

Pioneer Valley Railroad, Inc.

Vegetation Management Plan 2021–2025

For Railroad Rights-of-Way in Massachusetts

Prepared February 2021

by Wood Environment & Infrastructure, Inc.

for Pioneer Valley Railroad, Inc.

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I. INTRODUCTION AND GENERAL STATEMENT OF GOALS AND OBJECTIVES

This Vegetation Management Plan (VMP) describes the Pioneer Valley Railroad's (PVRR's) plan for vegetation management on PVRR's railroad rights-of-way (ROW) in the Commonwealth of Massachusetts for the five-year period 2021 through 2025. It was prepared in accordance with 333 CMR 11.00, the Massachusetts Rights-of-Way Management Regulations, as revised March 9, 2007. PVRR is a short-line railroad that manages railroad ROW in three municipalities over approximately 15 miles (listed and portrayed on a map in Appendix A).

The goal of the VMP is to describe the methods by which PVRR will manage vegetation on the ROW to ensure the safe and effective operation of the railroad while adhering to the requirements of the Commonwealth of Massachusetts as per 333 CMR 11.00 to minimize the uses of and potential impacts of herbicides on human health and the environment.

The specific objectives of the VMP are to:

- Describe PVRR's need to manage vegetation on the ROW;
- Identify target vegetation, proposed methods of vegetation management, and justification for the proposed use of herbicides on the ROW, including in sensitive areas;
- Provide additional information as required by 333 CMR 11.00 to enable the Massachusetts Department of Agricultural Resources (MDAR) to understand and approve PVRR's plan to manage vegetation on their ROW.

Railroad ROW are similar to other ROW in that they are linear properties that abut privately- and publicly-owned land. However, railroad ROW are owned by the railroad in fee, whereas electric and pipeline companies usually obtain easements which convey only specific use rights. Vegetation management on railroads also differs from some other ROW in that much of the ROW and railroad structures must be kept completely free of vegetation to ensure visibility and safety of train passage. PVRR's ROW passes through densely developed areas with industrial, commercial, and residential properties, and road crossings. PVRR serves their local area of Western Massachusetts and takes their responsibility for safety of the railroad and neighboring properties seriously. Effective vegetation management on the ROW is critical to the safe operation of the railroad.

Not all vegetation on PVRR's property will be removed during the vegetation management process. Tree and shrubs can offer an aesthetic benefit, low-growing species can slow the incursion of non-native species and can provide stability to embankments, and the railroad provides a managed corridor and woodland edge habitat that benefits some plant and animal species. PVRR's program seeks to control vegetation that may harm the railroad but allows vegetation outside the ballast shoulder that offers benefits to the railroad.

PVRR uses only herbicides permitted by MDAR for use in sensitive areas, and generally makes one foliar herbicide application per year to target vegetation on the ROW. The aim of this VMP is to comply with all applicable regulations and minimize the risk of harm to humans and the environment in the control of vegetation on the railroad ROW.

PVRR is a member of the Massachusetts Railroad Association but has elected to file this VMP independently in order to more closely control their annual vegetation management program.

II. DESCRIPTION OF THE RIGHTS-OF-WAY REQUIRING VEGETATION MANAGEMENT AND JUSTIFICATION FOR PROPOSED HERBICIDE USE

The railroad ROW consist of track and equipment used for the transport of trains and maintenance equipment. The steel track is mounted on a railroad bed constructed of cross-ties supported by a bed of ballast (crushed stone). The ballast is typically situated on a slightly elevated earthwork section that slopes downward away from the track to promote drainage. The railroad ROW also includes track switches, electrical signals and associated equipment, road crossing barriers, and signs. All of these facilities and equipment must be maintained free of vegetation, as described below.

The primary need for vegetation control is to ensure safety for the railroad and the public. Code of Federal Regulations, 49 Part 213, Section 37, Track Safety Standards - Vegetation, requires that vegetation on railroad property which is on or immediately adjacent to the roadbed shall be controlled so that it does not:

- (a) become a fire hazard to track-carrying structures (e.g., ties);
- (b) obstruct visibility of railroad signs and signals along the ROW, and at highway-rail crossings;
- (c) interfere with railroad employees performing normal trackside duties;
- (d) prevent proper functioning of signal and communication lines; or
- (e) prevent railroad employees from visually inspecting moving equipment from their normal duty stations.

In order to minimize the potential for fires, the Commonwealth of Massachusetts likewise requires the railroad to be free of vegetation, mandating by statute (Section 160 Chapter 235A) that railroads keep their ROW clear of flammable material including vegetation.

Vegetation on the railroad ROW affects the safety of the railroad operators and the public, both directly and indirectly. Trains depend on friction between the rails and wheels for moving and braking. Plant tissues crushed between the wheel and rail acts as a lubricant and can hinder train acceleration and braking.

Vegetation can also interfere with visibility, both for train and maintenance vehicle operators and for the public at road crossings. Vegetation can obstruct the visibility of signs, signals, and switches by the train operator and maintenance personnel. It can impede visual inspection, measurements and testing of track structure and geometry, and maintenance of the track structure and facilities. Vegetation can also create unsafe working conditions for track and facility maintenance personnel, cause damage to trains and cargo, restrict the drainage function of the roadbed causing saturation and soil instability, and long-term deterioration of the railroad, and present a fire hazard.

