Rare Plant Survey Report for the Kibby Wind Power Project

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I. INTRODUCTION

TransCanada is proposing a wind power project with 44 turbines to be located on the slopes and summits of Kibby Mountain (Skinner and Kibby Townships, 17 turbine sites) and Kibby Range (Kibby Township, 27 turbine sites) in Franklin County, Maine. The project will require turbine sites, access roads, laydown areas, and a substation to be located in this core area. The area is mountainous, with the elevations of the turbine sites located between approximately 2,500 feet and 3,220 feet above sea level.

Additionally, to deliver the generated electricity to the grid, the project will require the construction of approximately 27 miles of 115 kilovolt (kV) transmission line to a substation near Maine Rte. 27 in Carrabassett Valley Twp. The proposed 115 kV line will have a cleared corridor width of 125 feet.

To determine whether any impacts might occur to protected plant species or to rare natural communities within the montane and lowland areas affected, I performed a series of investigations and searches, directed primarily at the actual proposed footprint of the project. The methodology and results are detailed below, and recommendations as to how to avoid and minimize potential impacts are given.

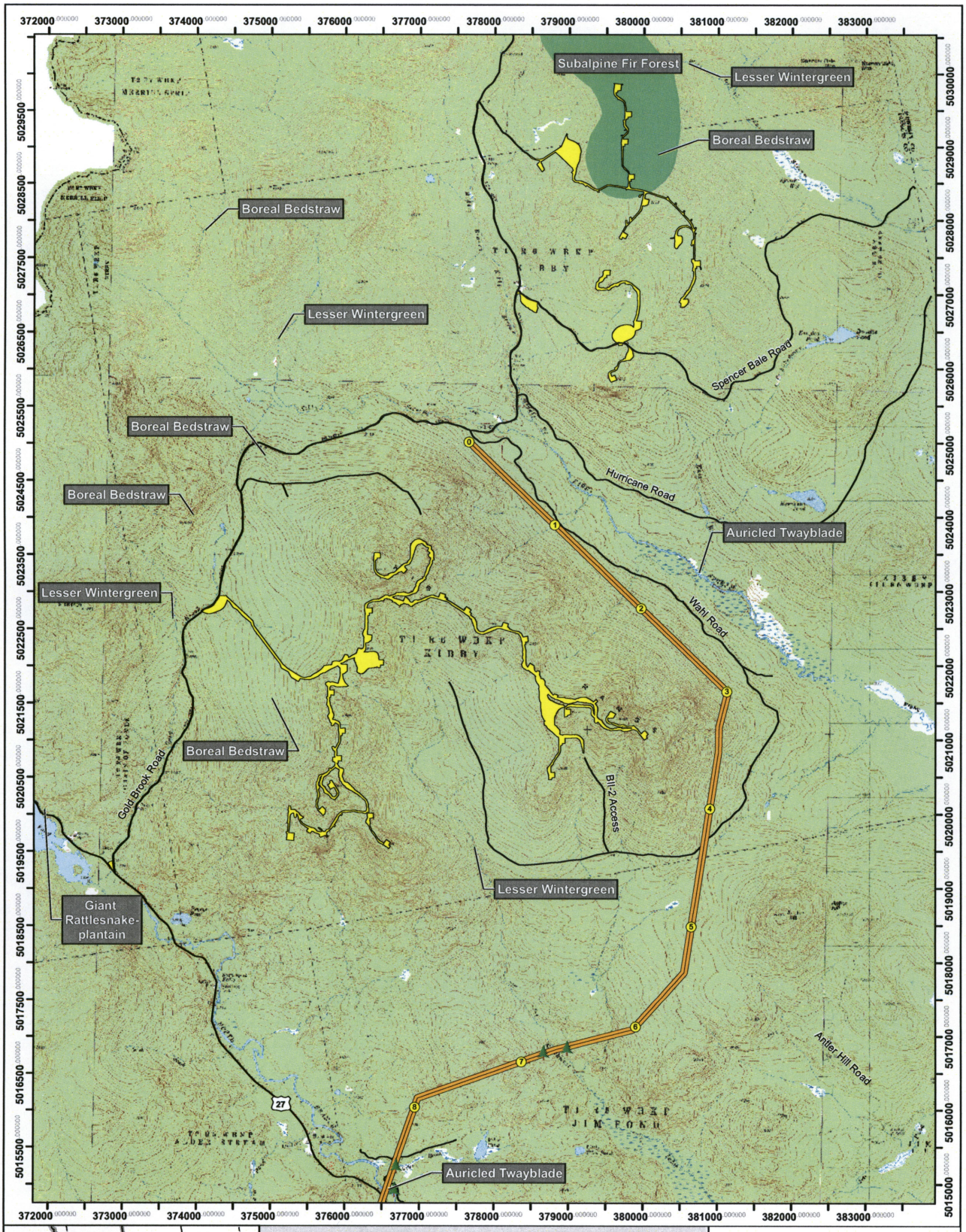
The TransCanada project is proposed on the site of a previous proposal, the Kenetech Windpower project, which was considered in the early 1990's. I was retained for similar studies for that proposal, with my findings summarized in a report to Kenetech (Gilman 1994). The TransCanada project layout is focused within a smaller project area and has a different ridge layout than the former project; the project changes in addition to the time between the two proposals has necessitated my recent review.

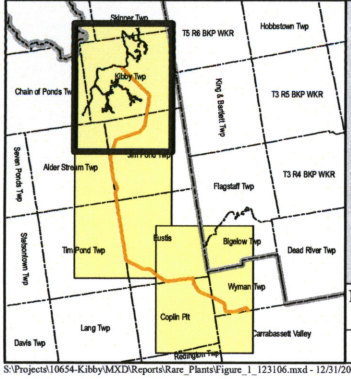
II. METHODOLOGY

Correspondence was undertaken by TRC Environmental Corporation with the Maine Natural Areas Program (MNAP; letter of Ross dated 12 May 2006) to determine whether there were any known populations for rare species within the project area and its surrounding terrain. This correspondence noted that five rare species were known within one mile of the project and transmission corridor between Kibby Township and Bigelow Substation in Carrabasset Valley and should be looked for:

Swarthy sedge	*Carex adusta*
Boreal bedstraw	*Galium kamtschaticum*
Giant rattlesnake plantain	*Goodyera oblongifolia*
Auricled twayblade orchid	*Listera auriculata*
Lesser wintergreen	*Pyrola minor*

MNAP also provided maps and shape files of these occurrences. See Figure 1a, 1b, and 1c for locations of these occurrences in relation to the project area.





