



**VERMONT ELECTRIC POWER COMPANY (VELCO)
&
GREEN MOUNTAIN POWER
(previously Central Vermont Public Service)**

**BEST MANAGEMENT PRACTICES
FOR THE AVOIDANCE OF
LISTED THREATENED AND ENDANGERED SPECIES
INTEGRATED VEGETATION MANAGEMENT AND O&M ACTIVITIES**

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EXECUTIVE SUMMARY

In accordance with Public Service Board Order (VT PSB Docket No. 7373), including Stipulation 5 of the Memorandum of Understanding (“MOU”), the Parties (i.e., Vermont ANR, VELCO and CVPS) agreed to work collaboratively to develop uniform best management practices (“BMPs”) for integrated vegetation management of electric utility corridors, including the use of selective herbicides.

Vermont Transco, LLC and Vermont Electric Power Company (referred to collectively as “VELCO”) and Green Mountain Power (“GMP”), formerly Central Vermont Public Service (“CVPS”) have prepared this document to describe BMPs that will be implemented during vegetation management, as well as operations and maintenance (“O&M”) activities along VELCO and CVPS transmission right-of-way corridors (“ROWS”) to proactively reduce the risk of unintended or inadvertent takings of threatened and endangered (“T&E”) species.¹

The BMPs in this document have been developed through a careful consideration of: existing vegetation management methods and practices, and typical maintenance work practices with associated environmental protection measures; a review and update of the actual documented T&E species that occur in VELCO and CVPS transmission management areas; an assessment of the effectiveness of past work protection and conservation plans for T&E species based on several projects and the construction compliance and post-construction monitoring of management areas of these projects; and, the development of enhanced and new BMPs to be proactively implemented to further protect T&E species during VELCO and CVPS vegetation management and maintenance work on their electric transmission line ROWs.

This BMP document is organized under the following BMP topics.

- Sections 1.0 and 2.0 include Introductory and Background Information
- Section 3.0 provides General Data Management, Training, Tailboard, and Flagging BMPs, which are applicable to all vegetation management and O&M activities.
- Section 4.0 provides BMPs specifically for vegetation management activities, and Section 5.0 provides BMPs specifically for O&M activities. Each Section includes BMPs as follows:

BMPs for the Protection of T&E Plant Species

- Option 1: Avoidance of Polygon
- Option 2: Avoidance of Plants within established Polygon
- Option 3: Conduct Activities during Dormancy Period

¹ Central Vermont Public Service (“CVPS”) was acquired by Green Mountain Power (“GMP”) in 2012. This document applies only to infrastructure that was previously owned and operated by CVPS. Throughout this document, “GMP” is used to refer to the company, generally; “CVPS” is used to refer to the vegetation management plans, work practices, infrastructure and easements.

- Option 4: Alternative Practices
- Emergency BMPs

BMPs for T&E Aquatic Animal Species

BMPs for T&E Terrestrial Reptiles

BMPs for T&E Bird Species

- Section 6.0 provides BMPs for protection of T&E bat species.

At the core of its BMPs, VELCO and GMP have developed a comprehensive GIS database and mapping system which is readily available to their Vegetation Management, O&M and Environmental Staff as a key resource management tool for evaluating and developing Vegetation Management Plans and O&M work plans and implementing the appropriate BMPs described in this document. Table 1 summarizes all of the threatened and endangered species documented within the VELCO and CVPS corridors and potential management areas.

VELCO and GMP recognize their responsibility to maintain its ROWs in the manner that most appropriately balances avoiding unreasonable risk of harm to the environment, neighbors, occupants, workers, and users of the land on which or adjacent to which its ROWs lie, while fulfilling its obligations as a utility by operating the most reliable transmission system possible, and minimizing the expense of vegetation management over the long term. It is the policy of VELCO and GMP to manage the vegetation growing on its transmission line ROWs in accordance with approved Transmission Vegetation Management Plans (TVMP) and all other applicable rules and regulations.

The VELCO transmission system comprises approximately 13,000 acres and extends over 732 linear miles. The CVPS transmission system is approximately 7,565 acres. In general, the prevailing integrated vegetation management approach for maintaining their ROWs is through the use of herbicides; greater than 40% for VELCO, and approximately 55% for CVPS. The remaining management areas are hand cut, mowed, or do not require management, such as in open or scrub-shrub or areas in higher use. As described in this document, herbicide use is a critical and effective component of “integrated” vegetation management, as its “targeted” use allows for the creation of stable, sustainable low-growing vegetative communities that are compatible with the transmission line clearance requirements, and facilitates over continual management cycles less and less vegetation management. As described in more detail in section 2.2.3 and 2.2.4, the quantity and extent of herbicide use decreases over time as sustainable, compatible, and low-growing vegetative communities are formed.

The herbicides described and used by VELCO and CVPS are all approved and include maximum rates of application specifically for use in right-of-ways and are included in the “Permits to Conduct Right-of-Way Herbicide Treatment”. In practice, herbicides are often applied at rates substantially lower than the permit approved rates, again due to the VELCO and CVPS’s integrated vegetation management approach as described in this document.

In consultation with TRC and Gilman & Briggs Environmental, VELCO and GMP have developed the BMPs herein in accordance with the Vermont Public Service Board MOU in Docket (No. 737),

Stipulation Number 5. The Project Team believes the BMPs developed herein proactively reduce the risk of takings of T&E species during vegetation management and O&M activities. These BMPs will be implemented during applicable vegetation management and O&M work activities within VELCO and CVPS transmission ROWs to protect T&E species. In accordance with the companies' existing integrated vegetation management programs and as enhanced in these BMPs, VELCO and GMP will monitor the effectiveness of these BMPs over time and pursue opportunities to enhance or improve these BMPs, including in the future combined programs (i.e., CVPS and GMP) under GMP operations and system-wide vegetation management and O&M programs.

1.0 INTRODUCTION

Vermont Transco, LLC and Vermont Electric Power Company (referred to collectively as "VELCO") and Green Mountain Power ("GMP")², retained TRC Environmental Corporation ("TRC") to develop a Best Management Practices (BMPs) manual for implementation of their Integrated Vegetation Management ("IVM") and operations and maintenance ("O&M") activities along their transmission line corridors throughout the State of Vermont in an effort to further reduce the risk of an unintended takings of threatened and endangered ("T&E") species, as defined under the Vermont endangered species statute (10 V.S.A. §5401-5410) and the Federal Endangered Species Act of 1973 (16. U.S.C. §1531 et seq.).

The development of the BMPs was supported by the following technical activities:

- TRC observed vegetation management and O&M activities conducted by VELCO and GMP during the spring and summer of 2012;
- TRC evaluated existing VELCO and CVPS Vegetation Management Plans and permits;
- TRC conducted a desktop review of populations of known occurrences of threatened and endangered species that occur within VELCO and CVPS transmission line corridors;
- TRC reviewed multiple protection plans and monitoring reports associated with known populations of T&E species on electric transmission line corridors in Vermont.

This document describes the current VELCO and CVPS vegetation management programs and typical O&M work practices, the status of existing BMPs implemented as part of these programs, and new BMPs to be proactively implemented to protect T&E species during VELCO and CVPS vegetation and right-of-way (ROW) management and operations and maintenance work on transmission lines and associated electrical infrastructure.

² Central Vermont Public Service ("CVPS") was acquired by Green Mountain Power ("GMP") in 2012. This document applies only to infrastructure that was previously owned and operated by CVPS. "GMP" is used to refer to the company, generally; "CVPS" is used to refer to the vegetation management plans, work practices, infrastructure and easements.

2.0 BACKGROUND

On September 2, 2008, VELCO, Central Vermont Public Service (“CVPS”) and the Vermont Agency of Natural Resources (“ANR”) finalized a Memorandum of Understanding (“MOU”) as part of the Section 248 review for the Southern Loop Project (Vermont Public Service Board Docket 7373). The MOU specified that a uniform set of BMPs would be prepared for integrated vegetation management of electric utility corridors, including the use of selective herbicides (Stipulation 5). Since that time, VELCO and GMP have met numerous times with ANR staff to strategize on the development of BMPs, including most recently in March 2012. This document has been prepared to satisfy Public Service Board Orders, including Stipulation 5 of the MOU, and to develop measures to protect and reduce the risk of a “take” of T&E species³ during vegetation management activities and utility operation and maintenance work.

The following describes the findings of our background investigations for the development of the Best Management Practices.

2.1 NHIP- and Company-Documented Threatened and Endangered Species Occurrences

In June 2012, the VELCO Environmental Team prepared and provided TRC with shapefiles of the entire VELCO and CVPS transmission systems, which included the VELCO easements plus a 50-foot buffer on either side of the easement boundary (area of potential danger tree removal), and the CVPS easements and buffer comprised of 75 feet on either side of the centerline of their transmission lines (which includes area of potential danger tree removal).

On June 28, 2012, TRC received from the Natural Heritage Information Project (NHIP) the documented T&E Element Occurrence shapefile and metadata that intersects the VELCO and CVPS transmission systems.

Additionally, TRC reviewed all VELCO-documented occurrences from previous project surveys and verified their inclusion within a master dataset. In some instances, VELCO-documented occurrences were more recent than NHIP-documented occurrences and were incorporated into the master dataset. Additionally, NHIP often buffers the surveyed occurrence polygons—in these

³ 10 V.S.A §5401-10 - ... with respect to wild plants, [a taking] means uprooting, transplanting, cutting, injuring or killing or any attempt to do the same or assisting another who is doing or is attempting to do the same

10 V.S.A. §4001(23) Take and taking: pursuing, shooting, hunting, killing, capturing, trapping, snaring and netting fish, birds and quadrupeds and all lesser acts, such as disturbing, harrying or worrying or wounding or placing, setting, drawing or using any net or other device commonly used to take fish or wild animals, whether they result in the taking or not; and shall include every attempt to take and every act of assistance to every other person in taking or attempting to take fish or wild animals, provided that when taking is allowed by law, reference is had to taking by lawful means and in lawful manner.

Federal Endangered Species Act, Section 3: The term “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

cases, the more precise GPS-located extent of populations from recent VELCO surveys have been incorporated into the dataset, if available, for use during the implementation of BMPs. The specific NHIP-documented and/or surveyed locations of T&E species are referred to as T&E population polygons, or T&E polygons.

Table 1 identifies all of the threatened and endangered species documented within the VELCO and CVPS corridors and potential management areas. The vast majority of these species flourish in the early successional habitat created by VELCO and CVPS' associated vegetation management. Also, many of these species are found in areas subject to frequent ground disturbance. As such, it is clear that transmission line corridors and their management regimes contribute to the ongoing persistence of most of the documented populations. With the implementation of the BMPs contained herein to proactively avoid adverse impacts to T&E populations during integrated vegetation management and O&M activities, ROW and transmission line maintenance activities will undoubtedly contribute to the continued presence (and possible expansion) of these population occurrences and associated habitat.

<p style="text-align: center;">TABLE 1 Threatened and Endangered Species Documented Within VELCO and CVPS Potential Management Areas¹</p>				
Scientific Name	Common Name	State Rank	Federal Listing (T or E)	State Listing (T or E)
<i>Plants</i>				
<i>Allium canadense</i>	Wild Garlic	S1		T
<i>Arisaema dracontium</i>	Green Dragon	S2		T
<i>Blephilia hirsuta</i>	Hairy Wood-mint	S1		T
<i>Boechera stricta</i>	Drummond's Rock-cress	S1		E
<i>Calystegia spithamea</i>	Low Bindweed	S2		T
<i>Carex muehlenbergii</i> var. <i>muehlenbergii</i>	Muehlenberg's Sedge	S2		T
<i>Carex vaginata</i>	Sheathed Sedge	S1		E
<i>Corallorhiza odontorhiza</i>	Autumn Coral-root	S2		T
<i>Corydalis aurea</i>	Golden Corydalis	S2		T
<i>Crocanthemum bicknellii</i>	Plains Frostweed	S2S3		T
<i>Cynoglossum virginianum</i> var. <i>boreale</i>	Northern Wild Comfrey	S1		T
<i>Cyperus houghtonii</i>	Houghton's Cyperus	S2		T
<i>Cypripedium arietinum</i>	Ram's Head Lady's-slipper	S2		T
<i>Desmodium cuspidatum</i>	Large-bracted Tick-trefoil	S1		E
<i>Dryopteris filix-mas</i>	Male Fern	S2		T
<i>Eleocharis quinqueflora</i>	Few-flowered Spikerush	S2		T
<i>Gentiana andrewsii</i>	Fringe-top Closed Gentian	S2		T
<i>Gentianella quinquefolia</i>	Stiff Gentian	S1		T
<i>Glyceria acutiflora</i>	Sharp Manna-grass	S1		E

TABLE 1
Threatened and Endangered Species Documented
Within VELCO and CVPS Potential Management Areas¹