Vegetation also creates unsafe footing for railroad employees, particularly crews which may be at work at any hour and in any weather. The vegetation itself may be the hazard, or it may conceal objects or areas of unsafe footing.

Visibility is important both for railroad personnel working on or near trains and for motorists crossing railroad tracks. Train engineers and other operating personnel must be able to see all types of railroad signals. These signals indicate the status of the traffic on the track ahead and

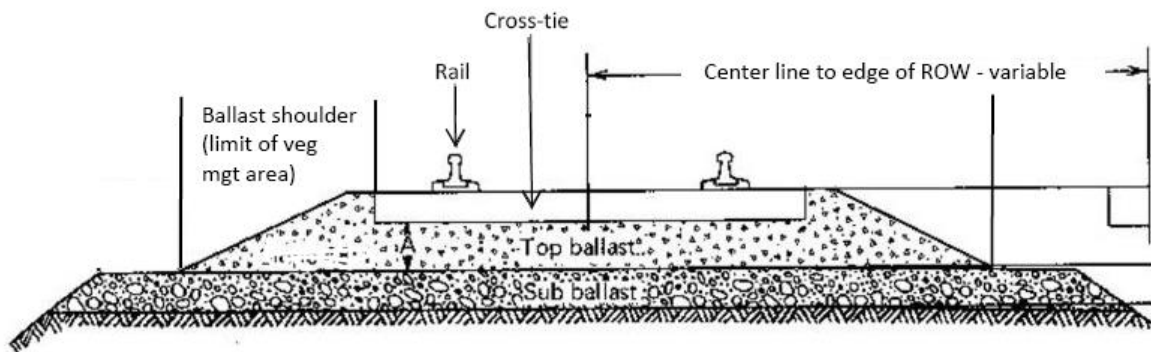
also indicate when whistles must be sounded as the train approaches a road crossing. Signs also provide other types of safety information as well. Motorists must be able to see trains as they approach railroad crossings and employees must be able to visually inspect moving rail equipment. Locomotive engineers must be able to see around curves and see that switches and derails are in the correct position.

Federal laws require vegetation control to ensure proper functioning of signals and communication lines. Trees and plants can cause short-circuits in electrical equipment and cause failure of communication systems and signals.

Vegetation itself is rarely directly the cause of a railroad accident or incident. Nevertheless, vegetation on railroad ROW has a significant indirect effect on railroad safety due to the factors described above, including reduced visibility and obscured track defects. Railroad accidents result in property damage with significant costs, lost productivity of our transportation system, injuries, and sometimes fatalities. Careful inspection and maintenance of the railroad, including the prevention of interference with vegetation, is critical to safe railroad operation.

The primary method for minimizing accidents caused by track and roadbed defects is the federally-mandated periodic visual inspections of rails and associated structures by a qualified track inspector. These inspections are performed weekly on the PVRR.

The railroad consists of a roadbed of sub-ballast and ballast, wooden cross-ties to support the rails, and two rails fixed to the cross-ties by steel plates. A typical cross-section diagram of the railroad bed is shown below.



Track inspections are normally done from a hi-rail (on-track) vehicle, supplemented when necessary by walking inspections of switches and other complicated trackwork. It is essential that the roadbed be kept free of vegetation to provide the track inspector with unobstructed views of the track structure including rails, ties, and fasteners. Vegetation within the roadbed increases the probability that a track or roadbed defect will go undetected resulting in greater potential for an accident. Vegetation in the roadbed hinders other methods of track inspection as well. Railroads employ electronic rail testing to periodically test rails for internal defects. This testing is done by special rail cars that establish a magnetic field around the rail. Vegetation adjacent to the rails hinders this process and can result in invalid tests. Other special rail cars measure track geometry such as surface, line, and gauge. The gauge measurement is done optically and is adversely affected by vegetation between and above the rails.

Concern for public and employee welfare, environmental protection, and safety is the primary reason for vegetation maintenance on the railroad ROW. Railroads are unique in their relationship to interstate commerce, carrying a flow of materials and products through the Commonwealth.

The railroad vegetation management program requires the use of specific herbicides because, based on railroad experience, this is the only means proven to manage vegetation adequately. Improved herbicides and the development of an integrated approach to vegetation control have reduced the amount of herbicide use, their frequency of application, and their potential deleterious effects in the environment greatly since they were first used. Herbicides are applied annually, when the target vegetation is actively growing. PVRR uses only herbicides permitted by MDAR for use in sensitive areas, as these materials result in good control over the entire ROW, and are not significantly long-lived or mobile in the environment.

