

Section 9. UNUSUAL NATURAL AREAS

9.1. INTRODUCTION

In 2016 and 2019 Stantec Consulting Services Inc. (Stantec) conducted desktop and field evaluations to determine the potential presence of unusual natural areas relative to botanical resources within or in the vicinity of the proposed Downeast Wind Project (Project) area. The Preservation of Unusual Natural Areas regulation under the No Adverse Environmental Effect Standard of Maine Site Law states that the applicant must demonstrate that the proposed development will not have any adverse effect on the preservation of unusual natural areas either in or near the development area, 06-096 CMR 375.12.⁵This rule further defines unusual natural areas as "...any land or water area, usually only a few acres in size, which is undeveloped and which contains natural features of unusual geological, botanical, zoological, ecological, hydrological, other scientific, educational, scenic, or recreational significance."

Stantec conducted an evaluation to ensure that the Project will not have an adverse effect on rare, threatened and endangered (RTE) plant species, which are part of the unusual natural areas. The areas that were evaluated included proposed turbine locations, electrical collection lines, substation, access roads, crane paths, and laydown areas, and any other Project component that might impact these resources. The following sections discuss unusual natural areas relative to botanical resources including RTE plant species as well as rare and exemplary natural communities.

9.2. AGENCY CONSULTATION

The Applicant met with the Maine Natural Areas Program (MNAP) on January 17, 2020 to introduce the Project and discuss the results of field surveys relative to botanical resources. At the meeting, MNAP requested additional information regarding anticipated vegetation management practices following construction as well as Project infrastructure components including the potential limits of disturbance and population data for mapped RTE plant locations.

On February 16, 2021, following finalization of the Project layout 039, Stantec provided MNAP with updated information including shapefiles for: the limits of disturbance, 2016 and 2019 RTE plant locations, RTE plant impact areas, potential RTE plant habitat areas identified based on the post-field survey desktop assessment, and a draft table of potential RTE plant impacts.

A follow-up teleconference was held on March 2, 2021 to present and discuss changes to the Project and potential impacts to RTE plants.

The USFWS Information, Planning, and Consultation (IPaC) online review process was performed for the Project and an official species list was generated on February 18, 2021. No federally Endangered Species Act plants were identified within the Project area (see Section 7).

9.3. DESKTOP REVIEWS AND FIELD SURVEYS

Desktop reviews and field surveys were conducted in order to determine the presence of unusual areas relative to botanical natural resources present within the Project. A complete discussion of

⁵ Available Online: <http://www.maine.gov/dep/land/sitelaw/index.html>

the methodology and results of the desktop assessments and field surveys is included in Exhibit 9-1.

Rare, Threatened, and Endangered Plants

Stantec conducted an initial RTE plant field survey between September 12 and September 30, 2016. Additional surveys were conducted between August 5 and August 27, 2019 (Exhibit 9-1). Two RTE plant species were observed within portions of the Project area: bog Jacob's-ladder (*Polemonium vanbruntiae*) and Canada mountain-rice grass (*Piptatherum canadense*). Bog Jacob's-ladder is listed as Endangered by MNAP and Canada mountain-rice grass is listed as Special Concern.

During the 2016 and 2019 field surveys, one location of bog Jacob's-ladder was observed and contained approximately 500 plants within a 12,500 square foot area. In addition, approximately 30,600 flowering stems of Canada mountain-rice grass were documented across approximately 685 mapped locations totaling approximately 23.5 acres within the Project area and representing one of the largest identified metapopulations in Maine.

A desktop assessment was conducted in the winter of 2021 to identify additional potential habitat areas for RTE plants. The assessment reviewed modifications of the Project layout 039 which had minor inclusions of previously unsurveyed areas. Potentially suitable habitat for bog Jacob's-ladder was identified in two areas associated with riparian shrub-dominated wetlands with habitat features, consistent with those of the known location nearby (see Exhibit 9-1, Figures 18 and 20). Potentially suitable habitat for Canada mountain-rice grass was identified on the edges of blueberry fields, early successional upland shrublands, and blueberry fields that are not currently being maintained (see Exhibit 9-1, Figures 2, 4, 7, 17–22, and 28–29). For the purposes of this permit application, the Applicant has assumed presence of RTE plants within potentially suitable habitats identified during the post-field survey desktop analysis.

Exemplary Natural Communities

The Project area is located adjacent to the Great Heath, an extensive wetland ecosystem complex designated as a Focus Area of statewide significance.⁶ The Great Heath supports rare and exemplary natural communities including Domed Bog Ecosystem, Sheep Laurel Dwarf Shrub Bog, Leatherleaf Boggy Fen, Huckleberry-Crowberry Bog, Northern White Cedar Woodland Fen, Sedge-Leatherleaf Fen Lawn, and Bluejoint Meadow. The proposed underground collection line traverses the northwestern portion of the Great Heath at the Pleasant River and Bog Stream / Beaver Meadow Brook crossing locations between the northern turbine array and the southern turbine array (see Exhibit 9-1, Figures 18 and 20).

9.4. IMPACT ANALYSIS

Rare Threatened, and Endangered Plants

Bog Jacob's Ladder

The Project will avoid direct impacts to the one location of observed bog Jacob's-ladder. To avoid any direct or indirect impacts to the two potential suitable bog Jacob's-ladder habitat locations, the Project will utilize horizontal direction drilling for the installation of collection lines. Therefore, no adverse environmental effect to this species is anticipated.

⁶ https://www.maine.gov/dacf/mnap/focusarea/great_heath_focus_area.pdf

the Project will utilize horizontal direction drilling for the installation of collections lines. Therefore, no adverse environmental effect to this species is anticipated.

Canada Mountain-rice Grass

Canada mountain-rice grass occurs within the Project area in a variety of open and early successional upland habitats with a history of past and ongoing disturbances and is evidently tolerant of and dependent upon natural and anthropogenic disturbances. The presence of approximately 30,600 specimens occurring within approximately 685 locations within the Project area strongly suggest that current land management practices associated with the blueberry barrens may be benefiting the species at these particular locations.

Permanent impacts are anticipated from construction of access roads, crane paths, and turbine foundations and pads as these construction activities will include grading and filling and result in removal of native topsoil, importation of gravel and other fill material for travel surface and foundation construction, soil compaction, and permanent habitat transformation. It is likely that over time through physical natural processes including soil weathering and accumulation of organic material, portions of the turbine pads may provide suitable habitat for Canada mountain-rice grass and allow for expansion of populations into turbine pad areas. However, the amount of potentially suitable habitat that may be provided over time is difficult to quantify for the purpose of these analyses.

Temporary impacts to Canada mountain-rice grass populations are anticipated in areas associated with the vegetation clearing limits beyond the edge of grading and filling areas, installation of the underground collection line, and the staging area. In these areas, vegetation will be removed and soil will be disturbed during construction but the areas will then be restored to their pre-construction condition by reinstalling topsoil and planting of a restoration seed mix to provide conditions that are favorable for recruitment and reestablishment of Canada mountain-rice grass. Construction mats will be utilized in areas of occupied or potential Canada mountain-rice grass habitat along the edges of blueberry fields and other open areas to further minimize soil disturbance during construction. The approximately upper 12 inches of topsoil will be stockpiled and segregated from subsoil during trenching of the underground collection line and reinstalled following completion of construction. It is anticipated that this stockpiled topsoil may contain a seed bank for Canada mountain-rice grass and will provide a favorable soil media for reestablishment following re-installation. The underground collection line will be maintained as open habitat, thereby providing favorable conditions for Canada mountain-rice grass recruitment and establishment.

Permanent and temporary impacts to the identified Canada mountain-rice grass populations and potentially suitable habitats have been estimated for the Project. The proposed Project will result in approximately 1.35 acres (58,762 square feet) of permanent impact and 1.02 acre (44,535 square feet) of temporary impacts to existing Canada mountain-rice grass populations. An additional 2.29 acres (99,653 square feet) of permanent impacts and 8.94 acres (389,406 square feet) of temporary impacts are anticipated in areas identified as potential Canada mountain-rice grass habitat, based on the post-field survey desktop assessment. Table 1 summarizes the proposed impacts to Canada mountain-rice grass by the Project.

Table 9-1. Summary of Canada Mountain-rice Grass Project Impacts

Impact Type	Project Component	Canada Mountain-Rice Grass Populations			Canada Mountain-Rice Grass Populations Desktop Assessment Areas	
		Square Feet	Acres	Proportion of Total Population ¹	Square Feet	Acres
Permanent	Access Road	5,416.4	0.12	0.53%	26,099.6	0.60
	Crane Path	6,764.0	0.16	0.66%	13,214.6	0.03
	Grading Limits	10,921.7	0.25	1.07%	45,383.2	1.04
	Turbine Pad	35,660.0	0.82	3.49%	14,955.2	0.34
	TOTAL	58,762.1	1.35	5.74%	99,652.7	2.29
Temporary	Clearing Limits	3,267.6	0.08	0.32%	9,672.0	0.22
	Clearing Limits - Underground Collection	34,043.0	0.78	3.33%	379,733.8	8.72
	Staging Area	7,224.1	0.17	0.71%	0.0	0.00
	TOTAL	44,534.7	1.02	4.35%	389,405.8	8.94

¹ Based on a total observed population size of 23.5 acres

The shifting of turbines from open blueberry fields to forested areas have minimized impacts to open habitats. The use of existing access roads within the Project area also limits impacts to the identified populations. These two avoidance and minimization measures undertaken during siting of the Project have greatly reduced potential impacts to Canada mountain-rice grass and have been implemented to the greatest extent practicable. However, the Project will directly impact Canada mountain-rice grass individuals, including potential populations within areas that were not surveyed, the species is demonstrably tolerant of anthropogenic disturbances and is expected persist following temporary ground disturbances. The loss of individual specimens during construction and/or habitat conversion will represent only a small fraction of the larger metapopulation of the surrounding landscape and is expected to be in part offset by the creation and maintenance of additional open sandy upland habitat elsewhere within the Project area.

Exhibit 9-1 provides additional details on the anticipated impacts to RTE plants.

Exemplary Natural Communities

The Project is not anticipated to have an adverse environmental effect on rare or exemplary communities. The underground collection line will be installed via directional drilling at the Pleasant River and Bog Stream / Beaver Meadow Brook crossings within the Great Heath Focus Area, thereby avoiding adverse impacts to portions of this exemplary wetland resource. No other rare or exemplary communities were identified within the Project area.

9.5. VEGETATION MANAGEMENT FOR CANADA MOUNTAIN-RICE GRASS

As noted above, Canada mountain-rice grass is associated with open and early successional upland habitats and it is undoubtedly more widespread in commercial blueberry field and early successional landscapes beyond the survey limits for this Project. One of the primary threats to Canada mountain-rice grass is succession of these open habitats to closed-canopy forests. Historic and on-going land management including blueberry farming and timber harvests have greatly benefited Canada mountain-rice grass populations in the landscape associated with the Project area by providing available open and early successional habitats. The Project components may further create and/or enhance Canada mountain-rice grass habitat through the creation and maintenance of open habitats associated with electrical collection corridors and the edges of access roads, crane paths, and turbine pad clearings within previously forested areas.

A GIS analysis was conducted by Stantec to identify forested areas associated with temporary Project land disturbance areas including the underground collection line and clearing limits around turbine pads and crane paths, and staging areas that share the same underlying moderately well drained to excessively drained soil types as those associated with known Canada mountain-rice grass populations. It is believed that the creation and maintenance of open and disturbed Project areas associated with moderately well drained to excessively drained sandy loam and loamy sand soils proximal to known Canada mountain-rice grass locations will provide suitable habitat that may allow for recruitment and expansion of Canada mountain-rice grass populations over time into these newly created habitat areas. A total of approximately 142 acres of forest will be converted to open habitat that may be potentially suitable for Canada mountain -rice grass following construction based on this analysis. The amount of potentially suitable habitat that will be created by the Project far exceeds the approximately 3.6 acres of occupied and potential habitat for this species that will be permanently impacted by the Project.

Operation of the Project area will require ongoing vegetation management of turbine pads, access roads edges, and underground collection lines to maintain open areas with low-growing vegetation. The management of vegetation within these areas is expected to be less intense from that within commercial blueberry barrens (e.g., no burning or frequent pesticide and herbicide applications) and will likely be more favorable for long-term maintenance of Canada mountain-rice grass populations. As such, it is expected that portions of the Project area will continue to provide for and maintain habitat suitable for Canada mountain-rice grass. The following discusses specific vegetation management objectives. A Vegetation Management Plan is provided as Exhibit 10-1.

Underground Collection Line

With the exception of the two locations of directional drilling associated with potential bog Jacob's-ladder habitat, the underground collection line will be installed via trench construction methods. Construction will involve clearing of vegetation and stripping of topsoil prior to installation of the underground infrastructure. The topsoil will be segregated from the subsoil and will be reinstalled following the completion of the underground infrastructure installations. Following construction, the underground collection corridor will be maintained as an open corridor approximately 50 feet wide with native shrub and meadow vegetation. Areas of the underground collection line that are within existing blueberry fields will continue to be maintained for blueberry cultivation during the normal course of blueberry field management.

Through stockpiling and re-installing topsoil following construction, the construction of the underground collection line is anticipated to restore habitat for Canada mountain rice-grass to its pre-construction conditions by providing suitable sandy soil media which may contain a potential seed bank for reintroduction. Nearby populations of Canada mountain-rice grass are similarly anticipated to facilitate recruitment of Canada mountain-rice grass into the restored habitat areas by providing a nearby seed source.

The construction of the proposed underground collection line through presently forested areas is anticipated to increase the amount of available habitat for Canada mountain-rice grass as construction will transform forested areas into open habitats. It is expected that areas with similarly suitable sandy, well-drained soil proximal to known Canada mountain-rice grass populations may allow for recruitment and expansion of species populations into these newly created habitat areas. Vegetation will be periodically managed to maintain an open corridor and is expected to involve mowing and brush hogging. As Canada mountain-rice grass flowers and develops seed typically by mid-summer, no mowing of the underground collection line corridor will be conducted before August 15 to allow the plants to mature and release seed.

Turbine Pads

Following construction, turbine pads will be maintained as open meadow habitat and will be periodically mowed. As these areas will experience significant land disturbances during construction including grading, filling, and soil compaction, it is not anticipated that the open habitats maintained around the turbines will provide significant quantities of habitat that are suitable for Canada mountain-rice grass. It is, however, anticipated that there will be some recruitment and restoration of Canada mountain rice-grass within small, discrete microhabitats associated with turbine pad areas, particularly along the edges of the pads where construction activities are expected to be less intense than those closer to the turbine tower base. Given the low likelihood of turbine pads supporting significant Canada mountain-rice grass populations, no specific vegetation management considerations are proposed.

Access Roads

Canada mountain-rice grass occurs in several areas along the edges of existing roads associated with the Project area. Vegetation along the road shoulders is periodically maintained through flailing of woody vegetation, thereby providing open to partially open habitat within sandy well-drained soils along the edges of roads. Access roads created as a result of the Project are expected to similarly provide habitat that is potentially suitable for Canada mountain-rice grass along their road shoulders where they traverse uplands with moderately well drained to excessively drained soil proximal to existing populations. Vegetation will be maintained in a similar manner and frequency as the existing road networks. Because vegetation management along access roads is directed towards controlling encroachment of woody plants, herbaceous vegetation is generally unaffected. Therefore, no time-of-year considerations for vegetation management along access roads is proposed.

9.6. SUMMARY

In summary, two RTE plants were observed within the Project area based on field surveys in 2016 and 2019: bog Jacob's-ladder and Canada mountain-rice grass.

The Project will avoid any direct and indirect impacts to known bog Jacob's-ladder locations. Areas providing potentially suitable habitat for this species will be horizontal directionally drilled to install the underground collection line in order to avoid impacts to potential suitable habitat.

The Project is not able to avoid direct impacts to Canada mountain-rice grass. Canada mountain-rice grass occurs in nearly 700 mapped locations within the Project area, totaling approximately 23.5 acres of populations. Additional potentially suitable habitat is present throughout the edges of blueberry fields, early successional woodlands, and former blueberry fields that have not been recently maintained within and in the landscape surrounding the Project area. The Project will result in permanent impacts to approximately 1.35 acres of the mapped Canada mountain rice-grass locations and temporary impacts to approximately 1.02 acres of the mapped populations and additional impacts to unmapped populations. The permanent loss of Canada mountain-rice grass is proportionately small compared with the larger metapopulation and is not anticipated to adversely affect the persistence of this species within the associated landscape.

Permanent impacts to Canada mountain-rice grass will in turn be off-set by the creation of additional open and early successional habitat in areas that are presently forested and not currently providing suitable habitat. The creation of potentially suitable Canada mountain-rice grass is anticipated as a result of the construction of the underground collection line as well as the edges of turbine pads and shoulders of access roads in areas with moderately well drained to excessively drained soil proximal to known populations.



EXHIBIT 9-1: RARE PLANT SURVEY REPORT



**Downeast Wind Project: Rare,
Threatened, and Endangered
Plant Survey Report**

Washington County, Maine

March 16, 2021

Prepared for:

Downeast Wind, LLC

Prepared by:

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DOWNEAST WIND PROJECT: RARE, THREATENED, AND ENDANGERED PLANT SURVEY REPORT

March 16, 2021

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DOWNEAST WIND PROJECT: RARE, THREATENED, AND ENDANGERED PLANT SURVEY REPORT

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1.0 INTRODUCTION

The Downeast Wind Project (Project) is located in Washington County, Maine, in the town of Columbia, and townships T18 MD BPP and T24 MD BPP (Figures 1–32). As proposed, the Project will include up to 33 turbine locations (30 proposed sites and 3 alternate sites) with a nameplate capacity of 126 megawatts. The Project will include a series of access roads, underground collection lines, a laydown area, and a substation. An operations and maintenance facility will be located off-site along Route 1 in Columbia, Maine. In support of facility planning, engineering design, and state and federal environmental permitting efforts, Stantec Consulting Services Inc. (Stantec) conducted field surveys for rare, threatened, and endangered (RTE) plant species within the Project area in 2016 and 2019. The objectives of these surveys were to identify RTE plant species for potential siting and project planning and to support Project permitting requirements under Maine’s Site Location of Development Act.

2.0 REGULATORY BACKGROUND

In Maine, RTE plants are afforded protection under Chapter 375 Section 12 of the Site Location of Development Act (Site Law). Under this section, development or land use projects that require a Site Law permit must take measures to demonstrate that the project will not have an undue adverse effect on unusual natural areas, which includes RTE botanical and ecological features.

The Maine Natural Areas Program (MNAP) identifies and tracks RTE plants in Maine. MNAP is not a regulatory agency but will review and comment on development projects relative to RTE plants and rare and exemplary natural communities as part of the Site Law permit review process. Species listed as Endangered, Threatened, and Special Concern (rare) are provided within MNAP’s *Elements of Natural Diversity Rare, Threatened, and Endangered Plants* (September 2015) list. Species listed as Endangered or Threatened have legal status under Maine Revised Statutes Title 12 Section 544. Species listed as Special Concern do not have legal status under Maine Revised Statutes.

The U.S. Fish and Wildlife Service regulates plant species listed under the U.S. Endangered Species Act. There are three species in Maine listed under the Endangered Species Act and include Furbish’s lousewort (*Pedicularis furbishiae*), eastern prairie white fringed bog-orchid (*Platanthera leucophaea*), and small whorled pogonia (*Isotria medeoloides*). Unavoidable take of federally listed species requires permitting under Section 7 of the Endangered Species Act.



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3.0 METHODOLOGY

3.1 DESKTOP REVIEW

Stantec conducted a desktop review to identify habitats within the Project area with the potential to contain RTE plants prior to conducting field surveys. This desktop review also included reviewing aerial photography and previously known locations of RTE plants within the surrounding landscape associated with the Project area, as identified in the “Beginning with Habitat” database for the associated organized towns.¹ The results of the desktop review were used to target subsequent field surveys in habitat areas potentially suitable for RTE plant populations.

3.2 FIELD SURVEY

Stantec botanists conducted meander surveys within habitats potentially suitable for RTE plants that were identified during the desktop assessment and had the potential to be impacted by the proposed turbine locations, electrical generation corridors, and access roads based on the Project layout information available at the time of the field surveys. Additional meander surveys were conducted in representative habitats associated with the proposed Project layouts to characterize their existing condition and to confirm the findings of the desktop assessment. In general, field surveys were conducted within approximately 300 feet of proposed turbine locations and within 100 feet of the proposed centerline of the electrical generation and access road corridors to account for the anticipated area of disturbance associated with these infrastructure components². RTE plant populations were also noted if they were incidentally encountered elsewhere in the Project area. RTE plant populations locations were located with a Trimble® GeoExplorer 7X Global Positioning System (GPS) receiver. The survey path was also recorded with the GPS receiver and is presented on Figures 1–32. Approximate population size, associated species and habitat conditions, and representative photographs of any RTE species encountered were recorded.

3.3 POST-FIELD SURVEY DESKTOP ASSESSMENT

Following the completion of the 2016 and 2019 field surveys, the Project layout was modified to include additional areas. A post-field survey desktop assessment was conducted for any additional areas using the desktop review methods described in Section 3.1 and the results of the wetland delineations to evaluate their potential to support RTE plant species.

¹ Known locations of rare plants within the vicinity of the Project area were obtained through Maine’s Beginning with Habitat Program (http://beginningwithhabitat.org/the_maps/pdfs/Columbia/Columbia%20Map%202.pdf)

² The 2016 RTE surveys were conducted based on turbine and electrical corridor layouts received on August 17, 2016, and September 26, 2016, and parcel permissions received through September 26, 2016; the 2019 RTE surveys were based on linear feature layouts received on March 19, 2019, and turbine locations received on April 30, 2019, and subsequently revised turbine locations received on August 7, 2019, and linear feature alignments received on August 19, 2019.



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4.0 RESULTS

4.1 DESKTOP REVIEW

The southern portion of the Project area is largely associated with Pineo Ridge, an extensive glacial outwash delta and moraine complex dominated by sand deposits across an open landscape that is largely managed commercially for blueberry farming³. Based on the aerial photography review, several Project components including proposed turbine locations, electrical collection corridors, and access roads are within open blueberry barrens and in adjacent forested upland areas. The northern portion of the Project area is located north of the Great Heath and is associated with a series of low-elevation forested ridges (e.g., Beech Hill and Ben Tucker Mountain) and terraces adjacent to commercial blueberry barrens. The proposed electrical collection corridors traverse several large open and forested wetland complexes.

Table 1 summarizes the RTE plants that have been documented from or potentially occur in the landscape associated with the Project area based on the available information from the “Beginning with Habitat” database as well as Stantec’s past survey experience within the associated RTE plant species of interior Washington County, Maine. None of the federally listed plants in Maine have potential to occur within the Project area as the Project area is well beyond their known range limits and/or lacks suitable habitat and none were identified based on a query of the U.S. Fish and Wildlife Service Information for Planning and Consultation (IPaC) screening tool (accessed February 18, 2021). Based on these results, blueberry barrens, forested and shrub-dominated wetlands, circumneutral fens, and woodlands dominated by rocky red oak (*Quercus rubra*) provide potential habitat for RTE plants and were targeted during the field survey.

Table 1. Rare Plants Potentially Occurring in Vicinity of Project Area

Species Name	Common Name	State Status	State Rarity Rank	Typical Habitat*
<i>Piptatherum canadense</i>	Canada mountain-rice grass	Special Concern	S2	Dry, sandy, rocky woods
<i>Polemonium vanbruntiae</i>	Bog Jacob’s-ladder	Endangered	S1	Wooded swamps, bottoms, sphagnum bogs, and mossy glades.
<i>Kalmia latifolia</i>	Mountain laurel	Special Concern	S2	Rocky or gravelly woods and clearings, sometimes swamps
<i>Carex waponahkikensis</i>	Dawn-land sedge	Special Concern	Not ranked	Early successional, disturbed habitats, open fields, roadside edges
<i>Galium labradoricum</i>	Bog bedstraw	Special Concern	S2	Bogs, mossy thickets, woods; often in circumneutral habitats

* Habitat based on rare plant fact sheets available online from MNAP: http://www.maine.gov/dacf/mnap/features/rare_plants/plantlist.htm

³ Caldwell, D.W. 1998. *Roadside Geology of Maine*. Mountain Press Publishing Company, Missoula, MT.



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4.2 FIELD SURVEY

Field surveys in the southern portion of the Project area were conducted between September 12 and 30, 2016. The 2019 field surveys were conducted between August 5 and August 27 in expanded areas of the Project with potential to be impacted by Project facilities at that time. Field surveys documented occurrences of Canada mountain-rice grass (*Piptatherum canadense*) and bog Jacob's-ladder (*Polemonium vanbruntiae*), which are described below. Representative photographs are included in Appendix A. Completed Special Plant Survey Forms are provided in Appendix B.⁴

4.2.1 Bog Jacob's-Ladder – Endangered

Surveys targeting bog Jacob's-ladder were conducted in several wetland community types throughout the Project area. The wetland communities observed included:

- Forested wetlands with mineral and organic soils that were dominated by red maple (*Acer rubrum*), balsam fir (*Abies balsamea*), red spruce (*Picea rubens*), and occasionally northern white-cedar (*Thuja occidentalis*) trees with mixed herbaceous and shrub species such as common winterberry (*Ilex verticillata*), mountain holly (*Ilex mucronata*), speckled alder (*Alnus incana*), three-seeded sedge (*Carex tripserrna*), sensitive fern (*Onoclea sensibilis*), cinnamon fern (*Osmundastrum cinnamomeum*), and dwarf raspberry (*Rubus pubescens*)
- Shrub-dominated riparian wetlands such as thickets dominated by speckled alder, bluejoint (*Calamagrostis canadensis*), and tussock sedge (*Carex stricta*)
- Forested to open peatlands dominated by black spruce (*Picea mariana*), red maple, mountain holly, rhodora (*Rhododendron canadense*), leatherleaf (*Chamaedaphne calyculata*), purple pitcherplant (*Sarracenia purpurea*), three-seeded sedge, and cinnamon fern
- Kettle wetlands dominated by leatherleaf, rhodora, highbush blueberry (*Vaccinium corymbosum*), and three-way sedge (*Dulichium arundinaceum*)
- Mixed graminoid / shrub marshes dominated by sweetgale (*Myrica gale*), bluejoint, tussock sedge, swollen-beaked sedge (*Carex utriculata*), speckled alder, leatherleaf, and red maple saplings

A single population of bog Jacob's-ladder was observed on August 8, 2019, in a riparian wetland along Bog Stream approximately 175 feet east of Schoodic Road and adjacent to a section of the initially proposed collection line (Figure 20). Approximately 500 plants were estimated within an approximately 12,500 square foot area and were associated with other plants species such as speckled alder, lakeside sedge (*Carex lacustris*), American larch (*Larix laricina*), dwarf raspberry, smooth goldenrod (*Solidago gigantea*), three-seeded sedge, fowl manna grass (*Glyceria striata*), bluejoint, crested wood fern

⁴ Due to the abundance of Canada mountain-rice grass within the Project area, one Special Plant Survey Form per associated town is provided for this species.



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(*Dryopteris cristata*), and rough bedstraw (*Galium asprellum*). The plants were also associated with an area of groundwater discharge (i.e., a spring) near the southern edge of the wetland. The associated soils are mapped as Medomak and Wonsqueak soils, frequently flooded.

Nearby habitat areas were carefully searched, including the riparian wetland areas to the north of the Bog Stream channel and areas to the west of Schoodic Road (Figure 20 shows the survey path of the areas surveyed). Riparian areas along the Pleasant River in the vicinity of the initially proposed collection line crossing exhibited similar habitat characteristics compared to that where bog Jacob's-ladder was observed (e.g., speckled alder and lakeside sedge riparian seepage wetland) and were also thoroughly searched in the vicinity of the initially proposed crossing (see Figure 18). However, no other occurrences of bog Jacob's-ladder were observed within the Project area.

4.2.2 Canada Mountain-Rice Grass – Special Concern

Canada mountain-rice grass frequently occurs within the Project area and is characteristic of open upland habitats with somewhat excessively to excessively drained soils. As a result of the field survey, approximately 30,600 flowering stems of Canada mountain-rice grass were documented across approximately 685 mapped locations totaling approximately 23.5 acres within the Project area (Figures 1–32). This species was predominantly associated with five upland habitat types:

1. Forested edges of blueberry barrens
2. Windrows through blueberry barrens
3. Early successional forested woodlands
4. Unmaintained or “abandoned” blueberry barrens
5. Existing transmission line corridors

Forested Edges of Blueberry Barrens

Canada mountain-rice grass subpopulations were commonly located along the forested edges of blueberry barrens with over 5,000 (estimated) specimens observed across over 200 mapped locations. Commonly associated vegetation includes lowbush blueberry (*Vaccinium angustifolium*), red oak, gray birch (*Betula populifolia*), sheep American-laurel (*Kalmia angustifolia*), bracken fern (*Pteridium aquilinum*), black chokeberry (*Aronia melanocarpa*), poverty oatgrass (*Danthonia spicata*), and red bearberry (*Arctostaphylos uva-ursi*). Soils are well-drained and sandy loam to loamy sand.

Windrows Through Blueberry Barrens

Nearly 650 (estimated) Canada mountain-rice grass specimens were observed across approximately 23 mapped locations within existing linear forested windrows through the blueberry barrens. These windrows are characterized by Jack pine (*Pinus banksiana*) trees, lowbush blueberry, sheep American-laurel, and poverty oatgrass.



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Early Successional Woodlands

Over 8,200 (estimated) Canada mountain-rice grass specimens were located in over 170 mapped locations in early successional forested woodlands beyond the immediate edge of the blueberry barren. These upland areas are generally low in overall species diversity and are dominated by red oak, gray birch, lowbush blueberry, bracken fern, sheep American-laurel, and wintergreen (*Gaultheria procumbens*). Areas where Canada mountain-rice grass were most abundant included canopy openings with low-growing shrub cover and a general abundance of *Cladonia* lichen species. Soils types vary within these areas but more commonly included the Colton gravelly sandy loam excessively drained soil series.⁵

Unmaintained or “Abandoned” Blueberry Barrens

Over 15,000 (estimated) Canada mountain-rice grass specimens were observed within nearly 100 mapped locations in blueberry barrens that were abandoned or have not been recently maintained through blueberry harvesting, burning, or vegetation removal. These areas had an open canopy and often contained sapling-sized early successional tree species such as gray birch and pin cherry (*Prunus pensylvanica*). Bracken fern, sheep American-laurel, lowbush blueberry, sweet-fern (*Comptonia peregrina*), and poverty oatgrass dominate the understory. Canada mountain-rice grass was typically evenly distributed within these areas, with many areas supporting several hundred to several thousand individuals. Associated soils are moderately well drained to excessively drained and include Colton gravelly sandy loam, Sheepscot-Croghan-Kinsman complex, and Sheepscot fine sandy loam soil types.

Existing Transmission Line Corridors

An existing transmission line traverses the southern portion of the Project area and supports over 1,000 specimens of Canada mountain-rice grass within an approximately 0.9-mile section of transmission line. Habitat conditions within the existing transmission line corridor are similar to those in the above habitats with coarse, excessively drained soils and a predominance of open dry site species such as bracken fern, sweet-fern, lowbush blueberry, and poverty oatgrass, and *Cladonia* lichens.

Based on a review of soil mapping data available from the US Department of Agriculture Natural Resources Conservation Service (USDA NRCS), Canada mountain-rice grass was frequently associated with Colton gravelly sandy loam and Marsardis fine sandy loam soil series (Table 2). Although Table 2 indicates that populations of Canada mountain-rice grass were associated with poorly drained and very poorly drained soils such as Brayton-Colonel association and Bucksport-Wonsqueak soils, these soil drainage conditions were not observed in the field to be associated with populations of this species.

⁵ US Department of Agriculture Natural Resources Conservation Service Web Soil Survey.



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Table 2. Summary of Soil Types Associated with Canada Mountain-Rice Grass

Soil Map Unit Name	Acres of Population	Drainage Class
Adams loamy sand, 0 to 3 percent slopes	0.002	Somewhat excessively drained
Adams loamy sand, 3 to 8 percent slopes	0.017	Somewhat excessively drained
Adams-Croghan association, 0 to 8 percent slopes	0.019	Somewhat excessively drained
Brayton-Colonel association, 0 to 8 percent slopes, very stony	0.904	Poorly Drained
Bucksport and Wonsqueak soils	0.001	Very poorly drained
Colton gravelly sandy loam, 0 to 3 percent slopes	1.653	Excessively drained
Colton gravelly sandy loam, 0 to 8 percent slopes, very bouldery	8.371	Excessively drained
Colton gravelly sandy loam, 15 to 70 percent slopes	0.106	Excessively drained
Colton gravelly sandy loam, 3 to 8 percent slopes	0.692	Excessively drained
Colton gravelly sandy loam, 8 to 15 percent slopes, very bouldery	3.228	Excessively drained
Colton-Adams complex, 15 to 70 percent slopes	0.319	Excessively drained
Colton-Adams complex, 3 to 15 percent slopes	0.452	Excessively drained
Colton-Hermon complex, 15 to 30 percent slopes, very bouldery	0.025	Excessively drained
Colton-Hermon complex, 3 to 15 percent slopes, very bouldery	0.001	Somewhat excessively drained
Hermon-Monadnock complex, 3 to 8 percent slopes, very bouldery	1.123	Somewhat excessively drained
Hermon-Monadnock-Skerry complex, 3 to 15 percent slopes, extremely bouldery	0.104	Somewhat excessively drained
Hermon-Monadnock-Skerry complex, 3 to 15 percent slopes, very bouldery	0.346	Somewhat excessively drained
Kinsman sand	0.022	Poorly Drained
Kinsman-Wonsqueak association, 0 to 3 percent slopes	0.062	Poorly Drained
Masardis fine sandy loam, 0 to 3 percent slopes	1.185	Somewhat excessively drained
Masardis fine sandy loam, 15 to 45 percent slopes	1.257	Somewhat excessively drained
Masardis fine sandy loam, 3 to 8 percent slopes	0.523	Somewhat excessively drained
Masardis fine sandy loam, 8 to 15 percent slopes	0.219	Somewhat excessively drained
Masardis-Adams complex, 15 to 70 percent slopes	0.068	Somewhat excessively drained
Masardis-Sheepscot complex, 0 to 15 percent slopes	0.175	Somewhat excessively drained
Sheepscot fine sandy loam, 0 to 8 percent slopes	1.209	Moderately well drained
Sheepscot-Croghan-Kinsman complex, 0 to 8 percent slopes	0.680	Moderately well drained
Skerry-Becket association, 3 to 15 percent slopes, very stony	0.692	Moderately well drained
Skerry-Colonel complex, 0 to 8 percent slopes, very stony	0.029	Moderately well drained
Total	23.5	



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4.2.3 Others

Additional meander surveys were conducted within other various habitat types to characterize their condition and confirm the findings of the desktop assessment relative to their potential to support RTE species. Beyond the habitat types noted above, a large proportion of the Project area consists of second growth forests dominated by red oak, white pine (*Pinus strobus*), red pine (*Pinus resinosa*), and gray birch trees. Overall understory species diversity is low and consists almost exclusively of bracken fern, sheep American-laurel, black huckleberry (*Gaylussacia baccata*), lowbush blueberry, and wintergreen. Overall canopy cover exceeds 70%. Moderate to large glacial erratics are scattered throughout and evidence of recent timber harvests is minimal. These forested upland habitats have low potential to support RTE plant species.

No circumneutral wetland habitats were observed within the Project area.

4.3 POST-FIELD SURVEY DESKTOP ASSESSMENT

Based on the desktop assessment conducted on the revised Project area in January 2021, several areas appear to contain habitats that are potentially suitable for Canada mountain-rice grass and bog Jacob's-ladder that were not previously surveyed or evaluated during the field surveys. Figures 2, 4, 7, 17–22, and 28–29 illustrate these potential habitat locations.

Potentially suitable habitat for bog Jacob's-ladder was identified in two areas of riparian shrub-dominated wetlands that will be traversed by the proposed collection line (Figures 18 and 20). Both locations exhibit physical and landscape characteristics that are consistent with the nearby observed bog Jacob's-ladder location including forested and shrub wetlands associated with meandering watercourses, similar poorly drained soils, and hydrology likely influenced by groundwater discharge from the base of the Pineo Ridge formation. In the absence of additional field surveys, the presence of bog Jacob's-ladder should also be assumed in these two locations identified during the revised desktop assessment.

The revised Project alignment traverses edges of blueberry fields, early successional woodlands, and abandoned blueberry fields that were not part of the initial field surveys. The potential for Canada mountain-rice grass is considered very high in the additional areas identified during the desktop assessment of the revised Project alignment. In the absence of additional field surveys, its presence should be assumed in the modified Project areas that intersect areas of potentially suitable habitat.

No other habitats potentially suitable for RTE plants were identified during the revised desktop analysis.

5.0 DISCUSSION AND IMPACT ANALYSIS

Bog Jacob's-ladder

The known bog Jacob's-ladder population will not be impacted by the Project as the proposed collection line was shifted approximately 240 feet east of the identified subpopulation to avoid any potential impacts (see Figure 20). However, the proposed collection line intersects similar wetland habitat that is contiguous



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with the wetland habitat associated with bog Jacob's-ladder. This area was not included in the previous field survey area and bog Jacob's-ladder may occur in this area given the associated landscape and habitat similarities with the known occurrence. Therefore, the underground collection line will be installed via directional drilling to avoid impacts to the potential bog Jacob's-ladder wetland habitat. An additional area of potential bog Jacob's-ladder habitat was identified during the post-field survey desktop assessment where the proposed collection line crosses the Pleasant River (Figure 18). Installation of the collection line will similarly be constructed via directional drilling to avoid impacts to the potential habitat area. In summary, the proposed Project will not adversely affect bog Jacob's-ladder populations or potential habitat areas.

Canada Mountain-rice Grass

While Canada mountain-rice grass may be rare on a state-wide level, it frequently occurs within the Project area in a variety of open and early successional habitats with moderately well drained to excessively drained sandy loam to loamy sand soil. Canada mountain-rice grass has a state rarity rank of "S2", meaning that the species is "*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.*" The approximately 30,600 specimens of Canada mountain-rice grass observed in hundreds of locations, totaling approximately 23.5 acres of occupied habitat during the 2016 and 2019 surveys strongly suggest that species is not "imperiled" in the landscape associated with the Project. Factors that may threaten occurrences of Canada mountain-rice grass associated with the Project area include natural succession of open early successional habitats and expansion of commercial blueberry operations. The species does not tolerate closed forest canopies based on minimal observations in forested habitats. Furthermore, the absence of Canada mountain-rice grass within the interior of commercial blueberry barrens indicates that the species may not tolerate the intensive management these areas are subjected to such as burning, mechanical harvesting, mechanical herbicide application, and irrigation. These management measures are likely less intensive along the forested edge of the fields, thereby creating more favorable habitat conditions for Canada mountain-rice grass. Canada mountain-rice grass occurrences were most abundant within unmaintained or "abandoned" blueberry fields where intensive management activities have been suspended for an estimated 10 to 15 years. However, if vegetation management is permanently suspended or if the areas are reclaimed back to active blueberry production, populations will likely decline as the canopy cover or the land use intensity of these areas increase.

