Section 10
Buffers

1.0 BUFFERS

Vegetated buffer strips help maintain the water quality of surface waterbodies and provide habitat and travel corridors for wildlife between habitats. Vegetated buffers are an effective, attractive way to visually screen certain forms of development. This section discusses the vegetative buffers that will be maintained around the turbines and access roads and along the collector line right-of-way (ROW) for the Revised Oakfield Wind Project (project).

Buffers around access roads and turbine pads will be preserved to provide stormwater management and phosphorus treatment. The collector line ROW will be continuously vegetated with shrubs and herbaceous vegetation, and several methods will be used to maintain vegetated buffers along that proposed corridor. Buffers for the project will include (i) no-cut buffers around roads and turbines; (ii) the typical ROW buffer created during ROW clearing and follow-up vegetation maintenance; (iii) standard waterbody buffers at streams and other waterbody crossings created by selective clearing during construction and reduced cutting of vegetation during maintenance and operation of the collector line; (iv) vernal pool buffers created by selective cutting within the vernal pool buffers and reduced clearing during construction and maintenance; and (v) Atlantic salmon (*Salmo salar*) stream buffers at salmon habitat stream crossings that combine strategic placement of structures, selective clearing during construction, and minimal cutting of vegetation during maintenance and operation of the collector line.

This section describes the desired objectives, characteristics, and methods to develop and maintain these buffers. The vegetation cutting practices used to preserve and maintain buffers include no cutting, limited and selective clearing, and normal mechanized clearing combined with the selective use of herbicides. The specific methods to be utilized along the ROW have been developed by Evergreen Wind Power II, LLC (Evergreen II) and have been tailored to meet the desired buffer objectives in a manner that will provide a clear, achievable set of standards for construction and maintenance personnel. Evergreen II will maintain these buffers in accordance with the Post-Construction Vegetation Maintenance Plan (VMP) and the Invasive Species Management Plan, which are provided in Appendices 10-1 and 10-2, respectively, of this section.

Table 10-1 below summarizes the four basic types of buffers proposed for the Project and the clearing and maintenance practices that will be implemented to maintain each type of buffer. Additional details and variations are provided in the remainder of this section and in the VMP.

Table 10-1. Revised Oakfield Wind Project Buffers

Name	Location	Buffer Width	Clearing During Construction	Cutting During Maintenance And Operation[1]	Pole Placement	Herbicide Use
Access Roads and turbine pads	Turbine project area	Variable buffer outside of disturbed area and as depicted on the site plans	None in the buffer area	As provided in stormwater plan	Not allowed	Not allowed
Typical collector line ROW	All areas not otherwise restricted	Not applicable	Cut at ground level all vegetation that is greater than 2 inches dbh[1,2]; remove or top all other vegetation that is 8-10 feet or taller	Cut at ground level all capable species that are 8-10 feet or taller; top all other vegetation that is 8-10 feet or taller	Standard	Allowed
Standard Waterbody	All areas not otherwise restricted	25 feet on each side of waterbodies	Cut at ground level all capable species that are 8-10 feet or taller; no other vegetation is cut. Limited clearing with 100 feet of streams.	Cut at ground level all species that are 8-10 feet or taller; no other vegetation is cut	Not Allowed	Not Allowed in buffer
Salmon Habitat Stream Buffers	ASC[3] Special Concern Salmon Habitat Streams	100 feet on each side of salmon streams	Top[4] or remove all capable species that could grow to within 15 feet of a conductor in the next 3-4 years; no other vegetation is cut	Top[4] or remove all capable species that could grow to within 15 feet of a conductor in the next 3-4 years; no other vegetation is cut	Not Allowed, but place as close as possible	Not Allowed in buffer

[1] dead or danger tees are removed at any time
[2] dbh = diameter at breast height
[3] ASC = Atlantic Salmon Commission
[4] Cut at ground level if topping the tree will not leave sufficient foliage to sustain the tree

1.1 BASIS FOR THE APPLICANT'S BUFFER DESIGNS

Many factors were considered to determine the number, size, location, and construction and maintenance restrictions associated with the various types of buffers proposed for the Project. Evergreen II has drawn on its considerable past experience with construction and maintenance of wind projects and blended that experience with more recent buffer proposals, Maine Department of Environmental Protection (MDEP) regulatory authority, ROW maintenance guidelines, and its consultations with resource and regulatory agencies and boards. During development of the proposed buffers and associated vegetation maintenance for the Project, seven items were identified as critical factors that must be incorporated. They are:

- The desire to use vegetated buffers as part of stormwater and phosphorus control;
- The requirement to successfully conduct the initial clearing of the collector ROW within the parameters set forth in the application and to institute the vegetation maintenance requirements;
- The need to ensure reliable operation of the collector line;
- The scientific objectives and public policy goals of protecting and preserving natural resources and the natural environment;
- The state of ROW construction and maintenance practices conducted by the Applicant and throughout the industry;
- Recent proposals for other wind power projects; and
- The Applicant's commitment to environmentally sensitive development.

These seven factors were taken into consideration to design buffers that balance the operational needs of the project with environmental benefits of riparian buffers. Evergreen II believes these buffers combine the best features of successful, existing practices with new ideas and more focused resource concerns while providing procedures and restrictions that are realistic to implement in the field. Evergreen II believes that the buffers and the VMP proposed for the project also respond to concerns expressed by the MDEP to create uniform and practical vegetative buffer standards.

2.0 ACCESS ROAD AND TURBINE BUFFERS

Stormwater buffers for the access roads and turbine buffers provide no-cut or limited cut areas that will provide a visual break and stormwater and phosphorus treatment from the developed areas. In addition to these buffers, the majority of the turbine pad area at each turbine will be reseeded, providing additional buffering capacity (see Section 12, Stormwater Management). These buffers are located in the areas depicted on the project drawings.

3.0 TYPICAL COLLECTOR LINE BUFFERS

The collector lines require cutting vegetation to continuously meet safety standards designed to protect against contact of the wires with vegetation. Buffers for the collector line are designed to provide for that cutting while also maximizing protection of the resources encountered within the ROW.

The Applicant's typical ROW construction and maintenance procedures require the retention of low ground cover to the maximum extent practicable during construction, immediate restoration and stabilization of areas affected by construction, and ongoing maintenance activities that promote the long-term growth of diverse, healthy, low vegetation. This results in a utility corridor that provides excellent cover for small animals and birds and significant browse habitat for larger mammals. In addition, it prevents soil erosion and the resultant sedimentation of water and wetland resources.

3.1 TYPICAL ROW BUFFER CLEARING PROCEDURES

Prior to any clearing, all resources and their buffers will be flagged in the field in order to identify these resources for the clearing crews. Additionally, clearing of the resources and buffers will be performed under frozen ground conditions whenever practicable. If clearing under frozen ground conditions is not

practicable, all methods to reduce ground disturbance, erosion, and sedimentation will be employed. Specific measures within each resource buffer are detailed below.

Prior to construction, crews with whole-tree harvesting machines will first ground-cut vegetation equal to or greater than two inches diameter-at-breast height. Remaining smaller vegetation will be removed or topped by hand-clearing crews and/or mowing and flailing machines. Significant branches that overhang the ROW and any dead or damaged trees outside the ROW that could contact the proposed power lines or cause an arc if they fall (i.e., danger trees) will also be removed. Large vegetation cut during initial clearing will be chipped on-site or removed, in accordance with the Maine Slash Law.

4.0 STANDARD STREAM BUFFERS

A minimum 25-foot buffer, as measured from the top of bank on each side, will be established for the streams crossed by the collector line and those adjacent to new access roads. Waterbodies crossed by the project in the summit area are a mix of permanently flowing streams connected to larger stream systems and intermittent stream segments that are disconnected from larger waterbodies. See Section 7, Appendix 7-1 for detailed locations.

To minimize soil disturbance adjacent to waterbodies, the collector line has been designed to avoid the placement of structures within waterbody buffers. Additional procedures and restrictions will apply within the waterbody buffers during construction and follow-up vegetation maintenance to further protect waterbodies from sedimentation and otherwise minimize any adverse project impacts.

