crew will visually survey the area to be treated for any additional sensitive areas.

X. OPERATIONAL GUIDELINES FOR HERBICIDE APPLICATORS

Weather Conditions and Drift Controls

Herbicide application will be restricted during certain adverse weather conditions, such as rain, wind or deep snow.

- Herbicide applications will not occur during periods of moderate or heavy rainfall.
- Foliar applications may be allowed in light mist situations as the plant pores open up and absorption of herbicide into the plant is generally increased, resulting in greater control. Once the rain is at the point of running off the leaves, then the applications must be stopped until the rain ends and active leaf runoff has ceased. If herbicide washes off the plant, control is reduced or stops, and there is potential for off-target movement of herbicide.
- However, any measurable rainfall that creates leaf runoff will require application to stop until the rain ends and active leaf runoff has ceased.
- Cut surface treatments, frill/girdling, basal treatment, and stem injection will cease during measurable precipitation and will not resume until precipitation has ceased.
- For foliar applications, when wind speeds are sufficient to bend the tops of the main stems of roadside trees, the applicator will monitor foliar application to ensure that there is no drift of the herbicide off target. If the applicator can see the herbicide moving off target, the application will immediately stop until the wind has subsided enough to permit further application.
- All herbicide solutions to be used for a foliar application will contain low drift agents. Low-drift agents will be added to the foliar herbicide solution as per the low-drift agent label. In moderate wind conditions, as per label recommendations, more low-drift may be added, at discretion of applicator to control increased drift.
- Cut surface treatments, frill/girdling, and stem injection treatments may occur in wind conditions as wind drift should not be a concern and because treatment is typically close to the ground.

Equipment - Foliar Application

- Foliar application equipment will be calibrated at the beginning, and during the season as well as prior to touch-up application treatment, and in accordance with manufacturer's recommendations. Foliar application equipment will be calibrated to maintain pressure specified below.
- The foliar treatment used shall be low pressure, below 60 psi at the nozzle, with a normal working pressure of 40 psi for application at volumes of less than 50 gallons/acre.
- Low pressure nozzles will be used to produce the largest possible droplet size and a drift control agent shall be added at the rate recommended on the label to keep drift to an absolute minimum. Previous studies and experience indicate minimal drift occurs when using low-pressure applications and adjuvants.
- Mechanical throttles will be kept to the minimum setting required to transport the herbicide solution to the tops of each target and penetrate the foliage to the main stem of each target.
- For vegetation beneath and immediately adjacent to roadway, a low-pressure foliar treatment typically shall be applied using a truck-mounted boom, attached to either side of the front of the unit. In addition, a separate handgun equipped with a low-pressure nozzle and adequate length of hose will be used for low-pressure spot treatments of target vegetation growing in pavement, median and traffic island cracks, around bridge structures, drainage structures, sign posts and other structures and appurtenances. For targeted vegetation not accessible by boom or hose, a backpack sprayer shall be used for foliar application.

XII. REMEDIAL PLAN TO ADDRESS SPILLS AND RELATED ACCIDENTS

All mixing and loading of herbicides will be conducted at a MassDOT District facility. Mixing only the amount of herbicides necessary to carry out the vegetation control, based on the monitoring results, will ensure that there will be no waste and minimize potential problems. The vehicle carrying out the spray operation will be equipped with a bag of absorbent, activated charcoal leak-proof containers, a broom and a shovel in case of minor spills. A clipboard log of the herbicides on the vehicle will be kept on the vehicle. Herbicide labels, YOP, and fact sheets will be carried on site by the applicator.

Spill Response

As soon as any spill is observed, immediate action will be taken to contain the spill and protect the spill area. The source 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. Protection of the spill area will be accomplished by placing barriers, flagging or crewmembers at strategic locations. If a fire is involved, care will be taken to avoid breathing fumes from any burning chemicals.

