**TransCanada Maine Wind Development Inc.**

# Kibby Wind Power Project

# 115 kV Transmission Line Vegetation Clearing and Post-Construction Vegetation Management Plan

***Prepared for:***

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## TABLES



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## 1.0 INTRODUCTION

TransCanada Maine Wind Development Inc. (TransCanada) has prepared this Vegetation Management Plan (VMP) documenting all clearing and maintenance requirements in order to allow for safe and reliable electric transmission and protection of natural resources along the Kibby Wind Power Project 115 kilovolt (kV) electric transmission right-of-way (ROW). This will help to ensure proper vegetation management practices are followed and that specified resources are properly identified and protected. The requirements set forth in this VMP: 1) will be incorporated in federal, state, and the Land Use Regulation Commission (LURC) or Maine Department of Environmental Protection (DEP) permits (depending upon the relevant jurisdictional authority); 2) apply to initial clearing and routine maintenance along the Kibby Wind Power Project ROW; and 3) are not intended to apply to emergency maintenance and repair activities.

Throughout construction, numerous construction techniques and impact mitigation measures and restrictions will be implemented to minimize potential adverse effects on natural resources. To continue that effort, the goal of this VMP is to supply TransCanada maintenance personnel and contractors with a single, comprehensive set of vegetation maintenance specifications for the Kibby Wind Power Project 115 kV transmission line ROW. TransCanada personnel or their designated representatives will ensure that these specifications are followed by regularly inspecting all work and prescribing corrective steps where necessary. This VMP will be used post-construction, in conjunction with the project As-Built Plan and Profile Drawings, to locate the resource areas where maintenance restrictions apply. In locations where individual restrictions or procedures overlap and/or multiple restrictions apply, the more stringent restrictions and all applicable procedures will be employed.

The natural resources subject to restrictive clearing and maintenance requirements include:

- Wetlands;
- Waterbodies including rivers and streams; and
- Areas with rare plant populations.

The remainder of the Vegetation Management Plan is organized as follows:

- Section 2.0 summarizes the importance of vegetation maintenance within a ROW.
- Section 3.0 summarizes the procedures to be used while performing initial clearing during construction within the 115 kV transmission line ROW.
- Section 4.0 summarizes the typical vegetation maintenance methods and procedures during operation that will be utilized by TransCanada along the 115 kV transmission line ROW, including for prevention of invasive species.
- Section 5.0 describes the additional vegetation maintenance requirements and restrictions associated with all waterbodies crossed by the 115 kV transmission line ROW. Section 5.0 also includes a table documenting the locations of waterbodies.
- Section 6.0 describes the maintenance procedures to be followed in the vicinity of rare plant species.
- Section 7.0 describes the system to be used for identifying restricted areas in the field while performing maintenance activities.
- Section 8.0 summarizes the training requirements for TransCanada ROW maintenance personnel and contractors.

## 2.0 IMPORTANCE OF RIGHT-OF-WAY VEGETATION MAINTENANCE

Routine vegetation maintenance of the Kibby Wind Power Project 115 kV transmission line ROW is required 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 of vegetation below minimum safety standards, such as below the electric conductors, is essential to maintaining safe, reliable, and uninterrupted availability of electrical power. For example, power outages occur if trees or other vegetation come into contact with or get too close to the conductors. Outages can occur either by direct contact between the object and the conductor or even if there is insufficient separation between them, causing an electrical arc. The arcing distance is a function of several factors including the voltage, load, and ambient wind and temperature conditions. When properly applied, this VMP will help ensure that a minimum distance of 15 feet between any object and the conductors is maintained during all phases of maintenance.

## 3.0 CLEARING PROCEDURES

Nearly the entire ROW will remain vegetated with low scrub-shrub and other understory species during construction, consistent with industry practices and standards. During initial clearing, the removal of vegetation will be done by standard timber harvesting equipment, selective hand cutting, and mechanical cutting or mowing. Trees greater than 8 feet tall and dense shrub vegetation that will hinder construction will be removed. Other understory and shrub vegetation will be left in place to the extent practicable. Stream and river (waterbody) buffers will be maintained during the initial clearing, with only larger trees removed (see Section 5.0 for a more in-depth description of buffers). Commercially valuable timer may be stored on-site and will be removed before the completion of construction. The remaining woody vegetation cut during initial clearing will be disposed of in accordance with the Maine Slash Law.

Ground disturbance will occur only at structure locations or occasionally in equipment travel corridors, and only limited ground disturbance will occur in waterbody buffers. These standards will help prevent both direct and indirect impacts to waterbodies and buffers. All necessary erosion and sedimentation control measures will be installed and maintained throughout construction to prevent adverse impacts to waterbodies and buffers. Crossings of wetlands, waterbodies, and buffers will be avoided and minimized to the extent practicable.

Temporary crossings of wetlands will follow the procedures outlined in the Erosion & Sedimentation Control Plan (Volume V, Appendix V-A of the Kibby Wind Power Project LURC application [the LURC Application]), where, unless the ground is sufficiently frozen to prevent rutting, equipment mats will be used to cross wetlands. Mowing or other mechanical clearing and removal will not be conducted in wetlands. In general, slash and felled trees will not be left in wetlands. However, in some instances the use of the “drop and lop” method may be allowed. This method involves the limited felling of trees in wetlands and cutting the trees into smaller segments, and should only be used when removing trees from wetlands can cause more environmental damage than cutting them into small segments and leaving them in the wetland. This method will only be employed after consultation with LURC or DEP staff, as applicable, and the Maine Forest Service, and its use will be conducted in accordance with the Maine Slash Law. Following completion of clearing or temporary work in any wetland area, any disturbed ground will be restored to original contours and stabilized with permanent vegetation. Follow-up vegetation maintenance practices as described in this VMP will encourage the growth of dense, low ground cover and shrub species.

# 4.0 TYPICAL RIGHT-OF-WAY VEGETATION MAINTENANCE PROCEDURES

## 4.1 Introduction

Typical ROW clearing and maintenance procedures for the Kibby Wind Power Project 115 kV transmission line are designed to provide a vigorous growth of herbaceous and short, scrub/shrub vegetation, while ensuring compliance with the New England Power Pool (NEPOOL) Vegetation Maintenance Standard (VMS) and the requirement to provide safe, reliable, uninterrupted electrical power. These procedures require retaining short shrub and herbaceous ground cover to the maximum extent practicable during construction, immediately restoring and stabilizing the affected areas, and implementing ongoing maintenance activities that promote long-term growth of diverse, healthy, early successional vegetation. These efforts result in a utility corridor that: provides excellent cover for small mammals and birds; provides significant browse for herbivorous mammals; and prevents soil erosion and sedimentation of water and wetland resources.