Alternative control methods have been attempted in the past. The Massachusetts Railroad Association, of which PVRR Transportation is a member, has tested several alternatives without success:

- No mechanical equipment has been developed that will operate in close proximity to the track components in the roadbed area. In 1996, Consolidated Rail Corporation, predecessor to PVRR Transportation in Massachusetts, built and tested a mowing machine specifically for target vegetation growing in the roadbed and ballast. This machine was completely ineffective at removing vegetation below the top-of rail height, and fouled the ballast with plant clippings, creating both drainage problems and a fire hazard.
- A steam application which required 7,000 gallons of potable water and several hundred gallons of diesel fuel per railroad mile for heating the water resulted in partial control lasting about one week.
- In another test, an application of a fish by-product resulted in approximately ten percent control of target vegetation.
- Manual weed control using conventional mowers, weed trimmers, or brush trimmers has proven similarly ineffective at removing vegetation from close proximity to rails, switches, and other steel structures.

Manual techniques for weed control will be used in areas where herbicide use is prohibited, where necessary, but they are not an effective alternative for vegetation management on most of the railroad ROW.

III. IDENTIFICATION OF TARGET VEGETATION

Vegetation targeted for control includes any vegetation that compromises the safe operation of the railroad, but in fact consists primarily of a group of species whose growth characteristics cause them to interfere with the track and equipment. The program of vegetation management includes the removal or restriction of weedy species that inhabit edges and disturbed ground, shrub and tree species that have the potential to grow into the track area or obscure other railroad structures, vines, non-native species, and species that may be hazardous to trackside workers, such as greenbrier and poison ivy.

Prior to herbicide application, track inspection will be used to identify areas where herbicide application is appropriate, noting location, density, and type of vegetation. In accordance with the federal regulations, all vegetation growing in the ballast and ballast shoulder, in yards (not constituting ROW), and around switches, signals, signs, and highway grade crossings is considered target vegetation and must be controlled.

Woody vegetation growing in areas adjacent to the shoulder will be managed to promote the growth of low-growing shrubs and restrict the growth of unwanted species. Targeted woody vegetation will be that which has the potential to block visibility or invade the roadbed and/or overhead communication lines. Target woody vegetation consists of all woody species growing within the rail gauge and on the ballast. Shrub species growing on ROW outside the ballast will not be controlled, but rather encouraged to grow and provide the benefits described earlier. PVRR's IVM program fosters the growth of species that will grow slowly and/or inhibit the nuisance species.

Low-growing, herbaceous, and vine species are a particular problem because of their tendency to obscure visibility of the track structure and obstruct the track and associated equipment. All low-growing species that have the potential to overgrow the ballasted areas will be removed. Particular effort will be made to control non-native invasive species wherever they occur on the ROW.

Examples of native herbaceous, vine, or woody species commonly found on railroad ROW and requiring control:

- Fox grape (*Vitis labrusca*)
- Poison ivy (*Toxicodendron radicans*)
- Roundleaf (common) greenbrier (*Smilax rotundifolia*)
- Virginia creeper (*Parthenocissus quinquefolia*)

Examples of non-native species commonly found on railroad ROW and requiring control:

- Japanese barberry (*Berberis thunbergii*)
- Japanese knotweed (*Polygonum cuspidatum*)
- Multiflora rose (*Rosa multiflora*)
- Oriental bittersweet (*Celastrus orbiculatus*)
- Reed canary grass (*Phalaris arundinacea*)

IV. INTEGRATED VEGETATION MANAGEMENT PROGRAM AND INTENDED METHODS OF VEGETATION CONTROL

PVRR uses an Integrated Pest Management program, herein refined to consist only of plants and termed Integrated Vegetation Management (IVM), as the principal means of vegetation control on the ROW. IVM is an effective and environmentally sensitive approach to management that consists of a series of management evaluations, decisions, and controls including action thresholds, monitoring and identification of unwanted species, prevention, and control, through the judicious use of appropriate herbicides. IVM uses information on the growth habits and life cycles of plants and their interaction with the environment, understanding of desirable versus undesirable species, as well as available weed control practices other than herbicides.

The vegetation management program used by PVRR has been developed and refined considerably since herbicides were first used on railroad ROW in the 1950s. The principal herbicide component of the IVM program is a selective low-pressure application in designated areas to control target vegetation (all vegetation growing in the ballast), timed to have the greatest effect on vegetation throughout the year through (normally) a single herbicide application per year. PVRR uses only herbicides permitted by MDAR for use in sensitive areas. The IVM program includes herbicides because, to date, no environmentally and economically feasible and safe alternatives to herbicides have been demonstrated for use in areas of the railroad ROW requiring total vegetation control.

Before resorting to herbicide application, limited control can be obtained in some locations as a result of track maintenance or construction activity. By identifying and coordinating the activities of divisional and operational units such as repair, ballast replacement, construction, and other ROW tasks the railroad can control vegetation as an indirect benefit of these activities. Thus, unnecessary application of herbicides can be avoided. No area of ROW will receive herbicide treatment if a routine or operational activity will remove the vegetation. This operational procedure will help reduce the amount of herbicide applied each year.

Due to the unique structure of the railroad ROW, different environmental areas, such as road crossings, may require different levels of vegetation control, and will be selectively managed based on the site and target species. A team of professionals comprised of roadmasters, inspectors, environmental scientists, and herbicide application specialists will develop the annual Yearly Operational Plans (YOP) to describe the vegetation control methods that will adequately control vegetation and minimize risk for the general public and the environment. Over the 5-year period covered by this VMP, PVRR will monitor and evaluate the success of the program and potentially integrate new methods in the YOPs consistent with the VMP as appropriate.