Waterbody or riparian buffers are typically designed to provide one or more of the following functions:

- Prevent soil erosion and the resultant sedimentation of surface waters;
- Slow the velocity, increase the infiltration, and otherwise remove sediment and other contaminants in stormwater runoff before it enters surface waters;
- Reduce accessibility of all-terrain vehicle users to streams;
- Provide shade to reduce the warming effect of sunlight (insulation) on water temperature; and
- Provide cover for wildlife when accessing waterbodies and traveling across the ROW.

As described above and in more detail in Section 14, Basic Standards, which includes Erosion and Sedimentation Control, nearly the entire collector line ROW will remain vegetated with low shrub and understory species during construction. Ground disturbance will occur only in localized structure locations or equipment travel lanes. Necessary erosion and sedimentation control measures will be installed and maintained throughout construction to prevent adverse impacts to waterbodies and other resources. During initial clearing and vegetation maintenance in these 25-foot waterbody buffers, the removal of vegetation will be done by hand-cutting or by traveling or reaching into the buffer using low ground pressure mechanized harvesting equipment. During clearing operations, mobile equipment will only be allowed inside the buffer on timber mats or will be monitored carefully to limit disturbance/rutting. The locations of temporary equipment crossings will be reviewed by an environmental inspector before equipment bridges are installed. The type and location of associated erosion and sedimentation controls will be established at that time. Equipment crossings will span the waterbody.

Following completion of construction in an area, any temporarily disturbed ground will be restored to original contours and stabilized with permanent seeding. Follow-up vegetation maintenance practices will encourage the growth of dense, low ground cover, and shrub species. The use of herbicides is prohibited within stream buffers and within 25 feet of any wetlands with water showing at the surface. In addition, no equipment refueling or maintenance will be performed within waterbody buffer zones.

Where removal of vegetation is further restricted (described below), a minimum 25-foot buffer will protect waterbodies crossed by the collector line from adverse effects from sedimentation and contaminated runoff. Generally, the conversion of forest cover to a scrub-shrub or early successional cover type within a collector line ROW will improve the ability of the land to absorb runoff due to the increased density of the root mass and near-ground leaf and stem material associated with the resultant vegetative cover.

In some locations, due to the characteristics of the crossing, wider buffers may be allowed without presenting undue difficulty to vegetation maintenance crews or the potential for increased environmental damage in order to maintain the buffer. In general, buffer widths of 25 feet work well because large trees within the buffer can typically be removed with a feller-buncher or similar mobile harvesting equipment. Based on existing terrain and size of the tree, such equipment can often reach into the area and cut and remove a tree without having to travel a significant distance into the buffer and without dragging the harvested tree out of the area. Tree removal becomes more difficult as buffer widths increase beyond 25 feet unless additional access for mobilized tree-clearing equipment is allowed. While hand-cutting of large trees is an alternative, skidding a large tree from more than 25 feet away typically increases the potential for significant soil disturbance, as well as increases the likelihood of damage to remaining vegetation. In short, wider construction buffers do not necessarily minimize the potential for environmental impacts.

In 1993, A.M. Peterson reported in the *North American Journal of Fisheries Management* that the removal of tree canopy on new ROWs increases stream insolation during the short term; however, within two years, the areas are bordered by dense shrubs and emergent vegetation, and water temperatures are not significantly greater when compared with upstream forested reaches.[1] Nevertheless, Sections 4.2 and 4.3, below, describe the restrictions related to vegetation cutting and maintenance that the Applicant will follow to allow for taller vegetation within riparian buffers. Taller vegetation will provide additional shading of streams and reduce the potential warming effect of direct sunlight. The taller vegetation will also provide additional cover for birds and animals accessing streams and crossing the ROW, and will provide some visual screening. As a result, the waterbody buffers will continue to function in a similar manner as before construction.

4.1 STRUCTURE PLACEMENT

To maintain the integrity and maximize the environmental benefits of the riparian buffers, no permanent structures are located within 25 feet of any stream, and the number of structures that must be placed within 100 feet of a waterbody is limited to the maximum extent practicable.

4.2 STANDARD STREAM BUFFER CLEARING PROCEDURES

Tree cutting in 100-foot riparian buffer zones will be limited. Prior to line construction, only capable species greater than 8 to 10 feet tall will be removed. No other vegetation, other than dead or danger trees, will be removed and impacts to shrub and herbaceous vegetation will be minimized. Within the 25-foot buffers, capable species will be removed by hand-cutting or by traveling/reaching into the buffer zone with low ground pressure (tracked) tree harvesting equipment. When possible, clearing within the stream buffers will take place during frozen ground conditions to minimize disturbance. No slash will be accumulated within 50 feet of the edge of the stream.

Temporary erosion and sedimentation control measures will be implemented along the collector line. Ground disturbance caused by the use of harvesting equipment will be repaired by returning the ground to its original contour, as needed, and seeding and mulching any bare ground.

4.3 STANDARD STREAM BUFFER MAINTENANCE RESTRICTIONS

Vegetation maintenance within stream buffers is typically conducted on a three or four-year cycle, depending on growth and vegetation. Consistent with clearing practices for construction, only capable species greater than 8 to 10 feet tall will be removed. Removal will be by hand-cutting only, with limited use of motorized equipment in areas that are directly accessible from public or private access roads or from the middle access way established during initial clearing. No herbicides will be used, stored, mixed, or transferred between containers within the stream buffer areas, and no refueling of chain saws or other equipment will be allowed.

[1] Peterson, Allen M., *Effects of Electric Transmission Rights-Of-Way on Trout in Forested Headwater Streams In New York*, North American Journal of Fisheries Management, vol. 13, pp. 581-585, 1993.

Appendix 10-1, Figure 1 illustrates vegetation clearing and maintenance practices within standard waterbody buffer zones. It is important to note that once the capable species (e.g., quaking aspen [*Populus tremuloides*], gray birch [*Betula populifolia*], balsam fir [*Abies balsamea*], white pine [*Pinus strobus*], and red maple [*Acer rubrum*]) are removed, the "desirable species" that will persist and be maintained in the buffers will consist primarily of shrubs (e.g., arrowwood [*Viburnum dentatum*], highbush blueberry [*Vaccinium corymbosum*], speckled alder [*Alnus incana*], and winterberry [*Ilex verticillata*]), grasses, sedges (e.g., *Carex* sp.), and rushes (e.g., *Juncus* sp.). The desirable species will be allowed to grow at their naturally occurring rate and height. Enhancement of the density and vigor of this vegetation will be achieved through the removal of taller, competing species. Additional restrictions on vegetation maintenance will provide still taller vegetation in designated salmon habitat stream buffers, as described in Section 6.2 through 6.3, to further enhance shading capacity.

The waterbody crossing table, provided as Table 1 in Section 3.1 of the VMP, includes the names and locations of waterbodies crossed by the 34.5-kilovolt collector line.

5.0 SIGNIFICANT VERNAL POOL BUFFERS

Vernal pool surveys for the collector line were conducted during the springs of 2009, 2010, and 2011, and no Significant Vernal Pools were identified within the proposed collector line ROW. Therefore, no specific buffers will be required along the collector line. Survey results for the collector line can be seen in Section 7, Appendix 7-1 of the Site Location of Development application**.**

6.0 SALMON HABITAT STREAM BUFFERS

In 2009, Critical Habitat was designated for the freshwater geographic range occupied by the Gulf of Maine Distinct Population Segment of Atlantic salmon, including all perennial stream, river, and lake habitats connected to the marine environment (50CFR226: Federal Register, June 19, 2009). The Project area is located partially within one HUC 10 watershed designated as critical habitat, the East Branch of the Mattawamkeag River watershed (HUC 10 102000302). The Applicant has identified additional construction design criteria and further vegetative maintenance restrictions that will provide additional shading of perennial waterbodies across the collector line to the maximum extent allowed by safety considerations. Therefore, a minimum 100-foot vegetated buffer, as measured from the edge of the stream on each side, will be established for salmon habitat streams within the collector line ROW.

6.1 SALMON HABITAT STREAM STRUCTURE PLACEMENT

The maximum height of vegetation within the ROW is a function of conductor height. The conductors are at their highest closest to a structure, and they are at a low point midway between structures. Accordingly, the Applicant has endeavored to locate structures as close to the edge of the salmon habitat stream buffers as possible to create a conductor height that will allow for higher vegetation. This will result in taller vegetation that provides maximum shading of the salmon habitat streams. The extra shading that results from adjusting pole locations or heights is proposed because these streams were identified during agency consultations as the most critical in terms of promoting potential habitat for Atlantic salmon. The additional vegetation height could also enhance shelter for wildlife, although this is not considered a primary objective for these predominantly small streams.

