

## 9.0 UNUSUAL NATURAL AREAS

### 9.1 Introduction

The Project area was evaluated for the presence of unusual natural areas. According to the Preservation of Unusual Natural Areas standard of the No Adverse Environmental Effect Standard of the Site Law (06-096 CMR 375.12), an unusual natural area is defined as “any land or water area, usually only a few acres in size, which is undeveloped and which contains natural features of unusual geologic, botanical, zoological, ecological, hydrological, other scientific, educational, scenic or recreational significance”. State and federal agencies were contacted to identify information regarding documented occurrences or the potential presence of sensitive natural resources within the project area. Following this interaction, Atlantic Resource Co, LLC (ARC) and Weber Ecological Services (WES) completed surveys for rare, threatened, and endangered (RTE) plant species to support state permitting efforts for the Project.

### 9.2 Agency Consultation

The Maine Natural Areas Program (MNAP) was contacted by the Applicant on December 6, 2018 (See Exhibit 9-1) as a request to review the project site for any rare and unique botanical features which includes the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. MNAP reviewed the Project area which involved examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts. The official response covers only botanical features. Upon their review, there were no rare botanical features documented specifically within the project area. This lack of data may have indicated minimal survey efforts rather than confirm the absence of rare botanical features. MNAP recommended that the Applicant have the site inventoried to ensure that no undocumented rare features are inadvertently harmed. See the full correspondence with MNAP in Exhibit 9-1.

### 9.3 Field Surveys

A field evaluation of hydrologic, soil, and vegetative conditions for the entire project area was completed during the wetland delineation by ARC and WES. A rare, threatened, and endangered plant field survey. The survey covered 6 areas totaling approximately 600 acres. Surveys were conducted during July, August, and September of 2019. One state listed species, Canada Mountain Rice Grass, was observed in the Project area. This species is currently listed as “S2” (imperiled because of rarity: 6-20 occurrences or fewer remaining individuals or acres or because of other factors making it vulnerable to further decline) by the Maine Natural Areas Program (MNAP). The species is listed as a Special Concern species (rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered). Exhibit 9-2 outlines the findings of the survey.

Due to the unclear evidence of the reasons for the rarity of this species, the report supports the statement that the proposed solar panel installation would provide a higher likelihood of habitat maintenance and Canada Mountain Rice Grass survival than blueberry production or reforestation. It is likely that Canada Mountain Rice Grass will persist under installed panels if a similar management regime is maintained, as is planned under the current design scenario. See Exhibit 9-2 for the full report.

## **Exhibit 9-1**

### Maine Natural Areas Program Agency Consultation



**PAUL R. LEPAGE**  
GOVERNOR

**STATE OF MAINE**  
**DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY**

93 STATE HOUSE STATION  
AUGUSTA, MAINE 04333

**WALTER E. WHITCOMB**  
COMMISSIONER

December 7, 2018

Aleita Burman  
Atlantic Resource Co  
PO Box 76  
Bass Harbor, ME 04653

Via email: [blburman@gmail.com](mailto:blburman@gmail.com)

CC: Roger St. Amand; [roger@arc-env.com](mailto:roger@arc-env.com)

Re: Rare and exemplary botanical features in proximity to #18-006, Commercial Energy Project, T16 MD Maine

Dear Ms. Burman:

I have searched the Natural Areas Program's Biological and Conservation Data System files in response to your request received December 6, 2018 for information on the presence of rare or unique botanical features documented from the vicinity of the project in T16 MD, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. You may want to have the site inventoried by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

**MOLLY DOCHERTY, DIRECTOR**  
MAINE NATURAL AREAS PROGRAM



PHONE: (207) 287-8044  
FAX: (207) 287-8040  
WWW.MAINE.GOV/DACF/MNAP

The Natural Areas Program is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. The Natural Areas Program welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by the Natural Areas Program are to be published in any form, the Program should be informed at the outset and credited as the source.

The Natural Areas Program has instituted a fee structure of \$75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for \$150.00 for two hours of our services.

Thank you for using the Natural Areas Program in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,



Kristen Puryear | Ecologist | Maine Natural Areas Program  
207-287-8043 | [kristen.puryear@maine.gov](mailto:kristen.puryear@maine.gov)



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## Rare and Exemplary Botanical Features within 4 miles of Project: #18-006, Commercial Energy Project, T16 MD, Maine

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Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
<b>Canada Mountain-ricegrass</b>						
	SC	S2	G4G5	1938-07-01	9	Dry barrens (partly forested, upland)
	SC	S2	G4G5	1930-07-08	1	Dry barrens (partly forested, upland)
<b>Domed Bog</b>						
	<null>	S3	GNR	2004-04-09	2	Forested wetland, Open wetland, not coastal nor rivershore (non-forested, wetland)

## STATE RARITY RANKS

- S1** Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
- S2** Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- S3** Rare in Maine (20-100 occurrences).
- S4** Apparently secure in Maine.
- S5** Demonstrably secure in Maine.
- SU** Under consideration for assigning rarity status; more information needed on threats or distribution.
- SNR** Not yet ranked.
- SNA** Rank not applicable.
- S#?** Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).

**Note:** **State Rarity Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines State Rarity Ranks for animals.

## GLOBAL RARITY RANKS

- G1** Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extinction.
- G2** Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- G3** Globally rare (20-100 occurrences).
- G4** Apparently secure globally.
- G5** Demonstrably secure globally.
- GNR** Not yet ranked.

**Note:** **Global Ranks** are determined by NatureServe.

## STATE LEGAL STATUS

**Note:** State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's **Endangered and Threatened** plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

- E** ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.
- T** THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

## NON-LEGAL STATUS

- SC** SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.
- PE** Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.

## ELEMENT OCCURRENCE RANKS - EO RANKS

Element Occurrence ranks are used to describe the quality of a rare plant population or natural community based on three factors:

- **Size:** Size of community or population relative to other known examples in Maine. Community or population's viability, capability to maintain itself.
- **Condition:** For communities, condition includes presence of representative species, maturity of species, and evidence of human-caused disturbance. For plants, factors include species vigor and evidence of human-caused disturbance.
- **Landscape context:** Land uses and/or condition of natural communities surrounding the observed area. Ability of the observed community or population to be protected from effects of adjacent land uses.

These three factors are combined into an overall ranking of the feature of **A**, **B**, **C**, or **D**, where **A** indicates an **excellent** example of the community or population and **D** indicates a **poor** example of the community or population. A rank of **E** indicates that the community or population is **extant** but there is not enough data to assign a quality rank. The Maine Natural Areas Program tracks all occurrences of rare (S1-S3) plants and natural communities as well as A and B ranked common (S4-S5) natural communities.

**Note:** **Element Occurrence Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines Element Occurrence ranks for animals.

Visit our website for more information on rare, threatened, and endangered species!  
<http://www.maine.gov/dacf/mnap>

cellular, digital television, radio, and emergency broadcast) can be found at:  
<http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm> and at:  
<http://www.towerkill.com>; and at:  
<http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

## Project Summary

Consultation Code: 05E1ME00-2019-SLI-0321

Event Code: 05E1ME00-2019-E-00608

Project Name: Three Rivers Solar

Project Type: POWER GENERATION

Project Description: The project is construction of a large scale solar array and substation, on about 550-acres of land.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/44.71936942574213N68.10210421473107W>



Counties: Hancock, ME

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## **Exhibit 9-2**

### Rare, Threatened and Endangered Survey Report

Atlantic Resource Co, LLC  
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Bass Harbor, ME 04653  
Tel 207.944.7288  
[roger@arc-env.com](mailto:roger@arc-env.com)  
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**Jill Weber**  
Consulting Botanist/Ecologist  
9 Cedar Avenue  
Bar Harbor, ME 04609 207-288-3250  
[jill.weber@roadrunner.com](mailto:jill.weber@roadrunner.com)

SEPTEMBER 22, 2019

**Mr. David Fowler**  
Three Rivers Solar Power, LLC/Swift Current Energy  
184 High Street, Suite 701  
Boston, MA 02111  
Via email:

**RE: Three Rivers Solar Project, T16MD, Maine– Rare, Threatened, and Endangered Plant Survey:**

Dear Dave,

Atlantic Resource Co, LLC (ARC) and Weber Ecological Services (WES) have completed surveys for rare, threatened, and endangered (RTE) plant species to support state permitting efforts for the Three Rivers Solar Power project in Township 16 MD. The survey covered 6 areas totaling approximately 600 acres. Surveys were conducted during July, August and September of 2019. One state listed species, Canada Mountain Rice Grass (*Piptatherum canadense*) was observed in the project area. This species is currently listed as “S2” by the Maine Natural Areas Program (MNAP). The enclosed report outlines the findings of the survey. We very much appreciate the opportunity to provide this report and please contact us with any questions or for further information.

