

INVASIVE PLANT SPECIES MANAGEMENT PLAN

**St. Lawrence Windpower, LLC
St. Lawrence Wind Farm**

**Towns of Cape Vincent & Lyme
Jefferson County, New York**



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1.0 INTRODUCTION

The Applicant, St. Lawrence Windpower, LLC (SLW) is proposing to develop a wind-powered electrical-generating facility with up to 53 turbine locations, with a total capacity of approximately 79.5 megawatts (MW). The proposed Project would be located in the Town of Cape Vincent with a portion of the transmission line in the Town of Lyme in Jefferson County, New York. All 53 turbines, temporary construction laydown area(s), access roads, underground interconnect lines, operations and maintenance building, meteorological towers, an electrical substation and other components would be located in the Town of Cape Vincent; most of the overhead electrical transmission line would be located in the Town of Lyme where the existing transmission grid substation is located.

Due to the disturbance to the site during construction activities, there is a potential for the introduction of invasive species to the area. This possibility makes an invasive species management plan an important aspect of the completion of the project. This Plan ensures that the disturbed area will be returned to a native vegetative state after construction is complete, and that the introduction of invasive species is eliminated or mitigated.

1.1 Definition

Invasive plant species are plants that have been introduced into an environment outside of their native range, where they have few or no natural enemies to limit their spread. When they move into these environments, they are able to colonize the area and dominate or disrupt natural communities. Even if these plants are native elsewhere on the continent or in the state, they are regarded as invasive vegetation if they colonize areas beyond their natural range of dispersal, such as native woody species that invade a prairie site. The spread of invasive plant species is a significant issue in construction projects that involve land disturbance. Earth moving activities contribute to the spread of invasive species, as does the use of contaminated construction fill, seed, or erosion-control products.

1.2 Purpose

The purpose of this Invasive Species Management Plan is to facilitate the identification, control, and monitoring of invasive vegetation thereby preventing its spread, which is the least expensive and most effective way to halt the spread of invasive vegetation. The goal of the Invasive Species Management Plan is to prevent expansion of invasive species within the Project Area during the effective term of the permit. Invasive plant control will be considered successful only if there is no increase in invasive species in the area. If the goal of this Invasive Species Management Plan is not met within the first five years post construction, SLW will review its control efforts with NYSDEC, submit a revised control plan, and implement control actions for an additional five-year monitoring term. Preventing the establishment or spread of invasive species relies upon:

- Educating workers about the importance of managing invasive species;
- Properly identifying invasive species;

- Avoiding, or treating existing invasive species populations; and
- Incorporating measures into the Project that prevent invasive species seeds or other plant parts from establishing new or larger populations.

2.0 LAWS AND REGULATIONS

2.1 Federal

There are many federal laws that contain provisions for the control of invasive species and establishment of native species that apply to Federal land management, stewardship and other activities such as the Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (16 U.S.C. 4701 *et seq.*), Lacey Act, as amended (18 U.S.C. 42), Federal Plant Pest Act (7 U.S.C. 150aa *et seq.*), Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 *et seq.*), and Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*). In addition, the Feb 3, 1999, Executive Order 13112 established the National Invasive Species Council to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts caused by invasive species. However, the Federal law applicable to the management of invasive species in this situation is Section 404 of the Clean Water Act (and it's implementing regulations).

2.2 New York State

The following Articles of the New York Consolidated Laws regulate management of invasive species in the State of New York. The New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Agriculture and Markets has the regulatory authority to implement these laws:

- Inspection and Sale of Seeds (Article 9);
- Integrated Pest Management Program (Article 11);
- Prevention and Control of Disease in Trees and Plants; Insect Pests; Sale of Fruit-bearing Trees (Article 14);
- Forest Insect and Disease Control (Article 9, Title 13);
- Fish and Wildlife (Article 11);
- Fish and Wildlife Management Practices Cooperative Program (Title 5).

3.0 IDENTIFICATION

Eleven invasive species were identified by the NYSDEC as potentially occurring within the Project area. These species, their effects on the environment and possible management options, if identified in the Project area, are provided in the Table below:

Plants	Issues/Effects	Management Options
Swallow-wort	Once established, pale swallow-wort is difficult to control. With a milkweed like pod its seeds can disperse easily when disturbed. This species can drown out local species and take over areas of the forest.	Small patches must be dug out by hand. The entire crown must be removed and destroyed. Large stands can be managed to prevent seed crops by mowing when pods are very small (early July). Large stands can also be cultivated on a yearly basis to achieve control over time. Stay out of infested areas during seed dispersal to prevent seed dissemination to unaffected areas. Likewise, clean boots and other equipment when coming out of infested areas.
Giant Hogweed	A public health hazard, hogweed's clear, watery sap has toxins that cause photo-dermatitis. Skin contact followed by exposure to sunlight produces painful, burning blisters that may develop into purplish or blackened scars. It reaches a height of 10 to 15 feet when in flower and has hollow stems, 2 to 4 inches in diameter with dark reddish-purple spots and bristles. Hogweed prefers moist soil and can quickly dominate ravines and stream banks.	There are multiple ways to control this plant including chemical control methods and grazing, since animals such as cows or pigs are willing to eat this plant and trample it. Treating the plant with an herbicide such as glyphosate and re-seeding the area can help to control the plant. Small patches can also be effectively dug out by hand.
Purple Loosestrife	Purple loosestrife adapts readily to natural and disturbed wetlands. As it establishes and expands, it out-competes and replaces native grasses, sedges, and other flowering plants that provide a higher quality source of nutrition for wildlife. The highly invasive nature of purple loosestrife allows it to form dense, homogeneous stands that restrict native wetland plant species, including some federally endangered orchids, and reduce habitat for waterfowl.	Small infestations of young purple loosestrife plants may be pulled by hand, preferably before seed set. For older plants, spot treating with a glyphosate type herbicide (e.g., Rodeo® for wetlands, Roundup® for uplands) is recommended. These herbicides may be most effective when applied late in the season when plants are preparing for dormancy. However, it may be best to do a mid-summer and a late season treatment, to reduce the amount of seed produced. While herbicides and hand removal may be useful for controlling individual plants or small populations, biological control is seen as the most likely candidate for effective long term control of large infestations of purple loosestrife. As of 1997, three insect species from Europe have been approved by the U.S. Department of Agriculture for use as biological control agents.

European Frogbit	Thick mats of frog-bit inhibit light penetration and can hinder the movement of fish, waterfowl and boats. It prefers quiet waters and can blanket shallow ponds, marshes and the edges of lakes. Like other aquatics, it can spread to new locations from plant fragments attached to boats and trailers.	Plants can be collected by hand or mechanical harvesters, with all parts composted away from aquatic environments. Care must be taken to prevent plant fragments from escaping the infestation site. Sites should be checked annually for re-infestations.
Japanese Knotweed	Japanese knotweed spreads quickly to form dense thickets that exclude native vegetation and greatly alter natural ecosystems. It poses a significant threat to riparian areas, where it can survive severe floods and is able to rapidly colonize scoured shores and islands. Once established, populations are extremely persistent.	Grubbing is effective for small initial populations or environmentally sensitive areas where herbicides cannot be used. Using a pulaski or similar digging tool, remove the entire plant including all roots and runners. Juvenile plants can be hand-pulled depending on soil conditions and root development. Any portions of the root system not removed will potentially re-sprout. All plant parts (including mature fruit) should be bagged and disposed of in a trash dumpster to prevent re-establishment.
Glossy Buckthorn	Natural community composition, especially of upland deciduous woods and of wetlands, may be altered due to invasion of common buckthorn and glossy buckthorn. These species can cause habitat degradation, shade out rare species, and give rise to general declines in native species diversity.	Cultural controls that have been used for management include cutting, mowing, girdling, excavation, burning, and “under-planting.” Repeated cutting reduces plant vigor. Mowing maintains open areas by preventing seedling establishment. Glossy buckthorn girdled with a two- to three-centimeter-wide saw-cut, completely through the bark at the base, does not re-sprout. Girdling may be done at any time of the year. A five-second flame torch application around the stem kills stems less than 4.5 centimeters in diameter. Seedlings or small plants may be hand-pulled or removed with a grubbing hoe.