Scientific Name	Common Name	State Rank	Federal Listing (T or E)	State Listing (T or E)
<i>Hackelia deflexa ssp. americana</i>	Nodding Stickseed	S2		T
<i>Helianthus strumosus</i>	Harsh Sunflower	S2S3		T
<i>Hypericum ascyron</i>	Great St. John's-wort	S2		T
<i>Isotria verticillata</i>	Large Whorled Pogonia	S2		T
<i>Juncus greenei</i>	Greene's Rush	S2		E
<i>Juncus secundus</i>	Secund Rush	SH		E
<i>Lactuca hirsuta</i>	Hairy Lettuce	S2		T
<i>Lechea mucronata</i>	Hairy Pinweed	S1		E
<i>Lespedeza hirta</i>	Hairy Bush-clover	S1		T
<i>Malaxis monophyllos var. brachypoda</i>	White Adder's-mouth	S2S3		T
<i>Omalotheca sylvatica</i>	Woodland Cudweed	S1		E
<i>Physostegia virginiana</i>	Obedient Plant	S2		T
<i>Piptatherum pungens</i>	Slender Mountain-rice	S2		T
<i>Platanthera flava</i>	Tubercled Orchid	S2		T
<i>Platanthera hookeri</i>	Hooker's Orchid	S2		T
<i>Polygonum douglasii</i>	Douglas Knotweed	S2		E
<i>Polymnia canadensis</i>	White-flowered Leafcup	S1		E
<i>Pterospora andromedea</i>	Pinedrops	S1		E
<i>Pycnanthemum incanum</i>	Hoary Mountain-mint	S1		E
<i>Quercus ilicifolia</i>	Scrub Oak	S1		E
<i>Quercus prinoides</i>	Dwarf Chinquapin Oak	S1		E
<i>Scirpus ancistrochaetus</i>	Barbed-bristle Bulrush	S2	E	E
<i>Triphora trianthophora</i>	Three-bird Orchid	S1		T
<i>Viola lanceolata</i>	Lance-leaved Violet	S1		T
Animals				
<i>Acipenser fulvescens</i>	Lake Sturgeon	S1		E
<i>Alasmidonta heterodon</i>	Dwarf Wedgemussel	S1	E	E
<i>Alasmidonta varicosa</i>	Brook Floater	S1		T
<i>Ammocrypta pellucida</i>	Eastern Sand Darter	S1		T
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	S1B		T
<i>Anodontooides ferussacianus</i>	Cylindrical Papershell	S1S2		E
<i>Apalone spinifera</i>	Spiny Softshell (Turtle)	S1		T
<i>Bartramia longicauda</i>	Upland Sandpiper	S2B		E
<i>Cicindela hirticollis</i>	Hairy-necked Tiger Beetle	S1		T

TABLE 1
Threatened and Endangered Species Documented
Within VELCO and CVPS Potential Management Areas¹

Scientific Name	Common Name	State Rank	Federal Listing (T or E)	State Listing (T or E)
<i>Cicindela puritana</i>	Puritan Tiger Beetle	SH	T	T
<i>Crotalus horridus</i>	Timber Rattlesnake	S1		E
<i>Lampetra appendix</i>	American Brook Lamprey	S1		T
<i>Lampsilis ovata</i>	Pocketbook	S2		E
<i>Lasmigona costata</i>	Fluted-shell	S2		E
<i>Leptodea fragilis</i>	Fragile Papershell	S2		E
<i>Ligumia recta</i>	Black Sandshell	S1		E
<i>Myotis sodalis</i>	Indiana Bat	S1	E	E
<i>Noturus flavus</i>	Stonecat	S1		E
<i>Pantherophis alleghaniensis</i>	Eastern Ratsnake	S2		T
<i>Percina copelandi</i>	Channel Darter	S1		E
<i>Potamilus alatus</i>	Pink Heelsplitter	S2		E
<i>Pyganodon grandis</i>	Giant Floater	S2S3		T

¹ The list of T&E species documented within VELCO and legacy CVPS potential management areas is not static and is subject to updates in accordance with the data management protocols described in Section 3.1.

2.1.1 Summary of State-listed Occurrences - VELCO

VELCO’s vegetation management area (i.e. transmission line ROWs and danger tree buffers) intersects 83 documented state-listed threatened or endangered species occurrence areas (or polygons) that include individuals or populations of 27 animal species populations and 56 plant species populations. These occurrence polygons comprise 19 different animal species and 31 different plant species (total of 50 different species). Of the 31 different plant species, most require early successional habitat or disturbance regimes and conditions typical of transmission line ROWs, and are “compatible” with ROW management. Specifically, two species, Muehlenberg’s Sedge (*Carex muehlenbergii* var. *muehlenbergii*) and Plains Frostweed (*Crocانthemum bicknellii*) are considered “disturbance specialists” and readily exploit new areas of disturbance, and seven additional species can flourish with light to moderate disturbance, including Lance-leaved Violet (*Viola lanceolata*), Greene’s Rush (*Juncus greenei*), Barbed-bristle Bulrush (*Scirpus ancistrochaetus*), Slender Mountain-rice (*Piptatherum pungens*), Hairy Lettuce (*Lactuca hirsuta*), and Houghton’s Cyperus (*Cyperus houghtonii*). Only a single plant species, Dwarf Chinquapin Oak (*Quercus prinoides*), is potentially incompatible with the transmission line clearance requirements (see discussion in next section).

2.1.1.1 Summary of Woody Plant Species Occurrences

One threatened and endangered woody plant species, Dwarf Chinquapin Oak, occurs within the VELCO transmission system. It typically only grows to 15 feet tall and should thus be mostly compatible with the transmission line clearance requirements depending on its location relative to

the transmission lines. However, due to clearance standards and requirements, “compatible species” as defined in VELCO’s vegetation management plan mature at heights less than 12 feet (see Section 2.2 for a discussion of compatible versus incompatible vegetation), and as such, depending on the age and location of this species and its growth patterns, some individuals may require periodic management (e.g., crown reduction) to ensure transmission line clearances are met (see Section 2.2 for a discussion of compatible versus incompatible vegetation and Section 4.1.4 for a discussion of the BMPs and associated regulatory requirements).

2.1.2 Summary of State-listed Occurrences - CVPS

CVPS’s vegetation management area (i.e. transmission line ROWs and danger tree buffers) intersects 54 documented state-listed threatened or endangered species occurrence areas (or polygons), including 19 animal species populations and 35 plant species populations. These occurrences comprise 16 different animal species and 24 different plant species (total of 40 different species). Of the 24 different plant species, most require early successional habitat or disturbance regimes and conditions typical of transmission line ROWs. Specifically, two species, Muehlenberg’s Sedge (*Carex muehlenbergii* var. *muehlenbergii*) and Plains Frostweed (*Crocotanthemum bicknellii*) are considered “disturbance specialists” and readily exploit and thrive in new areas of disturbance, and three additional species can flourish with light to moderate disturbance, including Lance-leaved Violet (*Viola lanceolata*), Greene’s Rush (*Juncus greenei*), and Tubercled Orchid (*Platanthera flava*). Only a single plant species, Scrub Oak (*Quercus ilicifolia*), is potentially incompatible with the transmission line clearance requirements (see discussion in next section).

2.1.2.1 Summary of Woody Plant Species Occurrences

One threatened and endangered woody plant species, Scrub Oak, occurs within the CVPS transmission system area. This is a low-growing species with a maximum height of 15 feet, which makes it mostly compatible with the transmission line clearance requirements depending on its location relative to the transmission lines. However, depending on the age and location of this species and its growth patterns, some individuals may require periodic management (e.g., crown reduction) to ensure the standard, required transmission line clearances are met (see Section 2.2 for a discussion of compatible versus incompatible vegetation and Section 4.4.4 for a discussion of the BMPs and associated regulatory requirements).

2.2 Vegetation Management Plans and Permits

Upon reviewing the documented occurrences of T&E species, the next step in the development of the Best Management Practices was to review existing Vegetation Management Plans and permits. The following sections summarize our findings.

2.2.1 VELCO Vegetation Management Plan

TRC reviewed VELCO’s current Transmission Vegetation Management Plan (TVMP) (dated December 2011). The TVMP is principal to the safe operation and maintenance of the transmission system. As a bulk transmission system operator, VELCO follows vegetation management practices designed to conform to the Transmission Vegetation Management Program reliability standards adopted by the North American Electric Reliability Corporation (“NERC”) as Standard FAC-003-1 and to the American National Standards Institute (“ANSI”) Standard A300 – Standard Practices for

Tree Shrub and Other Woody Plant Maintenance (Integrated Vegetation Management - Electric Utility Rights-of-Way). The current NERC Vegetation Management reliability standard was revised after the blackout of August 14, 2003, including a specification that organizations in the US found in violation of the NERC standard can be subject to fines up to \$1 million per day, per occurrence. The ANSI standard is considered a utility best management practice.

VELCO recognizes its responsibility to maintain its ROWs in the manner that most appropriately balances avoiding unreasonable risk of harm to the environment, neighbors, occupants, workers, and users of the land on which or adjacent to which its ROWs lie, while fulfilling its obligations as a utility by operating the most reliable transmission system possible, and minimizing the expense of vegetation management over the long term. It is the policy of VELCO to manage the vegetation growing on its transmission line ROWs in accordance with its TVMP and all other applicable rules and regulations.

The TVMP incorporates VELCO's Integrated Vegetation Management (IVM) program that promotes sustainable plant communities that are compatible with operating its transmission system ROWs, and discourages the growth of incompatible plants that may pose concerns, including safety, security, access, fire hazard, electric service reliability, emergency restoration, visibility, line-of-sight requirements, regulatory compliance, environmental, or other specific concerns (TVMP, p. 4).

VELCO's IVM Program also encourages the protection and enhancement of wildlife and sensitive species habitat in its ROWs. The TVMP states:

VELCO understands that properly maintained right-of-way result in improved wildlife habitat for numerous plant and animal species, including songbirds and rare plants. General observations on VELCO rights of way indicate a noticeable bio-diversity that provides very favorable habitat for many wildlife species. Right-of-way corridors that promote low growing desirable vegetation that is maintained in a stable early successional habitat have proven to be beneficial to many species of wildlife. VELCO's role in managing early successional habitat is becoming more important as this habitat type is disappearing throughout Vermont as farms are abandoned and developed. By managing for early successional habitat, the right of way develops into a stable habitat type that promotes wildlife habitat improvement (TVMP, p. 6).

Wildlife habitat enhancement in transmission ROWs has been investigated by studies conducted by Dr. W.R. Byrnes and Dr. W.C. Bramble over a period of 59 years at the State Game Lands 33 Research and Demonstration Area in Pennsylvania, which have demonstrated the early successional habitats created and maintained by IVM has increased use of ROWs by a wide variety of species and has improved food and cover for wildlife. In addition, TRC has been involved in numerous habitat assessments of VELCO's transmission ROWs and has observed and recorded many threatened and endangered species within these transmission corridors characteristic of such early successional habitats. Our observations document that the IVM practices sustain suitable early successional habitat for these species and others.

VELCO's IVM program includes the identification of compatible and incompatible vegetation, the development of action thresholds, the continued evaluation of the effectiveness of control methods, and the optimization of selected control methods to meet the TVMP objectives.

VELCO has adopted a four-year vegetation management cycle that integrates the control of the growth of incompatible species, especially deciduous tree species, while providing conditions that encourage the growth of compatible early succession shrub and herbaceous species. Vegetation control options are outlined in Section 2.2.3. During each year of four years, a portion of the VELCO transmission infrastructure is subject to vegetation management. After four years, this cycle is repeated. Each year, approximately 2,100 to 4,000 acres of transmission line corridors are managed. Attachment A depicts the general VELCO vegetation control program cycle, although management locations vary depending on the needs identified during transmission line review and inventory; there is the possibility that large areas (or even the entire system) will need to be assessed and managed. In any given year, vegetation management crews plan and inventory the following year's work and review the previous year's work in addition to conducting vegetation management, and thus VELCO has individuals mobilized over approximately three-quarters of the entire system each year.

2.2.1.1 Compatible and Incompatible Vegetation and Danger Trees

Primary factors used to determine compatible and incompatible vegetation in transmission ROWs include structure design and heights, voltage and the associated conductor or wire clearances, the growth rate and patterns of woody vegetation, and required minimum vegetation-to-conductor clearances. VELCO's transmission corridors are maintained with compatible vegetation that does not mature at heights greater than 12 feet, or grows very slowly. All incompatible species are removed because they have the potential to exceed the safe tree height in the four-year cycle interval. Thus, "compatible" species are those species that mature at short enough heights that they can grow indefinitely within the ROW without management, and "incompatible" species are those species that can grow to heights that pose risk to transmission line safety and reliability and require periodic management to ensure transmission clearances are maintained.

In an electric ROW, the Wire Zone is described as the area directly under the conductors and 15 feet outside of the conductors on each side of and directly underneath the conductors. This area varies due to different construction types and structure cross-arm lengths. The Border Zone is described as the area outside of the Wire Zone on both sides of the Wire Zone that extend out to the edge or cleared width of the ROW.

The main concern in maintaining vegetation in the Wire Zone is to ensure vegetation does not grow tall enough to grow into the wires, wires do not sag into the vegetation during heavy load conditions, or that a combination of both does not occur. This area is managed for vegetation that *does not* mature at heights greater than 12-feet, otherwise known as "compatible species." If vegetation exceeds the 12-foot height restriction, it is removed.

The main concern for maintaining the vegetation in the Border Zone is to ensure that vegetation does not grow tall enough to fall into the conductors, grow into the conductors or blow into the conductors during wind events. This area is managed for vegetation that *does not normally* mature at heights greater than 12 feet. The main factors in allowing the taller species in the Buffer Zone are

aesthetics and wildlife habitat concerns; however, this area still requires that minimum clearances as described above be met. The taller species may be allowed, where engineering and clearance requirements allow, in areas of aesthetic concerns, wildlife crossings, stream crossings, and other environmentally sensitive areas.

This is consistent with NERC Transmission Vegetation Management Standard FAC-003-1, which became effective April 7, 2006. The NERC FAC-003-1 (2006) standard requires that the Transmission Owner, in its TVMP, identify and document clearances of vegetation to conductors at the time of vegetation management and to prevent flashover between vegetation and conductors.