Sincerely,

A handwritten signature in blue ink, appearing to read 'R. St. Amand'.

Roger St. Amand, CSS, LSE, LPF, CPESC, PWS

Principal| Atlantic Resource Co, LLC

A handwritten signature in black ink, appearing to read 'Jill E. Weber'.

Jill E. Weber

Consulting Botanist| Weber Ecological Survey



## Rare, Threatened, and Endangered Plant Survey at the Three Rivers Solar Project Site

### T16 MD

#### Purpose

Weber Ecological Services was contracted to conduct a botanical survey to detect the presence of rare, threatened, and endangered (RTE) plant species as part of pre-permitting work at the Three Rivers Solar (TRS) site in T16 MD, Maine. TRS plans to install a 100-MW solar array on this ~600-acre site, see Sheet B-1 attached.

#### Study Site

Much of the project site was forested until about 10 years ago, when the landowner harvested the trees. The landowner created a transitional habitat by clearing vegetation, removing large boulders, conducting some grading that created bare soils, and applying herbicide treatments in the conversion of the land to blueberry production. Current herbicide treatments employ glyphosate applied with a wand at a height that kills taller woody plants but avoids contact with most herbaceous species. The TRS project site includes 6 areas, each of which has a gravel perimeter road, See Sheet B-2 Overview. Area 1 (the largest, at about 350 acres) has been the focus of the practices outlined above; thus, it is the most disturbed and open portion of the site, with the sparsest vegetation. Although there is some patchiness, Lowbush Blueberry (*Vaccinium angustifolium*) is dominant here. There is also fairly extensive cover by Sheep Laurel (*Kalmia*





*angustifolia*). Flattened Oatgrass (*Danthonia compressa*), Fireweed (*Chamerion angustifolium*), Rough Rice Grass (*Oryzopsis asperifolium*), and bentgrasses (*Agrostis* spp.). Areas 2 and 3 (41 acres and 35 acres, respectively) are less open, but still without extensive woody plant growth. The same species are associated, but there are more maple (*Acer* spp.), birch (*Betula* spp.), and Red Oak (*Quercus rubra*) stump sprouts. Areas 4 and 5 (23 acres and 26 acres, respectively) support a greater proportion of woody vegetation, most of which is ~15-foot-tall regrowth of stump sprouts from previously harvested hardwood species, mainly birch and maple. In addition, there is a drainage channel through Area 5 that supports typical poor fen species, including Woolgrass (*Scirpus cyperinus*), Rhodora (*Rhododendron canadense*), and Northern Long Sedge (*Carex folliculata*). Area 6 has a mixture of low and tall-shrub dominated vegetation, the northern portion of which has dense growth of Beaked Hazelnut (*Corylus cornuta*). (Fig. 2). There are some mapped wetlands on the site, but most of them are small and seasonal. The topography undulates with many low ridges and knobs.

Most rare plant species do not occur in the disturbed habitats present at the TRS site. However, a few species have been documented in disturbed areas, including: Canada Mountain Rice Grass (*Piptatherum canadense*), Dusky Sedge (*Carex adusta*), Dawnland Sedge (*Carex waponahkikensis*), and Allegheny Vine (*Adlumia fungosa*). Fact sheets about each of these species are available at the Maine Natural Areas Program (MNAP) website ([https://www.maine.gov/dacf/mnap/features/rare\\_plants/plantlist.htm](https://www.maine.gov/dacf/mnap/features/rare_plants/plantlist.htm)). MNAP maintains Maine's rare plant list and tracks RTE locations; there are no records of any RTE species within more than a mile of the site (MNAP, pers. comm.).



## Methods

Surveys consisted of parallel transects across each of the 6 areas at the site to detect the presence of RTE plants. Transects were located close enough together to allow all portions of the site to be visually examined; they were closer in areas with more woody vegetation where visibility was lower. Canada Mountain Rice Grass and Allegheny Vine are identifiable in the field. Dusky Sedge and Dawnland Sedge are in a cryptic group of sedges (Cyperoidae) and are more difficult to discern. We collected specimens of any sedges whose identity was in doubt and used a microscope to examine them in the office. Field crews used submeter Trimble GPS units to map occurrences of rare species observed for later mapping in GIS, along with supplemental mapping grade GPS units for navigation. If plants occurred individually, we mapped them as points. If several plants occurred near each other, we counted the number of stems present and used GPS to create a polygon around the area. We followed the nomenclature in Arsenault et al. (2013) for sedges, Mittelhauser et al. (2019) for grasses, and Native Plant Trust (2019) for all other plants.

## Results

We documented occurrences of Canada Mountain Rice Grass in all 6 areas within the project boundaries, but detected no other RTE species. We recorded thousands of Canada Mountain Rice Grass stems in the project area; some as individual plants and some as patches dispersed within discreet areas (mapped within polygons). In all, we determined that Canada Mountain Rice Grass covered approximately 25 acres. See Appendix A for a report specific to Canada Mountain Rice Grass.



It was impossible to characterize the preferred habitat of this species because it occurred so widely. The common factor among all occurrences was the absence of a closed woody canopy. Thus, even in area 5, where canopy cover was nearly 100%, we observed Canada Mountain Rice Grass in a few small openings where herbaceous species were dominant. It appeared to have no preference for exposure or topographic position.

Despite extensive searches in all portions of the project site, we detected no other RTE species. Our surveys occurred in mid- to late summer, when it is best to identify Dusky Sedge, Dawnland Sedge, and Canada Mountain Rice Grass. Although Allegheny Vine blooms earlier in the year, the foliage would have been persistent, and the growth habit would have allowed differentiation between it and the closely related common species, Pale Corydalis (*Capnoides sempervirens*), which grows on the site. We searched specifically for Dusky Sedge, Dawnland Sedge, Canada Mountain Rice Grass, and Allegheny Vine, but we would have documented any RTE plant species encountered; none were observed.

## **Discussion**

The project site has been subject to ongoing human disturbance in the form of forestry, fire, grading, herbicide application, and road-building. These practices have created a large expanse of what would naturally be a transitional habitat. If the current management regime continues, forest development will be prevented and the disturbed nature of the site will persist, thus maintaining habitat for the rare Canada Mountain Rice Grass.



In Maine, Canada Mountain Rice Grass is ranked S2 (imperiled because of rarity: 6–20 occurrences or few remaining individuals or acres or because of other factors making it vulnerable to further decline) and is listed as a Special Concern species (rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered; Maine Natural Areas Program 2013). Maine supports 8 documented Canada Mountain Rice Grass populations, excluding the occurrence at the Three Rivers Solar site. The MNAP fact sheet for this species says that the reasons for the rarity of this species are, “unclear; some locations are located in blueberry barrens which are historically not popular botanizing sites”, suggesting that the species might be more common than we know because there is abundant habitat in Maine, but most of it has not been surveyed. Indeed, what appears to be an aggressive disturbance regime has resulted in the largest population of Canada Mountain Rice Grass that we have seen.

