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**Best Management Practice:** **"ROADSIDE TERRESTRIAL INVASIVE PLANTS"**

**Effective Date:** **9-10-2012**

**VTrans Authorized Signature:** *Scott A. Rogers*
**Director, Operations Division**

# VTRANS STATE HIGHWAY SYSTEM ROADSIDE TERRESTRIAL INVASIVE PLANTS BEST MANAGEMENT PRACTICES (BMPS)

## PURPOSE STATEMENTS

The VTrans State Highway System Roadside Invasive Plants BMP guides maintenance activities in order to:

- Maintain safe roads and bridges for the traveling public;
- Prevent infrastructure deterioration;
- Comply with Federal or State rules and regulations;
- Reduce Cost (energy, equipment and personnel costs);
- Reduce VTrans energy consumption;
- Reduce VTrans green house gas and unhealthy emissions from mowing equipment;
- Protect water quality, wildlife habitats and the roadway's surrounding natural ecology;
- Protect worker's health;
- Preserve the scenic qualities of the highway corridor.

## GUIDING PRINCIPLES

The BMP has several guiding principles:

- Create consistent requirements throughout the state that prevent the spread of invasive species;
- Form the basis for contractor specifications;
- Limit activities only to those areas where management is necessary for the safety of workers, the traveling public and long-term infrastructure protection;
- Schedule management techniques to maximize benefit and minimize cost;
- Create mechanisms and standards for addressing environmentally sensitive areas, riparian areas, steep slopes, wetlands, rare & endangered species and their habitats;
- Create provisions for areas of special landscape treatment;
- Foster long term sustainable landscape vegetation management, minimizing excessive mowing and herbicide use;
- Preserve the scenic qualities of the corridor to the extent practicable, while maintaining environmental stewardship and conserving resources;

## GENERAL STANDARDS

These standards are applicable only to the VTrans State Highway System (limited access and non-limited access), are subject to the conditions and exceptions noted below and are intended to be implemented to the extent reasonable and practicable when not otherwise required by rule, regulation or law.

The DTA or its designee must ensure compliance with all VOSHA standards and the Manual for Uniform Traffic Control Devices (MUTCD) by use of contract language and safety plan review meetings with contractors or VTrans personnel. Items to be addressed in addition to VOSHA and MUTCD standards should include, but are not limited to, equipment loading, storage, and access plans; traffic control and mobile operations sign planning, and protection of personnel, infrastructure, and the traveling public.

## TARGET AUDIENCE

This BMP is primarily intended for VTrans Roadside Operations and is also applicable to highway maintenance yards, State airports, public transit and rail facilities. In addition, this BMP may also be applicable to municipally managed roadways and municipal maintenance crews.

Municipalities may wish to refer to these standards and implement the practices mentioned herein. VTrans will not be responsible for monitoring Municipal performance nor compliance under these standards and practices, but may serve as a technical resource for Municipalities regarding the implementation of these practices.

## ACKNOWLEDGEMENTS

This manual was prepared by:

Craig Dusablon, Landscape Coordinator, VTrans Operations Division, Technical Services Section, Environmental Program with input from:

- VTrans District Transportation Administrators (Operations Division)
- VTrans Construction Division
- VTrans Environmental Program Manager (Operations Division)
- VTrans Director of Operations

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# Section I – Introduction

## Impacts of Invasive Plants

An invasive plant is a non-native plant that is able to resist and proliferate outside of cultivation, resulting in ecological and/or economic harm. These plants readily colonize disturbed areas and habitat edges, such as transportation and river corridors. Once established in these areas, invasive plants often continue to spread to adjacent habitats. All invasive plant species are aggressive competitors with the ability to significantly reduce diversity of native plant and animal species.

The land adjacent to roadways tends to be ideal habitat for invasive plants because of its high level of disturbance and abundant sunlight. Invasive plants impact transportation corridors in a variety of ways. Certain invasive plants can reduce sight distance, block signs, increase the risk of fire, and encroach on travel lanes.

Some species are capable of pushing up through pavement and damaging shoulders and road edges. In addition, some species plug ditch lines and block culverts, reducing the effectiveness of these drainage structures and hindering their maintenance.

Some invasive plants contain compounds that can cause health problems (photodermatitis) to people who come in contact with the plants. They can severely burn and blister the skin. Giant Hogweed (Heracleum mantegazziamnum), Wild chervil (Anthriscus sylvestris), and Wild parsnip (Pastinaca sativa) are plants of concern. Spotted knapweed (Centaurea biebersteinii) contains compounds that may be carcinogenic in large quantities.