Routine vegetation maintenance of the Kibby Wind Power Project 115 kV transmission line ROW is required to maintain the integrity and functionality of the line, to maintain access in case of emergency repairs, and to facilitate safety inspections. The objective of the proposed ROW management is to control large woody vegetative growth to ensure the integrity and safe operation of the transmission line, and comply with set-back safety standards for transmission lines. This will be accomplished by practicing Integrated Vegetation Management (IVM) which utilizes a combination of hand cutting and selective herbicide applications. Mechanical mowing is used only in unusual circumstances to regain control of vegetation, should the typical procedures not be sufficient.

## 4.2 Typical ROW Maintenance Procedures

Vegetation management on the Kibby Wind Power Project 115 kV transmission line ROW is required to ensure reliable operation of the line, to maintain access in case of emergency repairs, and to facilitate safety inspections. This VMP accomplishes these goals by prescribing that large woody vegetative growth be controlled to ensure the integrity and safe operation of the transmission line.

After construction and during operation of the line, maintenance activities will include the selective removal of capable species within the ROW, and dead or live danger trees outside of the ROW. Capable species are defined as those plant species that are capable of growing tall enough to reach within the required clearance distance between the conductors and vegetation established by the NEPOOL VMS. The VMS[1] for a 115 kV transmission line requires that a minimum of 15 feet of separation be maintained between vegetation and the conductors. Due to the sag in the height above ground of electric transmission lines between poles, which varies with the distance between poles, tension on the wire, electrical load, air temperature and other changing conditions, the required clearance is typically achieved by removing all species capable of growing into the conductors and topping other vegetation greater than 8 to 10 feet tall.

Once the height of the remaining and re-established vegetation in the ROW reaches the NEPOOL safety thresholds, usually three to four years following construction, routine maintenance activities will begin. Routine maintenance activities will generally be carried out on a four or five-year maintenance cycle. 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. In order to provide for the 15-foot clearance, vegetation within the ROW will be managed to ensure that it does not grow taller than ten feet.

This is the manner in which vegetation height will typically be maintained along the ROW, except in buffer zones and areas of sensitive protected resources (Section 5.0) and at rare plant locations (Section 6.0). Figure 1 illustrates the results of typical vegetation clearing and maintenance to comply with the NEPOOL Vegetation Maintenance Standard.

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

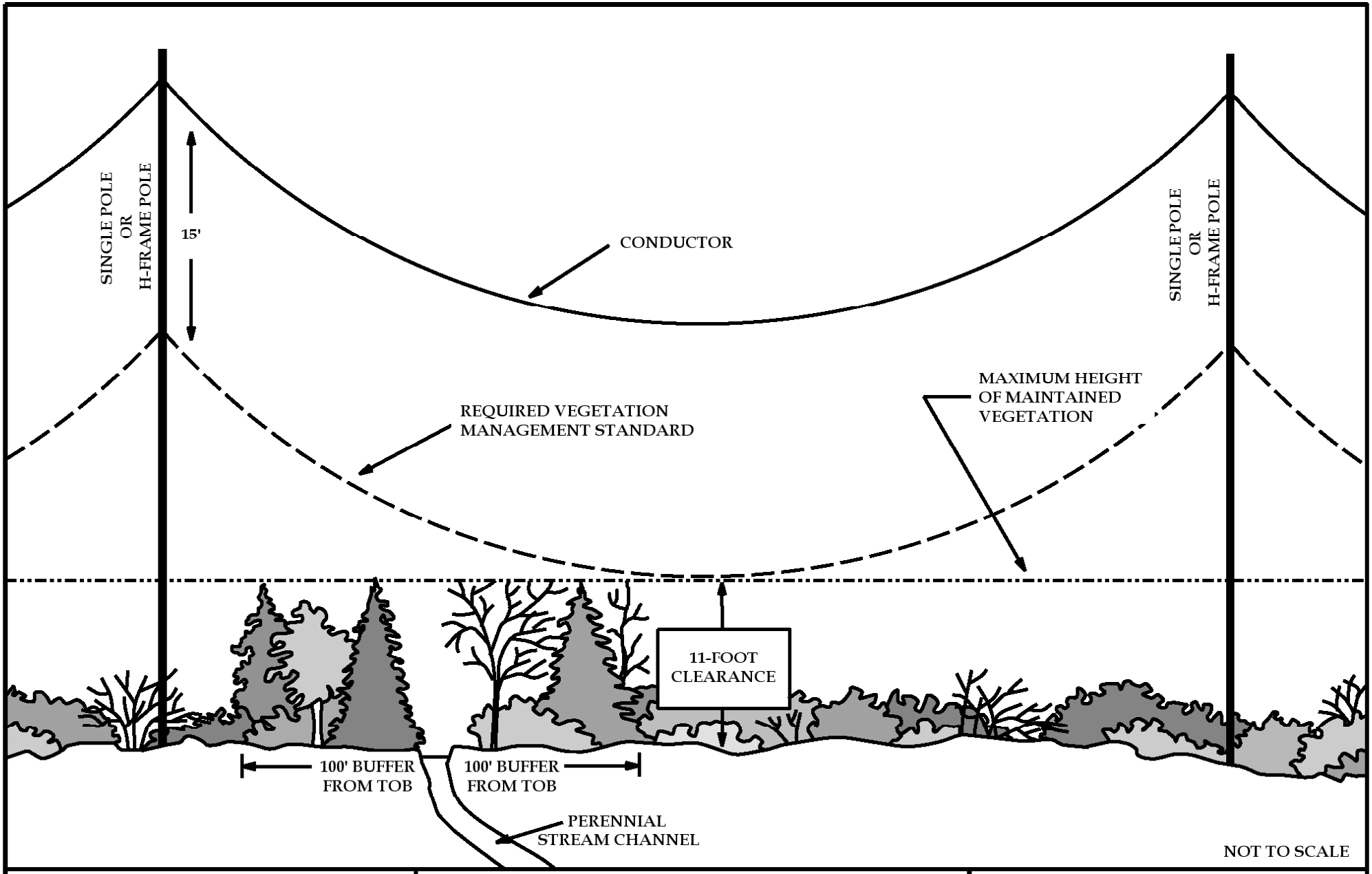
[1] *NEPOOL Operating Procedure No. 3- Transmission Maintenance Scheduling for Facilities Operating at 115 KV and Above (OP 3), Appendix C*, approved by the NEPOOL Participants Committee on May 3, 2002.

- Any areas of significant soil disturbance will be stabilized and allowed to re-vegetate immediately following completion of maintenance activities;
- 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;
- Equipment mats (or equivalent for equipment support) will be used if saturated soils are present; and
- Rutting or significant damage to wetland or waterbody bank vegetation, if any, will be repaired immediately following completion of maintenance activities in the area.

