High Bridge Wind Project
Invasive Species Control Plan

High Bridge Wind, LLC

2019

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1. PURPOSE AND GOAL

High Bridge Wind, LLC, ("High Bridge Wind") is proposing to construct a wind energy generating facility in the Town of Guilford in Chenango County, New York (the "Project"). The purpose of this Invasive Species Control Plan (ISCP) is to facilitate the identification, control, and monitoring of invasive species within areas where vegetation or soil is disturbed during construction of the Facility (the "Study Area"). The goal of the ISCP is to prevent expansion of invasive species within all areas that are disturbed during construction of the Facility. The ISCP will be considered successful if no new invasive species colonize the Study Area and invasive species currently within the Study Area do not establish new populations, when compared to baseline survey data.

This ISCP describes specific measures that will be implemented to minimize the chance that movement of topsoil, fill, and construction equipment will inadvertently introduce or increase the presence of invasive species within the Study Area. In addition, this ISCP describes a post construction monitoring plan to evaluate the success of these measures and implement corrective action if needed.

2. LAWS AND REGULATIONS

The Environmental Conservation Law and the Agriculture and Markets Law authorize the NYSDEC and the NYS Department of Agriculture and Markets (NYSDAM) to regulate invasive species. Under the Environmental Conservation Law, the NYSDEC has regulatory authority regarding Lands and Forests (Article 9) and Fish and Wildlife (Article 11). Under the Agriculture and Markets Law, NYSDAM has the regulatory authority regarding the Inspection and Sale of Seeds (Article 9); Integrated Pest Management Program (Article 11); and Prevention and Control of Disease in Trees and Plants (Article 14).

The official State listing of *Prohibited and Regulated Invasive Species* was last updated on September 10, 2014 (Appendix A). Part 575 of 6 NYCRR includes: 1) a list of prohibited species which are unlawful to knowingly possess with the intent to sell, import, purchase, transport, or introduce; 2) a list of regulated species which are legal to possess, sell, purchase, propagate, and transport but may not be knowingly introduced into a free-living state; and 3) requirements for a permit for research, education, and other approved activities involving prohibited species and release of regulated species into a free-living state. These regulations are expected to help control invasive species by preventing the introduction of new invasive species and the spread of existing populations.

Species listed as prohibited and regulated by the State will be the focus of identification, treatment, and control for the Project, although control methods may also be applied to large populations of non-listed invasive species of special concern that occur within the Project.

3. EXISTING CONDITIONS

Qualified ecologists surveyed the Study Area during the growing season in 2019 to identify NYSDEC-listed Prohibited Invasive Plant Species (NYSDEC 2014). All invasive species observed within the Study Area were recorded (see Table 1) and a GPS-enabled device was used to record the center point of any invasive species population with an absolute cover value above 25%.

The Study Area is characterized as predominately forested, interspersed with rural residences and areas of active and reverting agricultural land. Forests within the Project are largely intact, although past and current disturbance from logging activities is evident through the presence of logging roads. Invasive species identified within the Study Area were primarily associated with previously disturbed areas, including roadsides, skid trails, agricultural fields, rural residences, and hedgerows. Invasive species were also encountered on the edges of forests and streams. Ten different plants listed as prohibited invasive species were identified within the Study Area. These species are listed below in Table 1 and are mapped in Figure 22-1 of the High Bridge Wind Project Article 10 Application.

Table 1: Invasive Species Identified Within Study Area

Common Name	Scientific Name
Garlic mustard	*Alliaria petiolata*
Mugwort	*Artemisia vulgaris*
Japanese barberry	*Berberis thunbergii*
Spotted knapweed	*Centaurea stoebe*
Canada thistle	*Cirsium arvense*
Autumn olive	*Elaeagnus umbellata*
Morrow's honeysuckle	*Lonicera morrowii*
Japanese stilt grass[1]	*Microstegium vimineum*
Multiflora rose	*Rosa multiflora*
Swallow-wort[2]	*Vincetoxicum* sp.

[1] Due to the phenology of this species and the time of the survey, identification of this species is considered tentative. Presence will be confirmed during the invasive species survey conducted the growing season prior to the start of construction.
[2] Due to the phenology of this species and the time of the survey, it was not possible to determine whether the observed plants were *V. rossicum* or *V. nigrum.* However, both are listed as prohibited invasive species under 6 NYCRR Part 575.

Distribution and density of invasive species within the Study Area varies by species. Multiflora rose and Morrow's honeysuckle are both common and widespread. They occur throughout the Study Area, frequently together, with particular concentrations in hedgerows, successional habitats, and along forest edges, but are also present in low numbers in forest understories. Garlic mustard is also quite common, mostly in hedgerows and forest understories, especially near edges of agricultural fields. Japanese barberry and autumn olive were each observed in a small number of locations across the Study Area, the former in hedgerows and forest understories and the latter in hedgerows and successional areas. The other five species listed in Table 1 were relatively limited within the Study Area (e.g., mugwort was only observed in one location along a farm lane).

These existing populations of invasive species provide the opportunity for the further spread and/or transport of invasive plant species during the construction and operation of the Facility, or as a result of other processes that will occur irrespective of the development of the proposed Facility (e.g., the natural spread of multiflora rose by avian species).

4. PRE-CONSTRUCTION MONITORING FOR INVASIVE SPECIES

In the growing season prior to the commencing of construction-related activities, qualified ecologists will conduct a Pre-Construction Invasive Species Survey to document the location and absolute cover of invasive species within the Study Area. The data collected in the course of this survey will serve as the comparative baseline for all post-construction

invasive species surveys.

The Pre-Construction Invasive Species Survey methodology will consist of qualified ecologists surveying the Study Area and visually estimating the cover of all identified NYSDEC-listed Prohibited Invasive Plant Species (NYSDEC 2014). A GPS-enabled device will be used to record the boundaries of invasive species populations with absolute cover values above 25%; point data will be collected for invasive species populations with absolute cover values at or below 25%. All recorded populations of invasive species will be assigned a classification code[1] for absolute cover, as defined in Table 2.

Table 2: Invasive Species Cover Classification Codes

Classification Code	Description/Absolute Cover
1	Sparse: 5% or less absolute cover
2	Patchy: 6-25% absolute cover
3	Dense: 26-55% absolute cover
4	Monoculture: 56-100% absolute cover

Species data will be recorded using a four-letter code corresponding to the first two letters of the scientific name of the genus and the first two letters of the scientific name of the specific epithet (e.g., since the scientific name of multiflora rose is *Rosa multiflora*, multiflora rose populations will be labeled "ROMU"). Collected data will be used to produce a map series of invasive plant coverage throughout the Study Area. Photos will be taken to document pre-construction conditions throughout the Study Area, and example photos will be taken of each species detected.

The survey methods employed in this baseline survey will allow for a post-construction evaluation of the goals established in this ISCP. During post-construction surveys, an appropriately qualified biologist will return to the Study Area and employ the same methodology used for this baseline survey to generate results that will allow for a comparison between pre- and post-construction conditions.

5. PROPOSED CONTROL METHODS

During construction, all High Bridge-affiliated workers will be educated on the measures for controlling the spread of invasive species. This education will be accomplished through various training sessions provided by an independent, third-party environmental monitor hired by the Applicant ("Environmental Monitor"). The Environmental Monitor will confirm and document the implementation of the following control measures, as applicable:

5.1. Construction Materials Inspection

All imported construction material (e.g., seed mixes, mulch, topsoil, sand, gravel, crushed stone, rock, packing materials, etc.) must be certified to be free of invasive plant materials and other deleterious material before entering the Project.

[1] Classification codes were created based on established invasive plant survey protocols (Higman et al. 2012; Montana State University Extension 2006).

Proper methods for segregating stockpiled and spoil material will be implemented, and excavated soil will be reused to the maximum extent possible on the site that it was excavated from to limit opportunities for proliferation of non-native flora and other invasive species. In addition, at the earliest practicable time following construction activities, temporarily stockpiled soil and/or spoil materials will be spread and graded to reasonably match original contours. Soil and/or spoils excavated from areas free of invasive species will be stockpiled in designated staging areas with no invasive species. Excess excavated material should be disposed of at a Regulated Waste Facility or treated by a process that destroys seeds or propagules to prevent the spread of invasive species. Appropriate sediment and erosion control measures outlined in the Project-specific Stormwater Pollution Prevention Plan (SWPPP) will also be implemented to limit the spread of invasive species from one area to another.

5.2. Target Species Treatment and Removal

The results of the Pre-Construction Invasive Species Survey will be used to identify specific populations of invasive species that may require treatment and removal. Target populations will be identified based on the species and the location and extent of the population relative to populations of the same species within the Study Area. Specific treatment and disposal methods will be determined through consultation with the on-site Environmental Monitor. These methods may include: herbicide treatment, placement in an interim designated secure container, transport in a sealed contained and proper offsite disposal in a designated secure container, or leaving infested vegetative materials in the area that is already infested, provided that no filing of wetlands or adjacent areas will occur as a result. Any herbicide spot treatments would be applied by a Certified Commercial Pesticide Application, Commercial Pesticide Technician, or a Private Pesticide Applicator (i.e., individuals that meet the requirements set forth in 6 NYCRR Part 325, Application of Pesticides), in accordance with NYSDEC-approved herbicide and treatment measures.

Species-specific treatment and removal recommendations established by the NYSDEC for common invasive species that are known to occur within the regional Project area are summarized below (see also Appendix B). These treatment and removal recommendations will be applied by the Applicant, where applicable. Additional species-specific treatment and removal methods may be included in the Final Invasive Species Control Plan and/or the Site Engineering and Environmental Plan (SEEP), and/or may be incorporated into training efforts conducted by the Environmental Monitor.

Emerald Ash Borer

The emerald ash borer (*Agrilus planipennis*) is an invasive insect that has caused widespread die-offs of ash (*Fraxinus spp.*) trees in much of New York State. Chenango County is included in the NYSDEC and NYSDAM emerald ash borer restricted zone and known infestations have been documented near the intersecting borders of Chenango, Otsego, and Delaware Counties. In order to prevent further infestations, any ash trees (*Fraxinus sp.)* removed during Project construction should be treated according to NYSDEC and NYSDAM regulations.

Hemlock Wooly Adelgid

To prevent the spread of the hemlock woolly adelgid (*Adelges tsugae*), an invasive insect that has been documented in the southern portion of Chenango County (NYSDEC, 2017a), the above treatment and removal methods should also be implemented where clearing of eastern hemlock (*Tsuga canadensis*) trees occurs. In addition, incidences of infected trees should be reported to the NYSDEC to aid in documenting the spread of this species in New York State.

Giant Hog Weed

Giant hog weed (*Heracleum mantegazzianum*) is an invasive plant species found in northern portions of Chenango County that poses a significant safety concern to project personnel (NYSDEC, 2018). Detailed control methods provided by the NYSDEC, along with Health Hazards and Safety Instructions can be found in Appendix B. This species has not been observed within the Study Area to date. However, should it be identified during the preconstruction survey, all site personnel responsible for invasive species control and/or handling of the specific species should be prepared to wear the following: long waterproof gloves, long sleeves, pants, boots, and eye protection.

5.3. Construction Equipment and Personnel Sanitation

The introduction of non-native invasive plant species will be controlled by assuring that all construction equipment and personnel are clean (free of mud, debris, vegetation, roots, debris, etc.) upon arrival and that equipment utilized in areas with invasive species is cleaned prior to moving out of the infested area. The intent is that equipment should arrive at the site clean and leave the site clean. Equipment/clothing cleaning stations will be established to ensure that invasive species seeds and other viable plant parts cannot spread through runoff or other means. Cleaning stations will be located only within areas currently infested with invasive species. Power-washing with clean water (no soaps or chemicals) or compressed air will be used to clean equipment, where feasible. If conditions do not allow the use of power washing or compressed air, the equipment shall be cleaned of visible signs of plant material prior to exiting infested areas. Water used for cleaning equipment shall not come from surface waters that could contain invasive species. All personnel clothing, footwear, and gear should be cleaned of visible signs of plant material prior to exiting infested areas. Any wash water (including spray) shall not be discharged within 100 feet of any stream, wetland or adjacent area, or storm-water conveyance (ditch, catch basin, etc.). The Environmental Energy Alliance of New York Best Management Practices for Preventing the Transportation of Invasive Plant Species is also attached to this report, as an additional guidance document to minimize the spread of invasive species (Appendix D).

5.4. Restoration

Areas where soil is temporarily disturbed during construction will be graded, stabilized and restored in accordance with the Project-specific SWPPP. All fill material brought to the Project site will be free of non-native invasive plant species. To minimize the chance of invasive species spreading or increasing in abundance, all disturbed soils within and adjacent to areas with invasive species should be stabilized with a native seed mix and weed-free mulch as soon as possible following construction.

6. POST-CONSTRUCTION MONITORING FOR INVASIVE SPECIES

6.1. Term

Post-construction monitoring for invasive species will be conducted one, three, and five years following the completion of construction (the "MP Term").

6.2. Monitoring

During the MP Term, the Applicant will monitor the Study Area to identify increases in known invasive species. This monitoring will be conducted one, three, and five years following construction and will occur during the growing season. Treatment of any increases in invasive species will generally adhere to Integrated Pest Management (IPM) principles and the controls described in the Final ISCP.

6.3. Reports

On or before December 31 of the respective monitoring year during the MP Term, the Applicant will submit to the NYSDEC a post-construction monitoring report detailing the monitoring and the status of known invasive species in the Study Area.

6.4. Invasive Species Remedial Plan

If consecutive monitoring reports demonstrate no new invasive species in the Study Area and no new locations of existing invasive species in the Study Area, then the goals of this plan will have been deemed to have been met and the MP Term shall end.