In addition to incompatible species, VELCO needs to periodically identify and remove mature danger trees, or trees immediately adjacent to the cleared transmission corridor that are tall enough, or are capable of growing tall enough over the next four year cycle, to fall onto the transmission conductors. Danger trees are evaluated and removed based on the following criteria:

- Species: including failure rate of tree species, tensile strength of wood, longevity and rooting characteristic.
- Growth Patterns: including phototropism and lean of the tree.
- Location: including slope, shallow soils, wet soils, stream banks, or eroded area.
- Structural Defects: including poorly attached leaders/crotches with included bark, co-dominant leaders, or leaders rubbing on other trees.
- Disease/Insect Damage: including any defects caused by disease or insects.
- Decay: including decay caused from storm damage, mechanical damage, disease, frost cracks, and sun scald.

If a danger tree is determined to be an imminent threat, it is designated as a *threat tree*, and necessary actions are taken to have it removed immediately.

Finally, VELCO periodically needs to reclaim the edges of the corridor where vegetation has encroached by removing woody species.

Prior to vegetation management activities, an inventory is conducted to record information regarding incompatible species heights and densities, to prescribe the method of control (if control is required), to identify danger and threat trees for removal, and to assess whether the corridor has been encroached upon and needs to be reclaimed. Restrictions that may affect the vegetation management activities and treatment options are also identified, such as landowner requests and requirements, water quality standards, wetland regulations, and herbicide use permit conditions.

Inventories are conducted by aerial patrol, foot patrol (patrols conducted prior to cyclical, scheduled management activities), and imminent threat patrols (patrols conducted following receipt of information that danger trees or some other imminent threat requires attention). Inventoried

information is compiled into an Annual Work Plan for use during the subsequent cyclical vegetation management activities, which will be discussed in a latter section. As previously stated, identified threat trees are removed as soon as possible.

In keeping with an integrated vegetation management approach to vegetation management prior to each management cycle, an inventory of vegetation conditions shall be completed. The inventory will record information regarding incompatible species heights and densities and whether control methodologies need to be employed. If controls are required, the method of control is prescribed, danger trees are identified and listed, and restrictions that may affect the vegetation management are identified and prescribed.

The inventory is developed into the Annual Work Plan. The Annual Work Plans are developed into a request for proposal for vegetation management services from qualified vegetation management contractors. Contracts are developed for each line or line segment that includes a work scope, pricing, schedule of performance, general conditions, key personnel, and special conditions.

Following the award of the work to a specific contractor, and the approval of an herbicide use permit, a meeting is held with the contractor. The purpose of this meeting is to review the Work Plan and to discuss the details of the permit application and the approved permit issued by the Department of Agriculture.

In the meeting, requirements of the following documents are discussed:

1. Agreement for Vegetation Management Services
2. Permit Application
3. Herbicide Use Permit Issued

Additionally, the following resources are reviewed in detail:

4. Community Water Supplies-Locations/Water Supply Division
5. Vermont Significant Wetlands/National Wetlands Inventory Maps
6. Significant Habitat Maps/VT Fish & Wildlife Department
7. Known Threatened and Endangered Species/NHIP or recent inventories
8. Selective Areas (buffers & wildlife crossings)
9. VELCO's line maps/Reviewed with Field Foreman of crew.

The VELCO transmission system comprises approximately 13,000 acres and extends over 732 linear miles. In general, the prevailing management approach is through the use of herbicides, with greater than 40% of the transmission system managed in this manner. Herbicide use is a critical component of integrated vegetation management for VELCO and other utilities, as its targeted use allows for the creation of stable, sustainable low-growing vegetative communities that are compatible with the transmission line clearance requirements and require less and less management over time. As described in more detail in section 2.2.3 and 2.2.4, the quantity and extent of herbicide use decreases over time as sustainable, compatible, and low-growing vegetative communities are formed. The other management areas are either cut by hand, mowed, or they do not require management, such as in open or scrub-shrub areas, or areas in higher use.

2.2.2 CVPS Vegetation Management Plan

Like VELCO, GMP has implemented a TVMP for its CVPS transmission system with similar goals and strategies for IVM (“CVPS TVMP”). To ensure safety and reliability of its transmission system, the TVMP seeks to encourage the establishment of a semi-stable native plant and shrub community that will not interfere with work operations, is not a danger to lines and poles in the ROW, and keeps vegetation maintenance to a minimum.

The CVPS TVMP identifies the following standards for control:

- provide adequate clearance for maintenance of vegetation;
- establish suitable native low-growing vegetation;
- maintain shallow depth of vegetation for ease of line maintenance;
- ensure vegetation does not act as a major barrier to corridor access for line maintenance;
- do not allow vegetation to grow any closer than 15 feet from the transmission wires.

As with VELCO, the CVPS vegetation management procedures target incompatible species that mature at heights that pose risk to the transmission infrastructure. Specific incompatible and compatible species lists are included in the Vegetation Management Plan.

GMP conducts vegetation management on its CVPS transmission system on a 5-year cycle. During each year of five years, a new portion of the transmission infrastructure is subject to vegetation management. After five years, this cycle is repeated. Attachment B depicts the general CVPS vegetation control program cycle.

As with VELCO, more frequent vegetation management is sometimes required based on the results of line patrols and inventory, such as the removal of danger trees that pose an imminent threat to safety and reliability.⁴

The CVPS transmission system is approximately 7,565 acres, and the average CVPS ROW width is 100 feet (50 feet from each side of the centerline). Approximately 55% of areas are treated with herbicide, and the remaining areas are hand cut, mowed, or do not require management, such as in open areas or areas in higher use. These vegetation management control practices and selection factors are discussed in the following section.

⁴ CVPS terminology differs from VELCO as follows:

- CVPS “danger tree”: emergency actions required
- CVPS “hazard tree”: equivalent to VELCO “danger tree”, immediate removal is not necessary
- VELCO “threat tree”: emergency actions required
- VELCO “danger tree”: equivalent to CVPS “hazard tree”, immediate removal is not necessary

For clarity throughout this document, the BMPs will refer to the respective VELCO terminology.

2.2.3 VELCO and CVPS Vegetation Management Control Practices

A qualified contractor is retained to execute the Annual Work Plans for vegetation management of the VELCO and CVPS systems. Prior to the commencement of work, available environmental resource conditions in the subject ROW are reviewed on mapping and/or field laptop GIS systems, including water supplies, wetlands and streams, significant habitat and T&E polygons, and selective areas (e.g., wildlife crossings and buffers). Then the extent of vegetation control is established, constraints and restrictions are reviewed with the team, and the methods of control prescribed for each area described in the Annual Work Plan are confirmed. Methods of control include the following options:

2.2.3.1 Manual Control – Chainsaws and Brush Saws

Manual vegetation management methods are used frequently where chemical methods are restricted by regulation or landowners, or where non-chemical alternatives are favored. Advantages include the ability to employ these methods year round, the ability to selectively target incompatible species, and the fact that they are generally understood and accepted by the public.

The principal disadvantage to manual vegetation cutting methods is that they generally promote dense monocultures of incompatible plant species, thus reducing plant biodiversity and community structure, especially in terms of creating stable and sustainable threatened and endangered species habitat. Specifically, incompatible species stump sprout, which increases stem densities and provides only short-term control. This creates a cyclical, unstable community where stresses from unpredictable and changing competition for sunlight and water availability lead to dense monocultures of incompatible plant species, reducing the opportunity to create stable and sustainable threatened and endangered species habitat.

Manual control methods are also labor intensive, and they are the most unsafe for work crews, as personal injuries from chainsaw use can occur.

2.2.3.2 Mechanical Control – Mowing and Grinding Brush with Specialized Equipment

Mechanical methods are used where vegetation species, growth patterns, and non-chemical alternative are more suitable, or where chemical treatment methods are restricted by regulation or landowners. Advantages include the ability to employ these methods year round and the fact that they are generally understood and accepted by the public.

Disadvantages of mechanical methods include the indiscriminant removal of compatible and incompatible species, creating the opportunity through a clear-cut for extensive pioneer sprouting of incompatible species, thus increasing the need for more frequent and larger plant community control. Mechanical clearing is counter-productive to establishing stable and sustainable vegetation communities.

2.2.3.3 Biological Control

Biological control is rarely employed and generally chosen for field conditions in the subject ROW. This method is employed where use of the ROW is more suitable to encourage areas to convert to monotypic vegetation communities such as lawns, agricultural fields or pastures. Monotypic communities are achieved by planting low-growing brush and/or allelopathic plants; grubbing,

seeding and mulching certain areas of the corridor; introducing vegetation-eating insects; introducing wood-decaying fungus; or burning the ROW. The principal advantage to this control method is that it provides a longer-term control than manual and mechanical methods. The principal disadvantage is that these methods do not create an opportunity to encourage compatible and sustainable habitat for threatened and endangered species.

2.2.3.4 Chemical Control

VELCO and GMP, as with other utilities in New England, have found numerous advantages to integrating chemical control into their vegetation management programs as described as follows.

VELCO and GMP have conscientiously assessed all of the significant benefits and risks of the use of herbicides and their alternatives in the maintenance of their ROWs. Consequently, both companies have concluded that it will best fulfill their responsibilities to ensure a reliable transmission system by utilizing the limited, selective and regulated use of herbicides as described in their TVMPs.

As stated in the subject TVMPs, VELCO and GMP do not use herbicides for ROW vegetation management unless it is:

- (1) registered for general use by the U.S. Environmental Protection Agency (under authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) including that the EPA must classify all pesticide products for either “general” or “restricted” use) by evaluating the environment and human health;
- (2) approved for use by the Vermont Agency of Agriculture, Plant Industry Division; and,
- (3) determined by the Company’s experience, or the experience of others, to be effective for purposes for which it is used, and will not cause adverse effects to the environment.

TVMP Prohibition on Use of Herbicides

- Herbicides shall not be used in violation of any applicable law or regulation.
- Herbicides shall not be used at locations where, or during times when, they may pose a greater-than-normal risk of off-target dispersion (e.g. rain, snow, frozen ground, adjacent to streams or gardens, or in more than moderate wind).
- Herbicides shall not be used in easements within the property of any landowner who has, pursuant to the procedures of Vermont Public Service Board Rule No. 3.640, requested that they not be used.
- Herbicides shall not be used at any location where the Supervisor of ROW Management or his or her designee has determined that non-chemical measures would be substantially as effective, substantially as safe to applicators, and not substantially more costly than chemical means of vegetation management.

Applicable BMPs specific to Threatened & Endangered Species are listed in section 4.1.

VELCO and GMP employ similar herbicide application methods for their transmission systems. These methods include the following:

- Low Volume Foliar Application
- Low Volume Basal Application
- Cut Stump Treatment

Neither VELCO nor GMP employs high-volume foliar or aerial applications of herbicide.

Through many years of experience, several advantages have been observed by the use of herbicide treatment to control incompatible plant species in ROWs. Herbicides are regulated products that biodegrade relatively rapidly, they are relatively stable in the environment and they are not prone to leaching. This control method is integral to the IVM program. In herbicide controlled areas of the ROW, tree growth and populations are individually controlled and generally result in an increase of sustainable shrub and herbaceous populations. The net result is a gradual and sustained decrease in the amount of herbicide needed to control undesirable, incompatible species. Hand-held applicators allow for a more precise application of targeted incompatible species. The advantages of herbicide control methods include the following:

- they provide the only effective long-term vegetation management control method, as stem densities of undesirable or incompatible plant species are reduced and future management costs are reduced through a targeted and efficient application process,
- they foster the creation of stable plant communities that improve the potential for general wildlife habitat and plant biodiversity, and promote conditions for threatened and endangered species to develop pioneer populations, and
- they are the only feasible control method for invasive species, whose growth discourages biodiversity, becomes difficult to control once established, and reduces the potential for pioneer threatened and endangered populations.
- they require substantial training of workers and annual regulatory review and permitting that ensures safe, efficient, and effective use of regulated herbicide products.

Disadvantages include: there is a limited window of opportunity for herbicide application (e.g., foliar treatment is only effective when leaves are fully out, basal and cut stump treatment cannot occur in snow); and they can create short-term aesthetic concerns (e.g., upright dead saplings).

The following section describes various herbicide application methods available for different ROW conditions.

Low Volume Foliar: Low Volume Foliar is an herbicide application method where the herbicide application is made directly to the foliage of the incompatible species of vegetation. This application is very selective, and is applied as spot-type treatments in low densities of incompatible species (i.e., selective stem foliar treatment). This application is typically made from a backpack sprayer with a

THINVERT nozzle following full leaf out which is typically the middle to the end of June until leaf coloration which is usually the first of October. Low-volume foliar treatment is avoided during rain and wind, or if precipitation is in the near-term forecast. This application is 85-95% effective of controlling the targeted incompatible species in one application.

Low Volume Basal: Low Volume Basal applications are made to the cut stems of individual trees. The application is made to the complete circumference of lower 6-18 inches of the tree depending on the diameter. This application can be made during the growing or dormant season, with the exception of frozen ground or snow cover, using a back pack sprayer and low volume wand or hand spray bottle. The application is very selective as only stems of undesirable vegetation are treated. Low volume basal treatment is avoided during rain, or if precipitation is in the near-term forecast. This application is 85-90% effective of controlling the incompatible species in one application.

Cut Stump Treatment: Cut Stump Treatments are made directly to stumps of undesirable trees following manual treatments, and sometimes following mechanical treatments. This application can also be made during the growing or dormant season, with the exception of frozen ground or snow cover, using a back pack sprayer and low-volume wand. The application is very selective as only stumps of undesirable vegetation are treated. Cut stump treatment is avoided during rain, or if precipitation is in the near-term forecast. This application is 85-90% effective of controlling the incompatible species in one application.