## 4.3 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 or existing pathways within the ROW.

The procedure will be to cut all capable species and any dead or danger trees at ground level and top other vegetation greater than 8 to 10 feet tall, except in waterbody buffers and at rare plant and unique natural community locations. Danger trees will be identified and removed as necessary. All vegetation cut during routine maintenance will be removed from the ROW or otherwise handled in accordance with the Maine Slash Law.

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# KIBBY WIND POWER PROJECT

## FIGURE 1

TYPICAL ROW VEGETATION CLEARING / MAINTENANCE

## 4.4 Use of Herbicides

The herbicide application program will be consistent with accepted utility ROW techniques and used in conjunction with the mechanical methods of vegetation maintenance. It consists of directional spraying, by manual sprayers, of targeted species along the ROW by hand with a low-volume foliar application. In addition, herbicides may be applied to stumps and surfaces of larger trees. Herbicides are only used to control targeted capable woody species. Aerial or broadcast herbicide application will not be performed because the goal is to encourage the growth of relatively short plant communities consisting of grasses, forbs and shrubs. Only herbicides with low toxicity to non-target plants and animals, and that are registered with and approved by the U.S. Environmental Protection Agency (EPA), will be used.

Typically, the ROW will receive the initial herbicide treatment the growing season following construction and a follow-up treatment two to three years later to effectively control vegetation growth. After these treatments, and control is achieved, treatment occurs, as needed, on the industry standard four to five year cycle. By utilizing selective herbicide application, the ROW will eventually become a dense, low-growing plant community composed of vegetation such as shrubs and herbaceous plants. This dense plant community helps impede woody vegetation from being established; hence there are generally fewer capable species to treat in future applications.

The following procedures will be implemented during all 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 75 feet of perennial streams or rivers (as measured horizontally from the top of each bank), other waterbodies such as small ponds and beaver impoundments, or within 25 feet of intermittent streams and wetlands;
- Herbicides will not be mixed, transferred, stored, or applied within the 75 feet of wetlands that have water present at the surface;

- Herbicides will not be applied, mixed, transferred or stored within 75 feet of known rare plant species or identified unique natural communities, within 100 feet of any known well or spring, or within 100 feet of a home or other human dwelling;
- Herbicides will not be applied to any area when it is raining;
- The foreman of every crew using herbicides will be licensed by the Maine Board of Pesticides Control (MBPC), will supervise all persons on the crew applying herbicides, and will observe all herbicide applications. At least one individual from any company applying herbicides for TransCanada must also hold a Commercial Master License issued by the MBPC and must be in the vicinity of the ROW during the herbicide application process. Application of pesticides will be in accordance with applicable regulations promulgated under the Maine Pesticides Control Act, including those regulations to minimize drift, to establish and enforce setbacks from sensitive areas (residential/recreational areas and schools) during application, and to establish and enforce 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. Mixing and loading application equipment will not be performed on the ROW off of the access roads. The application is done by personnel with backpacks who travel along the ROW on foot or by all terrain vehicle and spot treat target species; and
- Each target tree is sprayed until the foliage is covered. Herbicide applications should have appropriate surfactant composition to minimize runoff and to provide adhesion after application.

Application of herbicides is prohibited within 75 feet of wetlands that have water present at the surface and within wetlands at any time. The location of all wetlands and other important natural resources crossed by the Kibby Wind Power Project 115 kV transmission line ROW will be shown on the as-built Plan and Profile Drawings. The presence of water on the surface will be determined based on field observations prior to herbicide use adjacent to any wetland. Tables identifying the locations of these resources are provided in Section 5.0.

The establishment of invasive plant species is a concern in any area where soil is disturbed. Soil disturbance during construction of the proposed transmission line will be minimal; this will limit the opportunity for non-native and invasive plant species to colonize disturbed areas, and will provide a suitable medium for indigenous shrub and tree regeneration.

Some areas may potentially require seeding for stabilization. In such areas, TransCanada will perform routine checks specifically to insure proper growth of desired species, and absence of invasive species. After construction, TransCanada will perform routine inspections for invasive plant species (particularly purple loosestrife [*Lythrum salicaria*] and Phragmites [*Phragmites australis*]) along the transmission ROW. If invasive species are observed, appropriate control and/or removal programs will be implemented.

# 5.0 VEGETATION MAINTENANCE WITHIN STANDARD WATERBODY BUFFERS

## 5.1 Overview

This section describes the proposed waterbody (perennial streams and rivers) buffer vegetation maintenance procedures for the Kibby Wind Power Project 115 kV transmission line. TransCanada is proposing to maintain 100-foot vegetative buffers on all perennial streams and rivers. These water bodies are listed in Table 1. The buffers are measured horizontally from the top of each stream bank. As such, the total buffer widths for each perennial stream will be a minimum of 200 feet. In some locations, the buffers may actually be wider due to the characteristics of the existing vegetation and topography.

Through the use of vegetative buffers, the potential for soil erosion and sedimentation into these waterbodies is minimized, and riparian habitat values are protected. Generally, the conversion of forest cover to a scrub-shrub or early successional cover type within a transmission line ROW will improve the ability of the land to absorb runoff due to increased root mass density and near-ground leaf and stem material associated with the resultant vegetative cover. The proposed buffers are consistent with Maine Department of Inland Fisheries and Wildlife (MDIFW) buffer recommendations to protect waterbodies from sedimentation and surface runoff for other recent electric transmission line projects.

The Kibby Wind Power Project 115 kV transmission line ROW will be continuously vegetated with herbaceous plants and shrubs, but restrictions on the clearing and maintenance within buffers will allow additional vegetation to remain along streams and rivers. Buffers bordering streams and rivers will be protected and maintained by selective clearing during construction and reduced cutting of vegetation during maintenance and operation of the transmission line. Selective and restricted techniques that will be used are discussed below.