In areas where total vegetation control is not required, such as those adjacent to the ROW roadbed, various selective vegetation control techniques can be practiced. The purpose of this approach will be to increase competition for light and growing space with desirable species by selectively eliminating undesirable species. Some shrubs, forbs, and graminoids are desirable species (non-target) that can be tolerated on the adjacent area and will be selectively managed. By selectively removing these target species by cutting or herbicide treatments, the non-target species will not be affected. If a target species capable of resprouting is cut or mowed, a cut

stump treatment will be applied to prevent sprouting and the need for further herbicide applications.

In certain adjacent areas of the ROW, branches and limbs of trees can grow into or have the potential to move into the roadbed area, striking trains or overhead communication lines. In these cases, the tree will not be removed if a selective side trimming of the encroaching limbs can be made from an aerial lift mounted on hi-rail equipment, or from a truck. Selective side trimming will be done on a site-by-site basis according to the type and density of target vegetation present and its propensity to invade the roadbed area or communication lines. Trees and brush on the ROW which act as a buffer between the adjacent property and ROW will only be managed if they will interfere with the function and safety of the ROW. Selective vegetation management increases desirable vegetation, prevents erosion, and is aesthetically pleasing.

V. METHODS OF VEGETATION MANAGEMENT

Federal laws require the railroad to control vegetation located on the roadbed and certain other areas. All vegetation will be eliminated from the following areas, except where they are located within sensitive areas as described in Section VI:

- Roadbed ballast section including shoulder
- Bridges
- Culverts
- Drainage ditches
- ROW areas adjacent to the shoulder, such as road crossings, signs, inside curves

1. Areas Requiring Vegetation Control

A. Roadbed

The roadbed is a man-made structure which consists of the rail and ties, ballast, ballast shoulder, and drainage system. The ballast and ballast shoulder are constructed of crushed stone which supports the track. The ballast distributes the load on the ties and track evenly and allows water to drain away from the track structure. The roadbed is the principal structure on the ROW requiring vegetation control. All parts of the roadbed outside of restricted areas will be treated as necessary to remove all vegetation.

B. Bridges

Open deck bridges, such as over streams and other water bodies, will not be treated. Roadbed approaches to bridges will be treated as necessary to maintain required setbacks to sensitive areas. Stonework in bridge abutments and similar structures may be treated if outside of the sensitive area setbacks because plant roots can loosen and damage mortar. The area under bridges will be maintained in low growing vegetation.

C. Culverts

Culverts are generally constructed with steel pipe, concrete pipe, or stone and are normally placed at right angles to the track to convey intermittent or small streams, or to provide a means for stormwater drainage from precipitation events (but are otherwise dry). Culverts which are not of sufficient length to extend beyond the roadbed plus the required setback, or which are shallow to the roadbed and constructed of stone and could allow herbicide to enter a watercourse, will not be treated, nor will the length of track within 10 feet of such culvert openings.

D. Drainage Ditches

Constructed drainage ditches must be maintained weed-free to permit the flow of water away from the ballast and track structure and maintain a stable roadbed. Ditches will be cleared by mechanical means and by herbicide application when no water is present except if the ditch constitutes a tributary to a public water supplies and is therefore a sensitive area per 333 CMR 11.00 (constructed and maintained drainage ditches do not constitute wetland resource areas per the Massachusetts Wetlands Protection Act).

E. Right of Way Area Adjacent to the Shoulder

Woody vegetation growing within the ROW and adjacent to the shoulder will be managed to promote the growth of low growing shrubs. Targeted vegetation will be that which has the potential to block visibility or invade the roadbed and/or overhead communication lines, as described above. On the side of the ROW containing overhead signal and communication lines, where present, low growing shrubs and most herbaceous plants will be maintained and encouraged in an effort to reduce the opportunity for growth and development of tall trees into these areas. Low growing vegetation will be encouraged in areas containing underground communication or signal lines. Vegetation on the area adjacent to the shoulder must be controlled in the following situations.

a. Grade Level Road Crossings

At grade level road crossings vegetation must be controlled to provide safe lines of sight between motorists and rail traffic.

b. Railroad Signals, Signal Cases, and Signs

The area around railroad signals, signal cases, and signs will be maintained weed free providing a safe line of sight and to permit maintenance access.

c. Inside Curves

In the area adjacent to the shoulder, on the inside of curves, low growing vegetation must be maintained to permit visibility and allow workers on the trains to inspect the trains as it moves around the curves.

F. Railroad Facilities

Railroad facilities include yards, buildings, fueling facilities, and off-track areas. These areas are not considered ROW, and are not covered under these regulations, but are treated with herbicides independently of the ROW.

2. Vegetation Control Procedure

The railroad ROW vegetation control procedure consists of two direct methods and one indirect method. The direct methods are mechanical cutting and herbicide applications. The indirect method is any ROW operational activity which eliminates vegetation as a secondary benefit (e.g., construction, resurfacing).