Permanent impacts are conservatively anticipated from construction of access roads, crane paths, and turbine foundations and pads as these construction activities will include grading and filling and result in removal of native topsoil, importation of gravel and other fill material for travel surface and foundation construction, soil compaction, and permanent habitat transformation. Temporary impacts to Canada mountain-rice grass populations are anticipated in areas associated with the vegetation clearing limits beyond the edge of grading and filling areas, installation of the underground collection line, and the staging areas. In these areas, vegetation will be removed and soil will be disturbed during construction but the areas will then be restored to their pre-construction condition thereby providing conditions that are favorable for recruitment and reestablishment of Canada mountain-rice grass. Topsoil will be stockpiled during trenching of the underground collection line and reinstalled following completion of construction. It is anticipated that this stockpiled topsoil may contain a seed bank for Canada mountain-rice grass and its



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reinstallation will provide a favorable soil media for reestablishment. The underground collection line will be maintained as open habitat, thereby providing favorable conditions for Canada mountain-rice grass recruitment and establishment. In addition, vegetation management such as mowing of the underground collection line, will be conducted in late summer, beginning no sooner than August 15, to allow Canada mountain-rice grass to develop and release mature seed prior to mowing.

Table 3 summarizes the proposed impacts to Canada mountain-rice grass by the Project. The proposed project will result in approximately 1.35 acres (58,762 square feet) of permanent impact and 1.02 acres (44,535 square feet) of temporary impacts to existing Canada mountain-rice grass populations. An additional 2.29 acres (99,653 square feet) of permanent impacts and 8.94 acres (389,406 square feet) of temporary impacts are anticipated in areas identified as potential Canada mountain-rice grass habitat based on the post-field survey desktop assessment.

Table 3. Summary of Canada Mountain-Rice Grass Project Impacts

Impact Type	Project Component	Canada Mountain-Rice Grass Populations			Canada Mountain-Rice Grass Populations Desktop Assessment Areas	
		Square Feet	Acres	Proportion of Total Population ¹	Square Feet	Acres
Permanent	Access Road	5,416.4	0.12	0.53%	26,099.6	0.60
	Crane Path	6,764.0	0.16	0.66%	13,214.6	0.03
	Grading Limits	10,921.7	0.25	1.07%	45,383.2	1.04
	Turbine Pad	35,660.0	0.82	3.49%	14,955.2	0.34
	TOTAL	58,762.1	1.35	5.74%	99,652.7	2.29
Temporary	Clearing Limits	3,267.6	0.08	0.32%	9,672.0	0.22
	Clearing Limits - Underground Collection	34,043.0	0.78	3.33%	379,733.8	8.72
	Staging Area	7,224.1	0.17	0.71%	0.0	0.00
	TOTAL	44,534.7	1.02	4.35%	389,405.8	8.94

¹ Based on a total observed population size of 23.5 acres

Although the Project will directly impact Canada mountain-rice grass individuals, including potential populations within areas that were not surveyed, the species is demonstrably tolerant of anthropogenic disturbances and is expected to become reestablished over time following temporary ground disturbances. The loss of individual specimens during construction and/or habitat conversion will represent only a proportionately small impact to the larger metapopulation of the surrounding landscape.

Canada mountain-rice grass is undoubtedly more widespread in commercial blueberry field and early successional landscapes beyond the survey limits for this Project and populations expected to continue to persist under the present land management. Furthermore, the Project components are likely to offset the



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impacts through the creation and subsequent maintenance of open habitats associated with electrical collection corridors and the edges of access roads, crane paths, and turbine pad clearings within previously forested areas proximal to existing Canada mountain-rice grass populations, thus allowing for recruitment and persistence of Canada mountain-rice grass within these habitats. The management of vegetation within these areas is expected to be less intense from that within commercial blueberry barrens (e.g., no burning or frequent pesticide and herbicide applications) and will likely be more favorable for long-term maintenance of Canada mountain-rice grass populations, including the implementation of late-season mowing to allow plants to develop and release mature seed.

A GIS (geographic information system) analysis was conducted to identify forested areas associated with temporary Project land disturbance areas including the underground collection line and clearing limits around turbine pads and crane paths, and staging areas that share the same underlying moderately well drained to excessively drained soil types as those associated with known Canada mountain-rice grass populations. It is believed that the creation and maintenance of open and disturbed Project areas associated with moderately well drained to excessively drained sandy loam and loamy sand soils proximal to known Canada mountain-rice grass locations will provide suitable habitat that may allow for recruitment and expansion of Canada mountain-rice grass populations over time into these newly created habitat areas. A total of approximately 142 acres of forest will be converted to open habitat that may be potentially suitable for Canada mountain-rice grass following construction based on this analysis. The amount of potentially suitable habitat that will be created by the Project far exceeds the approximately 3.6 acres of occupied and potential habitat for this species that will be permanently impacted by the Project. Table 4 summarizes the anticipated habitat that may be created for Canada mountain-rice grass following construction.

Table 4. Summary of Potential Canada Mountain-Rice Grass Habitat Creation

Associated Canada Mountain-Rice Grass Map Unit Soil Name	Acres of Potential Habitat Creation¹	Soil Drainage Class
Adams loamy sand, 3 to 8 percent slopes	0.05	Somewhat excessively drained
Adams-Croghan association, 0 to 8 percent slopes	4.04	Somewhat excessively drained
Colton gravelly sandy loam, 0 to 3 percent slopes	0.09	Excessively drained
Colton gravelly sandy loam, 0 to 8 percent slopes, very bouldery	7.99	Excessively drained
Colton gravelly sandy loam, 15 to 70 percent slopes	0.94	Excessively drained
Colton gravelly sandy loam, 3 to 8 percent slopes	0.61	Excessively drained
Colton gravelly sandy loam, 8 to 15 percent slopes, very bouldery	4.72	Excessively drained
Colton-Adams complex, 15 to 70 percent slopes	5.72	Excessively drained
Colton-Adams complex, 3 to 15 percent slopes	4.03	Excessively drained
Hermon-Monadnock complex, 3 to 8 percent slopes, very bouldery	12.16	Somewhat excessively drained
Hermon-Monadnock-Skerry complex, 3 to 15 percent slopes, extremely bouldery	2.78	Somewhat excessively drained
Hermon-Monadnock-Skerry complex, 3 to 15 percent slopes, very bouldery	16.53	Somewhat excessively drained



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Associated Canada Mountain-Rice Grass Map Unit Soil Name	Acres of Potential Habitat Creation ¹	Soil Drainage Class
Masardis fine sandy loam, 0 to 3 percent slopes	0.62	Somewhat excessively drained
Masardis fine sandy loam, 15 to 45 percent slopes	1.78	Somewhat excessively drained
Masardis fine sandy loam, 3 to 8 percent slopes	1.87	Somewhat excessively drained
Masardis fine sandy loam, 8 to 15 percent slopes	4.44	Somewhat excessively drained
Masardis-Adams complex, 15 to 70 percent slopes	0.10	Somewhat excessively drained
Masardis-Sheepscot complex, 0 to 15 percent slopes	3.50	Somewhat excessively drained
Sheepscot fine sandy loam, 0 to 8 percent slopes	1.41	Moderately well drained
Sheepscot-Croghan-Kinsman complex, 0 to 8 percent slopes	6.59	Moderately well drained
Skerry-Becket association, 3 to 15 percent slopes, very stony	44.52	Moderately well drained
Skerry-Colonel complex, 0 to 8 percent slopes, very stony	17.46	Moderately well drained
Total	141.96	

¹ Area of potential habitat is anticipated to be associated with temporary Project land disturbance areas including the underground collection line, temporary clearing limits, and staging areas.

6.0 SUMMARY AND CONCLUSIONS

The known bog Jacob's-ladder occurrence is located outside of the proposed Project alignment and will be avoided during construction. In addition, two additional areas providing potential habitat for bog Jacob's-ladder will be avoided by the Project through implementation of directional drilling for the construction of the underground collection line. No adverse impacts to bog Jacob's-ladder are anticipated as a result of the Project.

The Downeast Wind Project will result in a proportionately small area of impact to Canada mountain-rice grass, a species listed as Special Concern by MNAP. Field surveys conducted by Stantec in 2016 and 2019 have demonstrated that this species is widespread within the Project area with over 30,600 individuals totaling 23.5 acres of occupied habitat. The Project will permanently impact approximately 1.3 acres of known Canada mountain-rice grass occurrences as well as an additional 2.3 acres of potential habitat as a result of grading and filling associated with turbine pads, access roads, and crane paths. The Project will temporarily impact 1.0 acres of known Canada mountain-rice grass occurrences as well as an additional 8.9 acres of potential habitat as a result construction of the underground collection line and temporary clearing associated with turbine pads, access roads, crane paths, and staging areas.

Measures will be implemented during construction to minimize impacts to Canada mountain-rice grass, Topsoil will be stockpiled and will be reinstalled to provide suitable soil media for reestablishment of Canada mountain-rice grass within temporary impact areas such as the underground collection line.



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Long-term vegetation management of the temporarily impacted habitats within the Project area will delay mowing until late summer (i.e., after August 15) to allow the species to develop and release mature seed.

The Project will also create approximately 142 acres of open habitat associated with sandy loam to loamy sand soils that are moderately well drained to excessively drained. It is anticipated that over time portions of these newly created habitats will allow for continued spread and persistence of Canada mountain-rice grass within the Project area and effectively offset the permanent impacts to populations and potential habitat as a result of the Project.



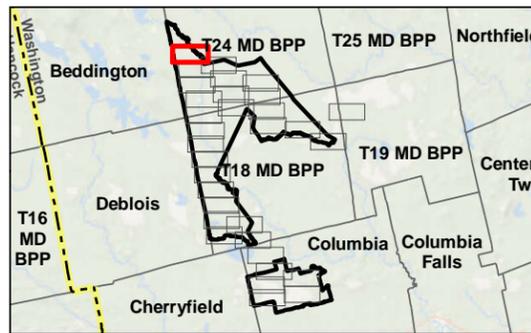
**DOWNEAST WIND PROJECT: RARE, THREATENED, AND ENDANGERED PLANT SURVEY
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FIGURES



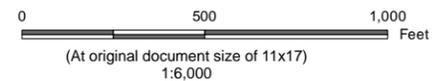
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- Legend**
- Proposed Turbine Location
 - Underground Collector
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland

Data Sources

1. Coordinate System: NAD 1983 UTM Zone 19N
2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
3. Background: NAIP 2018



Project Location
 Washington County
 Maine

Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

195601654

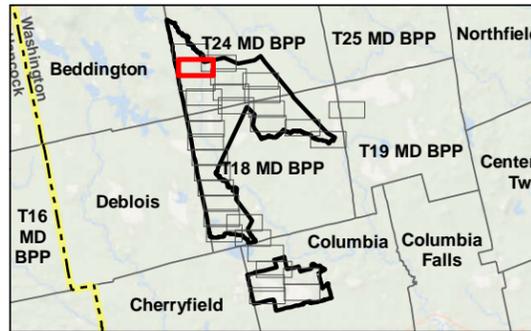
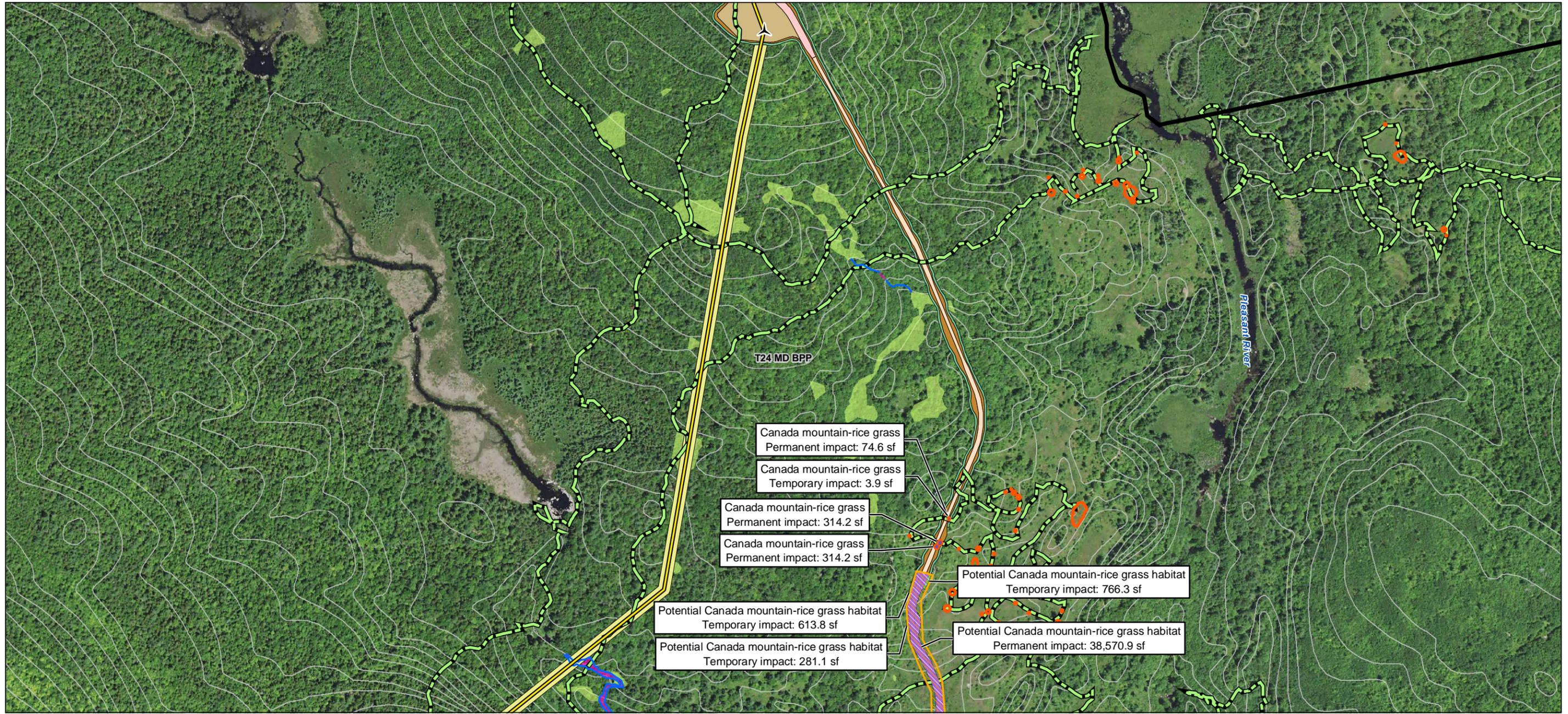
Figure No.
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Title
 2016 and 2019 Rare Plant Survey

Notes

1. Rare plant populations were located by Stantec in September 2016 and August 2019 with a Trimble GeoExplorer Series Receiver. Expected accuracy of GPS data is within 1 meter of actual position.
2. Areas providing potential rare plant habitat were identified based on a desktop assessment upon receipt of revised Project infrastructure in January 2021 and were not field verified.
3. Delineated wetland and stream data obtained from TRC on 12/17/2020. Additional wetland and stream delineation conducted by Stantec in the Fall of 2016 and Spring of 2017.

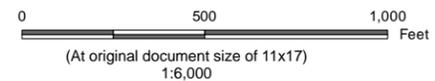
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Legend

	Proposed Turbine Location		Delineated Wetland
	Underground Collector		Delineated Surface Water
	Access Road	Rare Plant Area	
	Crane Path		Canada mountain-rice grass (<i>Piptatherum canadense</i>)
	Turbine Pad	Desktop Assessment Potential Rare Plant Habitats (see Note 2)	
	Grading Limits		Potential Canada mountain-rice grass habitat (<i>Piptatherum canadense</i>)
	Clearing Limits	Rare Plant Impact	
	Collector Clearing Limits		Permanent
	Project Boundary		Temporary
	20-foot Contours	Desktop Assessment Potential Rare Plant Impact	
	GPS Tracklog		Permanent
	Delineated Stream		Temporary



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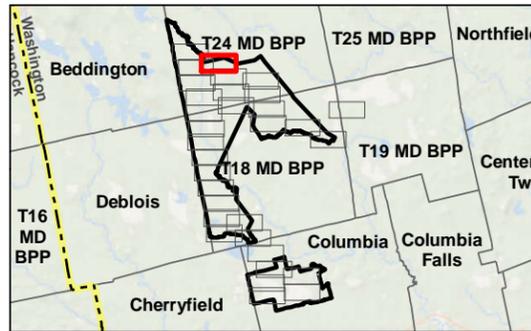


Project Location
 Washington County
 Maine
 Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County
 195601654

Figure No.
 2
Title
 2016 and 2019 Rare Plant Survey

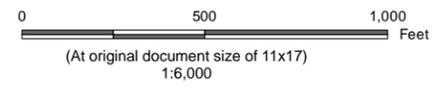
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Data Sources
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- Legend**
- Proposed Turbine Location
 - Underground Collector
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland

Rare Plant Area
 Canada mountain-rice grass (*Piptatherum canadense*)



Notes
 1. Rare plant populations were located by Stantec in September 2016 and August 2019 with a Trimble GeoExplorer Series Receiver. Expected accuracy of GPS data is within 1 meter of actual position.
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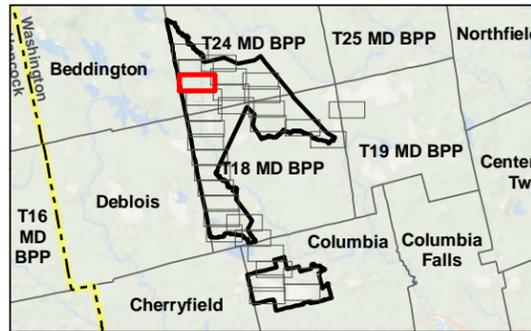
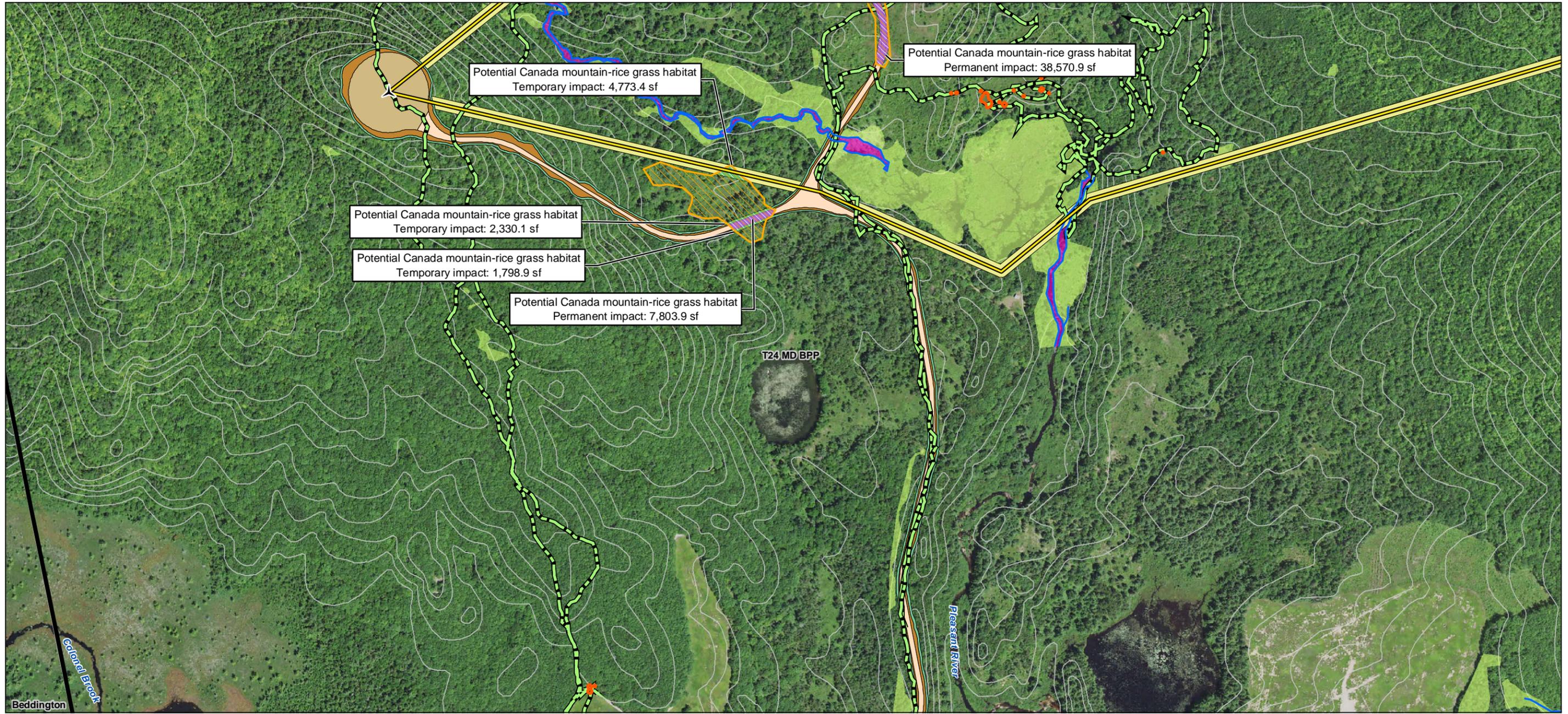


Project Location
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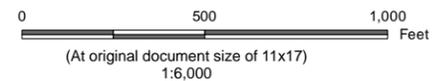
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Title
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Data Sources
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- Legend**
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 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Delineated Surface Water
 - Rare Plant Area**
 - Canada mountain-rice grass (*Piptatherum canadense*)
 - Desktop Assessment Potential Rare Plant Habitats (see Note 2)**
 - Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
 - Desktop Assessment Potential Rare Plant Impact**
 - Permanent
 - Temporary



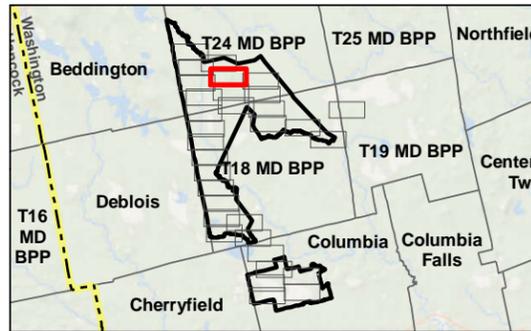
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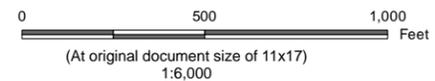
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 195601654

Figure No.
 4
Title
 2016 and 2019 Rare Plant Survey



- Legend**
- Proposed Turbine Location
 - Underground Collector
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Staging Area
 - Project Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland

Data Sources
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
 3. Background: NAIP 2018



Notes
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Project Location
 Washington County
 Maine

Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

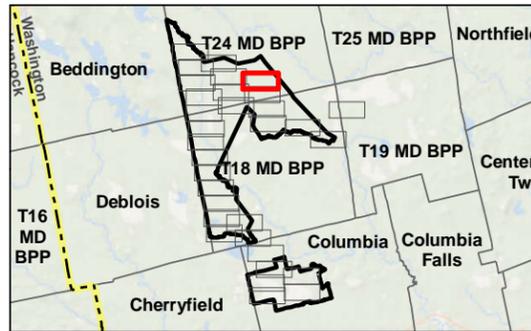
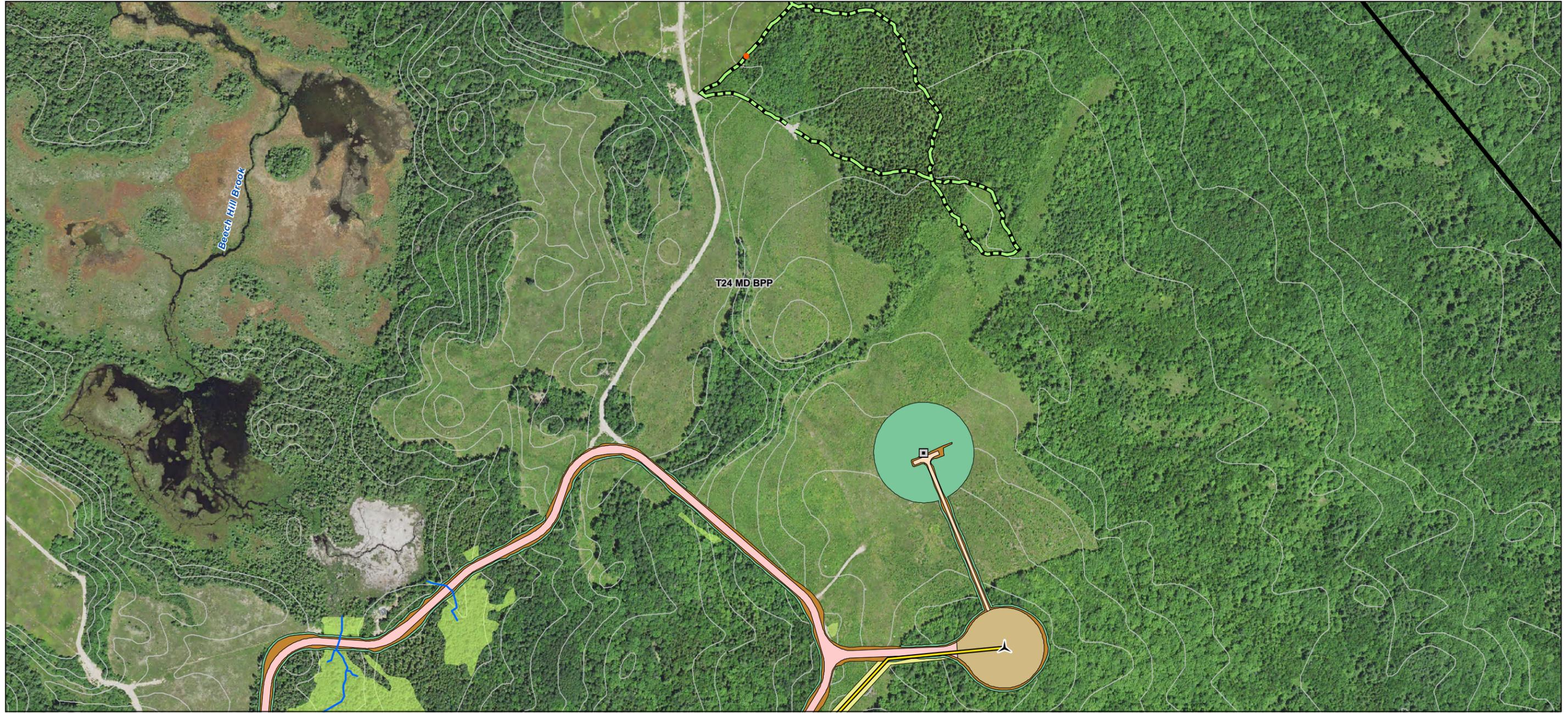
Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

Figure No.
 5

Title
 2016 and 2019 Rare Plant Survey

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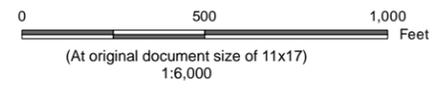
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- Legend**
- Proposed Turbine Location
 - MET Tower Location
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 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)

Data Sources

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2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
3. Background: NAIP 2018



Project Location
 Washington County
 Maine
 Prepared by GC on 2021-02-10
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 IR Review by AG on 2021-02-12
 195601654

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

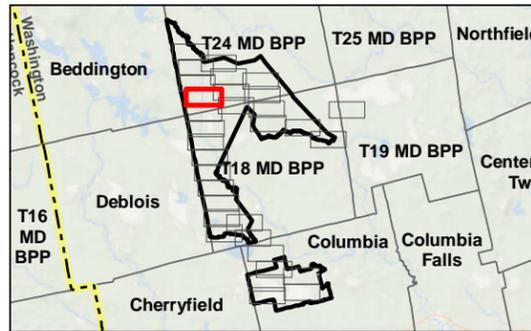
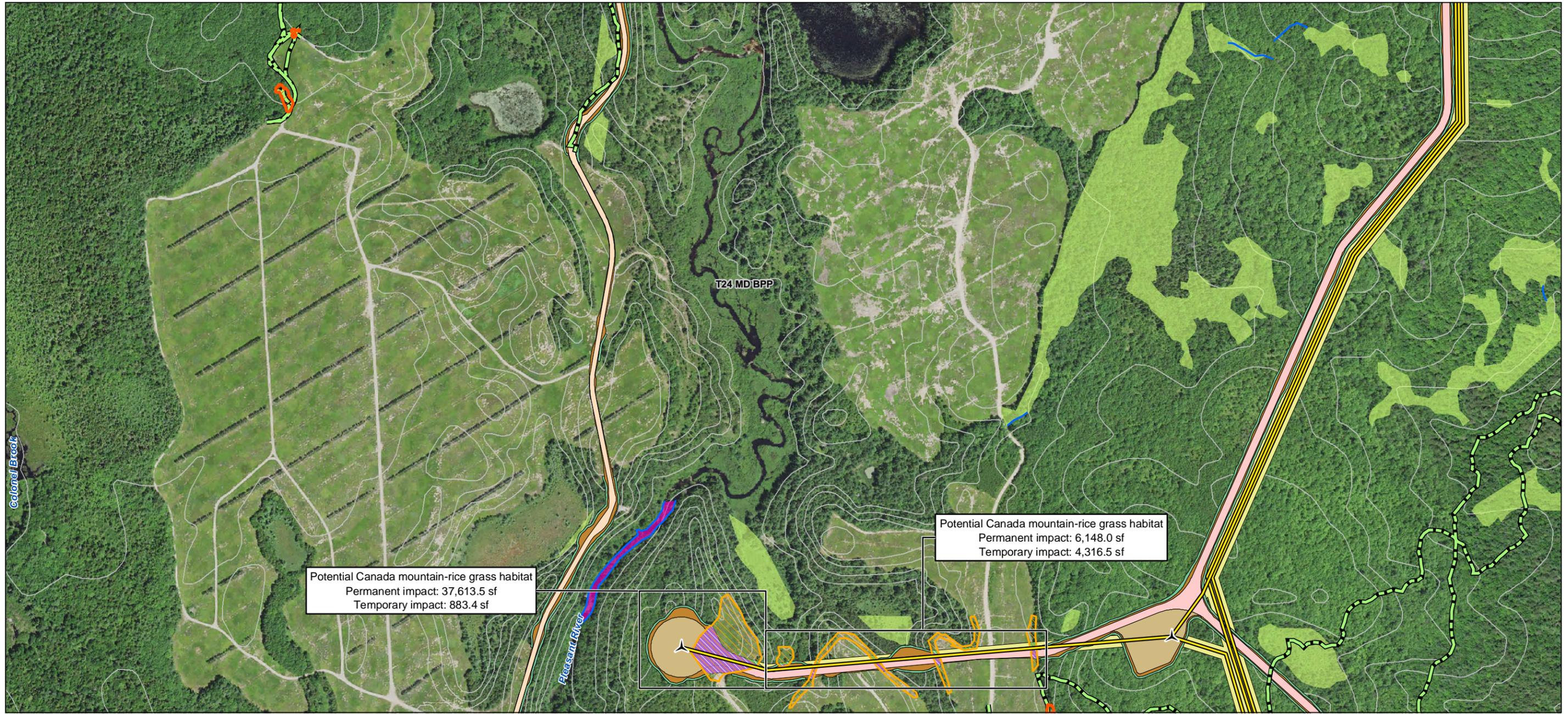
Figure No.
6

Title
2016 and 2019 Rare Plant Survey

Notes

1. Rare plant populations were located by Stantec in September 2016 and August 2019 with a Trimble GeoExplorer Series Receiver. Expected accuracy of GPS data is within 1 meter of actual position.
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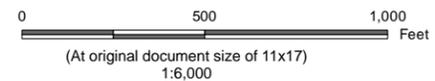
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 Revised: 2021-03-01 By: gcarpenter



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- Legend**
- Proposed Turbine Location
 - Underground Collector
 - Access Road
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 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
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 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Delineated Surface Water
 - Rare Plant Area**
 - Canada mountain-rice grass (*Piptatherum canadense*)
 - Desktop Assessment Potential Rare Plant Habitats (see Note 2)**
 - Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
 - Desktop Assessment Potential Rare Plant Impact**
 - Permanent
 - Temporary



Notes

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Project Location
 Washington County
 Maine

Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

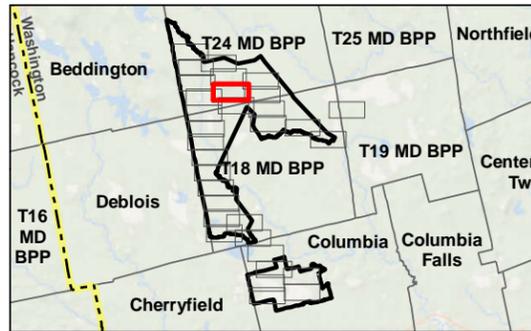
Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

195601654

Figure No.
 7

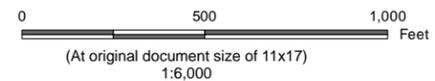
Title
 2016 and 2019 Rare Plant Survey

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- Legend**
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 - Delineated Wetland



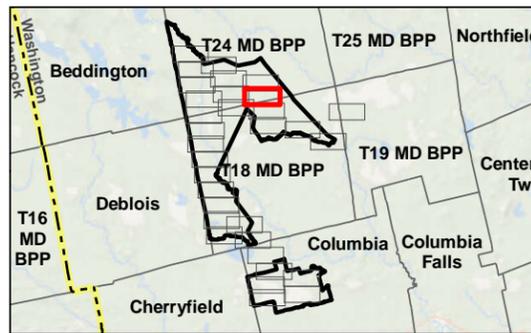
Project Location
 Washington County
 Maine

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

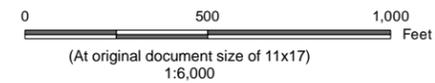
Figure No.
 8

Title
 2016 and 2019 Rare Plant Survey

Notes
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Project Location
Washington County
Maine

Prepared by GC on 2021-02-10
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Client/Project
Downeast Wind Project
Apex Clean Energy, Inc.
Washington County

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Figure No.
9

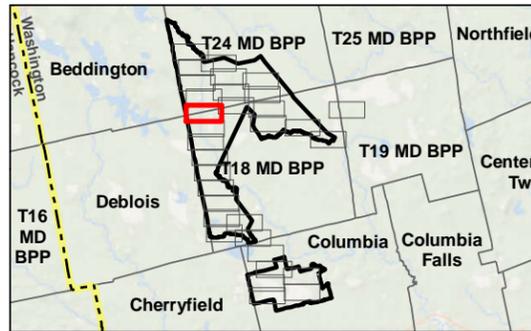
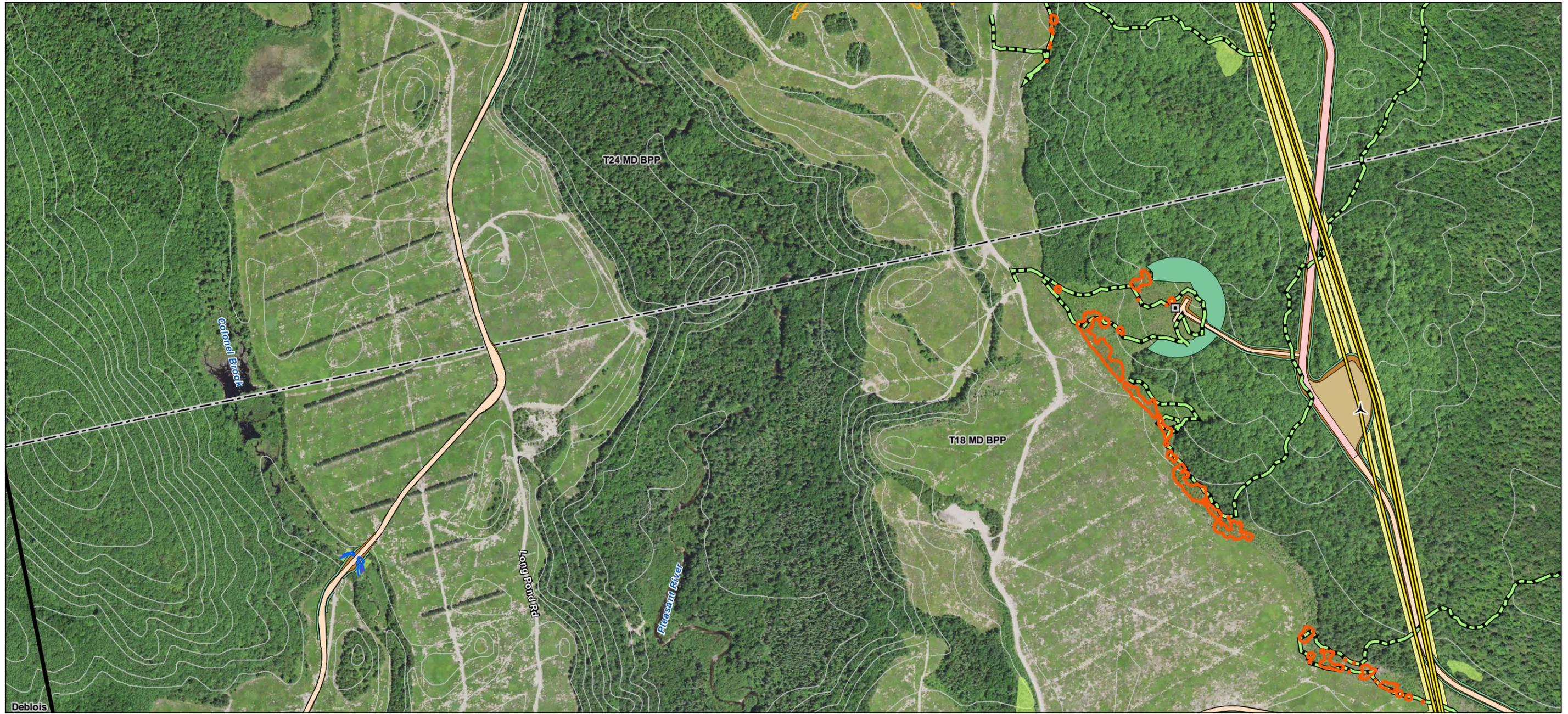
Title
2016 and 2019 Rare Plant Survey