The combination of closer structures and maximum allowable vegetation height within 100 feet of each bank at the salmon habitat streams will provide vegetation that ranges from approximately 20 to 30 feet tall, on average, over the course of a routine maintenance cycle. Maintaining vegetation within the range of heights indicated will minimize the potential for warming of water temperatures that might otherwise result from removal of existing vegetation.

6.2 SALMON HABITAT STREAM BUFFER CLEARING PROCEDURES

During initial clearing activity prior to collector line construction, only those trees capable of growing to a height within the minimum Vegetation Maintenance Standard of 15 feet from a conductor within the next 3 to 4 years will be topped or removed within the 100-foot buffer. Topping of trees is the preferred method of vegetation maintenance unless the tree is dead or dying, in which case topping will leave insufficient vegetation to sustain the tree. No other vegetation, other than dead or danger trees, will be removed. Removal of capable species will be by hand-cutting or with low ground pressure tree harvesting equipment working from inside the buffer. Mats will be used as necessary to prevent excessive rutting. In addition, no refueling or maintenance of equipment, including chain saws, will be performed within the salmon stream buffer zones.

6.3 SALMON HABITAT STREAM BUFFER MAINTENANCE RESTRICTIONS

The vegetation maintenance procedures and restrictions within salmon stream buffers are the same as those that apply during initial clearing, with limited use of motorized equipment in areas that are directly accessible from public or private access roads. Appendix 10-1, Figures 2 and 3 illustrate vegetation clearing and maintenance practices within salmon stream buffer zones.

7.0 POST–CONSTRUCTION COLLECTOR LINE ROW VEGETATION MAINTENANCE

Inadequate tree trimming near transmission lines can cause power outages and thus diminish the reliability of power delivery to the customer. Therefore, it is incumbent upon the Applicant to adequately clear vegetation during construction and adopt vegetation maintenance practices to ensure that reliable power is delivered to the grid and ultimately supplied to consumers. There is also a need to maintain appropriate buffers that serve a range of purposes, including environmental preservation, protection of fisheries, and visual mitigation.

Routine vegetation maintenance of the collector line ROW will be consistent with industry standards to maintain the integrity and functionality of the line, to maintain access in case of emergency repairs, and to facilitate safety inspections. Clearing and trimming vegetation before it gets too close to electrical conductors is essential to ensure the safe, reliable, and uninterrupted availability of electrical power. For example, power outages may occur if trees or other vegetation either come into contact with or get too close to the conductors. Insufficient separation between an object and the conductor can create an electric arc that can cause short circuits and fires. Consistent with operating procedures and to ensure safe, reliable operation of a transmission line, the VMP must ensure that there is a minimum distance of 15 feet between any object and the conductor during all phases of the maintenance cycles. Failure to do so may result in the line short circuiting and/or line outages.

The Applicant's proposed buffer maintenance plan balances the need to maximize buffer width and vegetation height in those areas where doing so brings about significant environmental benefits, while considering the practical and operational limitations under which the Applicant operates and its mandate to provide reliable power.

7.1 VEGETATION MAINTENANCE PLAN

The Applicant has prepared a VMP to be a stand-alone document containing post-construction vegetation maintenance requirements related to the Project. The VMP, provided in Appendix 10-1, contains detailed descriptions of the procedures and maintenance restrictions that apply to these buffers, as well as other protected areas, and the system that will be used to ensure that the specified buffers and other resources are properly identified in the field and protected accordingly. The Applicant will implement the VMP prior to initial vegetation maintenance activity on the collector line ROW and will continue to follow it during all subsequent vegetation maintenance action.

The Applicant has also prepared an Invasive Species Management Plan, Appendix 10-2, which is designed to address the anticipated procedures for controlling the spread of invasive species and

enhancing the value of uplands and wetlands located within the turbine and access road areas and along the collector line ROW. The Invasive Species Management Plan contains detailed descriptions of the invasive species identified within the Project area and recommended control strategies.

Appendix 10-1

Post-Construction Vegetation Maintenance Plan

Oakfield Wind Project Amendment
34.5-Kilovolt Collector Line
Aroostook County, Maine

APPENDIX 10-1
POST-CONSTRUCTION
VEGETATION MAINTENANCE PLAN

Prepared for:

Evergreen Wind Power II, LLC

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March 2011

Table of Contents

Tables

Figures

1.0 INTRODUCTION

Evergreen Wind Power II, LLC (Evergreen II) has prepared this Post-Construction Vegetation Maintenance Plan (VMP) as a stand-alone document containing restrictive maintenance requirements for natural resources along the 34.5-kilovolt (kV) collector lines for the Revised Oakfield Wind Project (project). The collector lines will run throughout the project area, and will be located along proposed project roads and within newly created right-of-way (ROW). The requirements set forth in the VMP, as proposed by Evergreen II and incorporated into federal and state permits for the project, apply to routine maintenance along the ROWs and are not intended to apply to emergency maintenance and repair actions.

Throughout construction, numerous construction techniques and mitigation measures and restrictions will be implemented to minimize potential adverse effects on natural resources. To continue that effort, the goal of the VMP is to supply Evergreen II's maintenance personnel and contractors with a single, cohesive set of vegetation maintenance specifications for the collector lines. The VMP is intended to be used in conjunction with the project As-Built Plan and Profile drawings to locate the areas where maintenance restrictions apply.

The natural resources subject to restrictive maintenance requirements include:

- Wetlands and waterbodies,
- Designated perennial streams,
- Vernal pools, and
- Osprey (*Pandion haliaetus*) nests that are or may be built on transmission line structures.

There are no Inland Wading Bird and Waterfowl Habitats or sand and gravel aquifers in or adjacent to the collector line ROW.

The remainder of the VMP is organized as follows.

- Section 2.0 summarizes the typical vegetation maintenance methods and procedures that will be utilized by Evergreen II for the collector line ROWs;
- Section 3.0 describes the additional vegetation maintenance requirements and restrictions associated with waterbodies crossed by the lines. Section 3.0 also includes a table detailing which waterbodies will be subject to these requirements;
- Section 4.0 describes the maintenance of perennial streams located within designated Critical Habitat for Atlantic salmon. Section 4.0 also includes a table detailing which waterbodies will be subject to these requirements;
- Section 5.0 describes the maintenance procedures to be followed in the vicinity of vernal pools;
- Section 6.0 provides the procedures to be used for managing or removing osprey nests that are built on power line structures;
- Section 7.0 describes the system to be used for identifying restricted areas in the field while performing maintenance activities; and
- Section 8.0 summarizes the training requirements for Evergreen II's ROW maintenance personnel and contractors.

In locations where individual restrictions or procedures overlap or multiple restrictions apply, the more stringent restrictions and all applicable procedures will be followed by the Applicant's maintenance personnel and contractors.

2.0 TYPICAL ROW VEGETATION MAINTENANCE PROCEDURES

Routine vegetation maintenance of the collector line is required to: 1) maintain the integrity and functionality of the line, 2) maintain access in case of emergency repairs, and 3) facilitate safety inspections. The objective of the Applicant's ROW management will be to control large woody vegetative

growth to ensure the integrity and safe operation of the collector line. This will be accomplished by practicing Integrated Vegetation Management, which uses a combination of hand-cutting and selective herbicide applications. Mechanical mowing may be used in unusual circumstances to regain control of vegetation should the typical procedures not be sufficient.

To minimize any negative environmental impacts, vegetation will remain in place to the extent practicable. The removal of large trees will be done during initial ROW preparation prior to construction of the new transmission line. Follow-up maintenance activities during operation of the line require only the selective removal of "capable species," dead and "danger trees." Capable species are defined as those plant species that are capable of growing tall enough to violate the required clearance between the conductors and vegetation. Sound industry practice requires that a minimum separation be maintained between vegetation and the conductors. Due to the sag of electric transmission lines between the poles, which varies with the distance between poles, tension on the wire, electrical load, air temperature and other variable conditions, the appropriate clearance is typically achieved by removing all capable species and topping other vegetation exceeding 8 to 10 feet tall.