In addition to health and infrastructure concerns invasive plants can spread to adjacent habitats. When invasive plants become established in natural areas, they can impact native species and ecosystem processes. Next to habitat loss, invasive species are considered the second most important factor in the decline of biodiversity in North America.

# Invasive Plant Prevention, Education & Training

Invasive plants spread by a variety of mechanisms, including birds, wind, and water. Human activities are also a major factor in the spread of these plants, from gardening and transport of nursery stock to erosion control and wildlife plantings. Routine maintenance and construction activities along transportation corridors can also play a significant role in the spread of invasive plants by dispersing or introducing seeds and other viable plant materials.

Eliminating or reducing the spread and establishment of invasive plants requires a proactive approach, in which there are three key elements.

- New introductions, especially those that occur due to human activities, must be avoided to the maximum extent possible.
- There must be an emphasis on early detection and eradication of new populations. Control measures are far more likely to be successful, as well as significantly less expensive, on small, young population rather than on larger, more established populations.
- Education & training is the key to dealing with invasive plants. The VTrans Training Center (VTTC) will be utilized to provide introductory and ongoing training to VTrans Operations Staff regarding the interpretation and implementation of this Best Management Practice for Roadside Terrestrial Invasive Plants.

  Students will learn about the need to prevent the spread of invasive plants, how to identify the plants and how to implement the respective best management practices.

The VTrans Operations Landscape Coordinator will also conduct ongoing on-site educational and technical support sessions as needed in addition to those scheduled at the VTTC and will be the primary point of contact to address questions and assist in implementation of these practices.

The following BMPs have been demonstrated to be very effective in the prevention of spreading invasive plants during construction activities and for roadside mowing in Vermont and other states. **It is not a BMP designed for the overall control of invasive plants. This would require a much more comprehensive effort, which would include an Integrated Vegetation Management Plan (IVMP) on a statewide basis with multiple stakeholders and partners.**

Experience-based reports of methods used to control certain species and their effectiveness under specific environmental factors are essential for invasive plant management. Benefits are derived from using shared data bases or having common points of contact on the internet, to share and benefit from each other's experience and learning. Invasive management can greatly benefit by use of best practices available and dissemination of experience and information.

# Regulatory Framework

The following federal and state laws and regulations pertain to preventing the spread of invasive species:

- Executive Order 13112 on Invasive Species (February 3, 1999)
  http://www.invasivespeciesinfo.gov/laws/execorder.shtml
- U.S. Fish & Wildlife
  http://www.fws.gov/invasives/laws.html
- Federal Highway Administration Guidance on Invasive Species (August 10, 1999)
  http://www.environment.fhwa.dot.gov/ecosystems/vegmgmt_inv_guid.asp
- Vermont Agency of Food and Markets, Quarantined #3 – Noxious Weeds
  http://www.vermontagriculture.com/ARMES/plantindustry/plantPathology/weeds/list.html

Of particular interest under the Vermont Agency of Agriculture, Food and Markets, Quarantined #3 – Noxious Weeds are the following sections.

**REGULATORY NOTE:** VTrans Operations Division (VTrans Ops) has consulted with the Agency of Agriculture, Food and Markets (AAFM) to determine the need for permitting a variance noted under Quarantine Rule Section VI: Variances and Exemptions. In doing so, VTrans Ops obtained the written acceptance of these BMP's as its "Statewide Management Control Plan" covering these regulated activities and confirmation from the AAFM indicating that these BMPs meet the intent of the regulations. Refer to ATTACHMENT A for this letter which specifically exempts the movement of listed weeds over roads or highways and also serves as a general permit to move and dispose listed noxious weeds and associated material. The VTrans Landscape Coordinator will lead and coordinate communication between Agencies and will educate and provide ongoing technical assistance to VTrans staff.

### Vermont Agency of Agriculture, Food and Markets, Quarantined #3 (in part):

**Section V: Prohibitions**

A. The movement, sale, possession, cultivation, and/or distribution of Class A Noxious Weeds designated in Appendix A (see below) is prohibited.
B. The sale, movement, and/or distribution of Class B Noxious Weeds designated in Appendix A (below) are prohibited.
C. Violation of any of these prohibitions may result in:
   1. The issuance of cease and desist order; and/or,
   2. Temporary or permanent injunctions; and/or,
   3. Administrative penalties as specified in 6 V.S.A., Chapter 1, Section 15, and Chapter 84, Sections 1027 &1038.

