

Section 16
Visual Impact Assessment

16.0 – VISUAL IMPACT ASSESSMENT

State law (Title 35-A M.R.S.A., Ch. 34-A) has designated an expedited permitting area as part of a process to expedite wind power projects in places where they are most compatible with existing patterns of development and resource values. The Land Use Regulation Commission (LURC) has amended Chapter 10 of its Rules to include wind energy development as a permitted use in all zoning subdistricts within the expedited permitting area.

In “making findings regarding the effect of an expedited wind energy development on scenic character and existing uses related to scenic character,” LURC is required to determine whether the development “significantly compromises views from a scenic resource of state or national significance such that the development has an unreasonable adverse effect on the scenic character or existing uses related to scenic character of the scenic resource of state or national significance.” 35-A M.R.S.A. §3452.1. In making this determination, LURC shall consider several specific factors, all of which are analyzed in the Visual Impact Assessment.

HIGHLAND WIND PROJECT
Visual Impact Assessment

December 27, 2010, rev.

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1.0 EXECUTIVE SUMMARY

1.1 Overview of Project and Location

Highland Wind LLC (Highland Wind) is proposing the Highland Wind Project (Project), a 39 wind turbine generating facility located in Highland Plantation, Somerset County, Maine. In addition to the wind turbines, the Project also includes a 34.5-kilovolt (kV) electrical collector system, an electrical collector substation, a 115-kV generator lead, an Operations and Maintenance (O&M) building, up to five permanent 80-meter meteorological towers, and a series of roads to construct and then access the turbines and related infrastructure. All project components are proposed to be located in Highland Plantation; however the generator lead, which delivers power from the electrical collector substation to the New England grid, also passes through Pleasant Ridge Plantation.

For purposes of this Visual Impact Assessment (hereinafter “VIA” or visual impact assessment), the “Study area” refers to the area within 8 miles of any of the proposed turbines. The “Project area” refers to the area directly impacted by the Project.

The Project will consist of the following components:

- A total of 39 turbines, along with associated electrical interconnection infrastructure and five permanent meteorological towers, installed in two distinct strings along ridges of the “Watering Tub” (aka the Elbow, west of Witham Mountain), Witham Mountain, Bald Mountain, Burnt Hill, and Briggs Hill in Highland Plantation. Turbines will be located at elevations between 1,552.5 and 2,237.4 feet above mean sea level, on ridges that rise 1,300 to 1,500 feet above the surrounding valleys. All components of the turbine will be painted white.

The western string of the Project includes the 18 turbines located on the ridgeline that connects the Watering Tub, Witham Mountain, and Bald Mountain. The eastern string includes 21 turbines extending from the northeastern end of Burnt Hill south to Briggs Hill.

The turbines used to conduct this visual assessment, including the photosimulations, are the tallest turbines being considered for installation by Highland Wind: the General Electric 2.5xl turbine, with an 85-meter hub height, a 100-meter rotor diameter, and a maximum tip-of-blade height of 135 meters (443 feet).

- Red warning lights, installed following Federal Aviation Administration (FAA) guidelines, mounted on the top of some of the nacelles and on each of the five permanent meteorological towers. The final lighting plan is determined by FAA approval.
- New access roads, plus upgrades to and extensions of existing logging roads within the Project area. Access will be from the Long Falls Dam Road in Highland Plantation. A 32-foot wide crane path will provide access along the ridgelines during construction. Half of the width of the 32-foot wide ridgeline crane path will be allowed to revegetate after construction.
- An Operations and Maintenance Building, located approximately 450 feet up the access road on the northeast side of Long Falls Dam Road in Highland Plantation.
- An electrical collector system to transfer power from the turbines to the proposed collector substation located northwest of Burnt Hill. The collector lines will be located underground along the ridgelines. The approximately 9.5-mile long, above-ground 115-kV generator lead will be located adjacent to an existing transmission right-of-way throughout most of its length, and will

connect the on-site collector substation to the existing Wyman Dam substation located in Moscow, Maine, where power will be transferred to the Central Maine Power Company (CMP) system and ultimately distributed to the New England grid.

The land on which the turbines, O&M building, and collector substation will be placed is managed by Wagner Forest Management Ltd and is used primarily for commercial timber production. Much of the land has been harvested within the past 10 years or is currently being harvested. Extensive clearing of forestland has occurred throughout the Project area as a result of forest road construction and timber cutting. To the extent practicable, existing roads and forest clearings will be used for the proposed Project, although certain existing roads will need to be widened or in some locations realigned to meet minimum road width and maximum slope requirements. Other land uses within the study area include small-scale agriculture, rural residential, and recreation.

1.2 Overview of Scenic Resources of State or National Significance Within Eight Miles of the Turbines

As defined by 35-A MRS chapter 34-A (hereinafter “the Maine Wind Power Law”), the Highland Wind Project will be visible from the following scenic resources of state or national significance located within an eight-mile radius of one or more turbines:

- The eastern end of Little Bigelow Mountain in the Bigelow Preserve, where the closest visible turbine will be 4.7 miles away.
- Bigelow Mountain National Natural Landmark (NNL). The eastern end of Bigelow Mountain (below Myron Avery Peak) is within 8 miles of the Project. One turbine within 8 miles of the project will be visible from a viewpoint below Old Man’s Head at a distance of 7.9 miles. Little Bigelow Mountain is not part of the NNL.
- The Appalachian National Scenic Trail (AT). Approximately 19.4 miles of the AT are located within the 8-mile study area. A cumulative total of approximately 0.32 miles (1,710± linear feet) of this 19.4 mile distance has elevated views – either open or filtered – to the surrounding landscape in various directions. The rest of the trail is typically bordered by dense vegetation that limits views to the immediate foreground. Within these 1,710± linear feet of trail, the proposed turbines will be visible – either fully or partially – from a cumulative total of approximately 350 linear feet of the trail from eight discrete viewpoints. The most open views will be from the ledges on the east side of Little Bigelow Mountain.
- The southeastern end of Flagstaff Lake. Flagstaff Lake, a 20,300-acre man-made impoundment created in 1949 by the construction of the Long Falls Dam, is noted for significant scenic quality in the Maine Wildlands Lakes Assessment. The closest visible turbine will be located 3.8 miles from the southeastern corner of the lake.¹
- Gilman Pond in Lexington Township (noted for significant scenic quality in the Maine Wildlands Lakes Assessment), located 6.3 miles from the closest visible turbine.²
- A portion of the Arnold Trail (listed on the National Register of Historic Places). Much of the land-based portion of the trail between the Kennebec River and Flagstaff Lake is on private land,

¹ The photosimulation from Flagstaff Lake in Appendix C

² The photosimulation from Gilman Pond in Appendix C is from a point at the southern end of the pond, where 7± turbines within 8 miles would be visible.

with an easement to the Arnold Expedition Historical Society. Turbines will be visible from a few viewpoints (primarily on or near the Carry Ponds and on a small portion of Wyman Lake) within eight miles of the turbines. The closest visible turbine will be located 4.9 miles from the Arnold Trail at West Carry Pond.

Within the study area, the Project will not be visible from any state parks, MaineDOT scenic turnouts, or scenic viewpoints located in the coastal area. It will also not be visible from Jackson Pond or the non-impounded section of the Kennebec River. Throughout the majority of the study area, public views of the wind turbines will be blocked by topography and roadside vegetation.

1.3 Need for a Visual Impact Assessment

Maine law, at 35-A M.R.S.A §3452.4, states that there is a rebuttable presumption that a visual impact assessment is not required for those portions of the development's generating facilities that are located more than 3 miles, measured horizontally, from a scenic resource of state or national significance. LURC may require a visual impact assessment for portions of the development's generating facilities located more than 3 miles and up to 8 miles from a scenic resource of state or national significance if it finds there is substantial evidence that an assessment is needed to determine whether there is the potential for significant adverse effects on the resource. In making its determination, LURC shall consider insignificant the effects of portions of the development's generating facilities located more than 8 miles, measured horizontally, from a scenic resource of state or national significance.

Although all of the Project's wind turbines are located beyond this 3-mile radius, and although LURC has made no determination that a VIA for the Project is required, Highland Wind LLC elected to have a visual impact assessment undertaken in recognition of the scenic resources of state or national significance located within 8 miles of the Project.

1.4 Overview of Conclusion

This visual impact assessment examined the criteria established by the Maine Wind Power Law: i.e., the context, significance, existing public use, viewer expectations, project impact, and the potential effect on public use and enjoyment, for each of the scenic resources of state or national significance. This information was used to make a determination of whether the project would significantly compromise views from any of these resources such that it would have an unreasonable adverse effect on its scenic character or the existing uses related to its scenic character.

The Highland Wind Project's visual impact on these resources will vary. While the Project will have adverse visual impacts on certain scenic resources of state or national significance, in no case will these impacts be unreasonably adverse, and in all cases these impacts will be within the range expected and allowed under the Maine Wind Power Law.

The VIA concludes that the Project will have a low to medium³ impact on a limited portion of the easternmost section of the Bigelow Preserve (i.e., viewpoints along the AT), but will have an insignificant

³ This assessment borrows definitions of "none," "low," "medium," and "high" impacts from LURC and Maine DEP consultant Dr. James F. Palmer in his *Review of the Spruce Mountain Wind Project Visual Assessment by James F. Palmer*, prepared for the Maine Department of Environmental Protection, June 11, 2010, and in his *Summary Review of the Amended Kibby Expansion Wind Project Aesthetic Impact Assessment*, prepared for the Land Use Regulation Commission, October 2, 2010. The definitions appear in Table 8 in this assessment. For example, a "medium" impact is "adverse but typical of wind energy development, and within the range of impacts that the Wind Energy Act anticipates."

impact or no visual impact on the many other viewpoints of state or national significance located in the Bigelow Preserve. The Project will have a low impact on the Arnold Trail and no impact on the Bingham Free Meetinghouse. The Project will have no impact on Jackson Pond, and a low to medium impact on both Flagstaff Lake and Gilman Pond. The Project will have no impact on the free-flowing portion of the Kennebec River and a low impact on Wyman Lake (the impounded part of the Kennebec River). The Project will have a low to medium impact on the Appalachian Trail in the area between the eastern base of Bigelow Mountain and East Flagstaff Road. While there are several miles of two designated scenic byways within the study area, there are no scenic turnouts that have been constructed by the Maine Department of Transportation that will have a view of the Project.

The associated facilities for the Project (i.e., the access road, ridgeline road, the underground electrical collection system, the aboveground electrical transmission line, and the O&M facility) will have a low impact on views from scenic resources of state or national significance. The associated facilities will not be of a location, character, or size to cause an unreasonable adverse visual affect on the scenic character of the study area. Adequate provisions have been made for fitting the associated facilities harmoniously into the existing natural environment to ensure that there will be no under adverse effect on the scenic character of the surrounding area.

2.0 INTRODUCTION

2.1 Background

Terrence J. DeWan and Associates (TJD&A), landscape architects in Yarmouth, Maine, prepared this VIA for the Project with assistance from Evan Richert, AICP. In addition, the assessment draws upon surveys conducted for Highland Wind by Portland Research Group⁴ in consultation with Evan Richert.

The study area for this VIA is all of the area within 8 miles of the Project, including areas in Highland Plantation, Pleasant Ridge Plantation, and abutting towns and unorganized townships (see Figure 1: Expedited Windpower Permitting Areas in Vicinity of the Highland Wind Project). The limits of the eight-mile study area are based upon and imposed by the Maine Wind Power Law, which instructs LURC (and the Maine DEP) to “consider insignificant the effects of portions of the development's generating facilities located more than 8 miles, measured horizontally, from a scenic resource of state or national significance.” (§ 3452.3.)

This report is based upon topographic mapping and design plans for the Project provided by Stantec and other professional members of the Project's design team. TJD&A created Map A Viewshed: Topography and Map B Viewshed: Topography and Vegetation with WindPRO software to help determine the limits of potential project visibility within 8 miles of the project. (See Appendix A.)

TJD&A used the three-dimensional resources of Google Earth Pro and WindPRO to look at and graphically portray the study area from the air and on the ground. These digital tools supplement TJD&A's extensive field observations and give reviewers the capability to experience the overall physical characteristics of the landscape and thereby better understand the setting of the Project relative to the surrounding topographic features.

⁴ Portland Research Group conducted two surveys for Highland Wind, LLC, during summer and fall 2010: one of hikers in western Maine's mountains generally, and one of hikers at Little Bigelow Mountain specifically. Final presentations of the survey results and final data presentation will be published in full and released to LURC prior to public proceedings before the Commission. This Visual Impact Assessment cites pre-publication results from the surveys.

2.2 Field Investigations

Field data were collected by TJD&A personnel during site visits on October 27, 2008; July 9, 10, 25, and 28, 2009; October 2, 2009; and June 25, 2010; and by TJD&A personnel with the assistance of Evan Richert on June 18, 2010, and October 28 and 29, 2010. Fieldwork concentrated on evaluating and photographing the relevant scenic areas of state or national significance, as identified above. TJD&A personnel visited the study area by automobile, on foot, and in kayaks, and with Evan Richert by automobile and on foot. Fieldwork was limited to lands that were open to the public; no attempt was made to enter or collect data on private properties other than those under the control of the Project or its principals.