<p>Honeysuckle</p>	<p>Exotic bush honeysuckles can rapidly invade and overtake a site, forming a dense shrub layer that crowds and shades out native plant species. They alter habitats by decreasing light availability, by depleting soil moisture and nutrients, and possibly by releasing toxic chemicals that prevent other plant species from growing in the vicinity. Exotic bush honeysuckles may compete with native bush honeysuckles for pollinators, resulting in reduced seed set for native species.</p>	<p>Hand removal of seedlings or small plants may be useful for light infestations, but care should be taken not to disturb the soil any more than necessary. In shaded forest habitats where exotic bush honeysuckles tend to be less resilient, repeated clippings to ground level, during the growing season, may result in high mortality. Clipping must be repeated at least once yearly because bush honeysuckles that are cut once and left to grow will often form stands that are more dense and productive than they were prior to cutting.</p>
<p>Spotted Knapweed</p>	<p>Spotted knapweed infests a variety of natural and semi-natural habitats including barrens, fields, forests, prairies, meadows, pastures, and rangelands. It out-competes native plant species, reduces native plant and animal biodiversity, and decreases forage production for livestock and wildlife. Spotted knapweed may degrade soil and water resources by increasing erosion, surface runoff, and, stream sedimentation.</p>	<p>The most cost effective management strategy for spotted knapweed is to prevent its spread to non-infested areas. Spread by seed can be minimized by avoiding travel through infested areas; by cleaning footwear, clothing, backpacks, and other items after hiking through infested areas; by not grazing livestock when ripe seeds are present in the flower heads; and by using weed free hay.</p>
<p><i>Phragmites</i></p>	<p>Eventually, <i>Phragmites</i> becomes the sole dominant plant in many of these wetlands. It is doing so at the expense of native flora and fauna dependent on these native habitats. The tall grass often forms monotypic stands where it is virtually the only species present. The change in plant structure (from short grasses to tall grass), in biodiversity (from many species to a single species), and in wildlife food production has reduced the habitat value of these marshes for many fish and wildlife species.</p>	<p>Once a problem stand of <i>Phragmites</i> has been identified, one or more techniques may be applied to control it. Possible control measures include cutting, burning, herbicides, hydrologic controls, and plastic covers.</p>

Eurasian Water Milfoil	Eurasian water milfoil can form large, floating mats of vegetation on the surface of lakes, rivers, and other water bodies, preventing light penetration for native aquatic plants and impeding water traffic. The plant thrives in areas that have been subjected to various kinds of natural and manmade disturbance.	Large harvesting equipment can be used to mechanically remove milfoil in larger areas; a sturdy hand-rake can be used for smaller areas. Other available options include manipulation of water level, light penetration and chemical control.
Rock Snot, <i>Didyma</i>	<i>Didyma</i> can create a large mat of algae sticking to rocks causing reduced habitat for small fish and invertebrates. This also reduces the amount of oxygen in the water due to the algae growth.	When leaving the affected water course, make sure all clumps are off of boots, clothing and equipment. For treatment of clumps completely drying the <i>Didyma</i> prevent spread or soak and scrub all items for at least one minute in hot (60°C) water, a 2 percent solution of household bleach or a 5 percent solution of salt, nappy cleaner, antiseptic hand cleaner or dishwashing detergent.

All of the plant species listed in the Table above could occur in the Project Area. The following discussion outlines management measures that may be implemented in the Project Area to identify, control, and monitor invasive species:

4.0 PRE-CONSTRUCTION PHASE

4.1 Identification

The Project Area will be surveyed prior to mobilization to identify and inventory populations of invasive species. This pre-construction baseline survey will be used during the post-construction phase to evaluate invasive species populations. Areas containing an infestation will be clearly identified on construction plans and in the field with signs, flagging, and/or stakes.

4.2 Pre-Construction Plant Removal and Treatment

The Applicant will determine if early removal or treatment of seed sources or reproducing plant parts is necessary prior to construction start.

4.3 Training

The St. Lawrence Wind Farm environmental inspector will hold training sessions for all appropriate contractors and subcontractors to explain the Invasive Species Management Plan prior to the start of construction. Contractors and subcontractors will be instructed in identification of invasive plant species, control and management of invasive species during construction, and post-construction monitoring measures. Prior to construction, the Applicant, environmental inspector, and contractors and subcontractors will conduct a walkover during which areas flagged for invasive species will be identified.

5.0 CONSTRUCTION PHASE

5.1 Inspection of Fill Sources

Source locations used for importation of fill and/or construction material, including topsoil, sand, gravel, rock, and crushed stone, from offsite locations for use as fill and/or construction material will be properly inspected by the environmental inspector for invasive species. If any of the invasive species listed above are found growing in or adjacent to the fill source, the material will not be accepted.

5.2 Invasive Species Vegetation Removal and Disposal

When invasive species are encountered within the Project Area they will be stripped and immediately removed. Cut plant material will be placed in heavy duty, 3 mil or thicker, black contractor quality plastic cleanup bags. Bags will be securely tied and transported from the site in a truck with a topper or cap in order to prevent spread or loss of the plant material during transport from the control work site to an appropriate staging or disposal location. Cut vegetation will not be disposed into native cover areas. Machinery and equipment used in this removal will then be pressure washed before leaving the invasive species affected area.

5.3 Top Soil Removal

Top soil containing invasive species will be stripped and immediately removed from the Project Area. Loads will be covered to prevent windborne dispersal of invasive vegetation. No disposal or transfer of excess spoils or cleared top soil into native cover

areas will be allowed. Machinery and equipment used in this removal will then be pressure washed before returning to the St. Lawrence Wind Farm site.