**Section VI: Variances and Exemptions**

A. A variance may be granted by the secretary of Agriculture Food and Markets to allow for the movement, possession and field experimentation of noxious weeds for scientific, educational, or other purposes under such conditions as may be prescribed by the secretary. Any variance(s) shall be in the form of a permit issued by the secretary.
B. Transportation of any Class A or B Noxious Weed on any road or highway of the state is exempt if:
   1. For disposal as part of a management control activity; or,
   2. For the purpose of identifying a species or reporting the presence of a species, and the Class A or B Noxious Weed is in a sealed container.
C. Preserved specimens in the form of herbaria or other preservation means are exempt.
D. Varieties, cultivars, hybrids and/or subspecies that have been shown through scientific research and analysis not to be invasive are exempt. Those cultivars and varieties so demonstrated as non-invasive are listed in Appendix B (below).
E. Permits for movement and disposal of listed weeds and associated material (soil, debris, etc.) may be granted by the secretary for the purposes of weed control or infestation mitigation efforts after review of the proposed procedures and disposal site(s). In granting permits, specific consideration shall be made regarding the location of disposal and monitoring sites and whether the movement and disposal effort(s) accomplishes the general intent of reducing the overall impact of noxious weeds on the environment.

## APPENDIX A: Designated Noxious Weeds - Prohibited Invasive Plants in Vermont
## Vermont Agency of Food and Markets, Quarantined #3 – Noxious Weeds

http://www.vermontagriculture.com/ARMES/plantindustry/plantPathology/weeds/list.html.

### A. Class A Noxious Weeds

1. *Cabomba caroliniana (*fanwort)
2. *Egeria densa* (Brazalian elodea)
3. *Hydrilla verticillata* (hydrilla)
4. *Hygrophila polysperma* (east Indian hygrophila)
5. *Myriophyllum aquaticum* (parrot feather)
6. *Myriophyllum heterophyllum* (variable-leaved milfoil)
7. *Salvinia auriculata* (giant salvinia)
8. *Salvinia biloba* (giant salvinia)
9. *Salvinia molesta* (giant salvinia)
10. *Vincetoxicum hirundinaria* (pale swallow-wort)

### B. Class B Noxious Weeds

1. *Aegopodium podagraria* (goutweed/bishopsweed/snow-on-the-mountain)
2. *Ailanthus altissima* (tree-of-heaven)
3. *Alliaria petiolata (A. officinalis)* (garlic mustard)
4. *Butomus umbellatus* (flowering rush)
5. *Celastrus orbiculatus* (oriental bittersweet)
6. *Fallopia japonica (Polygonum cuspidatum)* (Japanese knotweed)
7. *Hydrocharis morsus-ranae* (frogbit)
8. *Lonicera x bella* (bell honeysuckle)
9. *Lonicera japonica* (Japanese honeysuckle)
10. *Lonicera maackii* (amur honeysuckle)
11. *Lonicera morrowii* (Morrow honeysuckle)
12. *Lonicera tatarica* (Tatarian honeysuckle)
13. *Lythrum salicaria* (Purple loosestrife)
14. *Myriophyllum spicatum* (Eurasian watermilfoil)
15. *Nymphoides peltata* (yellow floating heart)
16. *Phragmites australis* (common reed)
17. *Potamogeton crispus* (curly leaf pondweed)
18. *Rhamnus cathartica* (common buckthorn)
19. *Rhamnus frangula* (glossy buckthorn)
20. *Trapa natans* (water chestnut)
21. *Vincetoxicum nigrum* (black swallow-wort)
22. *Acer platanoides* (Norway maple)*
23. *Berberis vulgaris* (common barberry)*
24. *Berberis japonicas* (Japanese barberry)*
25. *Euonymous elata* (burningbush)*
26. *Iris pseudocorus* (yellow flag iris)*
27. *Acer ginnala* (Amur maple)*
28. *Najas minor* (European naiad)*
29. All weeds listed in 7 C.F.R. 360.200 as amended, which is herby incorporated by reference including subsequent amendments and editions.

*Specimens of these species acquired prior to the final filing of this rule may be sold or offered for sale until January 1, 2015.

## APPENDIX B: Subspecies, Hybrids, Varieties and Cultivars Exempted Under Rule
## Vermont Agency of Food and Markets, Quarantined #3 – Noxious Weeds

1. *Rhamnus frangula* (Asplenifolia)
2. *Rhamnus frangula* (Fine Line)

# Using This Manual

The intent of this manual is to bring awareness to invasive plants and the role that VTrans can play in limiting the spread of these species along our rights-of-way and into adjacent habitats. The information in this manual is meant as guidance for maintenance and construction personnel, as well as contractors working for VTrans. Unless otherwise required by law, rule or regulation implementation (example, movement/transport/disposal of class A noxious weeds) of these BMP's are intended to be accomplished to the extent reasonable and practicable.