If, at the end of the MP Term, the Applicant identifies new invasive species and/or increases in the invasive species cover above what was documented in the Pre-Construction Invasive Species Survey, an Invasive Species Remedial Plan will be prepared. The Invasive Species Remedial Plan will describe the likely reasons for not achieving the goals of this ISCP, describe the actions necessary to correct the situation, and the schedule for conducting the remedial work. Once approved, the Invasive Species Remedial Plan will be implemented according to an approved schedule

7. REFERENCES

Higman, P.J., M.R. Penskar, Y.M. Lee, M.A. Sanders, and R.L. Rogers. 2012. *Garden Island Rare Species and Invasive Plant Survey.* Michigan Natural Features Inventory. Report Number 2012-02. Available at: https://mnfi.anr.msu.edu/reports/2012-02%20Garden%20Island%20Rare%20Species%20and%20Invasive%20Plant%20Survey.pdf.

Montana State University Extension. 2006. *Inventory and Survey Methods for Nonindigenous Plant Species*. Available at: http://www.weedcenter.org/store/images/books/INVENTORYBOOK.pdf.

New York State Department of Environmental Conservation (NYSDEC). 2017a. *Hemlock Woolly Adgelid Map.* Updated October 2017. Available at http://www.dec.ny.gov/animals/86382.html.

NYSDEC. 2017b. *Emerald Ash Borer Regulations and Quarantines*. Updated May 2017. Available at: http://www.dec.ny.gov/animals/47761.html.

NYSDEC. 2018. *Giant Hogweed Statewide Distribution Map.* Updated March 2018. Available at: https://www.dec.ny.gov/animals/41952.html.

Appendix A

NYSDEC Prohibited and Regulated Invasive Species

6 NYCRR Part 575
Prohibited and Regulated Invasive Species
September 10, 2014

ALGAE AND CYANOBACTERIA

Prohibited:
Caulerpa taxifolia, Killer Green Algae
Didymosphenia geminata, Didymo
Prymnesium parvum, Golden Algae

Regulated:
Cylindrospermopsis raciborskii, Cylindro
Grateloupia turuturu, Red Algae

PLANTS

Prohibited:
Acer pseudoplatanus, Sycamore Maple
Achyranthes japonica, Japanese Chaff Flower
Alliaria petiolata, Garlic Mustard
Ampelopsis brevipedunculata, Porcelain Berry
Anthriscus sylvestris, Wild Chervil
Aralia elata, Japanese Angelica Tree
Artemisia vulgaris, Mugwort
Arthraxon hispidus, Small Carpet Grass
Berberis thunbergii, Japanese Barberry
Brachypodium sylvaticum, Slender False Brome
Cabomba caroliniana, Fanwort
Cardamine impatiens, Narrowleaf Bittercress
Celastrus orbiculatus, Oriental Bittersweet
Centaurea stoebe (C. biebersteinii, C. diffusa, C. maculosa misapplied, C. xpsammogena), Spotted Knapweed
Cirsium arvense (C. setosum, C. incanum, Serratula arvensis), Canada Thistle
Cynanchum louiseae (C. nigrum, Vincetoxicum nigrum), Black Swallow-wort
Cynanchum rossicum (C. medium, Vincetoxicum medium, V. rossicum), Pale Swallow-wort
Dioscorea polystachya (D. batatas), Chinese Yam
Dipsacus laciniatus, Cut-leaf Teasel
Egeria densa, Brazilian Waterweed
Elaeagnus umbellata, Autumn Olive
Euphorbia cyparissias, Cypress Spurge
Euphorbia esula, Leafy Spurge
Ficaria verna (Ranunculus ficaria), Lesser Celandine
Frangula alnus (Rhamnus frangula), Smooth Buckthorn
Glyceria maxima, Reed Manna Grass
Heracleum mantegazzianum, Giant Hogweed
Humulus japonicus, Japanese Hops
Hydrilla verticillata, Hydrilla/ Water Thyme
Hydrocharis morsus-ranae, European Frogbit
Imperata cylindrica (I. arundinacea, Lagurus cylindricus), Cogon Grass
Iris pseudacorus, Yellow Iris
Lepidium latifolium, Broad-leaved Pepper-grass
Lespedeza cuneata, Chinese Lespedeza
Ligustrum obtusifolium, Border Privet
Lonicera japonica, Japanese Honeysuckle
Lonicera maackii, Amur Honeysuckle
Lonicera morrowii, Morrow's Honeysuckle
Lonicera tatarica, Tartarian Honeysuckle
Lonicera x bella, Fly Honeysuckle
Ludwigia hexapetala (L. grandiflora), Uruguayan Primrose Willow
Ludwigia peploides, Floating Primrose Willow
Lysimachia vulgaris, Garden Loosestrife
Lythrum salicaria, Purple Loosestrife
Microstegium vimineum, Japanese Stilt Grass
Murdannia keisak, Marsh Dewflower
Myriophyllum aquaticum, Parrot-feather
Myriophyllum heterophyllum, Broadleaf Water-milfoil
Myriophyllum heterophyllum x M. laxum, Broadleaf Water-milfoil Hybrid
Myriophyllum spicatum, Eurasian Water-milfoil
Nymphoides peltata, Yellow Floating Heart
Oplismenus hirtellus, Wavyleaf Basketgrass
Persicaria perfoliata (Polygonum perfoliatum), Mile-a-minute Weed
Phellodendron amurense, Amur Cork Tree
Phragmites australis, Common Reed Grass
Phyllostachys aurea, Golden Bamboo
Phyllostachys aureosulcata, Yellow Groove Bamboo
Potamogeton crispus, Curly Pondweed
Pueraria montana, Kudzu
Reynoutria japonica (Fallopia japonica, Polygonum cuspidatum), Japanese Knotweed
Reynoutria sachalinensis (Fallopia sachalinensis, Polygonum sachalinensis), Giant Knotweed
Reynoutria x bohemica (Fallopia x bohemica, Polygonum x bohemica), Bohemian Knotweed
Rhamnus cathartica, Common Buckthorn
Rosa multiflora, Multiflora Rose
Rubus phoenicolasius, Wineberry
Salix atrocinerea, Gray Florist's Willow
Silphium perfoliatum, Cup-plant
Trapa natans, Water Chestnut
Vitex rotundifolia, Beach Vitex

Regulated:
Acer platanoides, Norway Maple
Clematis terniflora, Japanese Virgin's Bower
Euonymus alatus, Burning Bush
Euonymus fortunei, Winter Creeper
Miscanthus sinensis, Chinese Silver Grass
Robinia pseudoacacia, Black Locust

FISH

Prohibited:
Channa argus, Northern Snakehead

Channa marulius, Bullseye Snakehead
Channa micropeltes, Giant Snakehead
Clarias batrachus, Walking Catfish
Gambusia affinis, Western Mosquitofish
Gambusia holbrooki, Eastern Mosquitofish
Hypophthalmichthys harmandi, Largescale Silver Carp
Hypophthalmichthys molitrix, Silver Carp
Hypophthalmichthys nobilis, Bighead Carp
Misgurnus anguillicaudatus, Oriental Weatherfish
Mylopharyngodon piceus, Black Carp
Neogobius melanostomus, Round Goby
Petromyzon marinus, Sea Lamprey
Proterorhinus semilunaris (P. marmoratus), Tubenose Goby
Tinca tinca, Tench

Regulated:
Carassius auratus, Goldfish
Cyprinella lutrensis, Red Shiner
Cyprinus carpio, Common Carp/ Koi
Gymnocephalus cernuus, Ruffe
Monopterus albus, Asian Swamp Eel
Oreochromis aureus, Blue Tilapia
Oreochromis niloticus, Nile Tilapia
Pterois miles, Common Lionfish
Pterois volitans, Red Lionfish
Sander lucioperca (Stizostedion lucioperca), Zander
Scardinius erythrophthalmus, Rudd

AQUATIC INVERTEBRATES

Prohibited:
Bellamya chinensis (Cipangopaludina chinensis),Chinese Mystery Snail
Bellamya japonica, Japanese Mystery Snail
Bithynia tentaculata, Faucet Snail
Bythotrephese longimanus (B. cederstroemi), Spiny Water Flea
Cercopagis pengoi, Fishhook Water Flea
Corbicula fluminea, Asian Clam
Crassostrea ariakensis, Suminoe Oyster
Didemnum spp., Carpet Tunicate
Dreissena polymorpha, Zebra Mussel
Dreissena rostriformis bugensis, Quagga Mussel
Eriocheir sinensi, Chinese Mitten Crab
Hemigrapsus sanguineus, Asian Shore Crab
Hemimysis anomala, Bloody Red Shrimp
Orconectes rusticus, Rusty Crayfish
Potamopyrgus antipodarum, New Zealand Mud Snail
Rapana venosa, Veined Rapa Whelk
Styela plicata, Asian Sea Squirt

Regulated:
Carcinus maenas, European Green Crab
Daphnia lumholtzi, Water Flea
Hemigrapsus takanoi (H. penicillatus), Brush-clawed Shore Crab/ Grapsid Crab

TERRESTRIAL INVERTEBRATES

Prohibited:
Achatina achatina, Giant Ghana Snail
Achatina fulica (Lissachatina fulica), Giant African Land Snail
Adelges tsugae, Hemlock Woolly Adelgid
Agrilus planipennis, Emerald Ash Borer
Amynthas spp., Asian Earthworms
Anoplophora glabripennis, Asian Longhorn Beetle
Apis mellifera scutellata x A. mellifera ligustica/ A. mellifera iberiensis, Africanized Honey Bee
Archachatina marginata, Giant West African Snail
Cryptococcus fagisuga, Beech Scale
Lymantria dispar, Asian and European Gypsy Moth
Monochamus alternatus, Japanese Pine Sawyer
Pityophthorus juglandis, Walnut Twig Beetle
Sirex noctilio, Sirex Woodwasp

TERRESTRIAL AND AQUATIC VERTEBRATES

Prohibited:
Cygnus olor, Mute Swan
Lepus europaeus, European Hare
Myocastor coypus, Nutria
Nyctereutes procyonoides, Asian Raccoon Dog
Sus scrofa (excluding Sus scrofa domestica), Eurasian Boar

Regulated:
Alopochen aegyptiacus, Egyptian Goose
Cairina moschata, Muscovy Duck
Myiopsitta monachus, Monk Parakeet
Oryctolagus cuniculus, European Rabbit
Trachemys scripta elegans, Red-eared Slider
Xenopus laevis, African Clawed Frog

FUNGI

Prohibited:
Amylostereum areolatum, Sirex Wasp Fungus
Geomyces destructans, White-nose Syndrome
Geosmithia morbida, Thousand Canker Disease
Phytophthora ramorum, Sudden Oak Death

For the official regulations and species lists please see: http://www.dec.ny.gov/regulations/265.html.

New York State Department of Environmental Conservation
Part 575 Invasive Species Regulations
Questions and Answers

What are invasive species?
Invasive species means a species that is non-native to the ecosystem under consideration; and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

Why are invasive species a problem?
Invasive species have a detrimental effect upon the State's natural communities and systems by out-competing native species, diminishing biological diversity, altering community structure and, in some cases, changing ecosystem processes. They can even harm human health.

How will these regulations help?
The regulations were developed by the Department of Environmental Conservation, in cooperation with the Department of Agriculture and Markets. These regulations, once implemented, are expected to help control invasive species by reducing the introduction and spread of invasive species populations by limiting commerce in such species, thereby having a positive impact on the environment.

How were the lists of species in the regulations developed?
The lists of prohibited and regulated species were developed using the standardized species assessment and listing process outlined in the 2010 report "A Regulatory System for Non-native Species". Lists of candidate non-native invasive species were compiled by reviewing other state regulations, reports, lists and consulting with agency experts. A rapid assessment was conducted to determine if the species warranted listing and was already federally regulated. Ecological invasiveness assessments were conducted on each potential invasive species followed by a socio-economic assessment for those ranking High or Very High. The assessment team then placed the species in the appropriate regulatory classification of Prohibited or Regulated. The initial recommendations were submitted to the Invasive Species Advisory Committee (25 Non-Government Organizations) and Council (9 State Agencies) for review and comment. The lists were then incorporated into the regulations.

Why isn't a particular species included on the prohibited or regulated lists?
Due to staffing limitations and time constraints, the initial list of prohibited and regulated species is not all-encompassing. We anticipate that the regulations will be updated on a regular basis. The regulations include language for petitioning for addition or removal of species from the prohibited and regulated lists. Some species were assessed, but do not meet the criteria for prohibition or regulation.

Aren't some of the species listed as either prohibited or regulated already established?
Yes, however, there are areas of the State in which they have not yet established populations and these regulations are intended to slow the spread by reducing the number of individuals of a species released into a region, to which they are not native, associated with the sale and introduction of such species.

When did the regulation become final?
The part 575 invasive species regulations were proposed, and a 60 day to public comment held between October and December 2013. During this time, four public hearings were scheduled across the State. All comments received were reviewed and a summary of public comments and agency responses was compiled. Required changes were made to the final regulations. A summary of the final regulations was published in the State Register September 10, 2014 and the full express terms were published on the Department's website.

Once finalized, when will the regulations become implemented?
A summary of the final regulations was published in the State Register September 10, 2014. The part 575 regulations take effect 6 months later (March 10, 2015).

What is the difference between prohibited and regulated invasive species?
Prohibited invasive species cannot be knowingly possessed with the intent to sell, import, purchase, transport or introduce. In addition, no person shall sell, import, purchase, transport, introduce or propagate prohibited invasive species. Regulated invasive species, on the other hand, are species which cannot be knowingly introduced into a free-living state, or introduced by a means that one should have known would lead to such an introduction, although such species shall be legal to possess, sell, buy, propagate and transport.

What is considered a free-living state?
A species is considered in a free-living state if it is introduced to public lands or lands connected to public lands, natural areas, and public waters or waters connected to public waters.