## TABLE 1: WATERBODY TABLE

| MILEPOST | WATERBODY | ASSOCIATED WETLAND | CROSSING WIDTH (FEET) | STREAM TYPE (perennial or intermittent) | SUBSTRATE | COMMENTS | LURC SUBDISTRICT |
|---|---|---|---|---|---|---|---|
| ***Kibby Township*** | | | | | | | |
| 0.04 | D24-1 | D-24 | 3 | Intermittent | peat-muck, silt-mud, sand | forestry activities diverted streams | P-SL2 |
| 0.09 | D24-2 | D-24 | 2 | Intermittent | silt-mud, sand | forestry activities diverted streams | P-SL2 |
| 0.43 | D28 | D-28 | 5 | Perennial | gravel/cobble, boulder | several waterfalls, steep valley cut | P-SL2 |
| 0.63 | D32-1 | D-32 | 2 | Perennial | sand, gravel/cobble | | P-SL2 |
| 1.06 | C138 | C-138 | 2 | Intermittent | silt-mud, sand, gravel/cobble, boulder | | P-SL2 |
| 1.16 | C137 | C-137 | 5 | Perennial | gravel/cobble | | P-SL2 |
| 1.20 | C136 | N/A | 3 | Intermittent | gravel/cobble | | P-SL2 |
| 1.25 | C134-1 | C-134 | 2 | Intermittent | gravel/cobble | | P-SL2 |
| 1.26 | C134-4 | C-134 | 1.5 | Intermittent | sand | | P-SL2 |
| 2.11 | C130-2 | N/A | 1 | Intermittent | gravel/cobble | | P-SL2 |
| 2.12 | C130-1 | N/A | 4 | Perennial | bedrock | | P-SL2 |
| 2.44 | C128-1 | C-128 | 3 | Perennial | sand, gravel/cobble | braided stream channels | P-SL2 |
| 2.45 | C128-2 | C-128 | 3 | Perennial | sand, gravel/cobble | braided stream channels | P-SL2 |
| 2.64 | C127 | N/A | 2 | Intermittent | sand | | P-SL2 |
| 2.83 | A123 | C-123 | 1.5 | Intermittent | sand | | P-SL2 |
| ***Jim Pond Township*** | | | | | | | |
| 3.45 | B152-1 | B152 | 1 | Perennial | sand, boulder | | P-SL2 |
| 3.47 | B152-2 | B152 | 1 | Intermittent | sand, boulder | | P-SL2 |
| 3.99 | B151-2 | B151 | 1 | Intermittent | peat-muck, silt-mud | | P-SL2 |
| 4.00 | B151-1 | B151 | 1 | Intermittent | sand, boulder | stream ends in grassy pool | P-SL2 |
| 4.86 | B145-1 | B145 | 20 | Perennial | gravel/cobble, boulder | possibly mink present and | P-SL2 |

| MILEPOST | WATERBODY | ASSOCIATED WETLAND | CROSSING WIDTH (FEET) | STREAM TYPE (perennial or intermittent) | SUBSTRATE | COMMENTS | LURC SUBDISTRICT |
|---|---|---|---|---|---|---|---|
| | | | | | | probable trout stream | |
| 4.89 | B145-2 | B145 | 10 | Intermittent | gravel/cobble, boulder | overflow channel | P-SL2 |
| 5.24 | B140 | B140 | 1 | Intermittent | peat-muck, gravel/cobble, boulder | | P-SL2 |
| 5.29 | Northwest Inlet B138 | B138 | 30 | Perennial | boulder | waterfall downstream | P-SL2 |
| 6.01 | B133 | B133 | 3 | Intermittent | boulder | braided channel | P-SL2 |
| 6.50 | B130 | B130 | 3.5 | Intermittent | silt-mud | | P-SL2 |
| 7.15 | Viles Brook B127 | B127 | 7 | Perennial | sand, gravel/cobble | old beaver activity | P-SL2 |
| 7.35 | North Branch Dead River B124 | B124 | 55 | Perennial | gravel/cobble, boulder | *Listera auriculata* on s. bank; beaver activity, trout stream | P-SL1; P-UA |
| 8.04 | B118-2 | B118 | 3.5 | Perennial | silt-mud, sand | beaver activity | P-SL2 |
| 8.10 | B118-1 | B118 | 7-10 | Perennial | sand, gravel/cobble | | P-SL2 |
| 9.08 | B113-3 | B113 | 4 | Intermittent | sand, gravel/cobble | int. tributary | P-SL2 |
| 9.11 | Alder Stream B113-2 | B113 | 70 | Perennial | sand, gravel/cobble | | P-SL2 |
| 9.14 | B113-1 | B113 | 15 | Perennial | gravel/cobble | oxbow not connected to Alder Stream | P-SL2 |
| 10.71 | B105 | B105 | 3 | Perennial | silt-mud | wading bird present | P-SL2 |
| ***Eustis*** | | | | | | | |
| 11.46 | Barnard Brook B101 | B101 | 5 | Perennial | silt-mud, gravel/cobble | fish present | NA |
| 12.73 | Sawyer Brook B96-1 | B96 | 8 | Perennial | silt-mud | tadpoles, frogs, and fish present | NA |
| 13.07 | Tim Brook B157 | B157 | 30 | Perennial | gravel/cobble, boulder | *Listera auriculata; Pyrola minor* | NA |
| 13.87 | B163-2 | B163 | 2 | Intermittent | peat-muck, silt-mud, sand | | NA |
| 13.88 | B163-1 | B163 | 4 | Intermittent | sand, gravel/cobble | meandering stream, several | NA |

| MILEPOST | WATERBODY | ASSOCIATED WETLAND | CROSSING WIDTH (FEET) | STREAM TYPE (perennial or intermittent) | SUBSTRATE | COMMENTS | LURC SUBDISTRICT |
|---|---|---|---|---|---|---|---|
| | | | | | | possible routes at peak flow | |
| 15.72 | Lutton Brook C174 | C174 | 5 | Perennial | sand | | NA |
| 15.96 | A174-4 | A174 | 4 | Perennial | sand, gravel/cobble | flows into channel A174-8, some area had no flow | NA |
| 15.97 | A174-1 | A174 | 8-12 | Perennial | sand, gravel/cobble, boulder | | NA |
| 15.97 | A174-2 | A174 | 5-10 | Perennial | sand, gravel/cobble, boulder | flows into channel A174-1 | NA |
| 15.97 | A174-3 | A174 | 2.5 | Intermittent | sand, gravel/cobble | flows into channel A174-2 | NA |
| 16.21 | A172 | A172 | 2.5 | Intermittent | sand, gravel/cobble | | NA |
| 16.27 | A171-1 | A171 | 1 | Intermittent | gravel/cobble | | NA |
| 16.27 | A171-2 | A171 | 2 | Intermittent | gravel/cobble | | NA |
| 16.34 | A170-1 | A170 | 2 | Intermittent | gravel/cobble | | NA |
| 16.41 | A170-2 | A170 | 1 | Intermittent | silt-mud, gravel/cobble | | NA |
| 17.42 | A165 | A165 | 30 | Perennial | peat-muck, silt-mud | flows out of wetland, venal pool, beaver activity | NA |
| 17.80 | A160 | A160 | 1.5 | Intermittent | sand, gravel/cobble | | NA |
| 18.06 | A154 | A154 | 15 | Intermittent | silt-mud, sand, gravel/cobble | stream appears to have been widened | NA |
| 19.46 | South Branch Dead River A147-1 | A147 | 100 | Perennial | gravel/cobble, boulder | with int. tributary flowing out of wetland | NA |
| 19.54 | A149 | A149 | 15 | Intermittent | silt-mud | beaver activity | NA |
| 20.10 | Nash Stream A142-1 | A142 | 20 | Perennial | gravel/cobble | fish present | NA |
| 21.16 | A135 | A135 | 5.5 | Perennial | silt-mud, gravel/cobble | beaver activity | NA |
| ***Coplin Plantation*** | | | | | | | |
| 20.10 | Nash Stream A142-1 | A142 | 20 | Perennial | gravel/cobble | fish present | P-SL2 |