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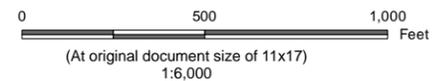
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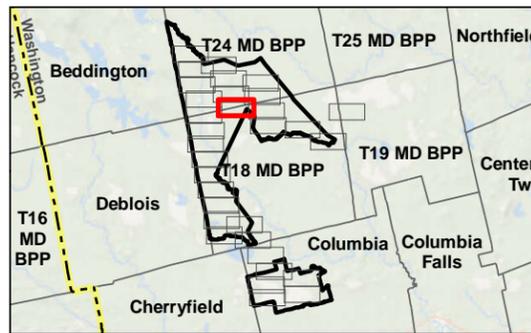
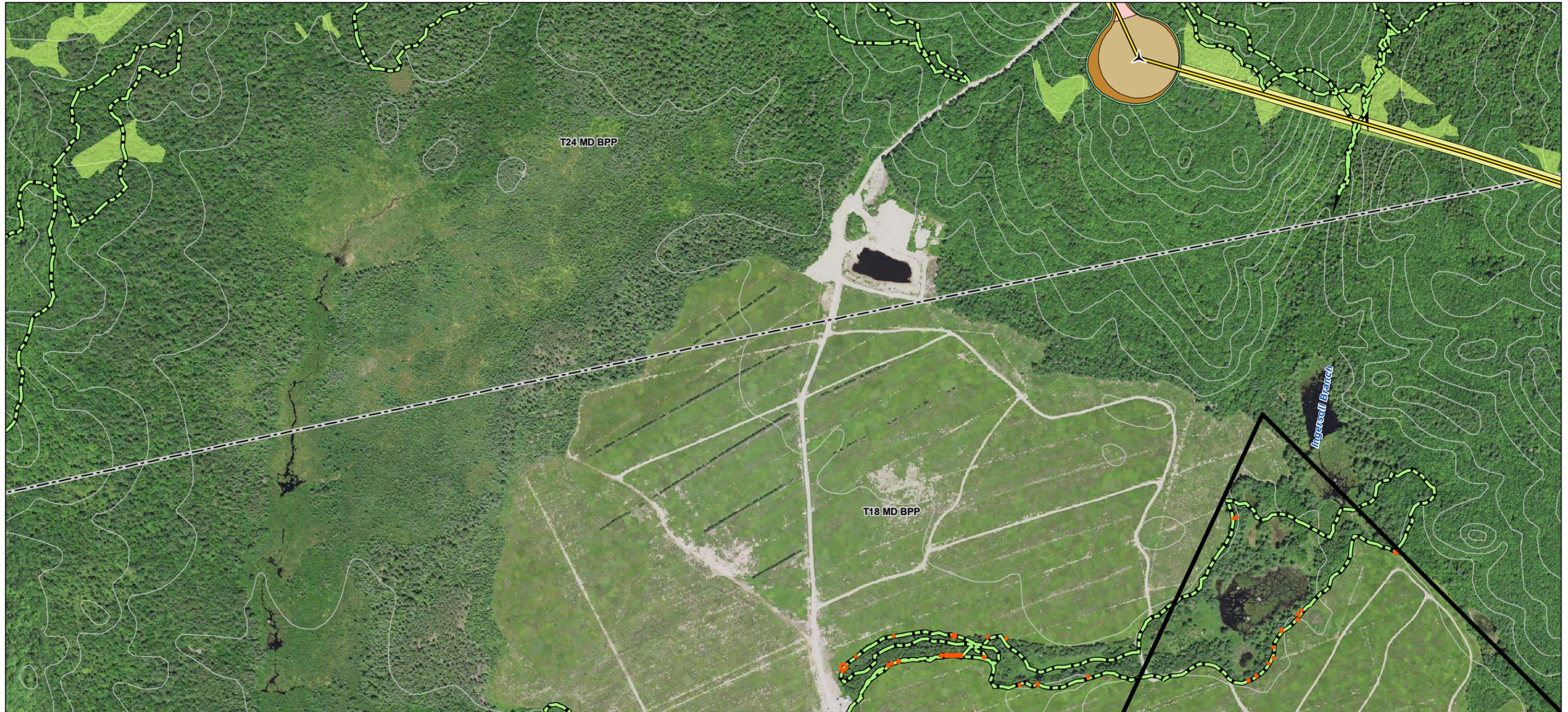


Project Location
 Washington County
 Maine
 Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

Client/Project
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 Apex Clean Energy, Inc.
 Washington County
 195601654

Figure No.
10
Title
2016 and 2019 Rare Plant Survey

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 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)

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 (At original document size of 11x17)
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Project Location
 Washington County
 Maine

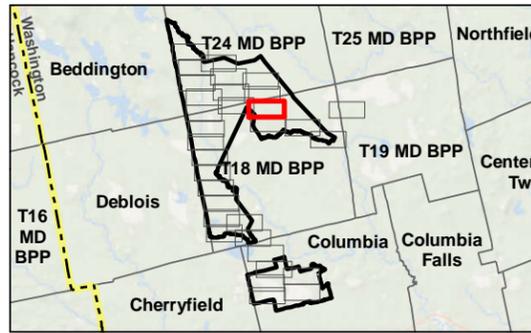
Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

Figure No.
 11

Title
 2016 and 2019 Rare Plant Survey

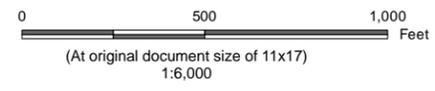
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- Legend**
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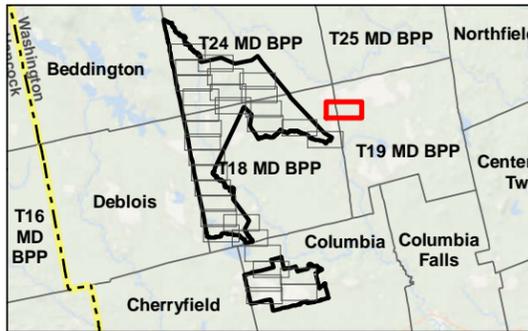
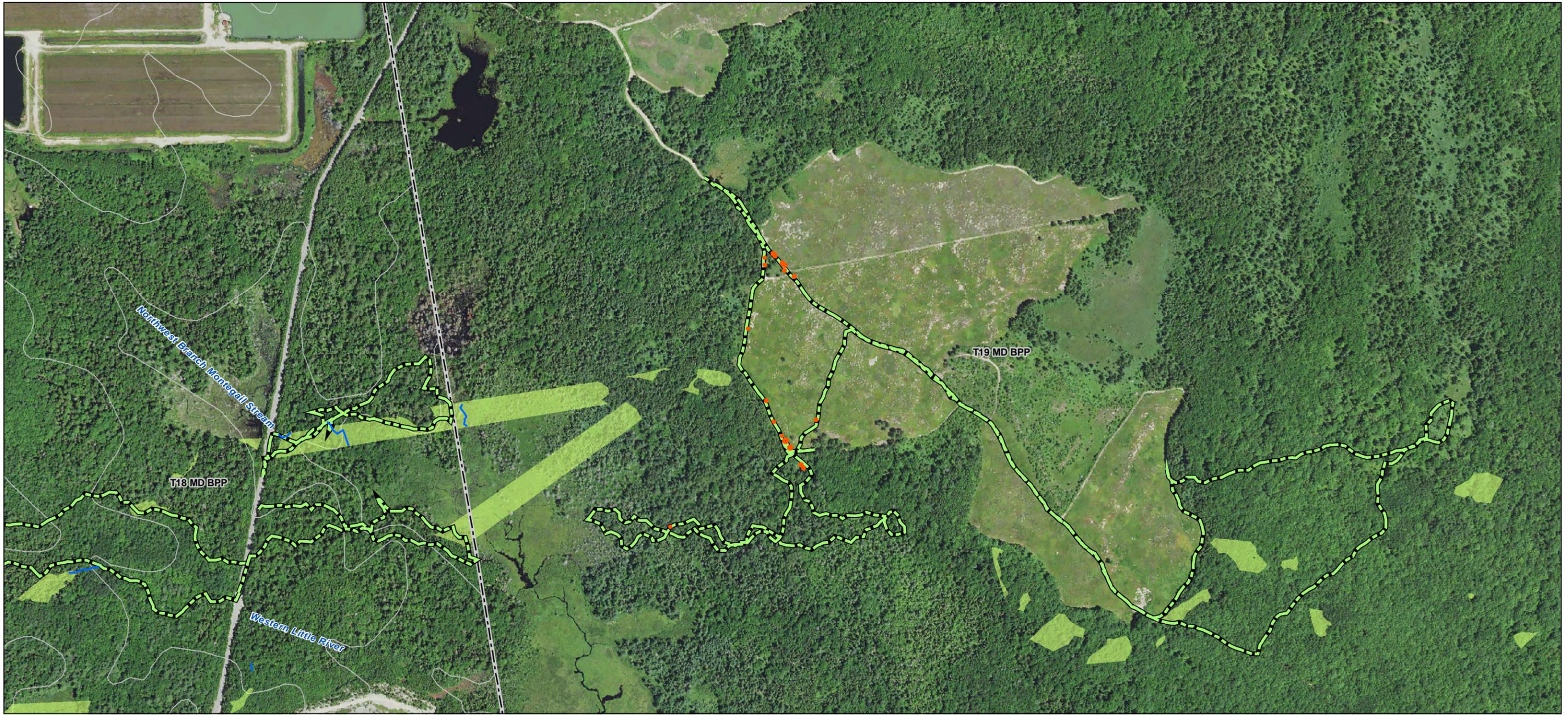
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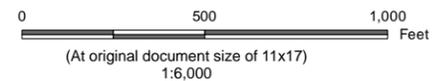
Project Location
 Washington County
 Maine
 Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County
 195601654

Figure No.
12
Title
2016 and 2019 Rare Plant Survey



- Legend**
- Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Rare Plant Area**
 - Canada mountain-rice grass (*Piptatherum canadense*)



Project Location
Washington County
Maine

Client/Project
Downeast Wind Project
Apex Clean Energy, Inc.
Washington County

Prepared by GC on 2021-02-10
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195601654

Figure No.
13

Title
2016 and 2019 Rare Plant Survey

Notes

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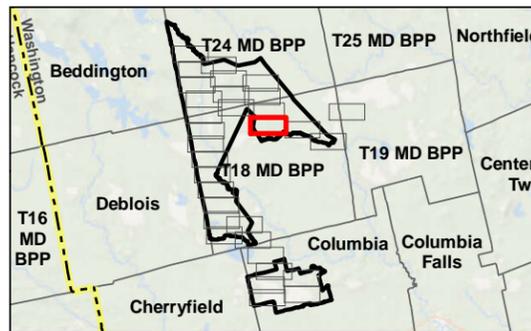
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Data Sources

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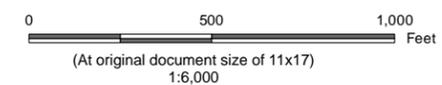
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- Legend**
- Proposed Turbine Location
 - Delineated Surface Water
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 - Delineated Stream
 - Delineated Wetland



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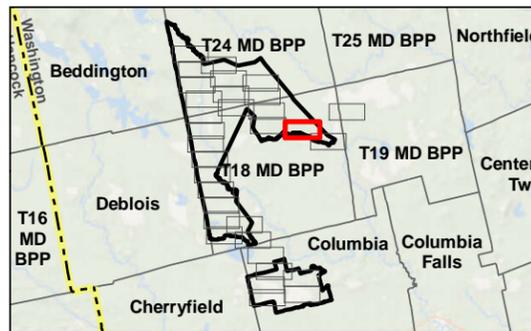


Project Location
 Washington County
 Maine
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Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County
 195601654

Figure No.
14

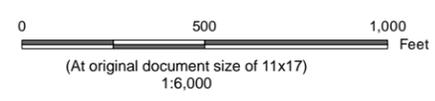
Title
2016 and 2019 Rare Plant Survey



- Legend**
- Project Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Delineated Surface Water
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)

Data Sources

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Washington County
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Client/Project
Downeast Wind Project
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Washington County

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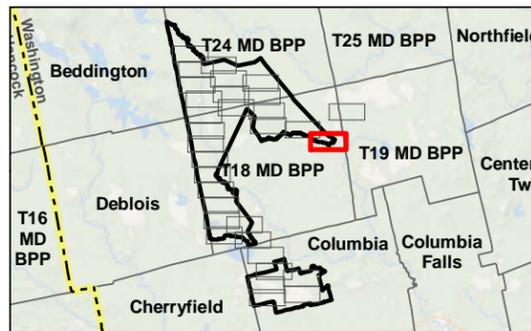
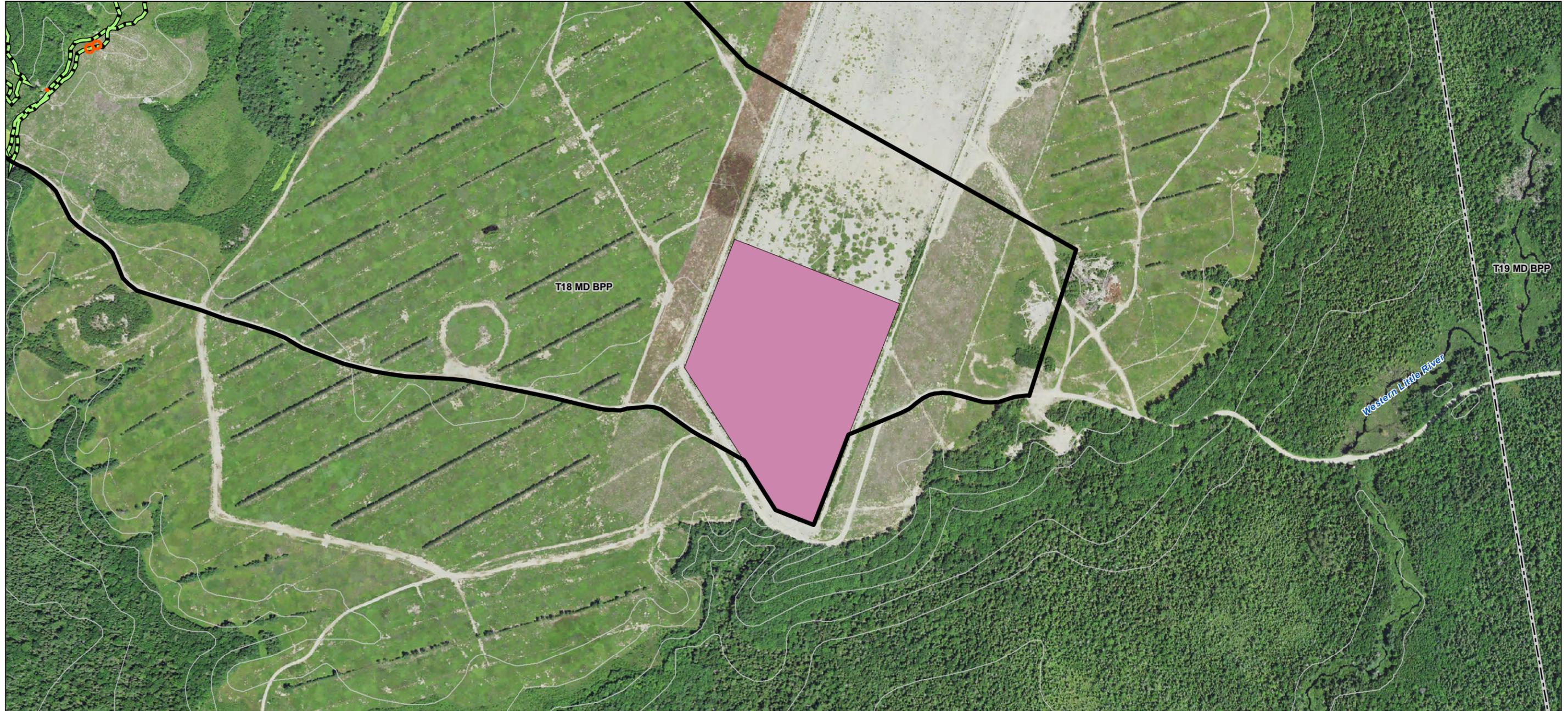
Figure No.
15

Title
2016 and 2019 Rare Plant Survey

Notes

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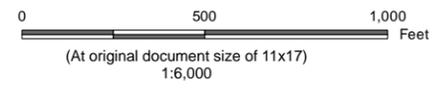
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- Legend**
- Staging Area
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Project Location
Washington County
Maine

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Client/Project
Downeast Wind Project
Apex Clean Energy, Inc.
Washington County

195601654

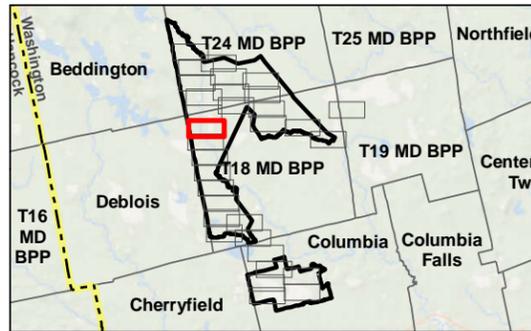
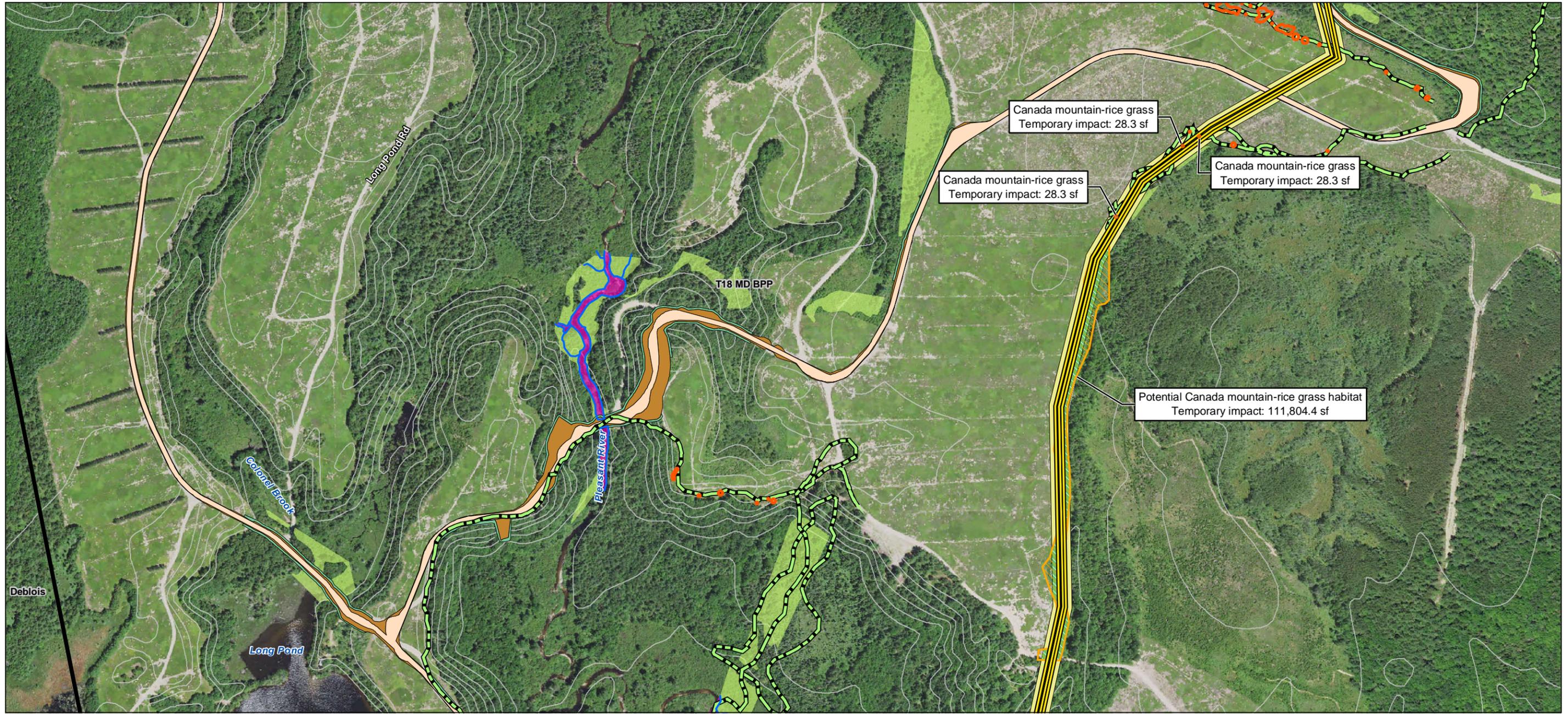
Figure No.
16

Title
2016 and 2019 Rare Plant Survey

Notes

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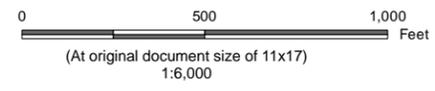
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- Legend**
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- Rare Plant Area**
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- Temporary
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Notes

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 TR by MP on 2021-02-11
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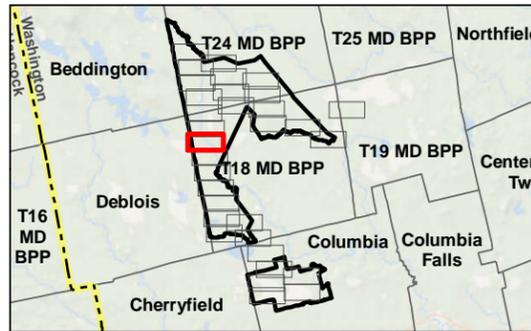
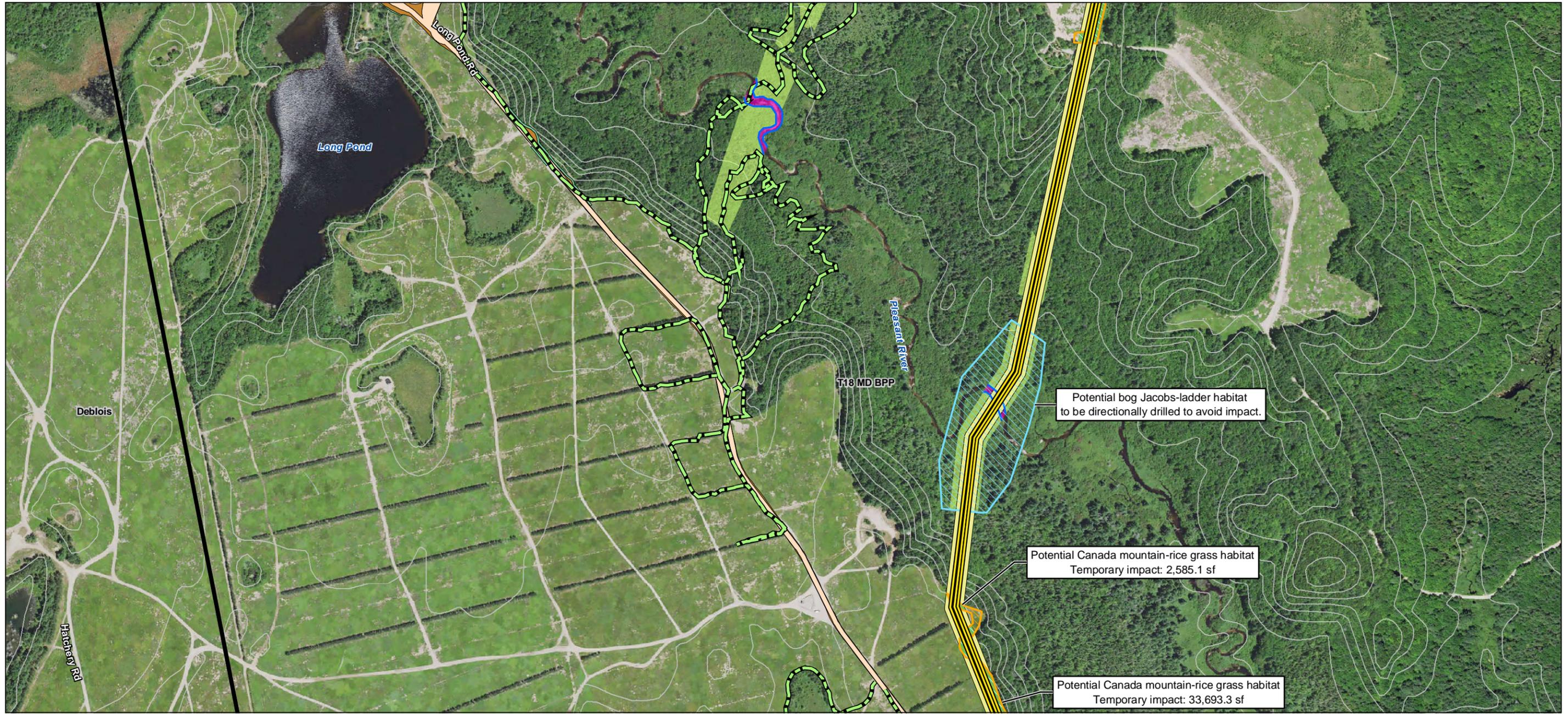
195601654

Figure No.
 17

Title
 2016 and 2019 Rare Plant Survey

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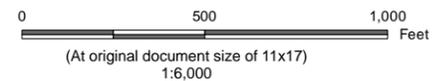
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Data Sources
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
 3. Background: NAIP 2018

- Legend**
- Underground Collector
 - Access Road
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Delineated Surface Water

- Desktop Assessment Potential Rare Plant Habitats (see Note 2)**
- Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
 - Potential bog Jacob's-ladder habitat (*Polemonium vanbruntiae*)
- Desktop Assessment Potential Rare Plant Impact**
- Temporary



Notes
 1. Rare plant populations were located by Stantec in September 2016 and August 2019 with a Trimble GeoExplorer Series Receiver. Expected accuracy of GPS data is within 1 meter of actual position.
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Project Location
 Washington County
 Maine

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

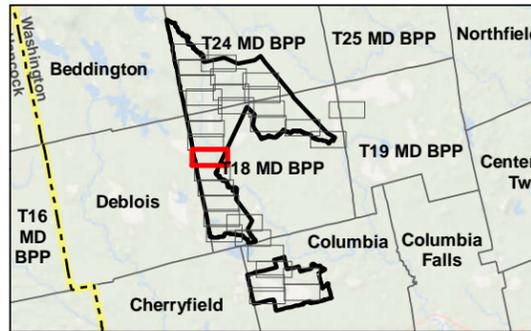
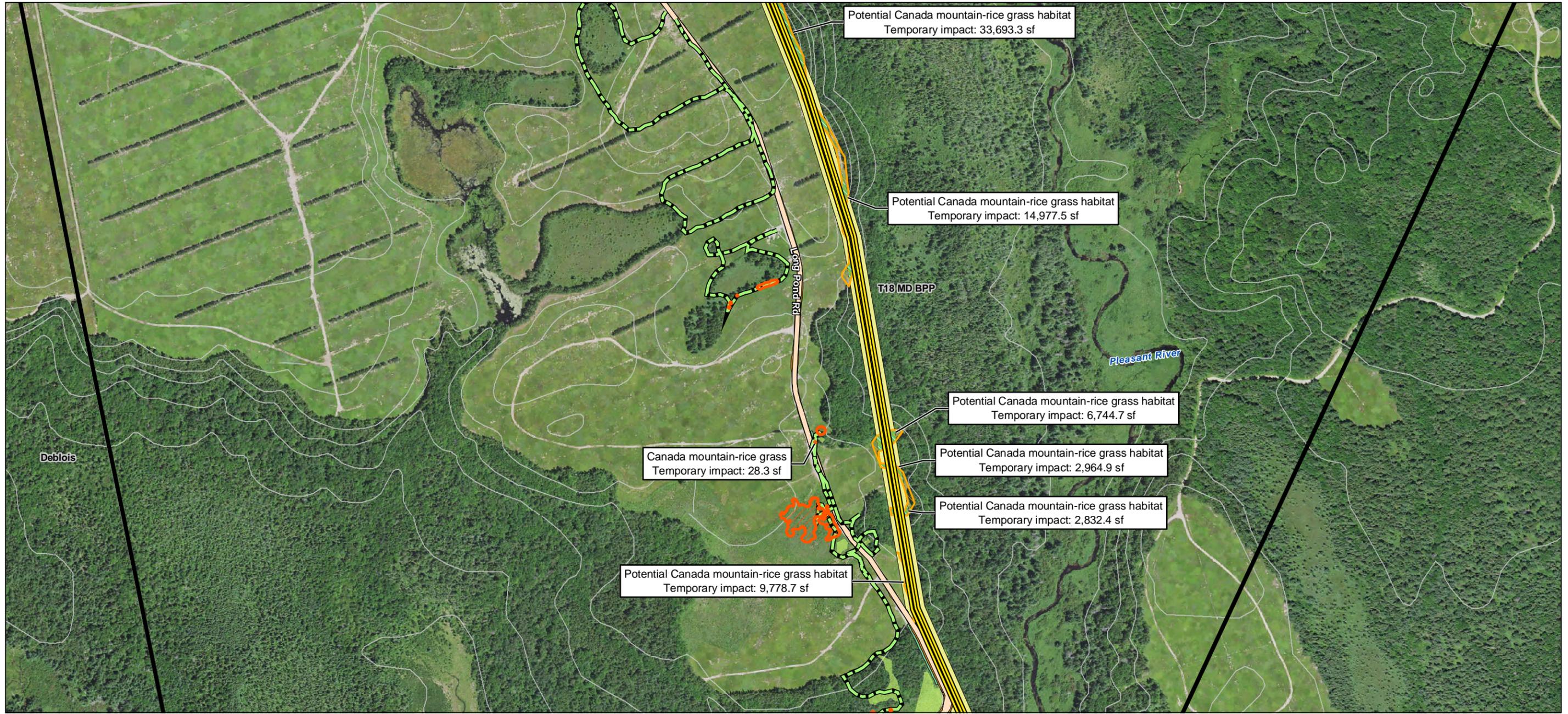
Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

195601654

Figure No.
 18

Title
 2016 and 2019 Rare Plant Survey

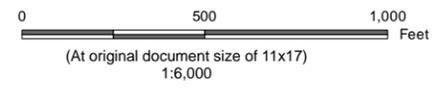
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Data Sources
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
 3. Background: NAIP 2018

- Legend**
- Underground Collector
 - Access Road
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland
 - Rare Plant Area**
 - Canada mountain-rice grass (*Piptatherum canadense*)
 - Desktop Assessment Potential Rare Plant Habitats (see Note 2)**
 - Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
 - Rare Plant Impact**
 - Temporary

- Desktop Assessment Potential Rare Plant Impact**
- Permanent
 - Temporary



Notes
 1. Rare plant populations were located by Stantec in September 2016 and August 2019 with a Trimble GeoExplorer Series Receiver. Expected accuracy of GPS data is within 1 meter of actual position.
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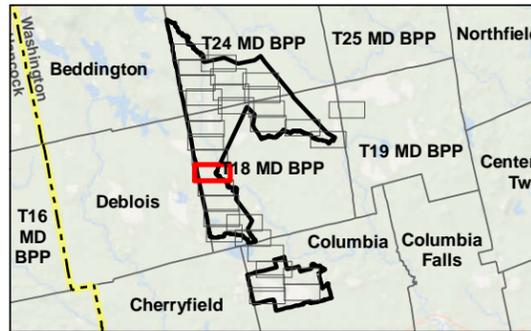
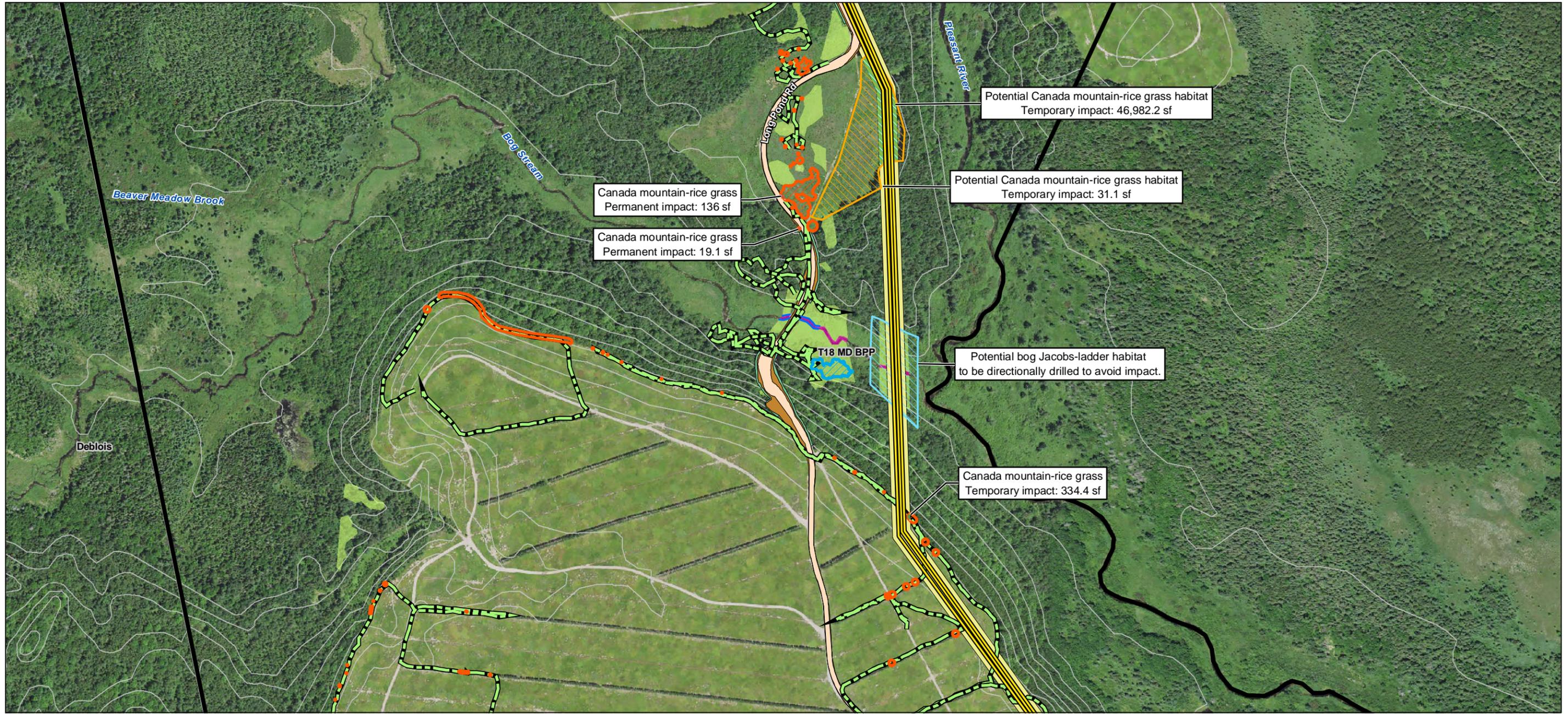


Project Location
 Washington County
 Maine
 Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County
 195601654

Figure No.
19
Title
2016 and 2019 Rare Plant Survey

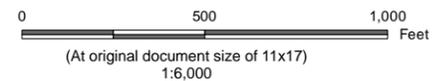
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Data Sources
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
 3. Background: NAIP 2018

- Legend**
- Underground Collector
 - Access Road
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Delineated Surface Water

- Rare Plant Area**
- Canada mountain-rice grass (*Piptatherum canadense*)
 - Bog Jacob's-ladder (*Polemonium vanbruntiae*)
- Desktop Assessment Potential Rare Plant Habitats (see Note 2)**
- Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
 - Potential bog Jacob's-ladder habitat (*Polemonium vanbruntiae*)
- Rare Plant Impact**
- Permanent
 - Temporary
- Desktop Assessment Potential Rare Plant Impact**
- Permanent
 - Temporary



Notes

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Project Location
 Washington County
 Maine

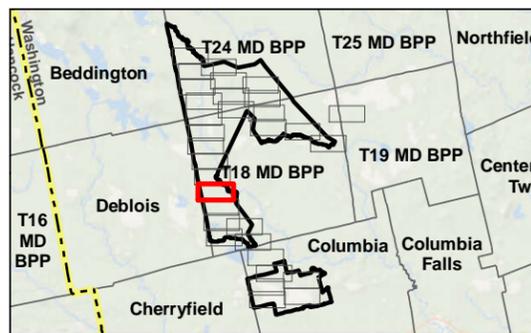
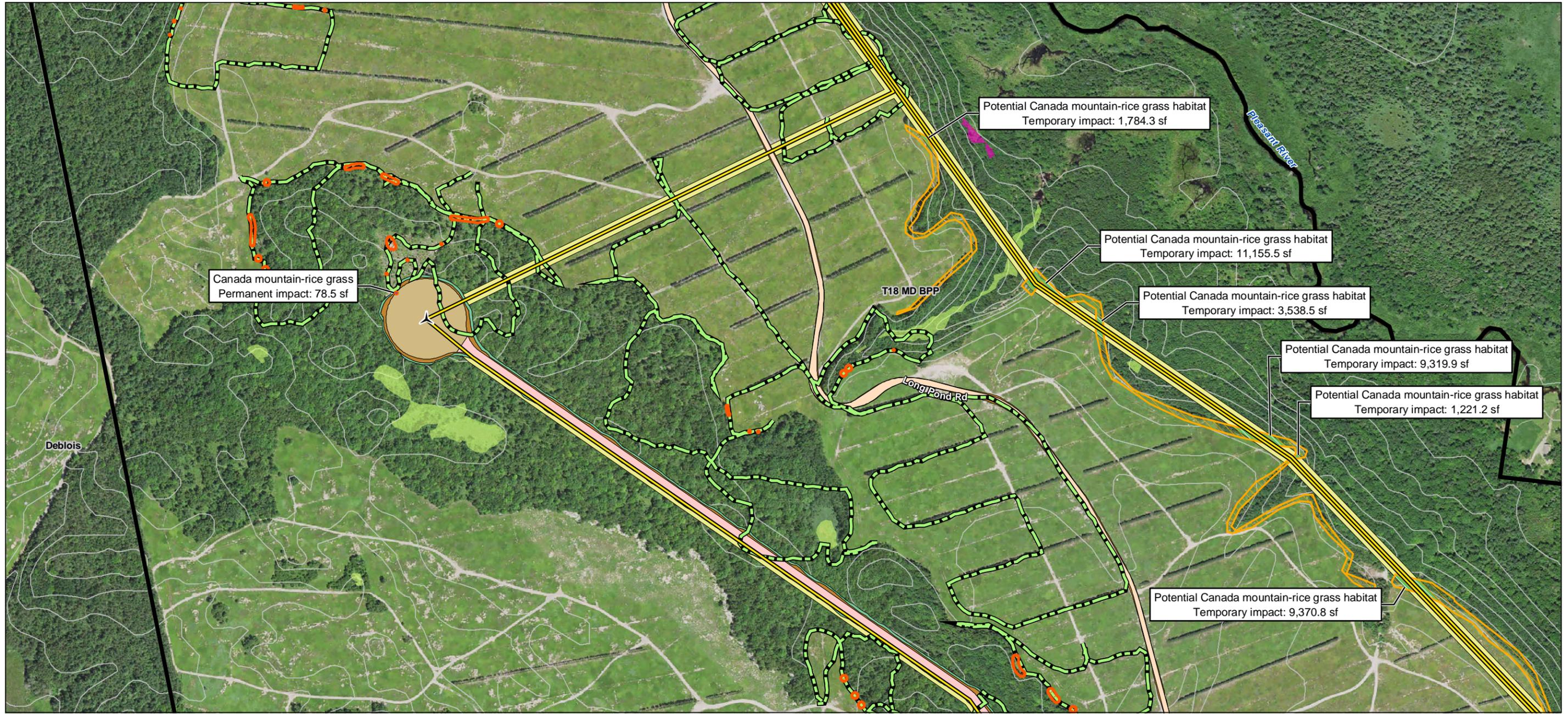
Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

195601654

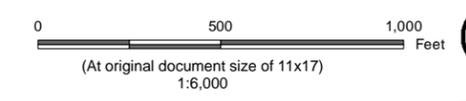
Figure No.
 20

Title
 2016 and 2019 Rare Plant Survey



Data Sources
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
 3. Background: NAIP 2018

- Legend**
- ▲ Proposed Turbine Location
 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland
 - Delineated Surface Water
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)
 - Desktop Assessment Potential Rare Plant Habitats (see Note 2)
 - Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
 - Rare Plant Impact
 - Permanent
 - Desktop Assessment Potential Rare Plant Impact
 - Temporary



Notes
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Project Location
 Washington County
 Maine

Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
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Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