The proposed solar panel installation would provide a higher likelihood of habitat maintenance and Canada Mountain Rice Grass survival than blueberry production or reforestation. In the current project design, panel rows are separated by at least 12 feet, which will allow some patches of the grass to remain undisturbed and still receive full sun following installation. There will be no ground disturbance during the solar panel installation, except placement of support posts and burying of electrical lines between the panels. The management plan for areas underneath and between the panels includes mowing, and/or continued glyphosate treatments to taller woody vegetation, which maintains the current management regime, thus, conserving Canada Mountain Rice Grass. The panels will be of sufficient height and angle that there will be some light penetration to ground level. Recent research shows that many species grow



successfully under solar panels and that the presence of native vegetation can benefit native organisms and even adjacent habitats (Jossi 2018, NPR 2019). It is likely that Canada Mountain Rice Grass will persist under installed panels if a similar management regime is maintained, as is planned under the current design scenario.



### Literature Cited

Arsenault, M., G.H. Mittelhauser, D. Cameron, A.C. Dibble, A. Haines, S.C. Rooney, and J.E. Weber. 2013. *Sedges of Maine: A Field Guide to Cyperaceae*. University of Maine Press, Orono, ME. 712 pp.

Maine Natural Areas Program. 2013. Canada Mountain Rice Grass fact sheet. Available online at <https://www.maine.gov/dacf/mnap/features/pipcan.html>.

Mittelhauser, G.H., M. Arsenault, D. Cameron, and E. Doucette. 2019. *Grasses and Rushes of Maine*. University of Maine Press, Orono, ME. 747 pp.

Native Plant Trust. 2019. Go Botany. Available online at <https://gobotany.nativeplanttrust.org/>. Accessed 1 September 2019.



## **Appendix A. Canada Mountain Rice Grass (*Piptatherum canadense*) at the Three Rivers**

### **Project Site, T16 MD, Maine**

#### **RTE Survey**

Weber Ecological Services was contracted to conduct a botanical survey to detect the presence of rare, threatened, and endangered plant species at the Three Rivers Solar site in T16 MD, Maine.

The project area is ~600 acres in extent. Surveys consisted of parallel transects across each of the 6 areas at the site to detect the presence of rare, threatened, and endangered plants. Rare species

likely to occur in this habitat include Canada Mountain Rice Grass (*Piptatherum canadense*),

Dusky Sedge (*Carex adusta*), Dawnland Sedge (*Carex waponahkikensis*), and Allegheny Vine

(*Adlumia fungosa*). We began our survey in the southwest portion of the site (Area 6) and

observed that Canada Mountain Rice Grass (CMRG), *Piptatherum canadense* (Poiret) Dorn

(Poaceae), was widely distributed throughout the area, see Sheet B-3-RTE). We mapped the first

few stems, then began drawing polygons around large occurrences via GPS. As the survey

continued across the parcel, we found CMRG in each of the 6 areas. In all, we encountered

thousands of stems of this species. Approximately 30 habitat areas or polygons totaling

approximately 25 acres and approximately 75 individual point-locations were mapped. Point

features included 1-10 plants in a distinct cluster, typically in an area less than 5-10 meters in

diameter. Larger contiguous areas were mapped and characterized by relative density of plants.

Low-density areas had occasional plants separated and scattered by 10 meters or more

throughout but too dense to map individually. Medium-density areas included denser patches and



sporadic individuals with less than 10 meters between individual plants. High-density areas had plants and clumps of plants that covered more than 25% of the immediate location.

### **Canada Mountain Rice Grass (*Piptatherum canadense*) Distribution, Abundance, and Natural History in Maine**

Canada Mountain Rice Grass is a perennial grass that occurs from the Canadian Maritime Provinces to western Canada and extends southward into northern New England and the northern Midwest. Despite its broad occurrence, it is ranked as rare in 12 of the 15 states or provinces in which it has been documented. In New England, this species occurs only in Maine and New Hampshire, with most of the extant and historic occurrences in Washington and Hancock counties of Maine (Lapin 2004). In Maine, it is ranked S2 (imperiled because of rarity: 6–20 occurrences or few remaining individuals or acres or because of other factors making it vulnerable to further decline) and is listed as a Special Concern species (rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered; Maine Natural Areas Program 2013). Maine supports 8 documented CMRG populations, excluding the occurrence at the Three Rivers Solar site.

This species tends to grow in nutrient-poor areas with well-drained soils, and appears well-adapted to disturbance (either natural, e.g., fire, or anthropogenic, e.g., blueberry cultivation conditions; Lapin 2004). CMRG “grows most often in open, frequently disturbed, acidic, sandy habitats, with ericaceous shrubs and open-canopy pine or spruce forest. The southernmost habitats are openings in dry, recently burned, or otherwise disturbed woods, or shrub heaths.





Populations are known from eskers with open forest, edges of blueberry (*Vaccinium*) fields, Pitch Pine (*Pinus rigida*) plains, a river shore, and high, mountain slopes with much bare rock and talus.” (Lapin 2004). Although eastern Maine (Hancock and Washington counties) has abundant habitat seemingly appropriate for CMRG, the species only occurs at very few sites.

Canada Mountain Rice Grass requires frequent disturbances that create areas of bare soil, which reverse successional changes to the vegetation. Natural disturbance regimes have been interrupted or halted by fire suppression and cultivation practices. However, some management protocols, such as periodic burning for blueberry cultivation, have likely benefitted the species. Indeed, we suggest that is the case at the Three Rivers Solar site.

### **Site History and Management Practices**

Until about 10 years ago, much of the project site was forested, when it was harvested by the landowner for future agricultural production of lowbush blueberry. The current management practices have created a transitional habitat by clearing vegetation, removing large boulders, conducting some grading that created bare soils, and applying herbicide treatments in the conversion of the land to blueberry production. Current herbicide treatments employ glyphosate applied with a wand that is likely at a height sufficient to avoid contact with the grass, but which appears to control competing vegetation. CMRG is favored by this regime. If the landowner halted the conversion to agricultural land and herbicide treatments, the site would return to forest. Conversely, if the parcel were actively managed for blueberry production, additional broad-spectrum herbicides would be used to specifically target grass species that compete with



the preferred crop. Either of these scenarios would likely result in near or total elimination of CMRG at this site.

### **Canada Mountain Rice Grass Conservation Post-installation at the Project Site**

The proposed solar panel installation would provide a higher likelihood of habitat maintenance and CMRG survival than either blueberry production or reforestation. In the current project design, panel rows are separated by approximately 15 feet, which provides for a high likelihood that patches of the grass will be undisturbed and in full sun to partial shade. There will be only minimal ground disturbance during the solar panel installation, except placement of support posts and burying of electrical lines between the panels, and a small area required for a substation located in Area 6. The management plan for areas underneath and between the panels includes mowing, and/or continued glyphosate treatments to taller woody vegetation, which maintains the current management regime, thus, conserving CMRG. The panels will be of sufficient height and at enough of an angle that there will be good light penetration to ground level. Recent research shows that many species grow successfully under solar panels and that the presence of native vegetation can benefit native organisms and even adjacent habitats (Jossi 2018, NPR 2019). It is likely that CMRG will persist under installed panels if a similar management regime is maintained, as is planned under the current design scenario.



## Literature Cited

Jossi, Frank. 2018. Scientific American. Available online at

<https://www.scientificamerican.com/article/solar-farms-produce-power-and-food/>.

Accessed 1 September 2019.

Lapin, Marc. 2004. *Piptatherum canadense* (Poiret) Dorn, Canada Ricegrass: Conservation and Research Plan for New England. New England Wild Flower Society, Framingham, MA.

Available online at

<https://www.nativeplanttrust.org/documents/96/piptatherumcanadense.pdf>.

Maine Natural Areas Program. 2013. Canada Mountain Rice Grass fact sheet. Available online at

<https://www.maine.gov/dacf/mnap/features/pipcan.html>. National Public Radio (NPR).

2019. All things Considered, 1 September 2019. Available online at

<https://www.npr.org/programs/all-things-considered/>. Accessed 1 September 2019.