Are there any exceptions to the definition of a free-living state?
Yes, such exceptions include artificial ponds and water gardens with no outlet to public waters, waters entirely within private land not connected to public waters, and water-use facilities with outflows not providing access to public waters.

Do the regulations require existing populations of species on the prohibited and regulated lists be managed or destroyed by the land-owner?
No, existing populations of non-native invasive species listed as prohibited or regulated and established prior to the implementation of the final part 575 regulations do not require management by the owner. However, once implemented, the final regulations do prohibit commerce involving those species listed as prohibited species and the release of regulated species into a free-living state.

What species have grace periods established in the regulations?
A one year grace period is included in the regulations for Japanese Barberry (*Berberis thunbergii*), during which existing stock of this species may be sold. In addition, a person may possess, sell, offer for sale, distribute, transport, or otherwise market or trade live Eurasian boars (*Sus scrofa*) until September 1, 2015. No person shall knowingly import, propagate or introduce Eurasian boars into a free-living state.

Will there be a fee for permits? No fee is anticipated for permits issued for research, education or other approved activity.

Who will enforce the final regulations?
The regulations will be enforced by the Department of Environmental Conservation, with assistance from the Department of Agriculture and Markets.

Appendix B

Control Methods for Select Invasive Plant Species

CONTROL METHODS FOR PURPLE LOOSESTRIFE
(*Lythrum salicaria*)

PLANT DESCRIPTION

Purple loosestrife is a wetland perennial native to Eurasia that forms large, monotypic stands throughout the temperate regions of the U.S. and Canada. It has a vigorous rootstock that serves as a storage organ, providing resources for growth in spring and regrowth if the plant has been damaged from cuttings. New stems emerge from the perennial roots enabling the plant to establish dense stands within a few years. Seedling densities can approach 10,000-20,000 plants/m² with growth rates exceeding 1 cm/day. A single, mature plant can produce more than 2.5 million seeds annually which can remain viable after 20 months of submergence in water. In addition, plant fragments produced by animals and mechanical clipping can contribute to the spread of purple loosestrife through rivers and lakes.

MANAGEMENT OPTIONS

1. Digging/pulling

Effectiveness: Can be effective in small stands i.e., <100 plants, low-med density (1-75% area), and <3 acres, especially on younger plants in unconsolidated soils.

Methods: Hand-pull plants <2 years old. Use mini-tiller for plants >2 years - gets most of roots w/minimum soil disturbance, has 3 heavy duty prongs on 1 side that are pushed under base of plant, then pry back on handle to leverage plant out of ground. Use weed wrench for plants >2 years old - good w/minimal soil disturbance. In mucky conditions, put base of wrench on small piece of wood (e.g., piece of 2x4) to keep wrench from sinking into mud. Use shovel for plants >2 years old - dig up plant, tamp down disturbed area and/or then replace soil and any existing cover.

Cautions: May increase habitat disturbance and increase spread of loosestrife. This method requires follow-up treatments of sites for 3 years to eliminate re-sprouting from fragments left behind. Must pull/dig ENTIRE rootstock or resprouting will likely occur. Must pull/dig before the plants begin setting seed or must remove flower/seed heads first (cut into bags) to prevent spread of seeds. Also remove previous year's dry seed heads. Erosion control may be necessary.

Disposal: Bag and remove all plant parts from site. Dispose of in approved landfill or incinerate with appropriate permits.

Sanitation: Clean all clothing, boots, and equipment to prevent spread of seed. See item #7 "Sanitation" in the General Practices section.

2. Cutting

Effectiveness: Can be effective in small stands i.e., <100 plants, low-med density (1-75% area), and <3 acres, especially on younger plants.

Methods: Remove flower heads before they go to seed, so seed is not spread when plant is cut or mowed. Repeated cutting and mulching is necessary to permit growth of grasses.

Cautions: Need to repeat for several years to reduce spread of plants. Doesn't affect rootstalk; thus, cut pieces can be spread that will resprout. Once severed, stems are buoyant and may disperse to other areas and re-sprout. Removal of seed heads should be done as late in the growing season as possible yet before seed set. Early cutting without additional seed head harvest could allow resprouting with greater subsequent seed production.

Disposal: Bag and remove all plant parts from site. Dispose of in approved landfill or incinerate with appropriate permits.

Sanitation: Clean all clothing, boots, and equipment to prevent spread of seed. See item #7 "Sanitation" in the General Practices section.

3. Herbicide

Effectiveness: Use when >100 plants and <3-4 acres in size.

Methods: Use glyphosate formulations only. If possible treat seedlings before they reach 12" in height. Cut and bag flower heads before applying herbicide. Apply prior to or when in flower (late July/Aug) so plants are actively growing. For spot application use a sponge tip applicator w/wick or stem injection.

Cautions: This herbicide is not selective (kills both monocots and dicots), thus should be applied carefully to prevent killing of non-target species. All tank mixes should be mixed with clean (ideally distilled) water because glyphosate binds tightly to sediments, which reduces toxicity to plants. Do not apply in windy conditions because spray will drift and kill other plants. Do not apply if rain is forecast within 12 hours because herbicide will be washed away before it can act. Choose glyphosate formulation for applications in standing water or along a shoreline.

4. Biocontrol

Two species of leaf-feeding beetle, *Galerucella calmariensis* and *G. pusilla*, have been shown to be effective in controlling purple loosestrife. Over 5 million of these beetles have been released in 30 states including New York, the northeastern and midwestern states as well as all of the Canadian Provinces. The beetles have shown dramatic decreases in purple loosestrife populations with subsequent increases in populations of native species. The scientific literature indicates that the beetles are very specific to

purple loosestrife with only minor “spillover” effects that do not compromise non-target plant populations.

Effectiveness: Use if site has at least a half acre of purple loosestrife of medium to thick density. Best type of control for large patches of loosestrife >3-4 acres.

Methods: The number of beetles released per site should be based on the size of the site, the density of loosestrife and the economics of purchase. More beetles are generally better than fewer.

Cautions: Use only if mowing, pesticide and herbicide use are not active practices on the site. The site must not be permanently flooded and should be sunny. Use only if winged loosestrife, *(Lythrum alatum)* and waterwillow *(Decodon verticillatus)* are not major components of the plant community on the release site. **Please note that identification of winged loosestrife and waterwillow should be done by a professional botanist prior to treatment to determine if this biocontrol method is appropriate.**

CONTROL METHODS FOR COMMON REED
(*Phragmites australis*)

PLANT DESCRIPTION
Phragmites is a perennial grass that can grow to 14 feet in height. Flowering and seed set occur between July and September, resulting in a large feathery inflorescence, purple-hued turning to tan. Phragmites is capable of vigorous vegetative reproduction and often forms dense, virtually monospecific stands. It is unclear what proportion of the many seeds that phragmites produces are viable. **Please note that identification of phragmites should be done by a professional botanist prior to treatment to distinguish the invasive non-native race from the non-invasive native.**

MANAGEMENT OPTIONS
1. Cutting and Pulling
Effectiveness: Need to repeat annually for several years to reduce spread of plants. Hand-pulling, though labor intensive, is an effective technique for controlling phragmites in small areas with unconsolidated soils or sediments.

Methods: The best time to cut phragmites is when most of food reserves are in aerial portion of plant (when close to tassel stage, at end of July/early August) to decrease plant's vigor. Some patches may be too large to cut by hand, but repeated cutting of the perimeter of a stand can prevent vegetative expansion. Phragmites stems should be cut below the lowest leaf, leaving a 6" or shorter stump. Hand-held cutters and gas-powered hedge trimmers work well. Weed whackers with a circular blade were found to be particularly efficient, though dangerous.

Cautions: If cut before in tassel stage or at wrong time, stand density may increase because phragmites is a grass. Remove cut shoots to prevent re-sprouting and forming stolons.

Disposal: Cut or pulled material should be removed from the site and composted, land-filled or incinerated. The harvested biomass can be disposed of onsite if the seed heads are removed and the cut stems are dispersed in an upland area.

Sanitation: Clean all clothing, boots, and equipment to prevent spread of seed. See item #7 "Sanitation" in the General Practices section.

2. Herbicide
Effectiveness: Herbicide use is a 2 year, 2 step process because the plants may need "touch-up" application, especially in dense stands since subdominant plants are protected by thick canopy and may not receive adequate herbicide in the first application.

Methods: Use glyphosate formulations only. Cut phragmites at waist-height just before onset of tassel stage. Immediately squeeze/inject 5 mil of 50% solution of glyphosate into each individual, freshly-cut stem. Secure all cut plant material; remove from site and dispose of at approved landfill or incinerator. A 50% solution of glyphosate equates to a one to one mix with distilled water. After 2 to 3 weeks following application of glyphosate, cut or mow down the stalks to stimulate the emergence and growth of other plants previously suppressed. Use spray bottle for individual foliar spot treatments or use swab or syringe with large gauge needle or Nalgene® Unitary® wash bottle (or equivalent) to apply 1-2 drops directly to cut stems if cutting done first, or cloth glove applicator.

Cautions: This herbicide is not selective (kills both monocots and dicots), thus should be applied carefully to prevent killing of non-target species. All tank mixes should be mixed with clean (ideally distilled) water because glyphosate binds tightly to sediments, which reduces toxicity to plants. Do not apply in windy conditions because spray will drift and kill other plants. Do not apply if rain is forecast w/in 12 hours because herbicide will be washed away before it can act. Choose appropriate glyphosate formulation for applications in standing water or along a shoreline.

3. Plastic

Effectiveness: Tarping can be effective in small stands i.e., <100 plants, low-med density (1-75%area). Plants die off within 3-10 days, depending on sun exposure.

Methods: Cut plants first to 6-8" (hand clippers or loppers, hand-pushed bush hog or weed whacker w/blade). After cutting a stand of phragmites, anchor a sheet of plastic over the cut area using sand bags or rocks. High temperatures under the plastic will eventually kill off the plants. This technique works best when the treated area is in direct sunlight. Black plastic is desirable, but clear plastic also works. Plastic should be at least 6 millimeters thick. Hold plastic in place with sandbags, rocks, etc. Treat runners along edge with spot application of glyphosate. Cut holes in plastic in Oct. - Nov. to promote germination of cattail shoots. The plastic can be removed the following year when the covered plants have been killed. A few phragmites shoots may return. These can be cut or hand-pulled.

Cautions: Must monitor to determine if shoots are extending out from under the plastic.

Disposal: Can leave cut material under plastic or bag all plant parts and remove from site. Dispose of in approved landfill or incinerate with appropriate permits.
Note: All plastic sheeting must be removed from State lands!

Sanitation: Clean all clothing, boots, and equipment to prevent spread of seed. See item #7 “Sanitation” in the General Practices section.

4. Cutting
Effectiveness: Can be effective in small stands i.e., <100 plants, low-med density (1-75%area) and <3 acres.

Methods: Cut just before the end of July, most of the food reserves produced that season are removed with the aerial portion of the plant reducing the plant's vigor. This regime may eliminate a colony if carried out annually for several years. This can be done after herbicides.

Sanitation: Clean all clothing, boots, and equipment to prevent spread of seed. See item #7 "Sanitation" in the General Practices section.

5. Pulling
Effectiveness: Can be effective in small stands i.e., <100 plants. This method is very labor intensive and best with sandy soils.

Methods: Hand-pull plants <2 years old. Use shovel for plants >2 years old-dig up plant, then replace soil and any existing cover.

Disposal: Bag and remove all plant parts from site. Dispose of in approved landfill or incinerate with appropriate permits.

Sanitation: Clean all clothing, boots, and equipment to prevent spread of seed. See item #7 "Sanitation" in the General Practices section.

6. Excavation
Effectiveness: Can be effective for patches up to ½ acre. Cost is the limiting factor.

Methods: When working in wetlands only tracked equipment shall be used. Rubber-tired excavators can operate from adjacent pavement or upland areas. All use of motorized equipment on State lands under the jurisdiction of DEC shall be in compliance with pertinent DEC policy regarding the use of motorized equipment on State lands.

Cautions: The patch should be excavated to below the depth of rhizome development. Follow-ups later in the season or the following year must be conducted to verify that all the plants have been removed.

Disposal: Bag and remove all plant parts from site. Dispose of in approved landfill or incinerate with appropriate permits.

Sanitation: Clean all clothing, boots, and equipment to prevent spread of seed. See item #7 "Sanitation" in the General Practices section.

CONTROL METHODS FOR GARLIC MUSTARD
(*Alliaria petiolata)*

PLANT DESCRIPTION
Garlic mustard is a naturalized European biennial herb that typically invades partially shaded forested and roadside areas. It is capable of dominating the ground layer and excluding other herbaceous species. Its seeds germinate in early spring and develop a basal rosette of leaves during the first year. Garlic mustard produces white flowers between late April and June of the following spring. Plants die after producing seeds, which typically mature and disperse in August. Normally its seeds are dormant for 20 months and germinate the second spring after being formed. Seeds remain viable for up to 5 years.

MANAGEMENT OPTIONS
1. Pulling
Effectiveness: Hand pulling is an effective method for removing small populations of garlic mustard, since plants pull up easily in most forested habitats. Plants can be pulled during most of the year. However, pulling also disturbs the soil and can increase rates of germination of buried seeds. In most cases cutting is the preferred hand control option.

Methods: Soil should be tamped down firmly after removing the plant. Soil disturbance can bring garlic mustard seeds to the surface, thus creating a favorable environment for their germination.

Cautions: Care should be taken to minimize soil disturbance but to remove all root tissues. Re-sprouting is uncommon, but may occur from mature plants not entirely removed. Cutting is preferred to pulling due to potential for soil disturbance.

Disposal: If plants have capsules present, they should be bagged and disposed of to prevent seed dispersal. Bag and remove all plant parts from site. Dispose of in approved landfill or incinerate with appropriate permits.