| MILEPOST | WATERBODY | ASSOCIATED WETLAND | CROSSING WIDTH (FEET) | STREAM TYPE (perennial or intermittent) | SUBSTRATE | COMMENTS | LURC SUBDISTRICT |
|---|---|---|---|---|---|---|---|
| 21.16 | A135 | A135 | 5.5 | Perennial | silt-mud, gravel/cobble | beaver activity | P-SL2 |
| 21.8 | B72-1 | B72 | 1 | Perennial | silt-mud/sand | | P-SL2 |
| 23.73 | B74 | B74 | 1 | Intermittent | sand, gravel/cobble | | P-SL2 |
| 23.81 | B79 | N/A | 2 | Perennial | gravel/cobble | frogs present | P-SL2 |
| ***Wyman Township*** | | | | | | | |
| 24.07 | B83-1 | B83 | 7 | Perennial | boulder | trout present | P-SL2 |
| 24.39 | B85 | B85 | 3.5 | Perennial | silt-mud, sand | wood frog present | P-SL2 |
| 24.67 | B88 | B88 | 2 | Intermittent | silt-mud, sand | | P-SL2 |
| 24.94 | B91 | B91 | 1.5 | Intermittent | silt-mud | | P-SL2 |
| 24.97 | B92-1 | B92 | 4 | Perennial | sand, gravel/cobble, boulder | | P-SL2 |
| 24.97 | B92-2 | B92 | 5 | Perennial | sand, gravel/cobble, boulder | trout present | P-SL2 |
| 25.15 | B93-1 | B93 | 1.5 | Intermittent | sand, gravel/cobble | | P-SL2 |
| 25.15 | B93-2 | B93 | 4 | Intermittent | sand, gravel/cobble | | P-SL2 |
| 25.27 | A130 | A130 | 2-6 | Perennial | silt-mud, gravel/cobble, boulder | | P-SL2 |
| 25.51 | A129 | A129 | 3 | Intermittent | gravel/cobble | | P-SL2 |
| 26.00 | A124 | A124 | 3 | Intermittent | gravel/cobble/boulder | | P-SL2 |
| 26.30 | Stoney Brook A118 | A118 | 35-40 | Perennial | gravel/cobble, boulder | | P-SL2 |
| 26.55 | A116-2 | A116 | 6 | Intermittent | gravel/cobble | | P-SL2 |
| 26.58 | A116-1 | A116 | 1 | Intermittent | sand, boulder | | P-SL2 |
| 26.69 | A115 | N/A | 4 | Perennial | gravel/cobble | insect larvae present | P-SL2 |
| 26.76 | A114-3 | A114 | 10 | Intermittent | gravel/cobble, boulder | | P-SL2 |
| 26.77 | A114-2 | A114 | 10 | Intermittent | gravel/cobble, boulder | | P-SL2 |
| 26.81 | A114-1 | A114 | 9 | Intermittent | gravel/cobble, boulder | | P-SL2 |
| 27.21 | B1 | B1 | 1 | Intermittent | sand | wood frog present | P-SL2 |

## 5.2 Objectives

The objective of managing vegetative buffers is to maintain the ecological values of the waterbodies that they border without sacrificing operational safety of the electric conductors. Vegetative buffers provide ecological benefits such as riparian habitat values, soil stabilization, and help protect aquatic habitat from the effects of insolation (the warming effect of sunlight). Maintaining buffers can also prevent indirect impacts to the adjacent waterbodies. The vegetation cutting practices used to protect and maintain buffers range from very limited, selective, hand cutting to normal mechanized clearing. The specific methods to be utilized along the ROW are tailored to meet the desired buffer objectives in a manner that provides a clear, achievable set of standards for construction and maintenance personnel. TransCanada will maintain these buffers in accordance with the project-specific techniques presented in this document. A TransCanada representative trained and familiar with vegetation management will provide input in the clearing and maintenance planning process.

Table 2 summarizes and compares the clearing and maintenance practices for typical ROWs and vegetated riparian buffers. Additional details and variations are provided in the remainder of this section and in other sections of the VMP.

**TABLE 2: VEGETATIVE BUFFER AND RIGHT-OF-WAY CLEARING AND MAINTENANCE SUMMARY COMPARISON**

| | **LOCATION** | |
|---|---|---|
| **Activity** | **Typical ROW**: All areas not otherwise restricted. | **Waterbody Buffers**: Within 100 feet of each bank for perennial streams and rivers. |
| **Clearing During Construction**[1] | Cut at ground level all vegetation that is greater than 2 inches dbh[2]; remove or top all other vegetation that is 8 to 10 feet or taller. | Cut at ground level all capable species that are 8 to 10 feet or taller; no other vegetation is cut. |
| **Cutting During Maintenance and Operation** | Cut at ground level all capable species that are 8 to 10 feet or taller; top all other vegetation that is greater than 8 to 10 feet or taller. | Cut at ground level all capable species that are 8 to 10 feet or taller; no other vegetation is cut. |
| **Pole Placement** | Standard. | Not allowed unless no other option possible. |
| **Herbicide Use** | Allowed. | Not allowed. |

[1] dead or danger trees are removed at any time

[2] dbh = diameter at breast height

## 5.3 Waterbody Buffer Design Concept

Many factors were taken into consideration for determining the clearing, construction, and maintenance restrictions associated with the buffers proposed for the Kibby Wind Power Project 115 kV transmission line. The buffer maintenance plan complies with state of Maine regulatory authorities and is consistent with industry standards for maintaining and protecting streams and buffers. During development of the proposed buffer and vegetation maintenance plan, six critical factors were considered.

- TransCanada has a responsibility to ensure the output of its project is able to enter the regional grid in a reliable and dependable manner.
- TransCanada has the responsibility to comply with the scientific and regulatory objectives and other goals to protect and preserve natural resources and the natural environment and to avoid and minimize wetland impacts.
- TransCanada has the ability to implement successfully and ensure compliance with vegetation clearing and maintenance requirements.
- TransCanada will utilize the accepted ROW construction and maintenance practices as conducted throughout the industry.
- The buffer VMP will be consistent with recent proposals for other utility projects.
- This plan will include input and recommendations received from regulatory agencies regarding the suitability of the proposed plan.

All of the above factors were taken into consideration to prepare a buffer VMP that maintains and balances the operational needs of the Kibby Wind Power Project 115 kV transmission line with environmental benefits of waterbody buffers. This plan combines the best features of successful, existing practices that are realistic to implement in the field.