The 2010 field data collection concentrated on the Appalachian Trail, specifically the portion of the trail between Old Man's Head (east of Myron Avery Peak) and the East Flagstaff Road parking area below Little Bigelow Mountain, i.e., that portion of the AT in the Bigelow Preserve that is 8 miles or less from the nearest turbine. During these visits the field teams recorded observations regarding a number of factors along the trail, stopping at each location where there was a view beyond the immediate foreground, whether or not there was a potential view of the Project. These data are summarized and presented in Appendix B.

In addition to the observations recorded at viewpoints, the field team took photographs and video clips to record the many natural features and other attractions that hikers experience along the trails.

Photographs of the project area were taken with a Nikon D300 digital camera, recording at the highest resolution (fine). Two lenses were used throughout the fieldwork, a Nikon 18–200mm lens and a 35mm lens (equivalent to a 50mm 'normal' lens in a 35 mm film camera). When the variable focal length lens was used for photosimulations, it was set to record images equivalent to those taken by a film camera equipped with a 50 mm (i.e., 'normal') lens, which is comparable to a non-distorted image seen by the human eye.⁵

GPS coordinates were recorded with a JOBO PhotoGPS mounted on the camera's hot-shoe to capture the LAT/LONG of each photograph.⁶ Annotated representative photographs within the study area are included in Appendices B, C, and D.

2.3 Photosimulations and Viewshed Maps

TJD&A prepared a series of photosimulations (computer-altered photographs) that are included in this VIA to illustrate the change to the views from scenic resources of state or national significance and other locations which will result from the construction of the Project. The photosimulations are provided in Appendix B and Appendix C. The following section describes the methodology used to develop these images:

- In order to answer the initial, albeit hypothetical question of "where might someone see a turbine or turbines *if there were no trees, buildings, or other obstacles to block the view?*" TJD&A prepared an initial viewshed map of the study area (see Map A Viewshed: Topography, in Appendix A) to determine where any part of any of the turbines may be visible within the 8-mile radius if one were to presume the complete absence of these elements. This initial viewshed map

⁵ The Nikon 18–200mm lens was set to a focal length of 35 mm, based upon manufacturer's recommendations and field tests conducted by TJD&A.

⁶ For more information on the PhotoGPS and its applicability to visual impact assessment, see *Landscape Architecture Magazine*, December 2009. X Marks the Shot, by James L. Sipes, ASLA, featuring work by TJD&A.

was prepared with WindPRO⁷ software. Topographic information was obtained from the National Elevation Dataset (NED). Using this map, one can determine the maximum Project visibility within the study area absent normal vegetation, existing human-created obstructions, and other obstacles. This map grossly overrepresents the visibility of the project because it does not consider obstacles (primarily forests) that will block views from roads, hiking trails, population centers, and scenic resources of state or national significance.

- A second viewshed map (Viewshed Map B: Topography and Vegetation) was prepared to answer the question, “what effect will forest cover and other vegetation have on the visual impact of the Project?” This map, using land cover data from the Maine Office of GIS, shows where turbines will be visible within 8 miles of the Project, factoring in the effect of tree cover on turbine visibility. Conservatively estimated heights of vegetation were assigned to the various cover types⁸. This map is based on the assumption that the observer would not be able to see turbines a) where the view is blocked by topography, b) while in wooded areas within the study area where the view is blocked by trees, and c) on waterbodies where the view is blocked by trees on forested ridgelines and along the shoreline. Viewshed Map B thus provides a more realistic estimation of the extent of project visibility than Viewshed Map A.
- Fieldwork by TJD&A verified the relative accuracy of Viewshed Map B and determined the location of characteristic viewpoints to use for photosimulations. The locations for photographs were selected to illustrate visual impacts to scenic resources throughout the eight-mile study area, with an emphasis on those areas of greater visual sensitivity and viewer expectation. The photographs used in Appendices B, C, and D were all taken from publicly accessible locations. Appendix B provides a sequence of photographs and photosimulations along the Appalachian Trail to give the reviewer a better sense of the existing conditions and the changes anticipated from the Project. Appendix C provides a sequence of photographs and photosimulations for scenic resources of state or national significance outside the Bigelow Preserve. Appendix D provides photographs of sites near associated facilities.
- The photographs selected are representative of the views from specific locations. When doing field work, TJD&A photographers typically record images from several locations, based upon tree cover, evidence of public use, and accessibility. The final image selection for all photosimulations was made after evaluating relative project visibility in Google Earth to provide a view where the maximum number of turbines would be seen from a scenic resource of state or national significance.
- TJD&A prepared photosimulations by using the Visual-Photo Montage WindPRO module. A digital elevation model (DEM) of the Project area was created in WindPRO, using data from National Map, an online data source from USGS (nationalmap.gov). The specifications of the wind turbines (location, manufacturer, model number, base height, rotor diameter, color)⁹ were entered into WindPRO, which created three-dimensional images of the turbines and placed them in the proper location on the model. Digital photographs of the selected view were imported into

⁷ WindPRO software was developed for the wind energy industry and is used world-wide for the planning, design, and visual representation of wind energy facilities.

⁸ TJD&A assumed an average tree height of 40' for the typical land cover, which is generally accepted as an average for visual impact assessments in forested land areas in the northeastern United States. Trees within 250 feet of lake and pond shorelines are typically 60 feet or greater in height and will block views of more of the Project from the water.

⁹ As noted in the Overview, for purposes of conducting this VIA the tallest turbine under consideration by Highland Wind – General Electric’s GE 2.5x1 turbines, with a height of 85 meters – was used, to show the “worst case” situation.

the computer and merged with the DEM, matching the lens focal length, the date and time of the photograph, the digital resolution, and the lighting. The DEM was matched with the photograph using the known elevation, latitude, and longitude data from the PhotoGPS log.

- Post-production editing involved digitally removing parts of towers that would be blocked from view by terrain, trees, or buildings, and making other appropriate context adjustments. Final adjustments were made in Photoshop to account for time of day, weather conditions, haze, and other environmental factors that can change the appearance and visibility of the turbine components. All adjustments were informed by comparisons to photographs of comparable turbines already erected in Maine and other parts of the country.
- The Project model was also inserted into Google Earth to verify the alignment of the photographs with the computer model, to determine the extent that existing vegetation blocks views of the turbines, and to verify the accuracy of the viewshed maps and photosimulations.
- Google Earth was used to determine the relative visibility of access roads, crane pads, and transmission lines (i.e., where tree removal would be seen from a particular viewpoint). Where these associated facilities were found to be visible, the photosimulation was adjusted in Photoshop to illustrate the anticipated change in the texture and color of the surrounding forestland. In most locations these associated facilities will not be visible beyond the immediate foreground.
- The resultant photosimulations (presented in Appendix C) were merged into a panorama in Photoshop to provide a more contextual view of the landscape. Each panoramic view is also accompanied by a 'normal' view to approximate what the human eye would see.

The legend in the panoramic views provides the following information:

- **Turbine Model:** General Electric 2.5xl turbines, with a nameplate of 2.5 MW.
- **Hub Height:** 85 meters (279 feet).
- **Rotor Diameter:** 100 meters (328 feet).
- **View Coordinates:** The latitude and longitude of the photograph and computer model.
- **Viewer Elevation:** Approximate distance above mean sea level in feet.
- **Direction of View:** The compass direction from the viewpoint (indicated by a red dot and arrows on the USGS Viewpoint Location map).
- **Closest Visible Turbine:** The horizontal distance in miles between the viewpoint and the closest turbine that may be visible from a particular viewing location.
- **Turbines Visible:** The approximate number of turbines within 8 miles that would likely be seen from the specific viewpoint, considering the effects of vegetation and structures.
- **Date/Time:** When the photograph was taken.

The normal view also provides the distance (in inches) that the reviewer should hold the photosimulation from the eye to accurately replicate real-world conditions.

3.0 REGULATORY REQUIREMENTS

State law (Title 35-A M.R.S.A., Ch. 34-A) has designated an expedited permitting area as part of a process to expedite wind power projects in places where they are most compatible with existing patterns of development and resource values. Figure 1, the Expedited Windpower Permitting Area in the Vicinity of Highland Wind Project, shows that Highland Plantation and Pleasant Ridge Plantation, as well as all the surrounding towns and townships (with the exception of Carrying Place Town Township and Dead River Township) are within the expedited permitting area. LURC has amended Chapter 10 of its Rules to include wind energy development as a permitted use in all zoning subdistricts within the expedited permitting area.

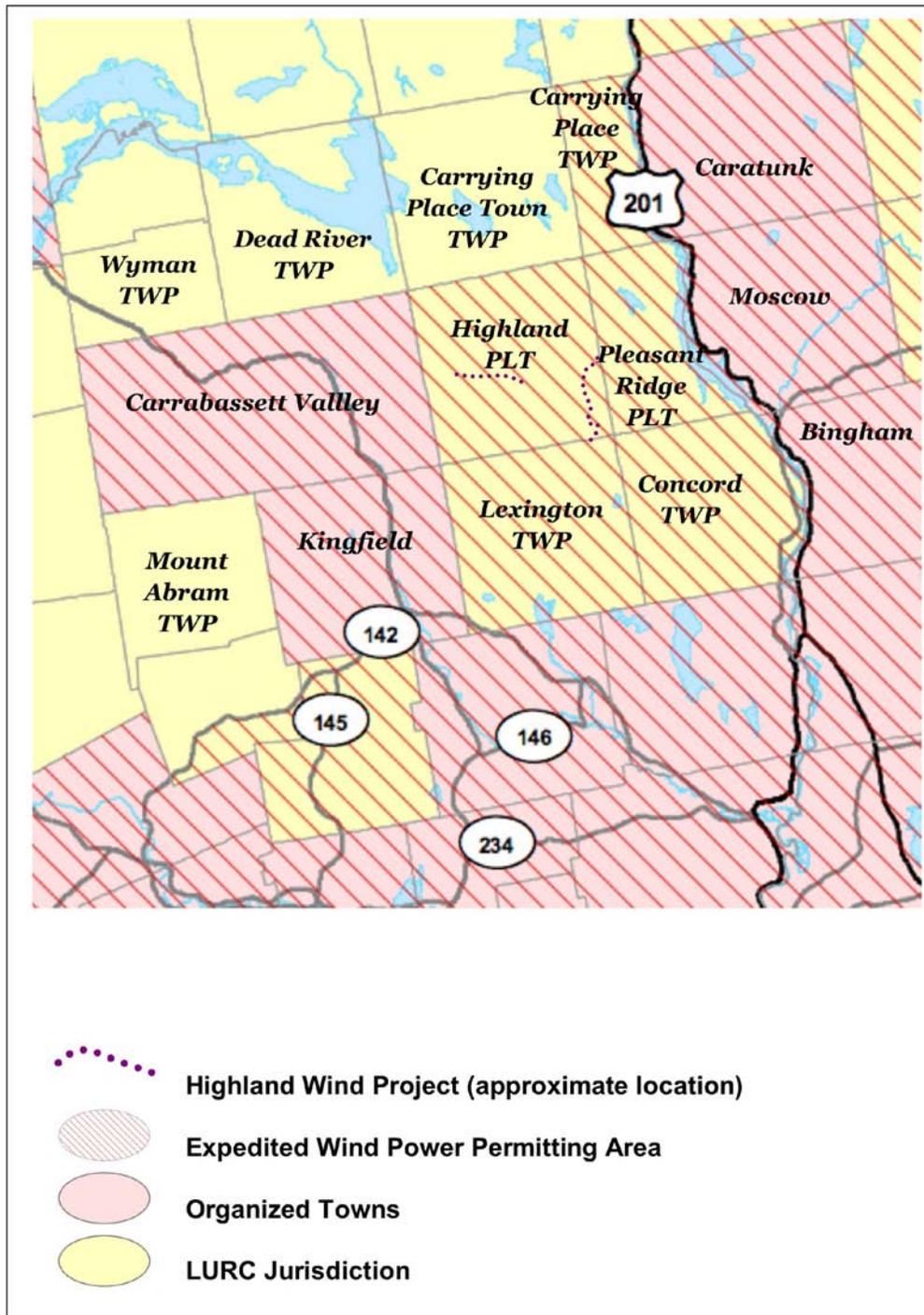
In “making findings regarding the effect of an expedited wind energy development on scenic character and existing uses related to scenic character,” LURC must determine whether the development “significantly compromises views from a scenic resource of state or national significance such that the development has an unreasonable adverse effect on the scenic character or existing uses related to scenic character of the scenic resource of state or national significance.” 35-A M.R.S.A. §3452.1. In making its determination, LURC shall consider:

- A. The significance of the potentially affected scenic resource of state or national significance;
- B. The existing character of the surrounding area;
- C. The expectations of the typical viewer;
- D. The project purpose and the context of the proposed activity;
- E. The extent, nature and duration of potentially affected public uses of the scenic resource of state or national significance and the potential effect of the generating facilities' presence on the public's continued use and enjoyment of the scenic resource of state or national significance; and
- F. The scope and scale of the potential effect of views of the generating facilities on the scenic resource of state or national significance, including but not limited to issues related to the number and extent of turbines visible from the scenic resource of state or national significance, the distance from the scenic resource of state or national significance and the effect of prominent features of the development on the landscape. *See* 35-A M.R.S.A. §3452.3.