Sanitation: Clean all clothing, boots, and equipment to prevent spread of seed. See item #7 “Sanitation” in the General Practices section.

2. Cutting
Effectiveness: Cutting is effective for medium to large sized populations depending on available time and labor resources. Dormant seeds in the soil seed bank are unaffected by this technique due to minimal disturbance of the soil.

Methods: Cut stems when in flower (late spring/early summer) at ground level either manually (with clippers or a scythe) or with a motorized string trimmer. This technique will result in almost total mortality of existing plants and will minimize re-sprouting.

Cautions: Cuttings should be conducted annually until the seedbank is depleted.

Disposal: Cut stems should be removed from the site when possible since they may produce viable seed even when cut. Bag and remove all plant parts from site. Dispose of in approved landfill or incinerate with appropriate permits.

Sanitation: Clean all clothing, boots, and equipment to prevent spread of seed. See item #7 "Sanitation" in the General Practices section.

3. Herbicide

Effectiveness: Glyphosate will not affect subsequent seedling emergence of garlic mustard or other plants.

Methods: Use glyphosate formulations only. Product should be applied after seedlings have emerged, but prior to flowering of second year plants. Application should be by wick applicator or spray bottle for individual spot treatments.

Cautions: This herbicide is not selective (kills both monocots and dicots), thus should be applied carefully to prevent killing of non-target species. All tank mixes should be mixed with clean (ideally distilled) water because glyphosate binds tightly to sediments, which reduces toxicity to plants. Do not apply in windy conditions because spray will drift and kill other plants. Do not apply if rain is forecast within 12 hours because herbicide will be washed away before it can act. Choose appropriate glyphosate formulation for applications in standing water or along a shoreline.

CONTROL METHODS FOR JAPANESE, GIANT AND BOHEMIAN KNOTWEED
(*Fallopia japonica ssp. japonica, F. sachalinensis, and F. x. bohemica*)

PLANT DESCRIPTION

The knotweeds are herbaceous perennials which forms dense clumps 1-3 meters (3-10 feet) high. Its broad leaves are somewhat triangular and pointed at the tip. Clusters of tiny greenish-white flowers are borne in upper leaf axils during August and September. The fruit is a small, brown triangular achene. Knotweed reproduces via seed and by vegetative growth through stout, aggressive rhizomes. It spreads rapidly to form dense thickets that can alter natural ecosystems. Japanese knotweed can tolerate a variety of adverse conditions including full shade, high temperatures, high salinity, and drought. It is found near water sources, in low-lying areas, waste places, and utility rights of way. It poses a significant threat to riparian areas, where it can survive severe floods.

MANAGEMENT OPTIONS

1. Digging

Effectiveness: This method is appropriate for very small populations.

Methods: Remove the entire plant including all roots and runners using a digging tool. Juvenile plants can be hand-pulled depending on soil conditions and root development.

Cautions: Care must be taken not to spread rhizome or stem fragments. Any portions of the root system or the plant stem not removed will potentially re-sprout.

Disposal: All plant parts, including mature fruit, should be bagged and disposed of in the trash to prevent re-establishment (dispose of in an approved landfill or incinerate with appropriate permits).

Sanitation: Clean all clothing, boots, and equipment to prevent spread of seed. See item #7 “Sanitation” in the General Practices section.

2. Cutting

Effectiveness: Repeated cutting may be effective in eliminating Japanese knotweed. Manual control is labor intensive, but is a good option where populations are small and isolated or in environmentally sensitive areas.

Methods: Cut the knotweed close to the ground at least 3 times a year. Plant native plant species as an alternative to continued treatment.

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[*] Stockpiling implies temporary storage prior to transfer to a permanent treatment facility.

Cautions: This strategy must be carried out for several years to obtain success. Both mechanical and herbicidal control methods require continued treatment to prevent reestablishment of knotweed.

Disposal: Bag and remove all plant parts from site (dispose of in an approved landfill or incinerate with appropriate permits).

Sanitation: Clean all clothing, boots, and equipment to prevent spread of seed. See item #7 "Sanitation" in the General Practices section.

3. Herbicide

Effectiveness: Glyphosate treatments in late summer or early fall are much more effective in preventing re-growth of Japanese knotweed the following year.

Methods: Use glyphosate formulations only. In late June/early July cleanly cut or mow down existing stalks/canes. Allow the knotweed to re-grow. After August 1, spray knotweed all re-growth with ROUNDUP®, RODEO®.

A cut-stem treatment utilizing glyphosate formulations can be an effective control for smaller colonies of knotweed. In early to mid-July cut the existing stems just below the 2nd or 3rd node above the soil surface. Immediately after cutting apply by swab or small spray bottle a 50% solution of glyphosate to the freshly-cut cross section and into the internodal cavity of each stalk/cane. Monitor treatment area by early to mid-August and repeat cut-stem treatment to any residual stems.

Stem injection is another promising control method for smaller colonies of knotweeds. Currently, a supplemental label for AQUAMASTER® (glyphosate) herbicide exists for this stem injection method. In late June/early July inject 5 mLs of AQUAMASTER® below the 2nd node above the ground of each stem in the clump. Use suitable equipment that must penetrate into the internodal region. JKInternational manufactures a stem injection tool that is suitable and recommended for this control method.

Cautions: Established stands of Japanese knotweed are difficult to eradicate even with repeated herbicide treatments. However, herbicide treatments will greatly weaken the plant and prevent it from dominating a site. Adequate control is usually not possible unless the entire stand of knotweed is treated (otherwise, it will re-invade via creeping rootstocks from untreated areas).

These herbicides are not selective (kills both monocots and dicots), thus should be applied carefully to prevent killing of non-target species. All tank mixes should be mixed with clean (ideally distilled) water because glyphosate binds tightly to sediments, which reduces toxicity to plants.

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[*] Stockpiling implies temporary storage prior to transfer to a permanent treatment facility.

Do not apply in windy conditions because spray will drift and kill other plants. Do not apply if rain is forecast within 12 hours because herbicide will be washed away before it can act. Choose Rodeo® formulation for applications in standing water or along a shoreline.

CONTROL METHODS FOR JAPANESE, MORROW'S, TATARIAN,
AMUR AND BELL'S HONEYSUCKLES
(*Lonicera morrowii, L. tatarica, L. japonica, L. maackii, L. x. bella*)

PLANT DESCRIPTION – JAPANESE HONEYSUCKLE

Japanese honeysuckle (*Lonicera japonica*) is a perennial trailing or climbing woody vine of the honeysuckle family (Caprifoliaceae) that spreads by seeds, underground rhizomes, and aboveground runners. It has opposite leaves that are ovate, entire (young leaves often lobed), 4-8 cm long, with a short petiole, and variable pubescence. In the southern part of the range the leaves are evergreen, while in more northern locales the leaves are semi-evergreen and fall off in midwinter. Young stems are reddish brown to light brown, usually pubescent, and about 3 mm in diameter. Older stems are glabrous, hollow, with brownish bark that peels in long strips. The woody stems are usually 2-3 m long, (less often to 10 m). *Lonicera japonica* creates dense tangled thickets by a combination of stem branching, nodal rooting, and vegetative spread from rhizomes.

Lonicera japonica (including the varieties) is easily distinguished from native honeysuckle vines by its upper leaves and by its berries. The uppermost pairs of leaves of *Lonicera japonica* are distinctly separate, while those of native honeysuckle vines are connate, or fused to form a single leaf through which the stem grows. *Lonicera japonica* has black berries, in contrast to the red to orange berries of native honeysuckle vines. The fruits are produced September through November. Each contains 2-3 ovate to oblong seeds that are 2-3 mm long, dark-brown to black, ridged on one side and flat to concave on the other.

The fragrant white (fading to yellow) flowers of *Lonicera japonica* are borne in pairs on solitary, axillary peduncles 5-10 mm long, supported by leaflike bracts. The species has white flowers tinged with pink and purple. Individual flowers are tubular, with a fused two-lipped corolla 3-4(-5) cm long, pubescent on the outside. Flowers are produced late April through July, and sometimes through October.

MANAGEMENT OPTIONS

1. Mowing and Pulling

Effectiveness: Removing the above-ground portion of *Lonicera japonica* reduces current-year growth but does not kill the plant, and generally stimulates dense regrowth. Cut material can take root and should therefore be removed from the site (not practical with most infestations).

Methods: Hand pulling is highly effective. Pull out Japanese honeysuckle by the roots in winter wherever it climbs, aim the roots upward and tie them in place. The absence of light energy causes the trailing vines to decline precipitously next year. This method greatly reduces spraying requirements.

Disposal: All plant parts, including mature fruit, should be bagged and disposed of in the trash to prevent re-establishment (dispose of in an approved landfill or incinerate with appropriate permits).

Cautions: Mowing is an ineffective control method, stimulating growth and encouraging formation of dense, albeit shorter, mats. Bush-hogging is an ineffective control, as *Lonicera japonica* re-invades within one growing season.

2. Herbicide

Effectiveness: In northern states, *Lonicera japonica* retains some leaves through all or most of the winter (semi-evergreen or evergreen), when most native plants have dropped their leaves. This provides a window of opportunity from mid-autumn through early spring when it is easier to spot and treat with herbicides, fire or other methods without damaging native species.

Controls: A foliar application of 1.5% glyphosate shortly after the first frost appears to be the most effective treatment, applied after native vegetation is dormant and when temperatures are near and preferably above freezing. Applications within 2 days of the first killing frost are more effective than applications later in the winter. *Lonicera japonica* is less susceptible to herbicides after the first hard frost (-4°C).

Cautions: Soil disturbance should be avoided in infested areas to minimize germination of seed in the seedbank. Treated plants should be re-examined at the end of the second growing season, as plants can recover from herbicide application.

These herbicides are not selective (kills both monocots and dicots), thus should be applied carefully to prevent killing of non-target species. All tank mixes should be mixed with clean (ideally distilled) water because glyphosate binds tightly to sediments, which reduces toxicity to plants.

Do not apply in windy conditions because spray will drift and kill other plants. Do not apply if rain is forecast within 12 hours because herbicide will be washed away before it can act.

PLANT DESCRIPTIONS – BUSH HONEYSUCKLES

Exotic bush honeysuckles (Morrow's, Bell's, Amur and Tatarian) are upright, multi-stemmed, oppositely branched, deciduous shrubs that range in height from 2 m to 6 m. The opposite leaves are simple and entire, and paired; axillary flowers are showy with white, pink, or yellow corollas. The fruits of *Lonicera spp.* are red, or rarely yellow, fleshy berries.

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[*] Stockpiling implies temporary storage prior to transfer to a permanent treatment facility.

In flower, exotic bush honeysuckles can be distinguished from all native bush honeysuckles except swamp fly-honeysuckle (*L. oblongifolia*) by their hirsute (hairy) styles. In fruit, the red or rarely yellow berries of the exotics separate them from the blue- or black-berried native waterberry (*L. caerulea*) and bearberry honeysuckle (*L. involucrata*). The exotic bush honeysuckles also generally leaf-out earlier and retain their leaves longer than the native shrub honeysuckles.

Within the exotic bush honeysuckles, *L. maackii* alone has acuminate, lightly pubescent leaves that range in size from 3.5 to 8.5 cm long and peduncles generally shorter than 6 mm. Its flowers are white to pink, fading to yellow, 15-20 mm long. Its berries are red or with an orange cast. Height ranges to 6 m.

In North America, there has been considerable confusion regarding the correct identification of *L. morrowii*, *L. tatarica*, and *L. x bella*, their hybrid. The literature contains a number of references to plants called by the name of one of the parents, but described as having characters more like those of the hybrid, *L. x bella*. The hybrid therefore, may be more common than the literature would indicate, and accurate field identification may be similarly problematic.

The two parent species of *L. x bella*, however, are dissimilar. *L. morrowii* has leaves that are elliptic to oblong gray-green, soft-pubescent beneath, and are 3-6 cm long. Its flowers are pubescent, white fading to yellow, 1.5-2 cm long, on densely hairy peduncles 5-15 mm long. The fruits are red. The height ranges to 2 m. *L. tatarica* has leaves that are ovate to oblong, glabrous, and are 3-6 cm long. Its flowers are glabrous, white to pink, 1.5-2 cm long, on peduncles 15-25 mm long. The fruits are red or rarely yellow. Height ranges to 3 m.

L. x bella has intermediate characteristics. The leaves are slightly hairy beneath. Flowers are pink fading to yellow, on sparsely hairy peduncles 5-15 mm. long. Fruits are red or rarely yellow. Height ranges to 6 m.

MANAGEMENT OPTIONS

1. Grubbing, Pulling, Cutting

Effectiveness: Mechanical controls include grubbing or pulling seedlings and mature shrubs, and repeated clipping of shrubs. Effective mechanical management requires a commitment to cut or pull plants at least once a year for a period of three to five years.

Methods: Grubbing or pulling by hand (using a Weed Wrench or a similar tool) is appropriate for small populations or where herbicides cannot be used. Mature *L. maackii* shrubs growing in shaded forest settings can be eradicated by clipping once a year, during the growing season, until control is achieved. Other bush honeysuckles growing in more open settings can be managed by clipping twice yearly, once in early spring and again in late summer or early autumn.

Disposal: All plant parts, including mature fruit, should be bagged and disposed of in the trash to prevent re-establishment (dispose of in an approved landfill or incinerate with appropriate permits).

Cautions: Any portions of the root system not removed can resprout. Because open soil can support rapid re-invasion, managers must monitor their efforts at least once per year and repeat control measures as needed. Winter clipping should be avoided as it encourages vigorous re-sprouting.

2. Herbicides

Effectiveness: Most managers report that treatment with herbicides is necessary for the control of *L. maackii* populations growing in full sun and may be necessary for all large bush honeysuckle populations.