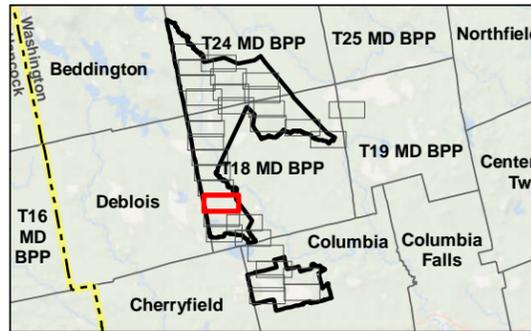
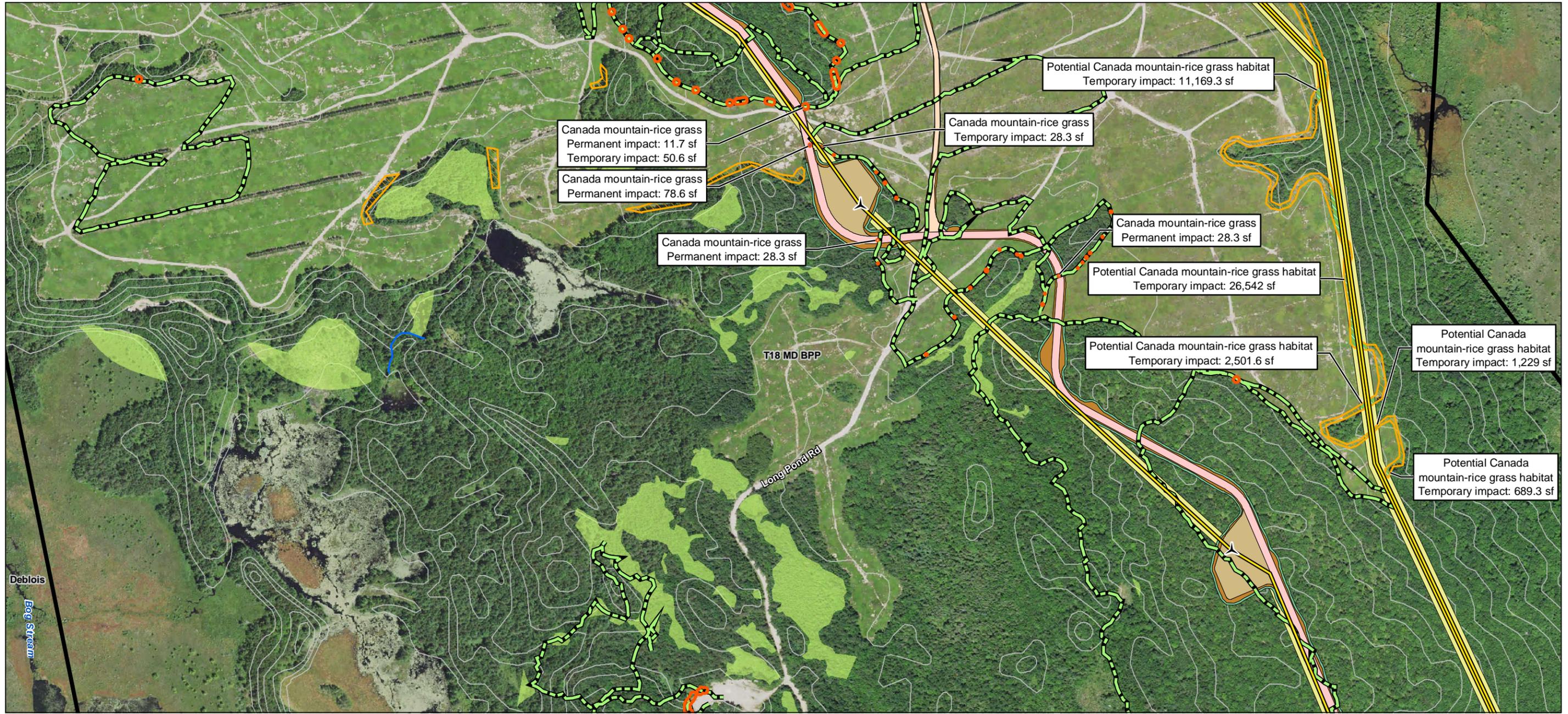
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Figure No.
 21

Title
 2016 and 2019 Rare Plant Survey

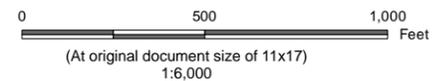
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Data Sources
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 3. Background: NAIP 2018

- Legend**
- Proposed Turbine Location
 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Rare Plant Area**
 - Canada mountain-rice grass (*Piptatherum canadense*)
 - Desktop Assessment Potential Rare Plant Habitats (see Note 2)**
 - Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
 - Rare Plant Impact**
 - Permanent
 - Temporary
 - Desktop Assessment Potential Rare Plant Impact**
 - Permanent
 - Temporary



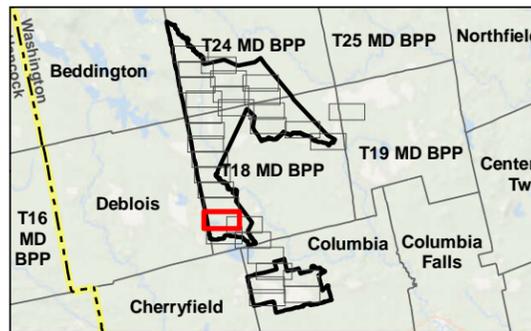
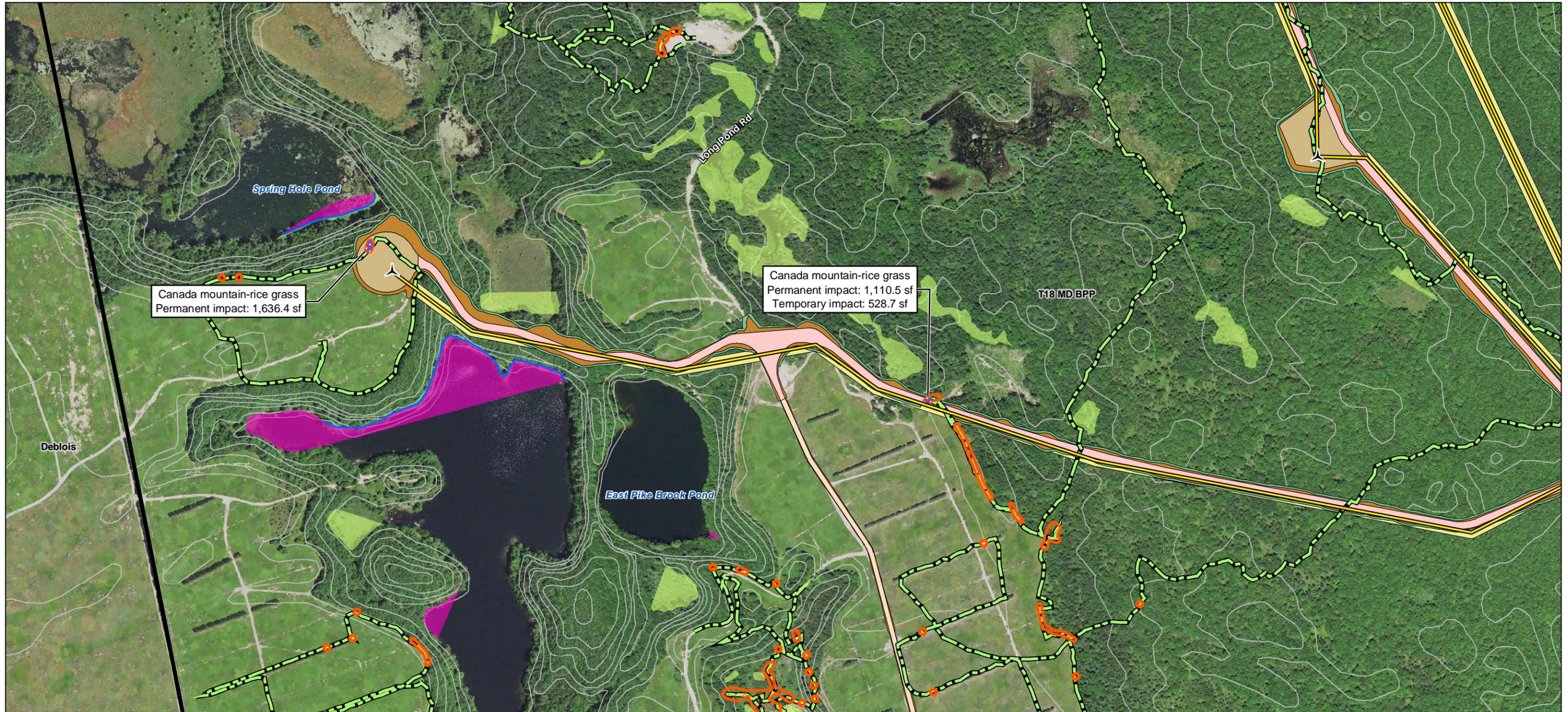
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Project Location
 Washington County
 Maine
 Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

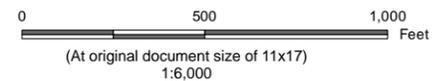
Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County
 195601654

Figure No.
 22
Title
 2016 and 2019 Rare Plant Survey



Data Sources
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
 3. Background: NAIP 2018

- Legend**
- ▲ Proposed Turbine Location
 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Delineated Surface Water
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)
 - Rare Plant Impact
 - Permanent
 - Temporary



Notes
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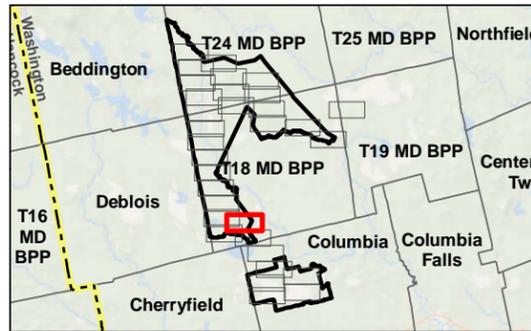
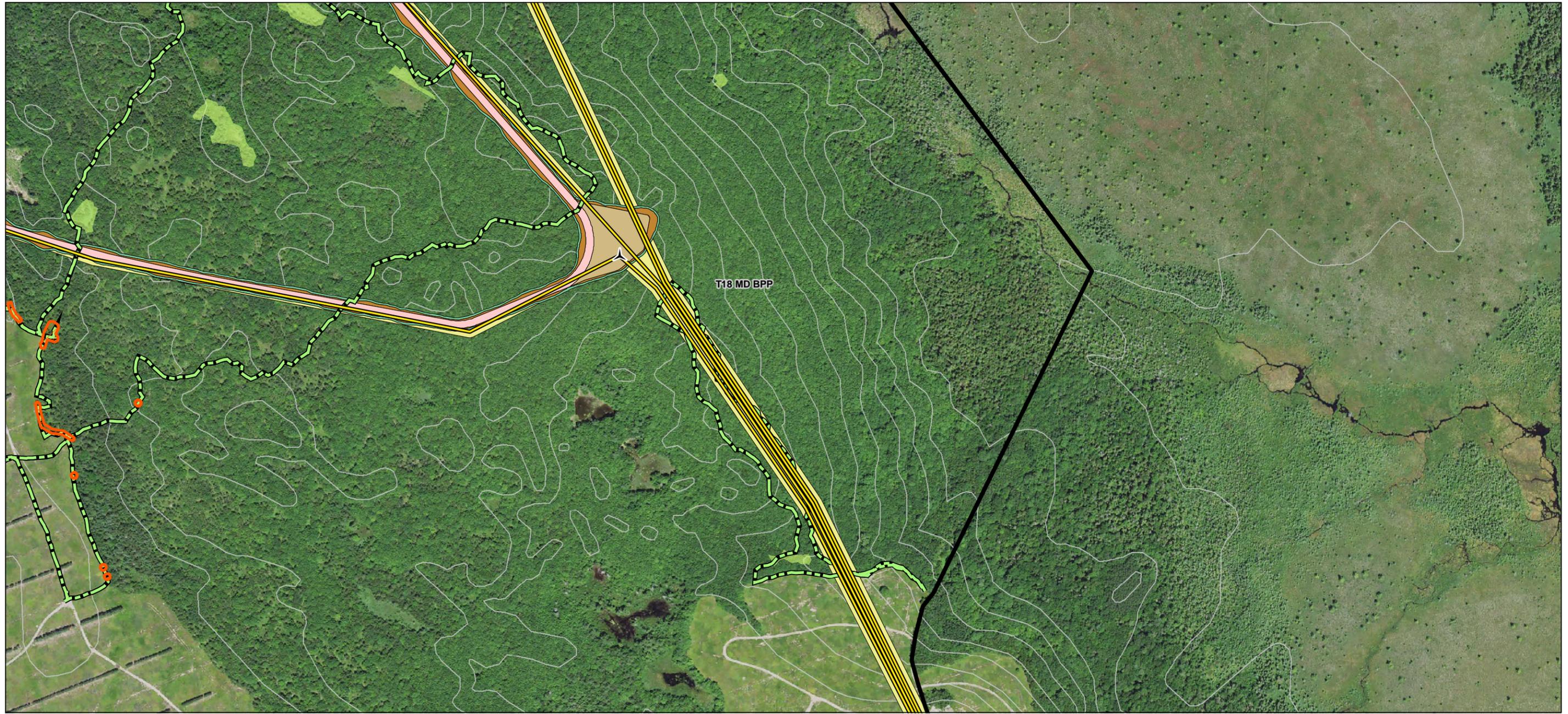
Project Location
 Washington County
 Maine
 Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County
 195601654

Figure No.
23
Title
2016 and 2019 Rare Plant Survey

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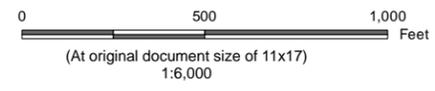
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Data Sources
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
 3. Background: NAIP 2018

- Legend**
- Proposed Turbine Location
 - Underground Collector
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland

Rare Plant Area
 Canada mountain-rice grass (*Piptatherum canadense*)



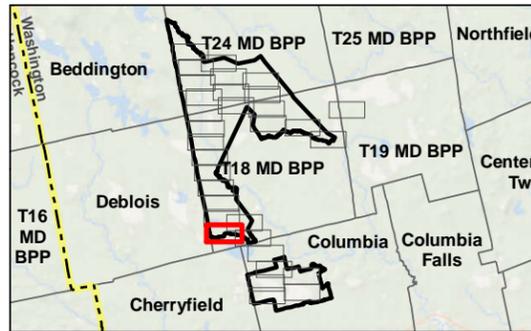
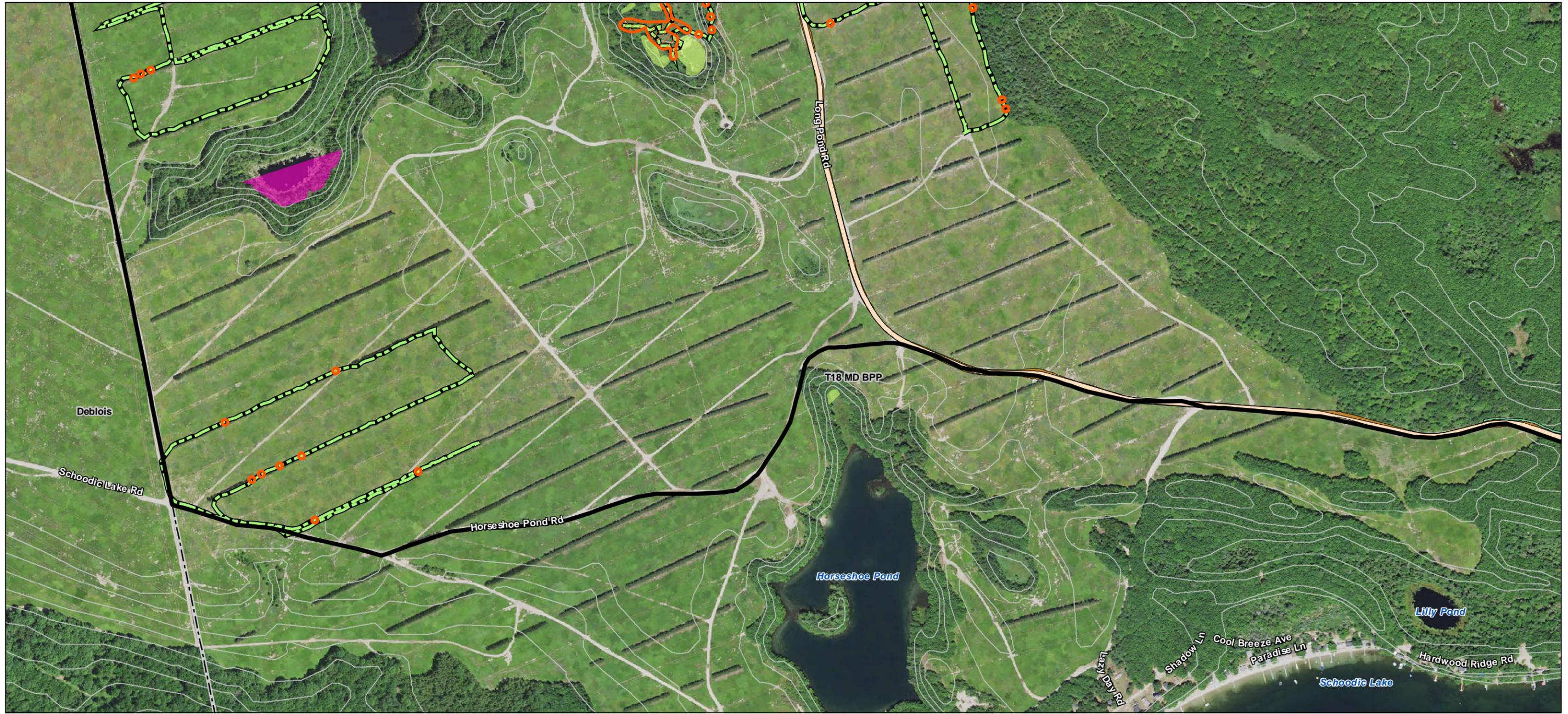
Notes
 1. Rare plant populations were located by Stantec in September 2016 and August 2019 with a Trimble GeoExplorer Series Receiver. Expected accuracy of GPS data is within 1 meter of actual position.
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Project Location
 Washington County
 Maine
 Prepared by GC on 2021-02-10
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 IR Review by AG on 2021-02-12

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County
 195601654

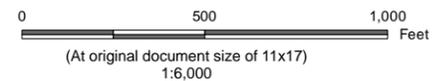
Figure No.
24
Title
2016 and 2019 Rare Plant Survey



- Legend**
- Access Road
 - Grading Limits
 - Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland
 - Delineated Surface Water
- Rare Plant Area**
- Canada mountain-rice grass (*Piptatherum canadense*)

Data Sources

- Coordinate System: NAD 1983 UTM Zone 19N
- Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
- Background: NAIP 2018



Project Location
Washington County
Maine

Prepared by GC on 2021-02-10
TR by MP on 2021-02-11
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Client/Project
Downeast Wind Project
Apex Clean Energy, Inc.
Washington County

195601654

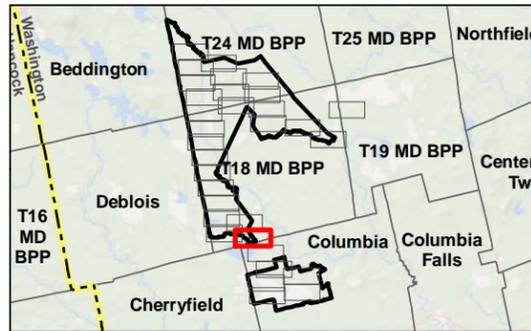
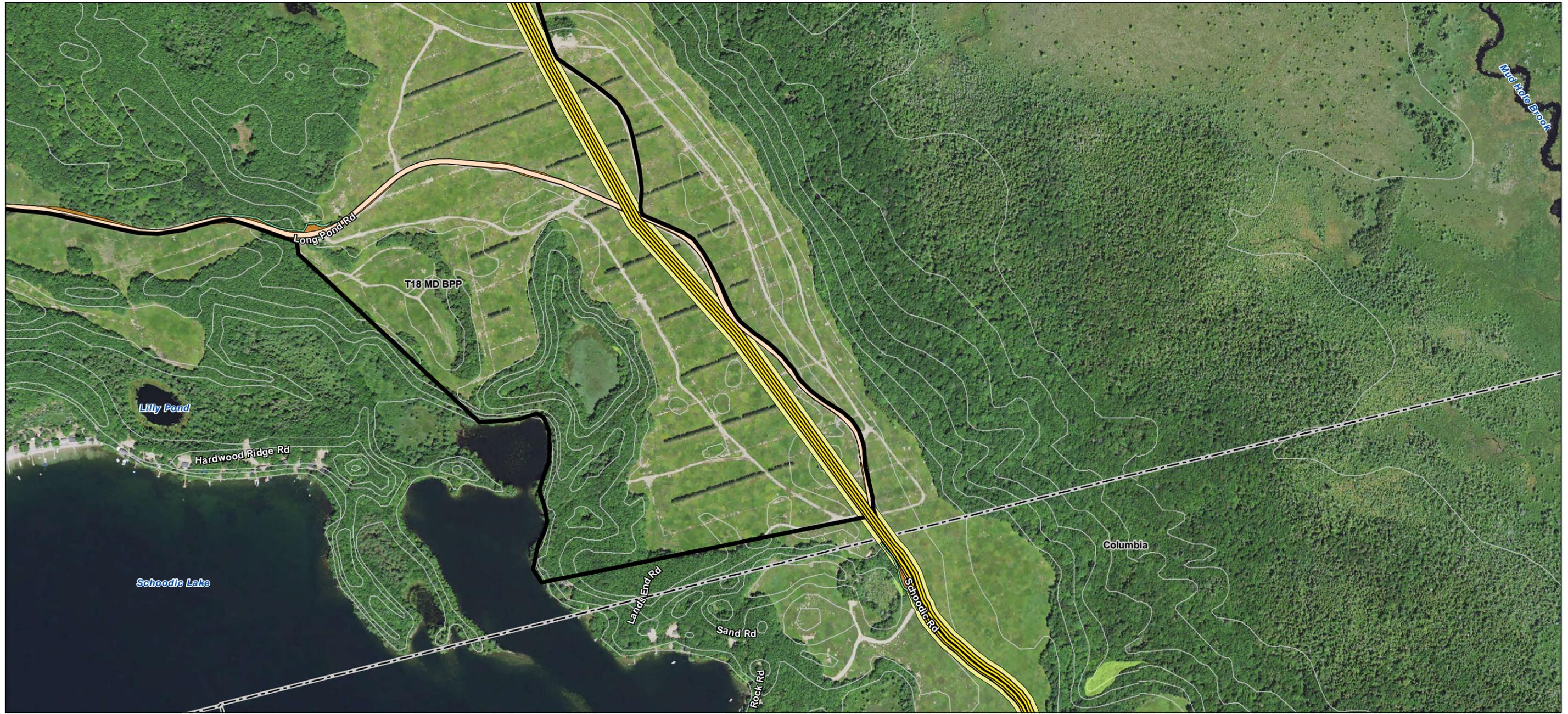
Figure No.
25

Title
2016 and 2019 Rare Plant Survey

Notes

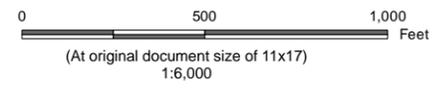
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- Legend**
- Underground Collector
 - Access Road
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - Delineated Wetland

Data Sources
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
 3. Background: NAIP 2018



Project Location
 Washington County
 Maine

Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

195601654

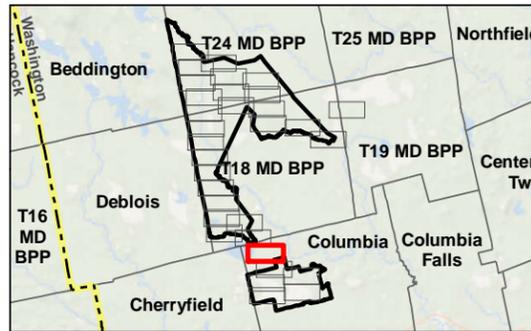
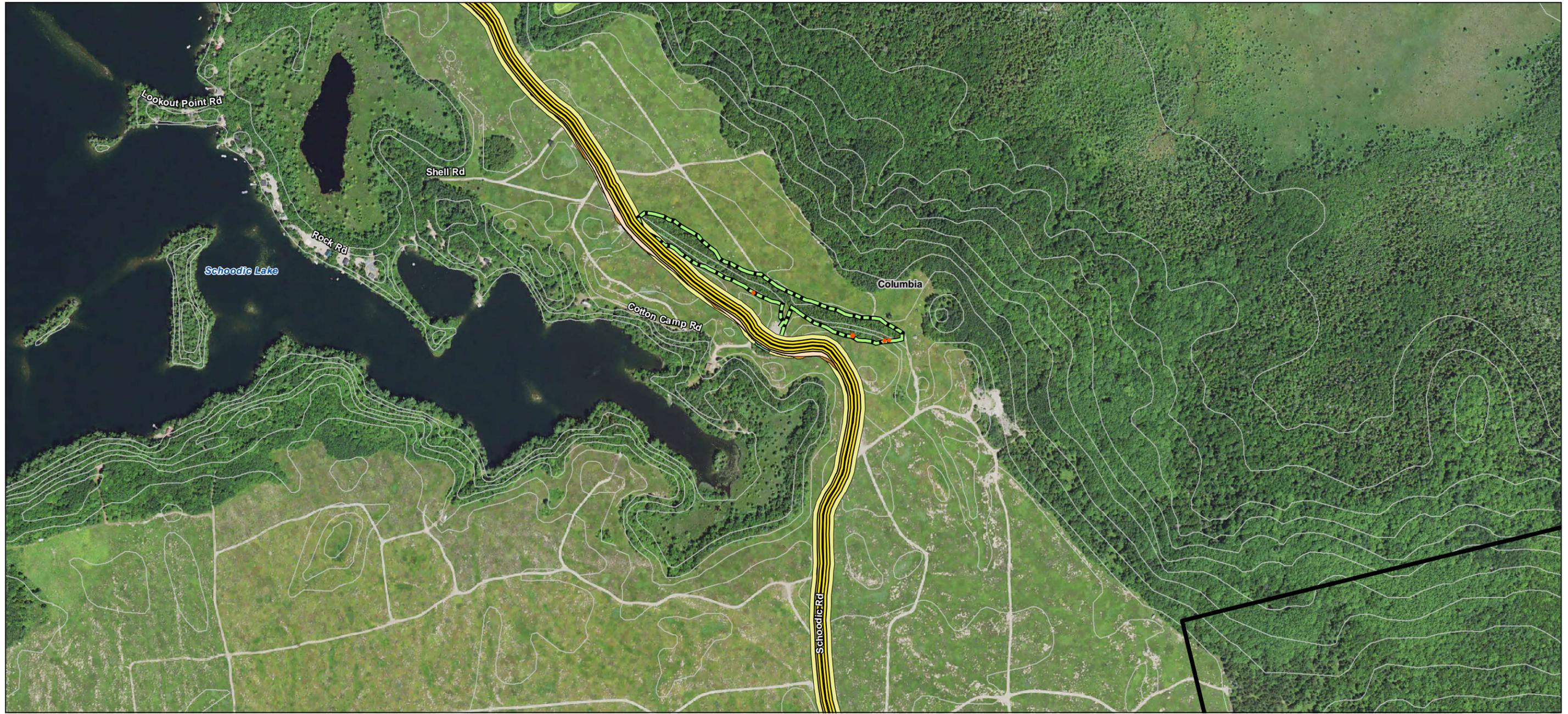
Figure No.
 26

Title
 2016 and 2019 Rare Plant Survey

Notes
 1. Rare plant populations were located by Stantec in September 2016 and August 2019 with a Trimble GeoExplorer Series Receiver. Expected accuracy of GPS data is within 1 meter of actual position.
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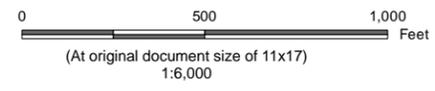
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- Legend**
- Underground Collector
 - Access Road
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)

Data Sources
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
 3. Background: NAIP 2018



Project Location
 Washington County
 Maine

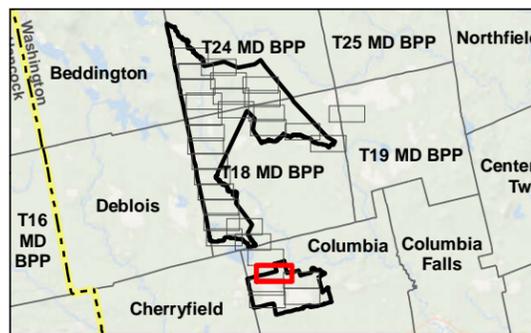
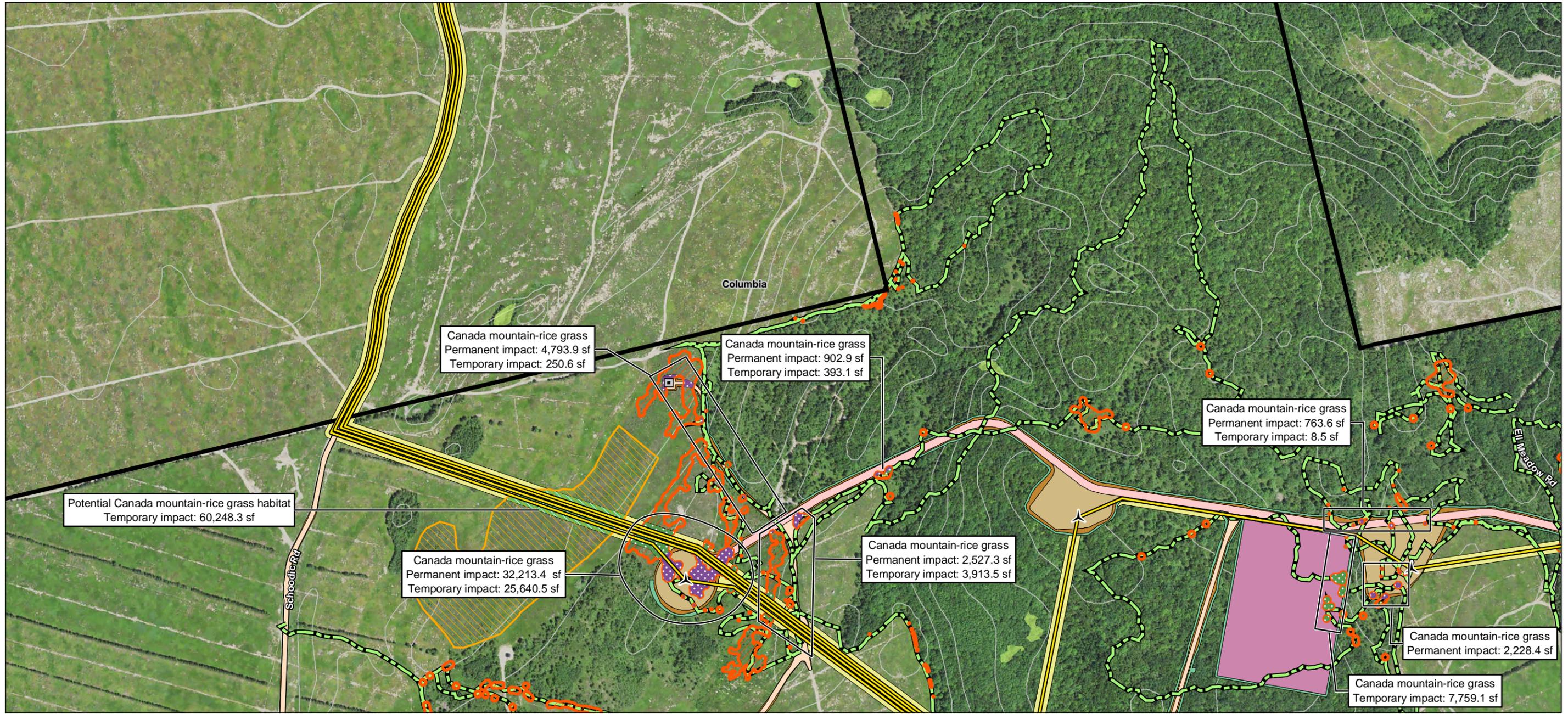
Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

Figure No.
 27

Title
 2016 and 2019 Rare Plant Survey

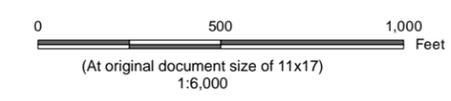
Notes

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Data Sources
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
 3. Background: NAIP 2018

- Legend**
- ▲ Proposed Turbine Location
 - MET Tower Location
 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Staging Area
 - Project Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)
 - Desktop Assessment Potential Rare Plant Habitats (see Note 2)
 - Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
 - Rare Plant Impact
 - Permanent
 - Temporary
 - Desktop Assessment Potential Rare Plant Impact
 - Temporary



Notes
 1. Rare plant populations were located by Stantec in September 2016 and August 2019 with a Trimble GeoExplorer Series Receiver. Expected accuracy of GPS data is within 1 meter of actual position.
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Project Location
 Washington County
 Maine

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

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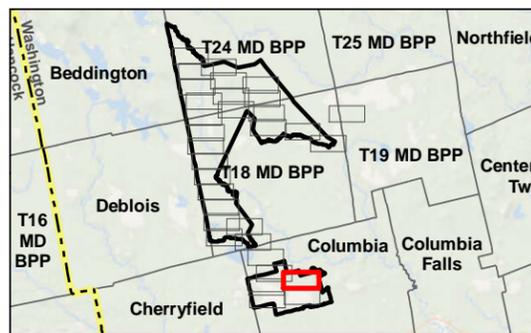
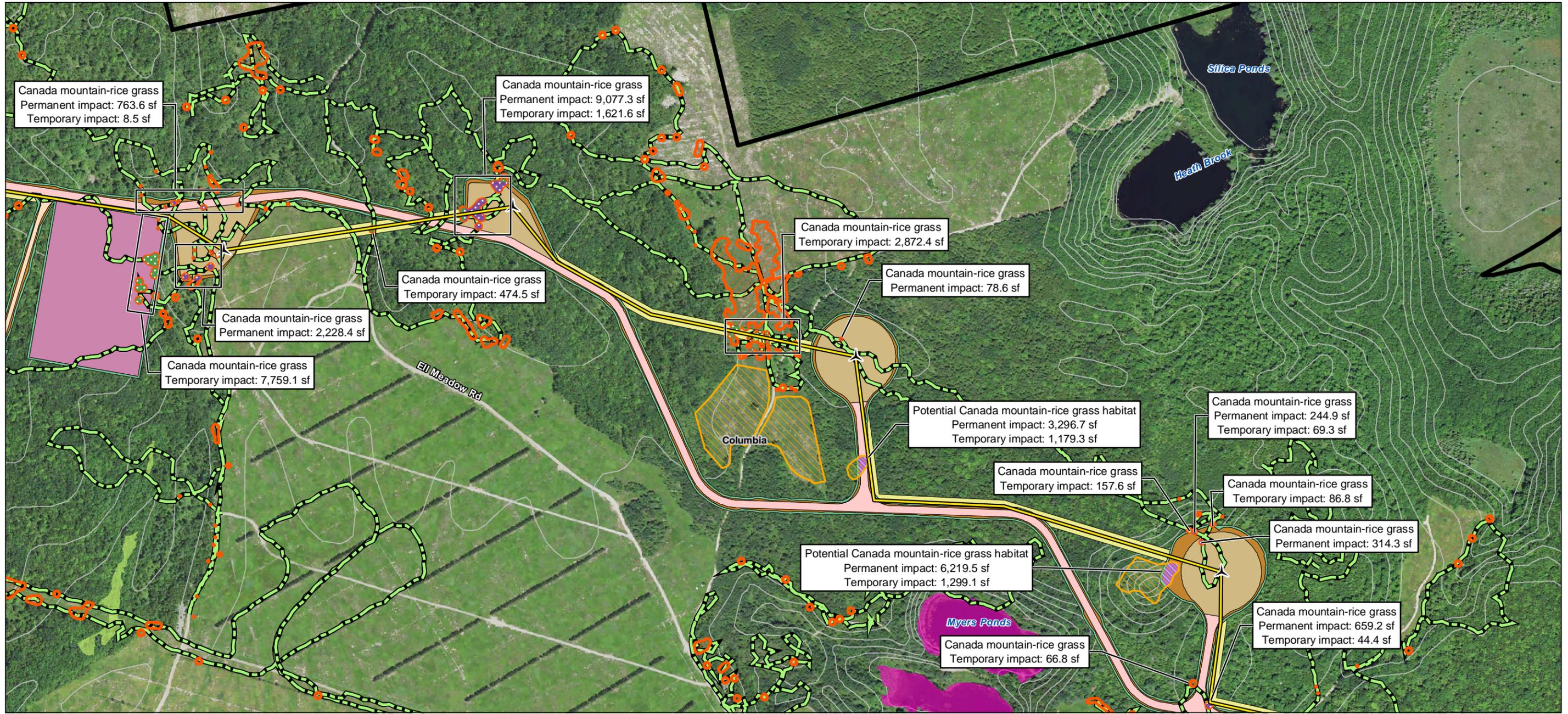
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Figure No.
 28

Title
 2016 and 2019 Rare Plant Survey

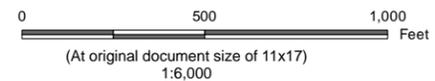
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Data Sources
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
 3. Background: NAIP 2018

- Legend**
- ▲ Proposed Turbine Location
 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Staging Area
 - Project Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland
 - Delineated Surface Water
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)
 - Desktop Assessment Potential Rare Plant Habitats (see Note 2)
 - Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
 - Rare Plant Impact
 - Permanent
 - Temporary
 - Desktop Assessment Potential Rare Plant Impact
 - Permanent
 - Temporary



Project Location
 Washington County
 Maine
 Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

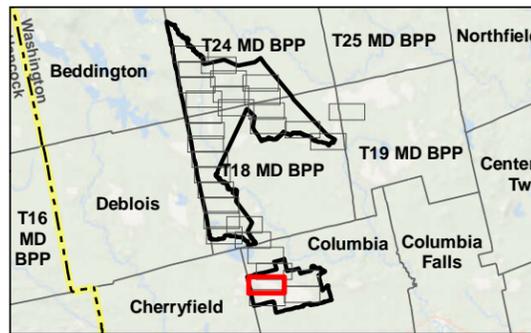
Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County
 195601654

Figure No.
 29

Title
 2016 and 2019 Rare Plant Survey

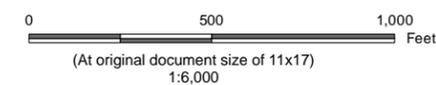
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- Legend**
- Underground Collector
 - Access Road
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Staging Area
 - Substation
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
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Project Location
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 Maine