2.2.4 VELCO and CVPS Permits and Authorizations to Conduct Right-of-Way Herbicide Treatment

Each year, VELCO and GMP apply for permits to use herbicide during vegetation management activities on VELCO and CVPS infrastructure. The use of herbicides is a specifically regulated activity under federal and state laws, requiring substantial compliance oversight and expertise, and all herbicide management activities are approved by the Vermont Agency of Agriculture.

Regulatory Herbicide Use Instructions

A request for a permit to apply herbicides on ROWs must be submitted to the Agency of Agriculture annually. Specific instructions for the use of herbicides in Vermont are listed in the revised regulation for control of pesticides in accordance with 6 V.S.A. Chapter 87. These regulations are administered through the Vermont Agency of Agriculture, Plant Industry Division.

The application is reviewed by the Vermont Pesticide Advisory Council (“VPAC”), comprised of representatives from the Vermont Departments of Environmental Conservation; Fish and Wildlife; Agriculture, Food & Markets; and Health; as well as from the Agency of Transportation, the University of Vermont, and the Governor’s office. VPAC makes recommendations to the Secretary of Agriculture regarding the approval of the permit. The Agency of Agriculture conducts field inspections on programs having approved permits to ensure compliance with regulations, according to labeling instructions and permit conditions.

The following is required to be on site and available to the herbicide application crews prior to and during herbicide application operations:

1. Vermont Agency of Agriculture-issued permit and permit application (including all herbicide labels and MSDS sheets).
2. At least one crew member that is a Vermont Agency of Agriculture Certified Pesticide Applicator.
3. A VELCO line map showing details such as: county lines, town boundaries, property ownership, water supplies, wetlands, access routes, environmental concerns and any special data available or gathered over the years (property owner requests, etc.).
4. Required personal protective equipment in accordance with herbicide labels.
5. Drinking water and wash water.
6. VELCO Vegetation Management Standards Manual.
7. VELCO Environmental Guidance Manual
8. Spill Kit (including spill response instructions), shovel, absorbent material and container.
9. Herbicide Spill Response Instructions.

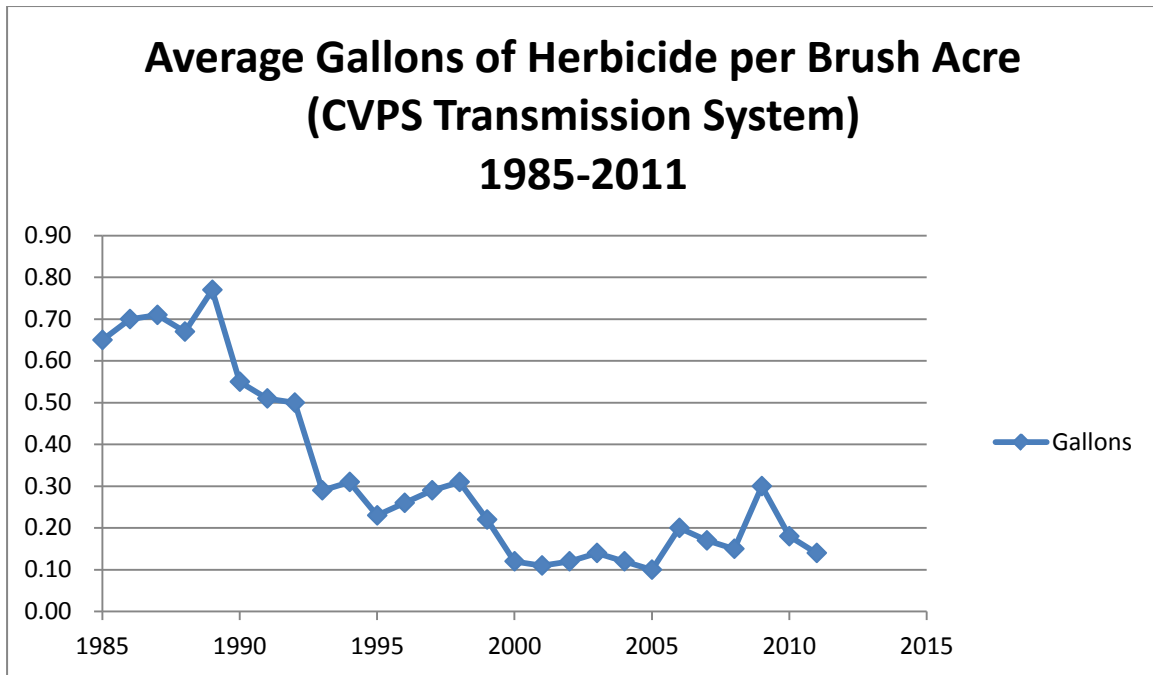
TRC reviewed the current VELCO and CVPS (now GMP) Permits to Conduct Right-of-way Herbicide Treatment (No. ROW 2012-1 and ROW 2012-3, respectively), issued by the Vermont Agency of Agriculture on May 11 and May 4, 2012 respectively, to evaluate current herbicide conditions of use. Herbicide use is highly regulated and requires compliance with many protection guidelines.

The following summarizes 2012 herbicide restrictions (which are typically included in all annual permits) that were considered during the development of this BMP document:

- Permit authorizations are generally effective from May 1 and valid through December 31.
- A certified applicator must be present with each application crew.
- Authorized herbicides acceptable for use near aquatic areas (surface water) may be made up to 10 feet from surface water.
- Cut stump herbicide application of Garlon 4 may be made up to 15 feet from surface water.
- All other herbicides have restrictions for application within 30 feet of surface waters
- Herbicides shall not be applied within 200 feet of public water supplies or within 100 feet of private water supplies. This applies to shorelines of lakes and ponds that provide drinking water.
- A map noting both public and private water supplies shall be provided to the herbicide applicator.
- No foliar application of herbicide shall take place within 100 feet of homes.
- Cut stump treatment is prohibited on Sugar Maple (*Acer saccharum*) and Red Maple (*Acer rubrum*) until May 1.

- All-terrain vehicles (ATVs) may be used to apply the herbicides within the ROW and ATVs shall be equipped with a spill kit capable of containing 125% of the combined storage total of the herbicides stored on the ATV.

The approved types of herbicide and maximum rates of applications are specifically included in the Permits to Conduct Right-of-Way Herbicide Treatment. In practice, herbicides are often applied at rates substantially lower than the permit approved rates. This is due to the VELCO and CVPS’s integrated vegetation management approach, as previously discussed in Section 2.2.3.4. VELCO and CVPS’s annual inventories and TRC’s observations have revealed that as the herbicides are used with limited and controlled procedures to manage woody vegetation, stable and sustainable low-growing vegetative communities are created as a result of the herbicide treatment. Accordingly, less and less herbicide is used over time. To illustrate this point, the following chart shows the significant decrease in average gallons of herbicide used per brush acre as documented by GMP over the period of 1985 to 2011 on the CVPS transmission system.



2.3 Operations and Maintenance Activities

Operations and maintenance (O&M) activities include the routine repair and maintenance of utility poles, lines and corridors in a manner which minimizes adverse impacts in accordance with BMPs included herein and elsewhere (e.g., Best Management Practices for Repair and Maintenance of Overhead Utilities under Section 6.08 of the Vermont Wetland Rules). O&M activities may include, but are not limited to, structure or anchor replacement, pole refurbishment, replacement of insulators, access route resurfacing and regarding and replacement of conductors.

2.4 Observation of Vegetation Management and O&M Activities

TRC observed vegetation management work and O&M activities on several VELCO and CVPS corridors in 2012, to support the evaluation of vegetation management programs, O&M activities, and the development of Best Management Practices. A summary of these observations and photographs are included in Attachment C.

Additionally, TRC has extensive experience working with utility companies throughout New England and the United States on vegetation management and O&M activities. We are accustomed to the requirements, constraints and challenges of all types of utility line management and construction activities, and we have drawn on this expertise during the development of BMPs included herein.

3.0 GENERAL BEST MANAGEMENT PRACTICES

This section describes Best Management Practices (BMPs) for implementation during vegetation management and O&M planning and activities to proactively reduce the risk of takings of state and federally listed threatened and endangered species (as defined in 10 V.S.A. § 4001 and 5401 – 10 and Section 3 of the Federal Endangered Species Act) and to promote the development and sustainability of suitable habitat for the encountered threatened and endangered species, while maintaining VELCO and GMP’s capability to meet established electric reliability standards.

3.1 Data Management BMPs

As part of this effort, VELCO and GMP have been provided with the NHIP Element Occurrences shapefiles within potential vegetation management areas, dated June 6, 2012. Additionally, all recently acquired GPS data from VELCO T&E surveys are incorporated into the master dataset. These data files have been developed to depict threatened and endangered species “population polygons” on field mapping and laptop GIS software for use by vegetation management crews.

- VELCO and GMP will request updates to the NHIP dataset on an annual basis and if additional infrastructure management areas are identified, and will update respective field mapping and GIS systems, as needed.
- If transmission line surveys are conducted and new species populations are identified, VELCO and GMP will incorporate new survey data onto field mapping and GIS systems as soon as possible and will provide such data to the NHIP.
- Documented T&E plant species populations will be resurveyed every 8 years (see “Last Observation” Element Occurrence column).
- Plant polygons will be removed from the dataset following two consecutive surveys that do not result in a T&E species observation (inclusive of any existing survey results documented in NHIP metadata). To qualify, the surveys shall be conducted in at least two separate growing seasons and removal will be completed following submittal of survey data and subject to evaluation by NHIP.
- VELCO and GMP shall incorporate, where available, photographs, keys, blooming periods and/or habitat requirements into the field laptop GIS systems or as standalone documents for use by crews in the field during activities if Plant Protection BMP Option 2c is selected (see Section 4.1.2 and 5.1.2).

Additionally, VELCO and GMP will be evaluating the integration of BMP descriptions into the Element Occurrence shapefile metadata for quick and easy reference on field laptop GIS systems.

3.2 Training, Tailboards and Flagging BMPs

- Annual Training for Vegetation Management and O&M Crews: On an annual basis, we recommend that each vegetation management and O&M crew be trained regarding the intent and scope of this BMP document and the specific BMPs that have been selected for implementation in the field during vegetation management or O&M activities.

- Daily Tailboard Meetings for Active Crews: Additionally, we recommend that planned activities, including designated access and work area limits, any identified T&E species population polygons, and BMPs to be implemented that day should be reviewed during daily safety and environmental “tailboard” meetings.
- Flagging, or some other suitable form of field identification (e.g., signage on nearby poles), should be installed near each T&E polygon prior to work activities. Depending on the site-specific factors (e.g., shape and extent of species polygon, ROW conditions), the planned activities, and the selected BMP, a single flag can be placed at the beginning and end of the polygon or known population as it is intersected by the easement (or a marker on the nearest structure). The intent of this BMP is to ensure crews are aware of the presence of T&E species in the vicinity and are prompted to consult literature or mapping, and to support the implementation of the selected BMP.

4.0 VEGETATION MANAGEMENT BEST MANAGEMENT PRACTICES

4.1 *Vegetation Management BMPs for T&E Plant Species*

VELCO and GMP shall implement an appropriate BMP from the following options, and as described in the following sections, for protection of T&E plant species occurrences during vegetation management activities within VELCO and CVPS management areas.

Through the coordination of the Vegetation Management Lead, vegetation inventories and planning process, BMP selection shall be based on the feasibility and site-specific requirements for vegetation management to ensure safe and reliable operation of the transmission infrastructure as well as landowner requests and concerns.

Vegetation Management staff should determine an appropriate BMP to implement from the following list based on the result of vegetation inventories that occur one year prior to vegetation management activities, specific safety and clearance requirements, and the site-specific Annual Work Plan:

- **Option 1: Avoidance of T&E population polygon, or**
- **Option 2: Targeted vegetation management within T&E population polygon during the growing season (3 options below)**
 - *2a: Flagging for avoidance with treatment, or*
 - *2b: Biological monitor during activities, or*
 - *2c: Crew surveys concurrent to activities, or*
- **Option 3: Targeted vegetation management within T&E population polygon during plant dormancy period, or**
- **Option 4: Submit notification to ANR for alternative practices (e.g., management of incompatible T&E species)**
- **Emergency Activities: Threat Tree Removal BMPs**

The following sections describe these BMP options in more detail.

4.1.1 **Option 1: Avoidance of Polygon**

- Avoidance of population polygons by vegetation management crews will occur.
- During field inventories by the Vegetation Management Team for the following year of vegetation management activities, the team will identify which, if any, population polygons

can be entirely avoided by vegetation management by indicating this on field mapping and/or field laptop GIS systems for inclusion into the Annual Work Plan.

- Prior to vegetation management, population polygons will be flagged or marked (as described in Section 3.2) and crews instructed to avoid the area.