## 5.4 Design Specifics

The project will be designed to avoid the placement of pole structures, to the extent practicable, within waterbody buffers in order to minimize soil disturbance adjacent to waterbodies and prevent indirect impacts. Additional procedures and restrictions 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 sedimentation of surface waters;
- Slow the velocity, increase the infiltration and otherwise remove sediment and other contaminants in 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 and habitat for wildlife that use riparian habitats.

## 5.5 Overview of Clearing and Maintenance Procedures

Consistent with industry practices and standards, nearly the entire ROW will remain vegetated with short shrub and herbaceous plant species during construction. Ground disturbance will occur only at structure locations or within equipment travel corridors. All necessary erosion and sedimentation control measures will be installed and maintained throughout construction to prevent adverse impacts to waterbodies and buffers. During initial clearing and vegetation maintenance, the removal of vegetation will be done by hand cutting or using mechanized harvesting equipment outfitted with low ground pressure tracks. When possible, mechanized equipment will operate outside of the buffers and “reach” into the buffers to remove capable species. When the use of mechanized clearing equipment within buffers is deemed necessary, TransCanada staff or qualified environmental representative(s), and construction personnel will review and determine the locations of travel lanes and TransCanada will oversee the clearing.

During construction, when access permits, temporary crossings will be minimized to the maximum extent practicable by approaching construction areas from either side. This technique can be utilized at the larger stream and river crossings, but may be impractical for the many small streams. Therefore, temporary crossings may be required for many of the small streams due to access limitations. The locations of temporary equipment crossings will be reviewed in

accordance with the Erosion & Sedimentation Control Plan before equipment bridges are installed. The type and location of associated erosion and sedimentation controls will be established at that time. All equipment crossings will span the waterbody and minimize disturbance to the banks as much as possible.

Following completion of construction, the crossing structures (typically bridges constructed from equipment mats) will be removed as part of restoration work and any disturbed ground will be restored to original contours and stabilized. Follow-up vegetation maintenance practices will encourage the growth of shrubs and herbaceous plant species. A TransCanada representative trained and familiar with the species of vegetation that need to be removed and those that should be encouraged on the ROW will provide input in the maintenance planning process. After construction is complete, the transmission line will be examined at least one time per year by aerial inspections, and one detailed ground-based inspection will be completed every five years. These inspections will be done to assess structure condition as well as evaluate vegetation maintenance needs.

## 5.6 Waterbody Buffer Clearing Procedures

Cutting in riparian buffer zones will be limited to ensure a greater amount of protection versus typical cutting practices. During 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. Removal of capable species will be conducted as discussed below.

The removal of large trees within the buffer can be accomplished using a feller-buncher, or similar mobile harvesting equipment. These machines can sometimes reach into a buffer area and cut and remove trees, thereby minimizing travel into the buffers. While hand cutting of large trees is an alternative, removing the tree: 1) increases the potential for soil disturbance; 2) could result in incidental damage to the remaining vegetation: and 3) requires considerably more time and expense when maintaining ROWs.

Due to the limited reach of mobilized tree harvesting equipment (feller-bunchers or mechanical harvesters), some access ways may be needed within the buffers to enable cutting and removal of large trees. In these situations narrow cleared access corridors will be established. The

need for, and locations of, these access lanes will be reviewed as discussed in the Erosion & Sedimentation Control Plan (Volume V, Appendix V-A of the LURC Application). TransCanada staff or qualified environmental representative(s), and construction personnel will review and determine the locations of travel lanes and TransCanada will oversee the clearing. Generally, these access corridors will only be located in the area immediately adjacent to the trees that need to be removed. The access ways will be 10-12 feet wide and only capable species, trees that could prevent the harvesting equipment from operating efficiently and safely, and other vegetation that would otherwise be seriously damaged by harvesting equipment traveling along the access lanes, will be removed. Existing low vegetation will remain.

Temporary erosion and sedimentation control measures will be implemented as needed along the access lanes, and any soil disturbed by harvesting equipment will be stabilized and these areas will be restored. Erosion and sedimentation control, soil stabilization, and site restoration measures are described in the Erosion & Sedimentation Control Plan, Volume V, Appendix V-A of the LURC Application.

No refueling or maintenance of any equipment will be performed within buffer zones, and will be done off ROW in designated areas only.

## 5.7 Waterbody Buffer Maintenance Procedures and Restrictions

Vegetation maintenance within stream buffers will generally be conducted on a three or four year cycle, depending on growth and vegetation. Only capable species greater than 8 to 10 feet tall will be removed. Removal of capable species will be by hand cutting only, with limited use of motorized equipment in areas that are directly accessible from public or private access roads. In addition, no herbicides will be used, stored, mixed, or transferred from container to container within the buffers, and no refueling or maintenance of equipment will be allowed.

Figure 1 illustrates the proposed 100-foot buffers. Species capable of growing into the electrical conductors such as quaking aspen (*Populus tremuloides*), balsam fir (*Abies balsamea*), white pine (*Pinus strobus),* and red maple (*Acer rubrum*) will be removed when they reach 8 to 10 feet tall. Vegetation generally considered to “desirable growth” within electrical transmission ROWs will be encouraged. This may include grasses, tree saplings, and shrubs such as dogwood

species (*Cornus sp.*), willow species (*Salix sp.*), speckled alder (*Alnus rugosa*), and winterberry (*Ilex verticillata*). Desirable species will be allowed to grow to their naturally occurring height. The establishment of desirable species will be achieved through the removal of taller, competing species.

## 6.0 VEGETATION MAINTENANCE AT RARE PLANT AND UNIQUE NATURAL AREA LOCATIONS

Two state-listed rare plant species occur along the Kibby Wind Power Project 115 kV transmission line ROW. These are auricled twayblade (*Listeria auriculata*) and lesser wintergreen (*Pyrola minor*). Auricled twayblade, a state-threatened species (S2), was observed in two locations. The first occurrence is on the banks of the North Branch of the Dead River in the vicinity of the proposed 115 kV transmission line crossing. This population is in Jim Pond Township at approximately Mile 8.7 of the proposed transmission line (Figure 2). Plants were observed on both stream banks; however, more individual plants were documented along the southern bank. The second occurrence consisted of a single plant observed on the north bank of Tim Brook at approximately Mile 14.4 of the proposed 115 kV transmission line route (see Figure 3).

Lesser wintergreen, a state-listed species of special concern, was observed in one location along the 115 kV transmission line corridor. Specifically, a small population of five individuals was observed along Tim Brook near the site of the second population of auricled twayblade. It was observed on a steep portion of the southern bank close to the water's edge, and was associated with various mosses and other pyrolids (e.g., shinleaf, *Pyrola elliptica*).