A. Mechanical Techniques

Mowing is the mechanical process of cutting a target species, generally with motor-driven rotating cutting heads. Mechanical control techniques are limited to woody and brush vegetation that cannot be adequately controlled using herbicides and includes target trees that interfere with the ROW. Mechanical techniques may also be used in the areas adjacent to the roadbed to remove unwanted woody vegetation in areas restricted for herbicide application. For clearing woody vegetation in these areas, cutting heads are mounted on hydraulic arms that greatly

extend the lateral reach of the equipment. These machines can be mounted on off-track, or on-track hi-rail equipment. Large machines are required for railroad application because of the wide range of conditions found on the ROW. Railroad safety guidelines may restrict the use of brush cutters within developed areas. Mechanical cutters such as mowers present certain safety hazards which the railroad personnel must consider. Not only is brush cutting potentially hazardous to the workers, but also poses a hazard to the public due to the potential for thrown projectiles. Mechanical cutting with high-reach mowing machines is often restricted within specific distances of roads, buildings, and inhabited areas for safety reasons, greatly restricting its application.

Hand-operated equipment such as brush cutters and string trimmers are appropriate in these areas, but are ineffective against larger-diameter woody vegetation, and generally do not result in adequate full-season control of smaller vegetation.

B. Herbicide Application

Herbicides are successfully applied on railroad ROW because of their specificity, range of target species, economics, relative ease of application, safety of railroad workers, and particularly the degree of effective vegetation control provided. Herbicides are essential to eliminate vegetation on the ROW roadbed (the ballast/shoulder area) because they offer complete control of the plants. There is no known mechanical method for adequate vegetation control on the railroad roadbed, as previously noted.

Herbicide use constitutes part of an integrated vegetation management approach by consideration of the area to be treated, target species, timing of application, and type of herbicide used. The two herbicide categories are pre-emergent herbicides, which the plant or seed absorbs before it can emerge, and post-emergent herbicides, which the plant absorbs through foliage and other green parts, roots, or through woody parts (i.e., bark, stem). Pre-emergent herbicides are used only on the railroad yards, not on the ROW. PVRR uses only post-emergent herbicides permitted by the MDAR where appropriate on ROW.

The post-emergent herbicide program is directed toward vegetation control on the railroad ROW. Post-emergent herbicide applications may be foliar, stem, or cut surface. Foliar application from a hi-rail truck mounted sprayer is the most common application. At level road crossings a backpack sprayer may be used to apply herbicides within the ROW out of reach of the hi-rail truck.

The target plants are any and all plants growing between the rails and on the ballast shoulder, and any weedy herbaceous, vine, or woody species with the potential to foul those areas, as previously described. Post-emergent herbicide application is normally performed in June or July, but is dependent on weather, target species, and the date of last treatment of that area. All treated areas are later inspected and the effectiveness of the treatment evaluated. If necessary, a second treatment may be selectively applied to some vegetated areas (per CMR 333 11.03(8)).

As required by 333 CMR 11.07, as part of the YOP process, PVRR will make a written public and regulatory agency notification of the YOP distribution and review (separate from the VMP notification process) and the proposed dates of herbicide application at least 21 days prior to the

application. PVRR will also publish a public notice of the proposed herbicide application 48 hours prior to the start of the treatment.

Foliar Treatment is the selective application of herbicide to the foliage and is normally performed using spray equipment mounted on a hi-rail truck. PVRR will use only post-emergent, low-pressure foliar treatment herbicide application on the ROW. Foliar application is made when the target vegetation is in full leaf and actively growing, and in accordance with the herbicide label requirements.

Foliar treatment requires the application of an herbicide and adjuvant diluted in water to the foliage of target vegetation. The hi-rail truck equipment applies herbicide at low pressure, normally between 10 and 60 pounds per square inch (psi), and never greater than 60 psi. Low pressure as defined by CMR 333 11.02 is less than 60 psi. The applicator adjusts the spray pressure (flow rate) to accommodate change in the speed of the truck, increasing the application pressure when the truck is traveling at a higher speed, in order to apply a consistent concentration of herbicide per area of railroad ROW.

The hi-rail trucks have a rear-mounted applicator boom located approximately 18 inches above the ground. Spray nozzles mounted on the boom are controlled by the driver from within the cab and can easily be switched on or off over a very short distance, as little as one foot, depending on the speed of the truck. Spray booms are independently controlled according to left side, center, and right side allowing the operator to shut off the application to areas lacking target vegetation. Foliar spray will not be used on vegetation greater than 12 feet in height, in accordance with the regulation, and is normally directed to vegetation along the ground. Spray nozzles are equipped with a spring-loaded shut-off valve to prevent dripping when the pressure is turned off. A trough is mounted below the spray boom to catch any drips from the spray nozzles when they are not in use, and to prevent dripping of herbicide when traveling through herbicide-restricted areas. Appendix B contains a photograph of a typical track-mounted herbicide applicator truck taken on PVRR ROW in Massachusetts.