4.1.2 Option 2: Targeted Vegetation Management within T&E Population Polygon during Growing Season

In many instances, it is feasible (and beneficial for the population) to conduct targeted vegetation management within a population polygon. The following options allow for targeted vegetation management within known T&E species polygons:

- Option 2a: If the subject species is difficult to identify (e.g., grass species) or is not in bloom, crews will be allowed to enter the population polygon area if it is determined that flagging and avoidance of individual species is feasible (i.e., through flagging of individual or clusters of species and utilizing a vegetation control method that avoids a takings of the T&E species, such as conducting targeted hand clearing, cut stump treatment, basal treatment, or low volume hand-application of foliar treatment), based on review of previous botanical survey results and associated GPS data and the vegetation management inventory.
- Option 2b: If it is determined that species density is such that individual flagging of species is infeasible, a biological monitor capable of identifying the species in question can be present onsite during the vegetation management activities to identify species with the crews and ensure protection of the species by overseeing a vegetation control method that avoids the takings of the T&E species (e.g., through targeted hand clearing, cut stump treatment, basal treatment, or low volume hand-application of foliar treatment). Crews should exercise extreme care during herbicide application in proximity to T&E species, including considering wind speed, to ensure a suitable distance between the area of application and the T&E species is maintained so as to avoid a taking.
- Option 2c: Alternatively, if the species is readily identifiable, such as a conspicuous flowering species during its blooming period, crews shall be trained on the identifying characteristics of the species and the importance of avoiding individual plants, and they will be allowed to enter the polygon area to manage vegetation while concurrently surveying and avoiding the T&E species (e.g., through targeted hand clearing, cut stump treatment, basal treatment, or low-volume hand-application of foliar treatment). Crews should exercise extreme care during herbicide application in proximity to T&E species, including considering wind speed, to ensure a suitable distance between the area of application and the T&E species is maintained so as to avoid a taking. At a minimum, photographs and general species identifying characteristics shall be reviewed. See the Element Occurrence dataset for conspicuous species that can be subject to this option (i.e., applies to species with “Y” in “Option 2C Suitability”).
 - If this option is selected, crews must take a precautionary approach. For instance, if considering this option for a Harsh Sunflower (*Helianthus strumosus*) population, crews must avoid all similar yellow-flowered species which may result in

protection of unlisted species, such as thinleaf sunflower (*Helianthus decapetalus*). This approach may also result in the infeasibility of completing work if too many individuals are identified to be safely avoided by work crews.

- All Options 2a-c: Targeted herbicide application practices are preferable, as these practices carefully target individual incompatible species and will support over time the creation of a sustaining, low-growing native herbaceous and shrub population that will require less frequent and less intensive management in subsequent vegetation management cycles.
- All Options 2a-c: Targeted manual clearing with hand-tools and chainsaws should be employed when herbicide applications are restricted from use. Cut brush should be removed from the polygon area to the extent practicable.
- All Options 2a-c: No heavy equipment or machinery will be allowed within the population polygon unless it is determined that T&E species can be avoided. If an existing ATV trail or access road is present, crews may utilize trails and access routes to travel through the polygon.

4.1.3 Option 3: Targeted Vegetation Management during Dormancy Period

As with the previous BMP option, in most instances we believe it is beneficial for the plant population to conduct targeted vegetation management within or surrounding the population polygon. This BMP option may be employed as an alternative to Options 1 or 2.

- Vegetation management shall occur in the population polygon during the dormancy period of October 1 through April 15, or as specified in the Element Occurrence dataset. See “Dormancy Period” column in the Element Occurrence dataset for the species-specific dormancy periods when management can occur.
- Management within the population polygon will be conducted through targeted hand clearing, cut stump treatment, or basal treatment. Crews should exercise extreme care during herbicide application in proximity to T&E species, including considering wind speed, to ensure a suitable distance between the area of application and the T&E species is maintained so as to avoid a taking.
- Targeted herbicide application practices are preferable, as these practices carefully target individual incompatible species and will support over time the creation of a sustainable, low-growing native herbaceous and shrub population that will require less frequent and less intensive management in subsequent vegetation management cycles.
- Cut brush should be removed from the polygon area to the extent practicable.
- Crews shall utilize existing ATV trails or access routes to the extent feasible. No grading or other significant soil disturbing activities shall occur within the population polygon.

4.1.4 Option 4: Notification to ANR for Alternative Practices

In some instances it may become necessary to devise alternatives to what has been outlined above. For example, crews may be required to manage threatened and endangered woody species in certain site-specific instances to maintain line clearances to ensure the safe and reliable operation of transmission line infrastructure, which may require obtaining a takings permit.

If alternative work practices are required, VELCO or GMP shall develop a tailored vegetation management plan or site-specific BMP for the specific species and/or polygon(s), and will submit to the ANR for its concurrence prior to conducting the activities.

4.1.5 Emergency Activities: Threat Tree Removal BMPs

VELCO and GMP occasionally identify “threat trees” that pose an imminent threat to transmission reliability and safety and require an immediate response. The following BMPs are applicable to emergency vegetation management activities:

- If emergency work is required in a population polygon, Vegetation Management Program staff shall consult with the VELCO or GMP Environmental Teams and will review T&E polygon mapping.
- VELCO or GMP will provide an email notification to ANR of the intended activities and follow-up inspections and reporting will be performed.

4.2 Vegetation Management BMPs for Aquatic Animal Species

The majority of T&E animal species occurrences on VELCO and CVPS ROWs are aquatic in nature, including numerous mollusks and fish.

Although existing herbicide use restrictions and Vegetation Management Plan guidelines shall ensure no impacts to these species occur, additional BMP have been developed and include:

- Favoring the continued growth and reproduction of compatible vegetation with canopies that provide shade to streams and rivers.
- If incompatible species dominate the species composition of a stream crossing removing all vegetation during one cycle will be avoided, if possible. If removing all vegetation cannot be avoided, appropriate erosion control methods would be used.
- Avoid use of mechanical methods that may cause soil compaction or rutting to the greatest extent possible.
- Leave all stumps in place so that the root mats maintain bank stability.
- Remove all slash and debris from the stream.
- Implement erosion prevention and sediment control measures as needed to prevent sediment-laden discharge to surface waters.

In addition, annual herbicide use permits issued by the Agency of Agriculture typically contain the following restrictions that will limit disturbance to aquatic habitats:

- Herbicides with aquatic labels may be made up to 10 feet from surface water.
- Cut stump herbicide application of Garlon 4 may be made up to 15 feet from surface water.
- All other herbicides shall not be applied within 30 feet of surface waters

4.3 Vegetation Management BMPs for Terrestrial Reptiles

The following threatened and endangered reptiles are documented in VELCO and CVPS corridors: Eastern Ratsnake (*Pantherophis alleghaniensis*) and Timber Rattlesnake (*Crotalus horridus*). The following BMPs shall be implemented in polygons for T&E terrestrial reptiles:

- Limit travel to existing ATV trails or access routes to the extent feasible.
- Avoid use of mechanical methods that may cause soil compaction, disturbance and rutting to the greatest extent possible. During the period of April 1 through November 1, where necessary to prevent excessive compaction or soil disturbance, use low-ground pressure equipment or construction matting.
- During the period of April 1 through November 1, avoid mowing within polygons.
- Avoid disturbing rock piles and bedrock formations.
- Implement erosion prevention and sediment control measures. Remove silt fencing and other barriers as soon as possible following activities. All erosion control matting shall be free of plastic mesh backing or similar which possess hazards to snakes and shall instead be constructed of loosely-woven, natural fibers, or a bonded fiber matrix product.
- Avoid any observed snakes. If observed, report sightings to the VELCO or GMP Environmental Team (and ANR). If possible, take a photograph but do not pursue species. Do not attempt to capture or relocate individuals.
- Remove cut material or cut up small enough so as not to create barriers or otherwise interfere with animal movement. Creating brush piles is acceptable and even encouraged. If woody material is being chipped, creating chip piles is also desirable.

4.4 Vegetation Management BMPs for Bird Species

The following threatened and endangered birds are documented in VELCO and CVPS corridors: Grasshopper Sparrow (*Ammodramus savannarum*), Upland Sandpiper (*Bartramia longicauda*) and Sedge Wren (*Cistothorus platensis*). The following BMPs shall be implemented in polygons of T&E bird species:

- Within species polygons, avoid work and especially work involving the prolonged use of loud equipment (such as ATVs, chainsaws, and other mechanized equipment) during the nesting period of April 15 to August 15 to the extent practicable.
- Absolutely no mowing or brush hogging shall occur in polygons during the April 15 to August 15 nesting period within polygon.
- If mowing or brush hogging is necessary in polygons during the nesting period, a pre-activity nesting bird survey will be conducted and the VT ANR will be consulted to discuss alternative work practices if nesting birds are identified.
- Targeted herbicide application practices are preferable, as these practices carefully target individual incompatible species and will support over time the creation of a sustainable, low-growing native herbaceous and shrub population that will require less frequent and less intensive management in subsequent vegetation management cycles.

In practice, VELCO generally avoids all mowing between April 1 and July 1 and GMP avoids all mowing of CVPS corridors between April 15 and August 15.

4.5 Vegetation Management BMPs for Bat Species

See Section 6.0 for applicable BMPs to protect T&E bat species during integrated vegetation management activities.

5.0 O&M BEST MANAGEMENT PRACTICES

In addition to the Vegetation Management BMPs provided in section 4.0, VELCO and GMP have developed the following Operation & Maintenance (O&M) BMPs. O&M activities include the routine repair and maintenance of utility poles, lines and corridors.

5.1 O&M BMPs for T&E Plant Species

VELCO and GMP shall implement an appropriate BMP from the following options, and as described in the following sections, for protection of T&E plant species during O&M activities.

Through the coordination of the Asset and Facilities Manager, and work planning process, BMP selection shall be based on the feasibility and site-specific requirements for O&M activities to ensure safe and reliable operation of the transmission infrastructure as well as landowner requests and concerns.

O&M staff, in consultation with VELCO and GMP Environmental Teams and GIS system maps previously described in this document, shall determine appropriate BMPs to implement from the following list of options, based on a review of the planned work activities:

- **Option 1: Avoidance of T&E population polygon, or**
- **Option 2: Avoidance of plants within T&E population polygon during the growing season (3 options below)**
 - *2a: Flagging for avoidance, or*
 - *2b: Biological monitor during activities, or*
 - *2c: Crew surveys concurrent to activities, or*
- **Option 3: Conduct O&M activities (no grading) within T&E population polygon during dormancy period**
- **Option 4: Submit notification to ANR for alternative practices**
- **Emergency O&M Activity BMPs**

The following sections describe these BMP options in more detail.

5.1.1 Option 1: Avoidance of Polygon

- Avoidance of population polygons by O&M crews will occur.
- During the O&M planning process, the team will identify which, if any, polygons can be entirely avoided by O&M activities by indicating this on field mapping and/or field laptop GIS systems.

- Prior to activities, polygons will be flagged or marked (as described in Section 3.2) and crews instructed to avoid the area.

5.1.2 Option 2: Avoidance of Plants within T&E Population Polygon during Growing Season

In many instances, it is feasible to conduct O&M activities while avoiding individual T&E species within a polygon. The following options allow for O&M activities within known T&E species polygons:

- Option 2a: If the subject species is difficult to identify (e.g., grass species) or is not in bloom, crews will be allowed to enter the population polygon area if it is determined that flagging and avoidance of individual or clusters of species is feasible based on review of the previous botanical survey results and associated GPS data and a construction look-ahead.
- Option 2b: If it is determined that species density is such that individual flagging of species is infeasible, a biological monitor trained on the identification of the species in question can be present onsite during the O&M activities to identify species with the crews and ensure protection of the species by overseeing activities.
- Option 2c: Alternatively, if the species is readily identifiable, such as a conspicuous flowering species during its blooming period, crews shall be trained on the identifying characteristics of the species and the importance of avoiding individual plants, and they will be allowed to enter the population polygon to conduct O&M activities while concurrently surveying and avoiding the T&E species. At a minimum, photographs and general species identifying characteristics shall be reviewed, and then crews will be allowed to enter the polygon area to plan the access and staging of work equipment, survey those areas for the species of concern, and conduct the required O&M activities while avoiding the T&E species. See the Element Occurrence dataset for conspicuous species that can be subject to this option (i.e., applies to species with “Y” in “Option 2C Suitability”).
 - If this option is selected, crews must take a precautionary approach. For instance, if considering this option for a Harsh Sunflower (*Helianthus strumosus*) population, crews must avoid all similar yellow-flowered species which may result in protection of unlisted species, such as thinleaf sunflower (*Helianthus decapetalus*). This approach may also result in the infeasibility of completing work if too many individuals are identified to safely avoid by crews.
- All Options 2a-c: Cut brush should be removed from the polygon area to the extent practicable.
- All Options 2a-c: No heavy equipment or machinery will be allowed within the population polygon unless it is determined that identified T&E species can be avoided. If an existing ATV trail or access road is present, crews may utilize trails and access routes to travel through the polygon.

- All Options 2a-c: Crews shall avoid identified T&E species during soil disturbing activities through the use of helical anchors, pole installation by auger, or other suitable work practices.

5.1.3 Option 3: Conduct O&M Activities (No Grading) during Dormancy Period

This BMP option may be employed as an alternative to Options 1 or 2.

- O&M activities shall occur in the population polygon during the dormancy period of October 1 through April 15, or as specified in the Element Occurrence dataset. See “Dormancy Period” column in the Element Occurrence dataset for the species-specific dormancy periods when management can occur.
- Crews shall utilize existing ATV trails or access roads to the extent feasible and will limit areas of new soil disturbance along access routes by accessing during dry or frozen conditions, through the use of low-ground-pressure equipment or construction matting, and/or limiting vehicle trips.
- No grading or other significant soil disturbing activities shall occur within the population polygon. The use of helical anchors or pole replacement by auger does not constitute significant soil disturbing activities.
- Cut brush should be removed from the polygon area to the extent practicable.

5.1.4 Option 4: Notification to ANR for Alternative Practices

In some instances it may become necessary to devise alternative practices than what has been outlined above. For example, crews may be required to grade a new “equipment pad” or work area in an area where T&E species were observed during a pre-activity survey, which may require obtaining a takings permit.

If alternative work practices are required, VELCO or GMP shall develop a tailored work plan or site-specific BMP for the specific species and/or polygon(s) and will submit to the ANR for their concurrence prior to conducting the activities.