Controls: Use formulations of glyphosate (brand names Roundup, and for use near water bodies, Rodeo) as foliar sprays or cut stump sprays and paints with varying degrees of success. Glyphosate is a non-selective herbicide which kills both grasses and broad-leaved plants. For cut stump treatments, 20-25% solutions of glyphosate can be applied to the outer ring (phloem) of the cut stem. A 2% solutions of glyphosate can be used for foliar treatments. Glyphosate should be applied to the foliage late in the growing season, and to the cut stumps from late summer through the dormant season.

Cautions: The subsequent flush of seedlings following all herbicide treatments must also be controlled.

These herbicides are not selective (kills both monocots and dicots), thus should be applied carefully to prevent killing of non-target species. All tank mixes should be mixed with clean (ideally distilled) water because glyphosate binds tightly to sediments, which reduces toxicity to plants.

Do not apply in windy conditions because spray will drift and kill other plants. Do not apply if rain is forecast within 12 hours because herbicide will be washed away before it can act.

[*] Stockpiling implies temporary storage prior to transfer to a permanent treatment facility.

CONTROL METHODS FOR YELLOW IRIS
(*Iris pseudacorus*)

Plant Description
Yellow iris (*Iris pseudacorus*) is a robust, clumping perennial herb in the Iridaceae (Iris family). *Iris pseudacorus* is easy to identify in flower, since it is the only totally yellow-flowered Iris in wild lands in the United States. At maturity, *I. pseudacorus* grows to a height of 0.40-1.5 meters (1.3-4.9 ft) tall. Its thick fleshy rhizomes often form dense horizontal mats, with each rhizome measuring 1 to 4 cm in diameter with roots that may extend vertically 10-20 (30) cm deep. The stiff, sword-like leaves are glaucous, number approximately 10 per ramet, are about 50-100 cm long by 10-30 mm wide, have raised midribs, and are arranged with sheathing and overlapping leaf bases.

Flowers of *I. pseudacorus* are borne on tall erect peduncles. Each inflorescence may have one to several large, showy flowers. The flowers measure 8-10 cm in diameter and vary from pale yellow to almost orange in color. The flowers are bisexual. The perianth segments (3 sepals and 3 petals) are fused at the base, and form a flaring tube with the sepals spreading and reflexed. The 3 stamens are each individually fused by their filaments to the sepals, and the showy tongue-shaped sepals are often adorned with brown spots or purple veins, and are generally less than 6 cm long. The petals are erect and less conspicuous, and are narrower than the sepals. The 3 style branches are petal-like with two-lobed lips, are mostly < 25 mm long, and are opposite and curved over the sepals. *I. pseudacorus* has an inferior, 3-chambered ovary. Fruits are elongated capsules.

Seeds of *I. pseudacorus* are pitted, pale brown, disc-shaped (roughly circular and flattened), and measure approximately 2.0-5.0 mm in diameter and 0.5-3.0 mm tall. Seeds are arranged in three densely packed vertical rows within the seed pod or capsule. These erect capsules at maturity are a glossy green color and measure 4-8 cm in length, 5.0-8.0 mm in width, and are 3-angled and cylindrical.

1. Digging, Pulling, Cutting
Effectiveness: Manual or mechanical methods that remove the entire *I. pseudacorus* rhizome mass can successfully control small, isolated patches.

Methods: Pulling or cutting *I. pseudacorus* plants may provide adequate control, but only if it is repeated every year for several years to weaken and eventually kill the plant. Dead-heading (removing the flowers and/or fruits) from plants every year can prevent seed development and seed dispersal, but will not kill those plants.
Cutting the foliage, followed by a herbicide application (see below for details), can provide good control with minimal off-target effects.

Disposal: If plants have capsules present, they should be bagged and disposed of to prevent seed dispersal. Bag and remove all plant parts from site.

Dispose of in approved landfill or incinerate with appropriate permits.

Cautions: These methods, however, are very time and labor-intensive, since even small rhizome fragments can resprout. Additionally, digging disturbs the soil, may fragment rhizomes, and promote germination of *I. pseudacorus* and other undesirable species from the soil seed bank.

Care should be taken when pulling, cutting, or digging *I. pseudacorus*, since resinous substances in the leaves and rhizomes can cause skin irritation.

2. Herbicide

Effectiveness: *Iris pseudacorus* can be effectively controlled by herbicides. Since it usually grows in or adjacent to water, an aquatic-labeled herbicide and adjuvant must be used. Glyphosate (for example, trade names Rodeo®, Aquamaster® or Glypro®) applied in a 25% solution (13% a.i.) using a dripless wick/wiper applicator, or applied in a 5 to 8% solution if sprayed, when used with the appropriate non-ionic surfactant adjuvant, can effectively kill *I. pseudacorus*. *I. pseudacorus* can be effectively controlled by stem injection utilizing Aquamaster® applied at .5 to .7 ml. of product per flowering stem.

Controls: The timing and choice of application technique will determine control efficacy and should work to minimize off-target effects. *Iris pseudacorus* can be controlled by either directly applying the herbicide to foliage, or by immediately applying herbicide to freshly cut leaf and stem surfaces. Herbicides can be directly applied to *I. pseudacorus* foliage or cut stems by a dripless wick system or using a backpack sprayer.

Cautions: These herbicides are not selective (kills both monocots and dicots), thus should be applied carefully to prevent killing of non-target species. All tank mixes should be mixed with clean (ideally distilled) water because glyphosate binds tightly to sediments, which reduces toxicity to plants. Do not apply in windy conditions because spray will drift and kill other plants. Do not apply if rain is forecast within 12 hours because herbicide will be washed away before it can act.

Be sure to always take appropriate precautions and wear suitable clothing and equipment, and follow all instructions on the herbicide label. Use a biodegradable tracer dye in the herbicide mix so you can watch for accidental contact or spill of the herbicide.

Giant Hogweed Control Methods Guide

Are you worried about giant hogweed hurting you or someone else? Is giant hogweed causing ecological damage to your environment through replacement of native plants or erosion of soil? Are giant hogweed plants limiting your access to areas where you wish to recreate (e.g. backyard, stream bank) or work in (e.g. overrunning your garden, field or orchards)? If you answered yes to any of these questions, you may be interested in learning about methods for controlling this non-native invasive plant.

A variety of control methods are available, including manual and mechanical methods, as well as herbicides. Some control methods are best used on small sites and others for large sites. You will have to choose the method that works best for the habitat, stage of plant growth and size of the site. In some cases, a giant hogweed infestation will be best controlled using several different methods. For instance, after using large-scale control methods (e.g. herbicide) for a number of years, it may be cheaper and easier to switch to a small-scale control method (e.g. cutting taproots) when only a few plants remain. The final part of any control method is to plant grasses or other plants to compete with giant hogweed and decrease soil erosion. Please read through all the available methods and information provided, particularly the safety instructions, before choosing and implementing the control strategy that will work best for your giant hogweed site.

In order for your control effort to be successful, you will have to ensure that no additional giant hogweed seeds are being introduced to the area. If your site is along a stream, you will want to coordinate with other properties upstream to limit seeds flowing downstream that could reinfest your site. It is very important to ensure that the giant hogweed plants are controlled ***before*** they produce seeds, and that ***all*** existing flower/seed heads are removed, heated by the sun in plastic bags for at least a week, and disposed of safely. With no influx of seed and persistent control efforts, giant hogweed plants can be eradicated.

For more giant hogweed information, to learn more about how to identify this plant, or if you have other giant hogweed-related questions, please refer to the DEC giant hogweed webpage www.dec.ny.gov/animals/39809.html. To connect with the giant hogweed program call 845-256-3111 or email ghogweed@dec.ny.gov.

Information Included in this Guide:

1. Giant Hogweed Growth & Development (pertaining to control) Page 2
2. Public Health Hazards & Safety Instructions Page 3
3. Manual & Mechanical Control Page 5
4. Herbicide Control Page 7
5. Animal Control (Grazing) Page 8
6. Monitor Page 9
7. Revegetation Page 9
8. Overall Giant Hogweed Control Strategies Page 9
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1. Giant Hogweed Growth & Development (pertaining to control)
Giant hogweed plants are long-lived perennial plants. Once seedlings emerge, they persist and will overwinter, as rosettes (circular clusters of leaves) for several years until the root gains sufficient nutrient reserves for the plant to flower. Most giant hogweed plants will die after producing a flower stalk, however if its root has developed side shoots, they could grow new plants the following year.

Giant hogweed seedlings

Giant hogweed juvenile

Giant hogweed leaf rosettes

Giant hogweed plants are most commonly recognized when they are mature and flowering. However, since giant hogweed plants typically take three to four years before flowering, one must also look for the more numerous younger vegetative plants with small to large basal-leaf rosettes when identifying plants to control. In its first few years of growth, leaves and stems of non-flowering plants will die back over the winter. After the mature plant flowers and sets seed, the whole plant, including the root, will die. Flowering plants that are damaged or cut above the root before the plants set seed may regrow. As a rough guide, giant hogweed plants start growing in early spring, flower in June-July, and set seed in August. Giant hogweed plants have a long branching taproot up to 2 feet-long (60 cm) and 6 inches (15 cm) in diameter at the crown. Their large taproots store substantial below-ground resources, which can give some defense against physical and chemical control practices.

Giant hogweed seed heads

Giant hogweed seeds

Seeds float for up to 3 days

The plants reproduce by seed. An average plant produces 20,000 seeds, but some plants have been reported to produce over 100,000 seeds. However, since most seeds fall within a few meters of the parent plant, seedlings develop under very crowded conditions and seedling mortality is high. Most seeds (95%) are found within the top 2 inches (5 cm) of soil. Seeds are dispersed short distances by wind and can travel longer distances by water, floating up to three days. Most seeds are found within 30 feet (10 meters) of the giant hogweed colony, with a few plants traveling more than 150 feet (50 meters) away. Seeds can travel farther when

assisted by people. Disposing of flower heads improperly, sharing seeds/seedlings with other gardeners, transporting seed-laden soil during construction, mowing along roadsides, and wind currents from vehicles along highways and railroads may cause seeds to travel farther. Seeds may remain viable in the seed bank for more than 5 years. Since the dispersal of giant hogweed is almost entirely by seeds, it is very important to prevent the plants from flowering and setting seed.

Giant hogweed plants grow best in open sites with abundant light, but can grow successfully in woodlands, forest edges and partially shaded habitats too. The plants grow well in undisturbed or unmanaged sites and are less frequently found in tilled or grazed areas. The plants are resistant to frost and can withstand flooding, though they cannot grow in lakes, streams or other permanently submerged areas.

Bare soil underneath GH plants

With their tremendous growth, large leaf area and prolific seed production, giant hogweed plants are able to outcompete and replace native vegetation. They shade out surrounding vegetation with their giant leaves and tight growth pattern. Bare soil is created below the plants, which leads to soil erosion in winter. Bare soil and the loss of plants with roots able to hold the soil is of special concern along slopes and stream banks.

Giant hogweed spreads along stream corridors

Studies have found that giant hogweed invasion often begins with cultivation as a garden ornamental. The spread begins slowly from cultivated areas. Long-distance dispersal occurs when plants grow along roadsides, and along river or stream corridors. Once the plants become more prevalent, they spread throughout a variety of habitats.

2. Public Health Hazards & Safety Instructions

Skin exposed to giant hogweed sap and sunlight can be severely burned. Clear, watery, giant hogweed sap contains several photosensitizing furanocoumarins. When it contacts skin and is exposed to sunlight, specifically ultraviolet light, it can cause phytophotodermatitis. This serious skin inflammation may lead to painful blisters within 48 hours. These blisters become dark pigmentation, or scars, that can last up to 6 years, though they typically only last a few months. The affected area often develops long-term sensitivity to sunlight. Needless to say, it is important to protect both your skin and your eyes while controlling giant hogweed to prevent serious injury from the sap.

Skin reaction depends on the individual's sensitivity to the sap. Heat and moisture (sweat or dew) can enhance the skin reaction. The phototoxic reaction can be activated by ultraviolet light as soon as 15 minutes after contact. Skin sensitivity typically peaks between 30 minutes and two hours after contact. Toxic furanocoumarins are present in all parts of the plant: the lower parts of the hollow stems and petioles may be partly filled with sap; the hollow hairs on

the plant also contain sap. The safety precautions in the next section describe how to protect yourself from injury as you control giant hogweed plants.

Example of a skin reaction to giant hogweed sap over a 5 month period Photo credit: Bob Kleinberg

Safety precautions to follow when controlling giant hogweed plants:

- Do not touch the plant with bare skin. Burns can result from any action that involves bruising, cutting or touching the foliage, stem, flower or fruit.
- Wear long waterproof gloves, long sleeves, pants, boots and eye protection if you plan to work near, handle or cut down plants. Since cotton and linen fibers can soak up sap and be penetrated by plant hairs, synthetic water-resistant materials are best (e.g. dishwashing gloves, a rain suit or Tyvek™ suit, and rubber boots).
- Keep water, soap and eye-wash near work area in case of exposure to sap.
- If you think you have been exposed to giant hogweed sap, stop work immediately and wash the affected area with soap and water as soon as possible. Prevent ultraviolet light from reaching the skin of areas exposed to sap.
- Apply sunblock before beginning to work near giant hogweed plants**.**
- Do not touch exposed skin with sap-covered gloves or other contaminated equipment! Consider wearing a face shield for extra protection from touching your face with sap-covered gloves. Teams using manual control methods should keep a good distance from one another, as sap can splash three to four feet.

Wear proper safety gear when controlling hogweed.