Side trimming, when done with herbicides, is the selective application of the herbicide to target portions of a tree and avoids removal of the entire tree. No foliar application of herbicides will be used to control vegetation greater than 12 feet in height except for side trimming, if necessary, as per 333 CMR 11.03 (5).

Stem Treatment includes any technique in which an herbicide is selectively applied to the stem, stump, or base of the target vegetation. The equipment for basal spraying is often a manual-pump apparatus. Normally, the herbicide is manually painted or otherwise applied directly onto the cut stump surface. These methods are not practical for most applications along the ROW but can be useful for treatment in difficult areas where foliar spray application is not feasible, or for certain target vegetation that may be resistant to foliar application.

VI. IDENTIFICATION AND CONTROL STRATEGIES FOR SENSITIVE AREAS

A. Sensitive Area Identification

Sensitive Areas, as defined in 333 CMR 11.04, are any areas within Rights-of-Way, including No-Spray and Limited-Spray Areas, in which public health, environmental, or agricultural concerns warrant special protection to further minimize risks of unreasonable adverse effects. Sensitive areas are identified using maps prepared by the Massachusetts Department of Environmental Protection (DEP), by reference to state regulations, and/or indicated by other data sources and field observations, as in the cases of private wells and inhabited areas. PVRR will apply herbicides where warranted in accordance with the IVM program in compliance with the requirements of 333 CMR 11.00, including all sensitive area restrictions.

No herbicide application is allowed within the following sensitive areas:

- (a) Within a Zone I (area of contribution to a drinking water supply);
- (b) Within 100 feet of any Class A Surface Water Source;
- (c) Within 100 feet of any tributary or associated surface water body where the tributary or associated surface water body runs within 400 feet of a Class A surface water source;
- (d) Within ten feet of any tributary or associated surface water body where the tributary or associated surface water body is at a distance greater than 400 feet from a Class A surface water source;
- (e) Within a lateral distance of 100 feet for 400 feet upstream, on both sides of the river, of a Class B Drinking Water Intake;
- (f) Within 50 feet of any identified Private Well;
- (g) Within ten feet of any Wetlands or Water Over Wetlands;
- (h) Within ten feet of the mean annual high-water line of any river;
- (i) Within ten feet of any Certified Vernal Pool.

Herbicide application is restricted to no more than one application every two years:

- (a) Within any Zone II or Interim Wellhead Protection Area;
- (b) Between 100 feet and 400 feet of any Class A Surface Water Source;
- (c) Between 10 and 200 feet of any tributary or associated surface water body where the tributary or associated surface water body runs outside the Zone A for the Class A surface water source;
- (d) Between 100 and 200 feet for 400 feet upstream, on both sides of the river, of a Class B Drinking Water Intake;
- (e) Between a 50- and 100-foot radius around a private well.

Herbicide application is restricted to no more than one application per year:

- (f) Between 10 and 100 feet from wetlands or water over wetlands;
- (g) Between 10 feet from the mean annual high water line of any river to the outer boundary of the Riverfront Area;
- (h) Between 10 feet from any Certified Vernal Pool to the outer boundary of the Certified Vernal Pool Habitat (100-foot buffer);
- (i) Within one hundred 100 feet of any agricultural or inhabited area.

For the purposes of identification to ensure the restrictions are followed, sensitive areas are separated into two categories: areas that are readily identifiable in the field; and areas that are not readily identifiable in the field. According to 333 CMR 11.03 (4), “the perimeter of any sensitive areas which are not readily identifiable on the ROW shall be identified with a clearly visible marker system, consistent with the VMP, prior to any herbicide application.”

PVRR has determined that the following areas are readily identifiable in the field: inhabited areas; agricultural areas; and areas of intermittent standing or flowing water, such as drainage ditches, in which herbicide application is prohibited in the event that standing or flowing water is present at the time of application (not including intermittent tributaries to a Class A surface water source, whether in a natural or artificial channel, which will be mapped as restricted).

The remaining sensitive areas are considered not readily identifiable in the field, and as such have been marked with a permanent marker system that itself is identifiable in the field to the PVRR track inspector, herbicide applicator, and interested parties. The most common type of sensitive area encountered on the PVRR ROW are areas within 100 feet of wetlands or water over wetlands. The other sensitive areas marked in the field are certified vernal pools and setbacks from public and private drinking water supply areas.

B. Map Preparation

In order to accurately mark sensitive areas in the field, PVRR reviewed several data sources, principally geographic data publicly available from the Massachusetts Office of Geographic and Environmental Information (MassGIS). The most recently available relevant data layers from MassGIS (listed below) were downloaded and overlain on a USGS topographic base layer (MassGIS USGS Topographic Quadrangle Images) and/or digital orthophoto layer. The MassGIS 1:5,000 Road and Rail Centerlines datalayer was placed on the base maps, modified as necessary by hard copy map and other data from PVRR. An example of the maps used to guide operators in the field is included in Appendix B.