5.1.5 Emergency O&M Activity BMPs

VELCO and GMP occasionally must respond to imminent threats to transmission line reliability and safety, such as responding to storm damage, or up righting a leaning transmission poles, which require immediate response. The following BMPs are applicable to emergency O&M activities:

- If emergency work is required in a population polygon, O&M staff shall consult with the VELCO or GMP Environmental Teams and will review T&E polygon mapping.
- VELCO or GMP will provide an email notification to ANR of the intended activities and follow-up inspections and reporting will be performed.

5.2 O&M BMPs for Aquatic Animal Species

The majority of T&E animal species on VELCO and CVPS ROWs are aquatic in nature, including numerous mollusks and fish.

The following BMPs shall be implemented during O&M activities:

- Avoid soil disturbance along stream riparian corridors to the extent feasible and implement erosion prevention and sediment control measures as needed to prevent sediment-laden discharge to surface waters.
- T&E Mollusks:
 - Avoid in-stream work within the polygon.
 - If in-stream work is required, a preconstruction aquatic survey and habitat assessment by a qualified individual will occur.⁵ If suitable habitat or species are not observed, the work may proceed with appropriate erosion and sediment controls (e.g., dry channel construction methods through the use of dam and pump). Otherwise, consultation with the ANR shall occur.
- Fish:
 - In-stream activities may proceed with a dry channel method, such as dam and pump around the work area. Appropriate screens shall be installed on intake pipes to ensure fish do not enter.

5.3 O&M BMPs for Terrestrial Reptiles

The following threatened and endangered reptiles are documented in VELCO and CVPS corridors: Eastern Ratsnake (*Pantherophis alleghaniensis*) and Timber Rattlesnake (*Crotalus horridus*). The following BMPs shall be implemented in polygons for T&E terrestrial reptiles:

- Limit travel to existing ATV trails or access routes to the extent feasible.
- Avoid use of mechanical methods that may cause soil compaction, disturbance and rutting to the greatest extent possible. During the period of April 1 through November 1, where necessary to prevent excessive compaction or soil disturbance, use low-pressure equipment or construction matting.
- Avoid disturbing rock piles and bedrock formations.
- Implement erosion prevention and sediment control measures. Remove silt fencing and other barriers as soon as possible following activities. All erosion control matting shall be

⁵ A Scientific Collection Permit and/or Threatened and Endangered Species Taking Permit may be required to conduct the necessary surveys and species identification.

free of plastic mesh backing or similar which possess hazards to snakes and shall instead be constructed of loosely-woven, natural fibers, or bonded fiber matrix.

- Avoid any observed snakes. If observed, report sightings to the VELCO or GMP Environmental Team (and ANR). If possible, take a photograph but do not pursue species. Do not attempt to capture or relocate individuals.
- Remove cut material or cut up small enough so as not to create barriers or otherwise interfere with animal movement. Creating brush piles is acceptable and even encouraged. If woody material is being chipped, creating chip piles is also desirable.

5.4 O&M BMPs for Bird Species

The following threatened and endangered birds are documented in VELCO and CVPS corridors: Grasshopper Sparrow (*Ammodramus savannarum*), Upland Sandpiper (*Bartramia longicauda*) and Sedge Wren (*Cistothorus platensis*). The following BMPs shall be implemented in polygons of T&E bird species:

- Within species polygons, avoid work and especially work involving the prolonged use of loud equipment (such as ATVs, chainsaws, and other mechanized equipment) during the nesting period of April 15 to August 15 to the extent practicable.
- No mowing, brush hogging or grading shall occur in polygons during the April 15 to August 15 nesting period.
- If mowing, brush hogging or grading is necessary in polygons during the nesting period, a pre-activity nesting bird survey will be conducted and the VT ANR will be consulted to discuss alternative work practices if nesting birds are identified.

5.5 O&M BMPs for Bat Species

See Section 6.0 for applicable BMPs to protect T&E bat species during O&M activities.

6.0 BAT SPECIES BMPs

Management strategies for Indiana Bat (*Myotis sodalis*) were developed by VELCO and CVPS (now GMP) and in consultation with the Vermont Fish and Wildlife Department (VFWD) in 2011. They have been adopted in this BMP document and are provided below. These BMPs will also be implemented to protect the state-listed Northern Long-Eared Bat (*Myotis septentrionalis*) throughout Vermont.

It is recognized by VELCO, GMP and the VFWD that implementation of these BMPs may be affected or restricted by emergency restoration activities, imminent threats to reliability, state and federal reliability standards, and easement or other property restrictions. The BMPs will be implemented within the confines of such restrictions, and VELCO and GMP will act in good faith to minimize the impacts of emergency repair and restoration efforts on their successful and continual application.

The following practices are grouped according to their intended purpose, and listed in order of preferred use. Where the application of a particular practice is not practicable due to physical, property, reliability, or regulatory constraints, utility managers will seek to use an alternative listed practice.

6.1 *Protection of Roosting Bats during Efforts that Involve the Clearing of Trees*

The simplest and most effective method of protecting roosting individuals during clearing activities is to avoid the felling or removal of trees containing roosting bats. This can be accomplished through time-of-year restrictions that limit the removal of large trees to the period of time when bats are hibernating in caves and mines, or by site-specific assessments where such restrictions are not practical.

In order to avoid the taking of roosting individuals during tree removal efforts:

- Perform tree removals during the period between October 15 and April 15. If required for access, trees less than 8 inches diameter at breast height (dbh) may be removed and/or trimmed as needed, taking care to protect any larger trees.
- Where larger trees must be removed outside the allowed time period, the area of clearing should be assessed for the presence of potential roost trees (trees of suitable size, species, and height with peeling or loose bark capable of providing shelter for roosting bats) by a GMP or VELCO employee trained in identifying such trees by the VFWD. If necessary, VFWD biologists may assist in identifying potential roost trees on the project site. Potential roost trees should be marked prior to the commencement of clearing activities, and care must be taken to protect these trees and potentially roosting bats from damage during clearing activities.

- Potential roost trees protected during initial clearing activities may subsequently be removed as necessary during the period between October 15 and April 15. It is anticipated that sufficient roost trees are available within 2.5 miles of the project site to offset the loss of these potential, yet unconfirmed, roost trees.
- Concerning threat trees: Given the immediate hazard to the electrical stability of Vermont’s electrical network posed by threat trees, VELCO and GMP will attempt to implement the above management recommendations; however, immediate removal of potential roosting trees may be necessary. In these cases, VELCO and GMP will evaluate disassembling, or “topping,” the tree in such a manner that the main cavity or exfoliation can be retained to the greatest extent possible (e.g., “top” tree by leaving greater than 10 feet of trunk).

6.2 Protection of Foraging Habitat and Bat Crossings during Construction Efforts

In order to maintain existing foraging areas and adequate cover for bats to move across a maintained right of way, the following steps should be taken during construction efforts:

- When available, compatible woody species should be retained where possible, with the following exceptions as appropriate in the judgment of the utility:
 - Areas needed to provide clearance for safe and efficient access; and
 - the “wire zone”, which for the purposes of this plan is an area, centered on the pole structures and under the electrical conductors/communication wires, and which must be maintained free of woody vegetation for reliability and safety.
 - The removal of “danger trees” as those trees represent a strike hazard to the line due to defects and/or growth characteristics.
- Efforts to retain existing compatible woody vegetation should focus on areas where it can provide continuous cover at least 25 feet in width and at least 6 to 10 feet in height between the edges of the cleared ROW. Areas containing streams and wetlands are particularly valuable and should take precedence over upland areas where practicable.

6.3 Creation of Foraging Habitat and Bat Crossings during Construction Efforts

For certain construction and maintenance efforts, VFWD may determine that it is appropriate to create new crossings, or enhance existing crossings, through the use of strategic plantings. In addition, utilities and VFWD may agree to the creation of new crossings within existing cleared rights of way. When creating new foraging habitat and bat crossings:

- Encourage existing compatible woody vegetation to create crossings, the length of which shall extend to both edges of the cleared corridor, with the exception of the "wire zone" as appropriate in the judgment of the utility.
- If existing vegetation is not suitable, crossings will be created by planting suitable woody vegetation, the length of which shall extend to both edges of the cleared corridor, with the exception of the "wire zone" as appropriate in the judgment of the utility.
- Plantings should consist of compatible woody species suitable for the site and consistent with maintenance requirements and reliability standards, and will be spaced in a manner to provide continuous cover between the edges of the right of way at maturity. Each crossing should be at least 25 feet in width and be maintained at heights no less than between 6 to 10 feet. When feasible, crossings should be located along streams and wetlands.
- Crossings should be maintained as described in this plan until VFWD determines that they are no longer necessary for the protection of Indiana bats (within the limits of above- listed constraints associated with emergency work or routine vegetative management work to ensure compliance with reliability standards).

6.4 Creation/Enhancement of Roosting Habitat during Construction Efforts

For certain construction projects, particularly those involving new or expanded ROW that may remove potential roost trees, VFWD may determine that it is appropriate to create or enhance new potential roosting sites through innovative management techniques. The utilities and VFWD may agree to the creation of new potential roosting sites within and along existing cleared ROW. Creation of potential roost trees will generally be accomplished through the removal of crowns and limbs from identified trees along the outer edges of the right of way, encouraging the gradual creation of roosting cover as the trees die and bark begins to peel away. In addition, enhancement of potential roost trees can be accomplished through the "daylighting" of existing potential roost trees by removing adjacent trees. The daylighting practice is intended to increase solar radiation on the potential roost tree. Daylighting may require additional landowner permissions if tree removals are outside utility easements or beyond the scope of normal clearing and danger tree removal.

When creating potential roost trees:

- Roost tree candidates of appropriate diameters, species, and solar exposure should be identified and marked prior to commencement of clearing or widening activities.
- In the areas of roost tree creation, clearing and widening activities should begin with the removal of limbs and crowns, and/or girdling as appropriate. Trunks of marked trees should be left in place and cut to a height (i.e., no less than 10 to 12 feet) that allows and encourages use by roosting bats once the bark begins to separate from the wood, but in no

case may the retained trunk be left at a height that would allow contact with wires, guys or poles, or blockage of access in the event of trunk failure. Trunks should be double girdled as appropriate to ensure that the tree dies and sheds the bark.

When enhancing (i.e., daylighting) potential roost trees (with landowner permission as required):

- Existing potential roost trees of appropriate diameters and species should be identified and marked prior to commencement of clearing or widening activities.
- Create small openings (on as many as three sides) adjacent to identified potential roost trees, leaving adequate canopy cover within 20 feet for bats to emerge into forest cover.

6.5 Ongoing Research and Monitoring of Retained and Newly-Created Habitat

GMP and VELCO shall allow VFWD reasonable access within their ROW to conduct scientific studies within habitat management areas (subject to any additional landowner or other permissions that may be required). Landowner approvals shall be obtained by VFWD in coordination with the utility. Utility activities may require temporary interruption of studies and/or alterations of mitigation plantings. Disruptions shall be kept to the minimum required. GMP and VELCO shall work with VFWD to re-establish ongoing research activities following necessary disruptions.

7.0 CONCLUSION

With the support of TRC and Gilman & Briggs Environmental, VELCO and GMP have developed these BMPs in accordance with the Vermont Public Service Board Memorandum of Understanding (VT PSB Docket No. 7373), Stipulation Number 5. In Stipulation Number 5 of the aforementioned MOU, the Parties (i.e., Vermont ANR, VELCO and CVPS) agreed to work collaboratively to develop uniform BMPs for integrated vegetation management of electric utility corridors, including the use of selective herbicides. VELCO and GMP believe the BMPs developed herein proactively reduce the risk of takings of T&E species during vegetation management and O&M activities. These BMPs will be implemented during applicable vegetation management and O&M work activities within VELCO and CVPS infrastructure to protect T&E species and their habitat. In accordance with the companies' existing integrated vegetation management programs, as enhanced in these BMPs, VELCO and GMP will monitor the effectiveness of these BMPs over time and pursue opportunities to enhance or improve these BMPs, including in the future combined programs (i.e., CVPS and GMP) under GMP operations and system-wide vegetation management and O&M programs.