In addition, a finding by DEP or LURC that the development's generating facilities are “a highly visible feature in the landscape is not a solely sufficient basis for determination that an expedited wind energy project has an unreasonable adverse effect on the scenic values and existing uses related to scenic character of a scenic resource of state or national significance.” 35-A M.R.S.A. §3452.3. Further, in making its determination, DEP or LURC “shall consider insignificant the effects of portions of the development's generating facilities located more than 8 miles, measured horizontally, from a scenic resource of state or national significance.” 35-A M.R.S.A. §3452.3.

This VIA addresses all impacts to be analyzed pursuant to the factors set forth in the Maine Wind Power Law.

Figure 1: Expedited Windpower Permitting Areas in the Vicinity of Highland Wind Project.



4.0 PROJECT DESCRIPTION

The following section describes the visible components of the Highland Wind Project generating facilities and its associated facilities.¹⁰

4.1 Wind Turbines

Highland Wind is proposing that the 39 turbines be located in two distinct strings. The western string will include 18 turbines located on the ridgeline that connect the Watering Tub, Witham Mountain, and Bald Mountain. The eastern string will include 21 turbines extending from the northeastern end of Burnt Hill south to Briggs Hill.

The turbines used to conduct this visual assessment are the tallest turbines being considered for installation by Highland Wind, the General Electric GE 2.5xl turbine, with an 85-meter hub height, a 100-meter rotor diameter, and a maximum tip-of-blade height of 135 meters (443 feet). The turbines will be located at elevations between 1,552.5 and 2,243.0 feet above mean sea level.

The turbines will be spaced a minimum of two rotor diameters apart (200 meters/656 feet). By using a constant height for all bases, each nacelle will be roughly parallel to the ridgeline. The turbines are controlled electronically so they always face into the wind.

The blades will spin very slowly in low wind, and will begin producing energy when the wind velocity reaches approximately 3 m/s (6.7 mph). After the wind reaches a certain maximum velocity (generally 25 m/s or 60 mph, but will vary with the intensity of turbulence) the machines will cut out. The turbines may not be operational at other times, such as when the turbines are in-line (wind direction is parallel to the string, which limits the number of turbines that can operate) or when they are taken out of service for repair.

Depending upon the wind velocity, the blades will rotate at 5 to 14 revolutions per minute (RPM), which is equivalent to one revolution every 12.0 to 4.3 seconds. Under unobstructed viewing conditions within 8 miles of the turbines, individual blades will be visible with virtually no detectable blurring while they rotate.

The turbine components (base, nacelle, and blades) will be painted white. By using white turbines, which offer a considerable amount of visual contrast for pilots, the FAA will not require daytime lighting. If an alternate color were used, the FAA would likely recommend white strobes for daytime lighting, which would make the Project considerably more noticeable.

Turbine contrast and visibility is a highly variable phenomenon; turbines can appear to change from dark gray to a shade that almost matches the background sky, depending upon the time of day, orientation of the viewer, atmospheric conditions, and weather. In the midground and background viewing distances (greater than five miles) from which the Project will typically be seen, the turbines will appear as light gray due to the effects of atmospheric perspective¹¹, especially on hazy or overcast days.

¹⁰ The Maine Wind Power Law defines “associated facilities” as those “elements of a wind energy development other than its generating facilities that are necessary to the proper operation and maintenance of the wind energy development, including but not limited to buildings, access roads, generator lead lines and substations”.

¹¹ The term ‘atmospheric perspective’ refers to the effect that atmospheric conditions have on the visibility and appearance of objects that are seen from a distance. As the horizontal distance between the viewer and an object increases, contrasts between the object and its background tend to decrease, along with the amount of detail that is

4.2 Project Lighting

Lighting for the project will follow the Federal Aviation Administration (FAA) recommendations for aviation safety. Red lights will be mounted on the top of some of the nacelles in accordance with an FAA approved lighting design. Under normal operations, the lights will be red, flashing, with a slow-on, slow-off profile. The five permanent meteorological towers will also have FAA approved lighting. Turbine warning lights are designed to be brightest when viewed from above or at the same horizontal plane to make them most apparent to pilots. Because nighttime lighting is required by FAA regulation to concentrate emitted light to a beam that is $3\pm$ degrees of horizontal, the intensity of the light diminishes below the horizon, which minimizes impacts on surrounding land uses.

4.3 Access Roads

Access to the project site is proposed by constructing new roads and by upgrading and extending existing logging roads within the project area. The primary access will be from the Long Falls Dam Road in Highland Plantation. Access roads will be constructed or upgraded to $16\pm$ feet in width in most locations to accommodate the construction vehicles and delivery trucks used for the turbine and crane components, including limited pullouts for passing of large vehicles. The access road should not be visible to the general public beyond its immediate intersection with Long Falls Dam Road. See photographs of existing conditions in the vicinity of the access road in Appendix D.

4.4 Ridgeline Roads

Each wind turbine will be linked by a $32\text{ foot}\pm$ wide temporary gravel road. In some instances the topography will dictate a circuitous route to accommodate the engineering requirements of the installation equipment and minimize site disturbance. In some locations road cuts and downslope fills will be required in steeper terrain to gain access to turbine pad locations. In most locations the ridgeline roads will be screened by existing vegetation on either side of the road and would not be visible from outside the immediate area.¹² Following installation, the ridgeline roads will be allowed to revegetate to a width of 16 feet.

4.5 Electrical Collection System / Collector Substation

The electrical collector system will transfer power from the turbines to the proposed collector substation. The collector lines will be located underground along the ridgeline. The collector substation will be located north of Burnt Hill on an upgraded gravel logging road. The $28,300\pm$ SF substation will not be visible from any scenic resources of state or national significance.

4.6 Generator Lead Line

The approximately $9.5\pm$ -mile long 115 kV generator lead line will connect the on-site collector station to the existing Wyman Substation in Moscow. The generator lead line will be located in a 100-foot wide cleared transmission corridor. The proposed generator lead line will parallel an existing 115 kV transmission line (on the southern edge) for a $7.2\pm$ mile segment to a point near Rowe Pond Road, where it will cross the existing line and generally run parallel to the existing line to the Wyman Substation. The

□ perceptible. As distances increase, the object's colors become less saturated and shift toward the background color, which is often blue.

¹² The exception will be from a few of the viewpoints on Little Bigelow Mountain and on Gilman Pond, where the ridgeline roads, and associated cuts and fills, along with the edges of the adjacent woodlands may appear as gray green lines and oval patches, slightly different in color than the surrounding forest vegetation.

existing transmission line is located in a 150-foot wide corridor that has generally been cleared to a width of 125 feet. The existing wooden H-frame transmission structures are typically 50 to 60 feet in height; the proposed generator lead line structures will typically be 60 feet in height.

4.7 Meteorological Towers

The five existing meteorological towers are temporary and will be removed during Project construction. They will be replaced by up to five permanent 80-meter (262 feet) towers, which will remain for the life of the project. The permanent towers will be lighted according to FAA requirements. The towers are expected to be of a guyed lattice construction with a triangular cross section approximately 18 inches across.

4.8 Crane Pads and Crane Assembly Area

A cleared and level pad area approximately two acres in size will be required at the base of each turbine for staging, crane movement, and turbine installation. Additional clearing may be needed in some areas to account for cut/fill slopes. Crane assembly will occur either within the road clearing or on the turbine pads; i.e., no additional area will be required for crane assembly.

4.9 Operations and Maintenance Facility

An operations and maintenance (O&M) facility will be constructed approximately 450 feet up the access road on the northeast side of Long Falls Dam Road in Highland Plantation. The O&M facility will consist of a single-story 7,875± SF building that will contain a warehouse and office; a small parking area; and an outdoor storage area for turbine components. The building will be served by on-site water and septic. It will have a dark roof and be painted a neutral color to minimize contrast in color with its surroundings.

5.0 PROJECT STUDY AREA

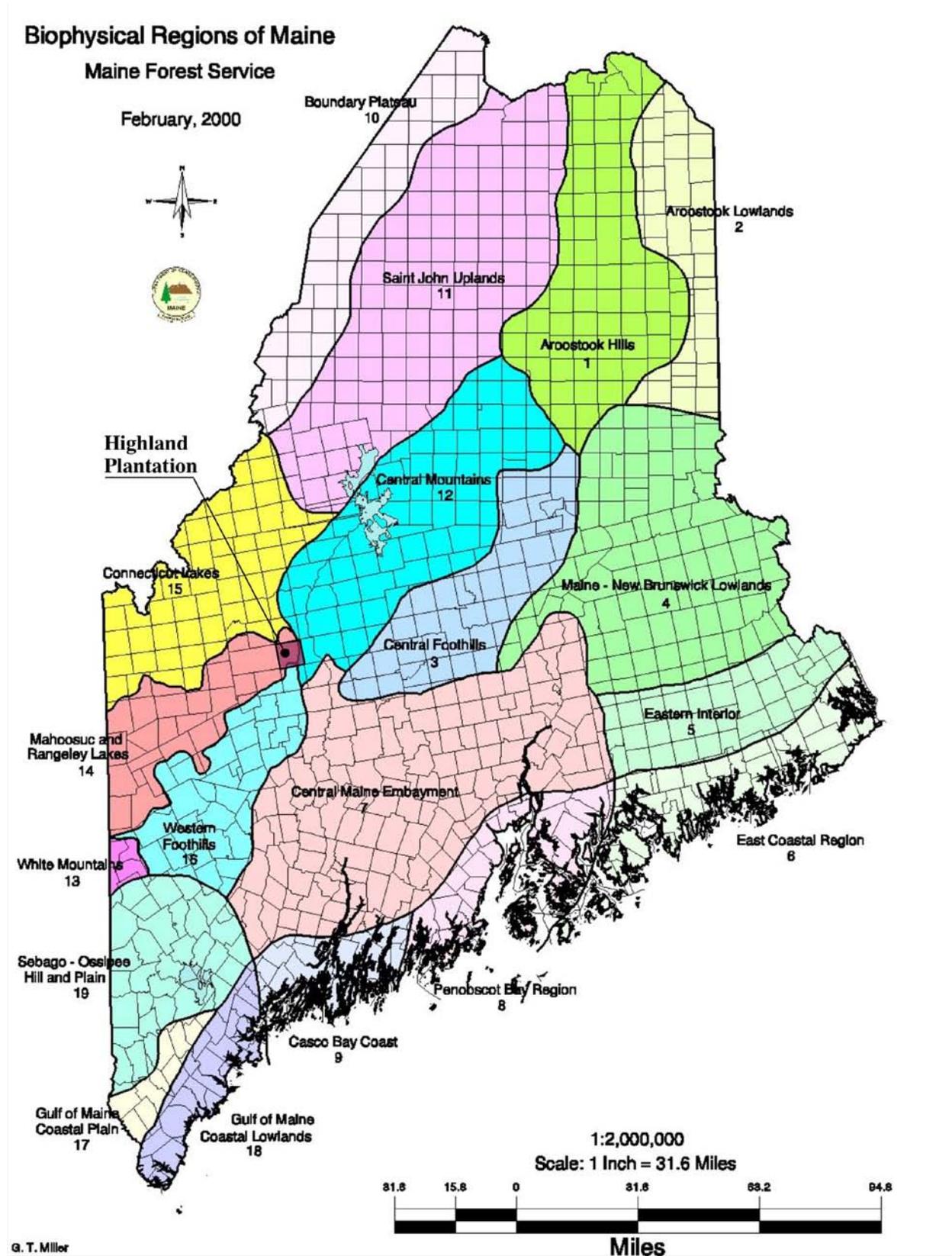
5.1 Existing Character of the Surrounding Area

The Project will be located within the Mahoosuc and Rangeley Lakes section of the Western Mountains Biophysical Region. The study area extends 8 miles out from each turbine to also include a small portion of the Connecticut Lakes section of the Western Mountains Biophysical Region on the north, the Western Foothills Region on the southwest, and a small portion of the Central Mountains Region on the east.¹³ See Figure 2 Biophysical Regions of Maine.

The study area includes all of Highland Plantation and portions of Pleasant Ridge Plantation, Moscow, Concord Township, Lexington Township, Kingfield, Carrabassett Valley, Dead River Township, Carrying Place Town Township, and Carrying Place Township. The resources within the statutorily

¹³ The Western Mountain Biophysical Region extends from Boundary Bald Mountain along the Maine-Quebec border to the Mahoosuc Range in southwestern Maine. The eastern boundary is defined by the 1000' contour line except for the northern portion, which includes several valleys of lower elevation west of Moosehead Lake. The region includes the Boundary Mountains to the north and the Longfellow Mountains to the south. These two mountain ranges are separated by a series of large lakes, including Umbagog, Upper and Lower Richardson, Rangeley, and Flagstaff. The mountainous landscape is highly dissected by small, steep-sided streams. Elevations average between 1000' and 2000'. *The Biophysical Regions of Maine: Patterns in the Landscape and Vegetation*. Janet McMahon. 1990.