Once the vegetation in an area is brought under control (usually three to four years following construction), these practices will generally be carried out on four-year or five-year maintenance cycles depending on growth, weather, geographic location, and corridor width. Significant branches that overhang the ROW and any dead or damaged trees outside of the ROW that could contact the power lines or come within 15 feet of a conductor ("danger trees") may be removed as soon as they are identified. Figure 1 illustrates the results of typical vegetation clearing and maintenance to provide safe operation of the collector line.

The following procedures will be implemented during all vegetation maintenance activities to ensure protection of sensitive natural resources.

- All resources and their buffers will be flagged or located with a Global Positioning System prior to any maintenance operations.
- All areas of significant soil disturbance will be stabilized and reseeded immediately following completion of maintenance activity in the area.
- Equipment access through wetlands or over waterbodies will be avoided as much as practicable by utilizing existing public or private access roads, with landowner approval where required.
- Waterbodies will be protected during maintenance. Bridge mats, low ground pressure (tracked) vehicles, or other methods will be used to span waterbodies to prevent excessive rutting and disturbance.
- Construction mats or equivalent for equipment support will be used if saturated soils are present.
- Rutting or significant damage to wetland or waterbody bank vegetation, if any, will be repaired immediately following completion of maintenance activities in the area.

2.1 MECHANICAL TECHNIQUES

During routine vegetation maintenance after construction, the mechanical means of maintaining the height of vegetation on the ROW consists primarily of hand-cutting, with limited use of motorized equipment in areas that are directly accessible from public or private access roads.

The procedure will be to cut all capable species and any dead or danger trees at ground level except in waterbody buffer zones. All large vegetation cut during routine maintenance is removed, chipped or flailed on-site or otherwise handled in accordance with the Maine Slash Law.

2.2 USE OF HERBICIDES

Evergreen II's herbicide application program is consistent with most New England utilities and will be used in conjunction with the mechanical methods of vegetation maintenance. It consists of directional

spraying on targeted species along the ROW with a low-volume foliar application. In addition, herbicides may be applied to cut stumps and surfaces of larger trees. The direct application to individual plant species, as opposed to a broadcast application, will control only the targeted woody vegetation, while leaving low-growing plant communities consisting of grasses, forbs, and shrubs to thrive. Selective herbicides will also be used to minimize the impacts to non-target species. Aerial applications will not be performed. Only herbicides that are registered with and approved by the U.S. Environmental Protection Agency (EPA-approved) and the Maine Board of Pesticides Control (BPC) will be used.

Typically, the ROW will receive herbicide treatment the year following construction and then again two to three years after to gain control of vegetation growth. When control is achieved, treatment occurs on the standard four-year to five-year cycle or as needed. By utilizing selective herbicides and application methods, the ROW will eventually become a dense, low-growing plant community and will aid to impede woody vegetation from being established. Therefore, fewer woody species will require treatment in future applications.

The following procedures will be implemented during vegetation maintenance activities utilizing herbicides.

- Herbicides will be used in strict accordance with the manufacturer's EPA-approved labeling and will not be applied directly to water or areas where surface water is present.
- Herbicides will not be applied, mixed, transferred or stored within the designated buffers, or applied within 25 feet of streams or wetlands with standing water.
- Herbicides will not be applied, mixed, transferred or stored within 75 feet of vernal pool basins.
- Herbicides will not be applied, mixed, transferred or stored over significant sand and gravel aquifers.
- Herbicides will not be applied, mixed, transferred or stored within 100 feet of any known well or spring or within 100 feet of a home or other human dwelling.
- Herbicides with a low potential for mobility and low persistence in the environment will be utilized in sensitive areas such as wetlands.
- Herbicides will not be applied to any area when it is raining or when wind speed exceeds 15 miles per hour as measured on-site at the time of application.
- The foreman of every crew using herbicides will be licensed by the Maine BPC and will remain in eye contact and within earshot of all persons on his/her crew applying herbicides. At least one individual from any company applying herbicides for the Applicant must also hold a Commercial Master License issued by the BPC and must be in Maine during any application. Application of pesticides will be in accordance with applicable regulations promulgated under the Maine Pesticides Control Act, including those regulations to minimize drift, to maintain setbacks from sensitive areas during application, and to maintain setbacks from surface waters during the storing/mixing/loading of herbicides.
- The chemicals are typically mixed in a truck-mounted tank that stays on the access roads. The application is done by personnel with backpacks who travel along the ROW by all-terrain vehicle and spot-treat target species.
- Each target tree is sprayed just enough to wet the foliage while avoiding any dripping or run-off.

As mentioned previously, application of herbicides is prohibited within 25 feet of streams and wetlands that have water present at the surface. The location of all streams, wetlands, and significant groundwater aquifers crossed by the connector and transmission lines will be shown on the As-Built Plan and Profile drawings. The presence of water on the surface will be determined prior to herbicide use in any wetland. Tables identifying the locations of other resources where herbicide application is prohibited are provided in the following sections. Crew leaders will assure that all resources and buffers are located and properly delineated on the ground for clear identification by the applicators.

3.0 VEGETATION MAINTENANCE WITHIN STANDARD STREAM BUFFERS

A minimum 25-foot buffer, as measured from the top of bank on each side, will be established for all

waterbodies crossed by the collector line. Special procedures and restricted activities will apply within these waterbody buffers during construction and follow-up vegetation maintenance. Vegetation maintenance within waterbody buffers is typically conducted on a three-year or four-year cycle, depending on growth and vegetation. This section describes the restrictions related to vegetation cutting and maintenance that will apply within all standard waterbody buffers. Table 1, provided at the end of this section, includes the names, locations, and details of the standard streams crossed by the collector line. The location of the waterbodies crossed by the line also will be shown on the As-Built Plan and Profile drawings.

It is important to note that the vegetation maintenance procedures and restrictions that apply to typical ROW maintenance (Section 2.0) also apply within the standard waterbody buffers. The applicable procedures and restrictions include the BPC restrictions, restoring and stabilizing disturbed soils, disposing of slash in accordance with the Maine Slash Law, ROW access, the restrictions on waterbody crossings by equipment within the ROW, and the use of construction mats, low ground pressure equipment, and/or other procedures related to work in wetlands.

3.1 Additional Vegetation Maintenance Restrictions within Standard Waterbody Buffers

The following additional restrictions apply to vegetation maintenance within standard waterbody buffers (i.e., 25 feet for streams, 75 feet for vernal pools).

- Prior to line construction and during vegetation maintenance after construction, only capable species vegetation greater than eight feet will be removed. No other vegetation, other than dead or danger trees, will be removed.
- Under most terrain conditions, removal of capable species, dead, or danger trees will be accomplished by hand-cutting or by traveling into the buffer zone with low pressure tree harvesting equipment and mats as necessary.
- No herbicides will be used, stored, mixed or transferred between containers within the buffer areas.
- No refueling or maintenance of equipment, including chain saws, will occur within the buffer areas.
- No accumulation of slash will be left within 50 feet of the edge of any waterbody.

The additional restrictions on vegetation maintenance within waterbody buffers will allow taller vegetation to provide additional shading of streams and reduce the warming effect of direct sunlight (insulation). Low ground cover will also remain to filter sediment in surface runoff. As a result, the buffers will continue to function in a similar manner as they did before construction. The restrictions are also intended to minimize ground disturbance and ensure that herbicides and petroleum products are not able to reach the waterbody via surface runoff or groundwater transport. Figure 1 also illustrates vegetation clearing and maintenance practice within standard waterbody buffer zones.

TABLE 1. STREAMS CROSSED BY THE OAKFIELD II COLLECTOR LINE

Stream ID	Associated Wetland ID	Natural Resource Map #	Perennial or Intermittent	USGS Name	Width
STR05	A007	1	Intermittent	--	1-3'
STR46	--	5	Intermittent	--	1-2'
STR47	--	5	Intermittent	--	3-6'
STR29	A080, A081	10	Intermittent	--	1-3'
STR57	--	11	Intermittent	--	1-2'

Note: Wetland S137, marked with an *, was delineated and reported on as part of the Oakfield I project.

4.0 VEGETATION MAINTENANCE WITHIN SALMON STREAM BUFFERS

In 2009, Critical Habitat was designated for the freshwater geographic range occupied by the Gulf of Maine Distinct Population Segment (GOM DPS) of Atlantic salmon, including all perennial stream, river, and lake habitats connected to the marine environment (50CFR226: Federal Register, June 19, 2009). A portion of the project area is located within one HUC 10 watershed designated as critical habitat, the East Branch of the Mattawamkeag River watershed (HUC 10 102000302).