In the event of a spill information on safety precautions and clean up procedures may be gathered from the following sources:

- Herbicide label
- Herbicide SDS sheet
- Herbicide Manufacturers
Dow

(517) 636-4400

Dupont	(800) 441-3637
Monsanto	(314) 694-4000
BASF	(800) 832-4357
NuFarm USA	(630) 455-2000
• Massachusetts DAR - Pesticide Bureau	(617) 626-1700
• Massachusetts DEP Emergency Response Section	(888) 304-1133
• ChemTrec	(800) 424-9300
• Massachusetts Poison Control Center	(800) 682-9211
• Massachusetts Department of Public Health Bureau of Environmental Health Environmental Toxicology Program	(617) 624-5757
• Michael LeBlanc, District 3 Safety and Health Inspector	(617) 892-3069

Minor spills will be remedied by soaking up the spill with absorptive clay or other adsorptive material and placing it in leak proof containers for proper disposal. Dry herbicides, such as granular, will be swept up or shoveled up directly in leak proof containers for proper disposal. All contaminated soil will be placed in leak proof containers, removed from the site and disposed of properly. Activated charcoal will be incorporated into the soil at the spill location at a rate of seven pounds per thousand square feet to inactive herbicide residue. Any minor spill will be reported to the Pesticide Bureau.

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 DEP Emergency Response Section and MDAR must be contacted. All spills that exceed regulatory thresholds of material shall be reported to MassDEP Emergency Response Section.

XIII. HERBICIDE ALTERNATIVES

Mass DOT has made a concerted effort to identify effective alternatives to conventional herbicides. With funding from the Federal Highway Administration, the agency oversaw an intensive three-year field and greenhouse study of alternative herbicide materials and control methods, conducted by the University of Massachusetts Plant and Soil Sciences Department. No alternative herbicide was found to be as effective as conventional herbicides for roadside applications and conditions. The published report of this study is available online: <https://www.mass.gov/lists/miscellaneous-publications>.

In 2026, District 3 will be experimenting with a thermal weed killer to assess its effectiveness in managing herbaceous weeds.

XIV. ALTERNATIVE LAND USE

It is a common practice of abutters to mow and maintain the adjacent ROW area. In these instances, vegetation management by District 3 is not needed, provided the management aligns with the objectives outlined in this VMP.

MassDOT has an Adopta program that allows organizations to adopt certain ROW locations. Adopta Site activities range from pollinator gardens to invasive plant control. All activities must be approved and permitted by District 3 and must meet the objectives outlined in this VMP.

XV. QUALIFICATIONS OF PERSONNEL

Arthur Resca is the Assistance Maintenance Engineer for District 3. He oversees all maintenance operations for roadways and roadsides and supervises the maintenance labor force. He oversaw the District's guardrail spray program in 2012 and 2013 and has overseen District 3's invasive treatment program, targeting primarily knotweed, from 2010 through 2025. Arthur began his career with MassDOT (then MassDPW) in 1991 as a Resident Engineer in Construction. In 2001, he moved to the Maintenance Department, where, except for a brief period during which he held the position of Construction Area Engineer from 2013 – 2021, he has assisted in overseeing all roadway maintenance operations. Arthur has a B.S. in Civil Engineering and a M.S. in Construction Project Management from Worcester Polytechnic Institute.

Tara Mitchell is a landscape designer and restoration specialist for Massachusetts Department of Transportation's (MassDOT) Highway Division. She has worked for MassDOT for over 25 years focusing on ecological design and restoration for both urban and naturalized sites. She oversees planting and invasive plant management on construction projects and assists the Maintenance Department with vegetation management. Her work includes designing native seed mixes, writing contract specifications and vegetation related guidance, and reviewing landscape and wetland designs for MassDOT contracts. She received an MLA from Cornell University.