Figure 2: Biophysical Regions of Maine

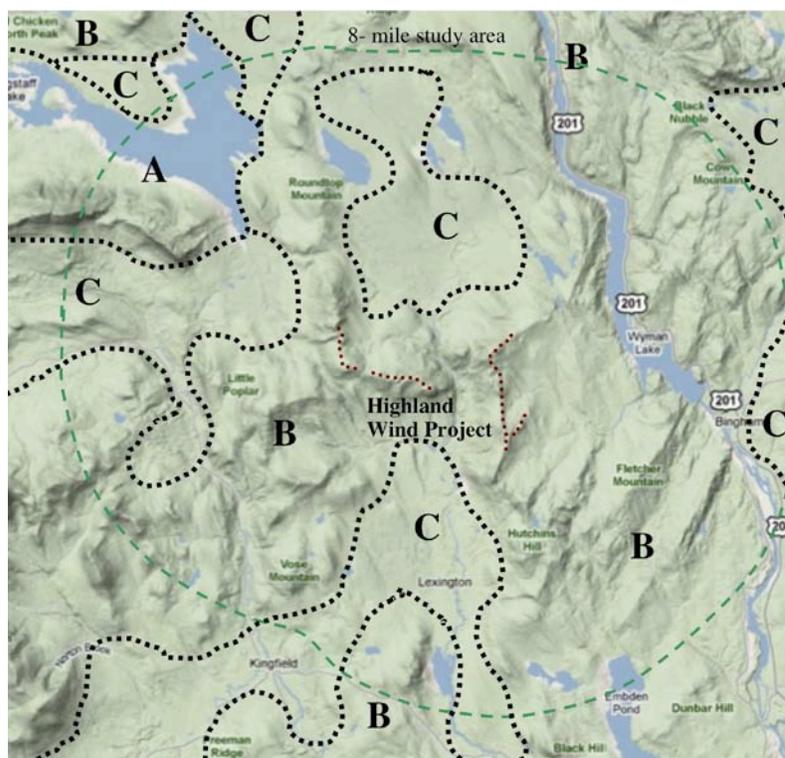


determined 8-mile study area that are considered scenic resources of state or national significance are described in greater detail in Section 6: Scenic Resources of State or National Significance.

The existing scenic character of the surrounding area is defined by its landforms, water resources, vegetative patterns, and cultural character. Figure 3 provides an overview of the general characteristics of the landscape in the surrounding area.

“A” areas (primarily the Bigelow Range and Flagstaff Lake) are characterized by unusually rugged landforms, a man-made impoundment with a highly configured shoreline, natural-appearing vegetative patterns, and general lack of cultural features. The high peaks are recognized as regional focal points visible from extended distances. The combination of open water and distinctive landforms creates an outstanding scenic resource.

Figure 3: General Landscape Characteristics of the Study Area



“B” areas are characterized by rolling hills, rounded mountains, small to medium-sized lakes and ponds, and vegetation patterns that are natural-appearing but have often been harvested for timber. Cultural modifications, in the form of roads, settlements, and recreation facilities, are dispersed throughout the area and often highly visible. The complex landscape often presents a layered appearance, especially when seen from higher elevations. The scale and complexity of the landforms give these areas a greater capacity to accommodate physical change without adversely affecting a viewer’s experience than either areas A or C.

“C” areas are the less distinctive part of the landscape, characterized by relatively flat to gently rolling topography, open fields and forestland, and concentrations of development. Major waterbodies and notable scenic features are generally absent.

Landforms

The landscape within and around the eight-mile study area is a complex mixture that includes some of Maine’s tallest mountains, a series of lower mountains, broad valleys, and a major river system, all interspersed with lakes, ponds, man-made impoundments, and small streams.

The landforms within eight miles of the proposed project include well-defined mountains and ridges rising up to 3,000± feet above broad valleys located at the eastern end of the Bigelow Preserve, and rounded mountains and hills rising up to 1,400± feet above broad undulating valleys (e.g., Witham Mountain and Burnt Hill).

The Bigelow Range is the most notable landform in and around the study area. The range is composed of two separate mountains: (1) “Bigelow Mountain,” which comprises, from west to east, Cranberry Peak, the Horns (north and south), West Peak, and Myron Avery Peak, and (2) Little Bigelow Mountain, running west to east on the south side of Flagstaff Lake.¹⁴ The three middle peaks of Bigelow Mountain – the Horns, West Peak and Myron Avery Peak – are all over 3,700 feet in elevation, have a notable, jagged profile that is easily recognizable, and are all beyond eight miles from the Project. Cranberry Peak and Little Bigelow Mountain, at either end of the range, are both lower in elevation and flatter in profile (3,194’ and 3,040’, respectively). The only peak in the Bigelow Range that is within eight miles of the Project is Little Bigelow. It is a distinct landform, separated and set apart from Bigelow Mountain by a deep notch. Figure 4 is a photograph taken from the northeastern end of Flagstaff Lake that illustrates the differences in landform and height between Bigelow Mountain and Little Bigelow Mountain.

Figure 4: Panoramic Photograph of Bigelow Mountain, Little Bigelow Mountain, and Location of Highland Wind Project



Landforms on the Project site

The Project will be built on two separate ridgelines, both located below elevation 2,700. The western string will be located on an undulating ridgeline that connects the L-shaped Watering Tub (el. 2,210±), Witham Mountain (el. 2,299), and Bald Mountain (el. 2,007). The eastern string extends in a relatively straight north-south line from the northeastern end of Burnt Hill (el. 2,236) south to Briggs Hill (el. 1,982±). None of the mountains upon which the turbines or associated facilities will be constructed is a scenic resource of state or national significance.

¹⁴ The Flagstaff Region Management Plan notes the distinction between the two mountains. “The Bigelow Act provided for the long-term acquisition and management of approximately 40,000 acres of land, located on the southerly side of Flagstaff Lake and including the entirety of Bigelow and Little Bigelow Mountains.” Flagstaff Region Management Plan, Maine Department of Conservation, Bureau of Parks and Lands, June 12, 2007. P. 23.

Water Resources

Rivers and Major Impoundments. The landscape within the study area has been significantly altered over the past century by dams constructed on the two major rivers in the study area, the Dead River and the Kennebec River. The largest alteration occurred in 1949 when Central Maine Power constructed Long Falls Dam on the Dead River, resulting in the creation of Flagstaff Lake. This man-made impoundment, now operated by Florida Power and Light (FPL), is 14 miles long and 6 miles wide at its widest point. Because the Long Falls Dam is operated to regulate the amount and timing of waterflow from the Dead River into the Kennebec River, it experiences significant fluctuations in water levels during the year. Flagstaff Lake covers 20,300 acres when completely filled with water but only 6000 acres, or one-quarter of this size, when fully drawn down. It is typically drawn down 10 to 15 feet in the fall and 20 to 25 feet in the spring in anticipation of runoff from the snowmelt. Scheduled releases from the Long Falls Dam by Florida Power and Light have allowed whitewater rafting companies to offer scheduled runs on the Dead River in May, June, September, and October.

The Maine Rivers Study classifies the Kennebec River between Madison and The Forks as a “B River,” with unique/significant scenic resource values. Wyman Lake, a man-made impoundment created in 1931 by the construction of the Wyman Dam on the Kennebec River and extending north of that dam for 11 miles, is the only portion of the Kennebec River where the Project would be visible. Several recreation facilities have been constructed along its shoreline for boat access, swimming, and picnicking. Wyman Lake is not considered to have scenic resources by the Maine Wildlands Lakes Assessment. See Section 6E for a description of the Kennebec River and the visual effects of the Project.

Table 1 summarizes the characteristics of the major man-made impoundments in the study area:¹⁵

Table 1. Major Man-Made Impoundments within 8 miles of the Highland Wind Project

IMPOUNDMENT	LOCATION	DIST (miles)	SIZE (acres)	ACCESS	DEV	RES CLASS	SCENIC RATING	TURBINES VISIBLE W/IN 8 MILES
Flagstaff Lake	Dead River TWP	3.8	20,300	AC	UNDEV	1A	S	Up to 9
Wyman Lake	Pleasant Ridge PLT	3.0	3,146	AC	**	2		6 – 23, all concentrated at southern 3± miles
DIST: Distance to the nearest visible turbine. AC: Accessible. INAC: Inaccessible. DEV: Developed. UNDEV: Undeveloped. **: The Maine Wildlands Lake Assessment did not rate Wyman Lake for development. RES CLASS: 1A: Lakes of Statewide significance with multiple outstanding natural values. 1B: Lakes of Statewide significance with a single outstanding natural value. 2: Lakes of regional significance (no outstanding values but at least one significant resource value). 3: Lakes of local or unknown significance. SCENIC RATING: S: Significant O: Outstanding. TURBINES VISIBLE: The approximate number of turbines within eight miles that may be visible from the lake/pond.								
SCENIC RESOURCE OF STATE OR NATIONAL SIGNIFICANCE								

In Kingfield, on the west side of the study area, the Carrabassett River is impounded by a concrete mill dam that creates a focal point for the local business community and residential

¹⁵ The information in Tables 1 and 2 is from the Maine Wildlands Lakes Assessment, Findings. Land Use Regulation Commission, Maine Department of Conservation. June 1, 1987.

neighborhoods. While portions of the river are within the study area, the dam is over eight miles from the nearest turbine. The Project will not be visible from the Carrabassett River, which is not recognized for its scenic resources by the Maine Rivers Study.

The land on the east side of the Project drains to the Kennebec River, which parallels Route 201 throughout its length in the study area. Most of the land on the west side of the Project drains to either the Carrabassett River in Carrabassett Valley and Kingfield, or Poplar Stream in Carrabassett Valley and Highland Plantation. Neither waterbody is included in the list of Scenic Rivers in the Maine Rivers Study, Appendix G.

Other Lakes and Ponds. In addition to the two major man-made impoundments, there are 16 lakes and ponds within the 8-mile study area. These range in size from Embden Pond (1,568 acres), 6.9 miles to the south in Embden, to Lost Pond (18 acres) 3.5 miles to the northeast in Pleasant Ridge Plantation. (See Table 2: Lakes and Ponds within 8 miles of the Highland Wind Project.) Two of these waterbodies – Jackson Pond and Gilman Pond – are rated for their scenic resources by the Maine Wildlands Lakes Assessment and are considered scenic resources of state or national significance, based upon this rating. See Section 6D for a description of these resources and the anticipated visual impact of the Project.

Waterfalls. The Maine Atlas and Gazetteer¹⁶ lists two scenic waterfalls within the eight-mile study area: Houston Brook Falls, near the southwestern end of Wyman Lake in Pleasant Ridge Plantation, and Poplar Stream Falls in Carrabassett Valley. Both falls are located in dense woods and will have no visual contact with the turbines. The 115 kV generator lead that connects the on-site collector station with the existing Wyman Dam substation will pass within 0.6 miles of Houston Brook Falls and will be screened by existing vegetation.

Vegetative patterns

The predominant forest cover in the study area is mixed second growth softwood/hardwoods. The majority of the land in the study area is either state-owned (Bigelow Preserve) or privately held and actively being used for timber production. Aerial photos show extensive areas of recent cutting activity, e.g., south of West Carry Pond; on the west side of Burnt Hill and Briggs Mountain; and on the north side of Gilman Pond Mountain in Lexington. The most visible timber harvesting activity is seen on the northwestern face of Stewart Mountain, which has resulted in a series of vertical clearcuts that are clearly visible from the Appalachian Trail. (See photographs from the AT in Appendix B).

In addition to the Bigelow Preserve, the Bureau of Parks and Lands (BPL) owns a number of smaller woodlots in the Flagstaff region, managed primarily for timber production and secondarily for wildlife and recreation. BPL owns five lots in Highland Plantation and one in Pleasant Ridge Plantation: a two-parcel Double lot (300 acres) southwest of Witham Mountain; the Southeast or Oak lot (125 acres) on the western slope of Briggs Hill; the West or Long Falls Dam lot (325 acres) on the western slope of Stewart Mountain; a lot on the north side of Burnt Hill; and a lot in the southwestern corner of Pleasant Ridge PLT. The last two lots are considered outside the Flagstaff region by BPL.¹⁷ None of these properties is a scenic resource of state or national significance.

¹⁶ Maine Atlas and Gazetteer, 27th Edition. DeLorme, Yarmouth, Maine.

¹⁷ Flagstaff Region Management Plan, Maine Department of Conservation, Bureau of Parks and Lands, June 12, 2007.