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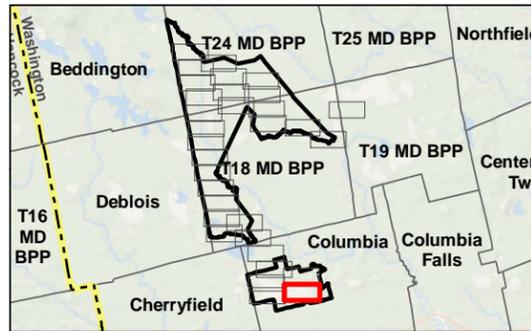
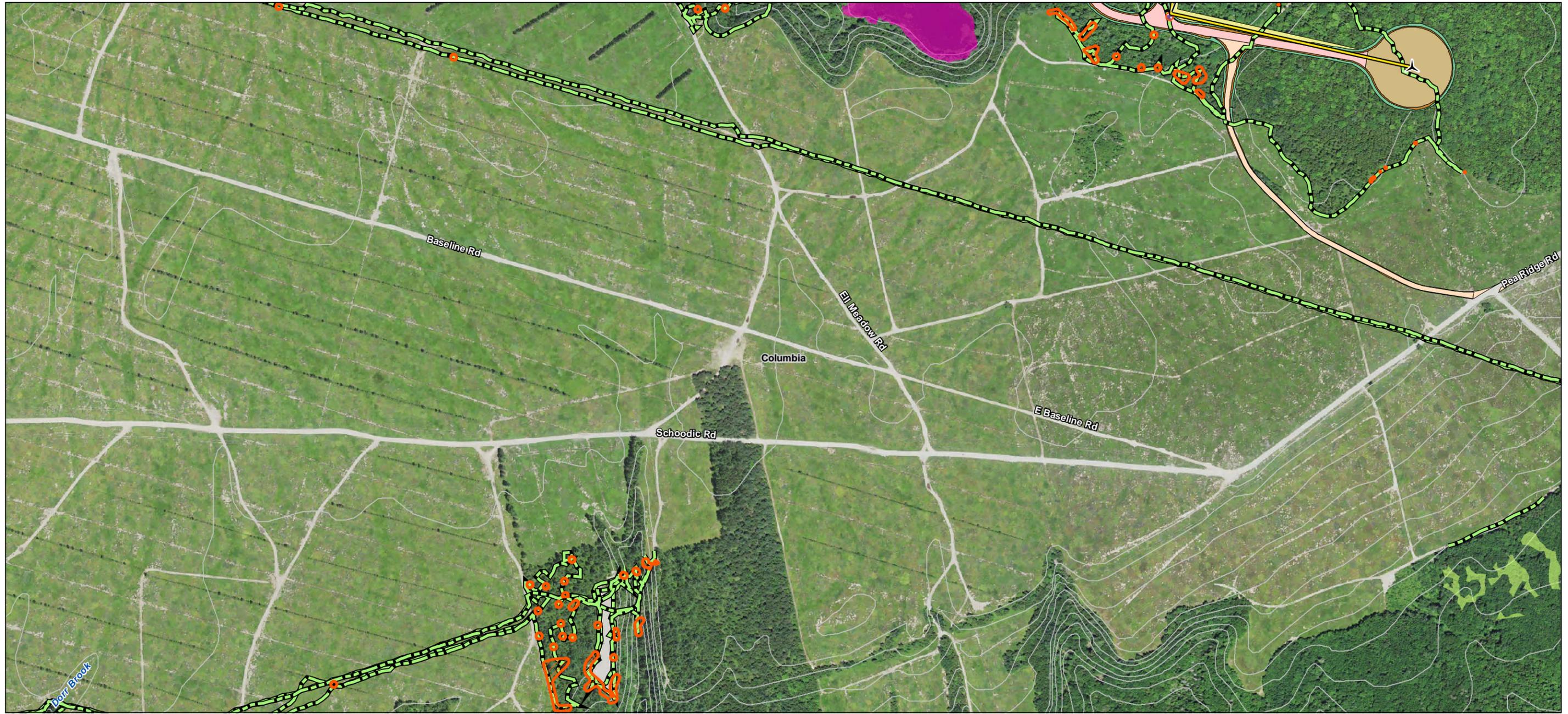
Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
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Figure No.
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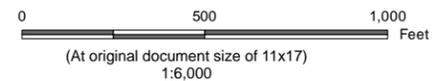
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- Legend**
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 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
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 - Collector Clearing Limits
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 - Rare Plant Impact
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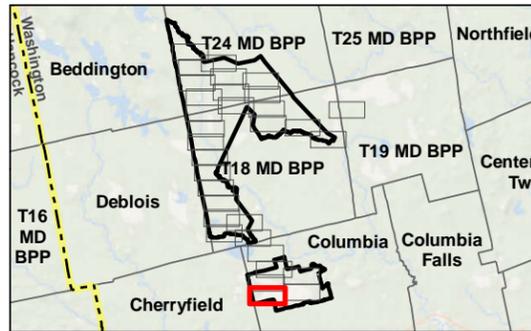
Figure No.
31

Title
2016 and 2019 Rare Plant Survey

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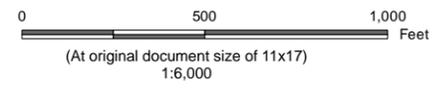
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- Legend**
- Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland
 - Delineated Surface Water
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)

Data Sources

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Project Location
Washington County
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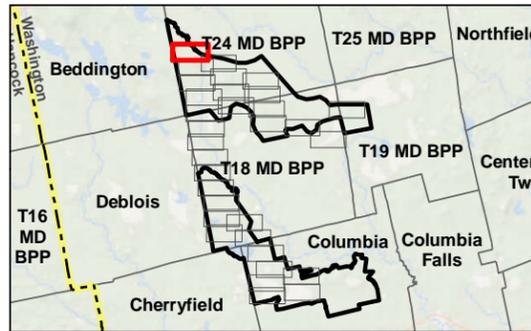
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Title
2016 and 2019 Rare Plant Survey

Notes

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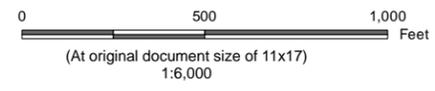
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- Legend**
- Proposed Turbine Location
 - Underground Collector
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland

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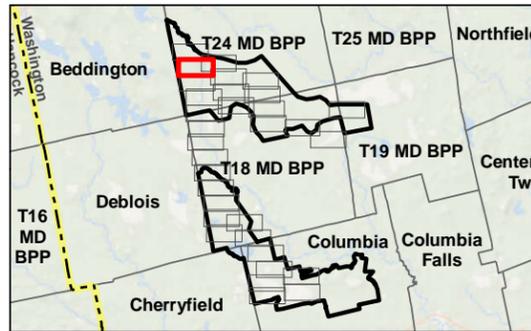
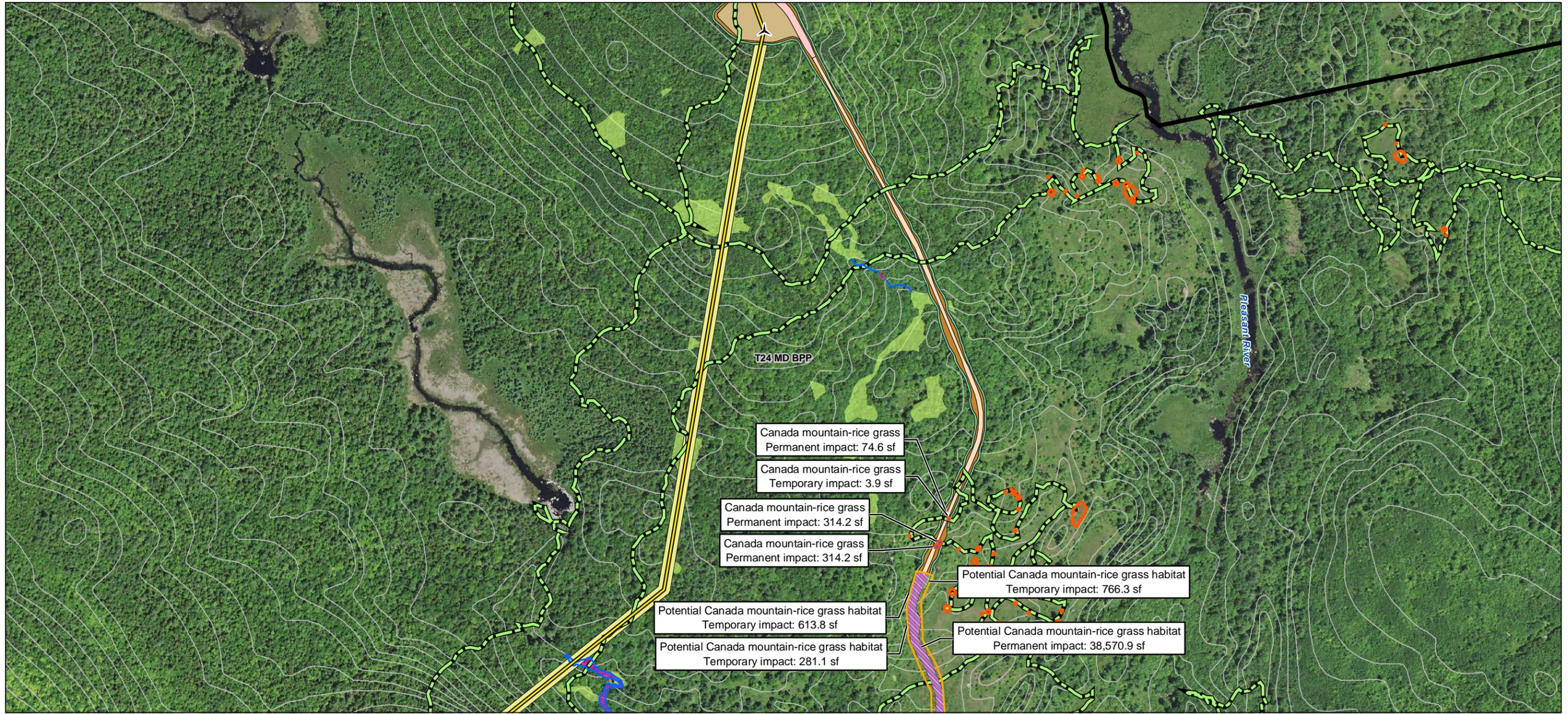
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 Apex Clean Energy, Inc.
 Washington County

Figure No.
1
Title
2016 and 2019 Rare Plant Survey

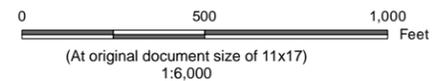
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- Legend**
- Proposed Turbine Location
 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Delineated Surface Water
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)
 - Desktop Assessment Potential Rare Plant Habitats (see Note 2)
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 - Rare Plant Impact
 - Permanent
 - Temporary
 - Desktop Assessment Potential Rare Plant Impact
 - Permanent
 - Temporary



Notes

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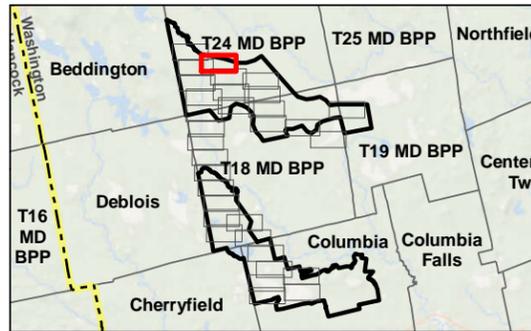


Project Location
 Washington County
 Maine
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 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County
 195601654

Figure No.
2
Title
2016 and 2019 Rare Plant Survey

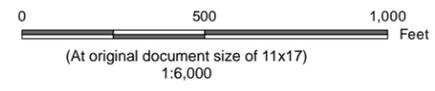
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- Legend**
- Proposed Turbine Location
 - Underground Collector
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland

Rare Plant Area
 Canada mountain-rice grass (*Piptatherum canadense*)



Notes
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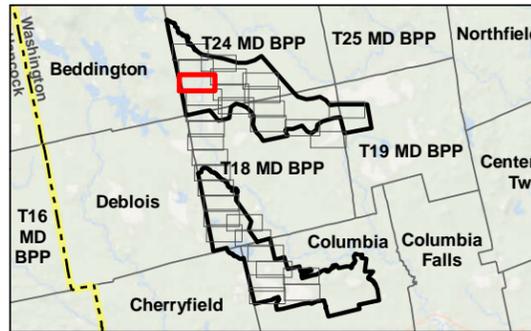
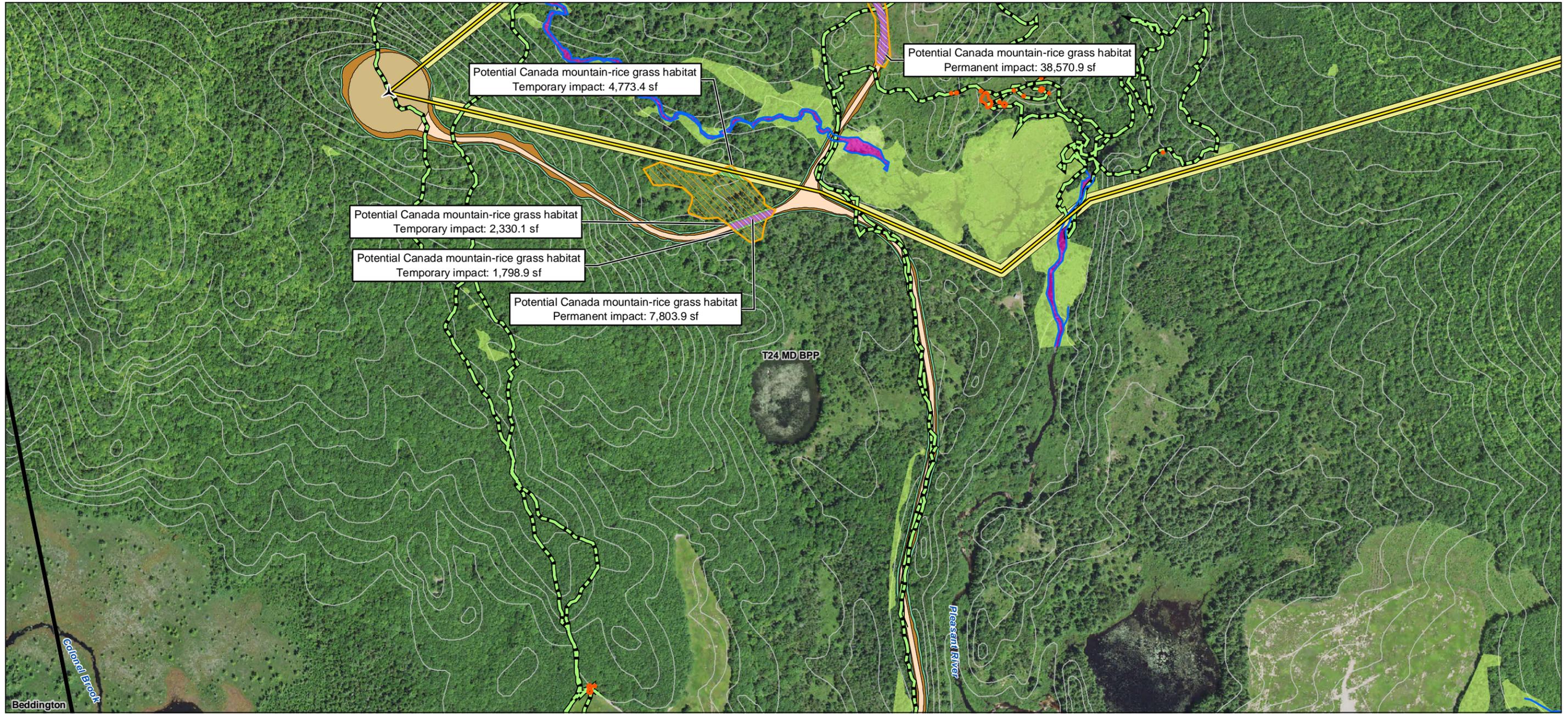
Client/Project
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 Washington County

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Figure No.
3

Title
2016 and 2019 Rare Plant Survey

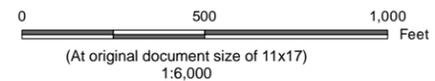
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Legend

- Proposed Turbine Location
- Underground Collector
- Access Road
- Turbine Pad
- Grading Limits
- Clearing Limits
- Collector Clearing Limits
- Project Boundary
- Town Boundary
- 20-foot Contours
- GPS Tracklog
- Delineated Stream
- Delineated Wetland
- Delineated Surface Water
- Rare Plant Area**
- Canada mountain-rice grass (*Piptatherum canadense*)
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- Desktop Assessment Potential Rare Plant Impact**
- Permanent
- Temporary



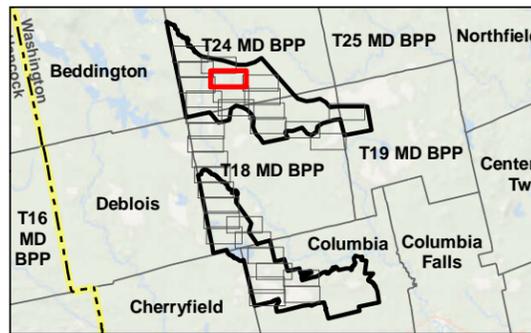
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 Washington County
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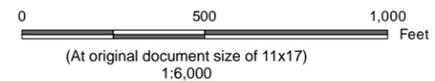
Figure No.
 4
Title
 2016 and 2019 Rare Plant Survey



- Legend**
- Proposed Turbine Location
 - Underground Collector
 - Crane Path
 - Turbine Pad
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 - Collector Clearing Limits
 - Staging Area
 - Project Boundary
 - 20-foot Contours
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Washington County

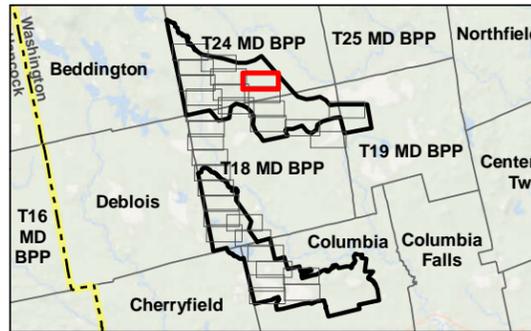
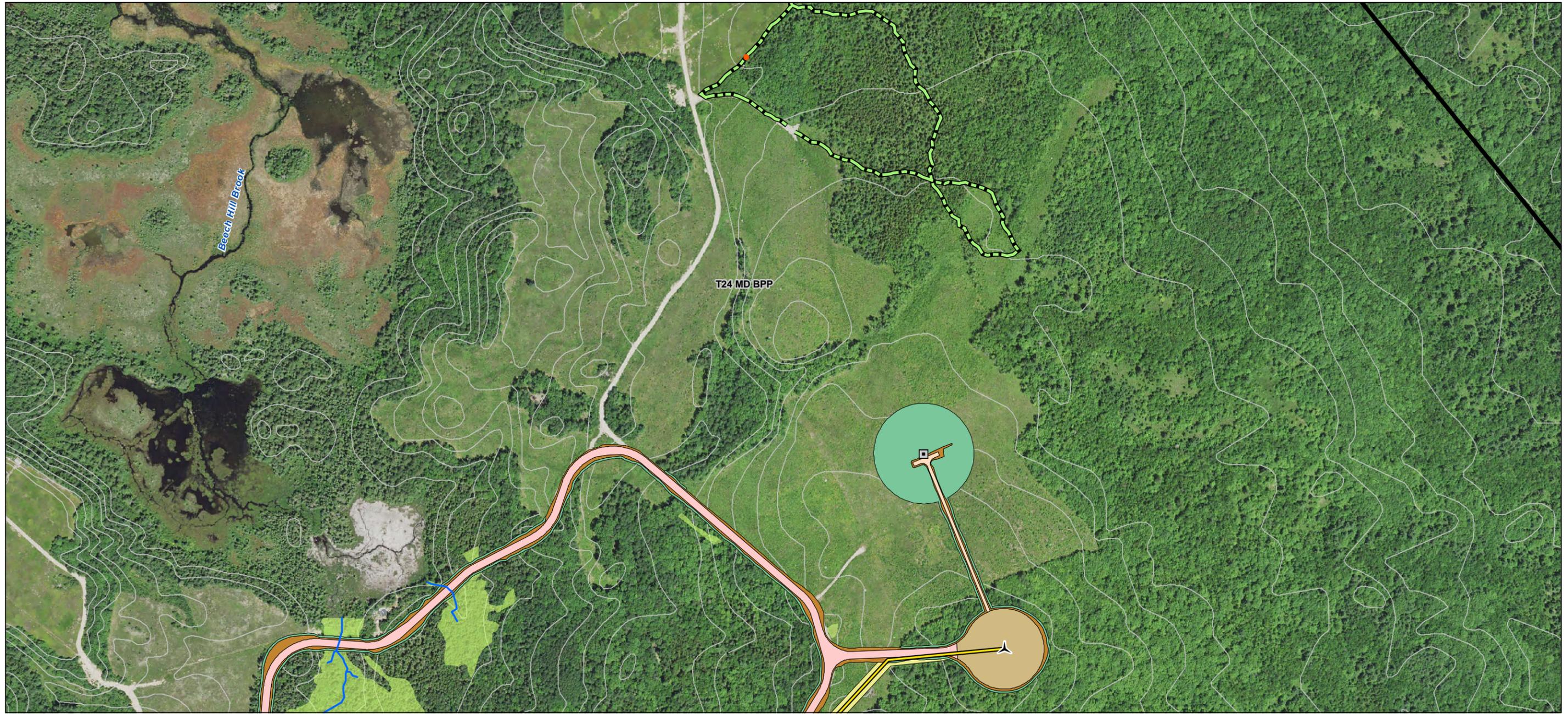
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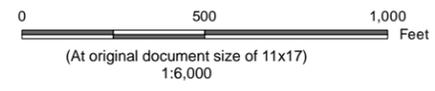
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- Legend**
- Proposed Turbine Location
 - MET Tower Location
 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
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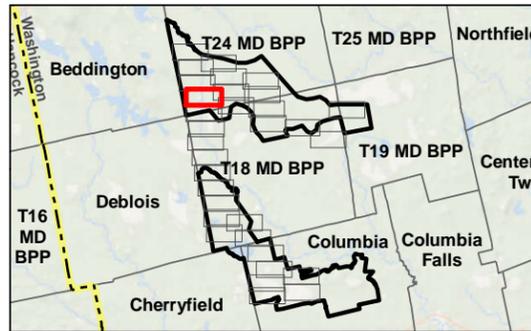
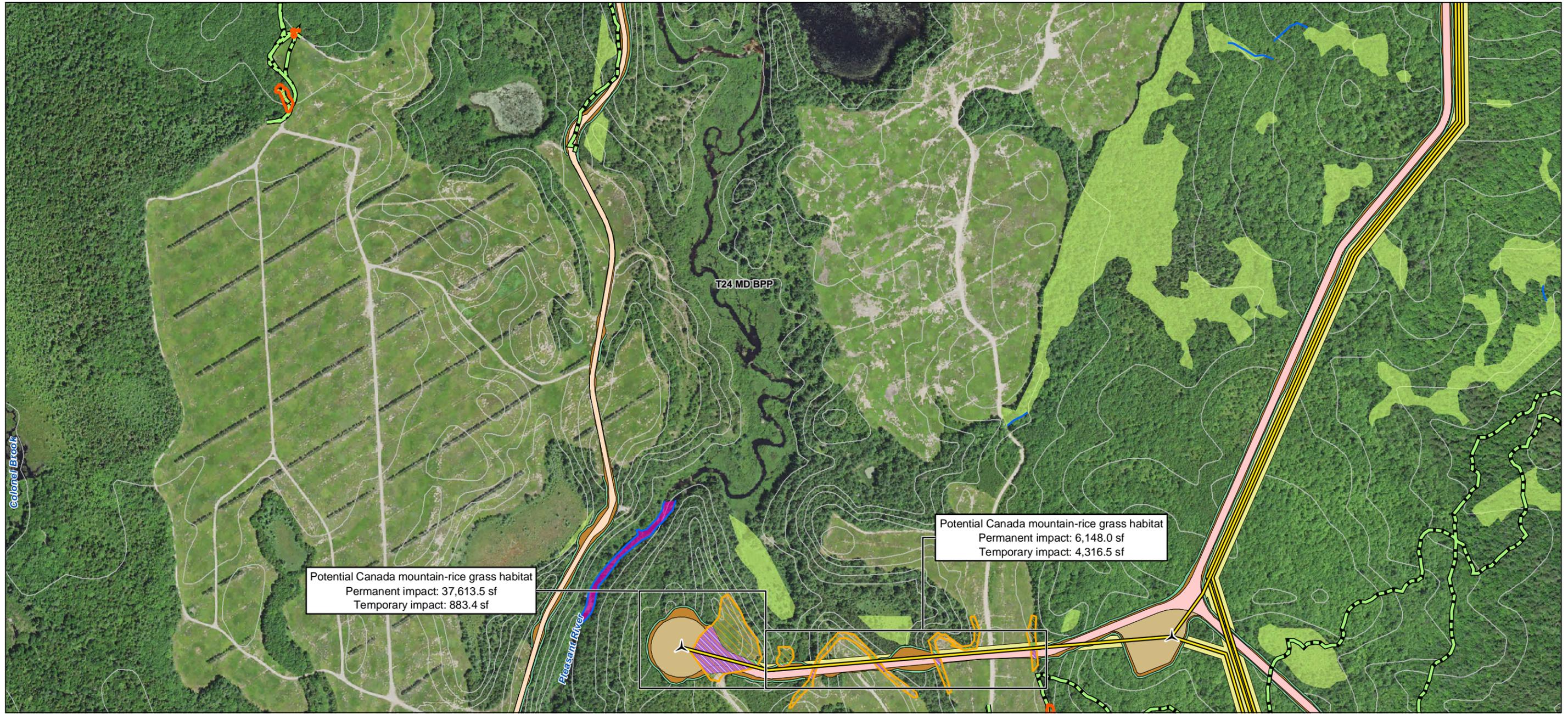
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Title
2016 and 2019 Rare Plant Survey

Notes

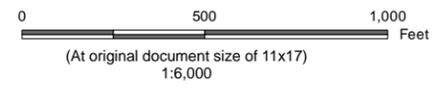
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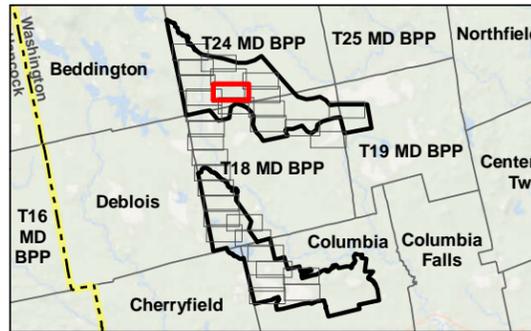
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 Apex Clean Energy, Inc.
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Figure No.
 7

Title
 2016 and 2019 Rare Plant Survey

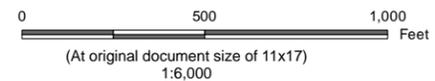
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 - Delineated Stream
 - Delineated Wetland

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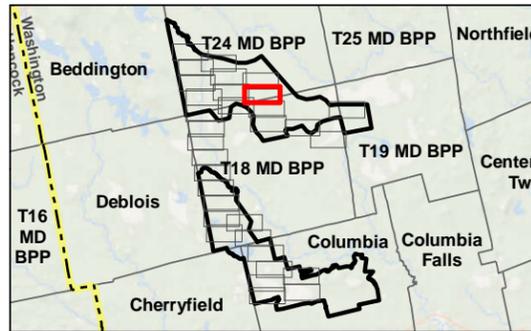
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Title
2016 and 2019 Rare Plant Survey

Notes

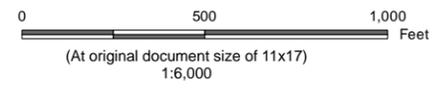
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Data Sources
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
 3. Background: NAIP 2018

- Legend**
- Proposed Turbine Location
 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland



Notes
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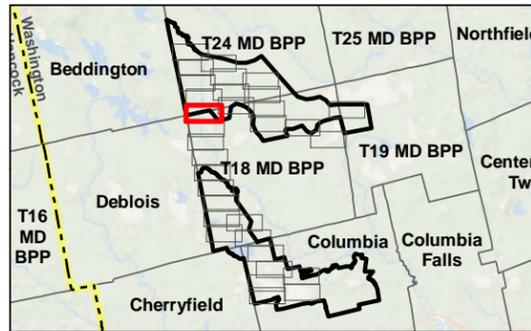
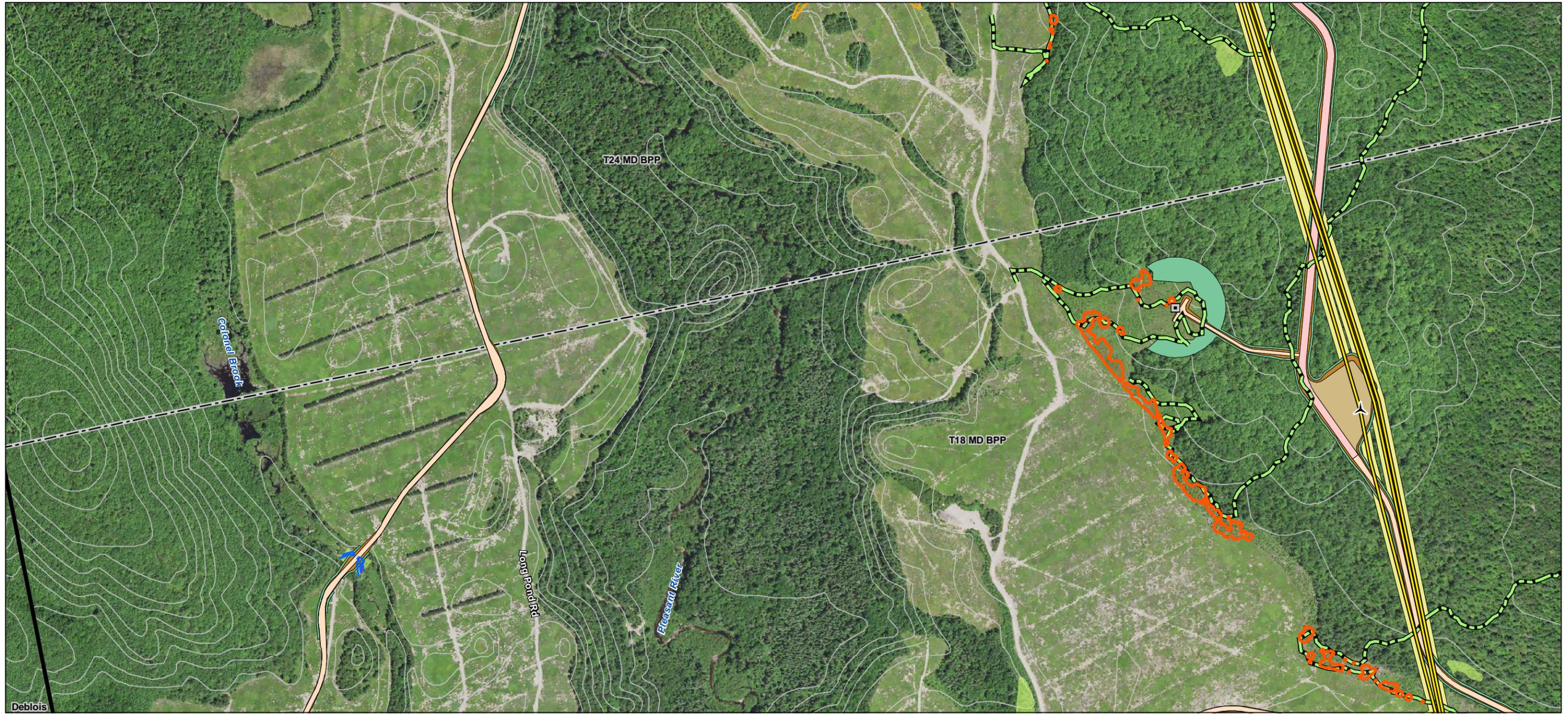


Project Location
 Washington County
 Maine
 Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12
 195601654

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

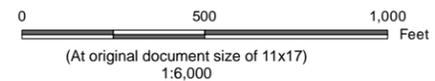
Figure No.
9
Title
2016 and 2019 Rare Plant Survey

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Data Sources
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- Legend**
- Proposed Turbine Location
 - MET Tower Location
 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Delineated Surface Water
 - Rare Plant Area**
 - Canada mountain-rice grass (*Piptatherum canadense*)
 - Desktop Assessment Potential Rare Plant Habitats (see Note 2)
 - Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)



Notes
 1. Rare plant populations were located by Stantec in September 2016 and August 2019 with a Trimble GeoExplorer Series Receiver. Expected accuracy of GPS data is within 1 meter of actual position.
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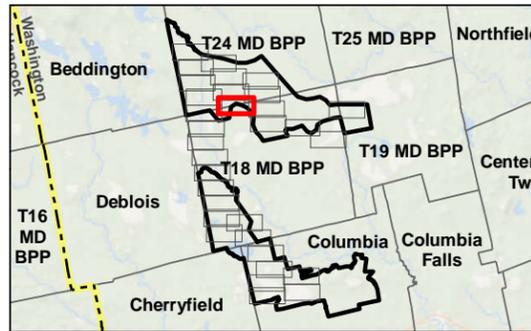
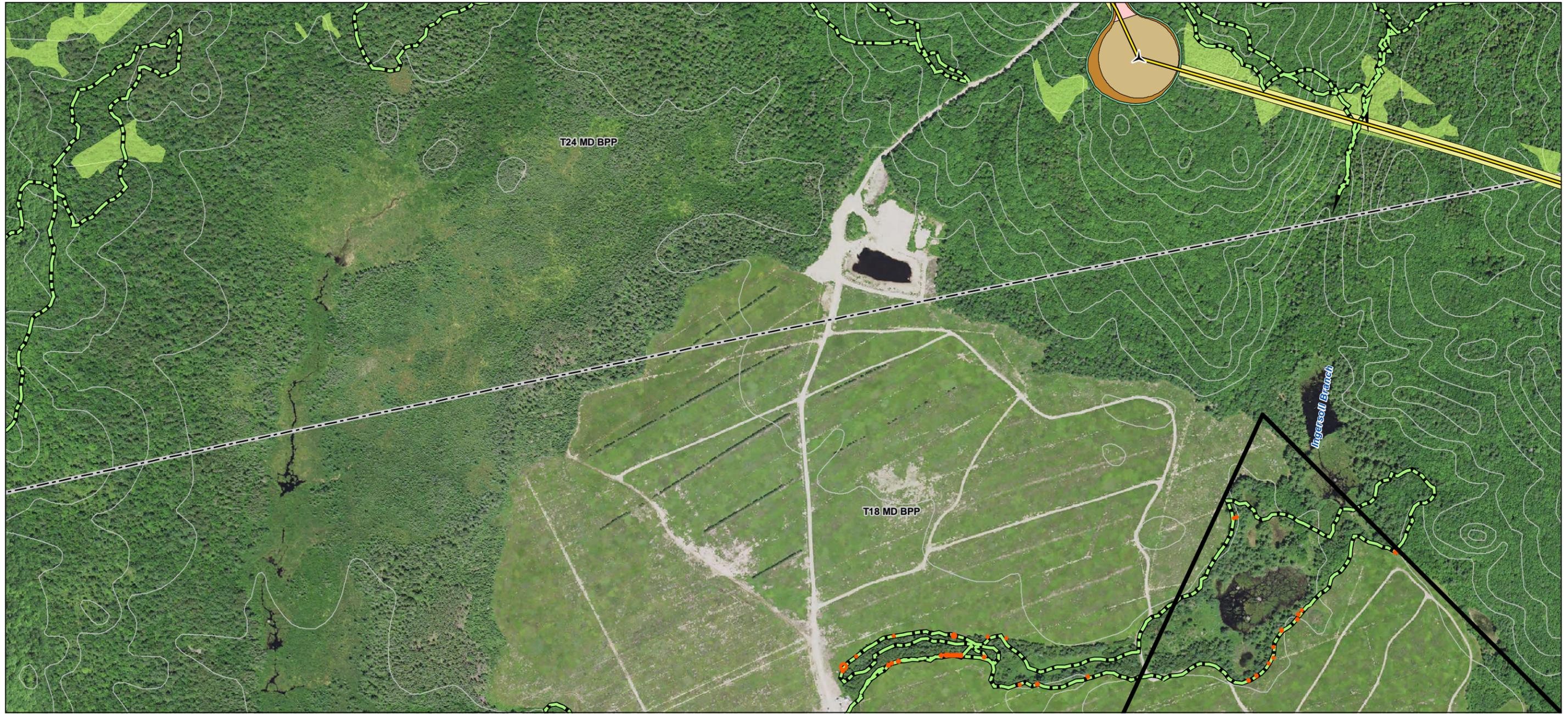


Project Location
 Washington County
 Maine
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 IR Review by AG on 2021-02-12

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County
 195601654

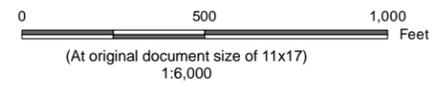
Figure No.
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Title
2016 and 2019 Rare Plant Survey

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Data Sources
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- Legend**
- Proposed Turbine Location
 - Underground Collector
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)



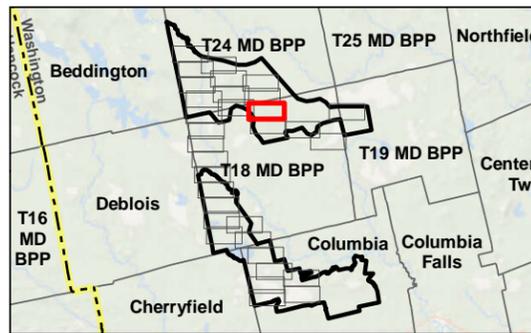
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Project Location
 Washington County
 Maine
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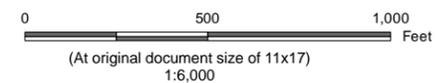
Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County
 195601654

Figure No.
 11
Title
 2016 and 2019 Rare Plant Survey



Data Sources
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
 3. Background: NAIP 2018

- Legend**
- ▲ Proposed Turbine Location
 - Underground Collector
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - ▭ Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)