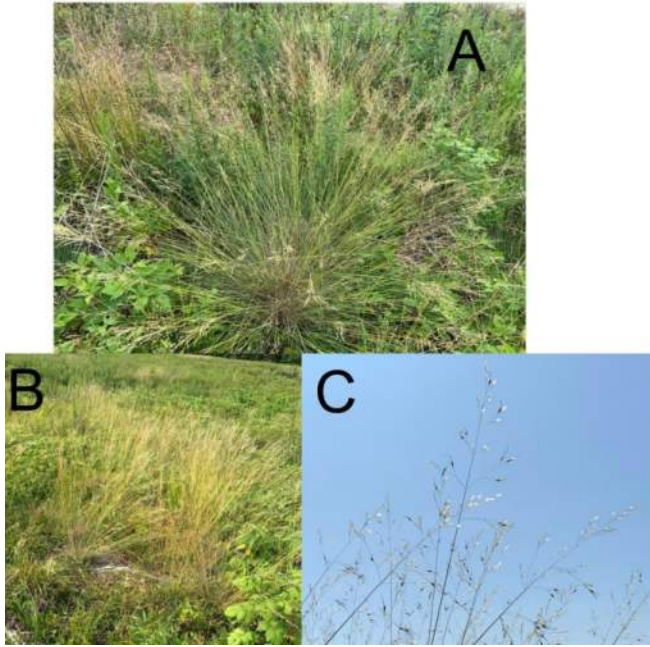


Figure 1. Canada Mountain Rice Grass. A. Single plant. B. Several plants. C. Close-up of fruiting structures.

## SPECIAL PLANT SURVEY FORM

Site:	Three Rivers Solar Project	Survey Site:	T16 MD
Quad name:		Quad code:	
County:	Hancock	Town:	T16 MD

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

Date: August 2019	Surveyor(s): Jill Weber, Roger St. Amand	Sourcecode (MNAP assigns):
Primary Surveyor Address: 9 Cedar Avenue, Bar Harbor, ME 04609	Phone: 207-460-7250	Email: jill.weber@roadrunner.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°-43'-42."9 North 68°-05'036.07" West Additional Coordinates

Directions to Occurrence: Go east on Rt. 1 from Ellsworth, turn north on Rt. 182 in Hancock, turn north on Rt. 200 in Franklin, turn east on Mo Pond Road in Eastbrook. When pavement ends, use air photos to assist with turns on dirt roads.  
 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

<b>EO DATA</b>	Phenology	Population Area	Vigor? <input type="checkbox"/> Normal <input checked="" type="checkbox"/> Other than normal
# of Plants thousands	<input type="checkbox"/> In leaf	<input type="checkbox"/> 1 square yard	Explain: Plants extremely vigorous and numerous compared to populations in other Maine locations.
<input checked="" type="checkbox"/> Individuals	<input type="checkbox"/> In bud	<input type="checkbox"/> 1 – 5 square yards	Evidence disease, predation, etc? Explain:
<input type="checkbox"/> Ramets	<input type="checkbox"/> In flower	<input type="checkbox"/> 5 – 20 square yards	<input type="checkbox"/> Yes
Population Structure	<input type="checkbox"/> Immature fruit	<input type="checkbox"/> 20 – 100 square yards	<input checked="" type="checkbox"/> No
15 % Vegetative	<input checked="" type="checkbox"/> Mature fruit	<input type="checkbox"/> 100 sq yds to 1 acre	Type of reproduction? Explain:
85 % Reproductive	<input checked="" type="checkbox"/> Seed dispersing	<input checked="" type="checkbox"/> 1 acre +	<input checked="" type="checkbox"/> Sexual
	<input type="checkbox"/> Dormant	25 acres~area <b>actual</b> habitat	<input type="checkbox"/> Asexual
		~500~ area <b>potential</b> habitat	<input type="checkbox"/> Not Observed
Other Comments: Apparently land management practices have created optimum conditions for this species. Woody plant cover is low, thus ent habitat.			

### GENERAL DESCRIPTION

Associated natural community: Nothing natural about this community. Formerly forested and some areas have had stumps removed, others are being prepared for lowbush blueberry cultivation.

Associated plant species: *Kalmia angustifolia*, *Danthonia comprssa*, *Vaccinium angustifolium*, *Chamerion angustifolium*, *Agrostis* spp., *Acer rubrum*, *Betula* spp.

Substrate/soil type: well drained to moderatley well drained sandy loam tills, Peru, Modnanock soil series,

Threats to Population: Changes in herbicide regime, changes in current management practices.

Conservation/Management/Research needs: Current management practices are known and continuation of the current regime will likely help to preserve this population. We searched similar habitats (i.e., other blueberry barrens) to determine if this species was widespread in apparently suitable habitat, but found no populations outside this project site.

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

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 type="checkbox"/> No <input checked="" type="checkbox"/> Yes    sensu lato: <i>Oryzopsis asperifolia</i>
	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): E.J. Jordan & Sons	Phone	Is landowner aware of plant? <input checked="" 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 ~ 10 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:**

**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:**

**SIZE / QUALITY:** How large is this population relative to typical populations of this species? huge  
 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:** Continued management is likely necessary for persistence of population.

**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:** This huge population is the result of disturbance. The surrounding landscape is also disturbed, but is owned by the same person who owns the EO site, so uses in the surrounding landscape are not likely to change much.

**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:

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

**Comments:** This disturbed habitat seems perfect for this species, and continued management/disturbance regime is probably necessary for persistence of the population

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

Date: \_\_\_\_\_ Reviewer: \_\_\_\_\_ Rationale: \_\_\_\_\_



*Figure 1. Piptatherum canadense photo 1*





*Figure 2: Piptatherum canadense photo 2 close-up of inflorescence*





Figure 3: *Piptatherum canadense* photo 3, typical habitat





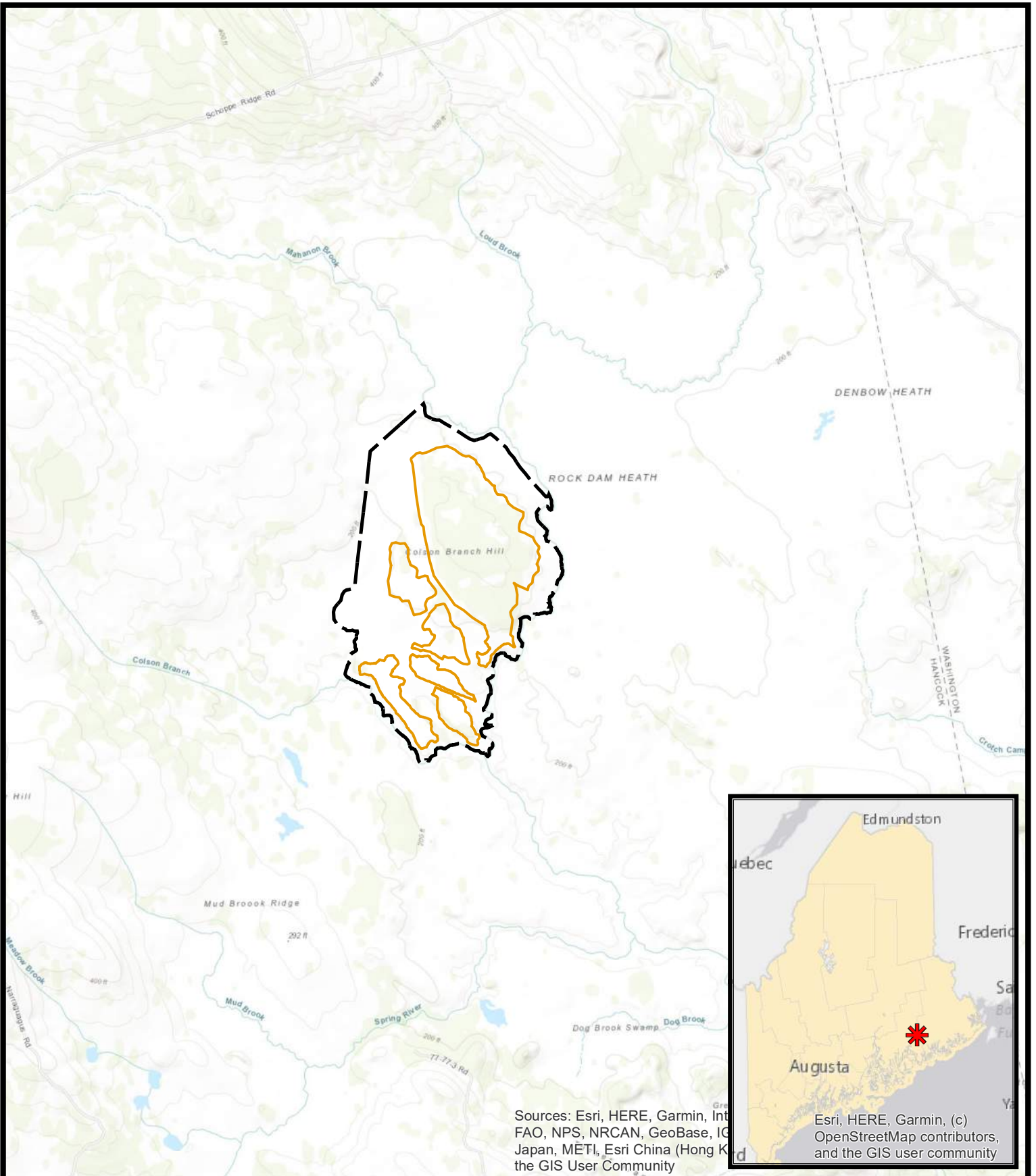
*Figure 4: Piptatherum canadense photo 4*