Legend

- Cedar Wetland
- MNAP Rare Plant Natural Community
- Proposed Wind Turbine and Road Construction Area
- Proposed Transmission Corridor
- Road

2

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249 Western Ave
Augusta, ME 04330

Kibby Wind Power Project

Search Area and MNAP Identified Rare Plant Occurrences and Natural Communities

Figure: 1a

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

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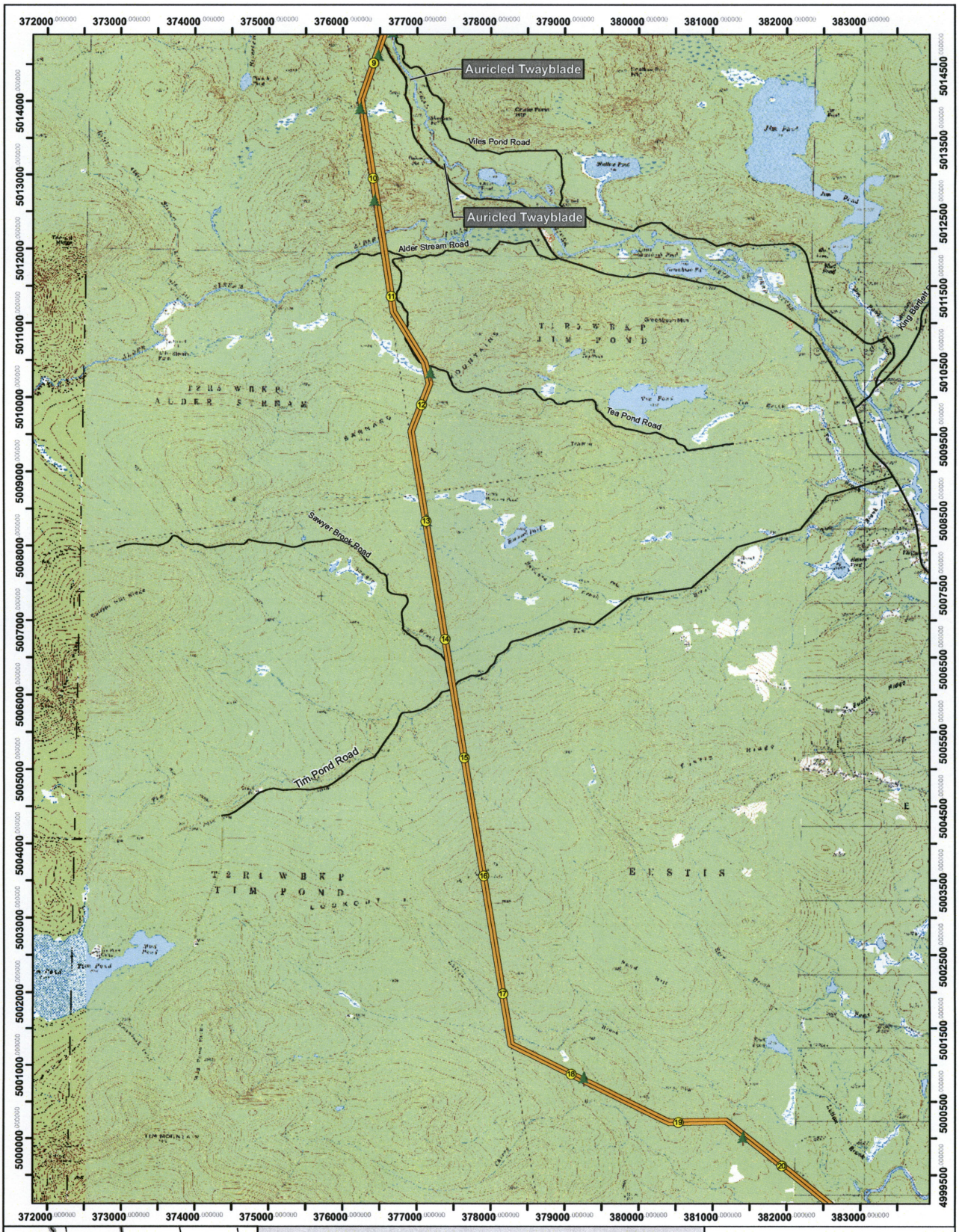

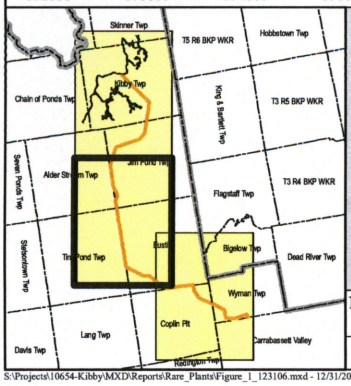

Legend

- Cedar Wetland
- MNAP Rare Plant Natural Community
- Proposed Wind Turbine and Road Construction Area
- Proposed Transmission Corridor
- Road

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

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Kibby Wind Power Project

Search Area and MNAP Identified Rare Plant Occurrences and Natural Communities

Figure: 1b

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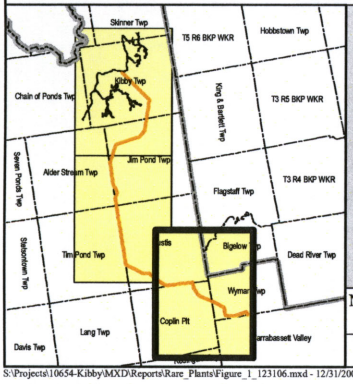

Legend

- Cedar Wetland
- MNAP Rare Plant Natural Community
- Proposed Wind Turbine and Road Construction Area
- Proposed Transmission Corridor
- Road

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

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Kibby Wind Power Project

Search Area and MNAP Identified Rare Plant Occurrences and Natural Communities

Figure: 1c

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Available literature for these species was reviewed (see Literature Cited), including the report prepared by Gilman (1994) for the previous iteration of this project. Web searches for the species in question were also undertaken to determine if new information about these species has become available, especially as to habitats and habitat management for them. Other literature in regard to regionally rare species was also reviewed, and any known to occur in the region were kept in mind during the searches.