Table 2. Lakes and Ponds within 8 miles of the Highland Wind Project

LAKE/ POND	LOCATION	DIST (miles)	SIZE (acres)	ACCESS	DEV	RES CLASS	SCENIC RATING	TURBINES VISIBLE W/IN 8 MILES
West Carry Pond	Carrying Place Town TWP	4.9	675	AC	DEV	1A		Arnold Trail: 15±
Middle Carry Pond	Carrying Place Town TWP	5.6	126	AC	DEV	2		Arnold Trail: 7±
East Carry Pond	Carrying Place Town TWP	6.2	267	AC	DEV	1B		28±
Lost Pond	Pleasant Ridge PLT	3.6	18	INAC	UNDEV	2		0
Rowe Pond	Pleasant Ridge PLT	1.8	205	AC	UNDEV	2		Blades of 7 – 10
Bean Pond	Pleasant Ridge PLT	2.6	20	INAC	UNDEV	2		North end: blades of 10±
Jewett Pond	Pleasant Ridge PLT	2.4	32	AC	UNDEV	3		Blades of 6±
Clear (Mill) Pond	Pleasant Ridge PLT	1.6	23	AC	UNDEV	2		0
Jackson Pond	Concord TWP	5.9	32	AC	UNDEV	1B	O	0
Embden Pond	Embden	6.9	1,568	AC	DEV	1B		Blades of 2±
Hancock Pond	Embden	6.3		AC	DEV			0
Gilman Pond	Lexington TWP	6.1	242	AC	UNDEV	1B	S	North end: 23 South end: 7
Spruce Pond	Lexington TWP	2.2	49	AC	UNDEV	2		0
Safford Pond	Lexington TWP	5.7	40	INAC?	UNDEV	1B		South end: 6 – 9±
Indian Pond	Lexington TWP	6.9	53	INAC?	UNDEV	2		South end: blades of 13±
Butler Pond	Lexington TWP	5.6	28	INAC	UNDEV	2		0
DIST: Distance to the nearest turbine. AC: Accessible. INAC: Inaccessible. DEV: Developed. UNDEV: Undeveloped. RES CLASS: 1A: Lakes of Statewide significance with multiple outstanding natural values. 1B: Lakes of Statewide significance with a single outstanding natural value. 2: Lakes of regional significance (no outstanding values but at least one significant resource value). 3: Lakes of local or unknown significance. SCENIC RATING: S: Significant O: Outstanding. TURBINES VISIBLE: The approximate number of turbines within eight miles that may be visible from the lake/pond.								
SCENIC RESOURCE OF STATE OR NATIONAL SIGNIFICANCE								

Cultural character

Cultural features within eight miles of the project include:

- **Town centers** of Moscow and Bingham on the Kennebec River, 6± miles east of the nearest turbines on Briggs Hill, and the town center of Carrabassett Valley, 4.7 miles west of the nearest turbines on the Watering Tub. None of these town centers contains scenic resources of state or national significance, with the exception of the Bingham Free Meetinghouse in Bingham, a property listed on the National Register of Historic Places, which will not have a view of the wind turbines or associated facilities due to intervening topography and

vegetation. Views of the Project from these town centers will likewise be blocked by topography and vegetation.

- **Small villages** of Pleasant Ridge, Lexington, North New Portland, and Highland Plantation. None of these small villages contains property listed on the National Register of Historic Places, or other scenic resources of state or national significance. Views of the Project will be blocked by vegetation and intervening topography in most of these villages. In Lexington, where Long Falls Dam Road is oriented in a northerly direction toward Witham Mountain, several turbines would be visible to northbound motorists over approximately 5.7 miles of the road, with the closest view at 2.2 miles. In Highland Plantation, turbines on most of the ridgelines will be visible in the vicinity of the general store at the intersection of Long Falls Dam Road and Sandy Stream Valley Road.
- **Lakeside cottages** are found on Flagstaff Lake, West Carry Pond, Middle Carry Pond, East Carry Pond, Embden Pond, Jewett Pond, Rowe Pond, and Gilman Pond. None of these cottages is listed on the National Register of Historic Places or otherwise qualifies as scenic resources of state or national significance. The majority of these cottages are not oriented toward the Project and will not have views of the turbines. The largest concentration of homes and seasonal cottages (several hundred) is found on West, Middle, and East Carry Ponds, which are only accessible through a gated private road network.
- **Very low density rural residential development**, found throughout the study area. The closest year-round residence that may have an unobstructed view of the turbines (on Bald Mountain) is over one mile to the south on Sandy Stream Valley Road in Highland PLT.
- **Recreational areas:** in addition to the designated hiking trails, there are a number of other recreational areas within the study area, none of which qualifies as a scenic resource of state or national significance. These include a small beach and boat launch on the southeastern end of Flagstaff Lake in Dead River TWP; a short section of the Northern Forest Canoe Trail as it traverses the eastern end of Flagstaff Lake; boat launches, picnic areas, and other facilities on Wyman Lake (see Scenic Byways below); informal boat launches on Rowe Pond and Clear Pond in Pleasant Ridge PLT; campgrounds and primitive campsites on Flagstaff Lake; primitive campsites (landowner permission required) in Highland PLT, on Jewett Pond in Pleasant Ridge PLT, and in Carrying Place TWP; and Baker Mountain Ski Area in Moscow.
- **Scenic Byways:** There are two designated Scenic Byways within eight miles of the Project – Route 201 (Old Canada Road Scenic Byway) and Route 27. Under the Maine Wind Power Law the only portion of scenic byways that are considered scenic resources of state or national significance are scenic turnouts constructed by Maine Department of Transportation (MDOT).

The Old Canada Road Scenic Byway (Route 201) is both a Maine State Scenic Byway and a National Scenic Byway.¹⁸ Approximately 16.9 miles of Route 201 is within 8 miles of the Project. For a distance of 0.3± miles on the Byway in the town of Moscow up to 21 turbines

¹⁸ The National Scenic Byways Program is part of the U.S. Department of Transportation, Federal Highway Administration. The program is a grass-roots collaborative effort established to help recognize, preserve and enhance selected roads throughout the United States. The U.S. Secretary of Transportation recognizes certain roads as All-American Roads or National Scenic Byways based on one or more archeological, cultural, historic, natural, recreational and scenic qualities. <http://www.byways.org/>

will be intermittently visible to the west over Wyman Lake at a distance of 4.5± miles. There are no scenic resources of state or national significance along the 0.3 mile length of Route 201 where the turbines may be intermittently visible, i.e., there are no pull-offs, rest stops, or designated scenic overlooks.

The Wyman Lake Scenic Turnout on Route 201, located 0.2 miles south of the Moscow/Caratunk town line, is 5 miles from the Project. None of the turbines will be visible due to intervening topography and shoreline vegetation. There are several informal pull-offs along Route 201 in Moscow where gaps in the guardrails allow space for visitors to park. None of these are MDOT designated pull-offs, and none will have views of the Project due to intervening topography and shoreline vegetation. See Study Area Map in Appendix A for location of the scenic byway and related features.

The Route 27 Scenic Byway (State designation) parallels the Carrabassett River on the west side of the Project area, from Kingfield on the south to the Canadian Border and Coburn Gore on the north. At its closest point, the Byway will be approximately 4 miles from the nearest turbines. However, a series of low mountains (Little Poplar Mountain, Poplar Mountain, Clay Brook Mountain, Ira Mountain, and Vose Mountain) that parallel the Carrabassett River will block all views of the Project from the Byway and from the scenic overlook between Kingfield and Carrabassett Valley.

- **Designated Hiking Trails:** The study area is well known for its abundance of hiking trails, focused on the Bigelow Range. The most well-known is the Appalachian National Scenic Trail (AT), a unit of the National Park System, which extends 2,175 miles from Mount Katahdin in Maine to Springer Mountain in Georgia. Approximately 19.4 miles of the trail are located within eight miles of the Project. The Appalachian Trail is a scenic resource of state or national significance and is described in greater detail in Section 6F below.

The high peaks of the Bigelow Preserve can be reached from all four directions. The Appalachian Trail provides access from the east (from East Flagstaff Road) and the south (via Cranberry Pond). The ridgeline can also be accessed from the south over the Fire Warden's Trail and the Horn's Pond Trail. The Bigelow Ridge Trail, which starts in Stratton near the Boralex Stratton Energy plant, provides access from the west. The Safford Brook Trail is a northerly route to Myron Avery Peak.

The Flagstaff Region Management Plan notes that heavy use on the Fire Warden's Trail and the Horn's Pond Trail may require alternative routes in the high peaks area. The Management Plan also recommends a North Col Trail to relieve pressure on the heavily used Safford Brook Trail¹⁹. The Management Plan does not note excessive use or recommend any improvements to that section of the AT within the study area, i.e., between Little Bigelow Mountain and East Flagstaff Road.

A relatively new attraction in the region is a system of eco-lodges along a 180-mile trail that eventually will connect the Mahoosuc Mountains in the Bethel area on the west to the Moosehead Lake area. Maine Huts and Trails, which is operated by The Western Mountain Foundation, opened its first lodge in 2008.

¹⁹ Flagstaff Region Management Plan. Maine Department of Conservation, Bureau of Parks and Lands. June 12, 2007.

Figure 5: ITS Routes in the Study Area

Each hut can accommodate up to 42 people. The system's first hut is located on private property at the eastern end of Flagstaff Lake, approximately 2.0 miles southeast of Long Falls Dam in Carrying Place Township. A second hut is located at Poplar Stream Falls on the north side of Little Poplar Mountain in Carra-basset Valley. A third hut is two miles below Grand Falls on the banks of the Dead River, approximately 12 miles north of the Flagstaff Lake hut. The Project will not be visible from any of the huts, which are all located in wooded sites and well screened from scenic resources.

According to staff at Maine Huts and Trails, their visitors are infrequent users of the AT; they tend to be an older clientele who seek out the hut-

and-trail system because the trail does not require hiking to peaks. Moreover, the trail system, which is groomed for cross-country skiing and is free of charge, is designed for and more heavily used in winter than in the hiking season. (Telephone contact Oct. 19, 2010.) It is unlikely that the hut-and-trail system will lead to significantly increased use of the AT.

While portions of the Maine Huts and Trails' trail system are located within the eight-mile study area, there should be virtually no visual contact with the Project since the trails generally are located in woodlands at lower elevations and avoid the more prominent mountains.

- **Designated snowmobile trails** near the Project include ITS (Interconnected Trail System) 115, which is located on the north and east side of the Bigelow Range, and ITS 87, located on the east side of the Kennebec River. There are no designated snowmobile trails within the Project boundary. The existing ITS routes are generally located in the valleys and should have minimal visual contact with the Project. See Figure 5, ITS Snowmobile Routes Near the Highland Wind Project. While snowmobile / ATV trails are not considered scenic resources of state or national significance, some of the local trails may cross Flagstaff Lake and Gilman Pond, both of which are scenic resources of state or national significance.

There are no existing structures in the Project area other than the five temporary meteorological towers erected by Highland Wind LLC.

5.2 Distance Zones

The concept of distance zones is based upon the USDA Forest Service visual analysis criteria for forested landscapes and on the amount of detail that an observer can differentiate at varying distances.²⁰ Given the height of contemporary wind turbines, the distance zones that have been established to evaluate scenic impacts for more common development projects may have different significance for wind power projects. Nonetheless, the designation of foreground, midground, and background distance zones provides a useful framework for evaluating the presence of wind turbines and their related facilities in the larger landscape. The distance zones used for the Highland Wind Project are defined as:

- **Foreground:** 0 to 1/2 mile from the observer. Within the foreground, observers are able to detect surface textures, details, and a full spectrum of color. For example, the details of the turbines (blades, nacelles, support towers) will be readily apparent.

There are no scenic resources of state or national significance within one-half mile of the Project.

- **Midground:** 1/2 mile to 3-5 miles from the observer. The midground is a critical part of the natural landscape. The Maine Wind Power Law presumes that a visual impact assessment will be required to evaluate potential scenic impacts if there are scenic resources within three miles. Within this zone the details found in the landscape become subordinate to the whole: individual trees lose their identities and become forests; buildings are seen as simple geometric forms; roads and rivers become lines. Edges define patterns on the ground and hillsides. Development patterns are readily apparent, especially where there is noticeable contrast in scale, form, texture, or line. Colors of structures become somewhat muted and the details become subordinate to the whole. This effect is intensified in hazy weather conditions, which tend to mute colors and de-sharpen outlines even further. In panoramic views, the midground landscape is the most important element in determining visual impact.

Scenic resources of state or national significance that are in the midground of the Project include the eastern end of Little Bigelow Mountain, portions of Flagstaff Lake, other limited portions of the Bigelow Preserve, a section of the Appalachian Trail below Little Bigelow Mountain, and a few locations on the Arnold Trail.

- **Background:** greater than 3–5 miles²¹. Background distances provide the setting for panoramic views that give the observer the greatest sense of the larger landscape. However, the effects of distance and atmospheric haze will obliterate the surface textures, detailing, and form of project components. Objects in the background will be highly visible only if they present a noticeable contrast in form or line, and when weather and lighting conditions are favorable. Most structures in typical development proposals cease to be uniquely recognizable at distances greater than 3–5 miles. However, since wind turbines are very tall and relatively simple objects, their form and color remain readily distinguishable within the midground and well beyond into the background (up to eight miles from the observer). Due to the thinness of the design, the outer ends of the turbine blades will be minimally visible in the outer portion of the background.

²⁰ Landscape Aesthetics: A Handbook for Scenery Management. USDA Forest Service. Agricultural Handbook Number 701. December 1995.

²¹ For purposes of this visual impact assessment, the background viewing distance is limited to eight miles, since the Legislature has determined that “the primary siting authority (LURC) shall consider insignificant the effects of portions of the development’s generating facilities located more than 8 miles, measured horizontally, from a scenic resource of state or national significance.” (§ 3452.3.)

The Maine Wind Power Law considers the visual impact of turbines on views from scenic resources of state or national significance beyond 8 miles to be insignificant. Scenic resources of state or national significance that have background views of the Project are the Bigelow Preserve, portions of the Appalachian Trail on Little Bigelow Mountain, portions of Flagstaff Lake, Gilman Pond, and portions of the Arnold Trail.