*Figure 5: Piptatherum canadense photo 5, patch of multiple plants*





Sources: Esri, HERE, Garmin, Int  
 FAO, NPS, NRCAN, GeoBase, IC  
 Japan, METI, Esri China (Hong K  
 the GIS User Community





Esri, HERE, Garmin, (c)  
 OpenStreetMap contributors,  
 and the GIS user community

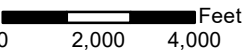


AUGUST 26, 2019 ARC  
 NOT A LEGAL SURVEY

**Legend**

-  TRS\_PROJECT AREA\_ACH
-  TRS\_TRI Area\_PLISGA

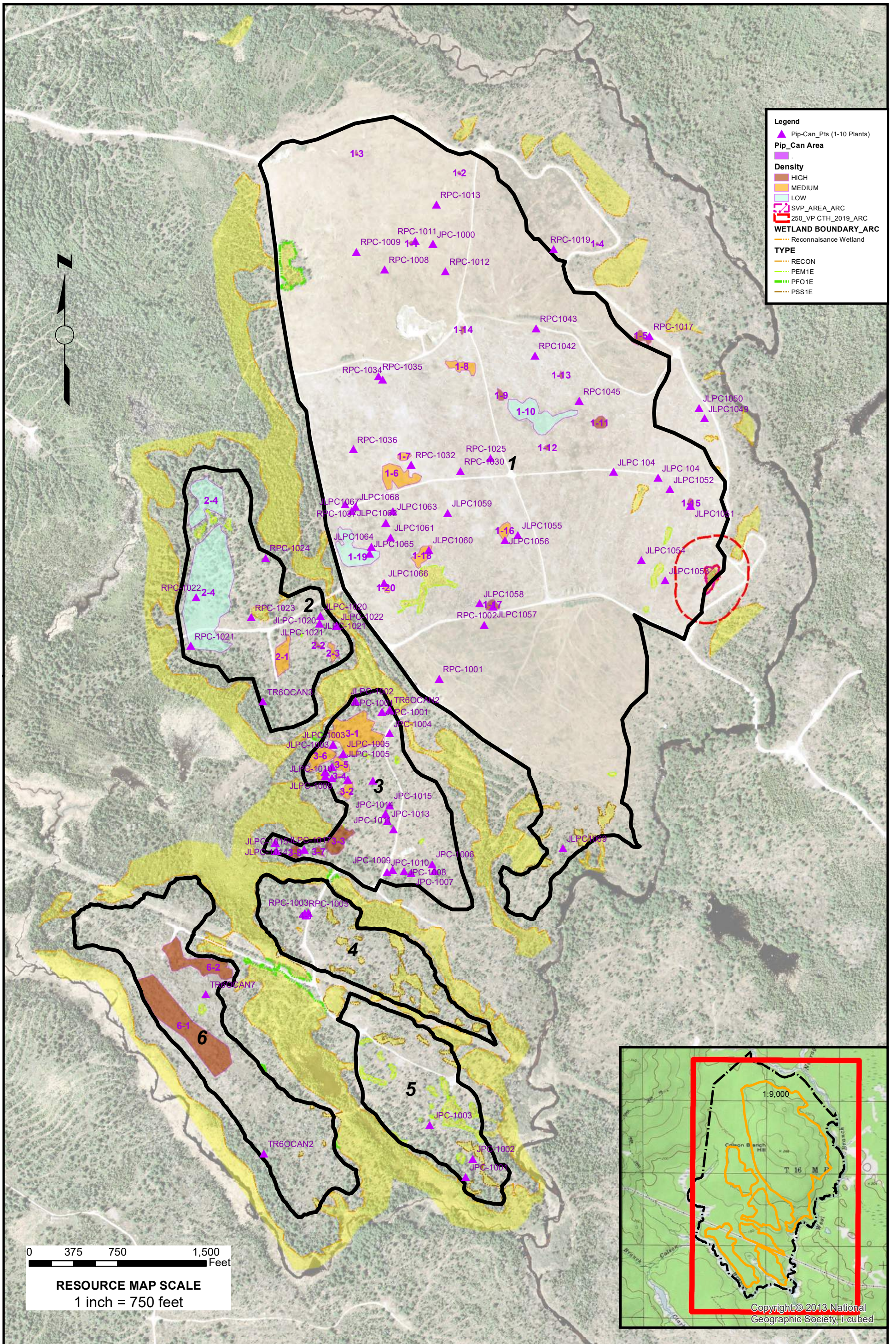
1 inch equals 4,000 feet



1:48,000

**SHEET B-1**  
**LOCATION MAP**  
**THREE RIVERS SOLAR**  
**THREE RIVERS SOLAR POWER, LLC**  
**T16 MD, HANCOCK COUNTY, MAINE**



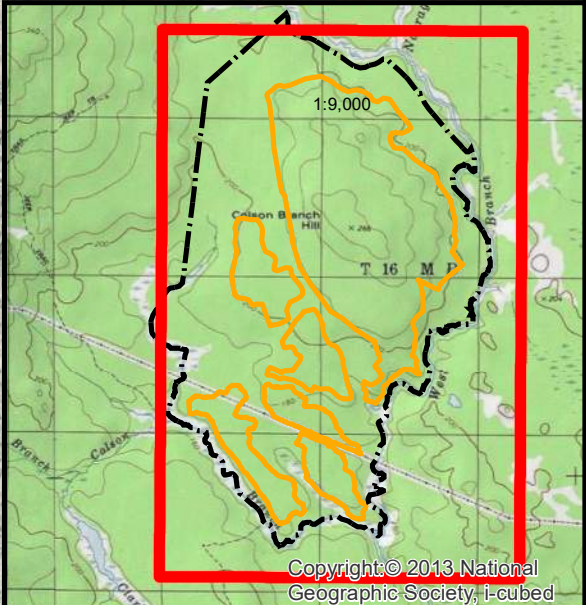


**Legend**

- Pip-Can\_Pts (1-10 Plants)
- Pip\_Can Area
- Density
  - HIGH
  - MEDIUM
  - LOW
- SVP\_AREA\_ARC
- 250\_VP\_CTH\_2019\_ARC
- WETLAND\_BOUNDARY\_ARC
  - Reconnaissance Wetland
- TYPE
  - RECON
  - PEM1E
  - PFO1E
  - PSS1E