Other resource maps and literature in regard to bedrock formations (Boone 1981; Osberg et al. 1985) were consulted, as were the USGS topographic maps and aerial photography of the project area. From these and from previous experience in the region (as summarized in Gilman 1994), priority areas for searches were chosen.

Searches were carried out in August 2005 and in August and September 2006. A total of 9 days of searches were undertaken, including roughly 7.5 days on Kibby Mountain and Kibby Range, and 1.5 days along the proposed 115 kV transmission line and substation sites. During these surveys, the growing season was well advanced and plants were readily identifiable from vegetative, flowering, or fruiting parts; on all days of the searches, the weather was dry and was conducive to efficient and thorough searches.

Searches in the ridge areas were primarily rare species habitat-based, with particular attention paid to look for "rich northern hardwood" communities, and to survey "spruce-fir" and "heart-leaved paper birch" communities, ledge outcrops, and wetlands. Otherwise, searches were directed to the locations of the access roads and turbine sites, so other habitats were searched as they were encountered. As the project has developed, some areas that were searched are no longer proposed for construction activities. Several alternative access roads, in particular, were searched. When it became apparent that one rare species, boreal bedstraw, was a more or less regular component of some wetlands on these mountains, additional wetland areas outside of the project footprint were also searched to document more thoroughly the extent of the populations.

Along the proposed 115 kV transmission line, particular attention was paid to ledge outcrops, large wetlands including northern white cedar (*Thuja*) swamps, ravines, steep slopes, and stream or river crossings. Because northern white cedar swamps often support rare species in Maine, wetland delineators for the project were requested to note any such areas along the corridor during their delineation work.

The North Branch of the Dead River was a search area of particular interest because Gilman (1994) had earlier identified auricled twayblade at this site. Other transmission route crossings of major streams (e.g., Tim Brook, South Branch of the Dead River, and Nash Stream) were also visited to look for this rare orchid.

The locations of these searches are shown on Figure 1a, 1 b, and 1c.

Some sites that had been reviewed earlier by Gilman (1994) were not revisited, e.g., the crossing of Northwest Inlet, the height of land at Lookout Hill (Eustis Ridge), and the crossing of Lutton Brook. These sites were thoroughly surveyed by Gilman in 1994, and do not have characteristic

habitat for rare plant species encountered in this part of Maine. During those surveys no rare plants were observed, and it is unlikely that rare species will be found there today.

Additional to these searches, a site visit with the MNAP Botanist, Don Cameron, was made on 11 September 2006. The purpose of this visit was to review sites and habitats where rare species had been located and to discuss potential ways to avoid and minimize potential impacts. Mr. Cameron's findings are reported in a letter to Dana Valleau, dated 27 September, 2006 (see Appendix A).

III. RESULTS and DISCUSSION

Three species of concern were observed within the project area, as follows: auricled twayblade (*Listera auriculata*), lesser wintergreen (*Pyrola minor*), and boreal bedstraw (*Galium kamtschaticum*).

- The first of these, auricled twayblade, was observed in two locations on the proposed 115 kV transmission line route, along the North Branch of the Dead River in Jim Pond Twp. and along Tim Brook in Eustis, but it was not observed on Kibby Mountain or Kibby Range.

- Two sites for lesser wintergreen were observed, one along a small unnamed perennial stream on Kibby Range and one along Tim Brook in Eustis on the proposed 115 kV transmission line route.

- Numerous sites for boreal bedstraw were observed on and around Kibby Mountain and Kibby Range, but none were observed on the proposed 115 kV transmission line corridor.

These sightings are discussed in more detail below with discussion of habitats, population sizes, and management recommendations.

Other than these limited species occurrences, the project area was found to be generally poor in habitats that would support other rare species. For example, no significant outcroppings of mafic substrates were located, nor were any habitats that typically harbor rare plant species such as rich fens, 'cove' forests, calcareous rivershore ledges, or non-forested talus slopes. No rare species were observed in northern white cedar swamps at any location. As noted, both auricled twayblade and lesser wintergreen were observed at Tim Brook, but not elsewhere; other streams do not seem to have the same type of overbank flooding and sand deposition apparent at the North Branch and at Tim Brook.

In particular, no rare species or communities were observed where the project is near or co-located with the Appalachian Trail.

III.a. Rare Species

Auricled twayblade

Auricled twayblade was observed in two locations. The first is on the banks of the North Branch of the Dead River, where the 115 kV transmission line will cross this stream. This site is in Jim Pond Township at approximately MP 8.7 of the proposed transmission line (see Figure 2). It is located on both sides of the stream, although more commonly on the southerly side (at least in the area of the crossing). This population was first observed in 1994 (Gilman 1994), and appears much the same now as then.

The second population, with only one plant observed at the time of the survey, is on the north (left) bank of Tim Brook at approximately MP 14.4 of the proposed 115 kV transmission line route (see Figure 2).

This species is ranked[1] by MNAP as S2, and it is listed as Endangered. It is known in Maine from approximately 30 locations (MNAP 2005), although most are considered historical rather than recent. Hoy (2001) listed 9 occurrences as being extant or current, the Dead River population (in Eustis) being one of them. Within the state, it is generally distributed through western and northern Maine, with outlying populations (not recent) at Mount Desert Island. Outside of Maine, it is known from New Hampshire, Vermont, New York, Michigan, Wisconsin, and Minnesota, and it also occurs in eastern Canada (USDA 2006).