4.1 SALMON HABITAT STREAM BUFFERS

The Applicant will establish a 100-foot buffer along those streams designated as providing critical habitat and these streams will be subject to additional maintenance restrictions to enhance the shading of these waterbodies consistent with safe and reliable operation of the collector line. Vegetation maintenance near the salmon habitat streams will be subject to the same procedures and prohibitions, as applicable, that are required in the typical ROW and for standard stream buffers, namely BPC requirements, restoring and stabilizing disturbed soils, disposition of slash, ROW access constraints, the restrictions on stream crossings by equipment within the ROW, the use of construction mats and other procedures related to work in wetlands, the limited use of mechanized tree harvesting equipment, and the prohibition on the use, mixing, or transfer of herbicides and petroleum products within the buffer zone.

4.1.1 Additional Vegetation Maintenance: Restrictions within Salmon Habitat Stream Buffers

The following additional restrictions apply to vegetation maintenance within salmon stream buffers. Table 2, provided at the end of this section, includes the names, locations, and details of the salmon streams crossed by the collector line. The location of the salmon streams crossed by the collector line also will be shown on the As-Built Plan and Profile drawings.

- Only those trees capable of growing to a height within 15 feet of a conductor within the next 3 to 4 years will be topped or removed. No other vegetation other than dead or danger trees will be removed.
- Tree topping is the preferred method of vegetation maintenance, unless the tree is dead or dying, or unless topping will leave insufficient vegetation to sustain the tree.

4.1.2 Structure Locations and Salmon Habitat Buffers

Structure locations will be sited as close to the edge of the salmon stream buffers as possible to create a conductor height that allows for higher vegetation requiring minimal trimming. The closer the structure is to the stream, the higher the conductor will be over the stream and the taller the vegetation. This will result in taller buffers that provide maximum shading (and cooling) of the salmon habitat streams.

Figures 2 and 3 illustrate vegetation clearing and maintenance practices within salmon stream buffer zones.

TABLE 2. SALMON STREAMS CROSSED BY THE OAKFIELD II COLLECTOR LINE

Stream ID	Associated Wetland ID	Natural Resource Map #	Perennial or Intermittent	USGS Name	Width
STR01	--	1	Perennial	--	3-4'
STR02	A002, A003, A004	1	Perennial	Moose Brook	10'
STR06	A008	1	Perennial	Moose Brook	10-20'
STR07	A008, A010	1	Perennial	--	2-5'
STR65	A175, A176	2	Perennial	--	1-3'
STR25	A061	8	Perennial	--	1-4'
STR63	A174	11	Perennial	--	3-6'

5.0 VEGETATION MAINTENANCE AT VERNAL POOL LOCATIONS

6.0 VERNAL POOL SURVEYS FOR THE COLLECTOR LINE WERE CONDUCTED DURING THE SPRINGS OF 2009, 2010, AND 2011, AND NO SIGNIFICANT VERNAL POOLS WERE IDENTIFIED WITHIN THE PROPOSED COLLECTOR LINE ROW. THEREFORE, NO SPECIFIC VEGETATION MAINTENANCE STANDARDS WILL BE REQUIRED ALONG THE COLLECTOR LINE. SURVEY RESULTS FOR THE COLLECTOR LINE CAN BE SEEN IN SECTION 7, APPENDIX 7-1 OF THE SITE LOCATION OF DEVELOPMENT APPLICATION.MAINTENANCE PROCEDURES FOR OSPREY NESTS

It is common for osprey to nest on the top of power line structures. Typically, nests are allowed to remain in place unless there is a chance they are going to come into contact with the conductor. Osprey use nests from year to year and build up the nests annually. Sometimes the nests get so large they can touch a conductor or be close enough to create an arc. If there is a risk of arcing or conductor contact, Evergreen will follow its existing guidelines for removing nests (set forth in Section 6.1), which usually takes place in the fall of the year.

6.1 GUIDELINES FOR REMOVAL OF OSPREY NESTS

The following process will be completed for any removal of an osprey nest that is built on the 34.5-kV collector line structures.

- Only inactive nests will be taken. Nests that contain eggs or chicks will not be disturbed.
- Nests will only be taken between September 1 and April 15, and only if birds are not actively using the nest.
- Nests will be relocated to nesting platforms, when possible. Otherwise, they will be destroyed when they are removed.
- The designated person will be notified of the date, number of nests moved or destroyed, and the town where the nest(s) are/were located. He/She will keep an updated, running total of nests moved or destroyed. The list of nests removed will be distributed to the line supervisors periodically. He/She will evaluate what steps may need to be taken if more than 20 nests require action in one year.
- He/She will submit an annual report of all osprey nests moved or removed by Evergreen II to the Maine Department of Inland Fisheries and Wildlife.

7.0 SYSTEM FOR LOCATING/MARKING RESTRICTED AREAS

Prior to conducting maintenance activities along the ROW, a foreman or supervisor will identify restricted areas with flagging or signage. Evergreen has in place a system for locating specific areas or features in the field by maintaining a database that references a variety of sensitive areas to the nearest structure (pole) or road location. In some instances, signage is attached to the structures. Structures along the collector line will be numbered at the time of construction. The numbers will be included on the As-Built Plan and Profile drawings. The Evergreen database will include sensitive areas along the lines and their locations relative to the nearest numbered structure. That data will then be incorporated in this VMP.

Protected resources, buffer areas, and other areas where maintenance restrictions apply will be located in this manner. The distance and direction from the nearest structure to the sensitive area will be included beside the name of the area and the structure number. Maintenance contractors working on the ROWs will be given the VMP prior to receiving the required environmental training (Section 8.0).

Use of the VMP in conjunction with the As-Built Plan and Profile drawings will enable maintenance contractors to locate and mark restricted areas in the field.

8.0 TRAINING OF MAINTENANCE PERSONNEL

This section summarizes the environmental training that will be required for personnel with maintenance responsibilities on the ROW.

8.1 PERSONNEL AND SCHEDULE

Evergreen II personnel and contractors who will be participating in vegetation maintenance activities on the ROWs will receive appropriate environmental training before being allowed access to the ROWs. The level of training will be commensurate with the type of duties of the personnel. The training will be given prior to the start of maintenance activities. Replacement or new employees that did not receive the initial training will receive similar training prior to performing any maintenance activities on the ROWs.

8.2 CONTENT OF TRAINING SESSIONS

Prior to receiving maintenance training, each participant will be required to review this Post-Construction VMP. The training session will consist of a review of all protected resources and restricted areas, the respective maintenance requirements and restrictions for each, and a review of how these areas and resources can be located in the field (relative to the nearest numbered structure). Training will include familiarization with and use of the As-Built Plan and Profile drawings in conjunction with the contents of this VMP, as well as basic causes and preventive and remedial measures for contamination, erosion and sedimentation of water resources. Training will also include a review of safety, clean-up, monitoring, and reporting requirements.