0 375 750 1,500 Feet

**RESOURCE MAP SCALE**  
1 inch = 750 feet



1) RTE SURVEYS CONDUCTED IN 2019 BY WEBER ECOLOGICAL SERVICES. WETLAND AND POT VERNAL POOL SURVEYS COMPLETED DURING 2018 & 2019 BY ATLANTIC RESOURCE CO. LLC  
 2) RESOURCES LOCATED USING SUBMETER GPS.  
 3) RESOURCE DATA IN NAD83 UTM ZONE 19-US FEET. SOURCE:  
 1) ORTHOIMAGERY-ESRI ARCGIS ONLINE  
 2) USGS TOPO QUADS- ESRI ARCGIS ONLINE USA TOPO MAPS  
 3) BASE SURVEY PROVIDED BY: PLISGA & DAY, ACHERON ENGINEERING



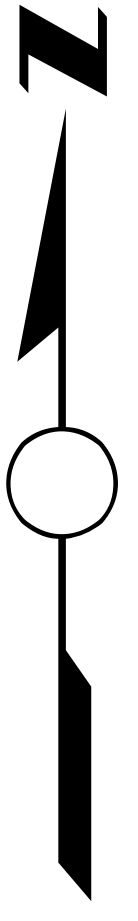
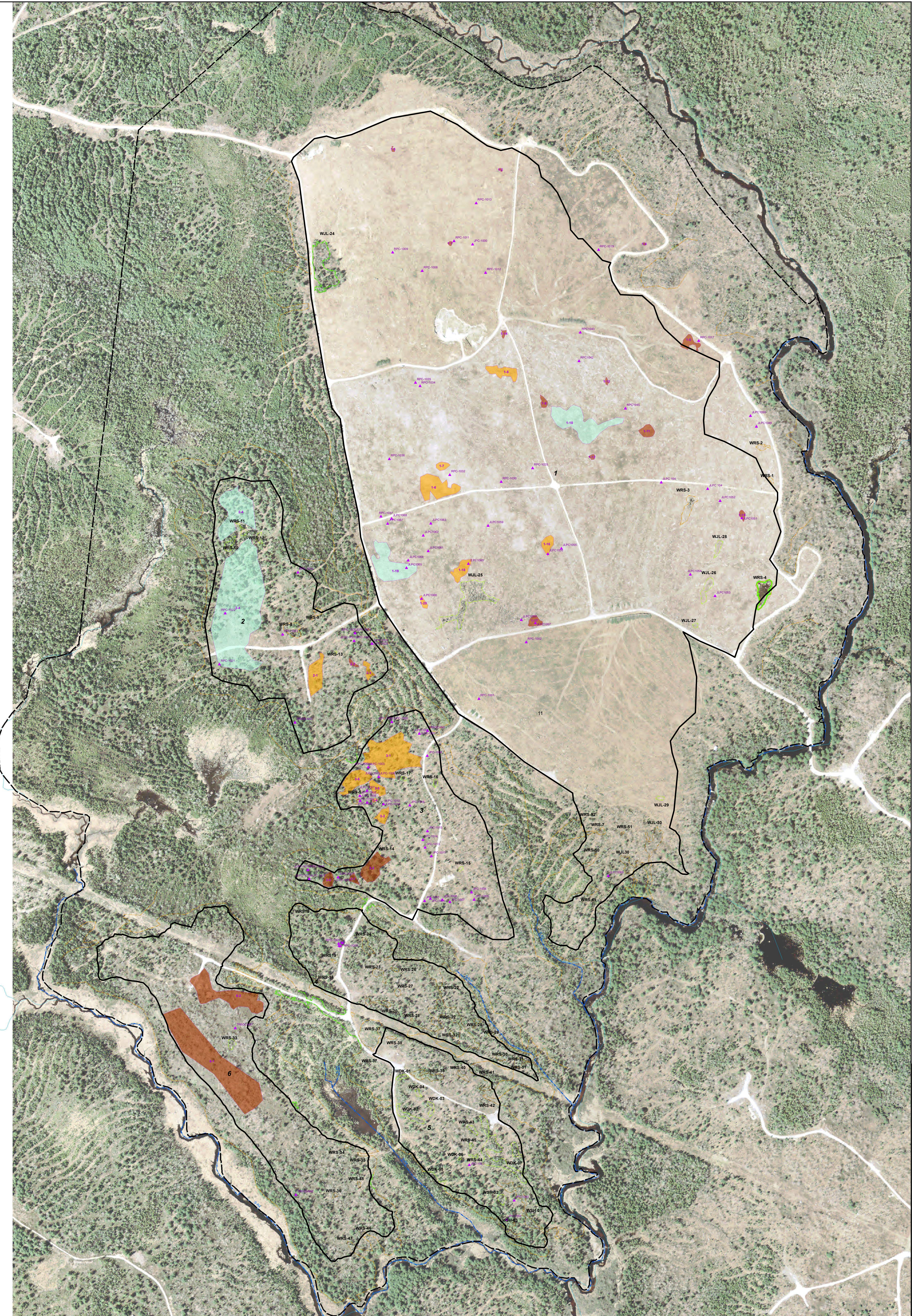
**THREE RIVERS SOLAR PROJECT**  
**THREE RIVERS SOLAR PPOWER, LLC**  
**T-16 MD, HANCOCK COUNTY, MAINE**