6.0 VISUAL IMPACTS ON SCENIC RESOURCES OF STATE OR NATIONAL SIGNIFICANCE

As noted in Section 5, there are scenic resources of state or national significance within eight miles of the Project. The following section evaluates each of these resources, using the criteria in the Maine Wind Power Law (which are cited in parentheses):

- **Context:** “*The existing character of the surrounding area,*” and “*the context of the proposed activity.*” (§§ 3452.3.B and 3452.3.D). This section describes the physical characteristics of the resource and the landform, water bodies, vegetation, and cultural patterns of the land that surrounds it. The context descriptions are supplemented by photographs presented in Appendices B, C, and D.
- **Significance:** “*The significance of the potentially affected scenic resource of state or national significance.*” (§ 3452.3.A). This section describes the reasons that the area has been designated a scenic resource of state or national significance; e.g., the ratings from the Maine Rivers Study or Maine Wildlands Lake Assessment; descriptions from the Flagstaff Region Management Plan; and/or the rationale behind the National Natural Landmarks designation. Where available, descriptions from guidebooks and other current media that describe the resource’s significance and uniqueness are included. Levels of significance (e.g., outstanding, significant) are included where they are part of the reports responsible for designation.
- **Public Uses:** “*The extent, nature and duration of potentially affected public uses of the scenic resource of state or national significance.*” (§ 3452.3.E). This section describes public use patterns to the extent that they have been documented. Estimates have been compiled from available resources and supplemented by survey or other research by Highland Wind’s consultants.
- **Viewer Expectations:** “*The expectations of the typical viewer*” who would be using and enjoying the scenic resource of state or national significance. (§ 3452.3.C). This section describes the primary reason(s) that viewers are drawn to the scenic resource and how visual cues influence how people perceive the resource.
- **Project Impact:** “*The scope and scale of the potential effect of views of the Project on the scenic resource of state or national significance, including but not limited to issues related to the number and extent of turbines visible from the scenic resource of state or national significance, the distance from the scenic resource of state or national significance, and the effect of prominent features of the development on the landscape.*” (§ 3452.3.F). This section describes the visual impact that the turbines and associated facilities may have on the scenic resource. Where possible, quantitative measurements are provided to illustrate the degree and character of the anticipated changes to the landscape (e.g., distance to project, length of viewing area or viewpoint, number of turbines within eight miles visible, amount of turbine visible, angle of view, percent of panoramic view occupied by the project, etc.). Photosimulations are used to supplement the narrative description by illustrating whether the wind turbines will dominate the

landscape, interrupt notable views, conflict with important focal points, contribute to visual clutter, or otherwise impact the scenic resource. The photosimulations are representative of worst-case conditions, i.e., public viewpoints where the most number of turbines will typically be seen.

- **Potential Effect on Public Use:** “*The potential effect of the generating facilities' presence on the public's continued use and enjoyment of the scenic resource of state or national significance.*” (§ 3452.3.E). This section examines how the typical viewer would react to the presence of the wind turbines as seen from the scenic resource. To the extent that it is known, this section is based on an understanding of the users' experience and expectations, the effect that the Project would have on that experience, and the effect that the Project would have on the public's continued use of the resource.
- **Conclusion:** An evaluation of whether “*the development significantly compromises views from a scenic resource of state or national significance such that the development has an unreasonable adverse effect on the scenic character or existing uses related to scenic character of the scenic resource of state or national significance.*” (§ 3452.1). The conclusion describes the overall scenic impact of the project on the scenic resource, considering the significance of the resource, the relative numbers and expectation of the users, the scarcity of the resource, and the degree of impact that the project would have on the resource.

6.1 SCENIC RESOURCES OF STATE OR NATIONAL SIGNIFICANCE

6.1.A. A national natural landmark, federally designated wilderness area or other comparable outstanding natural and cultural feature, such as the Orono Bog or Meddybemps Heath (35 M.R.S.A. §3451.9.A.)

► Bigelow Preserve / Bigelow Mountain National Natural Landmark

Context. The Bigelow Preserve is a Maine Public Reserved Land administered by the Bureau of Public Lands, Maine Department of Conservation (BPL). The Bigelow Preserve comprises 35,843 acres of public land, extending from Stratton on the west to Flagstaff Lake on the east, and encompasses the entire Bigelow Range. The Range includes two mountains: Bigelow and Little Bigelow. Bigelow Mountain's highest peaks are West Peak (el. 4,145 foot) and Myron Avery Peak (4,088 feet), two of only 14 Maine summits over 4,000 feet in elevation.²² Both are more than eight miles from the Highland Wind Project. Little Bigelow Mountain, at the eastern side of the Bigelow Preserve (el. 3,040 feet), is the only peak in the Bigelow Range within eight miles of the Project.

The Bigelow Preserve was established by a citizen-initiated referendum in 1976 to acquire the Bigelow Range in the face of a planned recreation development that would allegedly have transformed the mountains and a portion of Flagstaff Lake into the “Aspen of the East.” The Bigelow Act – “An Act to Establish a Public Preserve in the Bigelow Mountain Area” – mandated the State to “set aside land to be retained in its natural state for the use and enjoyment of the public.” According to BPL, the Bigelow Preserve was established to protect the Bigelow Range from development, to maintain the visual quality of the mountain and the 35,843-acre Preserve that surrounds it, to provide a semi-remote environment for the people of Maine, and to protect important and fragile habitats from being destroyed.²³

²² www.maine.gov/cgi-bin/online/doc/parksearch/details.pl?park_id=42 states there are “10 summits” in Maine over 4,000 feet. Other sources, such as Wikipedia (http://en.wikipedia.org/wiki/Four-thousand_footers#The_New_England_list), list fourteen “4,000 footers.”

²³ [Bigelow Preserve Management Plan](#), Bureau of Parks and Lands. August. 1989.

Table 3: Peaks in the Bigelow Preserve

PEAKS (highest to lowest)	ELEVATION	DISTANCE TO NEAR TURBINE	DISTANCE TO FAR TURBINE	TURBINES W/IN 8 MILES ²⁴
West Peak	4,145'	9.0 miles	14.8 miles	0
Myron Avery Peak	4,088'	8.4 miles	14.2 miles	0
The Horns (N/S)	3,792 / 3,805'	10.5 miles	16.4 miles	0
Cranberry Peak	3,194'	13.2 miles	18.9 miles	0
Little Bigelow Mountain	3,040'	4.7 miles (eastern summit)	10.7 miles	18
West Peak, Myron Avery Peak, The Horns, and Cranberry Peak are all part of Bigelow Mountain; Little Bigelow Mountain is a separate and distinct mountain. The proposed Highland Wind Project will be visible from a limited portion of Little Bigelow Mountain. See Appendix B and section 6F, Appalachian Trail, for more detailed evaluation of the visual impacts on Little Bigelow Mountain.				

In 2007 the Bureau of Parks and Lands issued the Flagstaff Region Management Plan, a 15-year plan to “provide a balanced spectrum of opportunities across the Flagstaff Region, in keeping with the opportunities and resources available in the broader surrounding Western Mountains Region.” The Management Plan recognizes the significance of visual management in planning for timber and other management activities within the Preserve to “retain the appearance of an undisturbed forest when viewed from hiking trails.”²⁵ However, the Management Plan does not prescribe or propose any restrictions on management activities on non-state land outside of the Preserve.

In 1975 the United States Department of the Interior established Bigelow Mountain as a National Natural Landmark (NNL) in recognition of the extensive and varied alpine communities found at the summit. The Program describes Bigelow Mountain as “one of the best alpine vegetation zones among New England’s 4,000-foot peaks.” As noted, the 4,000-foot peaks are not within 8 miles of the Project, but the eastern flank of Bigelow Mountain, below Avery Peak, approaching the notch that separates Bigelow Mountain from Little Bigelow Mountain, is. Bigelow Mountain is one of 14 NNL’s in Maine.²⁶

Significance. The NNL website notes that “in terms of size, condition and lack of disturbance, Bigelow Mountain possesses one of the best alpine vegetation zones among New England’s 4,000-foot peaks. It is exceptionally scenic and wild, with some of the best summit views in the eastern United States.”

²⁴ Additional turbines beyond 8 miles may be visible from these viewpoints. However, the Maine Legislature has determined that “the primary siting authority (in this case the Land Use Regulation Commission) shall consider insignificant the effects of portions of the development’s generating facilities located more than 8 miles, measured horizontally, from a scenic resource of state or national significance.” (§ 3452.3 Evaluation Criteria.)

²⁵ Flagstaff Region Management Plan, Maine Department of Conservation, Bureau of Parks and Lands, June 12, 2007.

²⁶ National Natural Landmarks (NNL) are natural areas that have been designated by the Secretary of the Interior to recognize some of the best biological or geological resources in the nation. According to the National Park Service the goals of the NNL Program are to “encourage the preservation of sites illustrating the geological and ecological character of the United States, to enhance the scientific and educational value of sites thus preserved, to strengthen public appreciation of natural history, and to foster a greater concern for the conservation of the nation’s natural heritage.” www.nature.nps.gov/nnl/NNL_FAQ.cfm#4

Public Uses. The Bigelow Preserve is a backcountry recreation area that offers a wide range of activities for public recreation, including hiking, snowmobiling, backpacking, hunting, cross-country skiing, snowshoeing, camping, fishing, swimming, mountain bike touring, and boating.

A very small portion of the land comprising the Bigelow Preserve is within 3 miles of the proposed Highland Wind Project (approximately 5.6 acres, or 0.02% of the total area). About one quarter (27.5%) of the Preserve – the portion that is east of all the high peaks in the Preserve – is within 8 miles of any turbines. The highest use areas in the Preserve are beyond the eight-mile radius of the Project to the west, including the Horns Pond camp site, the popular loop trail that begins with the Firewarden’s Trail off Route 27, and the highest peaks in the range (South and North Horns, West Peak, and Myron Avery Peak).²⁷

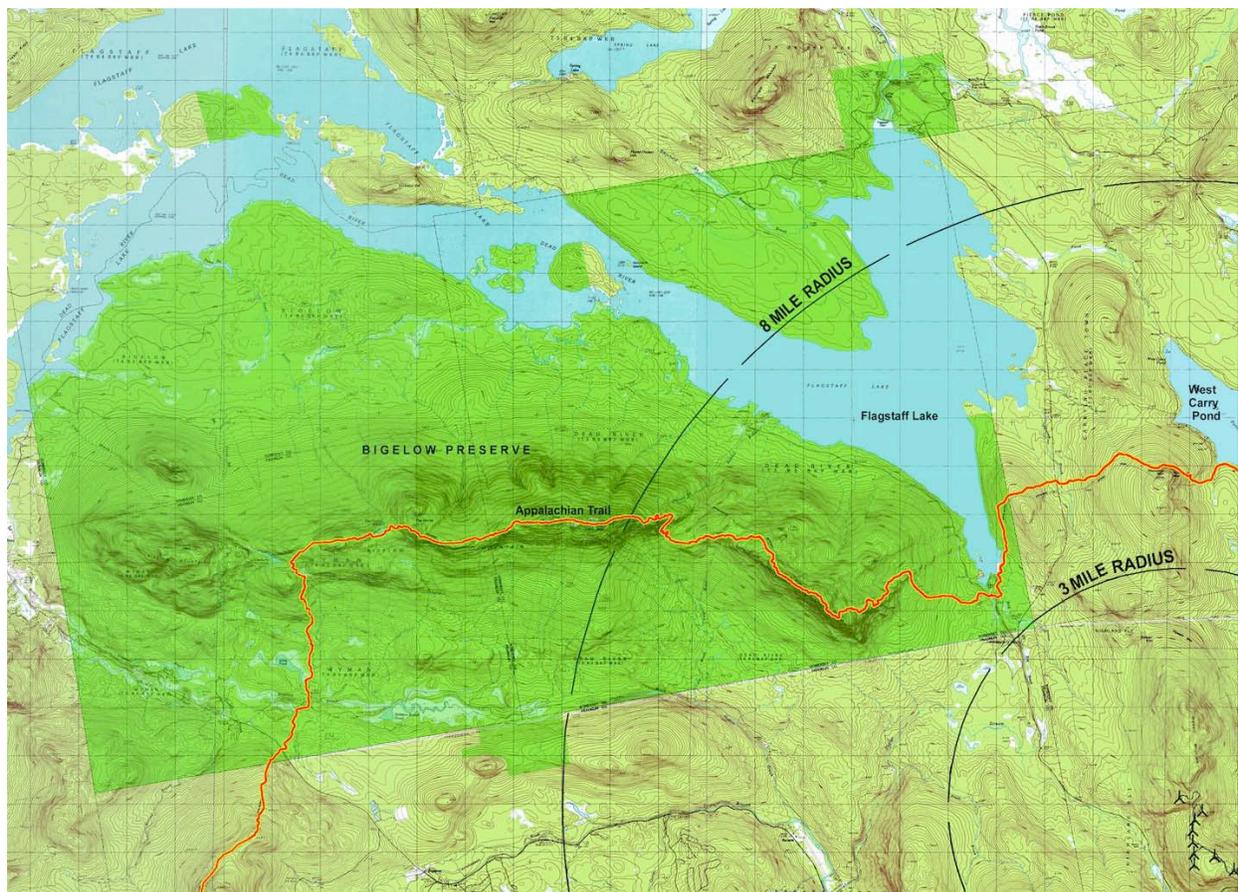
Within the 8-mile radius of the Project, the actively used portions of the Preserve – in terms of public use – appear to be the AT; the Little Bigelow lean-to shelter near the base of Little Bigelow Mountain above East Flagstaff Road; the Safford Brook Trail up the north side of Bigelow Mountain; the Safford Notch campsite; the Bigelow Lodge and picnic area at the bottom of this trail; and several primitive camping sites along Flagstaff Lake. The Safford Brook Trail is a well-used route up to the high peaks, offering a shorter distance to the high peaks than the Little Bigelow trail. Of these, only portions of the AT will have views of the Project.