- Take care not to touch your skin when removing the contaminated protective gear after you are finished with control.
- Wash equipment with soap and water immediately after use.
- Change out of work clothes and wash yourself with soap and water after doing control.
- Limit exposure to sunlight after control.
- Launder clothing that may have contacted plants separately.
- At small sites, some have chosen to work after sunset to limit exposure to sunlight.
- DO NOT use a “weed-whacker” or brush cutter to avoid sap splattering on you.

What should you do if you are exposed to giant hogweed sap?
If you are accidentally exposed to sap, wash the affected area thoroughly with soap and water as soon as possible. Keep the exposed area away from sunlight for at least 48 hours. If a reaction occurs, topical steroids applied early can reduce its severity and ease discomfort. If sap goes into your eyes, rinse them with water, wear sunglasses and seek immediate medical care. As the affected area may be sensitive to sunlight for a few years, you may want to apply sunblock and/or keep the affected area covered from the sun for that length of time. Please see a physician if you have a reaction or have any questions.

3. Manual & Mechanical Control
Manual and mechanical control methods include root cutting, cutting the plant, covering the soil, mowing, plowing and removing the umbels (flower/seed heads). Except for root cutting, manual control will not cause immediate death of the plant. All the other manual and mechanical control methods need two to three treatments per year for several years to deplete root reserves and kill the plants. All methods need to occur for multiple years until no new plants grow from the seed bank. Once no new plants grow from the seed bank, monitor the site for at least three more years to make sure no seedlings appear.

a. Cut or dig up roots
This is labor intensive but very effective. It will typically kill the plant after one treatment. It is ideal for a single plant or small infestations. We have found 400 plants to be a manageable amount for one or two people to control with this method. Root cutting can also be used for larger infestations if you have more time and/or people.

Cut the taproot approximately 6 inches (15 cm) below ground level using a spade with a sharp blade. In areas with erosion or on steep inclines, where additional soil may be covering the plant base, taproots may need to be cut up to 10 inches (25 cm) below the soil surface. When cutting the root, you need to separate the thick stem base bearing old leaf scars, from the root below. The stem base can be covered with up to 2 inches (5 cm) of soil. It is easiest to cut in early spring before the leaves are very large. If the plant does not die, cut again when it regrows. The cut part of the plants should be removed from the soil and left out to decompose. To lessen contact with the plant, it is recommended to leave cut plant material on location. If you choose to move cut plant material, use extra caution to avoid sap from cut stems and roots.

Cut the taproot approximately 6 inches below ground level

To make root cutting even more effective, return to the site 2 weeks or more after the first root cut. Cut the roots of any giant hogweed plants missed the first time, and remove any giant hogweed seedlings that have started to grow. Survey the site in July for missed plants that may be flowering and remove any seed heads found (read section 3c).

b. Hand pull
Young plants can be easily hand pulled (April-May). This is easiest to do when the soil is loose and moist. The stems are not woody and will break easily, so it is best to pull them gently to ensure full root removal. Using a trowel or other small hand tool may help ease

them out of the soil. Pulling will not work for mature plants, as the taproot is too large. Since you may actually be touching the plant, you must be very careful to wear waterproof gloves and clothing and not get the sap on yourself.

c. Hogweed flower/seed head removal & safe disposal

Removal of the seed head can be as effective as cutting the whole mature plant. The plant is going to die after flowering and setting seed, but cutting off the flower/seed head is VERY important to keep it from spreading seed. If this is your only control method for a particular plant, *timing is crucial*. If cut too early, while plants are flowering, new flowers will form on lower branches. Seed heads should be cut after the seeds have formed and white flowers are no longer visible. Cut seed heads before the seed matures and becomes dry to prevent the plant from shedding seeds while you are removing the seed heads. When cutting a mature seed head, try to avoid scattering seeds on the ground; if seeds are shedding, contain them within as small an area as possible.

Seed head removal using a cut-and-hold pruner

NOTE: It is appropriate to cut the plant in the flowering stage if done in conjunction with other control methods, such as root-cutting or herbicide control. If flower head removal is your only form of control, you will need to revisit the plant in a couple of weeks to cut off any new flower heads that may form.

A cut-and-hold long-reach pruner is the ideal tool for flower/seed head removal, but any sharp cutting tool long enough so you won't touch the plant can be used. Use the cutter to carefully cut off all flower/seed heads and place them in sturdy trash bags or doubled or even tripled lighter-duty trash bags. Since seeds may mature on severed flower heads, they must be carefully disposed of. Clear or dark trash bags will work for solarization (using heat from the sun to destroy seed viability). Seal trash bags tightly. If sap gets on the outside of a bag, put it inside another bag so the outside is safe to handle. If possible, place bags in a secure location where they will be exposed to direct sunlight for 1 week or more to destroy seed viability. Then dispose of trash bags in the garbage.

Place flower/seed heads in trash bags for 1 week or more before disposal to destroy seed viability

d. Plowing

Plowing is one of the best methods of mechanical control for giant hogweed, though it has to be done for multiple years, as large roots are capable of regrowth. This method eradicates the plant from infested fields and, if done in the fall, frost and freezing temperatures help degrade the root stock. Large roots should be removed from the plow zone to ensure no regrowth occurs. Deep plowing will significantly reduce germination of hogweed seeds, since the upper soil layer is buried and most seeds are within the top 2 inches of soil. Best results are obtained if plants are controlled mechanically or chemically

before plowing. Make sure to clean the plowing equipment before using it in another area to avoid spreading giant hogweed seeds to new locations.

e. Cutting & Mowing

Cutting plants above ground is not recommended as an eradication method. If you choose to use this method, plants must be cut at least three times per growing season for several years until their taproot energy reserves are depleted. In the beginning of this process, plants will typically grow back within a couple of weeks after being cut. Start when plants are small and continue mowing throughout the season, NEVER mow plants with a flower or seed head to avoid spreading seed. Repeated mowing is often used for large infested areas. If done consistently and on a regular basis, it can destroy most of the plants. Scything can be done in areas unsuitable for mechanical mowing, such as along riverbanks or on slopes, but it will not be effective in killing the plants without repeated control. Be careful not to spread the seeds. All flower heads should be removed and carefully disposed of (read part 3.c.) before mowing. Mowing equipment should be cleaned on site before using it in another area to avoid spreading giant hogweed seeds.

f. Cut and cover

This is an effective method when done correctly. It is recommended for use in small areas. It will keep plants from regrowing and prevent seedlings from emerging. Cut plants down to ground level and cover the soil with black plastic. Check the following year to make sure seedlings don't poke through the black plastic. After a few years, the black plastic can be removed and the area revegetated with native or non-invasive plants.

g. Bury plants & seeds using a skid loader

This is a very effective method. Use a skid loader to invert the infested area upside down and you will smother and compost most of the plants. Since the majority of seeds (95%) are found within the top 2 inches (5 cm) of soil, bury the topsoil to a minimum depth of 20 inches (50 cm) and cover it with clean soil to prevent the emergence of new plants. It is important to clean the equipment used on site before using it in another area to avoid spreading giant hogweed seeds.

4. Herbicide Control

Giant hogweed is susceptible to systemic herbicides, such as glyphosate and triclopyr. The application of these herbicides is considered effective and cost efficient. Herbicide application can be used for controlling a single plant or large stands. Systemic herbicides are absorbed by the leaves and move into the root to prevent regrowth. Triclopyr is a selective herbicide that acts only on broadleaf plants and will not harm grasses in the area. Glyphosate does not persist in the soil but is a non-selective herbicide, killing any surrounding vegetation it comes into contact with. Some triclopyr and glyphosate products are labeled for use in riparian areas and near water. Areas sprayed with triclopyr can recolonize with grasses and other herbaceous species within the same growing season. This helps to suppress giant hogweed seedling growth and decrease soil erosion.

DEC staff control larger sites with herbicide

Recolonization of sites where glyphosate was used may be slower than triclopyr sites unless glyphosate sites are reseeded.

Spray giant hogweed leaves with an herbicide containing triclopyr or glyphosate as the active ingredient. Use the recommended manufacturer's dose and follow label instructions; there is no advantage to using a higher dose. Apply herbicide between late April and early June, when hogweed leaves are green and actively growing. A follow-up treatment in July or August may be needed for plants that did not die from the first herbicide application (e.g. seedlings, leaf rosettes which were covered by leaves of plants originally sprayed). During this follow-up treatment, it is strongly recommended that you remove any flower/seed heads present to decrease next year's seed source (Read part 3.c.). Giant hogweed plants can be sprayed through mid-October, as long as they are still green and not dying back. It is easiest to spray before the plants grow overly tall. For tall plants, spray them in place or cut them down to ground level and spray the regrowth. To be successful in eradicating giant hogweed, herbicide treatments (or another control method) have to be repeated for multiple years in order to kill plants missed the prior year, as well as plants emerging from the seed bank.

Spray during dry and calm weather. Cover leaf surfaces thoroughly with herbicide, but do not spray to the point that liquid is dripping off the leaves. Adding a dye to the herbicide will help you see where you have already sprayed. Do not apply herbicide to non-target plants as you want them to live and revegetate the area. Be patient, it may take treated plants one to two weeks to begin to die. Do not cut or dig up the plant until the top growth has died back. If leaves remain green several weeks or a month after the initial treatment, spray them with herbicide again.

For certified commercial pesticide applicators, technicians and apprentices, listed below are five herbicides that are legal for specific use on giant hogweed in New York State.

Accord XRT II, EPA Reg. No. 62719-556 (contains glyphosate)
Garlon 4 Ultra, EPA Reg. No. 62719-527 (contains triclopyr)
Rodeo, EPA Reg. No. 62719-324 (contains glyphosate)
Roundup ProMax Herbicide, EPA Reg. No. 524-579 (contains glyphosate)
Roundup Pro Concentrate Herbicide, EPA Reg. No. 524-529 (contains glyphosate)

A copy of the FIFRA 2(ee) Recommendation letter which grants approval for use of the herbicide on giant hogweed, as well as a copy of the herbicide label, needs to be carried by the applicator when applying herbicides. The herbicide labels and 2(ee) recommendations can be downloaded at the NYS Pesticide Administration Database (NYSPAD) www.dec.ny.gov/nyspad. Garlon 4 Ultra and Rodeo are classified as restricted and can only be applied by, or under the supervision of, a certified commercial pesticide applicator.

5. Animal Control (Grazing)

Grazing by cattle, sheep, pigs or goats is very efficient for control of large stands of hogweed. Livestock prefer young plants, so it is best to begin the grazing early in the season when the plants are small. In areas with dense stands of hogweed, a single cut or mow is recommended to allow establishment of other plant species so livestock can have a mixed diet. Grazing pressure can be adjusted for stand density and growing season. It is recommended to use 20-30 sheep per hectare and reduce grazing pressure at the end of June to 5-10 sheep per hectare. Giant hogweed contains chemicals that can cause inflammation of the skin and any mucus-secreting membrane that is exposed to light (lips, nostrils, and eye areas). Densely pigmented skin and hairy surfaces are more resistant to the negative effects of these

chemicals. Choose hairy livestock with dark pigmentation where their skin is bare. Animals that show skin inflammation or blistering must be removed from the field temporarily. Livestock require monitoring by a veterinarian. If possible, the fenced area should include the giant hogweed colony as well as the surrounding area where seed dispersal may have taken place. Grazing will need to continue for a number of years until the taproot energy reserves and seed bank are depleted.

6. Monitor

It may be possible for hogweed seeds to remain viable in the soil for 15 years. For this reason, long-term monitoring is important. Check the site and surrounding areas for the next several years for the emergence of any hogweed seedlings or regrowth from previous year's plants. Seed bank longevity is dependent on soil conditions and the number of years viable seed was produced.

Giant hogweed seedlings

7. Revegetation

This step is very important. After removing giant hogweed plants, you may be left with an area of bare soil vulnerable to erosion, giant hogweed seedlings, and introduction of other invasive weeds. Re-establishment of native or non-invasive vegetation (e.g. through sowing of grass mixtures) at treated sites may be necessary to help achieve your desired control outcome. This will help to reduce soil erosion and provide competition for giant hogweed seedlings.

8. Overall Giant Hogweed Control Strategies

- Prevent introduction into new areas.
- Prevent the plant from dispersing seed
- Control hogweed until the seed bank in contaminated soil is exhausted. If removal of contaminated soil is necessary, bury the soil to a minimum depth of 20 inches (50 cm) and cover it with clean soil to prevent seedling emergence.
- Control new, smaller infestations first before the seed bank has a chance to establish.
- Comply with state and federal laws. NYS law prohibits possession of giant hogweed with the intent to sell, import, purchase, transport, introduce or propagate. Giant hogweed is a federal Noxious Weed, making it unlawful to propagate, sell or transport in the United States.
- Locate and map distribution of all populations.
- Focus on populations on the margin of range expansion as a way to slow or prevent further invasion.
- Target populations along rivers and streams and urban stormwater systems. Coordinate throughout the entire drainage system. Sites upstream should be controlled first, since seeds will be dispersed downstream.
- Manage stands along transportation corridors (railroads, highways) to prevent dispersal of seeds by air currents from vehicles and trains. Prevent spread of seeds by road maintenance practices.
- Educate the public to help locate giant hogweed populations, prevent spread, and control plants on their property.