FIGURES

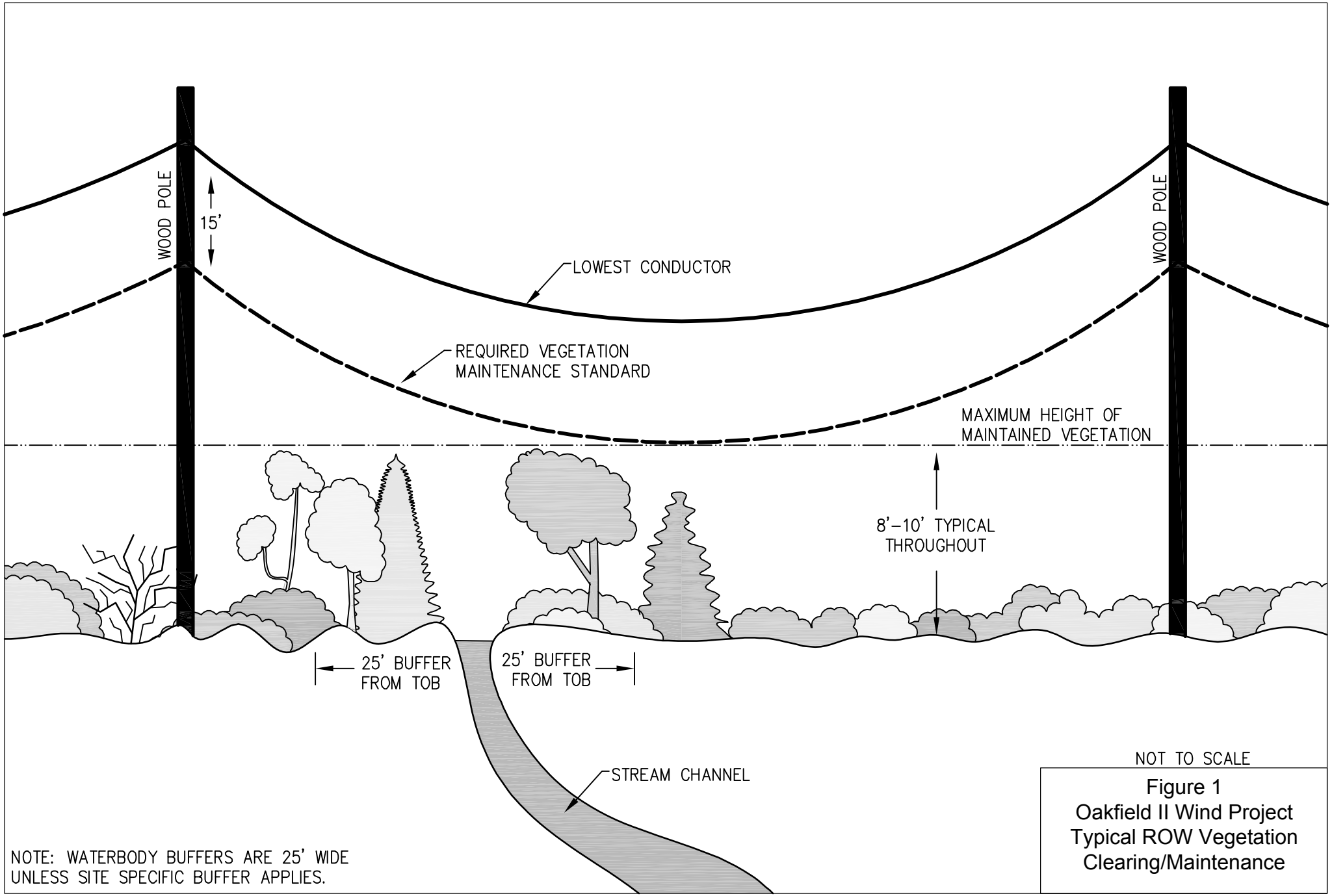


Figure 1
Oakfield II Wind Project
Typical ROW Vegetation
Clearing/Maintenance

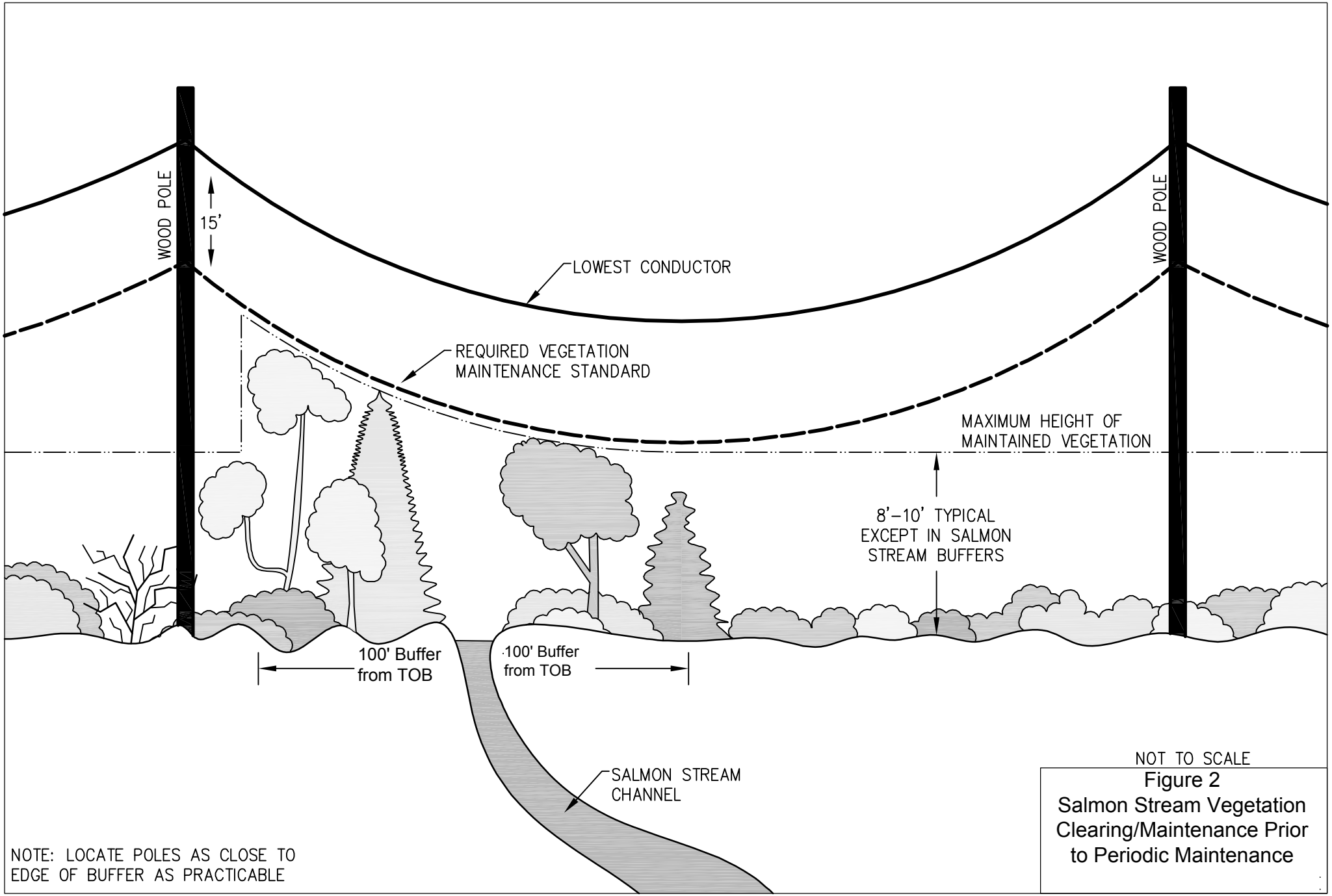
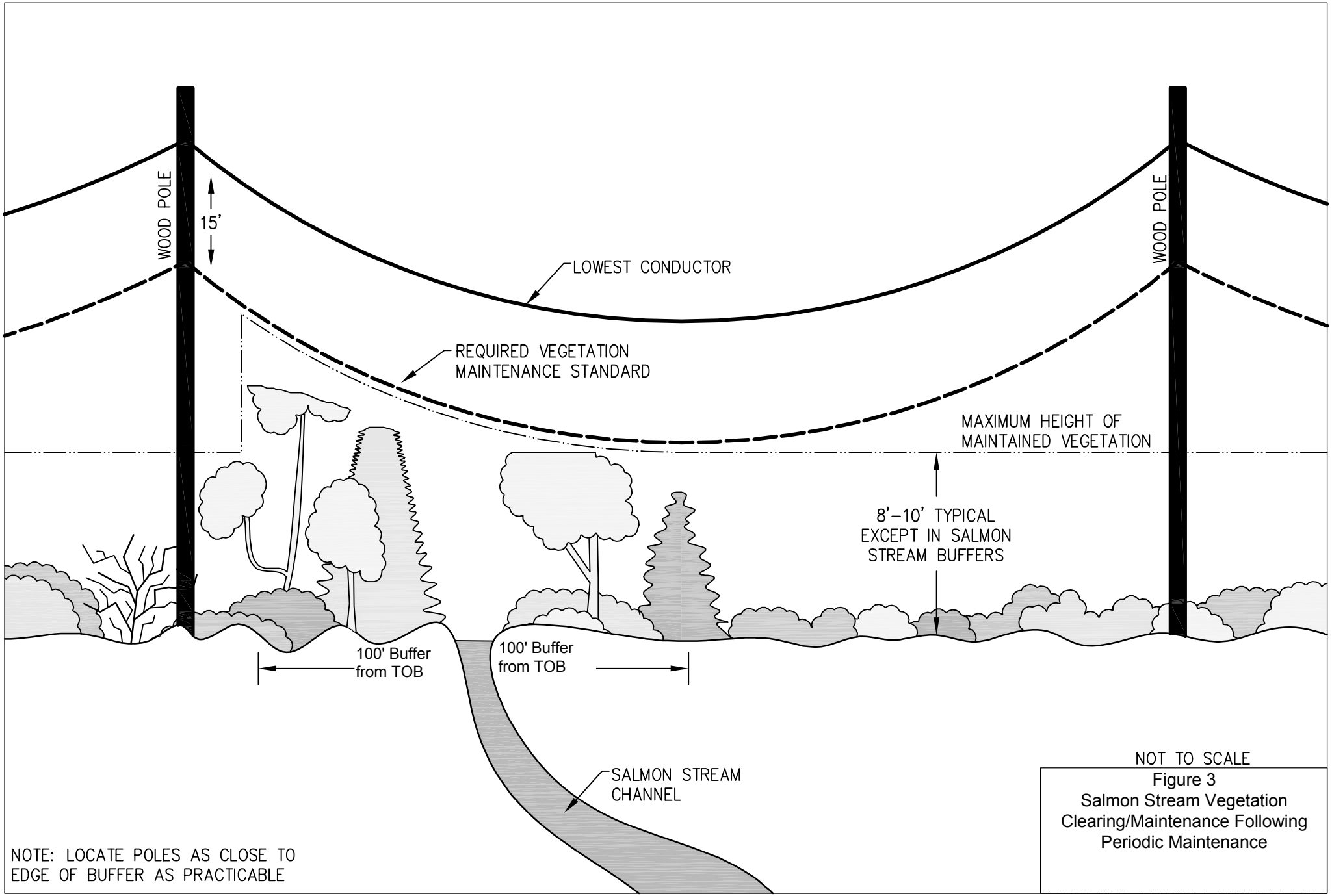