This manual is divided into three sections.

**Section I: General Best Management Practices (BMP)**
General Best Management Practices (BMP) that are discussed are applicable to all invasive plants, including those listed on the Vermont Prohibited Invasive Species list. When followed, these BMPs will reduce the likelihood of introducing invasive plants into new areas via maintenance and construction activities.

**Section II: VTrans Priority Plant Species and Preferred Control Methods**
These BMPs that are discussed are applicable specifically to VTrans priority plant species. When followed, these BMPs will reduce the likelihood of introducing invasive plant seed or propagules from these priority plant species.

Priority invasive plant species are discussed, including appropriate species-specific BMPs and Preferred Control Methods. Priority species are those species that have at least two of the following characteristics:

1) Easily spread by VTrans activities,
2) Significant negative impact on transportation infrastructure, and
3) Very difficult to eradicate. The three priority species are Japanese knotweed, Purple loosestrife, and Phragmites.

All priority species are already widespread throughout Vermont. That said, there are other species of concern that are mentioned under Section II, which deserve the same attention and these BMP's will apply to the prevention and management of those as well.

**Section III: Resources**
Contacts and other resources are listed to provide for more information, especially in regard to invasive plant identification. The websites listed in the section provide detailed identification characteristics and photographs of invasive plants. A glossary is also included to define terms used throughout the manual.

# Section I – General Best Management Practices

## Soil Disturbance and Stabilization

**BMP # 1**
Whenever possible, excavation should be avoided in areas containing invasive plants.

**BMP # 2**
If avoidance is not possible, then minimize soil disturbance in areas containing invasive plants. Monitor recent work sites for the emergence of invasive plants for a minimum of two years after construction. Should invasive plants be detected early, use a certified pesticide applicator and spray within limits of pesticide permit, consult with VTrans Landscape Coordinator; and/or take other actions as may be deemed appropriate as noted in this BMP.

**BMP # 3**
Plant species on the prohibited invasive plant list should never be planted.

**BMP # 4**
Stabilize disturbed soils as soon as possible by seeding, mulching or using stone or other materials that are free of invasive plant materials. Very few disturbed areas will generate satisfactorily in a reasonable time without assistance, therefore, a properly managed revegetation plan can assure the effective return of the land to a self sustaining condition. Site specific revegetation efforts should address site preparation, species selection, and overall maintenance of the area. The activities to reduce invasive plants are intended to compliment other practices addressing such things as erosion control, proper drainage, and protecting the initial investment in the infrastructure.

**BMP # 5**
Materials such as fill, loam, gravel, mulch or hay should not be brought into project areas from sites where invasive plants are known to exist or have existed.

## Movement and Maintenance of Equipment

**BMP # 6**
Locate and use a staging area that is free of invasive plants.

**BMP # 7**
If equipment must be used or staged in areas where invasive plants occur, all equipment, machinery, and hand tools should be cleaned of all viable soil and plant material before leaving the project. NOTE: linear projects (ie. ditch maintenance) will likely require close attention. Acceptable methods of cleaning include but are not limited to:

- Portable wash station that contain runoff from washing equipment (containments must be in compliance with wastewater discharge regulations)
- High pressure air
- Brush, broom or other tool (used without water) – this is likely to be the BMP most practiced in an effort to avoid unintentional transport of invasive species as equipment moves from site to site.

**BMP # 8**
If equipment must be used in areas containing Japanese knotweed, Phragmites, or Purple loosestrife, aboveground plant material should be cut and properly disposed of (see BMP # 14) prior to the start of work. If excavation occurs in these areas, see BMPs # 17 - # 20.

# Impacts of Mowing Invasive Plants

## Mowing

Few studies have been conducted on the effects of mowing plant communities and invasive plants. What is known is that maintenance roadside mowing, while essential for safety, aesthetic, operational and environmental purposes, can, has and does play a significant role in the introduction, spread and proliferation of invasive plants.