1 inch = 750 feet



**SHEET B-2**  
**RTE PLANT**  
**RESOURCE MAP**  
 DATE: SEPTEMBER 21, 2019



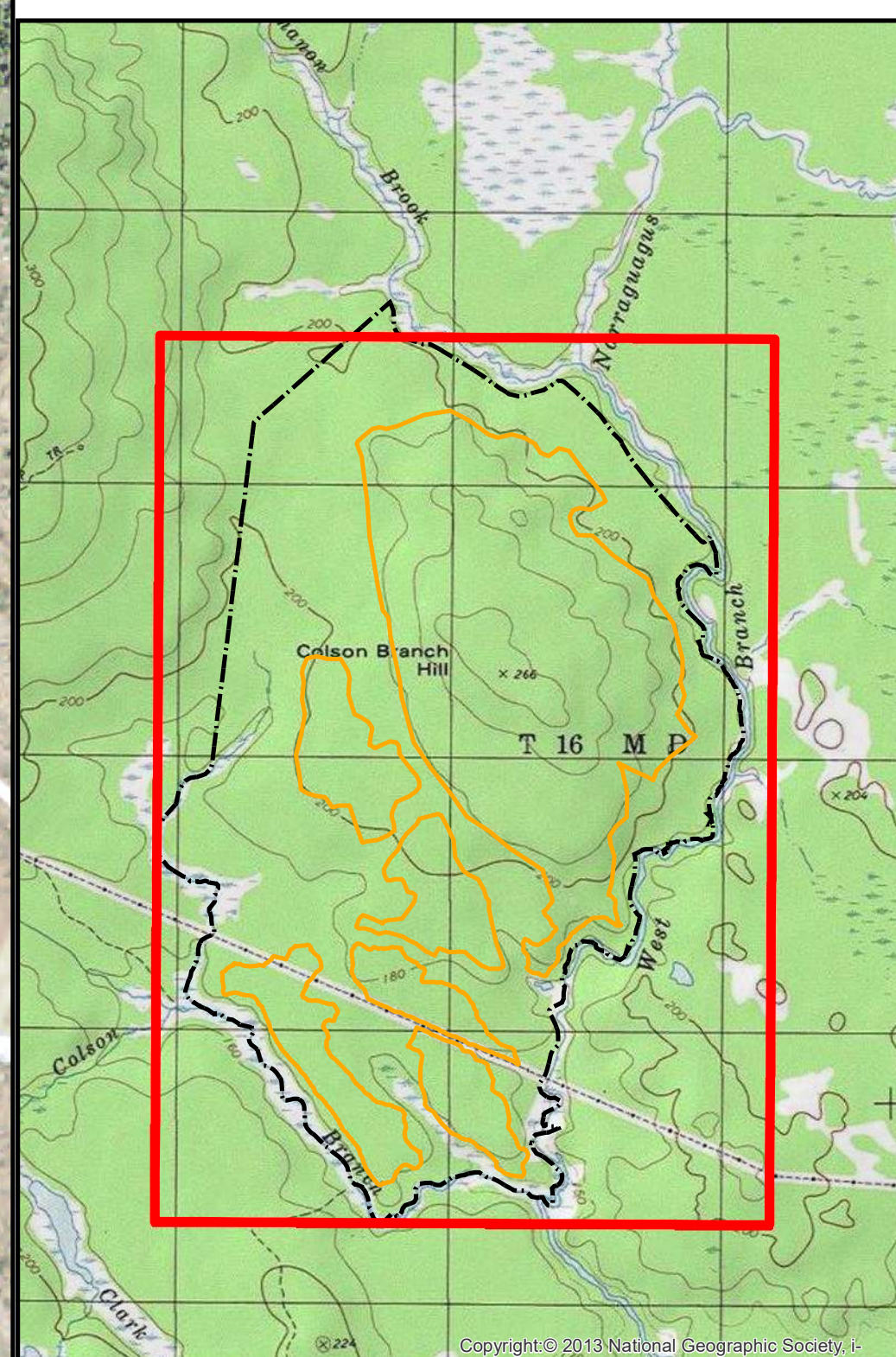


0 150 300 600 Feet  
 1 inch = 250 feet  
**RESOURCE MAP SCALE**

**Legend**

- Pip-Can\_Pts (1-10 Plants)
- Pip-Can Area**
- Density
  - HIGH
  - MEDIUM
  - LOW
- AOI\_TRS
- WETLAND BOUNDARY\_ARC\_2019**
- Reconnaissance Wetland
- TYPE**
- RECON
- PEMIE
- PFOIE
- PSSIE
- DELIN\_STREAM\_ARC
- NHD\_Streams

**Index Map Scale:**  
 1 inch = 250 feet  
 1:3,000

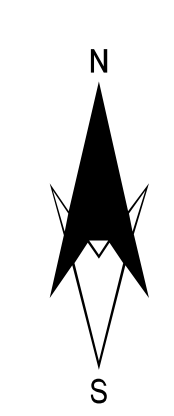


1.) RARE, THREATENED & ENDANGERED SPECIES SURVEYS COMPLETED DURING 2019 BY WEBER ECOLOGICAL SERVICES & ATLANTIC RESOURCE CO. LL  
 2.) BOUNDARIES LOCATED USING SUBMETER GPS  
 3.) RESOURCE DATA IN NAD83 UTM ZONE 19-US FEET. SOURCE:  
 1.) ORTHOIMAGERY-ESRI ARCGIS ONLINE  
 2.) USGS TOPO QUADS- ESRI ARCGIS ONLINE USA TOPO MAPS  
 3.) BASE SURVEY PROVIDED BY PLISGA & DAY, ACHERON ENGINEERING



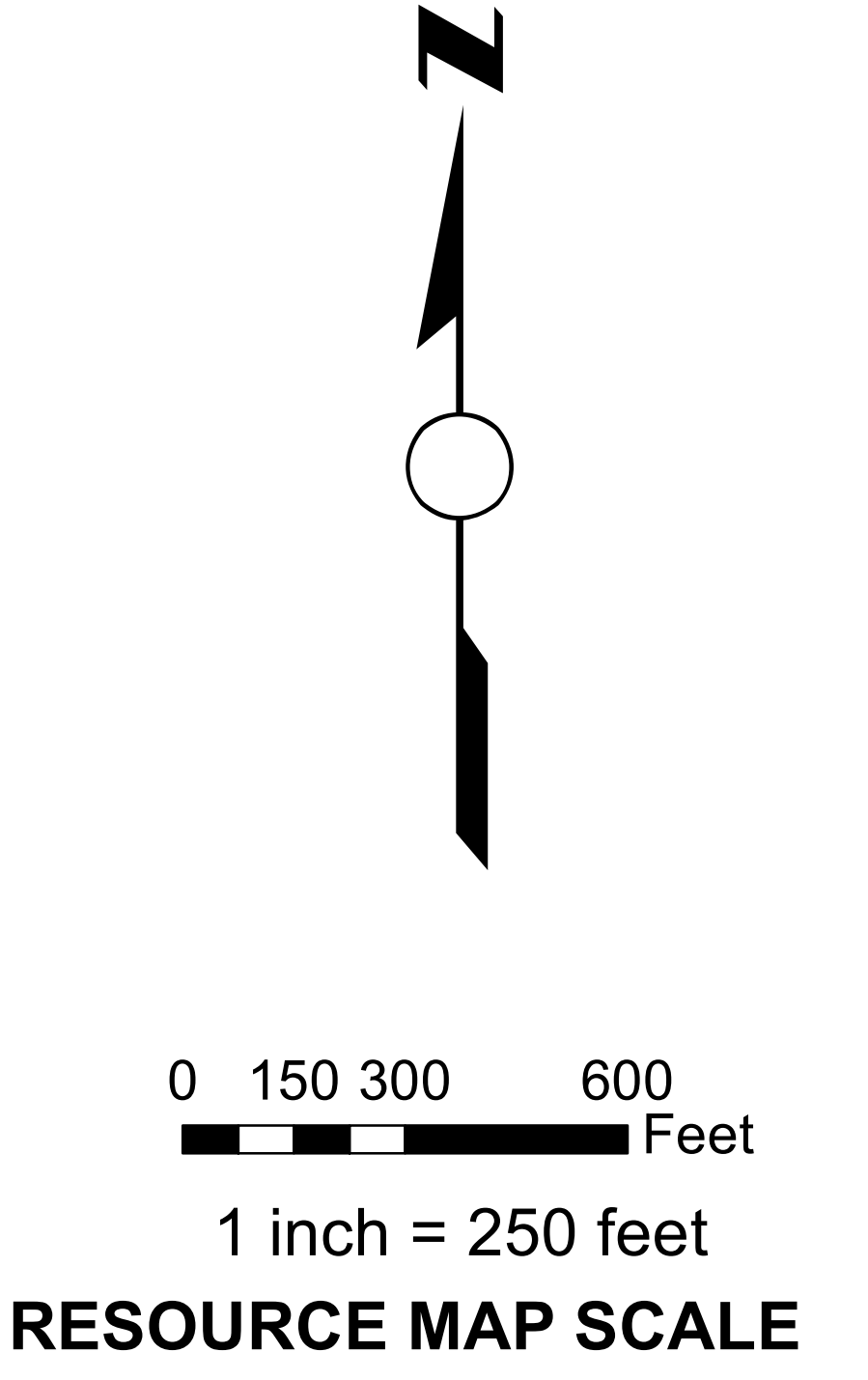
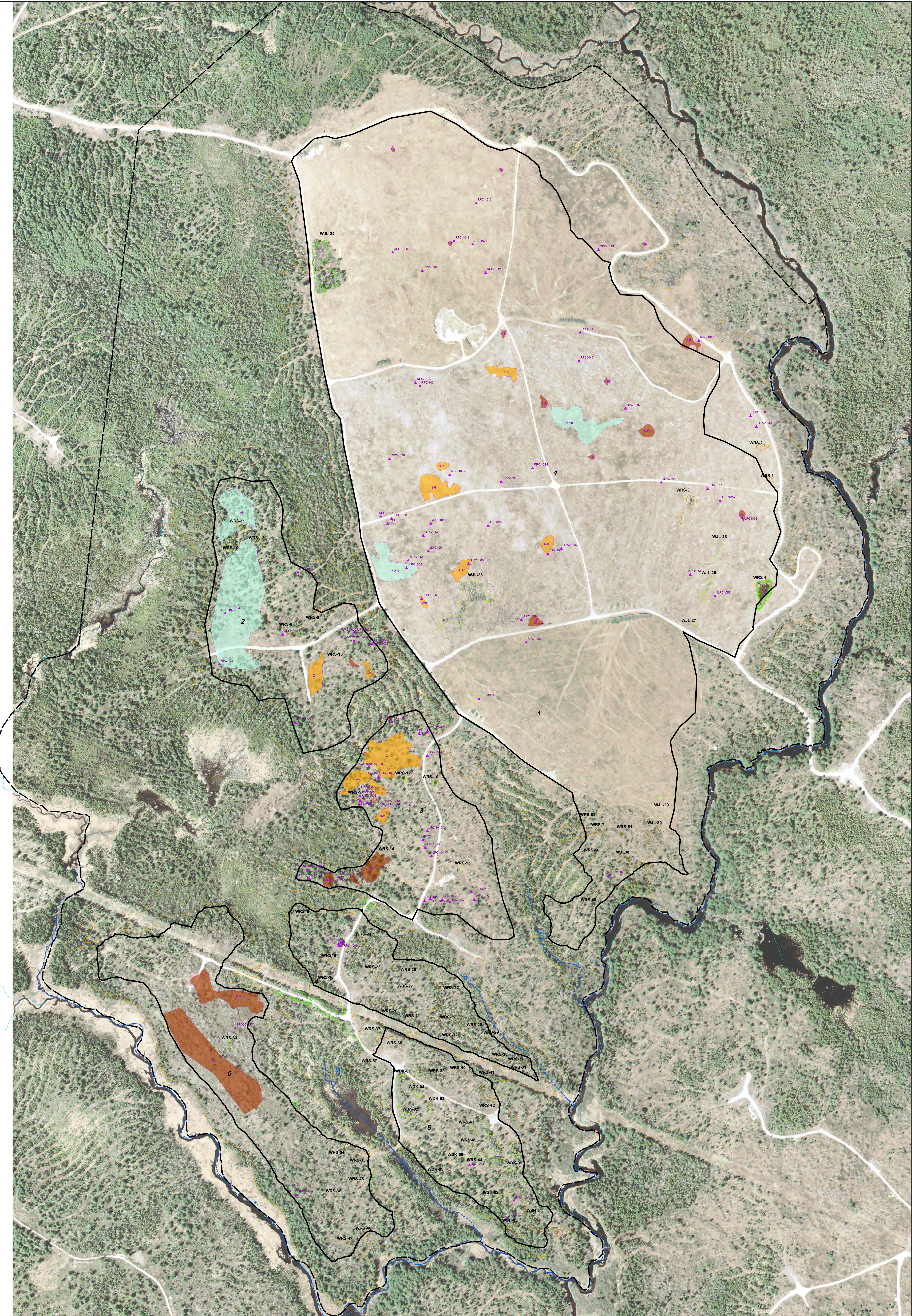
**3 RIVERS PROJECT  
 THREE RIVERS SOLAR POWER, LLC  
 T-16 MD, HANCOCK COUNTY, MAINE**