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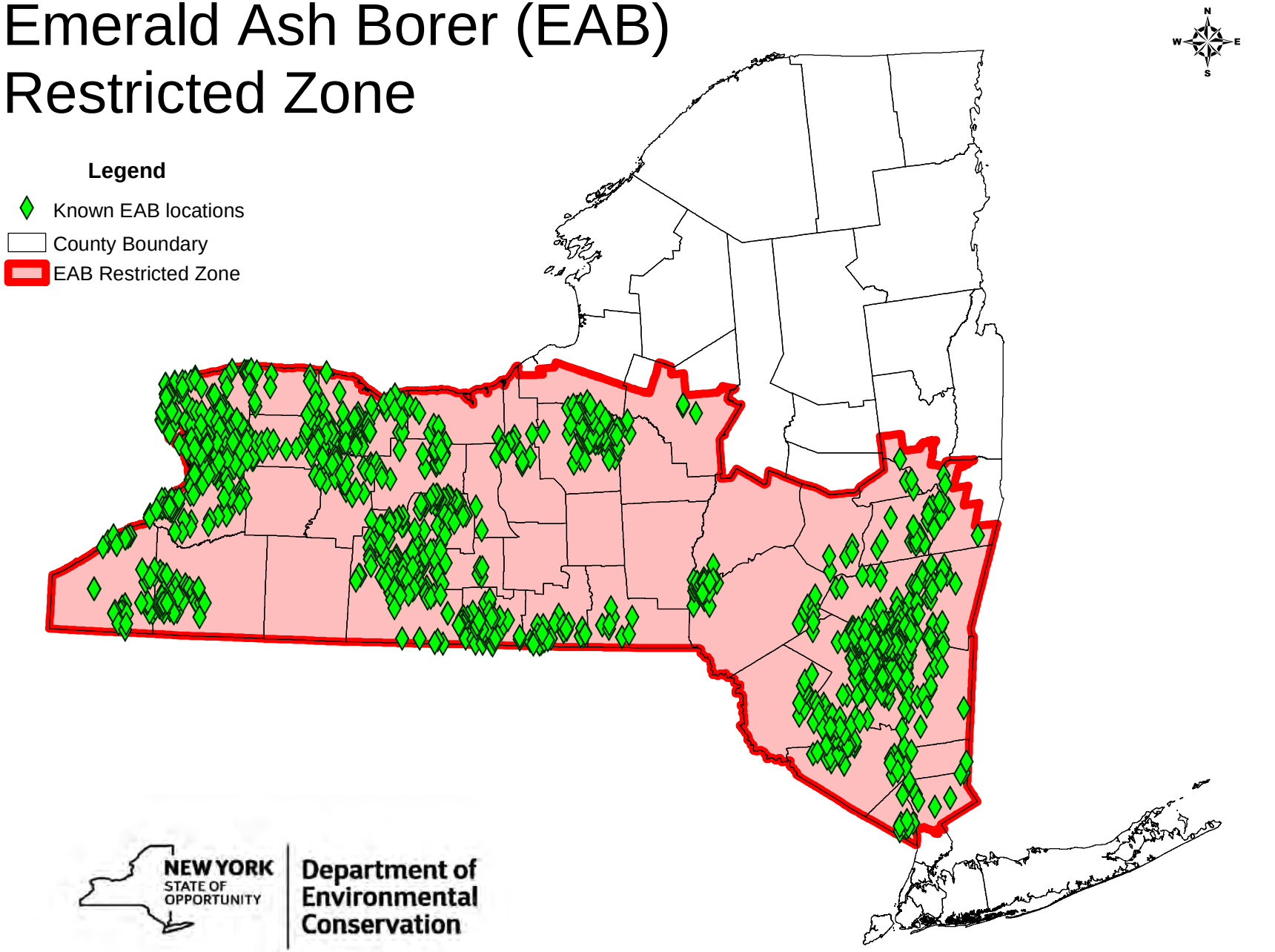
Appendix C

NYSDEC Emerald Ash Restricted Zone Map

Emerald Ash Borer (EAB) Restricted Zone



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Appendix D

Environmental Energy Alliance of New York

Best Management Practices for Preventing the Transportation

of Invasive Plant Species

New York Utility Company Best Management Practices for Preventing the Transportation of Invasive Species

Environmental Energy Alliance of New York

Revisions January 2015

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Appendices

Appendix 1 - Best Management Practices (BMP's) for Invasive Species Transportation Prevention

Appendix 2 - 6 NYCRR Part 575 Prohibited and Regulated Invasive Species, September 10, 2014

1.0 Introduction

Invasive species are non-native plant, animal, or microbial species that cause, or are likely to cause, economic or ecological harm or harm to human health (Presidential Executive Order 13112). Invasive species means, "A species that is nonnative to the ecosystem under consideration; and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Harm must significantly outweigh benefit" [New York Environmental Conservation Law §9-1703(10)(a)] Invasive species have been introduced by human action into a region outside their natural geographic range. Introductions occur along a variety of pathways or vectors, either intentionally such as intentional transport of a species for trade, or by accidental means, as in the case of stowaway species found in the ballast-water of ocean-going vessels.

Most scientists regard invasive species as second only to habitat loss as a threat to biodiversity. The presence of invasive species in a given region is one of the leading causes of endangerment to species native to that region. On a nationwide basis, about half of plant and animal species listed as federally Endangered or Threatened are at risk because of invasive species.

Annual economic losses due to invasive species in the U.S. have been estimated at over $138 billion (Pimentel et al. 2000). These losses include damage to crops and pasture, forest losses, damage from insect and other invertebrate pests, human diseases, and associated control costs.

In an effort, where feasible, to limit the introduction and spread of *invasive species*, this Best Management Practice ("BMP") will be employed when performing activities that occur in *jurisdictional areas* as authorized by the DEC. The BMP identifies procedures that will be incorporated into routine work practices to prevent the introduction and spread of *invasive species*.

2.0 Definitions

The following definitions are applicable to this BMP.

Environmental Energy Alliance of New York (EEANY) – is an association of electric and gas Transmission and Distribution (T&D) companies and electric generating companies that provide energy services in the State of New York. This BMP was prepared by the Land Use Subcommittee of the T&D Committee, which currently represents the following members: Central Hudson Gas & Electric Corporation, Consolidated Edison Company of New York, Long Island Power Authority, National Grid USA Service Company, Inc., New York Power Authority, New York State Electric & Gas Corporation, Orange and Rockland Utilities, and Rochester Gas & Electric Corporation.

Invasive species – species that are non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health (Management Plan National Invasive Species Council, 2001). For purposes of this document, *invasive species* are those contained on the list contained within 6 NYCRR Part 575 Prohibited and Regulated Invasive Species (Appendix – 2).

Invasive species plant material – seeds, roots, or pieces of plant material that could germinate into live plants.

Jurisdictional Area – lands under the statutory jurisdiction of the NYSDEC such as certain freshwater wetlands and adjacent areas, tidal wetlands, certain water bodies, and any protected and species habitat areas specified by natural resource supervisors.

NYSDEC General Permit – a NYSDEC permit authorizing certain utility line activities under Articles 15, 24, and 25 of NYS Environmental Conservation Law. These activities include: inspection, maintenance, repair, restoration, reconstruction of pre-existing structures, vegetation cutting and trimming, and emergency actions affecting tidal wetlands, protected waters, regulated freshwater wetlands, adjacent areas, and protected habitat areas.

Regulated Activity – an activity taking place within a *jurisdictional area* that requires authorization from the NYSDEC.

Utility Rights-of-Way - is an easement-acquired or fee-owned corridor in which gas or electric transmission facilities are located.

3.0 Purpose

This BMP provides guidance for inspecting and cleaning vehicles and equipment to help prevent the spread of invasive species. The procedures identified within this manual outline cost-effective and realistic practices that *Environmental Energy Alliance of New York (EEANY)* utility members will implement when conducting a *regulated activity* within a *jurisdictional area*.

4.0 Applicability

This management practice applies to all *EEANY* utility members performing NYSDEC *regulated activities* within *jurisdictional areas* with populations of *invasive species*.

5.0 Procedures

There are two procedural options for EEANY companies to follow; one is to conduct the BMPs as detailed in the following sections of this plan or to conduct vegetation surveys for invasive species as outlined in Section 5.6. Field crews will be provided a flowchart to assist with determining when to implement these best management practices (Appendix 1).

The following detailed practices will apply where feasible when invasive species are present and when the work is covered by a GP or individual wetland permit.

5.1 Equipment

a. Equipment must arrive clean without visible soil clumps, plant or animal material.
b. Equipment includes, but is not limited to, vehicles, trailers, machinery, matting, boats, barges, and other watercraft, tools, and other materials.
c. Transporting equipment will be cleaned before accepting a new load.
d. Consider tracking pads as a means to remove soil from equipment. If tracking pads are used they must be cleaned after each use in a specific area.
e. Equipment will be cleaned using one of the methods listed below (use the most effective method that is practical):
    - Brush, broom, shovel or other similar hand tools (used without water)
    - High pressure air (when feasible)
f. Equipment must be cleaned within one of the below areas:
    - the infested work area
    - an area immediately adjacent to the work area that is itself currently infested with *invasive species*
g. Do not clean equipment in or near waterways as it may promote the spread of *invasive species* downstream.
h. Where possible, staging areas will be established in locations that are free of *invasive species*. Otherwise, all equipment will be cleaned using the techniques described in 5.3 before leaving the area.
i. When wetland matting is required, it will arrive on site visibly clean, be installed prior to any activities, and will be appropriately cleaned before leaving the area.

5.2 Inspection and Cleaning

a. Inspections and cleaning should be conducted especially when moving from an infested area to an un-infested area.
b. Prior to exiting work area clothing, footwear, and gear should be cleaned of visible signs of plant material.
c. Carry appropriate cleaning equipment (e.g. wire brush, small screwdriver, boot brush) to help remove soils, seeds, and plant material.
d. Preferred locations for cleaning are those where:
    - Work activities are taking place;
    - *Invasive species* are already established; or
    - An area immediately adjacent to the work site that is itself currently infested with *invasive species*.
e. No cleaning of clothing, footwear, gear in or adjacent to waterways – it may promote the spread of *invasive species* downstream.
f. Cleaning will include brushing or self "pat down" of clothing, footwear, and other personal gear within the infested work area.

5.3 Disposal of Impacted Material

a. Preferred locations for equipment cleaning are those areas where work activities are taking place or immediately adjacent areas currently impacted with *invasive species*.
b. Do not clean equipment, vehicles or trailers in or near waterways.
c. Do not dispose of soil, seeds, or plant material in storm drains.
d. Any plant materials that are incidentally removed after completion of steps a-c from site will be properly disposed of in a manner that prevents viable plant parts and propagules from being spread

5.4 Other Prevention Measures

a. Reasonable steps to avoid transportation of *invasive species,* including small, isolated, populations, will be taken.
b. As an alternative to cleaning, ancillary equipment such as spare tires and winches when feasible will be covered when entering *jurisdictional areas* containing populations of *invasive species*.
c. Vehicular access into areas containing populations of *invasive species* will be reduced or minimized to the maximum extent practical. When practical vehicles will be parked outside of the impacted area and crews will enter on foot.

5.5 Site Restoration

a. Minimize soil disturbances by reducing work areas and reducing activities that may result in soil disturbances.

b. Re-vegetate bare soils as soon as feasible to minimize the possible establishment of *invasive species*. When seeding, non-invasive or local native species must be used (seed mixes will vary from region to region). Seed will be broadcasted over all bare soil areas and covered with a mulch layer such as straw. Choose appropriate seed mixes based on site conditions.

c. On steep sloping areas (i.e. slopes exceeding 20 percent), soil erosion control matting (i.e. jute mesh or straw blankets) must be installed over the seeded area. The matting should be secured with biodegradable tacks.

d. Stabilize disturbed soils using appropriate erosion and sediment control procedures as soon as possible. Use invasive free materials such as straw or wood chips; avoid using hay.

5.6 Vegetation Survey (Optional)

If the above BMPS are not followed, then vegetation surveys of site(s) to detect populations of invasive species should be made in advance prior to any activities. If the optional vegetation survey is performed and no invasive species are found, then the procedures outlined above in section 5.1 through 5.5 will not be followed. Survey inspections can be integrated with other activities such as ROW inspections and should be kept as simple as possible to meet invasive species management objectives. If significant populations of invasive species are detected on surveys, then Sections 5.1 to 5.5 apply.

a. Prior to implementing activities scout for, locate and document significant invasive species infestations.
b. Consider the need for actions based on: 1) the degree of invasiveness; 2) severity of the current infestation; 3) amount of additional habitat or host at risk for invasion; and 4) feasibility of managing the spread.
c. Plan activities to limit the potential for introduction and spread of invasive species, prior to construction.
d. Provide appropriate resources in identification of known invasive species for corridor workers.

6.0 Training

A flowchart (Appendix 1) to assist field crews on when to implement the above procedures will be distributed to all field crews.

All transmission vegetation management planners, foresters, and ROW maintenance personnel will be trained in the procedures outlined in Section 5.0 above. Additionally, training sessions focused on the identification of *invasive species* identified in Appendix 2 will be conducted by the individual utility companies. This may take the form of hard copy materials, tail gate briefings and/or presentations during regular staff meetings.

7.0 Emergency Work

During emergencies, *EEANY* utility members will strictly comply with the Emergency Action condition protocol outlined in the *NYSDEC General Permit*. Appropriate site-specific *invasive species* controls and restoration efforts will be determined on an individual basis in conjunction with the regional NYSDEC office.