Additional information about the Appalachian Trail within 8 miles of the Project is provided in 6F, below.

Viewer Expectations. People who recreate in the Bigelow Preserve, with its dramatic combination of mountain and lake scenery, likely have high expectations of scenic quality. Hikes to the high peaks of Bigelow Mountain, namely the Horns, West Peak, and Avery Peak, are prominently mentioned in most hiking guides to mountains in Maine and New England (see Appendix E), both reflecting and helping to shape high expectations. As will be discussed in 6F below, viewer expectations for the section of the Preserve within 8 miles of the Project, including Little Bigelow Mountain (the only peak in the Preserve within 8 miles) are somewhat less than for the high peaks.

Among those who hike in the Western Maine Mountains, according to findings by Portland Research Group in a survey of Western Maine Mountain hikers performed at the request of Highland Wind LLC, the Bigelow Preserve is not as well known or as often mentioned as a scenic destination as places such as Baxter State Park, Acadia National Park, and other locations in Maine. By comparison, among those hiking in the Preserve, Bigelow Mountain (as distinct from Little Bigelow) is one of the most frequently cited scenic destinations in Maine, behind Katahdin/Baxter State Park.

²⁷ For example, one of the most visited destinations within the Preserve, according to user counts maintained by the Maine Appalachian Trail Club (MATC), is the Horns Pond camp site, which is located near the junction of the AT and the Horns Pond Trail, and is a stopping place both for hikers of the popular loop that includes the Avery and West peaks and for through-hikers and other overnight backpackers. The site is staffed by a caretaker for MATC, and, according to counts by MATC, an average of at least 2,600 hikers per hiking season (roughly Memorial Day to Columbus Day) stopped at or passed through this location over the last six years, including an average of about 400 through-hikers per season.

Figure 6: Bigelow Preserve

Viewer expectations in the Preserve are tempered by the presence of the four-season Sugarloaf ski resort complex and related development in Carrabassett Valley that are visible from the higher elevations. This includes Sugarloaf ski area, Sugarloaf golf course, Sugarloaf Regional Airport, and development along Route 27. Existing development within the viewshed also includes a highly visible transmission line corridor just below the Preserve's mountain range, on the south side, stretching to the horizon in both easterly and westerly directions.

Project Impact. Most of the Bigelow Preserve, including the high peaks of Bigelow Mountain, is more than eight miles from the Project. Within 8 miles, the Project turbines will be visible within the preserve from some locations on Little Bigelow Mountain. Woodlands and/or topography otherwise block visibility of the project. A description of project impacts to Little Bigelow Mountain is provided in 6F below as part of the discussion of the AT.

Potential Effect on Public Use. The Highland Wind Project will introduce an additional, large-scale, man-made element in a landscape that is largely natural but also includes a transmission corridor, airport, ski resort, and other evidence of human use. However, the turbines will be more than eight miles from most of the Preserve. The Project will not be visible from any existing campsites within the Preserve or the Bigelow Lodge. The Project will not be located within 8 miles of most of the hiking trails in the Preserve, and for the one hiking trail in the Preserve with a portion that is located within eight miles of the

Project – the AT – the Project will be visible for a cumulative total of approximately 350 linear feet along the Appalachian Trail, primarily on Little Bigelow Mountain. The Project will have a low impact on the public's continued use and enjoyment of the Bigelow Preserve, based upon all information available to Highland Wind regarding use and user expectation. See 6F below for a discussion on the impact on the Appalachian Trail in the Bigelow Preserve.

Conclusion. The Highland Wind Project will not have any adverse visual effect on the alpine zones of Bigelow Mountain, which is the primary reason that led to its designation as a National Natural Landmark. The Project will also have minimal impacts on the recreational resources that are found within the Bigelow Preserve, with the exception of a limited section of the Appalachian Trail, as described in 6F below. The Project will not have an unreasonable adverse effect on the Preserve's scenic character or the uses related to the scenic character of the Preserve.

6.1.B. A property listed on the National Register of Historic Places pursuant to the National Historic Preservation Act of 1966, as amended, including, but not limited to, the Rockland Breakwater Light and Fort Knox. (35 M.R.S.A. §3451.9.B.)

Two properties located within 8 miles of the Project are on the National Register of Historic Places: the Arnold Trail to Quebec, located north of the Project area, and the Bingham Free Meetinghouse in Bingham, located 6.2± miles east of the nearest turbine on Briggs Hill.²⁸ The Bingham Free Meetinghouse will not have a view of the wind turbines or associated facilities due to intervening topography and vegetation. There will be a view of the turbine locations from some of the publicly accessible portions of the Arnold Trail, including water-based portions on Flagstaff Lake and West Carry Pond, as well as some of the land-based portions which are located on private land.

► **Arnold Trail To Quebec Historic District (Arnold Trail)**

Context. The Arnold Trail is the route that Benedict Arnold took in 1775 in an ill-fated attempt to attack Quebec during the Revolutionary War. According to the National Register nomination form,²⁹ the trail is 194 miles long, stretching from Fort Popham at the mouth of the Kennebec River to Coburn Gore on the Canadian Border.

According to the 1969 National Register Nomination Form, Arnold's forces carried their bateaux and other equipment overland between the Kennebec River and the Dead River (now Flagstaff Lake) between October 11 and October 16, 1775. This 12±-mile passage, which crosses portions of East Carry, Middle Carry, and West Carry Ponds, is called the Great Carrying Place Portage Trail by The Arnold Expedition Historical Society. The Society has acquired easements over several miles of this property and has marked the route with orange blazes. There are very few signs for the trail within the study area; one is found at a trailhead in the woods on the eastern end of the trail near the Kennebec River. The Historical Society has recently published a map and guide to Arnold's march.³⁰

According to the Arnold Expedition Historical Society, the Great Carrying Place Portage Trail, which is a combination of maintained trails, logging roads, a short section of the Appalachian Trail, and map-delineated routes across or around water bodies, closely follows the actual route of the Arnold expedition. The trail is co-located with the Appalachian Trail for 2± miles between Middle Carry Pond and West

²⁸ The area covered by the PALS Highland Historic Architectural Reconnaissance Survey extends out to a radius of eight miles.

²⁹ National Register of Historic Places, Inventory – Nomination Form, Arnold Trail to Quebec. Maine State Park and Recreation Commission. July 14, 1969.

³⁰ Arnold's Wilderness March Map & Guide, Arnold Expedition Historical Society. Shapleigh, Maine. 2009.

Carry Pond. At West Carry Pond, the route of the trail is delineated as crossing the pond to the western shore, starting at a cove on the west side of Arnold Point.³¹ From the western shore it follows a private gated road that leads to the West Carry Pond Road and on to Flagstaff Lake. For those without a boat to cross the pond, the trail map suggests following the Appalachian Trail for 1.4 miles, then bushwhacking for 0.9 miles to a private road.

The 1969 National Register Nomination Form describes the setting of the Arnold Trail as it existed at the time of nomination, 41 years ago: “Except for areas around Augusta, Winslow, Waterville, Skowhegan, and Madison there has been moderate urbanization or commercialization. The banks of the Kennebec from its mouth to Bingham are a patchwork of farms and woodlands. Above Bingham the agricultural section ends, the land gets more hilly and rock, and the forest closes in. Virtually no virgin timber remains along the trail from Bingham to the Canadian border, but the entire region does give the appearance of a vast, hostile wilderness, as it did in 1775.”

“The rivers have been altered more than anything since 1775...above Augusta, the Kennebec has an entirely different aspect than it did in 1775. Dams have been constructed at 10-15 miles intervals up the river, giving the stream a rather placid appearance, far different from the quick flowing shallow and treacherous Kennebec that the bateaux men saw. Above the great carrying place the creation of Flagstaff Lake has covered many historic spots such as the point where Arnold’s Army first struck the Dead River. The Maine State Park and Recreation Commission has set up 33 interpretive panels at 9 different sites along the trail which have been very well received. These panels are located at Fort Popham, Hallowell, Skowhegan, Solon, Moscow, Stratton, Sarampus, Chain of Ponds, and Coburn Gore.”

A person following the Arnold Trail would not expect to encounter the same conditions that were present in 1775. In addition to today’s logging roads and evidence of commercial timber operations, the traveler would see many seasonal camps and year-round homes on the ponds which are either visible from the Trail or the designated route. All three ponds that are crossed by the Trail are described as “accessible developed” by the Maine Wildlands Lakes Assessment.³² West Carry Pond has at least 40± homes on its shoreline, most of which are directly visible from where the designated trail crosses the pond. (See photographs of typical camps on West Carry Pond in Appendix C.) East Carry Pond has at least a dozen camps at the southern end, in the immediate vicinity of the Arnold Trail put-in point.

Significance. The Flagstaff Region Management Plan, describing the “Arnold Trail Historic District,” which is partially in the study area, states “The area that lies in proximity to the original course of the Dead River prior to the construction of Long Falls Dam creating Flagstaff Lake, including the shoreline abutting the Preserve, is likely to contain important archaeological resources. There is potential for historic artifacts throughout this region.”³³ While the Management Plan stresses the historic significance of the Arnold Trail, it makes no mention of any significant scenic value.

According to the Flagstaff Region Management Plan, the Maine Historic Preservation Commission has filed an application to have the trail included in the American Battlefield Protection Program (a program of the National Park Service) to provide additional protections along the corridor. Maine’s Finest Lakes notes that West Carry Pond is “considered an outstanding cultural site. It is where the Benedict Arnold

³¹ According to the Arnold’s Wilderness March Map & Guide, Arnold Point is not part of the Arnold Trail or the treadway of the Appalachian Trail. The National Park Service owns the point as part of the land acquired for the Appalachian Trail.

³² Maine Wildlands Lake Assessment. Land Use Regulation Commission. June 1, 1987. The Assessment did not rate any of the Carry Ponds for their scenic resources.

³³ Flagstaff Region Management Plan, Maine Department of Conservation, Bureau of Parks and Lands, June 12, 2007.

expedition set up a field hospital on their march to Quebec.”³⁴ No significant scenic features were reported in Maine’s Finest Lakes.³⁵

The Land Use Regulation Commission has designated the land-based portion of the Carrying Place Trail, as generally shown on the Wilderness March Map & Guide between the Kennebec River and Flagstaff Lake, as a P-UA zone. The purpose of this designation is “To protect areas of significant natural, recreational, historic, scenic, scientific or aesthetic value which are susceptible to significant degradation by man’s activities, and for which protection cannot adequately be accomplished by inclusion in any of the other subdistricts.”

Public Uses. There is no evidence of frequent public use of the Arnold Trail in the study area, either the land-based portion of it between the Kennebec River and Flagstaff Lake, or the crossings of the Carry ponds. Throughout this area public access is very limited, either by ownership, lack of access facilities, or both. The only exception is the two-mile section between Middle Carry Pond and West Carry Pond, where the Arnold Trail is co-located with the Appalachian Trail³⁶. Much of the land surrounding the ponds is currently gated and requires landowner permission to traverse it. People on Flagstaff Lake may be incidentally in the vicinity of the Arnold Trail. However, due to the impounding of the Dead River and the flooding of the river trail by the creation of Flagstaff Lake, the route has been highly altered from its condition at the time of the Arnold expedition.

Within the study area there is an historic marker on the east side of the Kennebec River in Caratunk indicating the point at which the Arnold Expedition left the river and started the portage over the Great Carrying Place. This site has no view of the Project. (See photographs of the marker above the Kennebec River in Appendix C.)

A prominent sign marks the beginning of the portage trail in Bingham on the west side of the Kennebec River. Other than these markers and an occasional orange blaze, there is little guidance to indicate the route of the Arnold Expedition or to direct visitors to the trailheads. There are occasional parties of re-enactors who trace the Arnold Expedition’s route, but these seem to be infrequent. There was a notable reenactment in 1975 on the 200th anniversary of the Arnold March, sponsored and organized by the Arnold Expedition Historical Society,³⁷ In 2010 a group of 35 people from Virginia followed the route over the Columbus Day weekend to commemorate the 235th anniversary of the march.³⁸

Viewer Expectations. There appears to be no regular public visitation to the Arnold Trail within the 8-mile study area, except for the segment that is shared with the Appalachian Trail. Those who do visit the Arnold Trail for its historic significance likely know, from the same resources referenced in this section, that the area within eight miles of the Project has changed considerably from the wilderness and free-flowing rivers that the expedition encountered to the present condition of commercially harvested forestland, major impoundments, and gated cottage communities with modern conveniences such as automobiles, motorboats, and electricity. It is reasonable to conclude that re-enactors and other visitors who are drawn to the Arnold Trail in the study area are making the visit for its historic value and not with an expectation that the scenic resources they will encounter along the Trail are unchanged from the

³⁴ The Arnold Expedition Historical Society Map & Guide indicates that the hospital site was located on East Carry Pond.

³⁵ West Carry Pond itself is not a scenic resource of state or national significance except as the Arnold Trail may cross it.

³⁶ A 2-mile portion of the Appalachian Trail follows the Arnold Trail between West Carry Pond and Middle Carry Pond.

³⁷ Personal Communication, Tom Desjardins, Historian, Maine Bureau of Parks and Lands. November 5, 2010.

³⁸ The Irregular. Kingfield, Maine. October 6, 2010.

Revolutionary War era.