The habitat of this species at the North Branch of the Dead River is similar to that described for it elsewhere (Whiting and Catling 1977; CAP 1981; Case 1987) – sandy riverbanks subject to overbank flooding. Hoy (2001) summarized this typical habitat: "on temporarily flooded or iced-scoured riverbanks in northern forests, above bankful level on sandy alluvial deposits that may be bare or mossy. ... It is often in or near riverside thickets of speckled alder (*Alnus incana* ssp. *rugosa*), and tolerates shade. It prefers moist, cool microclimates." Although occasionally found in fens or cedar swamps (CAP 1981), it appears to be quite faithful to this distinctive riverbank habitat.

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[1] The state rarity ranks employed by MNAP are as follows:

S1 Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.

S2 Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.

S3 Rare in Maine (on the order of 20-100 occurrences).

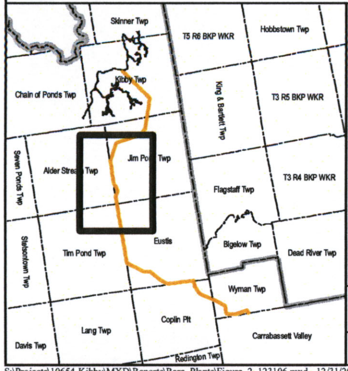
S4 Apparently secure in Maine.

S5 Demonstrably secure in Maine.

SH Occurred historically in Maine, and could be rediscovered; not known to have been extirpated.

SU Possibly in peril in Maine, but status uncertain; need more information.

SX Apparently extirpated in Maine (historically occurring species for which habitat no longer exists in Maine).



Legend

- Cedar Wetland
- Proposed Wind Turbine and Road Construction Area
- Proposed Transmission Corridor
- Road

Rare Plants Observed

- auricled twayblade orchid *Listera auriculata* 2 Observations
- boreal bedstraw *Galium kamtschaticum* 0 Observations
- lesser wintergreen *Pyrola minor* 1 Observations

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

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Kibby Wind Power Project

Transmission Line Plant Locations

Figure: 2

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The population at the North Branch of the Dead River extends along the riverbanks for several miles, at least downstream to the flat water of the Eustis dam setback near the King and Bartlett Road (Gilman 1994). It occurs in small patches of one to several plants in level areas of sand deposition, or under low shrubs and herbs on the crest of the bank. Overall, it likely consists of hundreds or thousands of plants scattered along this river.

Hoy (2001) cited changes to the hydrological regime from dams and dam releases, and from logging as the major threats to this species in New England. Logging to a stream's edge may increase sunshine in this critical habitat, promoting other species to the detriment of the twayblade, and logging roads may alter stream hydrology. Threats from invasive alien plants were considered (Hoy 2001) to be minimized by the general presence of alders in this habitat, as many invasive aliens are shade-intolerant.

Photo: A. V. Gilman, 1994, Jim PondTwp.

Recommendations for the Project

Ross (2006) recommended that "every effort be made to minimize impacts to these documented occurrences [of rare plants]." She especially recommended the avoidance of "inadvertent impacts to soil and vegetation" and suggested a policy of clearly marking "no disturbance zones" adjacent to construction areas. Additionally, the following are recommended for the populations of auricled twayblade:

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

Lesser wintergreen

Lesser wintergreen was observed in two locations, in very small numbers at both. The first site is along a small perennial stream on the southeast ridge of Kibby Range (see Figure 3). Here, it grows on the steep bank near the water's edge, associated with various mosses and other pyrolids (e.g, shinleaf, *Pyrola elliptica* and green shinleaf, *P. chlorantha*). This particular stream drains a small seep-slope, and upslope within the wetland are such species as boreal bedstraw, western sweet-cicely (*Osmorhiza berteroi*), pink pyrola (*Pyrola asarifolia*) and Braun's holly-fern (*Polystichum braunii*) – all evidence of somewhat 'enriched' soils and perhaps of a small inclusion of a different bedrock underlying this section. Here, 5 plants were observed (one was collected for a voucher specimen).

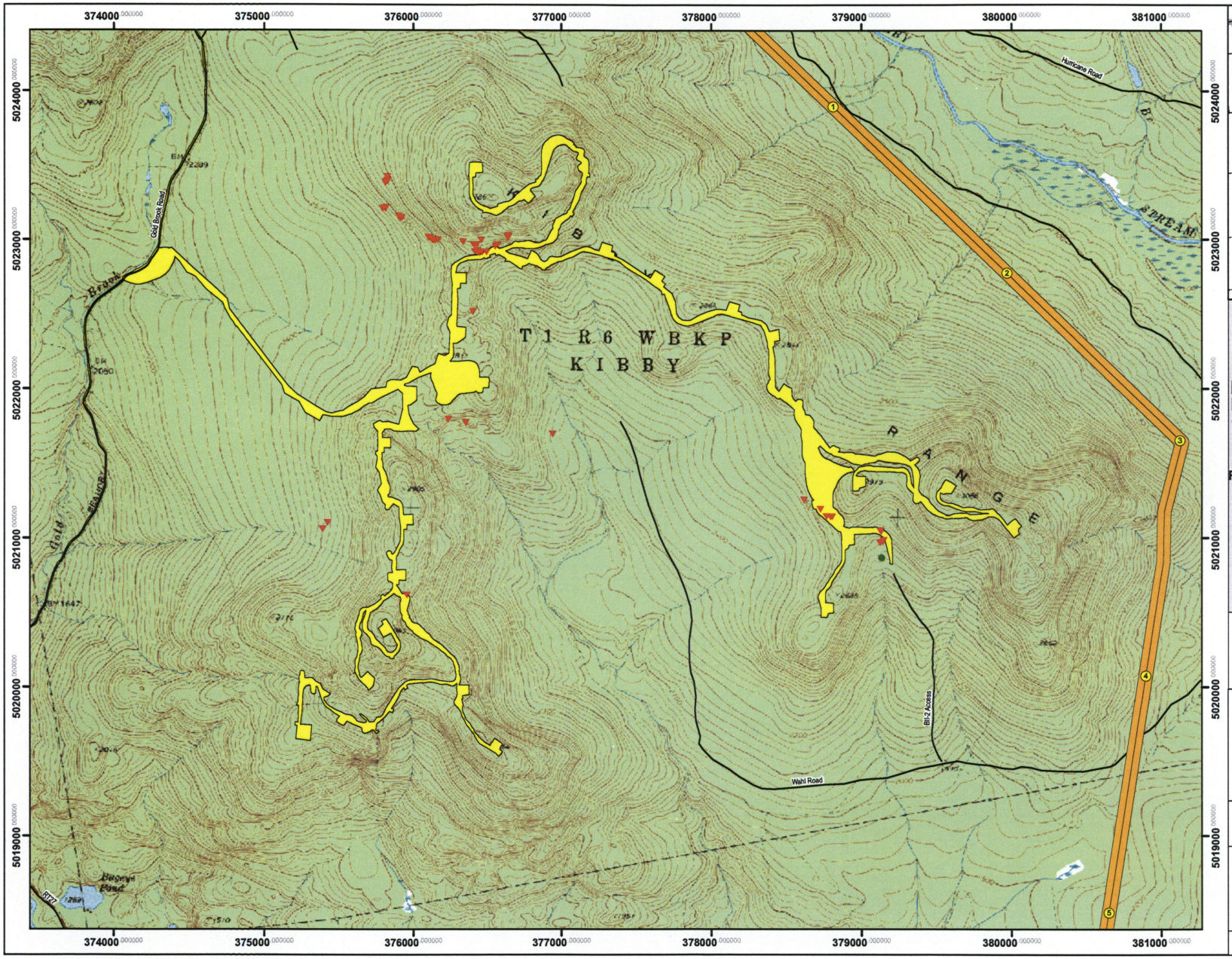
The other population, of similar size, was observed on the south (right) bank of Tim Brook where the 115 kV transmission line will be located (see Figure 2).