Sensitive area data layers obtained from MassGIS are:

- DEP Public Water Supplies (PWSDEP_PT)
- DEP Interim Wellhead Protection Areas (IWPA_POLY)
- DEP Approved Wellhead Protection Areas (ZONE2_POLY)
- Surface Water Supply Protection Areas (SWP_ZONES_POLY)
- Waterbodies (HYDRO25K_POLY)
- Rivers/Streams (HYDRO25K_ARC)
- Certified Vernal Pools (CVP_PT)
- Surface Water Supply Watersheds (SWP_WATERSHEDS_POLY)
- DEP Wetlands (WETLANDSDEP_POLY)

In addition to these GIS data, PVRR obtained data on locations of private wells by reviewing a copy of the Private Well Registry from MDAR, and by making written inquiry to the Board of Health in each municipality regarding wells potentially located with 100 feet of the ROW.

An extensive field investigation was conducted into the locations of jurisdictional wetlands, under the Massachusetts Wetlands Protection Act, near the ROW, and wetlands determinations

were sought from the Conservation Commission in each municipality in which wetlands were found to be present near the ROW (further described below).

PVRR used desktop GIS to develop rules describing appropriate setbacks that define the sensitive area boundaries. This GIS process was used to generate a map of the entire PVRR ROW system in Massachusetts showing all sensitive areas and restricted spray zone perimeters within the ROW. The map was divided into 1:5000 scale maps suitable for field use. Maps are updated each year as part of the YOP to include any changes to MassGIS data layers, and new private well data.

C. Field Marking of Sensitive Areas

The perimeters of sensitive areas where herbicide application is restricted, as described above, are marked on the PVRR ROW using permanent color-coded markers. No-spray areas are defined by yellow marker plates and/or yellow painted rail and cross-tie sections. Areas restricted to herbicide application no more than once every two years are similarly marked in purple/dark blue. Areas restricted to no more than one application every year are likewise marked in light blue. The locations of restricted spray areas were determined by GIS map data analysis for all sensitive areas except wetlands. Setbacks from wetlands and water over wetlands were preliminarily identified by GIS data, but were ascertained by field investigation. Appendix B contains a representative photograph of a wetlands in the railroad ROW and the field markings placed to guide the weed spray operation to avoid the no-spray area.

The rights-of-way management regulations 333 CMR 11.00 define wetlands as any of the areas defined in 310 CMR 10.02(1)(a), (b), (c), and (f). These consist of: any bank, freshwater wetland, coastal wetland, beach, dune, flat, marsh, or swamp bordering on the ocean, any estuary, creek, river, stream, pond, or lake; land under any of those water bodies; and land subject to tidal action. The herbicide application restrictions with respect to wetlands and water bodies are described on page 13.

PVRR performed a field investigation to identify and mark the locations of 10-foot and 100-foot offsets from wetlands where they intersect the ROW. The locations of all spray restriction zone starting and ending points were recorded using handheld sub-meter GPS equipment, and portrayed on ROW maps for use in the wetlands determinations, and to guide the herbicide application operators.

Wetlands were identified along the ROW in accordance with the DEP manual "Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act". The principal indicators used were direct observation of surface water, saturated conditions, or 50% or more wetland indicator plants in a sample plot, as defined by the U.S. Fish and Wildlife Service's National List of Vascular Plant Species that Occur in Wetlands, Northeast Region. As required by 333 CMR 11.02, PVRR requested a wetlands determination in accordance with 310 CMR 10.05(3)(a) 1 and 2 from the Conservation Commission of each municipality in which such wetland areas are present near the ROW.

D. Control Strategies for Sensitive Areas

Sensitive areas in which herbicide application is allowed but restricted to no more than once per year or per two years will be treated with herbicide, if necessary, using only low-pressure foliar techniques or cut-stump applications. As required by 333 CMR 11.03, no herbicide will be applied when the wind velocity is such that there is a high propensity to drift off target, no herbicide will be applied during measurable precipitation, and no person shall apply herbicides in such a manner that results in drift of herbicide into any no-spray area. For areas outside of any spray restriction, PVRR customarily uses the same chemicals as in the sensitive areas to facilitate an efficient application process. For sensitive areas in which herbicide application is prohibited, PVRR will control vegetation using mechanical methods. These sensitive area restrictions will apply to annual ROW vegetation control as described in this plan, and not for separate projects such as control of invasive species performed outside of the ROW management regulations.

VII. OPERATIONAL GUIDELINES FOR APPLICATORS RELATIVE TO HERBICIDE USE

Any applicator performing herbicide application on PVRR ROW (contractor to PVRR) will hold a valid pesticide certification (Massachusetts Commercial Certification for ROW, Category 40) granted by the Commonwealth of Massachusetts. The applicators will follow all railroad safety regulations, all relevant federal and state requirements, and all herbicide label instructions.

The applicator will be accompanied during the herbicide application procedure by a representative of PVRR who is familiar with that section of the ROW, and by a PVRR representative who has knowledge of the sensitive area locations, the maps and associated data defining those areas, and the applicable regulations.

The applicator and accompanying personnel will have access, during the treatment process, to paper maps and/or a laptop computer displaying GIS data indicating the locations of all restricted spray areas on the ROW being treated, to aid in identification of the boundaries of those areas and ensure no herbicide application is improperly made.