## Timing

Mowing can serve as a control method for certain invasive plants during certain periods of their reproductive cycles, but repeated mowing and attention to timing will be required. Mowing is most effectively used in combination with other vegetation management and invasive species control techniques. Mowing of large infestations of invasive plants is a long term commitment, which drops mowing down the list of preferred control methods for any particular site. Timing is primarily based on the growth stage of the plants to be mowed (mowing should always be done prior to seed maturation), which typically occurs later in the last half of the summer, secondarily, on the growth stage of the desired plants. If mowing occurs after seed maturation, hand clean, with brush or broom, upper parts of contaminated mowing equipment prior to moving to new locations, especially uncontaminated locations.

## Mower Height

Most grasses can tolerate short mowing once dormant. If the dominant vegetation has not yet shifted to invasive species and still contains adequate grass cover, mowing should generally be timed so the invasive plants are at the flowering stage and grasses are dormant. When the dominant vegetation is heavily infested with invasive plants, mowing height should be set at two inches high when the invasive plant is at the flowering stage. However, in some cases invasive species will reach the appropriate stage for mowing, but the grasses have not reached dormancy. If so, mow the invasive plants at a height above the desired plants. Mowing above the height of actively growing grasses allows seed production and unrestricted growth; this maintains vigor needed to minimize reinvasion. Defoliating the invasive plants reduces seed production and vigor, increasing resources available for neighboring grasses.

## Mowing Frequency

Mowing frequency for invasive species control should depend upon precipitation and the mowing tolerances of the vegetational function of relative growth rates, leaf replacement potential and the plant's ability to increase photosynthesis after mowing to compensate for leaf loss. Particularly important are the number, location and source of growing points on plant stems. An effective mowing strategy minimizes the removal of growing points of the desired plants and maximizes removal of growing points of the invasive plants. In addition, for annual, biennial, and tap rooted perennials the frequency of mowing will depend on precipitation. A single midsummer mowing after flower production can reduce or eliminate seed production and shift the balance in favor of desired plants in areas with little to no summer rain. However, as summer rains increase, regrowth potential increases, and mowing may increase plant vigor and seed production similar to pruning, requiring additional mowing.

**BMP # 9**

Whenever possible and to the extent practicable, mowing should be avoided in areas containing invasive plants. If mowing is to be performed as an invasive species management tool District Maintenance personnel must consult with the VTrans State Highway Mowing BMP http://www.aot.state.vt.us/ops/documents/AOT-OPS_Mowing.PDF to ensure deviations in normal mowing frequency and timing for invasive species are allowable under the "Conditions & Exceptions" section of the Mowing BMP.

**BMP # 10**

To avoid spreading invasive plants when mowing, invasive plant seeds and other plant material must be removed from mowing equipment. Equipment must be cleaned at least daily, as well as prior to transport. This can be done with a brush or broom at the mowing site. Water should not be used unless a portable wash station is utilized (see BMP # 7). Maintenance personnel should avoid coming in direct contact with poisonous invasive plants and wear appropriate clothing. (ie. long sleeve shirt and gloves)

**BMP # 11**
Some invasive plants can sprout from small fragments of stem. Japanese knotweed, Purple loosestrife, and Phragmites are some of these plants. If these plants are not causing a safety concern, mow around them where possible.

**BMP # 12**
If these plants are causing safety concerns (blocking signs or sight distance, or encroaching on the roadway or shoulders), they should be removed using one of these methods. If plant populations are too large then consider BMP #13 or #14.

- Whenever possible and to the extent practicable these plants should be cut with hand tools or line trimmers.
- Whole, intact stems can be left at the site of infestation, or stems can be bagged in heavy- duty plastic bags and allowed to rot in the bags prior to disposal, burned off-site, or buried at least three feet below grade; five feet below grade for Japanese knotweed.

**BMP # 13**
If these plants are too large to manage by hand, they can be mowed preferably prior to seed maturation, (approximately August 1st). All equipment must be cleaned thoroughly before leaving the site of infestation. Mowing should be limited to only the portion of the patch that is impacting safety.

**BMP # 14**

Herbicide Use: The intent to use herbicides to control invasive plants in the highway rights-of-ways is specific to preventing highway infrastructure damage and costly maintenance. Most importantly, it is intended to protect the traveler by addressing safety concerns and highway workers health when threatened by poisonous plants. Only VTrans Certified Pesticide Applicators and or VTrans Certified Pesticide Applicator Contractors listed on the Department Agriculture Food and Markets (VDAFM) Spray Permit will apply herbicides to VTrans right-of-ways.

It is not the intent of this BMP to eradicate or control all invasive plants in the rights-of-ways. With that said VTrans, is willing to work other people interested in controlling these plants for their own reasons. A permit to work in the highway right-of-ways may be issued to those people by VTrans. However, no hebicides will be allowed to be sprayed with this VTrans permit.