In order to avoid impacts to auricled twayblade, TransCanada proposes the following measures:

- No clearing of shrubs or small trees <15 feet tall along streambank.
- No stacking of brush from clearing at streambank or on first terrace (generally, not within 15 feet of top of bank), or in any manner that brush would be washed into or become lodged on the stream terrace.
- Place structures on either side of the stream to maximize conductor height above the streambanks, which will allow continued growth of alders and other shrubs up to 15 feet, to provide shade for this species.
- Take care in clearing and stringing lines to minimize foot traffic at the streambank.
- Mark sites with "Sensitive Resource Area" signs prior to the start of construction.
- Add notation on the site plans and add the locations to the long-term vegetation management plans (as noted in Table 3) so that impacts will not occur in future.

- Monitor for 3 years after construction, with final report to make recommendations in regard to future vegetation management.

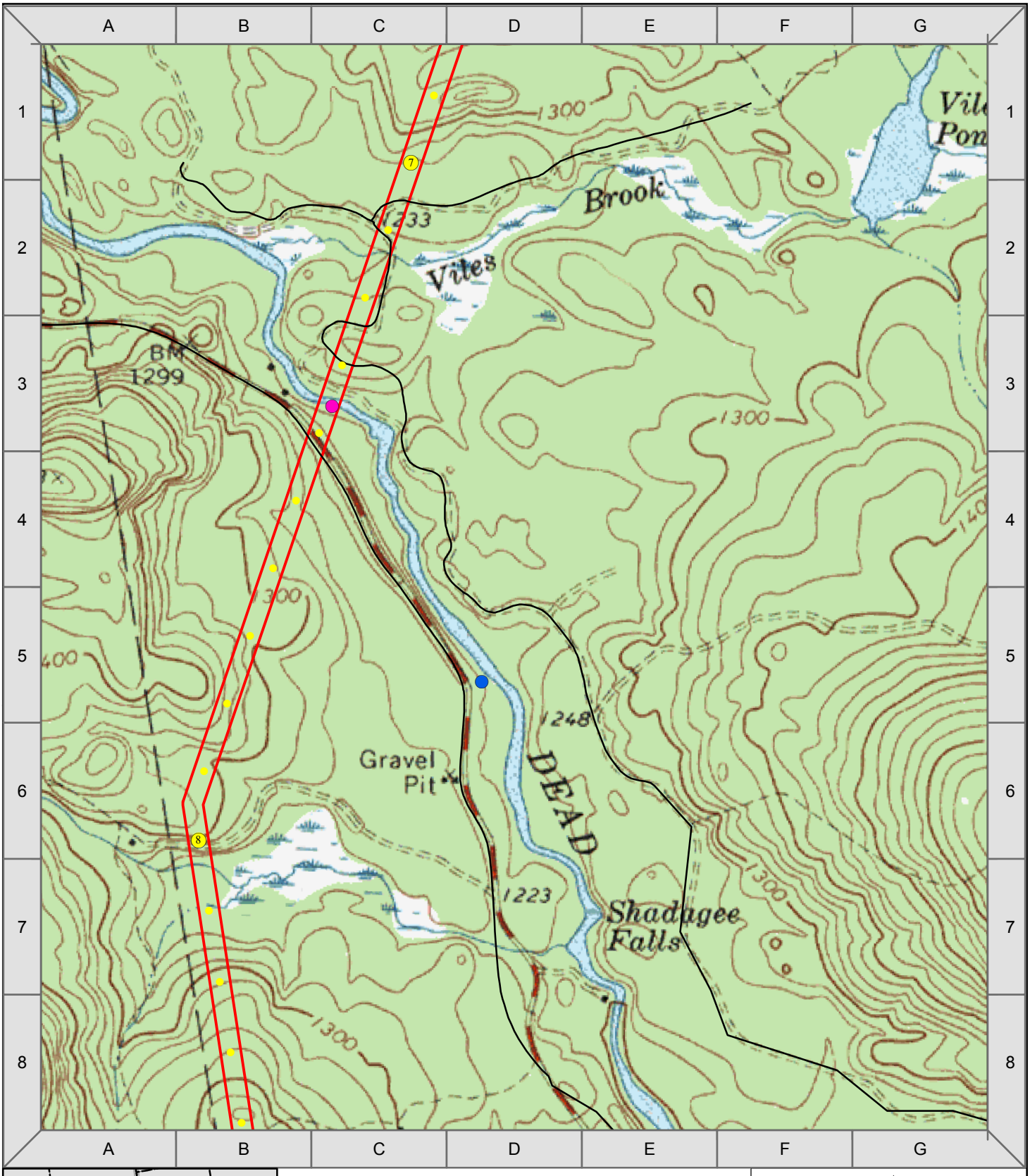
In order to avoid impacts to lesser wintergreen, TransCanada proposes the following measures:

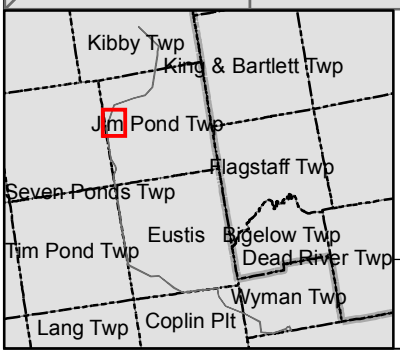
- Flag the micro-site and avoid during project clearing.
- Minimize clearing of shrubby vegetation to maintain shade.
- Take care in clearing and stringing lines to minimize foot traffic at the streambank.
- Mark the site with a "Sensitive Resource Area" sign prior to the start of construction.
- Add notation on the site plans and add the location to long-term vegetation management plan (as noted in Table 3) so that impacts will not occur in future.
- Monitor for 3 years after construction, with final report to make recommendations in regard to future vegetation management.

**TABLE 3: RARE PLANT AND UNIQUE NATURAL AREA LOCATIONS**

| Name, Town | Begin Milepost[1] | Begin Ref. Pole No.[1] | Distance (ft)[1] | Direction[1] | End Milepost[1] | End Ref. Pole No.[1] | Distance (ft)[1] | Direction[1] |
|---|---|---|---|---|---|---|---|---|
| Auricled twayblade[2, 3] | | | | | | | | |
| Auricled twayblade[2, 3] | | | | | | | | |
| Lesser wintergreen[2, 3] | | | | | | | | |

[1]To be updated as necessary following construction, per As-Built mileposts and pole number.
[2]Remove all trees except those less than 8 to 10 feet tall. Hand cutting only. No herbicide use within 75 feet.
[3]Follow waterbody buffer restrictions.