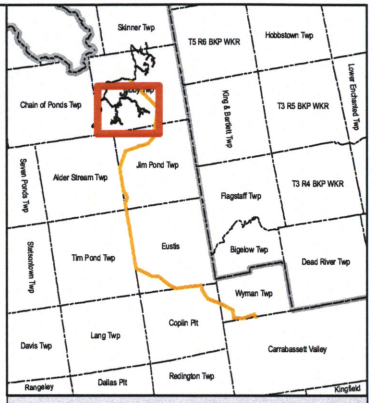
Lesser wintergreen is ranked by MNAP as S2, and is considered of Special Concern, although it is not listed as threatened or endangered. It is known in Maine from approximately 14 sites (inclusive of these two), of which 12 are recent. These are concentrated in the western mountains, with others in northern central and northern Maine. Outside of Maine it is known from New Hampshire, Vermont, New York, Michigan, Wisconsin, Minnesota, and numerous western (mountain) states, as well as Alaska and Canada (USDA 2006).

Little is known of its habitat requirements, except as can be determined from observations of the known populations, all of which are quite small. It is restricted to shady sites in the northern forests, and usually seems to be associated with small streams. It is often growing among mosses, on small mounds or knolls.

Recommendations for the Project

- Flag both micro-sites and avoid during project clearing.
- Minimize clearing of shrubby vegetation to maintain shade.
- Care in clearing and stringing lines to minimize foot traffic at streambank.
- Mark sites with "Sensitive Resource Area" signs during construction.
- Add notation on the site plans and add to long-term vegetation management plans so that impacts will not occur in future.
- Monitor for 3 years after construction, with final report to make recommendations in regard to vegetation management.





Legend

- Proposed Wind Turbine and Road Construction Area
- Proposed Transmission Corridor
- Road
- Cedar Wetland

Rare Plants Observed

auricled twayblade orchid	*Listera auriculata*	0 Observations
boreal bedstraw	*Galium kamtschaticum*	51 Observations
lesser wintergreen	*Pyrola minor*	1 Observation

Data Notes:

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

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Kibby Wind Power Project

B Ridge Series Plant Locations

Figure: 3

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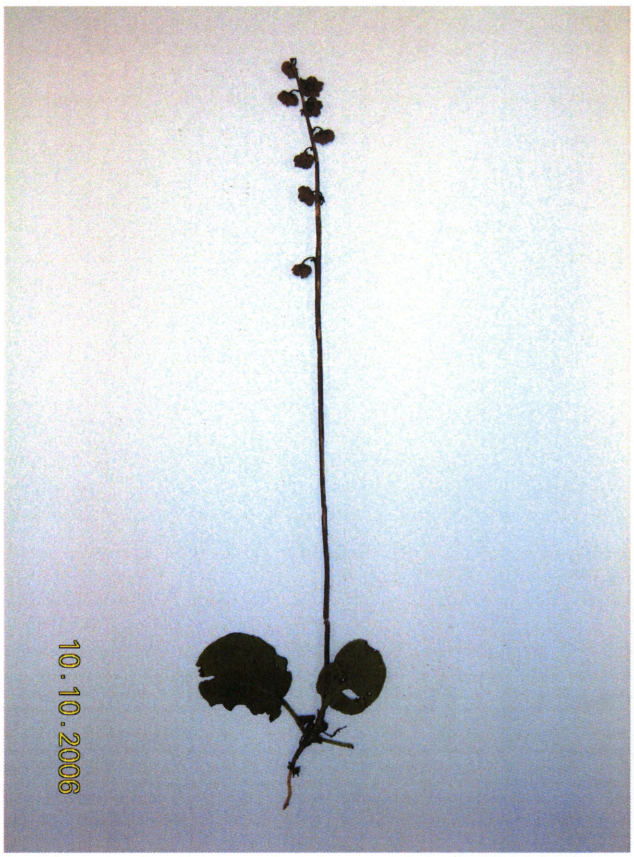


Photo: A. V. Gilman, 2006, collection from Kibby Range, Kibby Twp.