On an annual basis, VTrans solicits a recommendation from the Vermont Pesticide Advisory Council (V.P.A.C.) to spray herbicides as part of a Permit Spray Request which is then sent to the Secretary of Agriculture Food and Markets for approval. VTrans will include the request to spray for some invasive plants as part of its overall spray program. Along with expert resources; VTrans will follow V.P.AC.'s recommendation to control certain invasives based on their experiences with these plants and the effectiveness of these methods.

**REGULATORY NOTE:** All Vermont Pesticide Rules and Regulations will be followed for invasive plants control in addition to specific language written in the Pesticide Permit. VTrans Priority Invasive Plants and Preferred Control Methods will also be reviewed by V.PA.C. and approved by the (VDAFM) on an annual basis. Plants or methods to control them may be added or deleted based on their recommendations.

# Transport & Disposal of Plants

These activities (Disposal, Herbicide and Transport) are regulated under various permit programs – see "Regulatory Framework" discussion starting on Page 6 and are in place to ensure the movement and disposal effort(s) accomplish the general intent of reducing the overall impact of noxious weeds on the environment and that use of herbicides is performed pursuant to regulatory requirements.

**BMP # 15**
Disposal methods which can be used to destroy plant material include:

- Drying/Liquefying: For large amounts of plant material or for plants with rigid stems, place the material on asphalt, and under tarps, or heavy plastic to prevent the material from blowing away. For smaller amounts of plant material or for plants with pliable stems, bag the material in heavy- duty (3 mil or thicker) garbage bags. Keep the plant material covered or bagged for at least one month. Material is nonviable when it is partially decomposed, very slimy, or brittle. Once material is nonviable, it can be disposed of in an approved landfill or brush pile. Recommended for Japanese knotweed, Purple loosestrife, and Phragmites.
- Brush Piles: Plant materials from most invasive plants can be piled on site to dry out. However, when piling Purple loosestrife, Phragmites, and Japanese knotweed, care must be taken to pile stems so that the cut surfaces are not in contact with soil. This method is not recommended for any invasive plant with seeds or fruit attached, unless plants can be left within the limits of the infestation.
- Burying: Plant material from most invasive plants can be buried a minimum of three feet below grade. This method is best used on a job site that is already has disturbed soils. Recommended for any invasive plant but Japanese knotweed, unless it can be buried at the site of infestation at least five feet below grade.
- Burning: Plant material should be taken to a designated burn pile. (All necessary permits must be obtained before burning). Recommended but often not feasible for any invasive plant, especially Japanese knotweed, Purple loosestrife and Phragmites.

**BMP # 16**
Herbicide: If herbicide are applied at the disposal sites only licensed applicators with a permit from the Vermont Agency of Agriculture Food and Markets are allowed to apply herbicide treatments.

**BMP # 17**
Transport: Invasive plant material must be covered during transport and transport vehicles swept clean at the location transported to.

**REGULATORY NOTE:** VTrans Operations Division (VTrans Ops) has consulted with the Agency of Agriculture, Food and Markets (AAFM) to determine the need for permitting a variance noted under Quarantine Rule Section VI: Variances and Exemptions. In doing so, VTrans Ops obtained the written acceptance of these BMP's as its "Statewide Management Control Plan" covering these regulated activities and confirmation from the AAFM indicating that these BMPs meet the intent of the regulations. Refer to ATTACHMENT A for this letter which specifically exempts the movement of listed weeds over roads or highways and also serves as a general permit to move and dispose listed noxious weeds and associated material. The VTrans Landscape Coordinator will lead and coordinate communication between Agencies and will educate and provide ongoing technical assistance to VTrans staff.

## Excavated Material (includes ditching)

**BMP # 18**
Excavated material from the areas containing invasive plants may be reused within the exact limits of the infestation. Excavated material taken from the sites that contain invasive plant materials cannot be used away from the site of infestation until all viable plant material is destroyed.

**BMP # 19**
Any excavated material that contains viable plant material and is not reused within the limits of the infestation must be stockpiled on an impervious surface until viable plant material is destroyed or the material must be disposed. Material must be disposed of by burying a minimum of three feet below grade. Japanese knotweed must be buried at least five feet below grade.

**BMP # 20**
Whenever possible, excavation should be avoided in areas containing Japanese knotweed, Purple loosestrife and Phragmites. If excavation does occur in these areas, the BMPs described in Section II must be followed.