Figure 2
Salmon Stream Vegetation
Clearing/Maintenance Prior
to Periodic Maintenance



NOT TO SCALE

Figure 3
Salmon Stream Vegetation
Clearing/Maintenance Following
Periodic Maintenance

Appendix 10-2

Invasive Species Management Plan

Oakfield Wind Project Amendment
Proposed Wind Turbines and 34.5-Kilovolt Collector Line
Oakfield, Maine

APPENDIX 10-2
INVASIVE SPECIES MANAGEMENT PLAN

Prepared for:
Evergreen Wind Power II, LLC

Prepared by:
Stantec Consulting

March 2011

TABLE OF CONTENTS

1.0 PROJECT BACKGROUND

The Oakfield Wind Project Amendment (project) proposes a 150-megawatt (MW) wind farm with associated collector lines located in Oakfield and T4R3 WELS, Maine. The project also includes permanent meteorological towers, access roads, an electrical substation, and an operations and maintenance building. The turbine portion of the project consists of 50 Vestas 3.0 MW turbines located on several small ridges. The collector system portion of the project consists of a 34.5-kilovolt (kV) line that will run both adjacent to roads and cross-country, and will be primarily single-pole structures.

The turbine areas, access roads, and collector line will consist of newly cleared and existing right-of-way (ROW). Existing roads will be utilized to the greatest extent possible. The newly cleared areas are primarily located in undeveloped forest land, with occasional dirt roads and numerous all-terrain vehicle/snowmobile trails in the vicinity. Natural community features present within the study area include forested uplands and wetlands, scrub-shrub wetlands, emergent wetlands, and stream systems.

This Invasive Species Control Plan (Plan) addresses the anticipated procedures for managing invasive species and enhancing the value of wetlands and uplands located in the turbine areas and within the collector line ROW. This Plan is designed to supplement the existing ROW Vegetation Management Plan (VMP) as detailed in Section 10, Appendix 10-1, of the combined Maine Department of Environmental Protection (MDEP) Site Location of Development Act/Natural Resources Protection Act permit application for the project.

2.0 MANAGEMENT PLAN OBJECTIVES

The majority of the proposed turbine areas and collector line routes are located within forested uplands and wetlands. Vegetation clearing will be required for the construction of the turbines and the lines. The communities will be permanently converted from forested systems to communities dominated by shrubs and herbaceous vegetation. Because of this disturbance, the turbine areas and the new ROWs could be subject to colonization by invasive species as a result of construction activities.

During the review of past permit applications, the U.S. Army Corps of Engineers (Corps) has expressed concerns regarding the potential spread of invasive plant species in large project areas and along new segments of ROW. Accordingly, the Corps has requested that applicants develop these types of plans, including a program for post-construction monitoring of invasive species and implementation of appropriate invasive species controls.

The overall goal of this Plan is to preserve and enhance the functions and values of the wetlands and uplands within the project area, focusing on those areas in which invasive species were not present prior to the construction of the lines. While complete eradication of invasive species is not a stated goal, this Plan is designed to limit the spread of these species as much as possible. The Plan includes the following steps:

- Identify locations in the turbine areas and along the collector line ROW in which invasive species presently exist in order to develop a baseline for future monitoring;
- Provide a plan for monitoring the status of invasive species within the project area and coordinate with the involved agencies regarding the results of the monitoring;
- Identify appropriate strategies (e.g., mechanical cutting, herbicide application, biological control, or a combination thereof) for controlling and/or limiting the spread of invasive species within the turbine areas and along the collector line ROW; and
- Incorporate invasive plant species control strategies in the existing vegetation management program for the Project.

3.0 INVASIVE SPECIES BACKGROUND

Invasive plants are non-native species whose introduction to an area causes or is likely to cause environmental or economic harm. Invasive plants often lack natural predators and can successfully colonize and thrive beyond their natural ranges, often out-competing native plants. Generally, these

species have competitive adaptations, aggressive reproductive strategies, and efficient dispersal methods. The spread of invasive plant species in both wetland and upland areas is a concern for both biological reasons (e.g., threaten global biodiversity, reduce wildlife habitat value) and cultural/economic reasons (e.g., adverse aesthetic effects, reduced recreational opportunities).

The Maine Natural Areas Program (MNAP) maintains a list of invasive plants known to be present in Maine. Table 1 below presents the common invasive species likely to be present in the project area based on a review of this list, as well as on field surveys conducted by Stantec Consulting (Stantec) within the project area.

Table 1. Invasive Plant Species Likely to be Associated with the Revised Oakfield Wind Project

Common Name	Scientific Name
Norway Maple	*Acer platanoides*
Garlic Mustard	*Alliaria petiolata*
Japanese Barberry	*Berberis thunbergii*
Oriental Bittersweet	*Celastrus orbiculatus*
Black Swallowwort	*Cynanchum louiseae*
Russian Olive	*Eleagnus angustifolia*
Autumn Olive	*Eleagnus umbellata*
Japanese Knotweed	*Fallopia japonica*
Glossy Buckthorn	*Frangula alnus*
Morrow's Honeysuckle	*Lonicera morrowii*
Tatarian Honeysuckle	*Lonicera tatarica*
Purple Loosestrife	*Lythrum salicaria*
Common Reed	*Phragmites australis*
Wood Bluegrass	*Poa nemoralis*
Common Buckthorn	*Rhamnus cathartica*
Multiflora Rose	*Rosa Multiflora*

4.0 EXISTING CONDITIONS

During 2009 and 2010, Stantec performed wetland delineations, vernal pool surveys, and rare, threatened, and endangered (RTE) species surveys within the project area. The results of these surveys are presented in Appendix 7-1 of this application. During the course of each survey, Stantec documented any occurrences of invasive plant species. Across the entire project area, no invasive species were documented. The lack of invasive species present can be attributed to the relatively undeveloped landscape surrounding the project area.

5.0 INVASIVE SPECIES MONITORING PROGRAM

5.1. GOALS AND OBJECTIVES

Evergreen Wind Power, II, LLC (Evergreen II) is committed to performing monitoring to assess the status of invasive species within the project area and to identify areas where invasive species control measures will be required to maintain or enhance the functions and values of uplands and wetlands. This monitoring program will target the invasive species identified in Table 1 and will provide recommendations that will be used to select and implement appropriate control options for each invasive species location.

The objectives of the monitoring program will be to:

- Update the status of invasive species within the project area in order to target the areas where control measures will be required;
- Define the types of control measures that are most appropriate for each invasive species location; and
- Provide input in order to incorporate the invasive species control measures into the overall VMP (Appendix 10-1 of the MDEP permit application).