Boreal bedstraw

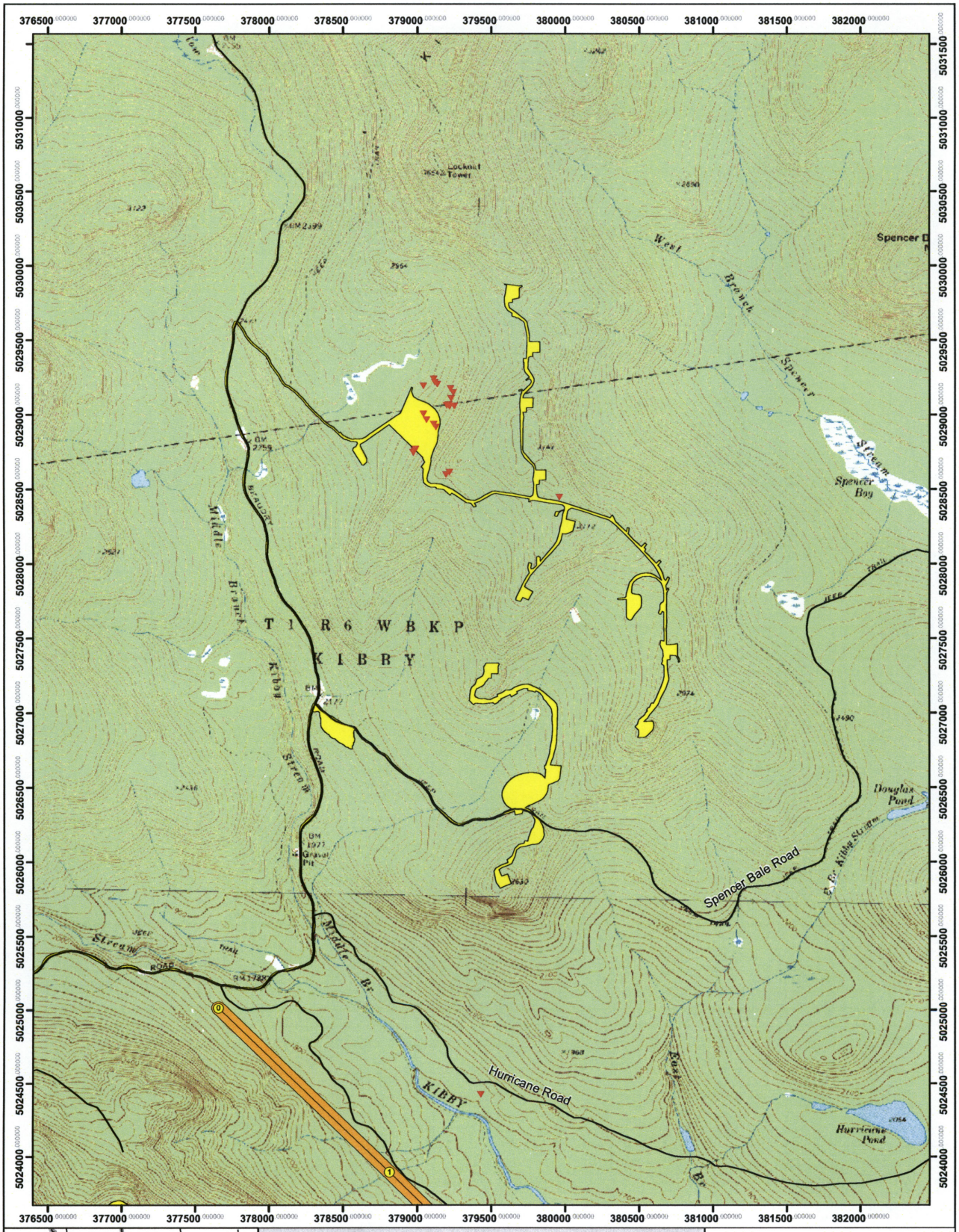
Boreal bedstraw was observed in numerous locations on Kibby Range, on Kibby Mountain, and at one site in Kibby Stream valley (see Figures 3 and 4). All of the populations are associated with northern hardwood forest and with mixed forest and none were observed in the spruce-fir zone that characterizes the summits of these mountains. The highest elevation that populations were observed is in a seep/wetland area on the southern half of Kibby Mountain, at an elevation of approximately 2,900 feet (ca. 880 m). The lowest elevation the species was found was at approximately 1,700 feet in Kibby Stream valley at the base of the south end of Kibby Mountain. Most populations located during surveys for the project are on the mid-slopes of the mountains (ca. 2,500'-2,800', 760 m to 850 m), generally just below a major topographic 'break' that defines the upper slope/mid-slope interface, and nearly all are in jurisdictional wetlands.

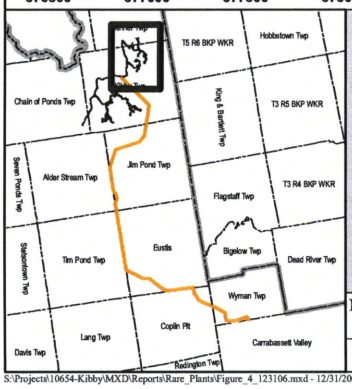
On Kibby Mountain, it was observed in two locations. In one of these areas several sub-populations are present within a large area that has scattered isolated wetlands. The overall population at this location consists of at least several hundred plants. The difficulty of estimating population sizes is noted, because this species is rhizomatous, with often more than one stem per plant, and because it grows more or less inter-matted with other low herbs. In general, the habitats within the project footprint on Kibby Mountain are dominated by spruce-fir forests with only a few wetlands and are therefore not conducive to this species.

On Kibby Range, it was found at many sites; in fact, practically every small seep wetland found above 2,500 feet in elevation that was surveyed harbored boreal bedstraw, generally in discrete populations numbering an estimated 25-100 plants at each site.

The plant was also observed in one patch at a relatively low elevation, at approximately 1,700 feet above sea level, in Kibby Stream Valley near the south end of Kibby Mountain.

Boreal bedstraw has been ranked by the MNAP as S2 (i.e., 6-20 occurrences) and is proposed as a Threatened species. The majority of the Maine populations are in the western mountains of the state, with only one outlying population east of Moosehead Lake at present (MNAP Fact Sheet). It was previously documented by MNAP from 11





Legend

- Cedar Wetland
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- Proposed Transmission Corridor
- Road

Rare Plants Observed

- auricled twayblade orchid *Listera auriculata* 0 Observations
- boreal bedstraw *Galium kamtschaticum* 23 Observations
- lesser wintergreen *Pyrola minor* 0 Observations

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

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Kibby Wind Power Project

A Ridge Series Plant Locations

Figure: 4

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sites in Kibby and Skinner Townships (see Figure 1a). Most of the known populations in Maine are considered current. Outside of Maine, it is known from New Hampshire, Vermont, New York, Michigan, and Washington, as well as Alaska and Canada (USDA 2006).