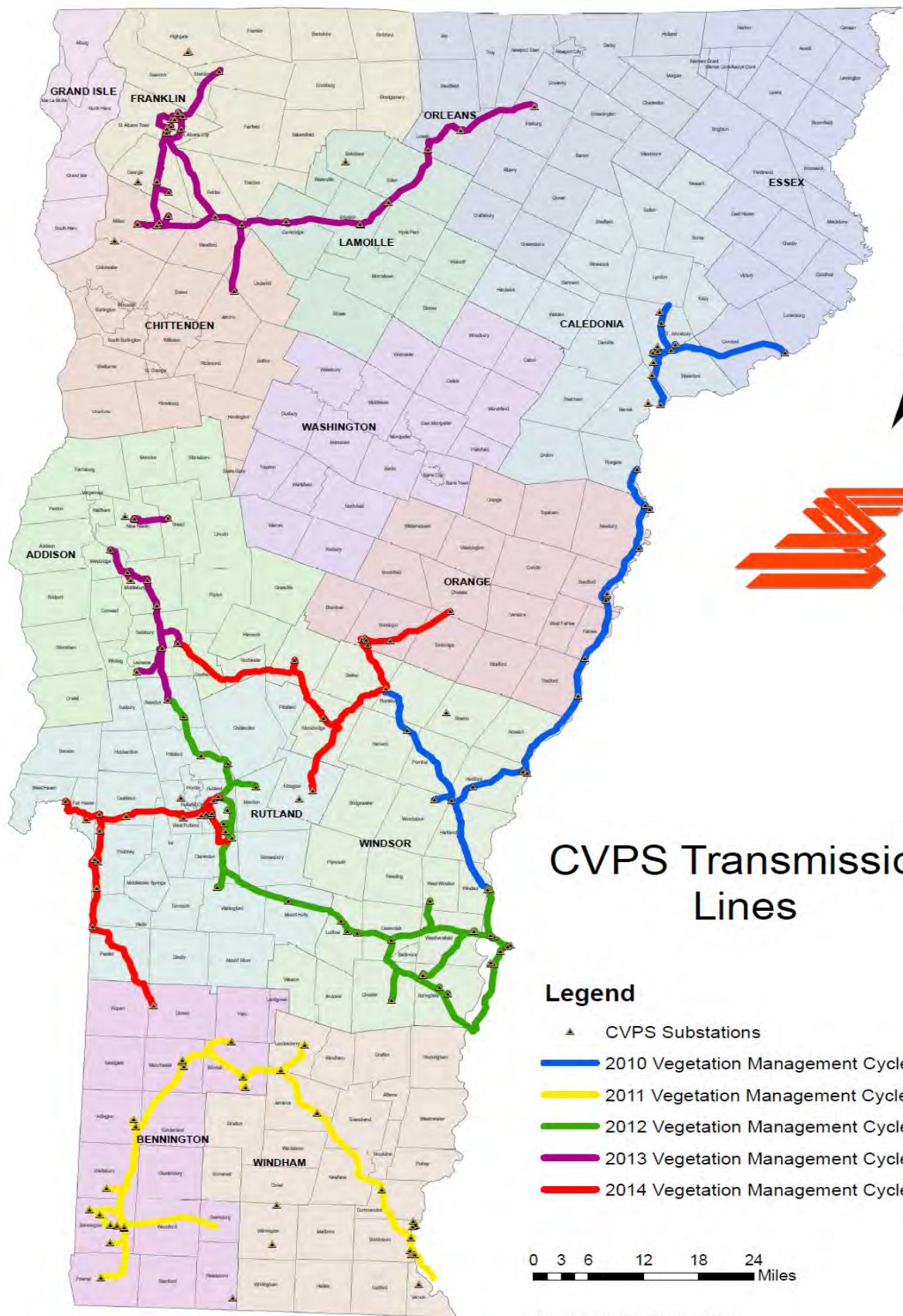
VELCO and GMP also see opportunities for the adoption of these or similar BMPs by other utilities and land managers operating in Vermont to ensure the risks of a taking of T&E species are proactively minimized in a practical and consistent manner. Monitoring and surveys of VELCO and GMP ROWs have revealed that T&E species are present in part due to the work that is performed to create and maintain habitat. Furthermore, properly maintained utility corridors and other managed spaces contribute to vibrant natural vegetation communities and habitats in Vermont.

Clearly, utility operators and other organizations that operate in Vermont are in the unique position to encourage, through operation and maintenance activities and proper management practices, conditions that support and sustain a diverse variety of T&E species habitat in the state, while simultaneously developing and improving practices that reduce the risk of takings and protect T&E populations during the course of operations.

**Attachment A:
VELCO Vegetation Management Activities Overview Map**



Attachment B:
CVPS Vegetation Management Activities Overview Map



CVPS Transmission Lines

Legend

- CVPS Substations
- 2010 Vegetation Management Cycle
- 2011 Vegetation Management Cycle
- 2012 Vegetation Management Cycle
- 2013 Vegetation Management Cycle
- 2014 Vegetation Management Cycle

0 3 6 12 18 24 Miles

This map is for the sole use of Central Vermont Public Service Corporation (CVPS). CVPS makes no representation as to the accuracy or authenticity of this map. Data sources include CVPS and Vermont Center for Geographic Information, www.vcgi.org

**Attachment C:
Summary of Vegetation Management Observations and
Photographs**

VERMONT ELECTRIC POWER COMPANY (VELCO)

&

GREEN MOUNTAIN POWER

(previously Central Vermont Public Service)

BEST MANAGEMENT PRACTICES FOR THE AVOIDANCE OF LISTED THREATENED AND ENDANGERED SPECIES INTEGRATED VEGETATION MANAGEMENT AND O&M ACTIVITIES

Attachment C: Summary of Vegetation Management and Line Maintenance Observations and Photographs

1.0 INTRODUCTION

TRC observed vegetation management and operations and maintenance (O&M) activities on several VELCO and CVPS corridors in 2012, in support of the evaluation of vegetation management and O&M programs and the development of Best Management Practices. A summary of these observations and photographs are included in the following sections

2.0 VELCO VEGETATION MANAGEMENT ACTIVITIES

2.1 *K37 115kV Line –Cut Stump Treatment*

On June 20, 2012, a TRC biologist observed cut stump treatment on the K37 Line in Rutland Vermont, immediately west of Route 7 and south of Post Road. This area, as with all areas that will be subject to vegetation management, had been prescribed suitable management practices during previous inventories and planning. In this case, hand clearing with cut stump treatment was prescribed. These activities typically occur simultaneously (otherwise one will lose track of the stumps). Management prescriptions are rarely changed, except in unforeseen circumstances or when a landowner requests a change. Several 2- to 8-inch diameter elm (*Ulmus* sp.) trees had been cut along the edge of the corridor in the vicinity of a wetland and stream. A 15-foot buffer along the stream was flagged to indicate where cut stump treatment was prohibited. Trees were chipped, and excess wood chips and woody debris had been removed from the area. Contractor crews applied herbicide to the cut stumps by hand with spray bottle applicators. First, the top of the cut stump was sprayed and then the sides were treated. No herbicide was observed to have

“missed” the stump - all herbicide applications were targeted and accurately applied (see photographs below).



View of cut stump treatment with herbicide mix along K37 line.



Close-up of cut stump treatment with herbicide mix along K37 line.

2.2 370 Line (345 kV) and K30 Line (115kV) – Low Volume Foliar

On June 20, 2012, a TRC biologist observed low-volume foliar herbicide application activities along the right-of-way for the adjacent 370 and K30 Lines, which are within an approximately 250-foot-wide easement. Five individuals were conducting herbicide treatment with hand-pump backpacks and hand sprayers. For each structure span, the five individuals would proceed from one structure to the next on one side of the easement and would double-back on the alternate side. While walking down the easement, the crew sprayed incompatible woody vegetation species with extreme accuracy. This area was thick with incompatible species and high-growing herbaceous species, such as goldenrods (*Solidago* spp.), yet very little herbicide was observed missing the targeted leaves of incompatible species (see photographs below). Two utility task vehicles (UTVs) were utilized to transport larger containers of herbicide and were staged near the hand-work activities. UTVs were utilized along existing right-of-way access roads.

VELCO staff will review the success of treatment in the fall and will require re-treatment by work crews if determined necessary.

During the visit, several areas were observed near standing or open water. These areas were flagged in the field to denote herbicide restricted areas, and incompatible species had been recently hand cut in these areas.



View of low volume foliar application along 370 line.



View of sapling along 370 line subject to low-volume foliar herbicide application. Note white areas where herbicide was applied to foliage. None was observed on surrounding herbaceous vegetation.



View of area in the vicinity of surface water that was subject to hand cutting along the 370 line.

3.0 GMP VEGETATION MANAGEMENT ACTIVITIES

3.1 North Brattleboro to Dummerston 46kV Line 32 – ROW Clearing (Scrub Oak Polygon)

On June 28, 2012, a TRC biologist observed right-of-way clearing activities on the North Brattleboro to Dummerston 46kV Line 32 in the Black Mountain area and within a Scrub Oak (*Quercus ilicifolia*) element occurrence polygon (this is a state endangered species). Right-of-way clearing activities involved removing young and mature tree along the edge of this approximate 100-foot-wide corridor. The three-person crew was working on the western side of the polygon and were progressing eastwards. Crew members had parked their pickup trucks along an existing, disturbed access road. A single skidder bucket was being utilized to top trees and hand crews were removing the bases and cutting the timber into smaller pieces. Crews had utilized existing access routes with the equipment.

While onsite, work plans were reviewed for the polygon and it was re-emphasized to the crew lead the necessity of avoiding Scrub Oak by the hand felling operation. In accordance with the BMPs, crews were instructed to hand fell trees and restrict the use of the skidder bucket to the existing access route within the polygon. The crew Lead was trained on how to easily identify the Scrub Oak for avoidance—it was readily distinguished from Red Oak (*Quercus rubra*) by observing its substantial off-white downy fuzz on the undersides of the leaves. The fuzz easily fell off if rubbed.

The invasive Glossy Buckthorn (*Rhamnus frangula*) was observed growing in the vicinity of Scrub Oak (see photographs below). It was noted that cut stump treatment of the buckthorn would improve the habitat for Scrub Oak.



Underside of Scrub Oak leaf with off-white fuzz.



View of endangered Scrub Oak at right, with Glossy Buckthorn surrounding plants.



View of Scrub Oak habitat within CVPS Line 32 easement.

3.2 Cavendish to Springfield 46kV Line 93 – Hand Cutting

On June 28, 2012, a TRC biologist observed the result of right-of-way hand cutting activities along the Cavendish to Springfield 46kV Line 93. Hand cutting was underway on this line for the areas within 30 feet of surface waters and other herbicide restricted areas (e.g., vicinity of water supplies). Woody vegetation clearing had just occurred along a perennial stream. No slash or debris was observed in the stream, and limited slash was observed in the riparian corridor. Crews had completed work by hand and access had been conducted by all-terrain vehicle. No soil disturbance was observed.

Following hand cutting, low-volume foliar herbicide application crews will proceed with treatment on this line in the unrestricted areas. It was discussed that this was the typical order of operations for the vegetation management cycles—hand clearing crews “prep” the right-of-way by removing incompatible vegetation from herbicide-restricted areas (e.g., buffers from surface waters and water supplies) during one pass, and low-volume foliar herbicide application crews follow with a second pass.



View of perennial stream corridor within the CVPS Line 93 easement that was recently hand cleared of incompatible vegetation.

3.3 Ascutney to Cavendish 46kV Line 91 – Low Volume Foliar

On June 28, 2012, a TRC biologist observed the Ascutney to Cavendish 46kV Line 91 in Cavendish Vermont, east of the Cavendish Gorge, shortly after treatment by low-volume foliar herbicide application crews. A three-person crew and a UTV conducted one-pass of the ROW following the hand cutting crew. Crews were equipped with hand-pump back-packs and hand sprayers, while the UTV transported containers of herbicide (in accordance with the Agency of Agriculture herbicide use permit conditions).

No evidence of soil disturbance was observed, and only limited evidence of UTV use along an existing ATV trail was observed.

A documented occurrence of Wiegand's Sedge (*Carex wiegandii*), an S1-ranked rare species, was reviewed in this area. The species occurs in two wetlands within the cleared easement in this area. Several felled small white pine were observed along the wetland margin that were apparently removed by hand. Otherwise no incompatible species were observed in the vicinity of the habitat. Treatment within the wetland was not necessary and the area had been avoided. Fruiting Wiegand's Sedge plants were observed.



View of the CVPS Line 91 easement following a pass by low-volume foliar herbicide treatment crews. Note the nearly imperceptible evidence of ATV use—two slightly matted tracks within the herbaceous vegetation along a previously utilized trail.



View of Wiegand's sedge habitat within the CVPS Line 91 easement that was avoided.

4.0 VELCO O&M ACTIVITIES

4.1 340 Line (345kV) Pole Refurbishment/Topping

On July 9, 2012, a TRC biologist observed pole refurbishment (topping) activities along the 345kV 340 Line, which extends from the Vernon Substation in Vernon to the Coolidge Substation in Cavendish. Crews were observed working in Townshend, and work involved climbing wooden poles, cutting the tops of poles (where necessary), and applying a new pole topping (cover) to protect the integrity of the wood and extend the life of the poles. Work was conducted at a small subset of the transmission poles along this line. Crews were utilizing several ATVs for access to the structures, and they had been instructed to utilize existing access roads and avoid threatened and endangered species population polygons. No soil disturbance was observed or expected to occur as a result of the activities.



View of O&M crew utilizing ATVs on existing access road in the 340 Line right-of-way near Structure 211.



View of O&M crew climbing Structure 211 of the 340 Line to cut and top the wooden pole. No soil disturbance was observed or expected to occur.



View of existing access road that was utilized by crew in the vicinity of Structure 220. Crews avoided a mapped polygon of Northeastern Bulrush (*Scirpus ancistrochaetus*), a state and federally listed endangered species.

4.2 K32 Line (115kV) Pole Replacement

On June 19, 2012, a TRC biologist inspected a pole replacement work area at Structure 276 of the 115kV K32 Line in Ludlow, Vermont, several spans west of the Coolidge Substation. Crews had utilized a flex-track bucket and tracked excavator (i.e., low-pressure equipment) to replace the existing wooden pole structure. An existing access road and wetland crossing was utilized, and relatively minor soil disturbance was observed around the newly replaced structure. Restoration with a conservation seed mix and mulch had occurred. T&E polygons were avoided.