8.0 References

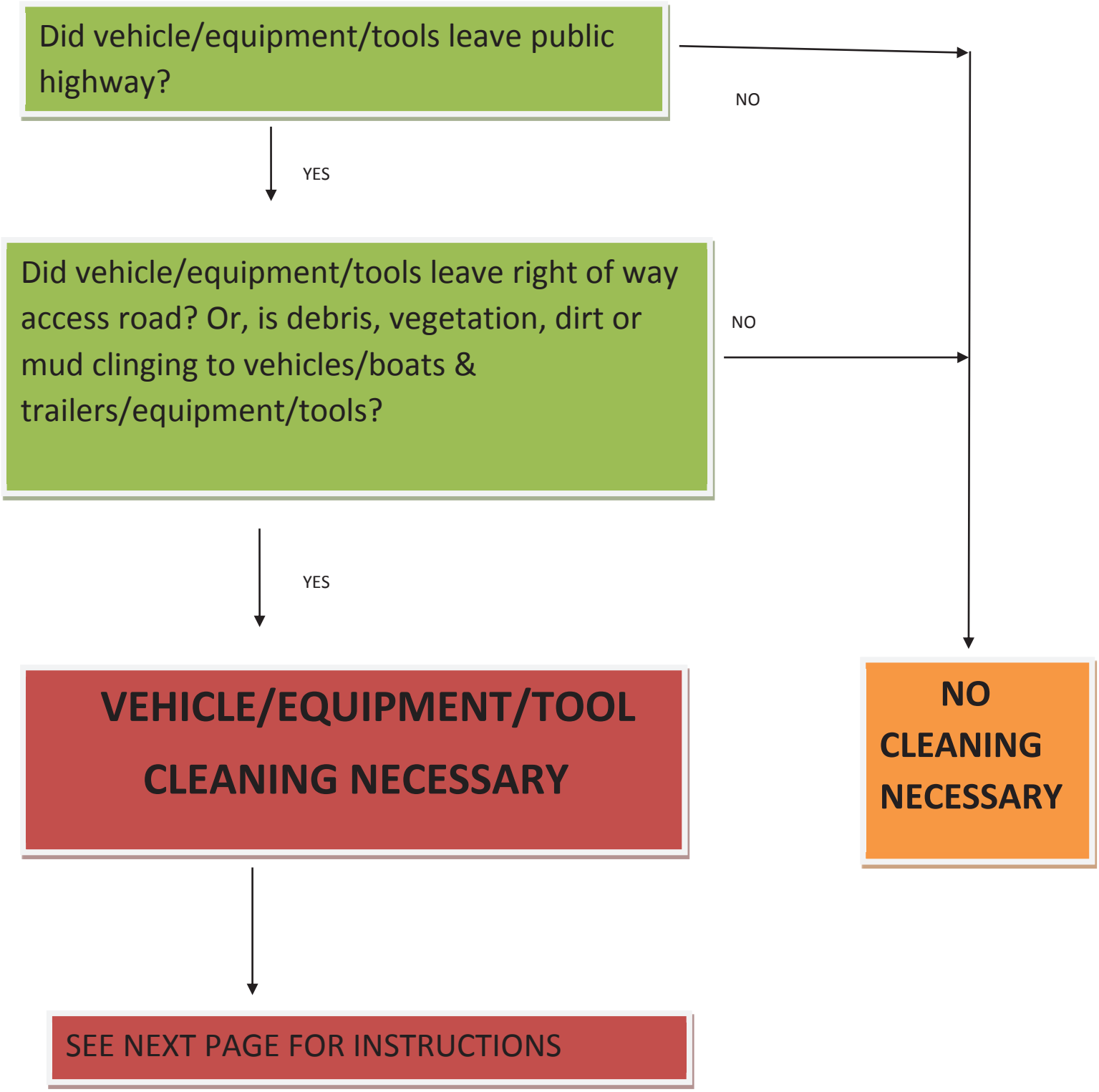
- Electric Power Research Institute, 2008. "Invasive Species and Utility Rights of Way: A Review of the Science". EPRI Publication number 1014032, Palo Alto, CA

- Pimentel, D., Lach, L., Zuniga, R. & Morrison, D**.** 2000. Environmental and economic costs of nonindigenous species in the United States. Bioscience, 50(1): 53-65.

- Presidential Executive Order 13112. Volume 64, Federal Register 1999. Invasive Species.

- Wisconsin Council on Forestry. 2010. *Invasive Species Best Management Practice for Transportation and Utility Rights-of-Way*.

BEST MANAGEMENT PRACTICES (BMP'S) for INVASIVE SPECIES TRANSPORT PREVENTION



PRIOR TO LEAVING THE RIGHT-OF-WAY

- Prior to loading vehicle/equipment/tools remove as much debris, vegetation, dirt and mud clinging to the equipment as feasible using a brush, broom, shovel or other similar hand tool.

- High pressure air can be used on site for cleaning debris, vegetation, dirt and mud off vehicles/equipment/tools.

- Pick-ups and other small road vehicles shall remove on the right-of-way, as much debris, vegetation, dirt and mud clinging to vehicle as feasible prior to entering the highway.

- Small equipment/tools/boots shall be cleaned on site before removal or storage.

- Arrangements can be made for onsite cleaning or washing of vehicles/equipment/tools if deemed necessary.

PRIOR TO LEAVING A BOAT LAUNCH:

CLEAN, DRAIN, DRY -- Prior to leaving a boat launch, **Clean** any visible mud, plants, fish or animals before transporting equipment; **Drain** all water holding compartments including live wells, bait wells and bilge areas; **Dry** the boat, trailer and all equipment before use in another water body

APPENDIX - 2

6 NYCRR Part 575
Prohibited and Regulated Invasive Species
September 10, 2014

ALGAE AND CYANOBACTERIA
Prohibited:
Caulerpa taxifolia, Killer Green Algae
Didymosphenia geminata,
Didymo Prymnesium parvum, Golden Algae

Regulated:
Cylindrospermopsis raciborskii, Cylindro
Grateloupia turuturu, Red Algae

PLANTS
Prohibited:
Acer pseudoplatanus, Sycamore Maple
Achyranthes japonica, Japanese Chaff Flower
Alliaria petiolata, Garlic Mustard
Ampelopsis brevipedunculata, Porcelain Berry
Anthriscus sylvestris, Wild Chervil
Aralia elata, Japanese Angelica Tree
Artemisia vulgaris, Mugwort
Arthraxon hispidus, Small Carpet Grass
Berberis thunbergii, Japanese Barberry
Brachypodium sylvaticum, Slender False Brome
Cabomba caroliniana, Fanwort
Cardamine impatiens, Narrowleaf Bittercress
Celastrus orbiculatus, Oriental Bittersweet
Centaurea stoebe (C. biebersteinii, C. diffusa, C. maculosa misapplied, C. xpsammogena), Spotted Knapweed
Cirsium arvense (C. setosum, C. incanum, Serratula arvensis), Canada Thistle
Cynanchum louiseae (C. nigrum, Vincetoxicum nigrum), Black Swallow-wort
Cynanchum rossicum (C. medium, Vincetoxicum medium, V. rossicum), Pale Swallow-wort
Dioscorea polystachya (D. batatas), Chinese Yam
Dipsacus laciniatus, Cut-leaf Teasel
Egeria densa, Brazilian Waterweed
Elaeagnus umbellata, Autumn Olive
Euphorbia cyparissias, Cypress Spurge
Euphorbia esula, Leafy Spurge
Ficaria verna (Ranunculus ficaria), Lesser Celandine
Frangula alnus (Rhamnus frangula), Smooth Buckthorn
Glyceria maxima, Reed Manna Grass
Heracleum mantegazzianum, Giant Hogweed
Humulus japonicus, Japanese Hops
Hydrilla verticillata, Hydrilla/ Water Thyme
Hydrocharis morsus-ranae, European Frogbit
Imperata cylindrica (I. arundinacea, Lagurus cylindricus), Cogon Grass
Iris pseudacorus, Yellow Iris
Lepidium latifolium, Broad-leaved Pepper-grass
Lespedeza cuneata, Chinese Lespedeza
Ligustrum obtusifolium, Border Privet
Lonicera japonica, Japanese Honeysuckle
Lonicera maackii, Amur Honeysuckle
Lonicera morrowii, Morrow's Honeysuckle
Lonicera tatarica, Tartarian Honeysuckle
Lonicera x bella, Fly Honeysuckle
Ludwigia hexapetala (L. grandiflora), Uruguayan Primrose Willow
Ludwigia peploides, Floating Primrose Willow
Lysimachia vulgaris, Garden Loosestrife
Lythrum salicaria, Purple Loosestrife
Microstegium vimineum, Japanese Stilt Grass
Murdannia keisak, Marsh Dewflower
Myriophyllum aquaticum, Parrot-feather
Myriophyllum heterophyllum, Broadleaf Water-milfoil
Myriophyllum heterophyllum x M. laxum, Broadleaf Water-milfoil Hybrid
Myriophyllum spicatum, Eurasian Water-milfoil
Nymphoides peltata, Yellow Floating Heart
Oplismenus hirtellus, Wavyleaf Basketgrass
Persicaria perfoliata (Polygonum perfoliatum), Mile-a- minute Weed
Phellodendron amurense, Amur Cork Tree
Phragmites australis, Common Reed Grass
Phyllostachys aurea, Golden Bamboo
Phyllostachys aureosulcata, Yellow Groove Bamboo
Potamogeton crispus, Curly Pondweed
Pueraria montana, Kudzu
Reynoutria japonica (Fallopia japonica, Polygonum cuspidatum), Japanese Knotweed
Reynoutria sachalinensis (Fallopia sachalinensis, Polygonum sachalinensis), Giant Knotweed
Reynoutria x bohemica (Fallopia x bohemica, Polygonum x bohemica), Bohemian Knotweed
Rhamnus cathartica, Common Buckthorn
Rosa multiflora, Multiflora Rose
Rubus phoenicolasius, Wineberry
Salix atrocinerea, Gray Florist's Willow
Silphium perfoliatum, Cup-plant
Trapa natans, Water Chestnut
Vitex rotundifolia, Beach Vitex

Regulated:
Acer platanoides, Norway Maple
Clematis terniflora, Japanese Virgin's Bower
Euonymus alatus, Burning Bush
Euonymus fortunei, Winter Creeper
Miscanthus sinensis, Chinese Silver Grass
Robinia pseudoacacia, Black Locust

FISH
Prohibited:
Channa argus, Northern Snakehead
Channa marulius, Bullseye Snakehead
Channa micropeltes, Giant Snakehead
Clarias batrachus, Walking Catfish
Gambusia affinis, Western Mosquitofish
Gambusia holbrooki, Eastern Mosquitofish
Hypophthalmichthys harmandi, Largescale Silver Carp
Hypophthalmichthys molitrix, Silver Carp
Hypophthalmichthys nobilis, Bighead Carp
Misgurnus anguillicaudatus, Oriental Weatherfish
Mylopharyngodon piceus, Black Carp
Neogobius melanostomus, Round Goby
Petromyzon marinus, Sea Lamprey
Proterorhinus semilunaris (P. marmoratus), Tubenose Goby
Tinca tinca, Tench

Regulated:
Carassius auratus, Goldfish
Cyprinella lutrensis, Red Shiner
Cyprinus carpio, Common Carp/ Koi
Gymnocephalus cernuus, Ruffe
Monopterus albus, Asian Swamp Eel
Oreochromis aureus, Blue Tilapia
Oreochromis niloticus, Nile Tilapia
Pterois miles, Common Lionfish
Pterois volitans, Red Lionfish
Sander lucioperca (Stizostedion lucioperca), Zander
Scardinius erythrophthalmus, Rudd

AQUATIC INVERTEBRATES
Prohibited:
Bellamya chinensis (Cipangopaludina chinensis),Chinese Mystery Snail
Bellamya japonica, Japanese Mystery Snail
Bithynia tentaculata, Faucet Snail
Bythotrephese longimanus (B. cederstroemi), Spiny Water Flea
Cercopagis pengoi, Fishhook Water Flea
Corbicula fluminea, Asian Clam
Crassostrea ariakensis, Suminoe Oyster
Didemnum spp., Carpet Tunicate
Dreissena polymorpha, Zebra Mussel
Dreissena rostriformis bugensis, Quagga Mussel
Eriocheir sinensi, Chinese Mitten Crab
Hemigrapsus sanguineus, Asian Shore Crab
Hemimysis anomala, Bloody Red Shrimp
Orconectes rusticus, Rusty Crayfish
Potamopyrgus antipodarum, New Zealand Mud Snail
Rapana venosa, Veined Rapa Whelk
Styela plicata, Asian Sea Squirt

Regulated:
Carcinus maenas, European Green Crab
Daphnia lumholtzi, Water Flea
Hemigrapsus takanoi (H. penicillatus), Brush-clawed Shore Crab/ Grapsid Crab

TERRESTRIAL INVERTEBRATES
Prohibited:
Achatina achatina, Giant Ghana Snail
Achatina fulica (Lissachatina fulica), Giant African Land Snail
Adelges tsugae, Hemlock Woolly Adelgid
Agrilus planipennis, Emerald Ash Borer
Amynthas spp., Asian Earthworms
Anoplophora glabripennis, Asian Longhorn Beetle
Apis mellifera scutellata x A. mellifera ligustica/ A. mellifera iberiensis, Africanized Honey Bee
Archachatina marginata, Giant West African Snail
Cryptococcus fagisuga, Beech Scale
Lymantria dispar, Asian and European Gypsy Moth
Monochamus alternatus, Japanese Pine Sawyer
Pityophthorus juglandis, Walnut Twig Beetle
Sirex noctilio, Sirex Woodwasp

TERRESTRIAL AND AQUATIC VERTEBRATES
Prohibited:
Cygnus olor, Mute Swan
Lepus europaeus, European Hare
Myocastor coypus, Nutria
Nyctereutes procyonoides, Asian Raccoon Dog
Sus scrofa (excluding Sus scrofa domestica), Eurasian Boar

Regulated:
Alopochen aegyptiacus, Egyptian Goose
Cairina moschata, Muscovy Duck
Myiopsitta monachus, Monk Parakeet
Oryctolagus cuniculus, European Rabbit
Trachemys scripta elegans, Red-eared Slider
Xenopus laevis, African Clawed Frog

FUNGI
Prohibited:
Amylostereum areolatum, Sirex Wasp Fungus
Geomyces destructans, White-nose Syndrome
Geosmithia morbida, Thousand Canker Disease
Phytophthora ramorum, Sudden Oak Death

For the official regulations and species lists please see: http://www.dec.ny.gov/regulations/265.html