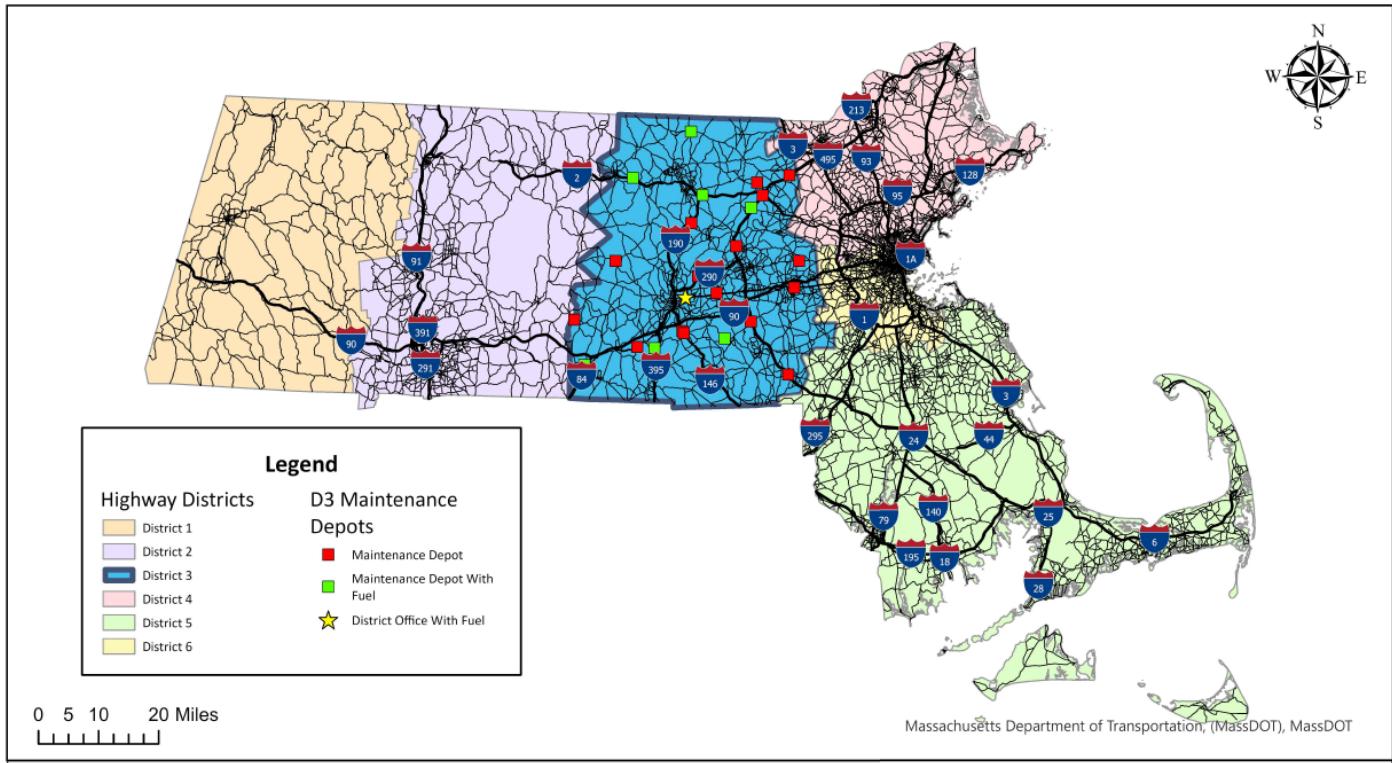
As required by 333 CMR 11.00, all applicators on roadside rights of way must hold a valid MDAR pesticide applicators license and all work shall be directly supervised, as required by regulations, by an individual with Right-of-Way Certification (Category 40). In addition to the applicable rules and regulations, applicators will adhere to the following operations guidelines.

XVI. NOTIFICATION PROCEDURES

Subject to approval of this VMP by MDAR, District 3 will prepare on an annual basis a Yearly Operational Plan (YOP) which will provide specific information about the vegetation management program to be carried out for the specified year. This YOP shall be submitted to MDAR for its review, comment and subsequent approval. A website where the YOP and the VMP can be viewed will be submitted to the senior administrative official, Conservation Commission, Board of Health, and appropriate water suppliers for each affected community listed in the YOP. A hard copy of the YOP and VMP are also available upon request. The municipal officials and general public shall have 45 days, upon receipt, to review the YOP and submit comments to MDAR. Following the review and comment period, MDAR will provide MassDOT with formal notice of approval or denial of the YOP, or request modification as necessary.

Over the five-year period of this VMP, District 3 will evaluate the program and, with MDAR approval, integrate appropriate new methods into the YOP.

APPENDIX A – DISTRICT 3 ROADWAYS AND DEPOTS



2024 ROAD INVENTORY YEAR-END REPORT

TABLE 1 - CENTERLINE MILES

JURISDICTION BY FUNCTIONAL CLASSIFICATION FOR DISTRICT 3

MassDOT District 3															
Jurisdiction	Urban					Rural					Urban and Rural				
	Interstate	Arterial	Collector	Local	Total	Interstate	Arterial	Collector	Local	Total	Interstate	Arterial	Collector	Local	Total
MassDOT	146.94	398.19	8.97	10.61	564.70	5.22	24.32	8.45	3.18	41.17	152.16	422.51	17.42	13.79	605.87
City/Town	0.00	1,004.74	707.96	4,112.86	5,825.56	0.00	27.46	206.52	617.96	851.93	0.00	1,032.20	914.48	4,730.82	6,677.49
DCR	0.00	0.00	0.00	0.54	0.54	0.00	0.00	0.00	5.63	5.63	0.00	0.00	0.00	6.17	6.17
MassPort	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
State Park	0.00	0.00	0.00	10.19	10.19	0.00	0.00	0.00	16.78	16.78	0.00	0.00	0.00	26.97	26.97
State	0.00	0.00	0.71	18.61	19.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.71	18.61	19.33
County	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
Combined	0.00	0.00	0.00	9.26	9.26	0.00	0.00	0.00	0.63	0.63	0.00	0.00	0.00	9.89	9.89
Unaccepted	0.00	0.34	0.22	376.36	376.92	0.00	0.00	0.00	41.05	41.05	0.00	0.34	0.22	417.41	417.97
Total	146.94	1,403.27	717.87	4,538.43	6,806.51	5.22	51.78	214.97	685.23	957.19	152.16	1,455.05	932.84	5,223.66	7,763.70