After review of the data and several of the sites in the field, MNAP considers the populations found during the current surveys to constitute two "element occurrences" (EO): one for the plants found north of Kibby Stream, one for those found south of Kibby Stream around Kibby Range (see Appendix B, e-mail from Goodrich, 2006).

The habitat for boreal bedstraw is discussed in a federal Bureau of Land Management plan for it in the Cascade Mountains of western Washington State (BLM 2006):

> "In general, this species grows on low angle slopes with saturated soils, under dense shrub (or in some cases ladyfern) thickets, in old-growth forest canopy gaps, from 500-1166 m (1500-3500 ft.) in elevation. There are exceptions: one of the largest and most vigorous populations in the Cascades occurs on steep talus with a dense shrub cover, but this site had surface seepage.
>
> "Canopy gaps can be formed by a variety of processes but the gaps where *Galium kamtschaticum* occurs appear to be the result of saturated soils, i.e., it is simply too wet for tree establishment in these areas. These gaps tend to be relatively narrow areas within the forest, so light penetration is modified by the surrounding stand. *Galium kamtschaticum* does seem to require shade because it is usually found underneath dense shrub cover and not in full sunlight. The few *Galium kamtschaticum* stems that were observed growing in direct sunlight were somewhat chlorotic."

This description is remarkably similar to the sites where it was observed on Kibby Mountain and Kibby Range – almost always in a wetland area that was characterized by groundwater discharge (i.e., a "seep") and almost always in dappled shade in a canopy-gap.

It was not observed in any area along the proposed 115 kV transmission line. Nor, in fact, was it observed in any "clearcut" area, although a few populations were seen in partially harvested areas. It may be present in 'clearcuts' but if so, it seems to be suppressed by the strong sunshine vs. the dappled sunshine of the more 'natural' locations it was observed.

Because the entirety of the potential habitats on these mountains was not searched, it is likely that more populations of boreal bedstraw occur than were observed. When the 2006 survey data is added to the previously known locations, it becomes apparent that this plant is widespread and locally common in appropriate habitat in the mountains found in Kibby and Skinner Townships. Considering the number of sites now known in this vicinity, by extrapolation it is likely that numerous others occur in similar habitats found on other nearby mountains in the Chain Lakes massif (i.e., Sisk Mountain, Caribou

Mountain, and Spencer Bale Mountain, etc.). Note, however, that areas within the project footprint that were not reviewed (e.g., the summits of the western 'arm' of Kibby Range), are dominated by spruce-fir forest and are unlikely to support this species.

Photo: A. V. Gilman 2006, Kibby Twp.

Recommendations for the Project

- Flag any populations that are within 50' of the project footprint limits.
- Mark sites with "Sensitive Resource Area" signs during construction.
- Minimize tree clearing along roads near known populations.
- Design culverts and waterbars not to discharge water into populations.
- Add notation on the site plans so that impacts can be avoided in future.
- Monitor sites that are adjacent to construction once, at 3 years after construction.

Other Plants

MNAP had identified one additional species, giant rattlesnake plantain (*Goodyera oblongifolia*; S2, endangered), occurring near the project area in Chain of Ponds Twp. (Ross 2006). No populations of this species were observed within the areas searched.

Swarthy sedge (*Carex adusta*) was mapped by MNAP in a series of borrow pits near Maine Rte. 27, in the vicinity of the 115 kV transmission line. This site well outside of the project footprint, and no borrow pit habitats occur along the proposed corridor. No plants of swarthy sedge were observed.

Five additional species of plants that were encountered at various locations within the project scope have in the past considered to be of concern but are no longer listed by MNAP because within the past decade they have been found to be more common than earlier known: variegated scouring-rush (*Equisetum variegatum*), woodland cudweed (*Omalotheca sylvatica*), western sweet-cicely (*Osmorhiza berteroi*), pink pyrola (*Pyrola asarifolia*) and Braun's holly-fern (*Polystichum braunii*). Two of these, western sweet cicely and pink pyrola, were discussed by Gilman (1994). Based on the numbers encountered within the project area, MNAP's ranking of these species as S3 or S4 (i.e., too common to be listed as special concern, threatened, or endangered) appears to be justified.

LITERATURE CITED

Boone, G.M. 1981. Preliminary bedrock and brittle fracture map of the Sherbrook 2° quadrangle. Maine Geological Survey open-file report No. 81-2. Augusta.

BLM (Bureau of Land Management). 2006. Online at www.blm.gov/or/plans/surveyandmanage/SP/VascularPlants/galiumkamtschaticum.htm Accessed 9 October 2006.

Critical Areas Program. 1981. Rare Vascular Plants of Maine. State Planning Office. Augusta. 656 pp.

Gilman, A. V. 1994. Rare, Threatened and Endangered Plant Surveys for Kenetech Windpower's proposed Turbine String and 115 kV Transmission Line in Franklin County, Maine. W. D. Countryman Environmental. Northfield, VT.

Case, F. W. Jr. 1987. Orchids of the Western Great Lakes region, revised ed. CRanbrook Institute of Science. Bloomington Hills, MI.

Haines, A. and T. F. Vining. 1999. Flora of Maine. V. F. Thomas Co. Bar Harbor.

Hoy, Joann M. 2001. *Listera auriculata* (Auricled Twayblade) Conservation Plan. New England Plant Conservation Program. Framingham, MA. Online at www.newfs.org/conserve/pdf/Listeraauriculata.pdf Accessed 9 October 2006.

Hudson, W. D., Jr., D. Parella, M. Calderera and K. Wolf. 1986. Old growth forests, subalpine forest, and alpine areas in the Bigelow Reserve, Mahoosuc Mountains, and the Baldpates. Maine State Planning Office. Augusta.