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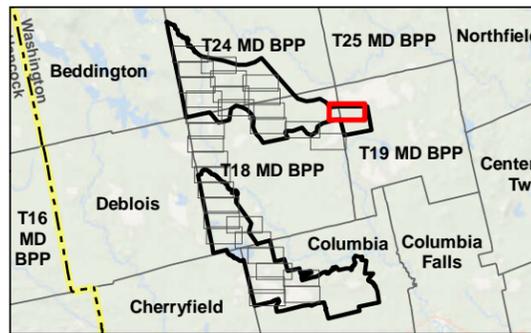
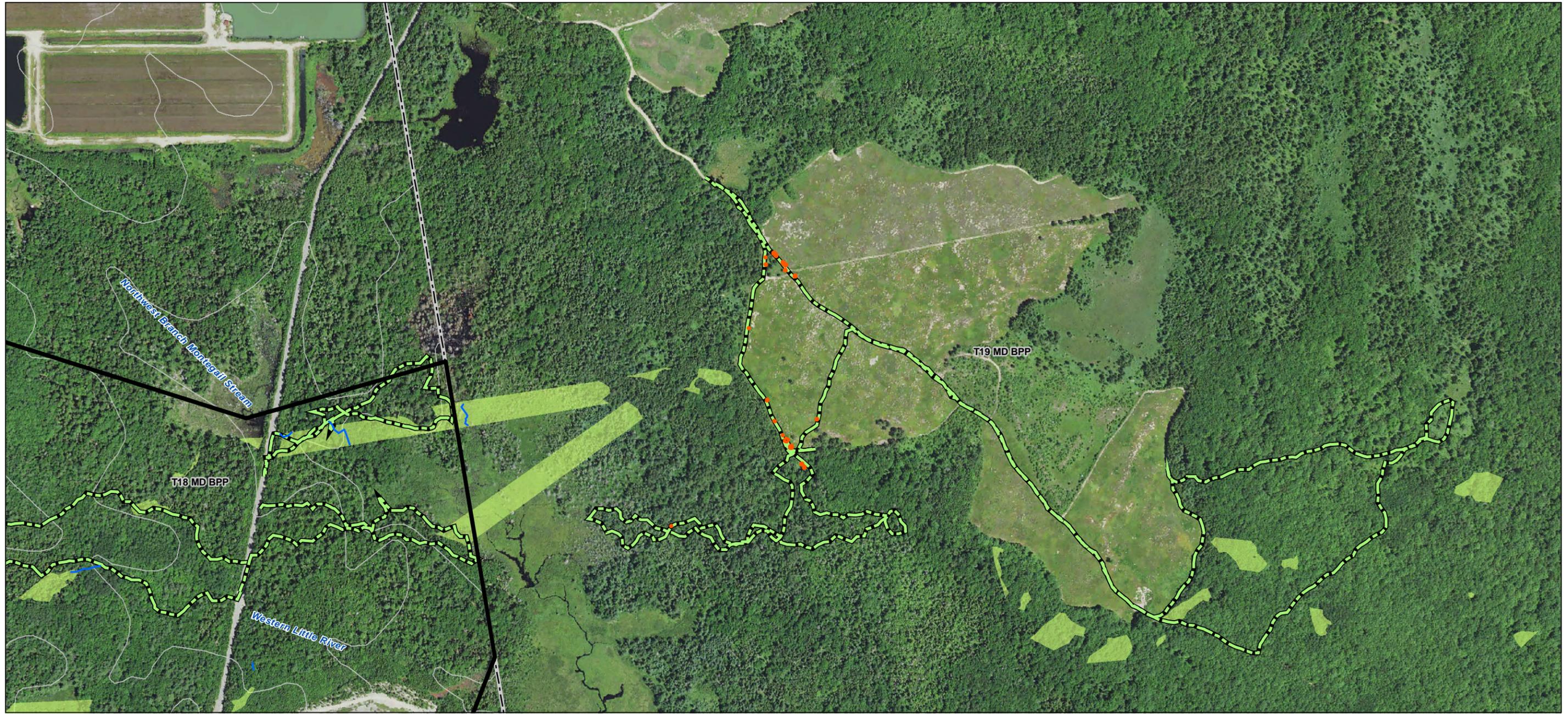


Project Location
 Washington County
 Maine
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Client/Project
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 Apex Clean Energy, Inc.
 Washington County
 195601654

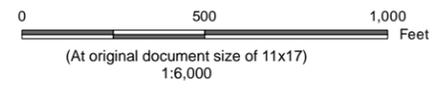
Figure No.
 12
Title
 2016 and 2019 Rare Plant Survey

V:\195601654\03_data\gis_cad\gis\MD\Rare Plant Survey\Report\01654_01_BotanicalReport.mxd Revised: 2021-02-10 By: gcarpenter



- Legend**
- Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)

Data Sources
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Project Location
 Washington County
 Maine

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Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

195601654

Figure No.
 13

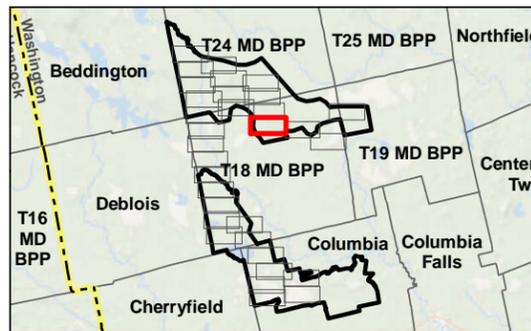
Title
 2016 and 2019 Rare Plant Survey

Notes

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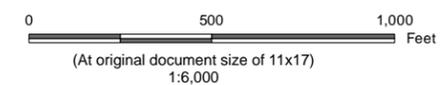
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- Legend**
- Proposed Turbine Location
 - Delineated Surface Water
 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - 20-foot Contours
 - Delineated Stream
 - Delineated Wetland



Notes
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Project Location
 Washington County
 Maine

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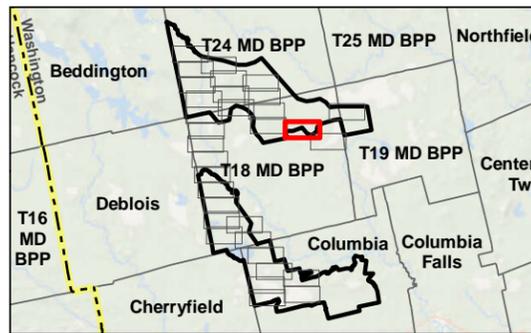
Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

195601654

Figure No.
14

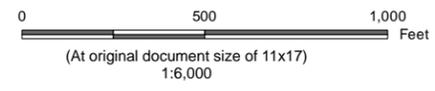
Title
2016 and 2019 Rare Plant Survey

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- Legend**
- Project Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Delineated Surface Water
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)

Data Sources
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Project Location
 Washington County
 Maine

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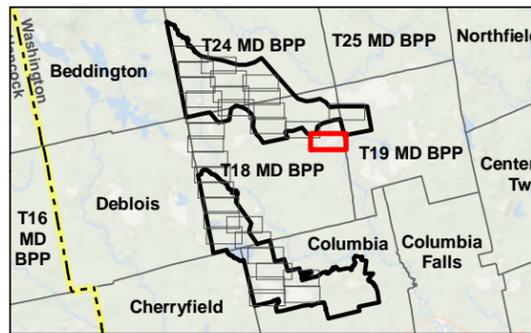
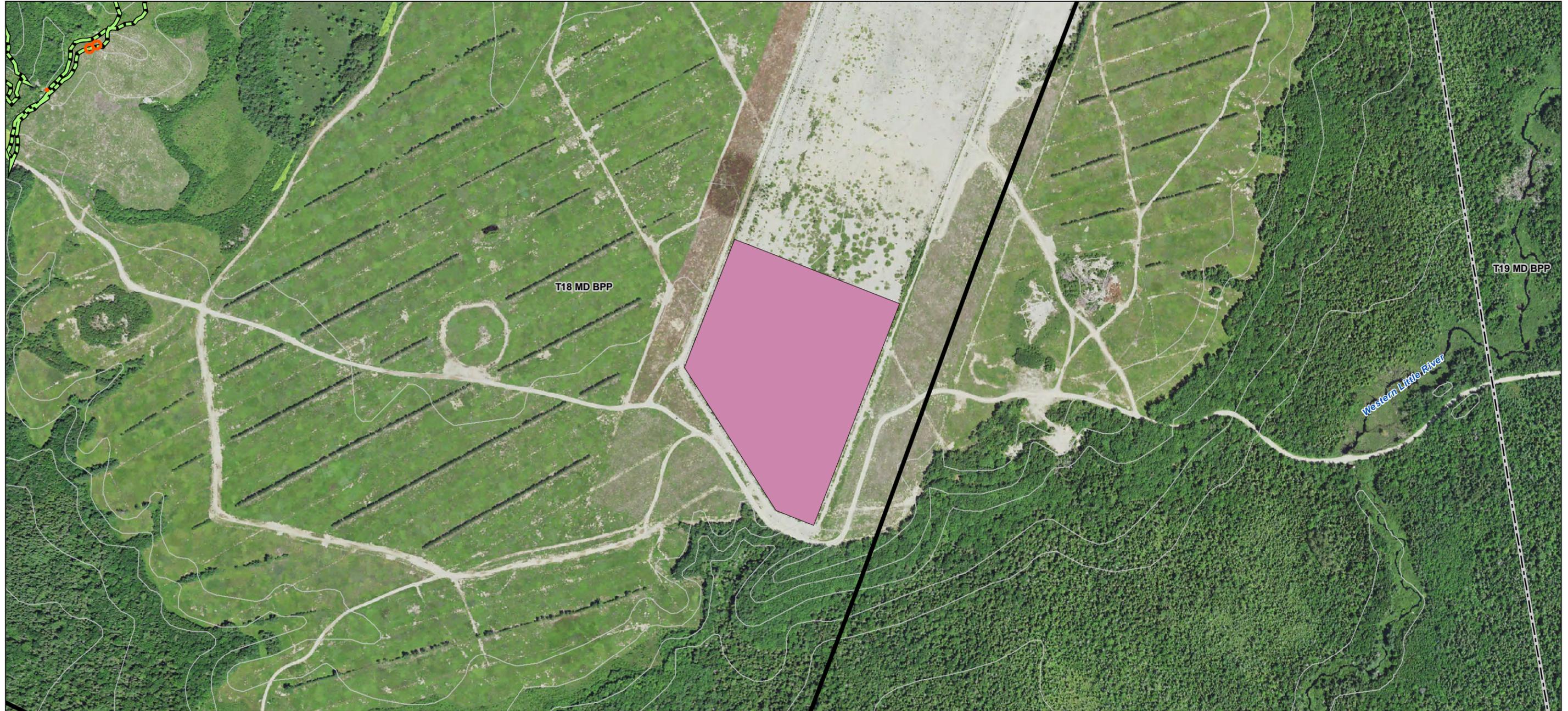
Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

195601654

Figure No.
15

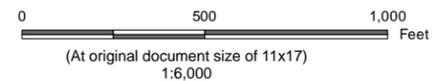
Title
2016 and 2019 Rare Plant Survey

Notes
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- Legend**
- Staging Area
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)

Data Sources
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Project Location
 Washington County
 Maine

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

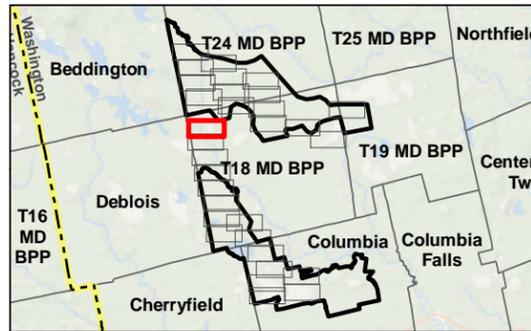
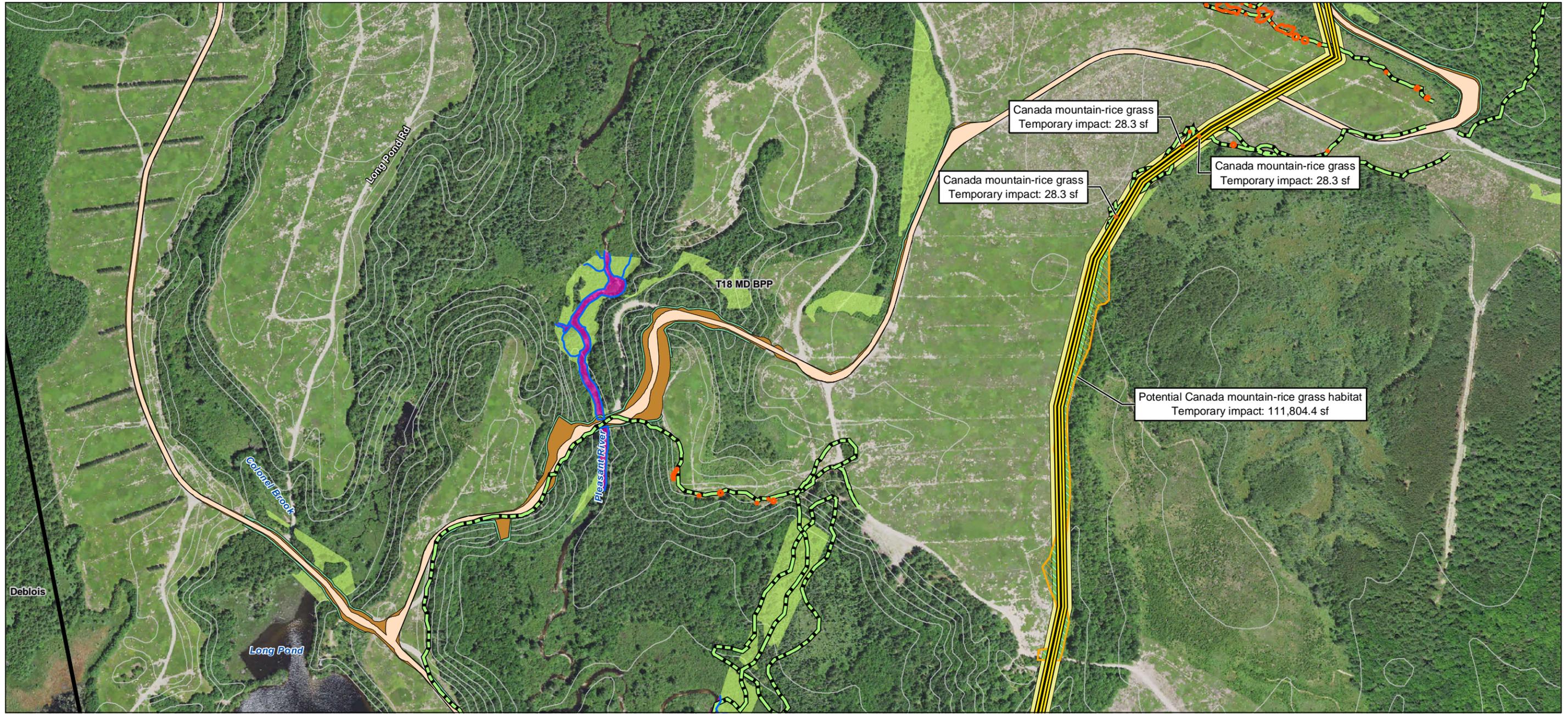
Prepared by GC on 2021-02-10
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 IR Review by AG on 2021-02-12
 195601654

Figure No.
 16

Title
 2016 and 2019 Rare Plant Survey

Notes
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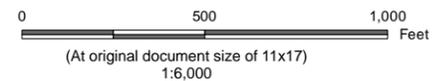
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Data Sources
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- Legend**
- Underground Collector
 - Access Road
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Delineated Surface Water

- Rare Plant Area**
- Canada mountain-rice grass (*Piptatherum canadense*)
 - Desktop Assessment Potential Rare Plant Habitats (see Note 2)
 - Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
- Rare Plant Impact**
- Temporary
 - Desktop Assessment Potential Rare Plant Impact
 - Temporary



Notes

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Project Location
 Washington County
 Maine

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Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

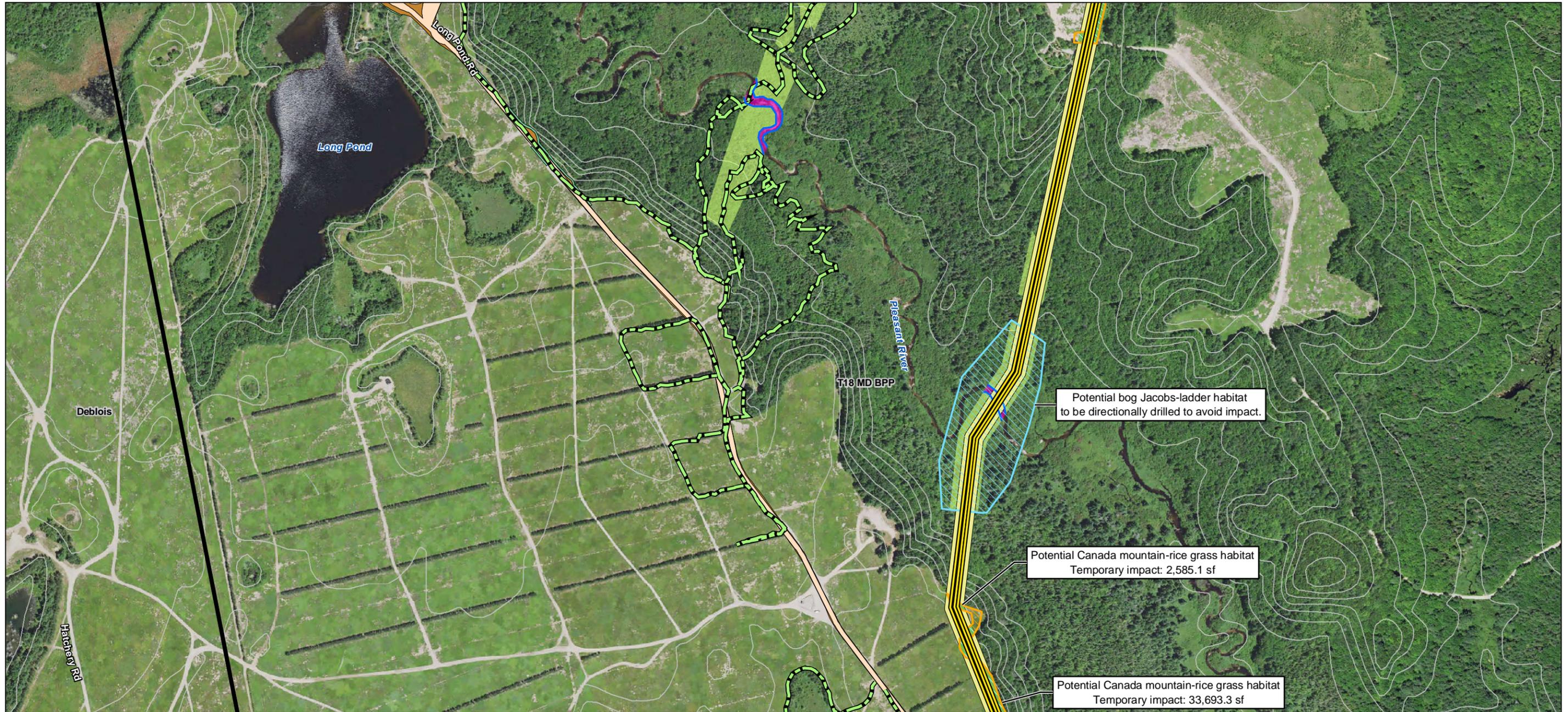
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Figure No.
 17

Title
 2016 and 2019 Rare Plant Survey

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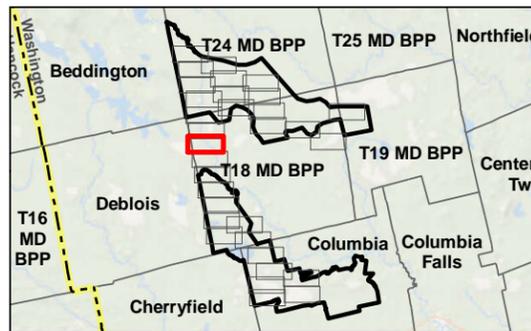
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Potential bog Jacobs-ladder habitat to be directionally drilled to avoid impact.

Potential Canada mountain-rice grass habitat
Temporary impact: 2,585.1 sf

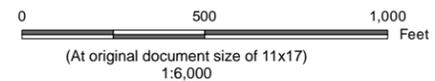
Potential Canada mountain-rice grass habitat
Temporary impact: 33,693.3 sf



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- Legend**
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 - Access Road
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Delineated Surface Water

- Desktop Assessment Potential Rare Plant Habitats (see Note 2)**
- Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
 - Potential bog Jacob's-ladder habitat (*Polemonium vanbruntiae*)
- Desktop Assessment Potential Rare Plant Impact**
- Temporary



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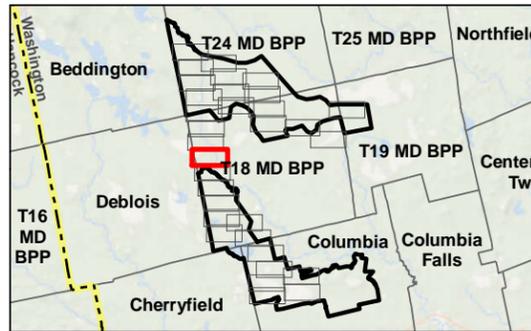
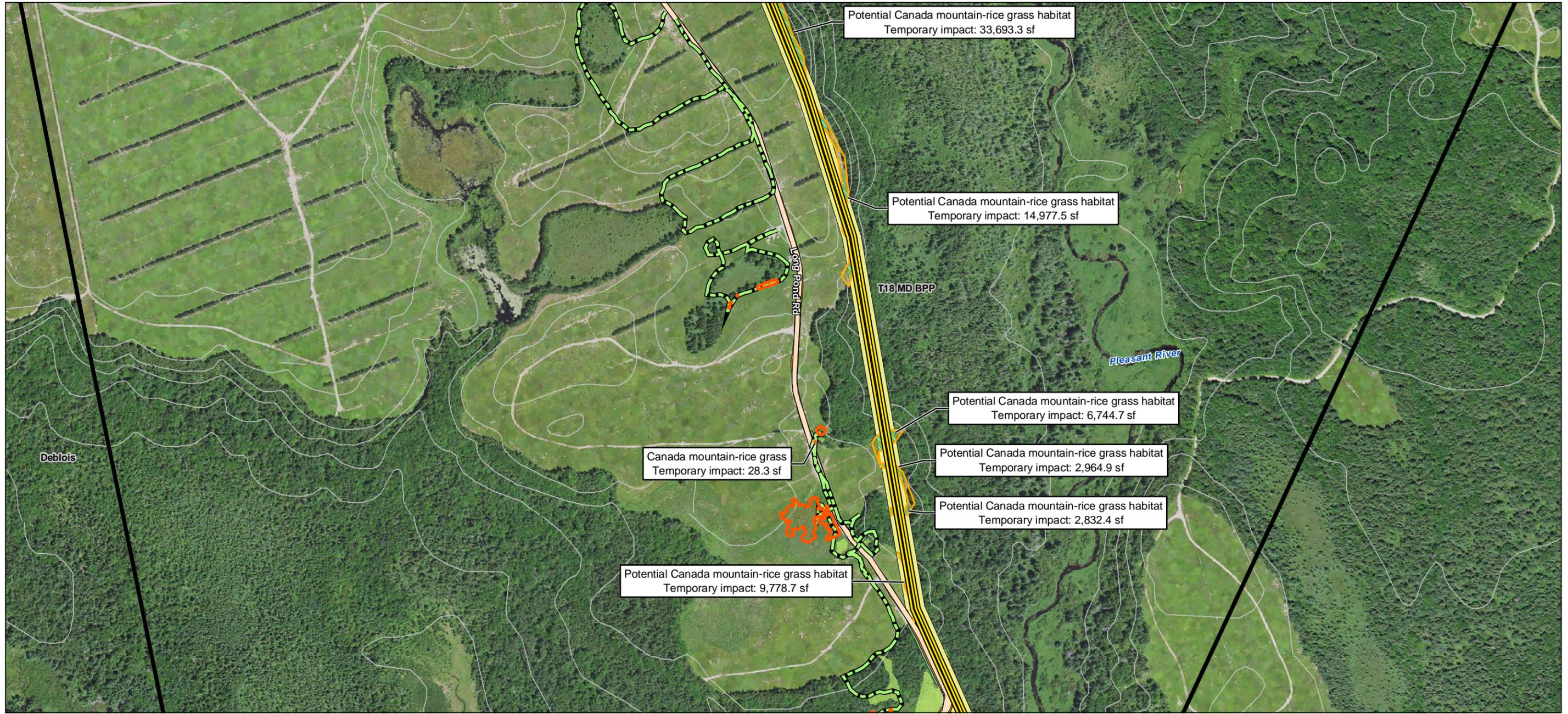
Project Location
 Washington County
 Maine

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

Figure No.
 18

Title
 2016 and 2019 Rare Plant Survey

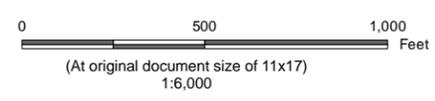
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- Legend**
- Underground Collector
 - Access Road
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours

- GPS Tracklog
- Delineated Wetland
- Rare Plant Area**
- Canada mountain-rice grass (*Piptatherum canadense*)
- Desktop Assessment Potential Rare Plant Habitats (see Note 2)**
- Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
- Rare Plant Impact**
- Temporary

- Desktop Assessment Potential Rare Plant Impact**
- Permanent
 - Temporary

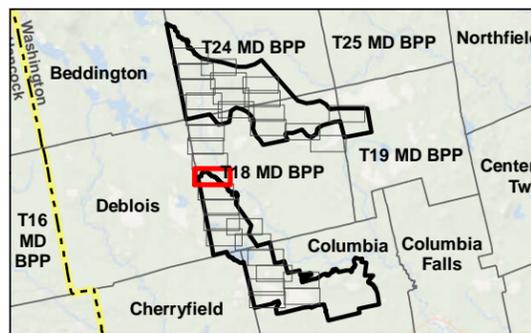
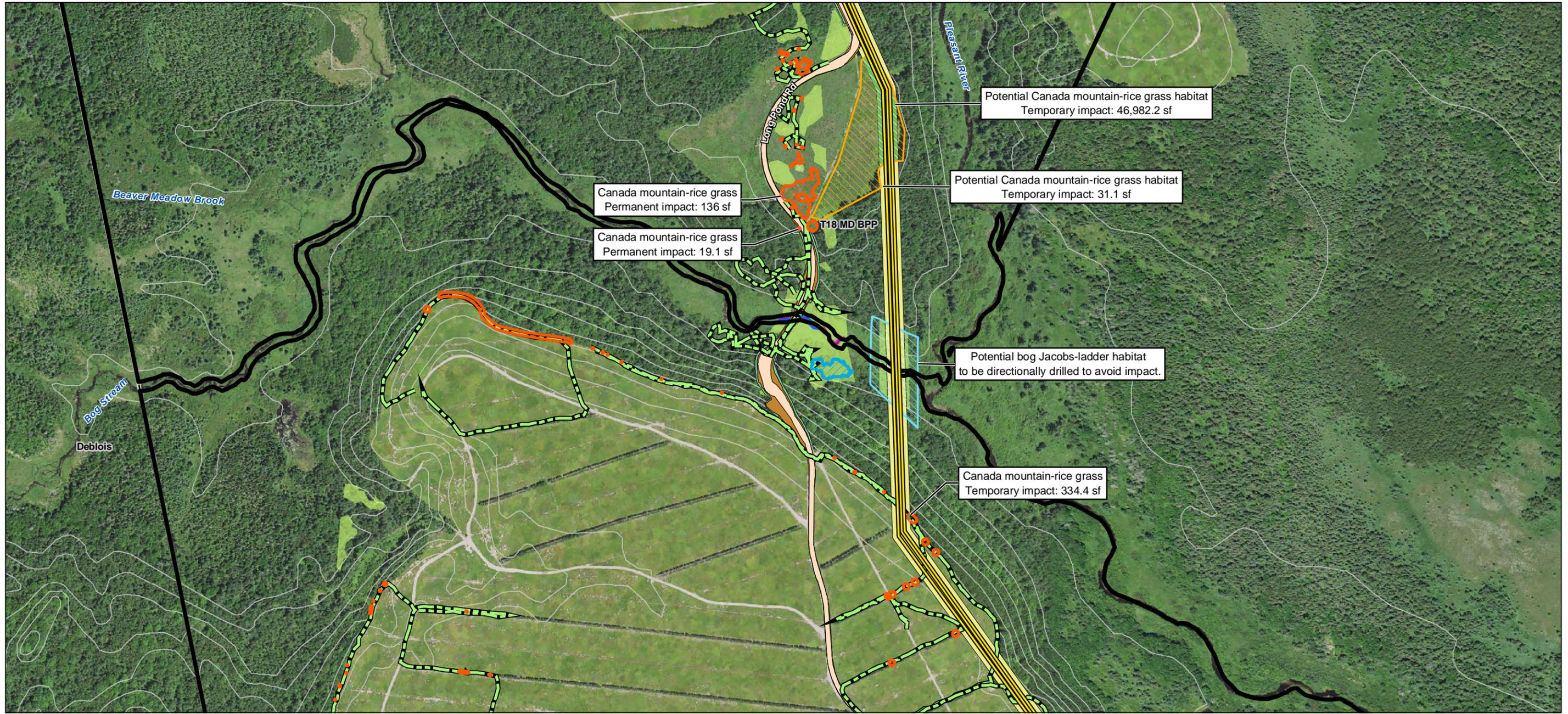


Project Location
 Washington County
 Maine
 Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12
 195601654

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

Figure No.
19
Title
2016 and 2019 Rare Plant Survey

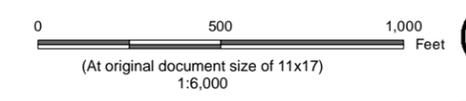
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 3. Background: NAIP 2018

- Legend**
- Underground Collector
 - Access Road
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
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 - Delineated Surface Water

- Rare Plant Area**
- Canada mountain-rice grass (*Piptatherum canadense*)
 - Bog Jacob's-ladder (*Polemonium vanbruntiae*)
- Desktop Assessment Potential Rare Plant Habitats (see Note 2)**
- Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
 - Potential bog Jacob's-ladder habitat (*Polemonium vanbruntiae*)
- Rare Plant Impact**
- Permanent
 - Temporary
- Desktop Assessment Potential Rare Plant Impact**
- Permanent
 - Temporary



Notes

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Project Location
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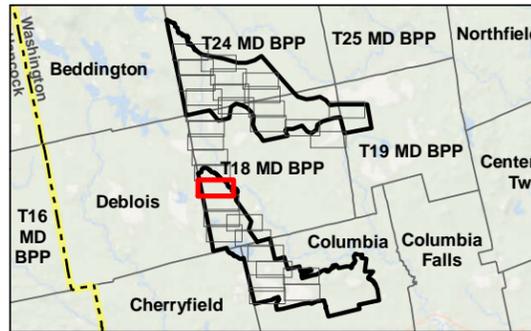
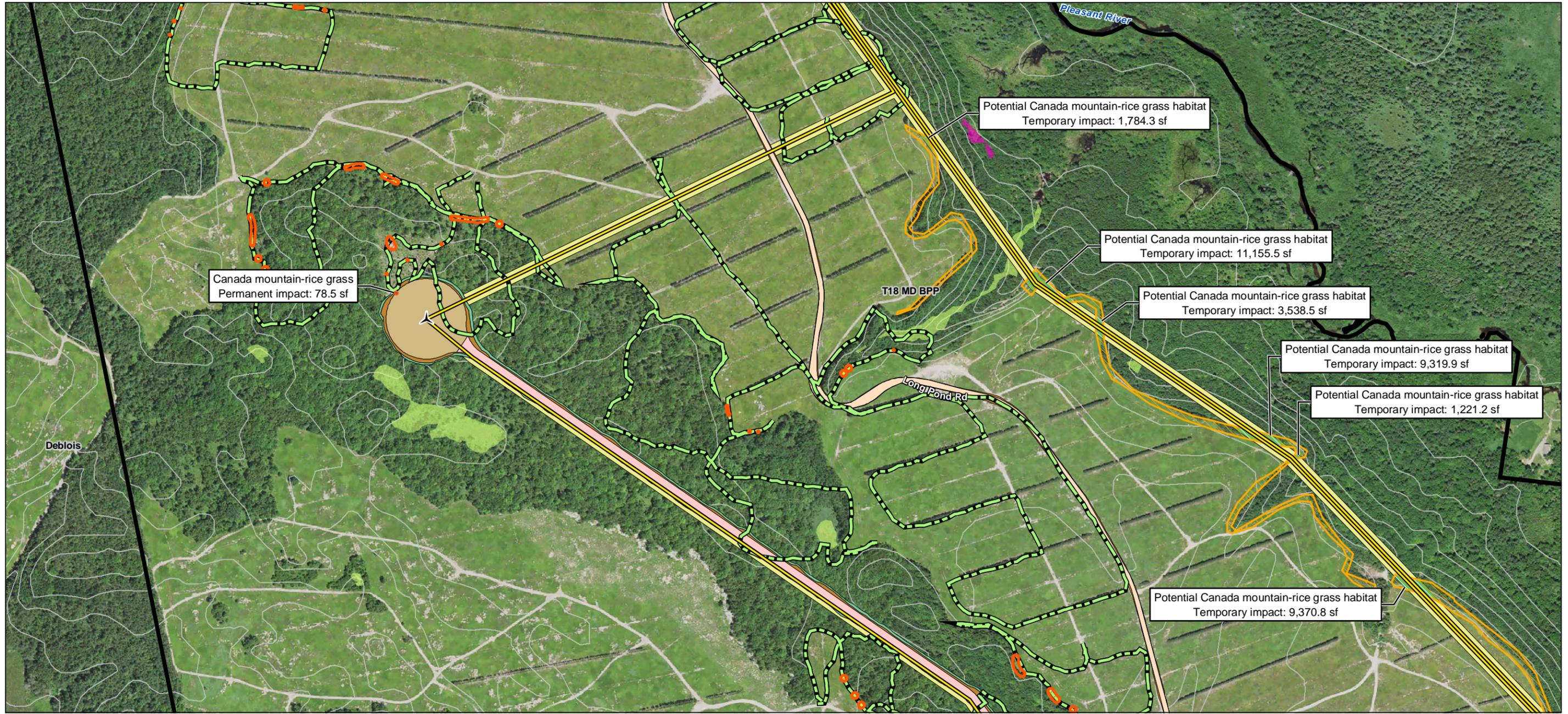
Client/Project
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 Apex Clean Energy, Inc.
 Washington County

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Figure No.
 20

Title
 2016 and 2019 Rare Plant Survey

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 3. Background: NAIP 2018

- Legend**
- ▲ Proposed Turbine Location
 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland
 - Delineated Surface Water
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)
 - Desktop Assessment Potential Rare Plant Habitats (see Note 2)
 - Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
 - Rare Plant Impact
 - Permanent
 - Desktop Assessment Potential Rare Plant Impact
 - Temporary

0 500 1,000 Feet
 (At original document size of 11x17)
 1:6,000



Notes
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Project Location
 Washington County
 Maine

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

Figure No.
 21

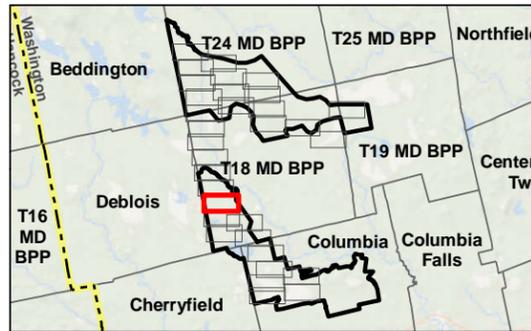
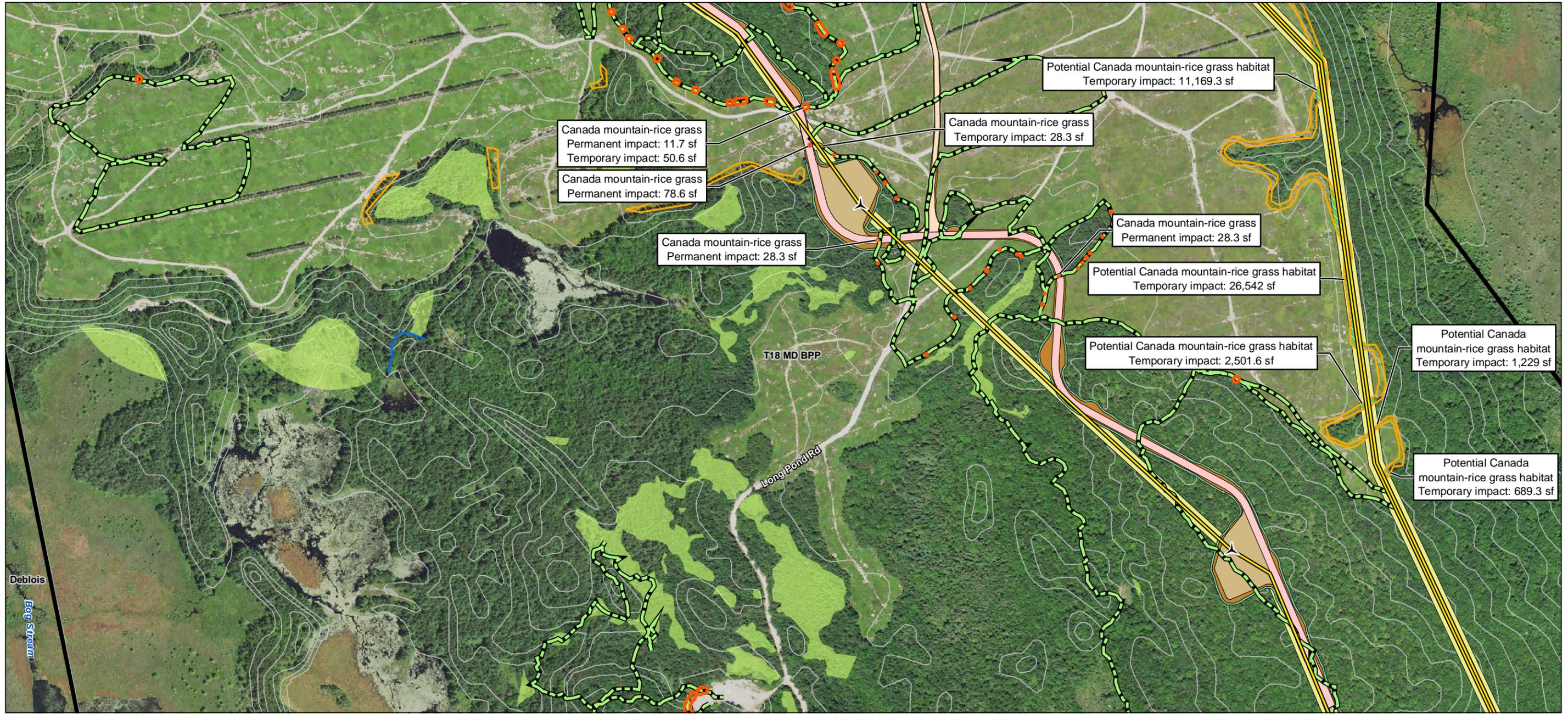
Title
 2016 and 2019 Rare Plant Survey

Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

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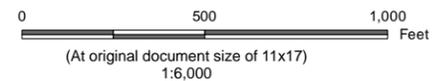
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Data Sources
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources: Base data obtained from the Maine Office of GIS (MEGIS), Stantec.
 3. Background: NAIP 2018

Legend

- Proposed Turbine Location
- Underground Collector
- Access Road
- Crane Path
- Turbine Pad
- Grading Limits
- Clearing Limits
- Collector Clearing Limits
- Project Boundary
- Town Boundary
- 20-foot Contours
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- Rare Plant Area**
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- Permanent
- Temporary
- Desktop Assessment Potential Rare Plant Impact**
- Permanent
- Temporary



