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MEMORANDUM

Introduction

There are several areas on the Northwest Reliability Project (NRP) that are considered rare and irreplaceable areas. For the West Rutland to New Haven segment, these include:

1. The floodplain forest on just south of Otter Creek in Brandon,
2. A "valley clayplain forest" just north of Bullock Road in Leicester,
3. The floodplain forest along the Leicester River,
4. A valley clayplain forest complex and associated wetlands south of Halnon Brook in Salisbury,
5. A valley clayplain forest north of the OMYA quarry in Middlebury, and
6. A large emergent marsh south of Town Hill Road in New Haven.

The natural communities in these areas are important to the environment of Vermont. Although the Public Service Board found that the NRP would not cause undue adverse impacts to them, it also ordered that special cutting and management plans be followed in these areas. This memorandum discusses the nature of these communities and sets out recommendations for cutting and maintenance. If followed, they should preserve the qualities and character of these areas, not entirely as they occur today, but with the potential that if the corridors are abandoned, then they would revert to communities similar to those that occur today.

Background

Natural communities are the products of complex interactions in the environment. Critical to the identified natural areas on the NRP are their soils, hydrology, and existing plant communities:

Floodplain forests

These communities are dominated by annual or otherwise cyclic flooding events from adjacent rivers, in this case Otter Creek and Leicester River. They generally have large, well-spaced trees with little or no shrub understory, but a significant herb layer (often large ferns). The forest floor is characterized by large woody debris.

The soils underlying these forests are generally alluvial and although often quite wet, are more well-drained than clay soils. They do not generally form the hummock-hollow micro-relief of the clayplain forests, but have a +/- even ground surface.

In these areas, removal of the large trees should be done cleanly, although it is not as necessary to avoid soil disturbance and rutting, because disturbed areas will normally be re-worked during the next round of flooding. It is more important not to pile slash or tops on ground vegetation, or on drainage patterns and ditches and to maintain whatever shrubs are present as best possible.

Clayplain forests

The Champlain Valley includes many areas of clay, and clay soils or clayey fine sands underlie and are critical to the areas of "valley clayplain forests." These are generally poorly drained or somewhat poorly drained soils, but they have high fertility.

The forests that have developed on clay soils, especially, are characterized by a hummock-and-hollow (or "cradle-and-knoll") micro-topography. When shallowly-rooted trees tip up, the soil from the roots falls to form a mound, and leaves a hollow. This microtopography is one of the most important features of the natural community, and it is important to impact this as little as possible.

The plant community is generally quite mixed with both woody and herbaceous species. A few of the herbaceous species of this community are considered rare in Vermont including, on the NRP, blunt-leaved bedstraw (*Galium obtusum*), spring cress (*Cardamine bulbosa*), and Massachusetts fern (*Thelypteris simulata*).

While it is necessary to remove and maintain woody vegetation that would intrude upon the conductor safety zone, it is also important to maintain the herbaceous plant community through avoidance of impacts, minimization of ground disturbance that would promote aggressive species, avoiding alteration of the hydrology, and by maintaining as much shrub cover as possible for shade.

Emergent marsh

Emergent marshes occur where there is too much water present, for too long a period during the year, to support shrub or tree growth. Usually, marshes have organic soils, although these soils may be relatively shallow and overlie impervious layers of clay or compact sand or silt.

They are characterized by perennial herbaceous plants, typically with strongly rhizomatous growth that produces large clones, such as cat-tail (*Typha latifolia*), lake sedge (*Carex lacustris*) and other sedges. In spite of the apparent dominance

of the community by a few species, generally there are many more species present in small numbers.

These habitats are especially vulnerable to degradation from traffic that can disturb the organic substrate, and can create channels and pools of open water. Although generally quite vigorous plant communities, such damage can take many years to recover.

In this habitat, clearing is generally not required; however, access to structures and construction can cause degradation. The plan for such an area focuses on minimization of initial impacts through construction on frozen ground in winter, or on mats in summer.