Herbicide application will be restricted during the following adverse weather conditions:

- Herbicide application will not be made during measurable rainfall. Foliar herbicide application may be effective in fog or mist conditions, but precipitation that creates runoff from plant leaves will render the herbicide ineffective. Herbicide application will be postponed until the leaves of target vegetation are sufficiently dry to allow the herbicide to adhere to the leaves and be effective;
- If application is interrupted by an unexpected rain event, herbicide application will be stopped and will not resume until precipitation and leaf runoff have stopped, and the leaves of target vegetation are sufficiently dry to allow herbicide to be effective;
- Excessive wind can cause drift of the herbicide spray; herbicide application will stop if the applicator observes significant movement of the spray and will not resume until the wind has subsided sufficiently to prevent observable movement away from the target of the spray.

A daily field report of vegetation control activities will be filled out each day by the licensed herbicide applicator, and will include, but not be limited to:

- date and time of application;
- vehicle identification;
- date of most recent equipment calibration;
- track identification;
- name and volume of all herbicide and associated materials used;
- weather; and
- any other information deemed by the applicator to be relevant to the day's herbicide application activities.

In the weeks following herbicide application, the scheduled PVRR track inspector will observe and make note of the effectiveness of the application for use in subsequent vegetation management activities.

VIII. ALTERNATIVE LAND USE

PVRR has evaluated alternative land uses on the ROW. Safety considerations preclude alternative land uses with regard to maintenance of the railroad ROW. Certain other uses of the ROW that are compatible with the railroad are co-located electric distribution and transmission, telecommunication lines, water or sewer lines, or other pipelines. These uses reduce the length of new ROW required for all uses, but do not change the vegetation management requirements along the ROW.

IX. REMEDIAL PLAN TO ADDRESS SPILLS AND RELATED ACCIDENTS

This remedial plan is offered as a guide to proper procedures for addressing pesticide accidents. In the event of an accident, the applicator must weigh factors specific to the situation and use their best judgment to decide the appropriate course of action.

Federal and state statutes establish emergency response procedures that must be followed by PVRR and their contractor in the event of a spill or related accident. It is the applicator's legal responsibility to clean up pesticide spills resulting from their use and handling of the product. Applicators are liable for damages, subject to penalties, and obligated to clean up and decontaminate areas resulting from pesticide spills.

Because applicators normally carry only relatively small amounts of herbicides, the potential for serious accidents is relatively small. The high-rail vehicle also carries diesel fuel, motor oil, engine coolant, other fluids (e.g. brake), and hydraulic oil. The applicator will be prepared to take remedial measures in the event of a spill of any of these materials.

Applicators will carry the herbicide labels, Safety Data Sheets (SDS) for the chemicals being used, as well as equipment for emergency action including gloves, sand or other absorptive material, broom, shovel, and heavy-duty plastic bags or other leak-proof sealable containers.

A copy of the YOP will be carried with the herbicide applicator. The YOP contains telephone numbers for the state police, local fire department, poison control center, herbicide manufacturer(s), and MassDEP, as well as a spill response checklist.

In the event of a spill or related accident, the following actions will be taken:

- administer first aid if required (if necessary, call ambulance, Massachusetts poison information center);
- in case of contact with herbicides, decontaminate as directed by the SDS, change clothing as appropriate, seek medical attention if appropriate;
- call police in event of damage to property, or fire/explosion;
- if possible and safe to do so, control the spill and confine the spread of liquids with dikes, sand, and/or absorbent materials;
- clean up spilled material as necessary and label any containers of contaminated materials for proper disposal;
- if unable to clean up entire spill with materials available, contact local police and fire department;
- notify MDAR when there is a spill of herbicides or an emergency related to herbicide application;
- notify MassDEP immediately if a wetland, water body, or other sensitive area is threatened or contaminated by release of hazardous materials;
- contact MassDEP immediately in the event of a spill of a reportable quantity of oil or hazardous materials.

X. IDENTIFICATION / QUALIFICATIONS OF INDIVIDUALS DEVELOPING THIS PLAN

This Vegetation Management Plan is based on the plan originally developed by Conrail in 1989 for the railroad ROW now owned by PVRR. This 2021-2022 Vegetation Management Plan was updated by Mr. Stephen Herzog of Wood Environment & Infrastructure, Inc. from the 2011-2015 VMP (PVRR's most recent VMP for 2016-2020 was prepared by TEC Associates). Wood is an international engineering and environmental consulting organization with expertise in civil and geotechnical engineering, natural resources, contaminated site remediation, human health and ecological risk assessment, environmental compliance and permitting, and GIS services. Mr. Herzog is a natural resources scientist with B.S. and M.S. degrees in environmental science and geology, and over 20 years' experience in environmental services. He has expertise in ecology, land use planning, and geographic information systems. For this project Mr. Herzog managed the field wetlands delineations, GIS data development, and preparation of the wetlands determinations required as part of sensitive area identification. He also developed the YOPs prepared under the previous VMP and has accompanied licensed herbicide applicators during vegetation control efforts on PVRR's ROW.

Appendix A – Affected Municipalities

Westfield
West Springfield
Holyoke

Appendix B – Representative Maps and Photographs