5.2. METHODS

Evergreen II will retain a qualified, independent researcher to conduct the monitoring program, which will consist of field surveys of the project area to determine whether invasive species are present and to provide recommendations concerning control options. For each invasive species location, researchers will complete invasive species monitoring forms and take representative photographs. Any conditions that would influence the use of a particular type of invasive control method will also be noted. Populations of invasive species identified immediately adjacent to the project area will also be noted, although control strategies for these populations will not be developed. Field surveys will be conducted during the growing season when plant species are most easily identifiable. The monitoring effort will be scheduled to allow time for invasive species treatments to be implemented in the same growing season.

Invasive species monitoring within the project area will be conducted in the first year following the completion of project construction and for four years thereafter (i.e., a total of five years of annual monitoring). If during the first five years of monitoring densities of invasive species are found to be low, monitoring frequency may be reduced to every other year. The goal of the five-year monitoring effort will be to identify locations where invasive species are present so that control measures can be implemented as soon as practical, particularly in any areas where invasive species are beginning to colonize as a direct result of project construction. The five years of monitoring will also allow for an evaluation of the effectiveness of the control measures. After the completion of five years of monitoring and treatments, this Plan will be integrated into the applicant's existing VMP. The VMP states that vegetation maintenance will generally be carried out on a four-year or five-year maintenance cycle, depending on growth, weather, geographic location, and corridor width. Once incorporated into the VMP, this invasive species monitoring program should occur in the year prior to routine vegetation maintenance work so that treatment recommendations can be included with the regular maintenance effort. Over time, as invasive species control becomes a standard component of the applicant's ROW vegetation management program, monitoring and control schedules may be adjusted to respond to site-specific issues (e.g., monitoring less frequently as densities decrease, instituting treatment in consecutive years to control an aggressive population).

5.3. MONITORING REPORT

The results of each year of invasive species monitoring will be detailed in a brief report that will include a summary of the field results, a table and map that identifies the locations of invasive species in the turbine areas or in the collector line, copies of the monitoring forms, and representative photos. Comparisons will be made as to whether invasive species are becoming more or less prevalent, based on a review of the pre-construction data and on the results of the previous year's monitoring results. The monitoring report will include recommendations regarding where invasive species control measures are required, the suggested type of control strategy, and the schedule for the implementation of control measures.

During the first five years of monitoring, reports will be submitted annually. If it is determined that monitoring will not be required every year, reports will only be submitted in years when monitoring has occurred. The monitoring report will be provided to the Corps and the MDEP by March 31 of the year following the year in which the monitoring was conducted (e.g., for monitoring conducted in the summer of 2011, the monitoring report will be submitted by March 31, 2012). See Table 2 below for the anticipated monitoring schedule. If requested, the applicant and its contractors will be available to meet with the involved agencies to review the results of the invasive species monitoring and control program.

The purpose of the meetings would be to assess the status of the program and the effectiveness of the monitoring and control methods.

Table 2. Anticipated Invasive Species Monitoring Schedule

Year	Date of Monitoring	Monitoring Report Submitted
1	Summer 2011	March 2012
2	Summer 2012	March 2013
3	Summer 2013	March 2014
4	Summer 2014	March 2015
5	Summer 2015	March 2016

Implementation of invasive species control measures will be based on the results of the monitoring and will not require approval from the regulatory agencies. The application of control measures will be performed pursuant to any standard permit and safety requirements governing such activities.

6.0 INVASIVE SPECIES CONTROL STRATEGIES

6.1. GOALS AND OBJECTIVES

To develop an effective approach for controlling invasive species within the project area, various factors must be considered. These include:

- The characteristics and functions/values of the wetlands and uplands in the project area;
- The invasive species that are present and their density within the project area;
- Sensitive areas along the collector line ROW, including wetlands, streams, vernal pools, RTE species, wildlife habitat, sand and gravel aquifers, and visual buffers;
- Adjacent land use developments, which can affect the value of wetlands on the collector line ROW and can influence the choice of control strategies; and
- The cooperation of the landowner and the potential lack of complete land use control, depending on the conditions of the ROW easements across private properties.

As a result of these factors, it should be recognized that invasive species control measures may not be practical or highly effective in all areas along the collector line ROW. Additionally, once established, complete eradication of invasive species is unlikely given the aggressive nature of most invasive species.

6.2. TYPES OF CONTROL

In general, there are three types of invasive species control methods: mechanical, chemical, and biological. These control methods may be combined to provide a more effective control strategy.

Mechanical control measures such as digging, pulling, and cutting may be effective in controlling isolated invasive plants or small stands of plants. However, such techniques may be labor-intensive and may be impractical in areas with dense infestations of invasive species such as common reed (*Phragmites australis*), purple loosestrife (*Lythrum salicaria*), and garlic mustard (*Alliaria petiolata*).

Chemical control (herbicides) is the most common alternative used for controlling invasive species along ROWs. If used selectively and in limited areas (i.e., not in wetlands with standing water or in streams), herbicides can be successfully applied in an environmentally-sound manner. In addition, herbicide applications often provide the most cost-effective method for controlling dense infestations of invasive species.

Biological controls can be effective in controlling purple loosestrife under certain conditions but are not yet proven for the control of other species. Consultation with the Corps indicates that species such as loosestrife beetles (*Galerucella calmariensis* and *Galerucella pusilla*) may be useful in controlling purple loosestrife. At this time, purple loosestrife has not been identified within the project area, and the use of loosestrife beetles is unlikely to be recommended for this project.

6.3. CONTROL OF EXISTING INVASIVE SPECIES

While no invasive species were observed in the project area, the applicant will be prepared to implement control methods should any invasive species be detected during construction. Measures such as cleaning construction equipment and construction mats, stockpiling contaminated soil, inspections of construction vehicles, etc., will be implemented immediately if populations of invasive species are encountered within the project area.

6.4. SCHEDULE FOR IMPLEMENTATION OF INVASIVE SPECIES CONTROLS

Following construction, the applicant recognizes that early treatment measures can prevent the spread of invasive species, particularly in areas where such species were not present prior to construction of the project. As a result, the applicant will implement an aggressive invasive species control approach in the first five years immediately following the completion of construction. Particular treatment efforts will be focused on preserving and enhancing the functions and values of the wetlands and uplands in the project area.

Based on the results of the monitoring program conducted in each of the first five years after construction, the applicant will schedule invasive species treatment measures annually, as soon as practical after the field monitoring recommendations are received. The schedule for the treatment will depend on the types of controls recommended. For example, mechanical removal of certain species can be performed almost any time of the year when plant species are identifiable, while herbicide applications and biological controls require that work be done during the growing season to be most effective. Over time, the applicant expects that the invasive species treatment program will be integrated into the overall ROW vegetation management effort.

Depending on the results of the monitoring, the applicant may contract a field biologist or wetland scientist to work with its ROW management contractor to oversee the implementation of invasive species control measures, to recommend methods for maximizing the potential re-establishment of native vegetation, and to suggest wetland plantings to enhance habitat values. For locations where invasive species controls are implemented, monitoring performed in subsequent years will serve to assess the effectiveness of such measures.

6.5. CONTROL STRATEGIES

Although specific treatments will be refined based on the results of the monitoring program, it is anticipated that the most effective general approach for controlling invasive species within the project area will likely be a combination of mechanical removal and application of herbicides in selected locations during the growing season. Repeated spot herbicide applications may be required in subsequent growing seasons in order to achieve effective control. Based on the lack of invasive species documented in the proposed project area, large-scale control is not anticipated.

The need for and types of chemical control of invasive species will be carefully evaluated, particularly in sensitive areas such as wetlands, streams, and vernal pools, and areas where the ROW is not owned by the applicant. Additionally, invasive species may be present in wetland and upland areas that are outside of the defined project area boundaries. The applicant has no authority to attempt to control invasive species that may be present in adjacent areas outside of the project area.

Herbicide applications will be performed according to applicable laws and regulations put forth by the Maine Bureau of Pesticides Control, MDEP, and the United States Environmental Protection Agency. The type of herbicide(s) to be used, method of application, and schedule for application will be determined based on the locations of the targeted areas and the particular invasive species to be controlled.

Similarly, the use of any biological control measures will be coordinated with MDEP and the Corps. The species used for biological control will be obtained from approved sources and released pursuant to specifications.