5.4 Washing Machinery and Equipment

All machinery and equipment to be used in the construction of the proposed Project, including but not limited to trucks, tractors, excavators, and hand tools such as shovels, rakes, hoes, picks, and etc., will be washed with high pressure hoses prior to delivery to the site, to ensure they are free of invasive species. The environmental inspector will check that all trucks and equipment have been washed prior to first use, and that there is no dirt or plant material clinging to the wheels, tracks, or undercarriage of the vehicles or equipment.

5.5 Erosion Control

The environmental inspector will ensure that contractors use only certified weed-free straw and mulch for erosion control. Appropriate erosion controls will be employed to reduce migration of non-native vegetation. On bare surfaces, contractors will be required to reestablish native vegetation and to use weed-free mulch to minimize weed germination.

5.6 Preserve and Restore Native Vegetation

Impacts on native vegetation will be avoided or minimized to the extent practicable. Wetland areas and riparian zones temporarily impacted during the construction of the wind farm will be restored to pre-construction contours and re-vegetated with native (non-invasive) plant material or seeds immediately following the completion of regulated activities at each site. This re-vegetation effort will ensure adequate vegetative cover to prevent the colonization of invasive species. Top soil stripped from a site that contained a community of invasive species will not be stored, disposed of, or re-spread in or adjacent to a wetland or riparian zone. Where hydrologic features have been temporarily disturbed, the original surface hydrology will be restored. Clean top soil obtained from a source known to be free of invasive species propagules will be used. An appropriate native seed mixture will be selected based on pre-disturbance surveys. All seed will be from local sources, to the extent possible dependant upon seed availability, and applied at recommended rates. Cleaning and maintenance of construction equipment also will minimize contact with sources of weed seed in areas not yet re-vegetated.

6.0 POST-CONSTRUCTION PHASE

6.1 Control Methods

The following methods of invasive species control may be employed to manage invasive plant communities (if other invasive species are discovered, the St. Lawrence Windpower, LLC staff will consult with NYSDEC regarding the most effective means of control):

6.1.1 Physical Control

- Determine if the site and invasive species are appropriate for mechanical or manual control methods; and
- Implement physical control methods on species that are known to respond to such treatment.

6.1.2 Chemical Control

- Determine effectiveness of herbicide application on the invasive plant species, including application rates, techniques, timing, combination with other control methods, and impacts to non-invasive plant communities;
- Implement chemical control methods in areas where herbicide is most effective;
- In all cases and for all herbicides, directions for use and restrictions found on the label will be followed;
- All herbicides will be applied by a New York State Certified Applicator or Technician in an appropriate category;
- In wetlands with standing water only the RODEO® glyphosate formulation will be used;
- In wetlands with no standing water either the RODEO®, ROUNDUP® or the AQUAMASTER® formulation may be used; and
- In uplands, either ROUNDUP®, AQUAMASTER® or GLYPRO® will be used.

6.1.3 Cultural Control

- Determine if construction and/or maintenance activities have introduction and spread of invasive species;
- Implement preventative measures, such as equipment washing and/or area-specific closures, to reduce spread;
- Make sure that bare soil is re-vegetated with native species wherever practical; and
- Defer soil disturbance until invasive species are under control.

6.2 Monitoring Program

Monitoring for the presence of invasive species will be integrated into the wetland mitigation site-monitoring program for at least the first five years post-construction. Restoration monitoring will be conducted continuously at the permanently impacted sites by routine inspections conducted by St. Lawrence Windpower, LLC staff and bi-annually during the growing season by conducting qualitative surveys for invasive species populations throughout the Project Area for comparison to the baseline survey completed prior to the commencement of construction activities. The first survey after construction will identify invasive plant communities and locate any new weed infestations. Thereafter, surveys may be conducted with spot ground checks in areas of infestation.

7.0 REFERENCES

Cornell Cooperative Extension of Jefferson County, Pale Swallow-wart; Control and prevention. <http://www.swallow-wort.com/swort013.html>

King County Noxious Weed Control Program, 2007,
<http://dnr.metrokc.gov/wlr/LANDS/weeds/hogweed.htm>

Swearingen, Jil M. National Park Service, Washington, DC, 2006.
<http://www.nps.gov/plants/ALIEN/fact.htm>

Wisconsin Department of Natural Resources, 2004,
<http://dnr.wi.gov/invasives/fact/frogbit.htm>

University of Maine Cooperative Extension, 2008,
<http://www.umext.maine.edu/onlinepubs/htmlpubs/2505.htm>

Massachusetts Audubon Society, 1998,
http://www.massaudubon.org/Kids/Lively_Lessons/Saltmarsh/restoration.html