APPENDIX B – LIST OF DISTRICT 3 TOWNS PROPOSED FOR HERBICIDE TREATMENT

Treatment for guardrails, back of curb, sidewalks, and other Zone 1 or ROW may take place in the following municipalities depending upon need and resources.

Acton, Ashburnham, Ashby, Ashland, Auburn, Ayer, Bellingham, Berlin, Blackstone, Bolton, Boxborough, Boylston, Brookfield, Charlton, Clinton, Douglas, Dudley, Dunstable, East Brookfield, Fitchburg, Framingham, Franklin, Gardner, Grafton, Groton, Harvard, Holden, Holliston, Hopedale, Hopkinton, Hubbardston, Hudson, Lancaster, Leicester, Leominster, Littleton, Lunenberg, Marlborough, Maynard, Medfield, Medway, Mendon, Milford, Millbury, Millville, Natick, North Brookfield, Northborough, Northbridge, Oakham, Oxford, Paxton, Pepperell, Princeton, Rutland, Sherborn, Shirley, Shrewsbury, Southborough, Southbridge, Spencer, Sterling, Stow, Sturbridge, Sudbury, Sutton, Townsend, Upton, Uxbridge, Wayland, Webster, West Boylston, Westborough, Westford, Westminster, Worcester.

Towns to be treated each year will be listed in the Yearly Operation Plan.

APPENDIX C – SENSITIVE AREA RESTRICTION GUIDE

Sensitive Area Restriction Guide (333 CMR 11.04)

Sensitive Area	No Spray Area	Limited Spray Area	Where Identified
Wetlands and Water Over Wetlands	Within 10 feet	10 – 100 feet; 12 months must elapse between applications; Selective low pressure, using foliar techniques or basal or cut-stump 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 foliar techniques or basal or cut-stump applications	YOP Maps and identify on site
Public Ground Water Supply	Within 400 feet (Zone I)	Zone II or IWPA (Primary Recharge Area); 24 months must elapse between applications; Selective low pressure, using foliar techniques or basal or cut-stump 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 low pressure, using foliar techniques or basal or cut-stump 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 low pressure, using foliar techniques or basal or cut-stump 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 low pressure, using foliar techniques or basal or cut-stump applications	
Private Water Supply	Within 50 feet	50 – 100 feet; 24 months must elapse between applications;	In YOP well list and

Sensitive Area	No Spray Area	Limited Spray Area	Where Identified
		Selective low pressure, using foliar techniques or basal or cut-stump Applications	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 low pressure, using foliar techniques or basal or cut-stump applications	YOP Maps and identify on site
Agricultural and Inhabited Areas	N/A	0 – 100 feet 12 months must elapse between application; Selective low pressure, using foliar techniques or basal or cut-stump applications.	Identify on site
State-listed Species Habitat		No application within habitat area except in accordance with a Yearly Operational Plan approved in writing by the Division of Fisheries and Wildlife	YOP Maps

APPENDIX D – INVASIVE PLANT MANAGEMENT GUIDANCE

The following are recommendations for invasive plant management on roadside construction projects and maintenance operations. Recommendations are based on generally accepted best practices.

I. Recommended Treatment Windows

The following table shows typical treatment windows, depending on target species and management goals. Due to the short term of construction contracts, eradication is often not feasible. The primary goal of MassDOT invasive control for construction projects is to minimize spread both on and off-site and to improve the chances of successful ecological restoration in the no or minimally managed environment of the roadside. Treatment times proposed should be oriented toward this goal unless otherwise discussed during the site walk. Japanese knotweed is considered the species of highest concern. For this reason, for most projects, the window of treatment is likely to be August-September. NOTE: Woody plants that will be cleared and grubbed as part of construction work do not typically need to be treated prior to that work.