Special Clearing and Management Plan for Forested Areas

Construction of the new 345 kV line from West Rutland to New Haven will require widening the existing 150' transmission corridor an additional 100'. To maximize the amount of canopy in the forested rare and irreplaceable natural areas ("RINA"), VELCO will employ selective clearing and feather cutting management techniques. At the time of initial corridor clearing, existing low and slow growing vegetation within the RINA will be retained as much as possible, allowing maximum growth height up to conductor safety zone. The outer 25' of the new corridor will be feather cut, or tapered, so that the vegetation height is increased as you move to the outer edge of the corridor. In some cases, such as in areas of mature trees with very little existing understory, feather cutting is not feasible at the outset. In these areas, native regrowth seedlings will be encouraged and will be managed over time to form a tapered corridor edge. Typically, this native resprouting occurs quickly, within the 4-year vegetation management cycle employed by VELCO.

Proposed Mitigation Parcels

The Nongame & Natural Heritage Program has requested 2:1 mitigation for adverse impacts to RINA resulting from clearing and/or construction activities. The NNHP has identified changing a forested swamp or floodplain into one that is largely shrub dominated to be an adverse impact. Consequently, VELCO will conserve 24 acres of comparable wet clayplain forest as mitigation for 12 acres of clearing within the Halnon Brook, Bullock Road, and OMYA clayplain forest RINAs, and will conserve 15 acres of floodplain forest as mitigation for 7.5 acres of clearing within the Otter Creek and Leicester River floodplain forest RINAs. VELCO will conserve an 11 acre parcel it owns adjacent to the Bullock Road clayplain forest RINA, and an 8 acre floodplain parcel bordering the Leicester River which will partially satisfy the mitigation requirement. The balance of the mitigation lands will be acquired through purchase of other lands. An attempt

will be made to locate one or more mitigation parcels adjacent to or at least within the same wetland complex where the clearing occurs. The mitigation will be of the same wetland type, and if possible, will be one parcel of sufficient size.

Otter Creek Floodplain

1. Cut in winter.

Most of the trees are red maples (*Acer rubrum*) with some swamp white oaks (*Quercus bicolor*) and black ash (*Fraxinus nigra*). There are no conifers. Most of the trees are mature and there are few shrubs except along the edge of the existing corridor, which are mostly winterberry (*Ilex verticillata*). These will be left as much as possible, and regrowth within the outer 25' of corridor will be managed as a feather cut.

2. Flag and protect Endangered Species in existing corridor. The species is tall or great St. John's-wort (*Hypericum ascyron*), and is an herbaceous plant of sunny wet areas. It is anticipated that this will also colonize the newly cleared corridor in a few years.
3. Work entirely within the new corridor. Fell trees inward to new corridor, not outward to existing corridor. Access as shown on plans, along new corridor from the field at the north end.
4. Windrow tops along south and west edge of corridor or, remove for disposal elsewhere. Because this is a flood area, debris should not be stacked. If chipped, scatter only in new corridor, not in existing corridor.
5. Maintain on VELCO's 4-year vegetation management cycle with no herbicide application. A community similar to that in the existing corridor will likely develop.

Bullock Road

1. Cut in winter only. Best if soil is frozen and snow cover is >1' deep. Best if able to protect the hummock-hollow nature of the terrain. Disrupt the soil as little as possible and do not alter drainage patterns, especially in the southern end of the parcel.
2. Trees are quite mixed as to species, including swamp white oak (*Quercus bicolor*), red maple (*Acer rubrum*), birches (*Betula alleghaniensis*, *B. populifolia*), ashes (*Fraxinus nigra*, *F. pensylvanica*), and hemlock (*Tsuga canadensis*) at the north end. Most are relatively slow-growing due to the nature of the terrain, and selective cutting will be employed.
3. Leave shrubs as much as possible. Note, poison sumac (*Rhus vernix*) occurs in this wetland.
4. Place logging/clearing accesses perpendicular to existing access to minimize length of new accesses within the area.
5. Do not windrow tops - leave scattered, or remove; if chipped, blow or scatter onto existing corridor and do not pile in heaps.
6. Maintain on VELCO's 4-year vegetation management cycle and feather cut the outer 25' of corridor. No herbicide applications in this area. A scrub/shrub swamp will likely develop near the southern end, similar to the one along the southern margin; near the northern end the new corridor would approximate the adjacent existing corridor.