**Attachment D:
Threatened and Endangered Species Population Polygon Data
Summary Tables and Maps**

Attachment D
Threatened and Endangered Species Population Polygon Summary Table
Plant Species

COMPANY	CVPS LINE	VELCO LINE	EO_ID	SCIENTIFIC NAME	COMMON NAME	Dormancy Period (Oct 1- April 15 unless specified)	Blooming Period (fruiting period for grasses)	BMP Option 2c Suitability (crew survey)	Number of Times Surveyed with no ID (if 2 or greater, remove)	S RANK	US_TE	VT_TE	OTHER_STAT
CVPS	110		47	Arisaema dracontium	Green Dragon	1 Sep - 15 April	May - June; identifiable by leaves to 15 August	N	0	S2		T	SGCN
CVPS	60		3638	Arisaema dracontium	Green Dragon	1 Sep - 15 April	May - June; identifiable by leaves to 15 August	N	0	S2		T	SGCN
CVPS	116		8654	Carex muehlenbergii var. muehlenbergii	Muehlenberg's Sedge		July - August	N	0	S2		T	SGCN
CVPS	32		5730	Crocianthemum bicknellii	Plains Frostweed		July - August; can be identified until 1 Nov based on fruit characters	N	0	S2S3		T	SGCN
CVPS	79		3896	Cynoglossum virginianum var. boreale	Northern Wild Comfrey		May - June	N	0	S1		T	Flora Conservanda, RFSS, SGCN
CVPS	38		9299	Dryopteris filix-mas	Male Fern		N/A; identifiable by leaves June-October	N	0	S2		T	Flora Conservanda, RFSS, SGCN
CVPS	36		5774	Eleocharis quinqueflora	Few-flowered Spikerush		July - August	N	0	S2		T	Flora Conservanda, SGCN
CVPS	60		4263	Gentianella quinquefolia	Stiff Gentian	1 Nov - 14 May	September	N	1	S1		T	Flora Conservanda, SGCN
CVPS	109		4904	Hackelia deflexa ssp. americana	Nodding Stickseed		July - September	N	1	S2		T	Flora Conservanda, RFSS, SGCN
CVPS	32		1449	Helianthus strumosus	Harsh Sunflower		late July - September	Y	0	S2S3		T	RFSS, SGCN
CVPS	79		2494	Helianthus strumosus	Harsh Sunflower		late July - September	Y	0	S2S3		T	RFSS, SGCN
CVPS	46		746	Hypericum ascyron	Great St. John's-wort		July - August; identifiable by fruit characters to October	Y	0	S2		T	SGCN
CVPS	32		2957	Juncus greenei	Greene's Rush		July - October	N	0	S2		E	SGCN
CVPS	116		8653	Juncus greenei	Greene's Rush		July - October	N	0	S2		E	SGCN
CVPS	32		4168	Lechea mucronata	Hairy Pinweed		July-August; identifiable by fruits and vegetation until 1 November	N	0	S1		E	SGCN
CVPS	79		2502	Lespedeza hirta	Hairy Bush-clover		July - September; may be identifiable in June by characteristic leaves; identifiable by fruits and leaves until 1 Nov	Y	0	S1		T	RFSS, SGCN
CVPS	58A		4609	Malaxis monophyllos var. brachypoda	White Adder's-mouth	1 Oct - 15 April	Late June - Early August	N	0	S2S3		T	SGCN
CVPS	83		6088	Physostegia virginiana	Obedient Plant		July - August; identifiable by leaves in June, by leaves and fruits until 1 Nov	Y	1	S2		T	RFSS, SGCN
CVPS	32		158	Platanthera flava	Tuberclad Orchid	1 Oct - 15 April	Late June - Late July	N	0	S2		T	SGCN
CVPS	32		4357	Platanthera flava	Tuberclad Orchid	1 Oct - 15 April	Late June - Late July	N	1	S2		T	SGCN
CVPS	36		3463	Polymnia canadensis	White-flowered Leafcup		mid July - early Sept; identifiable by characteristic leaves May - October	Y	1	S1		E	Flora Conservanda, SGCN
CVPS	43,52A		9298	Polymnia canadensis	White-flowered Leafcup		mid July - early Sept	Y	1 (documented in i	S1		E	Flora Conservanda, SGCN
CVPS	32		8794	Pycnanthemum incanum	Hoary Mountain-mint		Mid July - Late Sept	N	0	S1		E	SGCN
CVPS	32		1219	Quercus ilicifolia	Scrub Oak		Summer/Fall (in leaf)	Y	0	S1		E	SGCN
CVPS	42		1527	Viola lanceolata	Lance-leaved Violet		June - July; identifiable by distinctive leaves May - October	N	1	S1		T	SGCN
VELCO		K65 (VER to Ferry Rd UG)	8655	Allium canadense	Wild Garlic	1 Sep - 15 April	June	N	3, Remove	S1		T	SGCN
VELCO		K21,K22,K23,K24 ESX-MDSX,K25	672	Blephilia hirsuta	Hairy Wood-mint		July - August	N	2, Remove	S1		T	Flora Conservanda, RFSS, SGCN
VELCO		K22	1996	Calystegia spithamea	Low Bindweed		June - July; identifiable by distinctive leaves and habit, May - October	N	0	S2		T	Flora Conservanda, SGCN
VELCO		K18,K25	3912	Calystegia spithamea	Low Bindweed		June - July; identifiable by distinctive leaves and habit, May - October	N	1	S2		T	Flora Conservanda, SGCN
VELCO		K20	7295	Calystegia spithamea	Low Bindweed		June - July; identifiable by distinctive leaves and habit, May - October	N	0	S2		T	Flora Conservanda, SGCN
VELCO		K21	261	Carex muehlenbergii var. muehlenbergii	Muehlenberg's Sedge		July - August	N	0	S2		T	SGCN
VELCO		370,K30	6606 (updated)	Corallorhiza odontorhiza	Autumn Coral-root	15 Nov - 1 Aug	September-October	N	0	S2		T	SGCN
VELCO		K65 (VER to Ferry Rd UG)	9148	Corydalis aurea	Golden Corydalis		May-June	Y	0	S2		T	Flora Conservanda, SGCN
VELCO		K21	627	Crocianthemum bicknellii	Plains Frostweed		July - August; can be identified until 1 Nov based on fruit characters	N	0	S2S3		T	SGCN
VELCO		K19	4734	Crocianthemum bicknellii	Plains Frostweed		July - August; can be identified until 1 Nov based on fruit characters	N	0	S2S3		T	SGCN
VELCO		K22	5101 (updated)	Crocianthemum bicknellii	Plains Frostweed		July - August; can be identified until 1 Nov based on fruit characters	N	0	S2S3		T	SGCN
VELCO		K22	5733 (updated)	Crocianthemum bicknellii	Plains Frostweed		July - August; can be identified until 1 Nov based on fruit characters	N	0	S2S3		T	SGCN
VELCO		K19	1751	Cyperus houghtonii	Houghton's Cyperus		July - September	N	3, Remove	S2		T	Flora Conservanda, SGCN
VELCO		K22	4450	Cyperus houghtonii	Houghton's Cyperus		July - September	N	1	S2		T	Flora Conservanda, SGCN
VELCO		K19	7138 (updated)	Cyperus houghtonii	Houghton's Cyperus		July - September	N	0	S2		T	Flora Conservanda, SGCN
VELCO		K18,K23,K25	3256	Cypripedium arietinum	Ram's Head Lady's-slipper		late May - mid June	N	Multiple, Remove	S2		T	Flora Conservanda, SGCN
VELCO		K30	9534 (updated)	Gentiana andrewsii	Fringe-top Closed Gentian	1 Nov - 14 May	August - September	Y	0	S2		T	Flora Conservanda, SGCN
VELCO		350	9541 (updated)	Gentiana andrewsii	Fringe-top Closed Gentian	1 Nov - 14 May	August - September	Y	0	S2		T	Flora Conservanda, SGCN
VELCO		K33,K65 (Bay Rd UG to QCT)	5186	Gentianella quinquefolia	Stiff Gentian	1 Nov - 14 May	September	Y	Multiple, Remove	S1		T	Flora Conservanda, SGCN
VELCO		K19	2115	Hackelia deflexa ssp. americana	Nodding Stickseed		July - September	N	2, Remove	S2		T	Flora Conservanda, RFSS, SGCN
VELCO		K18,K23,K25	70	Helianthus strumosus	Harsh Sunflower		late July - September	Y	0	S2S3		T	RFSS, SGCN

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Threatened and Endangered Species Population Polygon Summary Table
Plant Species

COMPANY	CVPS LINE	VELCO LINE	EO_ID	SCIENTIFIC NAME	COMMON NAME	Dormancy Period (Oct 1-April 15 unless specified)	Blooming Period (fruiting period for grasses)	BMP Option 2c Suitability (crew survey)	Number of Times Surveyed with no ID (if 2 or greater, remove)	S RANK	US_TE	VT_TE	OTHER_STAT
VELCO		K22	2831	Helianthus strumosus	Harsh Sunflower		late July - September	Y	1	S2S3		T	RFSS, SGCN
VELCO		K65 (VER to Ferry Rd UG)	8663 (updated)	Helianthus strumosus	Harsh Sunflower		late July - September	Y	0	S2S3		T	RFSS, SGCN
VELCO		K20	9553 (updated)	Helianthus strumosus	Harsh Sunflower		late July - September	Y	0	S2S3		T	RFSS, SGCN
VELCO		K43	9625 (updated)	Helianthus strumosus	Harsh Sunflower		late July - September	Y	0	S2S3		T	RFSS, SGCN
VELCO		3340,3381,K40 Tie	4034	Hypericum ascyron	Great St. John's-wort		July - August; identifiable by fruit characters to October	Y	0	S2		T	SGCN
VELCO		370	6607 (updated)	Hypericum ascyron	Great St. John's-wort		July - August; identifiable by fruit characters to October	Y	0	S2		T	SGCN
VELCO		K18,K23,K25	8149	Isotria verticillata	Large Whorled Pogonia		June	N	1	S2		T	RFSS, SGCN
VELCO		340,3321	8165	Juncus greenei	Greene's Rush		July - October	N	2, Remove	S2		E	SGCN
VELCO		350,K32	9546 (updated)	Juncus greenei	Greene's Rush		July - October	N	0	S2		E	SGCN
VELCO		K34	8634	Juncus secundus	Secund Rush		July - August	N	SH, 1, remove	SH		E	SGCN
VELCO		K21	476	Lactuca hirsuta	Hairy Lettuce		July - August	N	1	S2		T	SGCN
VELCO		K21	477	Lactuca hirsuta	Hairy Lettuce		July - August	N	0	S2		T	SGCN
VELCO		K22	1753	Lactuca hirsuta	Hairy Lettuce		July - August	N	0	S2		T	SGCN
VELCO		K21	6093	Lactuca hirsuta	Hairy Lettuce		July - August	N	1	S2		T	SGCN
VELCO		K43	9621 (updated)	Lactuca hirsuta	Hairy Lettuce		July - August	N	0	S2		T	SGCN
VELCO		100	7966	Omalotheca sylvatica	Woodland Cudweed		July - August	N	2, Remove	S1		E	SGCN
VELCO		K22	2560 (updated)	Piptatherum pungens	Slender Mountain-rice		late May - early July	N	0	S2		T	SGCN
VELCO		K18,K25	3334	Piptatherum pungens	Slender Mountain-rice		late May - early July	N	0	S2		T	SGCN
VELCO		K18,K25	8024	Platanthera hookeri	Hooker's Orchid		early June - early July	N	0	S2		T	SGCN
VELCO		K34	1513	Polygonum douglasii	Douglas Knotweed		late June - late September	N	1	S2		E	Flora Conservanda, SGCN
VELCO		K18,K23,K25	8145	Pterospora andromedea	Pinedrops		July - October	N	1	S1		E	Flora Conservanda, SGCN
VELCO		340,3321	7793 (updated)	Scirpus ancistrochaetus	Barbed-bristle Bulrush		late July - early October	N	0	S2	E	E	Flora Conservanda, SGCN
VELCO		340,3321	7794 (updated)	Scirpus ancistrochaetus	Barbed-bristle Bulrush		late July - early October	N	0	S2	LE	E	Flora Conservanda, SGCN
VELCO		340,3320	NEW	Triphora trianthophora	Three-bird Orchid	15 Oct - 1 July	mid-August (limited)	N	0	S1		T	
VELCO		100	8651	Viola lanceolata	Lance-leaved Violet		June - July; identifiable by distinctive leaves May - October	N	0	S1		T	SGCN
VELCO and CVPS	37	370,K30	8678	Boechera stricta	Drummond's Rock-cress		late May - July	N	0	S1		E	RFSS, SGCN
VELCO and CVPS	54	K35	8737	Carex vaginata	Sheathed Sedge		July - August	N	0	S1		E	Flora Conservanda, SGCN
VELCO and CVPS	44	K34	5049	Desmodium cuspidatum	Large-bracted Tick-trefoil		Mid July - Late Sept	Y	0	S1		E	Flora Conservanda, SGCN
VELCO and CVPS	54,56	K35	3825	Glyceria acutiflora	Sharp Manna-grass		June-Aug	N	2, Remove	S1		E	SGCN
VELCO and CVPS	37	370,K30	8681 (updated)	Helianthus strumosus	Harsh Sunflower		late July - September	Y	0	S2S3		T	RFSS, SGCN
VELCO and CVPS	37	370,K30	8683 (updated)	Helianthus strumosus	Harsh Sunflower		late July - September	Y	0	S2S3		T	RFSS, SGCN
VELCO and CVPS	140	K41 I-MT,K47	1607	Juncus greenei	Greene's Rush		July - October	N	0	S2		E	SGCN
VELCO and CVPS	70	K64	8667 (updated)	Juncus greenei	Greene's Rush		July - October	N	0	S2		E	SGCN
VELCO and CVPS	2,6,15	L-3,K6	9489	Quercus prinoides	Dwarf Chinquapin Oak		Summer/Fall (in leaf)	Y	2, Remove (incore)	S1		E	SGCN
VELCO and CVPS	59		9547 (updated)	Viola lanceolata	Lance-leaved Violet		June - July; identifiable by distinctive leaves May - October	N	0	S1		T	SGCN