General Treatment Window	Primary Goal or Plants Targeted
June-July	<ul style="list-style-type: none">• Certain herbaceous species (ex., Swallowwort, garlic mustard)• To reduce growth for access or to accommodate construction schedule
Prior to seed set (typically June-July)	<ul style="list-style-type: none">• Infestations of annual species that can't be managed by mowing or pulling• Perennials and woody plants when appropriate to restoration efforts
August – September	<ul style="list-style-type: none">• Knotweed and phragmites• Woody plants• Certain herbaceous species
August – February	<ul style="list-style-type: none">• Woody plants using cut stem or basal bark application methods

II. Preventing Spread via Equipment

- Movement of maintenance and construction equipment should be from areas not infested by invasive plants to areas infested by invasive plants whenever possible. This applies to road corridors, rail trails, ditch cleaning, shoulder scraping activities, and other similar work.
- Equipment, machinery, and hand tools should be cleaned of all visible soil and plant material before leaving the project site. Equipment should be cleaned at the site of infestation or as shown on the Plans and as approved by the Engineer.
- The cleaning site should be clearly delineated and should have sediment barriers if determined to be necessary to prevent soil run-off.
- Acceptable methods of cleaning include, but are not limited to:
 - Brush, broom, or other hand tools (used without water)
 - High pressure air
 - Portable wash station that contains runoff from washing equipment (containment must comply with wastewater discharge regulations).
 - Location and methods for cleaning of equipment must be coordinated and agreed upon by the Engineer.
 - Locations should be monitored and treated for regrowth for duration of contract.

III. Temporary Stockpiling

Excavated material (soil, gravel, etc.) from areas with invasive species that spread by rhizomes (typically knotweed and phragmites) should be stockpiled separately. Care should be taken when selecting a stockpile location to avoid introducing plants of concern into a non-infested area. If feasible, soil should be placed on an appropriately sized geotextile barrier (ex., barrier with a puncture resistance equal to or greater than 500 lbs./2300 N). Stockpiles should be properly secured with sediment barriers and erosion prevention measures implemented as necessary. Signage is recommended as personnel may change over the course of a contract. Stockpiles should be monitored and regrowth treated. All equipment used for handling stockpiled materials should be cleaned.

IV. Disposal/Re-use of Excavated Soil at End of Project

The species of primary concern when moving or disturbing soil are species that spread by root/rhizome (i.e., knotweed, phragmites, and loosestrife). For some projects, species that spread by seed may also require soil management. Even after treatment, soils with knotweed or phragmites will likely still contain viable fragments. The following are general recommendations for disposal or re-use of soil that may contain viable rhizomes, in order of preference:

1. Bury on-site. Recommended minimum depths are:
 - Soil with plants that spread by seed: 3 feet or deeper below grade.
 - Soil with invasive plants that spread by rhizome: 5 feet or deeper below grade.
 - * Burial is typically not necessary if replacing soil in the same location from which infested soil was removed as remaining soil likely still contains viable material regardless of treatment.
2. Place back on site in lieu of loam where invasive plants were previously growing. Regardless of treatment, there is a high likelihood that invasive plants will re-grow from rhizome or existing seed in the soil. Ideally treatment can continue until plants are eradicated.
3. Place in lieu of loam in an approved location within the project limits where an infestation currently exists or where plants can be managed by mowing or spraying in the future.
4. Mound in an approved location within the project limits (ideally upland for wetland species).
5. If taken off-site, soil should be:
 - Placed in an approved location where knotweed already exists.
 - Placed in an approved location that will receive future monitoring and treatment.
 - Sent to a landfill (as applicable to contract items) with a receipt submitted to the Engineer.

V. Disposal of Above Ground Plant Material

The optimal disposal of above ground material is to grind or pile material on site and in the same location as the infestation. When feasible, the following is recommended. For most MassDOT projects, above ground material will need to be taken off-site.

- Burying (ideally in the same location):
 - Knotweed, phragmites, and loosestrife should be buried at least 5 feet below grade.
 - Material from most other invasive plants should be buried a minimum of 3 feet below grade.
- Brush piles or grindings left to decompose naturally on site:
 - Plant material from most invasive plants can be piled on site to dry out.
 - When piling material from species that can take root (ex., purple loosestrife, phragmites, and Japanese knotweed), care must be taken to pile stems so that cut surfaces are not in contact with the soil.
 - Plant with seeds or fruit attached should be piled within the limits of the infestation if feasible.