Leicester River Floodplain

1. Trees are mostly red maple (*Acer rubrum*). Although usually sprouting from base, these may not do so much in these seasonally inundated areas. Cut in winter or, if area is flooded, in driest part of summer.

South side of river and up to reroute - only additional 100' to be cleared.
North side of river on reroute - 250' to be cleared.

2. Remove tree trunks and tops. Because this area floods, do not stack tops so as to trap debris. Take care not to let debris enter farm ditches. Note - there are some trees tipped-up; cut and remove for safety purposes but otherwise leave.
3. Leave as many shrubs as possible. Some portions of the floodplain, near the southern end of the reroute, are shrubby now, and the aim will be to promote this type of community.
4. Maintain on VELCO's 4-year vegetation management cycle without herbicide application. Native regrowth seedlings will be encouraged and will be managed over time to form a tapered corridor edge.

Halnon Brook Wetlands

1. Cut in winter on frozen ground and snow cover if possible. Leave hummock-hollow character of the ground surface as natural as possible.
2. For Area 1, south of the field, protect rare species within the new corridor. The rare species is spring cress (*Cardamine bulbosa*), a very delicate herb of the forest floor at edges of little depressions and hollows. Flag around the area where these occur and disturb as little as possible - lift trees off or rope and fall away from this area if possible. Have environmental consultant oversee actual cutting operations in this area of rare plants. Trees in this area are small black ash (*Fraxinus nigra*), red maple (*Acer rubrum*), fir (*Abies balsamea*), hemlock (*Tsuga canadensis*), and yellow birch (*Betula alleghaniensis*).
3. For Area 1, access as much as possible perpendicular from existing corridor.
4. For Area 1, maintain on VELCO's 4-year vegetation management cycle, and feather cut outer 25' of corridor. Because of the rare species, no application of herbicides in this Area.
5. For Area 2, north of the field, there are rare plants within the existing corridor, but not within the new corridor. These are Massachusetts fern (*Thelypteris simulata*) and are small ferns of sunny or only partly shaded areas with organic soils. It is important to avoid them as much as possible, so access through existing corridor as little as possible and only where these plants are flagged off. This species may colonize the new corridor over time.
6. Leave shrubs along edge of existing corridor - these are mostly winterberry (*Ilex verticillata*), wild raisin (*Viburnum cassinoides*), and mountain holly (*Nemopanthus mucronata*).
7. Trees in Area 2 are larger than in Area 1 and include mature hemlock (*Tsuga canadensis*) and white pine (*Pinus strobus*). Windrow tops or other slash on west side of new corridor, not in existing corridor; be careful not to fill hollows (ie., temporary pools) with slash. Do a good cleanup job.
8. For Area 2, maintain on VELCO's 4-year vegetation management cycle. A corridor similar to that of the adjacent (existing) corridor will likely develop. Most of the fast-growing species on the existing corridor are pine and hemlock saplings, which do not sprout so there should be no need for basal application of herbicides. No herbicide application in this area.

Wetlands N of OMYA Quarry

1. Winter or summer clearing, best if done either with frozen ground and snow cover, or in the driest part of the summer. The forest cover is mixed, with birches (*Betula alleghaniensis*, *B. populifolia*), poplar (*Populus tremuloides*), red maple (*Acer rubrum*), and various other deciduous and coniferous species.
2. Leave shrubs as much as possible, especially along the edge of the existing corridor, promoting a feather cut.
3. Use existing accesses from OMYA Quarry.
4. Maintain on VELCO's 4-year vegetation management cycle, allowing maximum growth up to conductor safety zone. No herbicide applications in this area. A shrubby corridor similar to that of the adjacent (existing) corridor will likely develop.

Wetlands South of Town Hill Road

1. Winter construction, using mats if necessary to limit impacts.
2. Most of this area does not require clearing, as it is an open emergent marsh. Maintenance as a natural area depends mostly on retaining any watercourses and even minor surface drainages in as natural a state as possible with as little soil disturbance as possible. Work within designated access/work areas only to avoid the rare hairy fruited sedge population.
3. In the area to be cleared near the south end, leave as many shrubs as possible. Windrow slash perpendicular to slope, or along upslope (west) side.
4. Maintain on VELCO's 4-year vegetation management cycle with cutting only; no herbicide application.