Maine Natural Areas Program. March 2005. Rare, Threatened and Endangered Plant Taxa. Augusta. On-line at www.mainenaturalareas.org/docs/rare_plants/links/plant_list.pdf. Accessed 1 August 2006.

Maine Natural Areas Program. 2004. *Listera auriculata*, *Galium kamtschaticum*, and *Pyrola minor* Rare Plant Fact Sheets.

Ross, R. 2006. Letter to Dana Valleau dated 12 May 2006.

Osberg, P. H., A. M. Hussey II, and G. M. Boone. 1985. Bedrock Geologic Map of Maine. Maine Geological Survey, Department of Conservation. Augusta.

USDA (US Department of Agriculture). 2006. Plants Database. Online at http://plants.usda.gov. Accessed 10 October 2006.

US Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants. 50 C.F.R. 17.12.

Wallace. J. C. 1976. The Orchids of Maine. University of Maine at Orono Press. Orono.

Whiting, R. E. and P. M. Catling. 1977. Distribution of the auricled twayblade (*Listera auriculata*) in Canada and description of new stations in southern Ontario. Canadian Field-Naturalist 91: 403-406.

APPENDIX A

September 27, 2006

Dana Valleau
E-Pro Consulting
249 Western Ave
Augusta, ME 04330

Dear Mr. Valleau,

On Thursday September 11, 2006 as per your request I visited the site for the proposed wind power generation facility on Kibby Range and Kibby Mountain in Skinner Twp, Maine. Also along for the survey were both you (Dana Valleau) and Arthur Gilman. The purpose of the site visit was to determine if the proposed location of the wind power generation facility will jeopardize an occurrence of a Fir- Heart-leaved Birch Subalpine Forest Community as well as occurrences of two rare plant species, Auricled twayblade (*Listera auriculata*) on the Dead River and Boreal Bedstraw (*Galium kamtschaticum*) on Kibby Range.

We hiked the southern ridge of Kibby Mountain into an area that falls within the mapped polygon of the Fir- Heart-leaved Birch Subalpine Forest Community. Observations that were made included 1) that the area had historically received a heavy harvest and that current tree density and size reflected to some degree the growth response following the historic harvest, 2) the trees within the southern most portion of the mapped polygon were considerably larger (40-50 feet tall) than what is characteristic of a Fir- Heart-leaved Birch Subalpine Forest Community, and 3) further upslope (northward) on the ridge, the vegetation was characteristic of the mapped subalpine community. Conclusions from the survey of this area at Kibby Mountain are that the Maine Natural Areas Program will modify the polygon of this community to better reflect where the community occurs on the mountain and that the proposed entry into the southern most end of the community to construct and maintain proposed wind power facilities will result in only a minor impact to the subalpine community. If no other facilities are constructed on Kibby Mountain than what is currently proposed, the Subalpine Forest Community should continue function as a viable community for the foreseeable future.

We also hiked sections of Kibby Range, a mountain area where the rare plant Boreal Bedstraw has been documented. We looked at two areas where the proposed access road would likely impact occurrences of the Boreal bedstraw. Options for moving the road away from the plants were discussed. Of interest during the hike was that we encountered the Boreal Bedstraw in four additional locations, all of which were outside of the project area. After observing the species in these other locations, it became apparent that the construction of the access road on Kibby Range would only impact a small amount of the species habitat on the mountain. The

Maine Natural Areas Program suggests that to insure the accuracy of this conclusion, some additional survey work be done to document that the Boreal bedstraw is in fact more wide spread at the site than current data demonstrates.

A third site that was visited was the shore of the Dead River at the location where the proposed transmission line is to cross. A population of the Auricled twayblade has been documented here and some of the plants were still identifiable at the time of the visit. At this site the Auricled twayblade occurs in sandy soil on the riverbank generally within 10-15 feet of the river. Balsam fir and red maple trees also occur along the river bank and the adjacent narrow floodplain terrace. Arthur Gilman indicated that during his botanical survey of the area he had also observed Auricled twayblade plants spread over a long distance downstream of the crossing site. That information, along with the fact that Auricle twayblade has been previously documented by other surveyors at several areas up and down the Dead River suggests that the potential impact from the transmission line will not cause a significant impact to this species existence along the Dead River. We also note that the transmission line may not be incompatible with the species at this site as it will be well above the river, and that the alder and other shrubs will remain along the river bank. Removal of larger balsam firs and red maples from the site should be done when the ground is frozen and no machinery should operate along the river bank within 10 – 15 feet of the river.

Please let me know if there are any questions regarding the summary of this site visit. An invoice for $675.00 (13.0 hrs.) for the work completed will be forwarded to your office in a separate mailing.

Sincerely,

Donald S. Cameron, Botanist/Ecologist
Maine Natural Areas Program
Department of Conservation
#93 State House Station
Augusta, ME 04333-0093
(#207-287-8041/don.s.cameron@state.me.us

APPENDIX B

MessageFrom: Goodrich, Raquel [Raquel.Goodrich@maine.gov]
Sent: Monday, December 04, 2006 10:37 AM
To: Valleau, Dana
Cc: gbenvironmental@earthlink.net
Subject: RE: Kibby Wind Power Project RTE plant survey info

Hi Dana,
Thanks for your patience; our office was moving in the month of November, so data was put on hold.

Thanks also for the plant forms and the shapefile; I received them all and was able to access the shapefile just fine. The data looks complete; we'll be processing it this winter.

In terms of the Galium kamtschaticum observations, they will make up two EOs: one EO for the observations NE of Middle Branch Kibby Stream, and the second EO for all of the observations South of Kibby Stream.

Thank you,
Raquel Goodrich
Information Manager
Maine Natural Areas Program
P: 207-287-8046
F: 207-287-8040

From: Valleau, Dana [mailto:DValleau@eproconsulting.com]
Sent: Wednesday, November 29, 2006 2:52 PM
To: Goodrich, Raquel
Cc: gbenvironmental@earthlink.net
Subject: RE: Kibby Wind Power Project RTE plant survey info

Hi Raquel,

Since I haven't heard back from you, I would like you to confirm that you don't need anything else for your database.

And have you had time to figure out how many occurrences our Galium kamschaticum observations will be considered?

Dana Valleau
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