**Legend**

- Mile Marker
- Observed Listera auriculata
- MNAP Listera auriculata
- Streams
- Road
- Proposed Transmission Line

**Notes:** *Base map: USGS 24k Topographic Map.*
*Coordinate Grid: NAD83 UTM Zone 19N, Meters.*

N

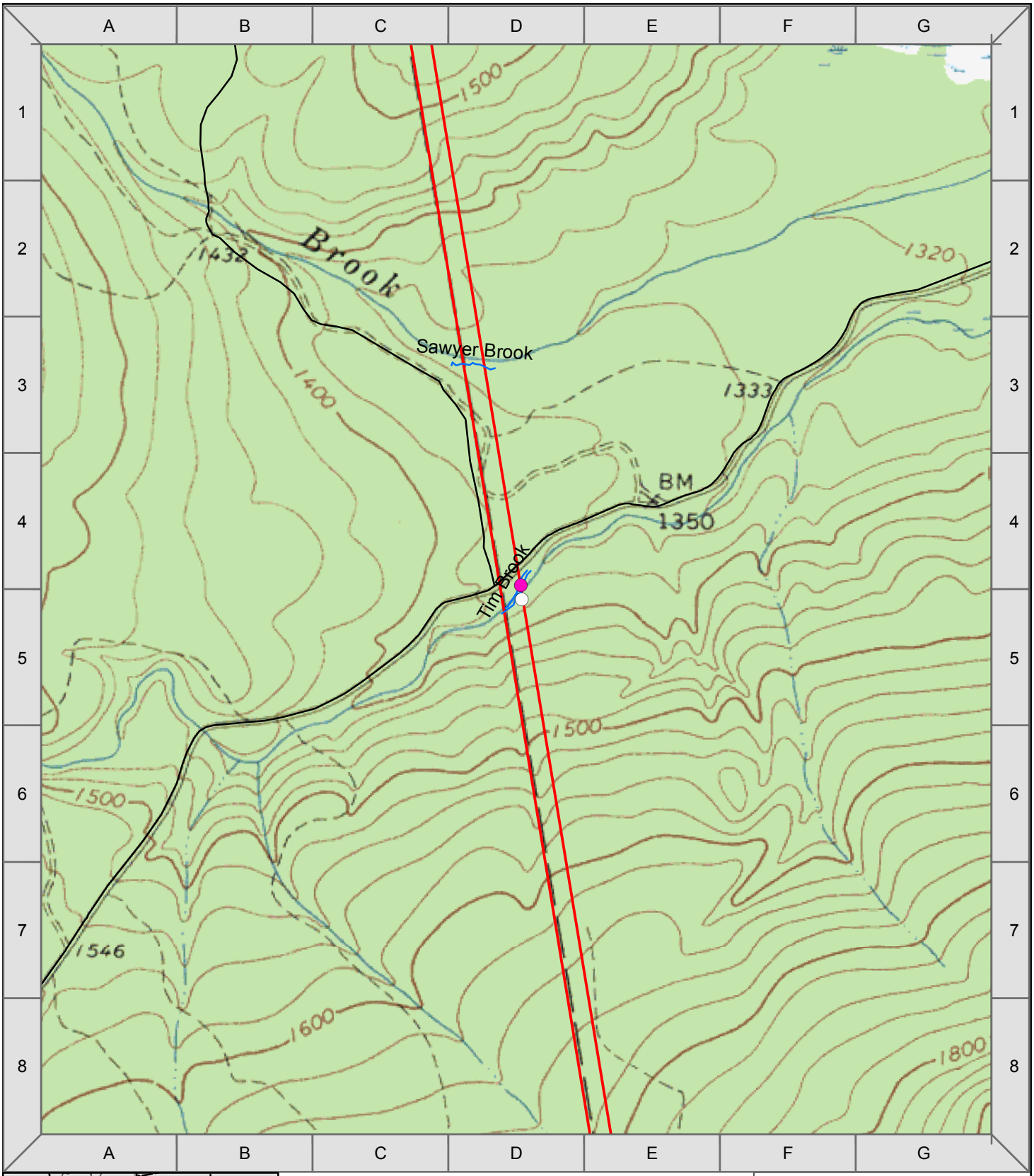
1,000

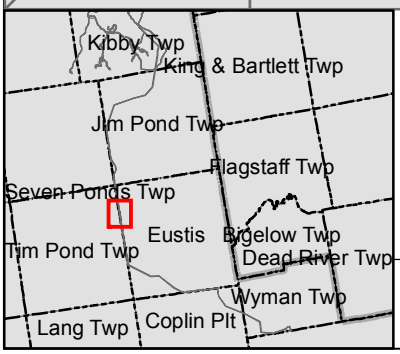
Feet

Figure 2

**Kibby Wind Power Project**

*Listera auriculata at North Branch of Dead River*




**Legend**

- Mile Marker
- Observed Listera auriculata
- Observed Pyrola minor
- MNAP Listera auriculata
- MNAP Pyrola minor
- Streams
- Proposed Transmission Line
- Road

**Notes:** *Base map: USGS 24k Topographic Map.*
*Coordinate Grid: NAD83 UTM Zone 19N, Meters.*

N

1,000

Feet

Figure 3

**Kibby Wind Power Project**

*Listera auriculata and Pyrola minor at Tim Brook*

## 7.0 SYSTEM FOR LOCATING/MARKING RESTRICTED AREAS FOR VEGETATION MAINTENANCE PURPOSES

TransCanada will use a systematic approach for locating specific areas or features in the field by maintaining a database that references a variety of sensitive areas to the nearest structure or road location.

Signs will be placed at visible locations near specific resources such as stream buffers and rare plant communities. Using structure identification numbers to designate a general area where a protected resource occurs has proven to be the most effective method for documenting and communicating the locations of these areas to construction crews. Therefore, all structures along the proposed transmission line route will be numbered at the time of construction, added to the as-built Plan and Profile Drawings, and cross referenced to specific protected resources forming a resource database. All protected resources, buffer areas, and other areas where maintenance restrictions apply will be located in this manner, in addition to the designations in the field. The distance and direction from the nearest structure to the sensitive area will be listed next to the resource designation and the structure number. This resource database will be updated to include all such sensitive areas along the Kibby Wind Power Project 115 kV transmission line ROW and their locations relative to the nearest structure. These data will then be incorporated in the final VMP. Both the database and field signage will enable maintenance contractors to locate protected resources. The purpose and use of the database will be included as part of environmental training vegetation maintenance personnel. Use of the database, VMP, and the As-Built Plan and Profile drawings will enable maintenance contractors to locate protected resources in the field and cross reference specific management activities.

# 8.0 TRAINING OF MAINTENANCE PERSONNEL

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

## 8.1 Personnel and Schedule

All TransCanada personnel and contractors who will be participating in vegetation maintenance activities on the ROW will receive appropriate environmental training from TransCanada before they are allowed access to the ROW. 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 ROW.

## 8.2 Content of Training Sessions

Prior to receiving maintenance training, each participant will receive a copy of this VMP and be instructed to read the entire plan before the scheduled training session. The training session will then 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 using the resource database (i.e., 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 the VMP, as well as basic causes and preventive and remedial measures for erosion, contamination, and sedimentation of water resources. Training will also include safety, monitoring, and reporting requirements.