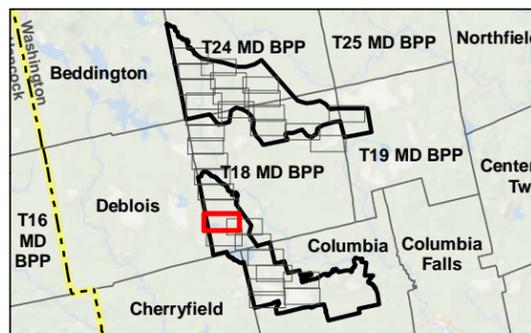
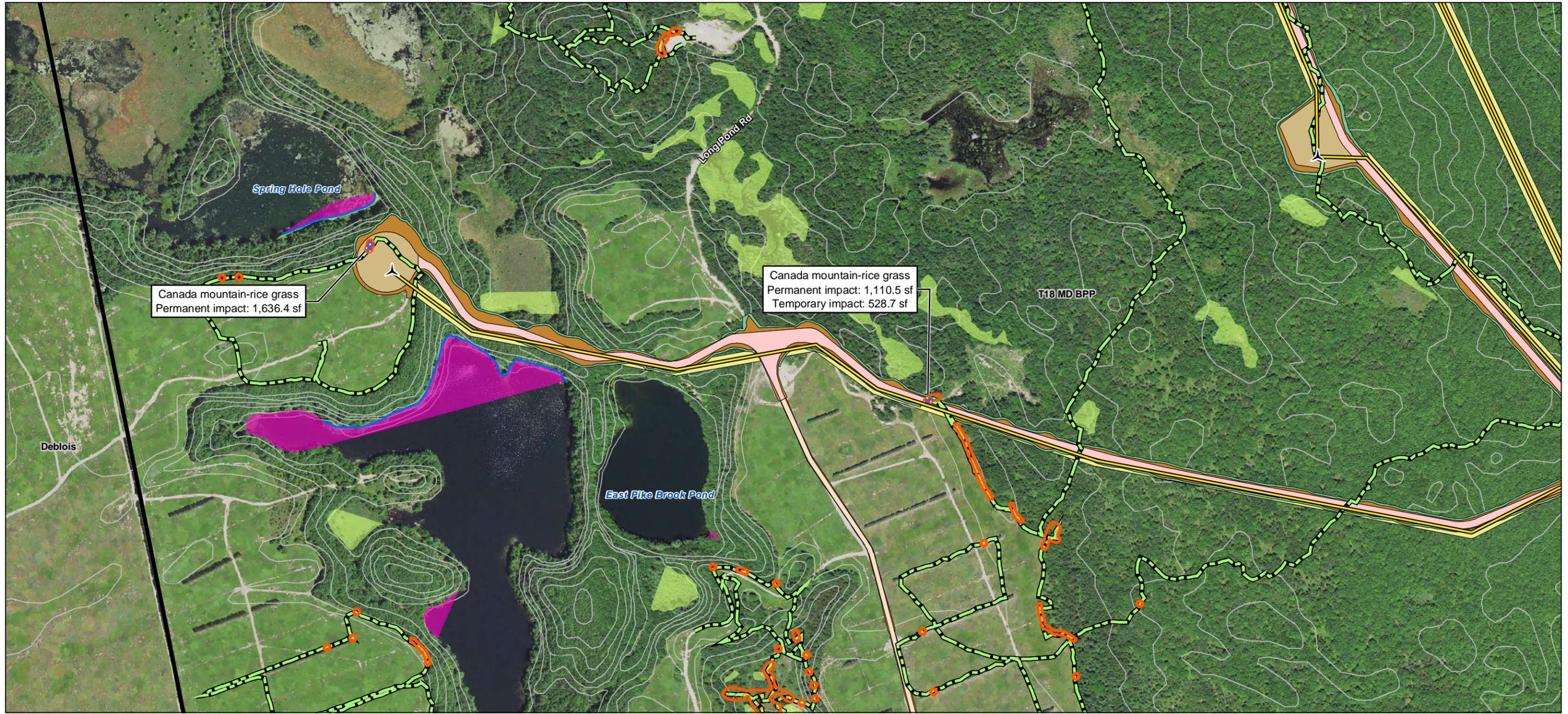
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Project Location
 Washington County
 Maine
 Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County
 195601654

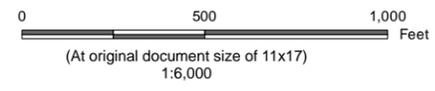
Figure No.
 22
Title
 2016 and 2019 Rare Plant Survey



- Legend**
- Proposed Turbine Location
 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Stream
 - Delineated Wetland
 - Delineated Surface Water
 - Rare Plant Area**
 - Canada mountain-rice grass (*Piptatherum canadense*)
 - Rare Plant Impact**
 - Permanent
 - Temporary

Data Sources

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Project Location
Washington County
Maine

Prepared by GC on 2021-02-10
TR by MP on 2021-02-11
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Client/Project
Downeast Wind Project
Apex Clean Energy, Inc.
Washington County

195601654

Figure No.
23

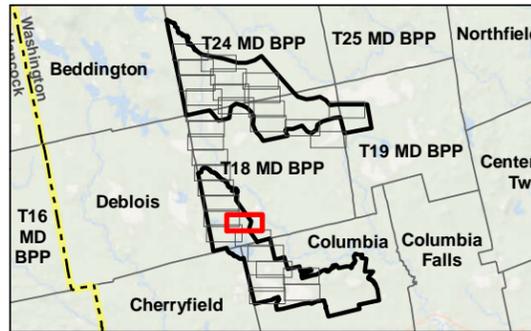
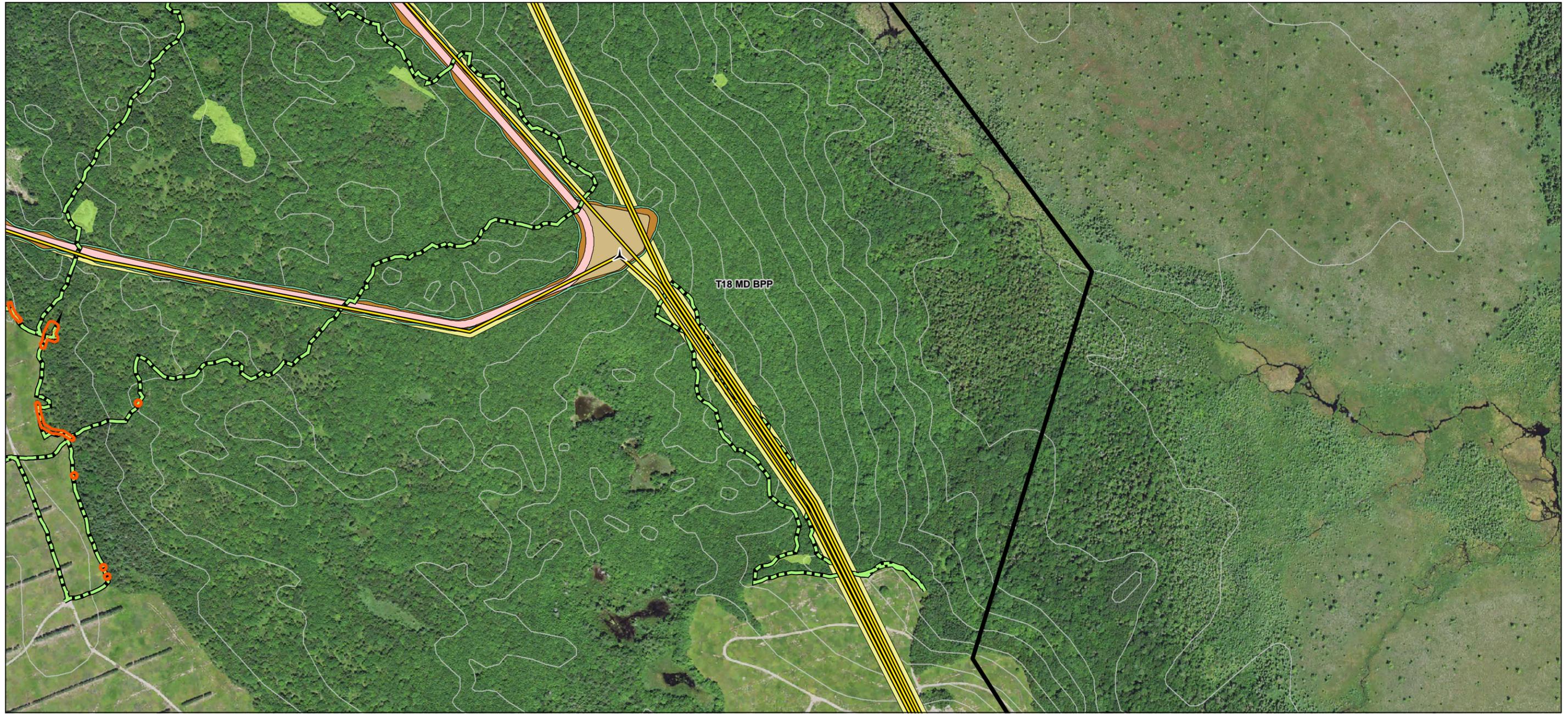
Title
2016 and 2019 Rare Plant Survey

Notes

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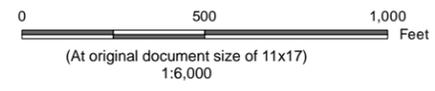
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- Legend**
- Proposed Turbine Location
 - Underground Collector
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland

Rare Plant Area
 Canada mountain-rice grass (*Piptatherum canadense*)



Notes
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Project Location
 Washington County
 Maine

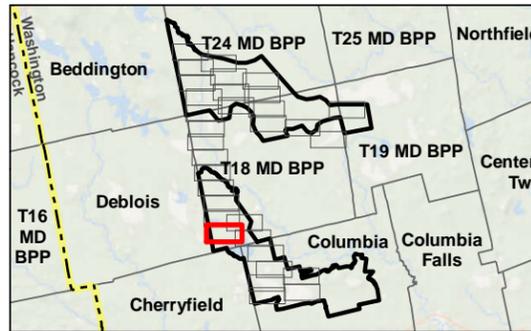
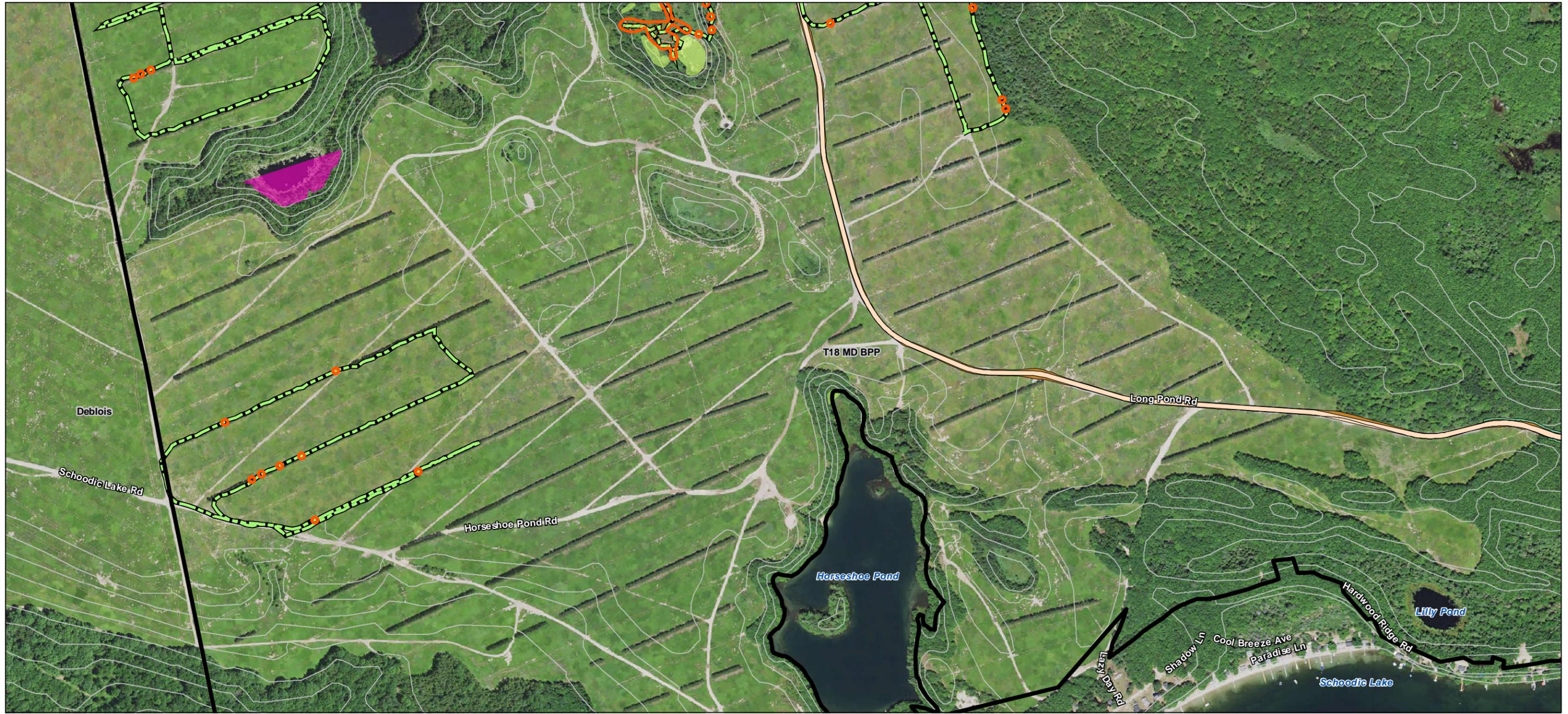
Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

195601654

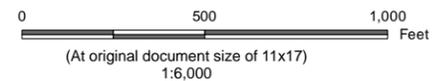
Figure No.
24

Title
2016 and 2019 Rare Plant Survey



- Legend**
- Access Road
 - Grading Limits
 - Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland
 - Delineated Surface Water
- Rare Plant Area**
- Canada mountain-rice grass (*Piptatherum canadense*)

Data Sources
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Project Location
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 Maine

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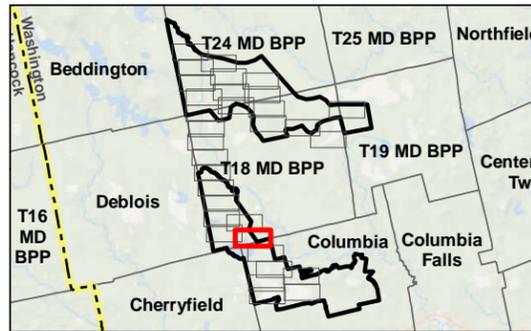
Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

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Figure No.
 25

Title
 2016 and 2019 Rare Plant Survey

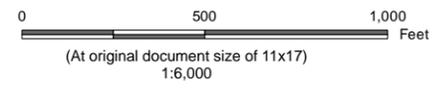
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- Legend**
- Underground Collector
 - Access Road
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - Delineated Wetland

Data Sources

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Project Location
Washington County
Maine

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Client/Project
Downeast Wind Project
Apex Clean Energy, Inc.
Washington County

195601654

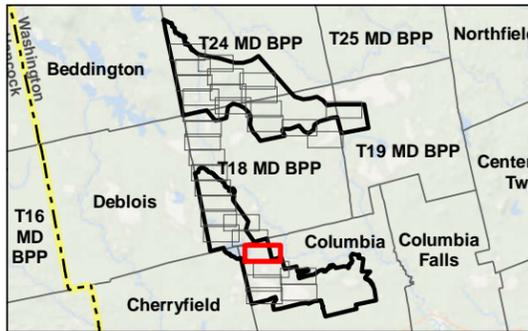
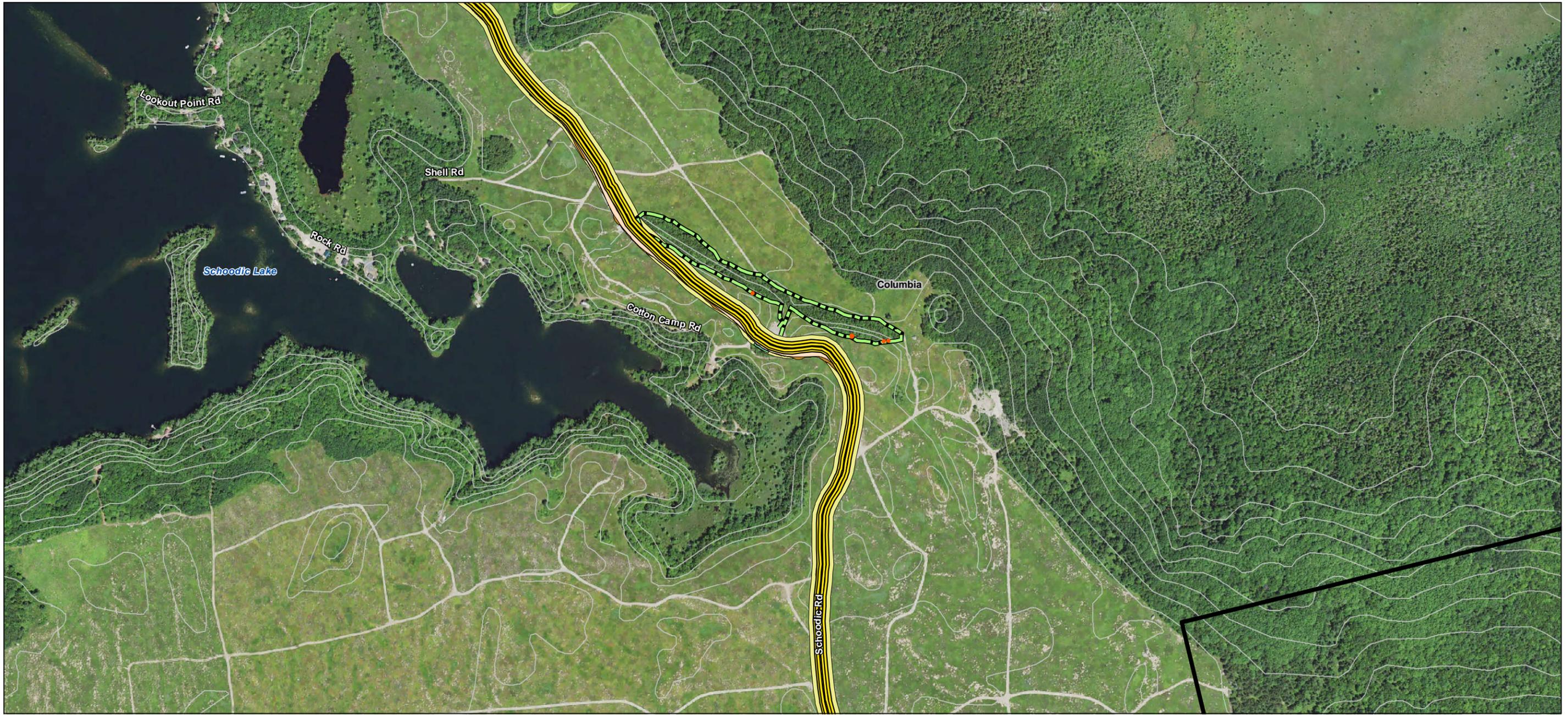
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26

Title
2016 and 2019 Rare Plant Survey

Notes

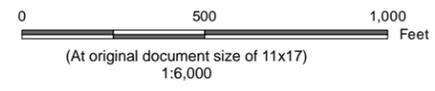
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- Legend**
- Underground Collector
 - Access Road
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Project Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)

Data Sources
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Project Location
 Washington County
 Maine

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

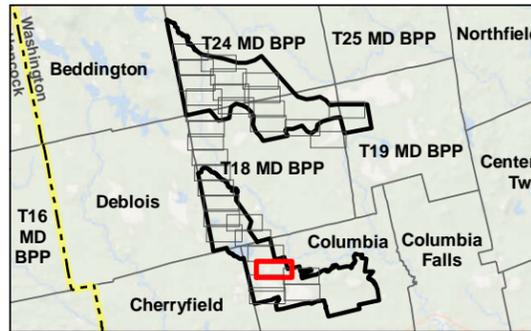
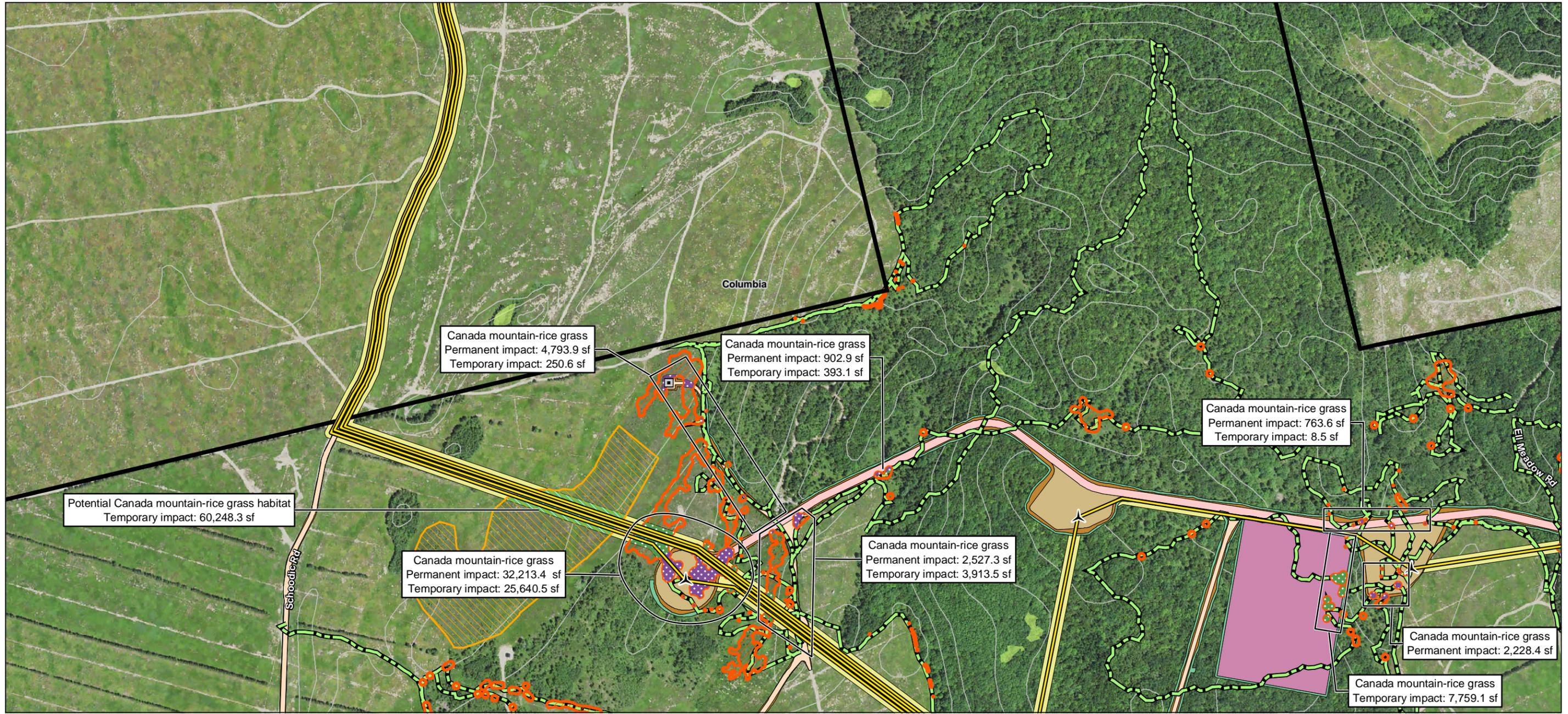
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Title
 2016 and 2019 Rare Plant Survey

Notes

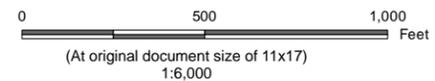
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- Legend**
- ▲ Proposed Turbine Location
 - MET Tower Location
 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Staging Area
 - Project Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland
 - Rare Plant Area
 - Canada mountain-rice grass (*Piptatherum canadense*)
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 - Potential Canada mountain-rice grass habitat (*Piptatherum canadense*)
 - Rare Plant Impact
 - Permanent
 - Temporary
 - Desktop Assessment Potential Rare Plant Impact
 - Temporary



Notes
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Project Location
 Washington County
 Maine

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

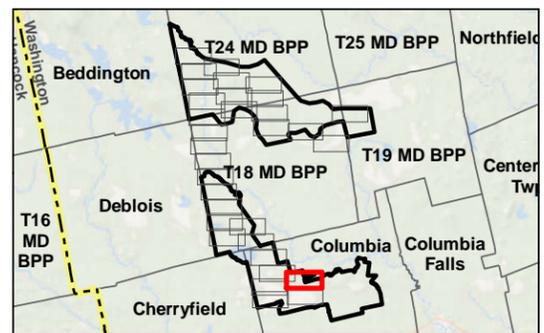
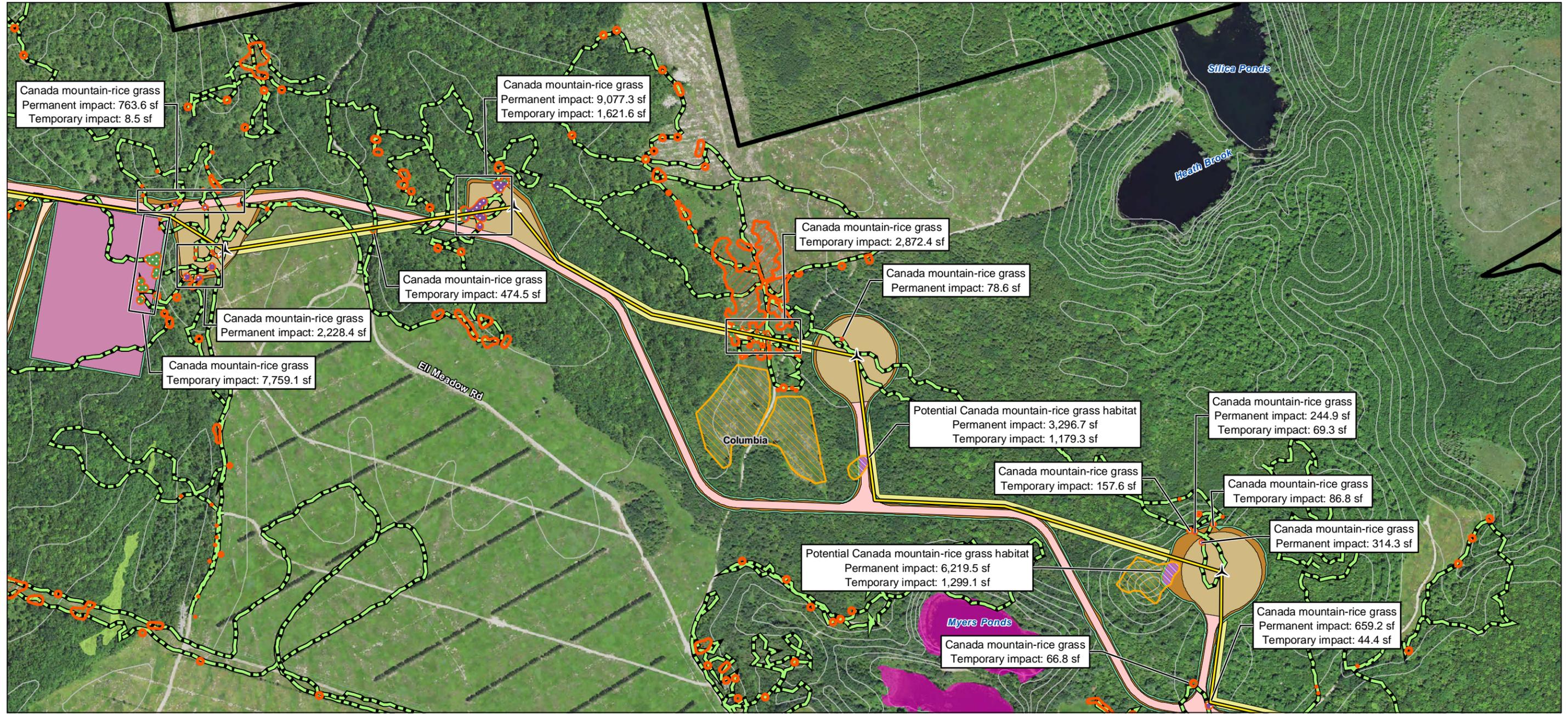
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Figure No.
 28

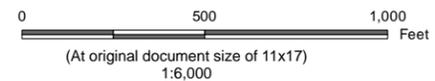
Title
 2016 and 2019 Rare Plant Survey

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- Legend**
- ▲ Proposed Turbine Location
 - Underground Collector
 - Access Road
 - Crane Path
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Staging Area
 - Project Boundary
 - 20-foot Contours
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 - Rare Plant Impact
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 - Permanent
 - Temporary



Project Location
Washington County
Maine

Client/Project
Downeast Wind Project
Apex Clean Energy, Inc.
Washington County

195601654

Figure No.
29

Title
2016 and 2019 Rare Plant Survey

Notes

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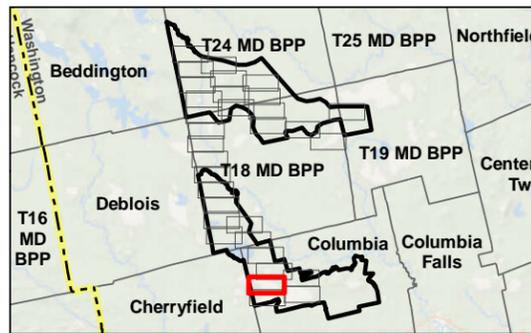


Canada mountain-rice grass
Temporary impact: 78.6 sf

Canada mountain-rice grass
Permanent impact: 515.7 sf

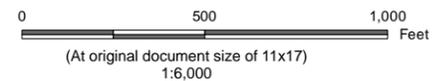
Canada mountain-rice grass
Permanent impact: 273.7 sf

Canada mountain-rice grass
Permanent impact: 269.4 sf



- Legend**
- Underground Collector
 - Access Road
 - Turbine Pad
 - Grading Limits
 - Clearing Limits
 - Collector Clearing Limits
 - Staging Area
 - Substation
 - Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland
 - Delineated Surface Water
 - Rare Plant Area**
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Data Sources
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Project Location
 Washington County
 Maine

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County

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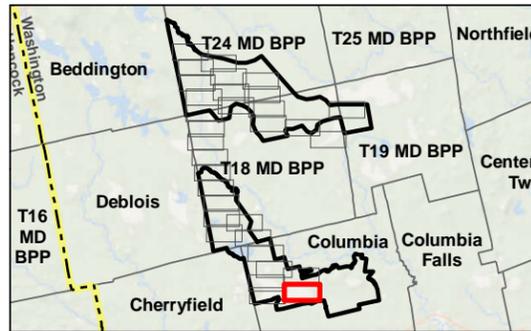
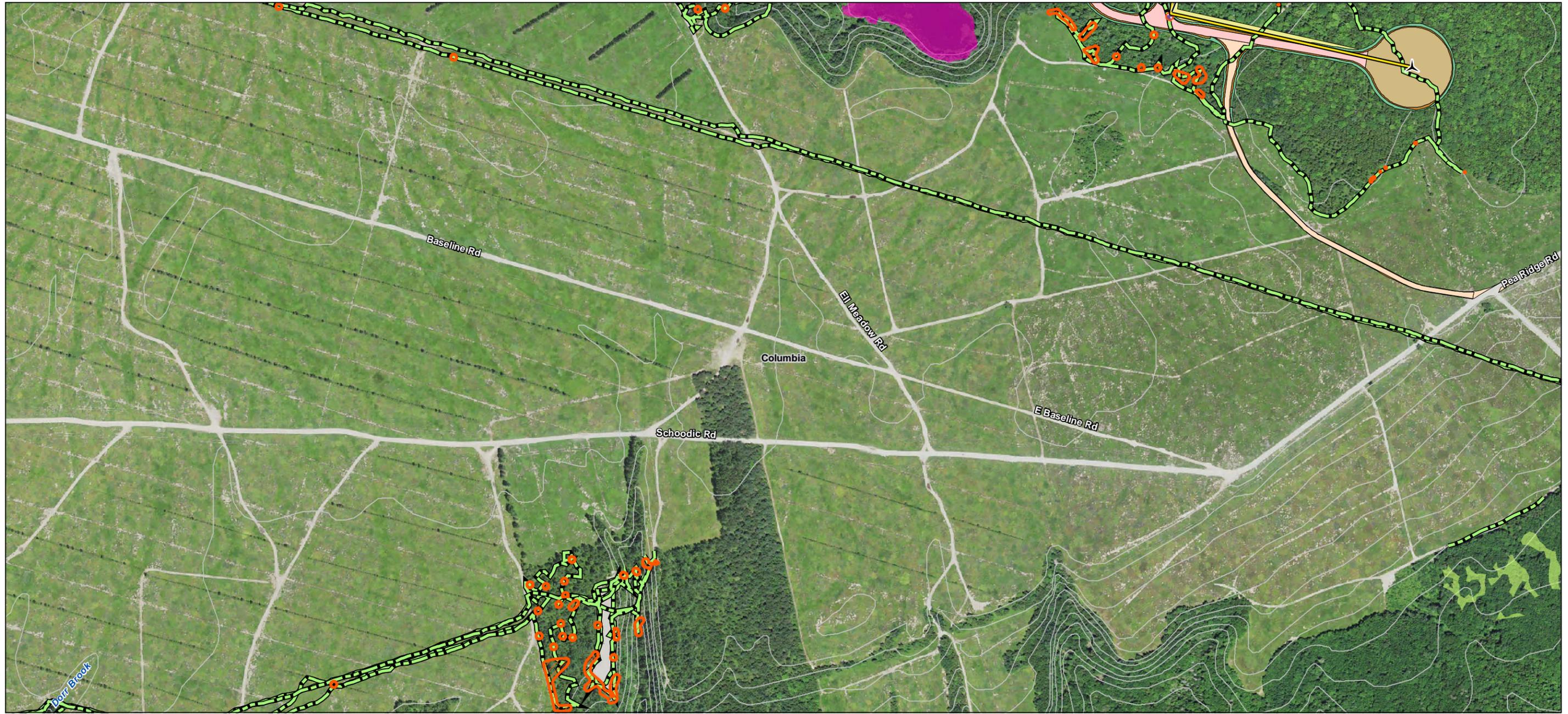
Figure No.
 30

Title
 2016 and 2019 Rare Plant Survey

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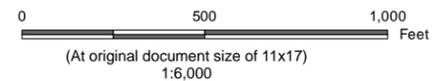
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- Legend**
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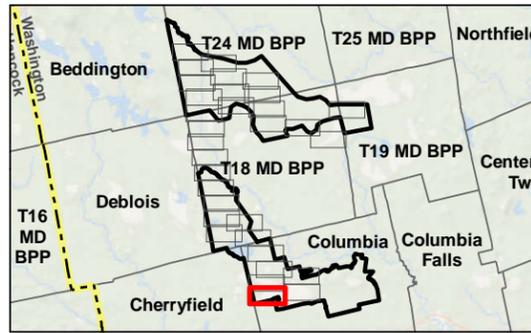


Project Location
 Washington County
 Maine
 Prepared by GC on 2021-02-10
 TR by MP on 2021-02-11
 IR Review by AG on 2021-02-12

Client/Project
 Downeast Wind Project
 Apex Clean Energy, Inc.
 Washington County
 195601654

Figure No.
31
Title
2016 and 2019 Rare Plant Survey

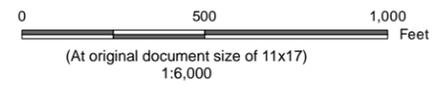
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- Legend**
- Project Boundary
 - Town Boundary
 - 20-foot Contours
 - GPS Tracklog
 - Delineated Wetland
 - Delineated Surface Water
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 - Canada mountain-rice grass (*Piptatherum canadense*)

Data Sources

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3. Background: NAIP 2018



Project Location
Washington County
Maine

Client/Project
Downeast Wind Project
Apex Clean Energy, Inc.
Washington County

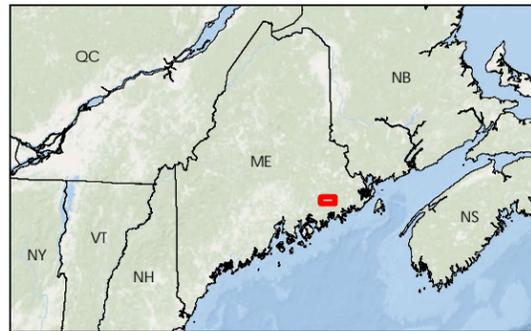
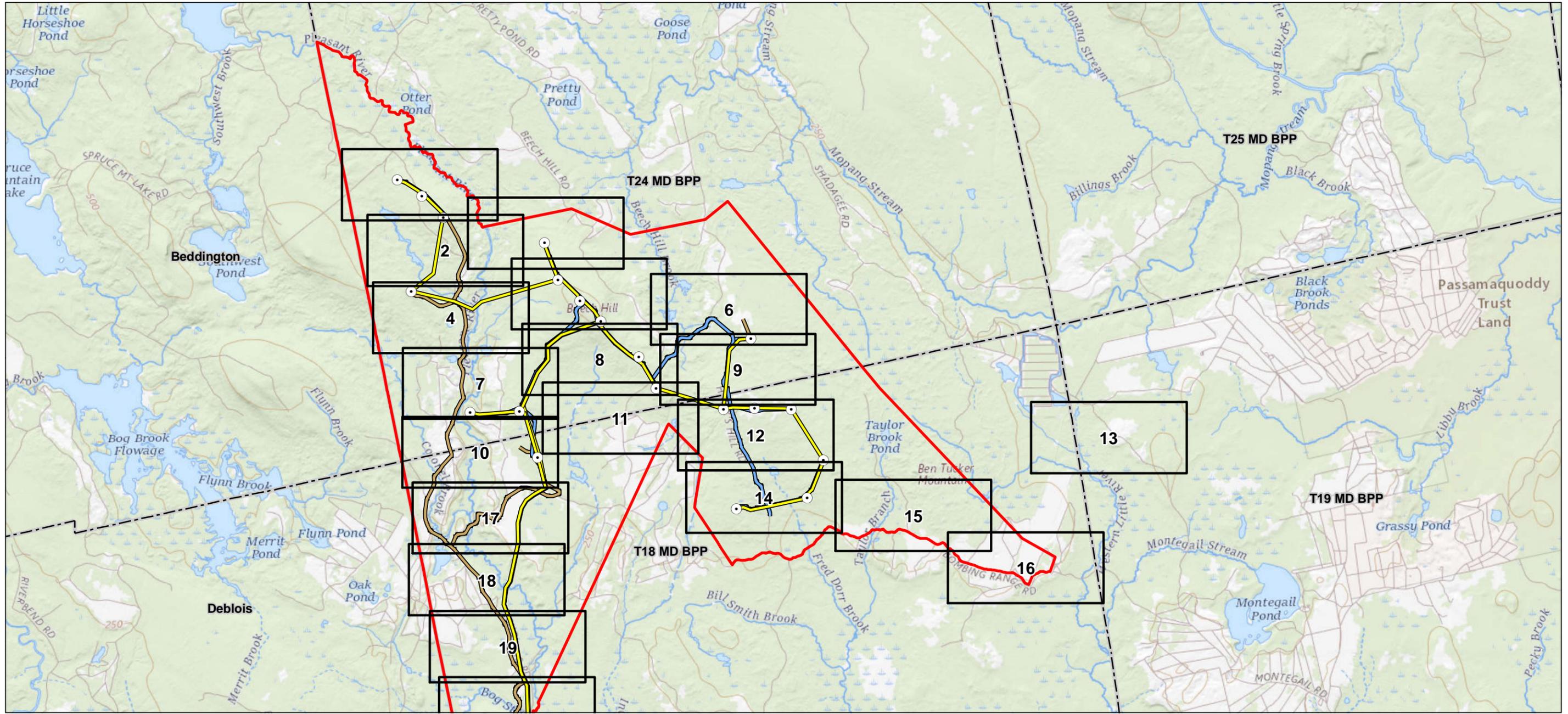
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Figure No.
32

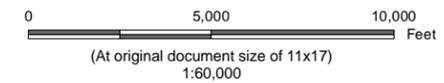
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- Legend**
- Turbine Layout 039
 - Underground Collector
 - Crane Path
 - Access Road
 - Project Boundary
 - Map Sheet



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Background: USGS The National Map



Project Location
Washington County
Maine

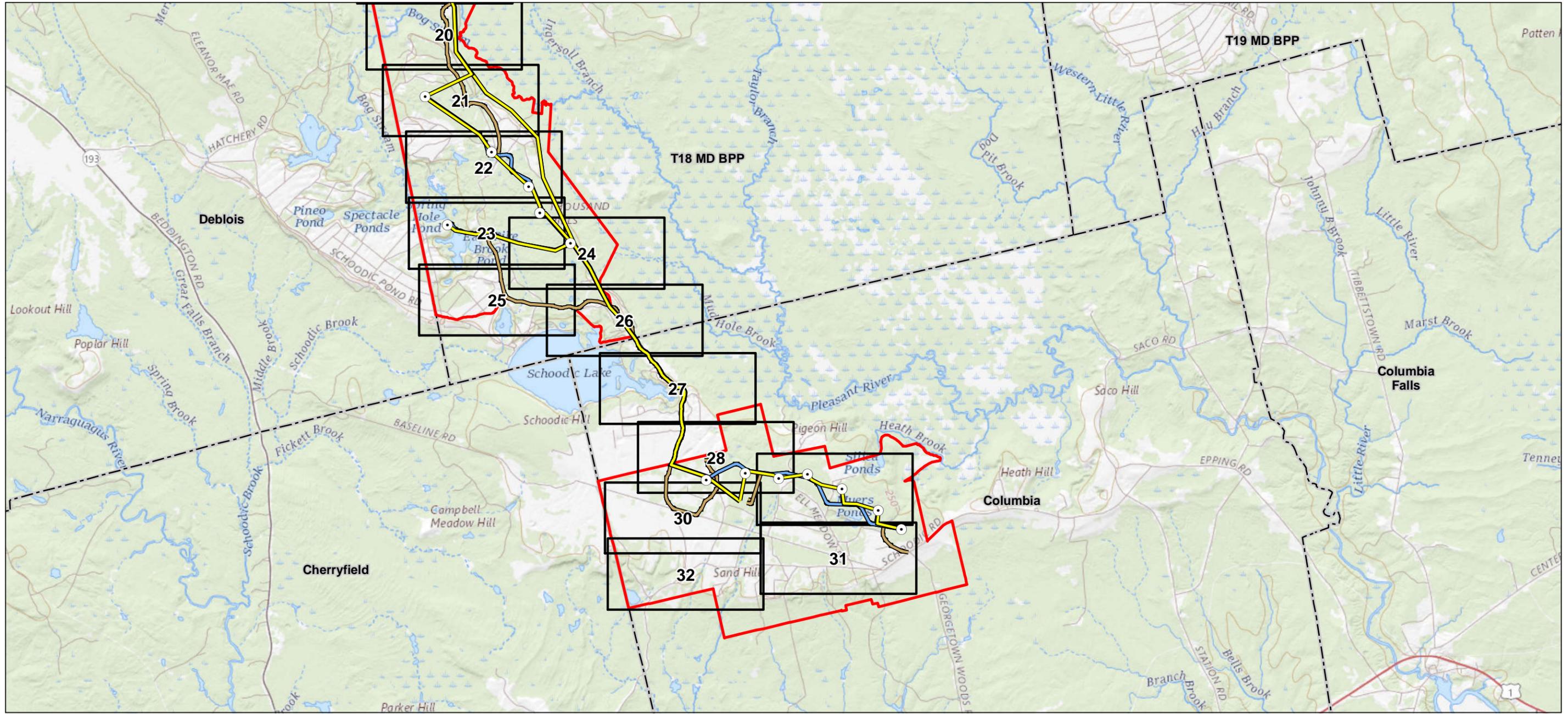
Prepared by GC on 2021-02-10
TR by MP on 2021-02-11
IR Review by AG on 2021-02-12

Client/Project
Downeast Wind Project
Apex Clean Energy, Inc.
Washington County

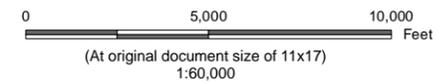
195601654

Figure No.
Index

Title
2016 and 2019 Rare Plant Survey
Sheet 1 of 2



- Legend**
- Turbine Layout 039
 - Underground Collector
 - Crane Path
 - Access Road
 - Project Boundary
 - Map Sheet



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Background: USGS The National Map



Project Location
Washington County
Maine

Prepared by GC on 2021-02-10
TR by MP on 2021-02-11
IR Review by AG on 2021-02-12

Client/Project
Downeast Wind Project
Apex Clean Energy, Inc.
Washington County

195601654

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Title
2016 and 2019 Rare Plant Survey
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**DOWNEAST WIND PROJECT: RARE, THREATENED, AND ENDANGERED PLANT SURVEY
REPORT**

March 16, 2021

APPENDICES



**DOWNEAST WIND PROJECT: RARE, THREATENED, AND ENDANGERED PLANT SURVEY
REPORT**

March 16, 2021

Appendix A REPRESENTATIVE PHOTOGRAPHS



**DOWNEAST WIND PROJECT: RARE, THREATENED, AND ENDANGERED PLANT SURVEY
REPORT**

March 16, 2021



Photo 1. Early successional woodland habitat for Canada mountain-rice grass. Stantec. September 29, 2016.