1 inch = 250 feet



**RTE MAP  
 PROGRESS PRINT  
 DATE: SEPTEMBER 09, 2019**

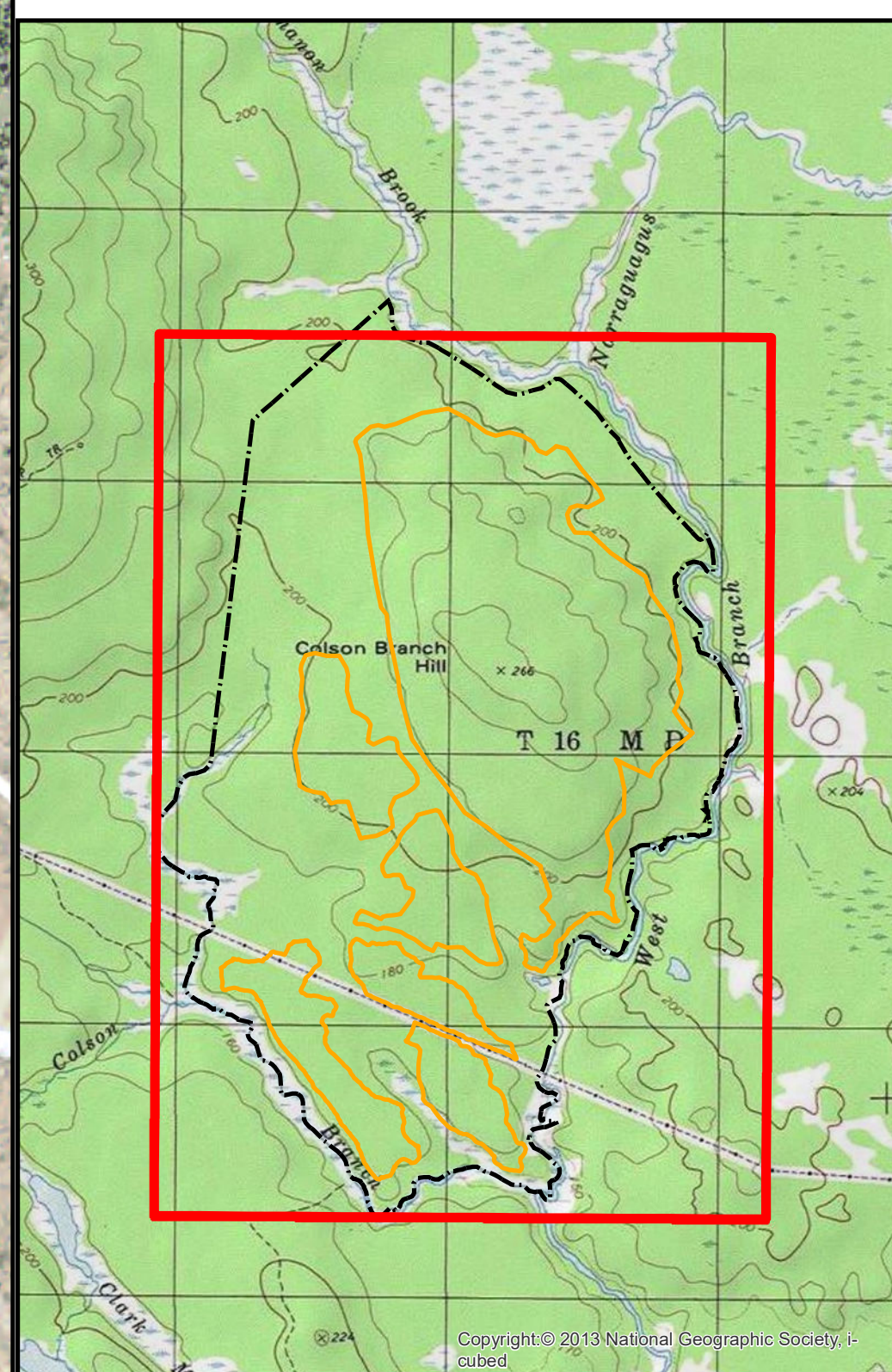




**Legend**

- Pip-Can\_Pts (1-10 Plants)
- Pip-Can Area**
- Density
  - HIGH
  - MEDIUM
  - LOW
- AOL\_TRS
- WETLAND BOUNDARY\_ARC\_2019**
  - Reconnaisance Wetland
- TYPE**
  - RECON
  - PEM1E
  - PFO1E
  - PSS1E
  - DELIN\_STREAM\_ARC
  - NHD\_Streams

**Index Map Scale:**  
1 inch = 250 feet  
1:3,000

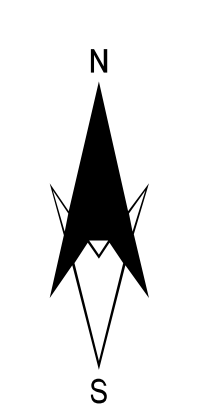


1.) RARE, THREATENED & ENDANGERED SPECIES SURVEYS COMPLETED DURING 2019 BY WEBER ECOLOGICAL SERVICES & ATLANTIC RESOURCE CO. LL  
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**3 RIVERS PROJECT  
 THREE RIVERS SOLAR POWER, LLC  
 T-16 MD, HANCOCK COUNTY, MAINE**

1 inch = 250 feet



**RTE MAP  
 PROGRESS PRINT  
 DATE: SEPTEMBER 09, 2019**