**BMP # 21**
Excavated materials including soil and other materials containing invasive plants must be covered during transport.

## Stockpiling of Invasive Plants

**BMP # 22**
If viable invasive material is transported to a staging area to be destroyed, all material must be covered during transport.

**BMP # 23**
Manage stock piles to limit the spread of invasive plants. The first step is to plant cover crops to prevent the establishment of invasive plants. Plant fast-growing grasses to shield and bind the soil. Mechanically disturb stockpiled soil to prevent growth of the invasive plants. Cover exposed piles of soil or construction material with plastic sheeting.

# Section II – VTrans Priority Invasive Plant Species

## Preferred Control Methods

**BMP # 24**

**Japanese knotweed Control Option #1: Chemical Control**
Herbicide treatment is the most effective way to eradicate knotweed. The best time to apply herbicide is late summer or early fall, when the plants are just starting to flower. The following application methods are effective; however, treatments will likely be required for at least two consecutive years, regardless of the method used.

Effective herbicide treatments:

a) Early summer cut followed by a late summer/early fall foliar spray – best for small to medium sized populations
b) Foliar spray twice in one growing season – best for large, dense populations
c) Stem injection – best for small to medium sized populations
d) Cut & fill (stem cut and filled with herbicide) – best for small to medium sized populations

Important considerations:

a) Any method that requires cutting the knotweed stems necessitates proper disposal of the cut stems.
b) A permit from the Vermont Agency of Food and Markets must be obtained prior to applying herbicide. Application of herbicide must be consistent with herbicide label and carried out by a licensed applicator.
c) Avoid herbicide drift and spillage to minimize impacts to non-target species.

**BMP # 25**

**Japanese knotweed Control Option #2: Mechanical Control**
If herbicide treatment is not an option, cutting is sometimes successful in eradicating knotweed, but only with small, young populations, and only when done repeatedly (at least 4 times each growing season) for several years. Cutting by hand with a scythe or loppers is preferable to mowing. Cut material should be destroyed as described in Section I (BMP # 12), and all equipment should be cleaned prior to leaving the site (see Section I BMP # 7).

# Preferred Control Methods

**BMP # 26**

**Loosestrife Control Option #1: Mechanical Control**
Cutting or pulling by hand can be effective in eradicating small, young populations. However, this treatment must be continued for several years and any disturbed soil must be stabilized. Any material that is cut or pulled must be rendered non-viable (see Section I – BMPs # 12 and # 15). Both stem and root fragments can sprout new plants.

**BMP # 27**

**Loosestrife Control Option #2: Biological Control**
Biological control measures have been developed for loosestrife and consist of leaf-feeding and root-feeding beetles. This control method is best for large, dense populations. More information about this option can be obtained from the Vermont Agency of Natural Resources.

**BMP # 28**

**Loosestrife Control Option #3: Chemical Control**
Herbicide can be applied in late July. The selected herbicide must be approved for use in wetlands. Treatments will likely be required for at least two consecutive years, regardless of the method used.

Effective herbicide treatments:

a) Foliar spray
b) Cut stem

Important considerations:

a) A permit from the Vermont Agency of Food and Markets must be obtained prior to applying herbicide. Application of herbicide must be consistent with herbicide label and carried out by a licensed applicator.
b) Avoid herbicide drift and spillage to minimize impacts to non-target species.

## Preferred Control Methods

**BMP # 29**

**Phragmites Control Option #1: Mechanical Control**
Cutting by hand, pulling, or digging can be effective in eradicating small, new populations. These methods should be used in late July or early August when the plants are close to or in tasseling stage. This treatment must be continued for several years and any disturbed soil must be stabilized. Any material that is removed must be rendered non-viable (see Section I – BMPs # 12 and # 14). Both stem and root fragments can sprout new plants.

**BMP # 30**

**Phragmites Control Option #2: Chemical Control**
Herbicide can be applied in late summer (after tasseling). The selected herbicide must be approved for use in wetlands. Treatments will likely be required for at least two consecutive years, regardless of the method used.

Effective herbicide treatments:

a) Foliar spray
b) Stem injection

Important considerations:

a) A permit from the Vermont Agency of Food and Markets must be obtained prior to applying herbicide. Application of herbicide must be consistent with herbicide label and carried out by a licensed applicator.
b) Avoid herbicide drift and spillage to minimize impacts to non-target species.

## Other Species of Concern

Additional species of concern include Wild Parsnip, Wild Chervil, Giant Hogweed and other priority invasive species. These prevention and management practices apply to the entire target species identified herein and others as may be identified in the future.