Photo 2. Early successional woodland habitat for Canada mountain-rice grass. Stantec. September 29, 2016.



**DOWNEAST WIND PROJECT: RARE, THREATENED, AND ENDANGERED PLANT SURVEY
REPORT**

March 16, 2021



Photo 3. Early successional habitat for Canada mountain-rice grass.
Stantec. August 5, 2019.



Photo 4. Early successional abandoned blueberry barren habitat for Canada mountain-rice grass.
Stantec. August 6, 2019.



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Photo 5. Early successional habitat for Canada mountain-rice grass. Stantec. August 8, 2019.



Photo 6. Early successional abandoned blueberry barren habitat for Canada mountain-rice grass. Stantec. August 13, 2019.



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Photo 7. Early successional abandoned blueberry barren habitat for Canada mountain-rice grass.
Stantec, August 26, 2019.



Photo 8. Patch of Canada mountain-rice grass in abandoned blueberry barren habitat,
Stantec, August 7, 2019.



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Photo 9. Representative blueberry barren habitat; Canada mountain-rice grass occurs on the forested edge. Stantec. August 13, 2019.



Photo 10. Jack pine windrow habitat with Canada mountain-rice grass. Stantec. August 12, 2019.



**DOWNEAST WIND PROJECT: RARE, THREATENED, AND ENDANGERED PLANT SURVEY
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Photo 11. Canada mountain-rice grass showing its diagnostic long-exserted awns on the florets.
Stantec. August 27, 2019.



**DOWNEAST WIND PROJECT: RARE, THREATENED, AND ENDANGERED PLANT SURVEY
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Photo 12. Bog Jacob's-ladder habitat. Stantec. August 8, 2019.



Photo 13. Bog Jacob's-ladder habitat. Stantec. August 8, 2019.



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Photo 14. Bog Jacob's-ladder. Stantec. August 8, 2019.



Photo 15. Large patch of bog Jacob's-ladder. Stantec. August 8, 2019.



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Photo 16. Bog Jacob's-ladder with immature fruit. Stantec. August 8, 2019.



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Photo 17. Mid-successional red oak forest. Stantec. August 6, 2019.



Photo 18. Red oak woodland. Stantec. August 6, 2019.



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Photo 19. White pine-dominated upland. Stantec. August 12, 2019.



Photo 20. Forested wetland. Stantec. August 6, 2019.



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REPORT**

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Photo 21. Shrub and graminoid fen along tributary of Pleasant River. Stantec. August 6, 2019.



Photo 21. Boggy fen. Stantec. August 7, 2019.



DOWNEAST WIND PROJECT: RARE, THREATENED, AND ENDANGERED PLANT SURVEY REPORT

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Photo 22. Wetland with past inundation by beaver. Stantec. August 7, 2019.



Photo 22. Forested wetland dominated by northern white cedar. Stantec. August 7, 2019.



DOWNEAST WIND PROJECT: RARE, THREATENED, AND ENDANGERED PLANT SURVEY REPORT

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Photo 23. Kettle wetland with shrub perimeter and three-way sedge fringe. Stantec. August 12, 2019.



Photo 25. Pleasant River. Stantec. August 26, 2019.



**DOWNEAST WIND PROJECT: RARE, THREATENED, AND ENDANGERED PLANT SURVEY
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Appendix B SPECIAL PLANT SURVEY FORMS



SPECIAL PLANT SURVEY FORM

Site:	Pineo Ridge	Survey Site:	Pineo Ridge
Quad name:	Epping, Schoodic Lake	Quad code:	
County:	Washington	Town:	Columbia

Plant Name: *Piptatherum canadense* New Update Occurrence #:

Date: September 2016; August 2019	Surveyor(s): Matt Arsenault	Sourcecode (MNAP assigns):
Primary Surveyor Address: Stantec, 30 Park Drive, Topsham, ME 04086	Phone: 207-798-2135	Email: matt.arsenault@stantec.com

GPS Datum WGS 84 NAD 83 NAD 27 Other
 GPS Coordinates UTM Zone 19N Decimal Degrees (dd.dddd) Deg Min Sec (dd mm ss) GPS (dd mm.mm) Other
 44.682840 North -67.865556 West Additional Coordinates see map

Directions to Occurrence: Use aerial map (coordinates represent +/- centroid). Plants are ubiquitous along edges commercial blueberry fields and early successional shrublands north of Baseline Road, west and south of Schoodic Road, and north, west and east of Ell Meadow Road
 Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

mapped to w/in 12.5 m of actual location; greater uncertainty (estimate = m / ft / km / miles); aerial delimited

Confidence in Observation of Population Extent

Confident full extent of feature **IS** known; Confident full extent is **NOT** known; **Uncertain** whether full extent is known

EO DATA # of Plants 20000+ <input checked="" type="checkbox"/> Individuals <input type="checkbox"/> Ramets Population Structure 10 % Vegetative 90 % Reproductive	Phenology <input type="checkbox"/> In leaf <input type="checkbox"/> In bud <input type="checkbox"/> In flower <input type="checkbox"/> Immature fruit <input checked="" type="checkbox"/> Mature fruit <input type="checkbox"/> Seed dispersing <input type="checkbox"/> Dormant	Population Area <input type="checkbox"/> 1 square yard <input type="checkbox"/> 1 – 5 square yards <input type="checkbox"/> 5 – 20 square yards <input type="checkbox"/> 20 – 100 square yards <input type="checkbox"/> 100 sq yds to 1 acre <input checked="" type="checkbox"/> 1 acre + 300+ ac~area actual habitat 800+ ac~ area potential habita	Vigor? <input type="checkbox"/> Normal <input checked="" type="checkbox"/> Other than normal Explain: Plants are characteristic of community Evidence disease, predation, etc? Explain: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Type of reproduction? Explain: <input checked="" type="checkbox"/> Sexual <input type="checkbox"/> Asexual <input type="checkbox"/> Not Observed
Other Comments: Surveyed area is just a small portion of larger metapopulation in the greater commercial blueberry field landscape			

GENERAL DESCRIPTION

Associated natural community: Early successional shrubland, blueberry field edges
Associated plant species: <i>Vaccinium angustifolium</i> , <i>Pteridium aquilinum</i> , <i>Gaultheria procumbens</i> , <i>Kalmia angustifolia</i> , <i>Danthonia spicata</i> , <i>Betula populifolia</i>
Substrate/soil type: Colton gravelly sandy loam, excessively drained
Threats to Population: Succession
Conservation/Management/Research needs: none - current landuse is maintaining a persistent metapopulation

Elevation	Aspect	% Slope	Light	Topographic Position	Moisture
Min 250' ft / m	<input type="checkbox"/> N <input type="checkbox"/> NE <input type="checkbox"/> E <input type="checkbox"/> NW <input type="checkbox"/> S <input type="checkbox"/> SE <input type="checkbox"/> W <input type="checkbox"/> SW	<input checked="" type="checkbox"/> Flat <input checked="" type="checkbox"/> 0-10 <input type="checkbox"/> 10-35 <input type="checkbox"/> 35+ <input type="checkbox"/> Vertical	<input checked="" type="checkbox"/> Open <input type="checkbox"/> Partial <input type="checkbox"/> Filtered <input type="checkbox"/> Shade	<input type="checkbox"/> Crest <input type="checkbox"/> Upper Slope <input checked="" type="checkbox"/> Mid-slope <input type="checkbox"/> Lower Slope <input type="checkbox"/> Bottom <input type="checkbox"/> Level Plain	<input type="checkbox"/> Inundated <input type="checkbox"/> Saturated (wet mesic) <input type="checkbox"/> Moist (mesic) <input type="checkbox"/> Dry-mesic <input checked="" type="checkbox"/> Dry (xeric)
Max 300' ft / m	<input checked="" type="checkbox"/> Flat or NA				

SPECIAL PLANT SURVEY FORM

Site:	Pineo Ridge-North / Crebo Flat	Survey Site:	Pineo Ridge - North / Crebo Flat
Quad name:	Northeast Bluff, Montegail Pond, Schoodic Lake	Quad code:	
County:	Washington	Town:	T18 MD BPP

Plant Name: *Piptatherum canadense* New Update Occurrence #:

Date: September 2016; August 2019	Surveyor(s): Matt Arsenault	Sourcecode (MNAP assigns):
Primary Surveyor Address: Stantec, 30 Park Drive, Topsham, ME 04086	Phone: 207-798-2135	Email: matt.arsenault@stantec.com

GPS Datum WGS 84 NAD 83 NAD 27 Other
 GPS Coordinates UTM Zone 19N Decimal Degrees (dd.dddd) Deg Min Sec (dd mm ss) GPS (dd mm.mm) Other
 44.745489 North -67.914670 West Additional Coordinates see map

Directions to Occurrence: Use aerial map (coordinates represent +/- centroid). Plants are ubiquitous along edges commercial blueberry fields and early successional shrublands bisected by Schoodic Road and associated secondary roads to the west and north of the Great Heath
 Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

mapped to w/in 12.5 m of actual location; greater uncertainty (estimate = m / ft / km / miles); aerial delimited

Confidence in Observation of Population Extent

Confident full extent of feature **IS** known; Confident full extent is **NOT** known; **Uncertain** whether full extent is known

EO DATA # of Plants 10000+ <input checked="" type="checkbox"/> Individuals <input type="checkbox"/> Ramets Population Structure 10 % Vegetative 90 % Reproductive	Phenology <input type="checkbox"/> In leaf <input type="checkbox"/> In bud <input type="checkbox"/> In flower <input type="checkbox"/> Immature fruit <input checked="" type="checkbox"/> Mature fruit <input type="checkbox"/> Seed dispersing <input type="checkbox"/> Dormant	Population Area <input type="checkbox"/> 1 square yard <input type="checkbox"/> 1 – 5 square yards <input type="checkbox"/> 5 – 20 square yards <input type="checkbox"/> 20 – 100 square yards <input type="checkbox"/> 100 sq yds to 1 acre <input checked="" type="checkbox"/> 1 acre + 300+ ac~area actual habitat 800+ ac~ area potential habita	Vigor? <input type="checkbox"/> Normal <input checked="" type="checkbox"/> Other than normal Explain: Plants are characteristic of community Evidence disease, predation, etc? Explain: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Type of reproduction? Explain: <input checked="" type="checkbox"/> Sexual <input type="checkbox"/> Asexual <input type="checkbox"/> Not Observed
Other Comments: Surveyed area is just a small portion of larger metapopulation in the greater commercial blueberry field landscape			

GENERAL DESCRIPTION

Associated natural community: Early successional shrubland, blueberry field edges
Associated plant species: <i>Vaccinium angustifolium</i> , <i>Pteridium aquilinum</i> , <i>Gaultheria procumbens</i> , <i>Kalmia angustifolia</i> , <i>Danthonia spicata</i> , <i>Betula populifolia</i>
Substrate/soil type: Sebago-Croghan-Colton-Adams, Vassalboro-Colton-Adams, excessively drained loamy sands
Threats to Population: Succession
Conservation/Management/Research needs: none - current landuse is maintaining a persistent metapopulation

Elevation	Aspect	% Slope	Light	Topographic Position	Moisture
Min 250' ft / m	<input type="checkbox"/> N <input type="checkbox"/> NE <input type="checkbox"/> E <input type="checkbox"/> NW <input type="checkbox"/> S <input type="checkbox"/> SE <input type="checkbox"/> W <input type="checkbox"/> SW <input checked="" type="checkbox"/> Flat or NA	<input checked="" type="checkbox"/> Flat <input checked="" type="checkbox"/> 0-10 <input type="checkbox"/> 10-35 <input type="checkbox"/> 35+ <input type="checkbox"/> Vertical	<input checked="" type="checkbox"/> Open <input type="checkbox"/> Partial <input type="checkbox"/> Filtered <input type="checkbox"/> Shade	<input type="checkbox"/> Crest <input type="checkbox"/> Upper Slope <input checked="" type="checkbox"/> Mid-slope <input type="checkbox"/> Lower Slope <input type="checkbox"/> Bottom <input type="checkbox"/> Level Plain	<input type="checkbox"/> Inundated <input type="checkbox"/> Saturated (wet mesic) <input type="checkbox"/> Moist (mesic) <input type="checkbox"/> Dry-mesic <input checked="" type="checkbox"/> Dry (xeric)
Max 300' ft / m					

Photograph taken? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	Specimen collected? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	Do other members of this genus occur at this site? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes
	Collection #	If yes, are there hybridization issues? <input checked="" type="checkbox"/> No; <input type="checkbox"/> Yes; Explain
	Repository	Are there identification issues? <input checked="" type="checkbox"/> No; <input type="checkbox"/> Yes; Explain

Landowner name/address for entire population (attach additional owner information on a separate sheet): Cherryfield Foods	Phone	Is landowner aware of plant? <input type="checkbox"/> Yes <input type="checkbox"/> No
	Tax map # (if known)	Is landowner protecting plant? <input type="checkbox"/> Yes <input type="checkbox"/> No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

<input checked="" type="checkbox"/> Logging-most recently ~ yrs ago	<input checked="" type="checkbox"/> Fire	<input type="checkbox"/> Dumping or mining
<input checked="" type="checkbox"/> Agriculture / Pasture	<input type="checkbox"/> Impoundment	<input checked="" type="checkbox"/> ORV / Vehicle disturbance
<input type="checkbox"/> Animal effects (insect outbreaks, browsing)	<input type="checkbox"/> Exotic plants	<input checked="" type="checkbox"/> Trails / Roads
<input type="checkbox"/> Wind or ice damage	<input type="checkbox"/> Erosion	<input type="checkbox"/> Other
<input type="checkbox"/> No Evidence of disturbance		

Describe: Portions of metapopulation are associated with managed blueberry barrens - land management is providing favorable habitat

Condition Rank **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)
 B – Some signs of human disturbance or degradation, but habitat generally intact
 C – Signs of human disturbance or degradation, and habitat compromised in some significant way
 D – Highly disturbed (multiple impacts causing habitat to be drastically altered)
 Other / Habitat disturbed, consistent with needs of species / **Explain:** Species requires maintenance of open, early successional habitat

SIZE / QUALITY: How large is this population relative to typical populations of this species? Much larger
 Does it appear to be capable of maintaining itself if its habitat remains basically intact? Yes No

Size / Quality Rank **A** – Excellent **B** – Good **C** – Fair **D** – Poor

Comments: Part of a larger metapopulation of the commercial blueberry field landscape

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments: Historic and ongoing commercial blueberry management has created and maintained favorable habitat for this species

Landscape Rank **A** – Population surrounded by > = 1000 acres of undisturbed landscape
 B – Population surrounded by fairly intact landscape, though there may be cuts nearby
 C – Population surrounded by fragmented forest or rural landscape
 D – Surrounding area developed
 Other / Explain: Even though landscape is heavily disturbed, it is exactly the type of habitat this species needs

OVERALL RANK for EO based on your experience **A** – Excellent **B** – Good **C** – Fair **D** – Poor **E** – Extant

Comments: Large size - characteristic species of early successional shrublands

MNAP reviewed / verified rank Date: Reviewer:	<input type="checkbox"/> A – Excellent <input type="checkbox"/> B – Good <input type="checkbox"/> C – Fair <input type="checkbox"/> D – Poor <input type="checkbox"/> E – Extant Rationale:
---	---

SPECIAL PLANT SURVEY FORM

Site:	T19 MD BPP Northwest	Survey Site:	T19 MD BPP Northwest
Quad name:	Montegail Pond	Quad code:	
County:	Washington	Town:	T19 MD BPP

Plant Name: Piptatherum canadense New Update Occurrence #:

Date: August 2019	Surveyor(s): Matt Arsenault	Sourcecode (MNAP assigns):
Primary Surveyor Address: Stantec, 30 Park Drive, Topsham, ME 04086	Phone: 207-798-2135	Email: matt.arsenault@stantec.com

GPS Datum WGS 84 NAD 83 NAD 27 Other
 GPS Coordinates UTM Zone 19N Decimal Degrees (dd.dddd) Deg Min Sec (dd mm ss) GPS (dd mm.mm) Other
 44.780843 North -67.800693 West Additional Coordinates 44.778372,-67.800609

Directions to Occurrence: Use aerial map. Site is located sesat of Northwest Branch of Little River and near former radar base. Access road is gated. From gate, walk southeasterly up road to blueberry field. Plants occur along edge of road and western edge of blueberry field.
 Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

mapped to w/in 12.5 m of actual location; greater uncertainty (estimate = m / ft / km / miles); aerial delimited

Confidence in Observation of Population Extent

Confident full extent of feature **IS** known; Confident full extent is **NOT** known; **Uncertain** whether full extent is known

EO DATA # of Plants ~300 <input checked="" type="checkbox"/> Individuals <input type="checkbox"/> Ramets Population Structure 10 % Vegetative 90 % Reproductive	Phenology <input type="checkbox"/> In leaf <input type="checkbox"/> In bud <input type="checkbox"/> In flower <input type="checkbox"/> Immature fruit <input checked="" type="checkbox"/> Mature fruit <input type="checkbox"/> Seed dispersing <input type="checkbox"/> Dormant	Population Area <input type="checkbox"/> 1 square yard <input type="checkbox"/> 1 – 5 square yards <input type="checkbox"/> 5 – 20 square yards <input type="checkbox"/> 20 – 100 square yards <input type="checkbox"/> 100 sq yds to 1 acre <input checked="" type="checkbox"/> 1 acre + 300+ ac~area actual habitat 800+ ac~ area potential habitat	Vigor? <input type="checkbox"/> Normal <input checked="" type="checkbox"/> Other than normal Explain: Plants are characteristic of community Evidence disease, predation, etc? Explain: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Type of reproduction? Explain: <input checked="" type="checkbox"/> Sexual <input type="checkbox"/> Asexual <input type="checkbox"/> Not Observed
Other Comments: Surveyed area is just a small portion of larger metapopulation in the greater commercial blueberry field landscape			

GENERAL DESCRIPTION

Associated natural community: blueberry field edges
Associated plant species: Vaccinium angustifolium, Pteridium aquilinum, Gaultheria procumbens, Kalmia angustifolia, Danthonia spicata, Betula populifolia
Substrate/soil type: Adams loamy sand, somewhat excessively drained
Threats to Population: Succession
Conservation/Management/Research needs: none - current landuse is maintaining a persistent metapopulation

Elevation	Aspect	% Slope	Light	Topographic Position	Moisture
Min 230' ft / m	<input type="checkbox"/> N <input type="checkbox"/> NE <input type="checkbox"/> E <input type="checkbox"/> NW <input type="checkbox"/> S <input type="checkbox"/> SE <input type="checkbox"/> W <input type="checkbox"/> SW <input checked="" type="checkbox"/> Flat or NA	<input checked="" type="checkbox"/> Flat <input checked="" type="checkbox"/> 0-10 <input type="checkbox"/> 10-35 <input type="checkbox"/> 35+ <input type="checkbox"/> Vertical	<input checked="" type="checkbox"/> Open <input type="checkbox"/> Partial <input type="checkbox"/> Filtered <input type="checkbox"/> Shade	<input type="checkbox"/> Crest <input type="checkbox"/> Upper Slope <input checked="" type="checkbox"/> Mid-slope <input type="checkbox"/> Lower Slope <input type="checkbox"/> Bottom <input type="checkbox"/> Level Plain	<input type="checkbox"/> Inundated <input type="checkbox"/> Saturated (wet mesic) <input type="checkbox"/> Moist (mesic) <input type="checkbox"/> Dry-mesic <input checked="" type="checkbox"/> Dry (xeric)
Max 250 ft / m					

Photograph taken? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	Specimen collected? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	Do other members of this genus occur at this site? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes
	Collection #	If yes, are there hybridization issues? <input checked="" type="checkbox"/> No; <input type="checkbox"/> Yes; Explain
	Repository	Are there identification issues? <input checked="" type="checkbox"/> No; <input type="checkbox"/> Yes; Explain

Landowner name/address for entire population (attach additional owner information on a separate sheet):	Phone	Is landowner aware of plant? <input type="checkbox"/> Yes <input type="checkbox"/> No
	Tax map # (if known)	Is landowner protecting plant? <input type="checkbox"/> Yes <input type="checkbox"/> No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

<input checked="" type="checkbox"/> Logging-most recently ~ yrs ago	<input checked="" type="checkbox"/> Fire	<input type="checkbox"/> Dumping or mining
<input checked="" type="checkbox"/> Agriculture / Pasture	<input type="checkbox"/> Impoundment	<input checked="" type="checkbox"/> ORV / Vehicle disturbance
<input type="checkbox"/> Animal effects (insect outbreaks, browsing)	<input type="checkbox"/> Exotic plants	<input checked="" type="checkbox"/> Trails / Roads
<input type="checkbox"/> Wind or ice damage	<input type="checkbox"/> Erosion	<input type="checkbox"/> Other
<input type="checkbox"/> No Evidence of disturbance		

Describe: Populatio is associated with managed blueberry barrens - land management is providing favorable habiat

Condition A – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)

Rank B – Some signs of human disturbance or degradation, but habitat generally intact

C – Signs of human disturbance or degradation, and habitat compromised in some significant way

D – Highly disturbed (multiple impacts causing habitat to be drastically altered)

Other / Habitat disturbed, consistent with needs of species / **Explain:** Species requires maintenance of open, early successional habitat

SIZE / QUALITY: How large is this population relative to typical populations of this species? Much larger

Does it appear to be capable of maintaining itself if its habitat remains basically intact? Yes No

Size / Quality Rank A – Excellent B – Good C – Fair D – Poor

Comments: Part of a larger metapopulation of the commercial blueberry field landscape

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments: Historic and ongoing commercial blueberry management has created and maintained favorable habiat for this species

Landscape A – Population surrounded by > = 1000 acres of undisturbed landscape

Rank B – Population surrounded by fairly intact landscape, though there may be cuts nearby

C – Population surrounded by fragmented forest or rural landscape

D – Surrounding area developed

Other / Explain: Even though landscape is heavily disturbed, it is exactly the type of habiat this species needs

OVERALL RANK for EO based on your experience A – Excellent B – Good C – Fair D – Poor E – Extant

Comments: Large size - characteristic species of early successional shrublands

MNAP reviewed / verified rank Date: Reviewer:	<input type="checkbox"/> A – Excellent <input type="checkbox"/> B – Good <input type="checkbox"/> C – Fair <input type="checkbox"/> D – Poor <input type="checkbox"/> E – Extant Rationale:
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SPECIAL PLANT SURVEY FORM

Site:	Crebo Flat - North	Survey Site:	Crebo Flat - North
Quad name:	Northeast Bluff	Quad code:	
County:	Washington	Town:	T24 MD BPP

Plant Name: Piptatherum canadense New Update Occurrence #:

Date: August 5, 2019	Surveyor(s): Matt Arsenault	Sourcecode (MNAP assigns):
Primary Surveyor Address: Stantec, 30 Park Drive, Topsham, ME 04086	Phone: 207-798-2135	Email: matt.arsenault@stantec.com

GPS Datum WGS 84 NAD 83 NAD 27 Other
 GPS Coordinates UTM Zone 19N Decimal Degrees (dd.dddd) Deg Min Sec (dd mm ss) GPS (dd mm.mm) Other
 44.803385 North -67.923848 West Additional Coordinates 44.808593, -67.920947 ; 44.791819, -67.930683

Directions to Occurrence: Use aerial map. Follow Schoodic Road and secondary roads north through blueberry fields to northern edge of barrens. Several populations are located throughout this area. Largest population is located along jeep/ATV trail that parallels Pleasant River to the west. Plants occur commonly along edges of blueberry barrens, in early successional forest openings and shrublands, and abandoned blueberry fields

Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

mapped to w/in 12.5 m of actual location; greater uncertainty (estimate = m / ft / km / miles); aerial delimited

Confidence in Observation of Population Extent

Confident full extent of feature **IS** known; Confident full extent is **NOT** known; **Uncertain** whether full extent is known

EO DATA	Phenology	Population Area	Vigor? <input type="checkbox"/> Normal <input checked="" type="checkbox"/> Other than normal Explain: Plants are characteristic of community
# of Plants 2000+ <input checked="" type="checkbox"/> Individuals <input type="checkbox"/> Ramets	<input type="checkbox"/> In leaf <input type="checkbox"/> In bud <input type="checkbox"/> In flower <input type="checkbox"/> Immature fruit <input checked="" type="checkbox"/> Mature fruit <input type="checkbox"/> Seed dispersing <input type="checkbox"/> Dormant	<input type="checkbox"/> 1 square yard <input type="checkbox"/> 1 – 5 square yards <input type="checkbox"/> 5 – 20 square yards <input type="checkbox"/> 20 – 100 square yards <input type="checkbox"/> 100 sq yds to 1 acre <input checked="" type="checkbox"/> 1 acre + 60+ ac~area actual habitat 80+ ac~ area potential habitat	Evidence disease, predation, etc? Explain: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Type of reproduction? Explain: <input checked="" type="checkbox"/> Sexual <input type="checkbox"/> Asexual <input type="checkbox"/> Not Observed
Population Structure 10 % Vegetative 90 % Reproductive			
Other Comments: Surveyed area is just a small portion of larger metapopulation in the greater commercial blueberry field landscape			

GENERAL DESCRIPTION

Associated natural community: Early successional shrubland, blueberry field edges
Associated plant species: Vaccinium angustifolium, Pteridium aquilinum, Gaultheria procumbens, Kalmia angustifolia, Danthonia spicata, Betula populifolia
Substrate/soil type: Colton-Adams association, excessively drained sandy spodosols
Threats to Population: Succession
Conservation/Management/Research needs: none - current landuse is maintaining a persistent metapopulation

Elevation	Aspect	% Slope	Light	Topographic Position	Moisture
Min 270' ft / m	<input type="checkbox"/> N <input type="checkbox"/> NE <input type="checkbox"/> E <input type="checkbox"/> NW <input type="checkbox"/> S <input type="checkbox"/> SE <input type="checkbox"/> W <input type="checkbox"/> SW <input checked="" type="checkbox"/> Flat or NA	<input checked="" type="checkbox"/> Flat <input checked="" type="checkbox"/> 0-10 <input type="checkbox"/> 10-35 <input type="checkbox"/> 35+ <input type="checkbox"/> Vertical	<input checked="" type="checkbox"/> Open <input type="checkbox"/> Partial <input type="checkbox"/> Filtered <input type="checkbox"/> Shade	<input type="checkbox"/> Crest <input type="checkbox"/> Upper Slope <input checked="" type="checkbox"/> Mid-slope <input type="checkbox"/> Lower Slope <input type="checkbox"/> Bottom <input type="checkbox"/> Level Plain	<input type="checkbox"/> Inundated <input type="checkbox"/> Saturated (wet mesic) <input type="checkbox"/> Moist (mesic) <input type="checkbox"/> Dry-mesic <input checked="" type="checkbox"/> Dry (xeric)
Max 310' ft / m					

Photograph taken? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	Specimen collected? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	Do other members of this genus occur at this site? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes
	Collection #	If yes, are there hybridization issues? <input checked="" type="checkbox"/> No; <input type="checkbox"/> Yes; Explain
	Repository	Are there identification issues? <input checked="" type="checkbox"/> No; <input type="checkbox"/> Yes; Explain

Landowner name/address for entire population (attach additional owner information on a separate sheet): Cherryfield Foods	Phone	Is landowner aware of plant? <input type="checkbox"/> Yes <input type="checkbox"/> No
	Tax map # (if known)	Is landowner protecting plant? <input type="checkbox"/> Yes <input type="checkbox"/> No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

<input checked="" type="checkbox"/> Logging-most recently ~ yrs ago	<input checked="" type="checkbox"/> Fire	<input type="checkbox"/> Dumping or mining
<input checked="" type="checkbox"/> Agriculture / Pasture	<input type="checkbox"/> Impoundment	<input checked="" type="checkbox"/> ORV / Vehicle disturbance
<input type="checkbox"/> Animal effects (insect outbreaks, browsing)	<input type="checkbox"/> Exotic plants	<input type="checkbox"/> Trails / Roads
<input type="checkbox"/> Wind or ice damage	<input type="checkbox"/> Erosion	<input type="checkbox"/> Other
<input type="checkbox"/> No Evidence of disturbance		

Describe: Portions of metapopulation are associated with managed blueberry barrens - land management is providing favorable habitat

Condition Rank **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)
 B – Some signs of human disturbance or degradation, but habitat generally intact
 C – Signs of human disturbance or degradation, and habitat compromised in some significant way
 D – Highly disturbed (multiple impacts causing habitat to be drastically altered)
 Other / Habitat disturbed, consistent with needs of species / **Explain:** Species requires maintenance of open, early successional habitat

SIZE / QUALITY: How large is this population relative to typical populations of this species? Much larger
 Does it appear to be capable of maintaining itself if its habitat remains basically intact? Yes No

Size / Quality Rank **A** – Excellent **B** – Good **C** – Fair **D** – Poor

Comments: Part of a larger metapopulation of the commercial blueberry field landscape

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments: Historic and ongoing commercial blueberry management has created and maintained favorable habitat for this species

Landscape Rank **A** – Population surrounded by > = 1000 acres of undisturbed landscape
 B – Population surrounded by fairly intact landscape, though there may be cuts nearby
 C – Population surrounded by fragmented forest or rural landscape
 D – Surrounding area developed
 Other / Explain: Even though landscape is heavily disturbed, it is exactly the type of habitat this species needs

OVERALL RANK for EO based on your experience **A** – Excellent **B** – Good **C** – Fair **D** – Poor **E** – Extant

Comments: Large size - characteristic species of early successional shrublands

MNAP reviewed / verified rank **A** – Excellent **B** – Good **C** – Fair **D** – Poor **E** – Extant

Date: Reviewer: Rationale:

SPECIAL PLANT SURVEY FORM

Site:	Bog Stream	Survey Site:	Bog Stream
Quad name:	Schoodic Lake	Quad code:	
County:	Washington	Town:	T18 MD BPP

Plant Name: *Polemonium vanbruntiae* New Update Occurrence #:

Date: August 8, 2019	Surveyor(s): Matt Arsenault	Sourcecode (MNAP assigns):
Primary Surveyor Address: Stantec, 30 Park Drive, Topsham, ME 04086	Phone: 207-798-2135	Email: matt.arsenault@stantec.com

GPS Datum WGS 84 NAD 83 NAD 27 Other
 GPS Coordinates UTM Zone 19N Decimal Degrees (dd.dddd) Deg Min Sec (dd mm ss) GPS (dd mm.mm) Other
 44.7429933 North -67.914124 West Additional Coordinates

Directions to Occurrence: Follow Schoodic Road to Bog Stream crossing. Park on edge of road. Look for a small patch of *Larix laricina* to the east of the road and south of the brook (approxiamtely 250 feet from road). Bushwhack towards the *Larix* and locate plants in an alder seepage wetlands with *Carex lacustris*
 Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

mapped to w/in 12.5 m of actual location; greater uncertainty (estimate = m / ft / km / miles); aerial delimited

Confidence in Observation of Population Extent

Confident full extent of feature **IS** known; Confident full extent is **NOT** known; **Uncertain** whether full extent is known

EO DATA # of Plants ~500 <input checked="" type="checkbox"/> Individuals <input type="checkbox"/> Ramets Population Structure 85 % Vegetative 15 % Reproductive	Phenology <input type="checkbox"/> In leaf <input type="checkbox"/> In bud <input checked="" type="checkbox"/> In flower <input checked="" type="checkbox"/> Immature fruit <input type="checkbox"/> Mature fruit <input type="checkbox"/> Seed dispersing <input type="checkbox"/> Dormant	Population Area <input type="checkbox"/> 1 square yard <input type="checkbox"/> 1 – 5 square yards <input type="checkbox"/> 5 – 20 square yards <input type="checkbox"/> 20 – 100 square yards <input checked="" type="checkbox"/> 100 sq yds to 1 acre <input type="checkbox"/> 1 acre + 0.3 ac~area actual habitat 0.3 ac~ area potential habitat	Vigor? <input type="checkbox"/> Normal <input checked="" type="checkbox"/> Other than normal Explain: Plans are growing rather dense Evidence disease, predation, etc? Explain: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Type of reproduction? Explain: flowers and fruit <input checked="" type="checkbox"/> Sexual <input type="checkbox"/> Asexual <input type="checkbox"/> Not Observed
Other Comments: Strong groundwater discharge component to habitat			

GENERAL DESCRIPTION

Associated natural community: Alder seepage floodplain
Associated plant species: <i>Alnus incana</i> , <i>Carex lacustris</i> , <i>Rubus pubescens</i> , <i>Solidago gigantea</i> , <i>Carex trisperma</i> , <i>Dryopteris x bootii</i> , <i>Larix laricina</i> , <i>Glyceria striata</i> , <i>Calamagrostis canadensis</i> , <i>Dryopteris cristata</i> , <i>Galium asprellum</i>
Substrate/soil type: Medomak and Wonsqueak, frequently flooded, very poorly drained
Threats to Population: Hydrological alterations (e.g., beaver inundation)
Conservation/Management/Research needs: Additional surveys downstream and upstream in watershed

Elevation	Aspect	% Slope	Light	Topographic Position	Moisture
Min 190 ft / m	<input type="checkbox"/> N <input type="checkbox"/> NE <input type="checkbox"/> E <input type="checkbox"/> NW <input type="checkbox"/> S <input type="checkbox"/> SE <input type="checkbox"/> W <input type="checkbox"/> SW <input checked="" type="checkbox"/> Flat or NA	<input type="checkbox"/> Flat <input checked="" type="checkbox"/> 0-10 <input type="checkbox"/> 10-35 <input type="checkbox"/> 35+ <input type="checkbox"/> Vertical	<input type="checkbox"/> Open <input type="checkbox"/> Partial <input type="checkbox"/> Filtered <input checked="" type="checkbox"/> Shade	<input type="checkbox"/> Crest <input type="checkbox"/> Upper Slope <input type="checkbox"/> Mid-slope <input type="checkbox"/> Lower Slope <input checked="" type="checkbox"/> Bottom <input type="checkbox"/> Level Plain	<input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated (wet mesic) <input type="checkbox"/> Moist (mesic) <input type="checkbox"/> Dry-mesic <input type="checkbox"/> Dry (xeric)
Max 195 ft / m					