# Section III – RESOURCES

## CONTACTS

State of Vermont, Agency of Transportation, Operations Division
One National Life Drive, Montpelier, VT 05633-5001

Craig Dusablon, Landscape Coordinator, VTrans Operations Division, Technical Services Section, Environmental Program
802-527-5448

## WEBSITES

http://www.aot.state.vt.us/ops/index.htm

http://www.aot.state.vt.us/ops/TechnicalServices/Landscape.htm

http://www.vermontagriculture.com/

http://www.vermontagriculture.com/ARMES/plantindustry/index.html

http://www.vermontagriculture.com/ARMES/plantindustry/plantPathology/weeds/list.html

http://www.invasivespeciesinfo.gov/laws/execorder.shtml

http://www.fws.gov/northeast/cpwn/pdf/activities/InvasiveSpecies/BMPsforRoadsideInvasivePlantsNH.pdf

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_363.pdf

http://environment.transportation.org/environmental_issues/construct_maint_prac/compendium/manual/9_0.aspx

https://www.dot.ny.gov/divisions/engineering/environmental-analysis/repository/InvasiveSpeciesBMPs_Transp-UtilityROWs.rtf

https://www.dot.ny.gov/divisions/engineering/design/landscape/trees/invasive-species?nd=nysdot

http://www.vtinvasives.org/

# GLOSSARY

| | |
|---|---|
| **Annual** | a plant that completes its life cycle in one year. |
| **Emergent** | having most vegetative growth above water. |
| **Germination** | beginning of growth, as from a seed. |
| **Herb** | a plant that does not produce woody, persistent tissue. |
| **Herbaceous** | having aboveground stems that are fleshy instead of woody. |
| **Herbaria** | a collection of dried plants systematically arranged. |
| **Native** | occurring naturally in a given range; not introduced by humans. |
| **Non-native** | introduced to areas outside of the species; natural geographic range. |
| **Nonviable** | not capable of living or developing. |
| **Perennial** | a plant that lives for two years or more. |
| **Propagules** | **i**n horticulture, a propagule is any plant material used for the purpose of plant propagation. |
| **Rhizome** | a horizontal, underground stem that can produce roots and aboveground stems. |
| **Vegetative Reproduction** | propagation by means other than seeds, including rhizomes, runners, stem cuttings, and root cuttings. |
| **Viable** | capable of growing or developing. |
| **Woody** | having hard, lignified stem tissue that persists throughout the year. |

VERMONT

ATTACHMENT A

**Agency of Agriculture, Food and Markets**
116 State Street
Montpelier, VT 05620-2901
**www.VermontAgriculture.com**

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September 11, 2012

Craig DiGiammarino
Operations Environmental Program Manager
Vermont Agency of Transportation (VTrans)
Operations Division - Technical Services Section
One National Life Drive, Montpelier, VT 05633-5001

Re: AOT Best Management Practices Exemption under AAFM Noxious Weed Rule

Dear Craig:

I have reviewed your Best Management Practices document (VTrans State Highway System Roadside Terrestrial Invasive Plants Best Management Practices (BMPs)) for consistency with the intent of the recognized exemptions and variances allowable within the Agency of Agriculture, Food and Markets Noxious Weed Quarantine Rule (section VI: Variances and Exemptions). I concur that your BMPs are consistent with the general intent of reducing the overall impact of listed noxious weeds on the environment.

Therefore, actions undertaken by AOT or your contractors and subcontractors with regard to movement of listed weeds over roads or highways of the state are covered by the exemption specified under VI (B) (1), allowing movement of regulated articles on any highway or road of the state as your efforts are recognized as legitimate management or control actions. AOT movement of these plants as part of control or mitigation activities is considered exempt, and do not require a variance under this section of the rule.

This letter shall also serve as a general permit to move and dispose listed noxious weeds and associated material (soils, debris, etc.) for the specific purposes of weed control or infestation mitigation efforts (VI (E)) on properties managed by VT AOT and their contractors/subcontractors, insofar as the management efforts are consistent with the practices and procedures outlined in your BMP document, and do not contribute to the spread of noxious weeds beyond the extent of existing infestations. Actions inconsistent with the rule, existing law, or with your BMPs are not covered under this exemption, and remain subject to administrative action.

Should you have any questions about this letter or the quarantine, please do not hesitate to contact me.

Sincerely,

Timothy F. Schmalz

cc.
Chuck Ross, Vermont Secretary of Agriculture

file