Project Impact. The entire Great Carrying Place Portage Trail is within eight miles of the Highland Wind Project. Viewshed Map B in Appendix A indicates that turbines will be visible from portions of the three ponds and Sandy Stream, and on portions of Flagstaff Lake (formerly the Dead River). While Arnold and his troops crossed these waterbodies in 1775, the Portage Trail, as illustrated on the 2009 Map & Guide, detours around them, following instead local logging roads and the Appalachian Trail. With the exception of a short segment of the trail near Arnold Point, the Portage Trail is located in woodland and will have little to no visual contact with the turbines.

As seen in the West Carry Pond Photosimulation (in Appendix C), which is based upon a photograph taken on the pond near Arnold Point, up to 15 turbines would be visible just above the relatively flat horizon across the pond at a distance of 4.9 to 6.6 miles. For people boating on West Carry Pond, tracing the route of the Arnold Expedition, the turbines would not be viewed directly ahead of the paddlers, but rather off to the side. People boating on the pond now see, and would continue to see up to 40 houses/camps located along its shoreline.

The potential impact of the Project has been minimized by Highland Wind's decision not to place turbines on Stewart Mountain, where they would have been highly visible from West Carry Pond. Instead, Stewart Mountain, rather than the turbines, is the focal point from the pond looking south. The upper parts of most turbines are visible above the surrounding trees, and they are clearly subordinate to the much higher Stewart Mountain and other elements of the landscape.

Potential Effect on Public Use. The Project will have minimal impact on the public's continued use and enjoyment of the Arnold Trail as a nationally significant historic resource.

Conclusion. The Highland Wind Project will not significantly compromise views from the Arnold Trail. The Project will not have an unreasonable adverse effect on its scenic character or the uses related to the scenic character of the trail.

6.1.C. National or State Parks (35 M.R.S.A. §3451.9.C.)

There are no state parks within eight miles of the project. The closest is Rangeley Lakes State Park in Rangeley, approximately 31 miles to the west. The Bigelow Preserve (a Maine Public Reserved Land) is administered by the Bureau of Parks and Lands and is described in 6.1.A above and 6F below.

The closest unit of the National Park Service is the Appalachian National Scenic Trail (AT), which is described in 6F below. Acadia National Park, which is over 90 miles southeast of the Highland Wind Project, is well beyond the viewshed of the Project.

6.1.D. A great pond that is:

- (1) One of the 66 great ponds located in the State's organized area is identified as having outstanding or significant scenic quality in the "Maine's Finest Lakes" study; or**
- (2) One of the 280 great ponds in the State's unorganized or deorganized areas designated as outstanding or significant from a scenic perspective in the "Maine Wildlands Lakes Assessment." (35 M.R.S.A. §3451.9.D.)**

There are three great ponds within the study area that have outstanding or significant scenic resources: Flagstaff Lake, Gilman Pond, and Jackson Pond. The viewshed maps in Appendix A, which assess the

potential for views based on topography and vegetation, have shown that the Project will not be visible from Jackson Pond.

► **Flagstaff Lake**

Context. Flagstaff Lake is the largest waterbody in the study area, and is classified as the fourth largest lake in the state. Flagstaff Lake is a man-made impoundment created in 1949 by Central Maine Power by the construction of Long Falls Dam on the Dead River. The lake has a highly configured (complex) shoreline and is approximately 14 miles long and 6 miles wide at its widest point. Because the Long Falls Dam is designed to regulate the amount and timing of water flowing into the Kennebec River, Flagstaff Lake experiences significant fluctuations in water levels during the year. While the lake covers 20,300 acres at maximum capacity, it covers only 6,000 acres, or one-third of this size, when fully drawn down. It is typically drawn down 10 to 15 feet in the fall and 20 to 25 feet in the spring in anticipation of runoff from the snowmelt.

Flagstaff Lake is part of the Northern Forest Canoe Trail (NFCT),³⁹ a 740-mile long-distance paddling trail connecting major watersheds in New York, Vermont, Quebec, New Hampshire, and Maine. Near the study area, the route follows the South Branch of the Dead River, crosses Flagstaff Lake to Long Falls Dam, and then continues north on the Dead River. It is expected that most users will paddle downstream and cross Flagstaff Lake west to east and stay as close to the northern shoreline as water drawdowns will allow, away from the windy central part of the lake. Canoeists may be able to see a residential-scaled wind turbine at the Flagstaff Lake Hut, part of the Maine Huts and Trails System, located on the eastern end of Flagstaff Lake. See Map C: Study Area in Appendix A for the route of the NFCT within the study area.

Significance. The combination of the Bigelow high peaks and Flagstaff Lake has created a significant scenic resource along Route 27 north of Stratton. The Maine Wildlands Lakes Assessment recognizes the lake's significant scenic resources, which are primarily the dramatic views of the Bigelow Range that parallel the southern end of the lake. (See photographs in Appendix C.) The LURC Comprehensive Land Use Plan (CLUP) assigns Flagstaff Lake to Management Class 2 (especially high value, accessible, undeveloped lakes). The criteria for this designation is that it is accessible to within 1/4 mile by 2 wheel drive vehicles; less than 1 development unit per mile of shoreline, two or more outstanding resource values in fisheries, wildlife, scenic, or shore character.⁴⁰

Prior to the publication of the Maine Wildlands Lakes Assessment, the State Planning Office issued the Scenic Lakes Character Evaluation in Maine's Unorganized Towns, which evaluated the scenic characteristics of all 1,509 lakes and ponds (with a surface area greater than 10 acres) in the area under LURC jurisdiction. The Evaluation was based on six criteria: relief, physical features, shoreline configuration, vegetation diversity, special features, and inharmonious development. A point system was

³⁹ <http://northernforestcanoetrail.org/> While the NFCT received start-up funding from the National Park Service, it is managed as a private non-profit organization.

⁴⁰ "The Commission intends to conserve the special values of these lakes by significantly restricting the density and intensity of development to one development unit per mile of shoreline. These restrictions will be applied to the area within 500 feet of the lakeshore to enable the Commission to regulate back lot development which could affect the lake's special values and is consistent with the management intent of the lake. Variation of density requirements may only be sought as part of a concept plan which is demonstrated by clear and convincing evidence to be fully protective of the special values associated with the lake." Appendix C. Comprehensive Land Use Plan for Areas Within the Jurisdiction of the Maine Land Use Regulation Commission. Maine Department of Conservation. Revised 2010.

developed to assign a rating to each of the criteria, depending upon their presence in the landscape. Table 4 provides a short description of each of the criteria and summarizes the findings for Flagstaff Lake.⁴¹

A total of 118 lakes with a total of 50 or more points were identified as ‘Outstanding’ in the Evaluation. Flagstaff Lake was not assigned to this category due to the maximum deduction of points possible for “inharmonious conditions,” namely the drawdown of water from the impoundment. Nevertheless, its other visual characteristics made it one of the 162 lakes in the state that achieved a score between 20 to 45 points and were identified as ‘distinctive’, which was the basis for the ‘Significant’ category in the Maine Wildlands Lakes Assessment.

Public Uses. Recreational use of the lake and its immediate shoreline are for canoeing/kayaking, boating, fishing, swimming, picnicking, snowmobiling, camping, and seasonal camps. A Maine guide offers pontoon boat tours out of Stratton at the west end of the lake during the summer until lake drawdowns after Labor Day limit the depth of the water.

Table 4: Visual Characteristics of Flagstaff Lake

FACTOR	DEFINITION	RATING	MAX. PTS.	SCORE
Relief	Complexity of relief Dramatic relief	High	30	30
Physical Features	Cliffs, vertical ledges, slab ledges, rockslides, boulders, islands, beaches.	Medium	25	15
Shoreline Config.	Relative complexity of the shoreline.	High	15	15
Vegetation Diversity	Four possible types were identified: mixed hardwood/softwoods; softwoods; marsh; super-story trees.	None	15	0
Special Features	Water clarity Opportunities for wildlife viewing	None	15	0
Inharmonious Development	Residential development, visible roads, powerlines, etc.	High	-20	-20
TOTAL				40

The use of the lake is influenced, and at times limited, by strong winds, relatively shallow water depths, annual drawdowns, and the appearance of the shoreline during drawdown conditions.⁴² According to those knowledgeable about the lake,⁴³ wind and waves are prevalent in the eastern third of the lake, which is the largest and most open section of the waterbody.

⁴¹ Maine State Planning Office. Scenic Lakes Character Evaluation in Maine’s Unorganized Towns. December, 1986. The ratings in the chart – from None to High – are taken from the SPO document. Under Inharmonious Development 20 Points were deducted for lakes with drastic changes in water levels; 10 points were deducted if inharmonious development was rated as ‘high’; 5 points were deducted if inharmonious development was rated as ‘medium’.

⁴² Weather conditions are discussed on many of the websites that describe canoeing on Flagstaff Lake. The following passage from www.Mainetodo.com is typical: “The lake can get rough and winds can pick up quickly so make sure you come prepared to handle all weather conditions.”

⁴³ Interviews of Maine Guide Jeff Hinman, Nov. 11, 2010, and Bigelow Preserve Manager Steve Swatling, Nov. 8, 2010. For example, scouting groups who may be undertaking a land-and-water loop trip by combining a hike across the Bigelow Range with canoeing on Flagstaff at times are unable to make the water-based part of the loop back toward the west due to wind and wave conditions.

Motorized craft, meanwhile, typically launch at Stratton at the far western end of the lake and are more likely to use this part of the lake than the eastern part. Although recreational facilities and thus recreational uses are dispersed around the lake, it is likely that the western two-thirds of Flagstaff are, overall, more active than the eastern third.

There are few public data sources on the extent of recreational uses of Flagstaff Lake. One is the filings by FPL Energy Maine under its hydropower license. Recreation reports are submitted to the Federal Energy Regulation Commission every six years. The reports cover the Flagstaff Lake reservoir plus the shoreline up to 4 feet above full pond level (or elevation 1150 feet). In 2009, FPL estimated total annual activity for all uses covering the entire lake and shoreline at about 44,000 visits.⁴⁴ This appears to be a comparatively low number for the state's fourth largest lake. For example, a similarly impounded lake in western Maine, Indian Pond behind the Harris Dam west of Greenville, which is one-fifth the size of Flagstaff Lake, received four times the use.⁴⁵

The FPL report does not break down these 44,000± visits per year by area of the lake, or by use or season. Most of the activity appears to be associated with sites that will not have views of the Project and/or are more than 8 miles from the closest turbine. For example, many of the sites surveyed for the FPL report are in the western half of the lake, including boat launches near Route 27 and at Trout Brook and camp sites such as at Myers Lodge and Hurricane Island; or at the northeast end of the lake, which is more than 8 miles from the Project, such as the boat launch and the portage near Flagstaff Dam; or within 8 miles of the Project but without views of it, such as Round Barn off East Flagstaff Road. The FPL survey included one activity site that is both within 8 miles of the Project and will have a view of it, i.e., the Bog Brook area at the southeast end of the lake. About 23% of the lake will be within 8 miles of the Project (measured at full pond elevation), all in what appears to be the lesser-used eastern portion. The turbines will be visible from approximately 67.8% of this area, or about 15.5% of the lake.⁴⁶

Boaters/Anglers. Boat access to the lake is limited to a trailerable boat launch in Stratton and several hand-carry sites, including at Round Barn,⁴⁷ Bog Brook, and Long Falls Dam.⁴⁸ On behalf of Highland Wind, Portland Research Group counted boats in the affected area of Flagstaff Lake during four days of survey work. These included one Friday, two Saturdays, and a Sunday, and on each day the affected eastern section of the lake was fully visible from Little Bigelow Mountain.⁴⁹ Of a total of 41 half-hour timeslots (between 9 a.m. and 4 p.m.) during these days:

- 29 half-hour timeslots had no boats/canoes in the affected area
- 7 half-hour timeslots had one boat/canoe
- 3 half-hour timeslots had two boats/canoes
- 2 half-hour timeslots had three boats/canoes
- 0 half-hour timeslots had more than three boats/canoes

⁴⁴ This number, which includes all uses on the lake and on land up to elevation 1150, includes canoeing/kayaking, boating, fishing, hunting, picnicking, swimming, camping, hiking, ice fishing, and snowmobiling.

⁴⁵ For comparison, annual visits at Indian Pond, which is about a fifth the size of Flagstaff, averaged about 163,000 visitors per year, and at Brassua Lake, which is about half the size of Flagstaff, visits are estimated to be about 49,000 per year.

⁴⁶ If any part of the turbine blade would be visible it is included in this calculation.

⁴⁷ The Round Barn site is also made available for trailerable boats during the fall waterfowl hunting season, a use that preceded the establishment of the Preserve. Flagstaff Region Management Plan, P. 32.

⁴⁸ Both the Flagstaff Region Management Plan and the DeLorme Atlas and Gazetteer note that there are three trailerable boat access sites on Flagstaff Lake (At Eustis/Stratton, Bog Brook, and Long Falls dam). However, the BPL website only shows Eustis on its website listing of Boat Sites www.maine.gov/doc/parks/programs/boating/sites/234.html. This was confirmed by observations by TJD&A.

⁴⁹ The four days were Saturday, July 17; Friday, August 6; Saturday, August 7, and Saturday, October 3, all in 2010.

This low level of use is consistent with the supposition that the eastern portion of the lake is less friendly to, and therefore less used for, canoeing and kayaking (and more distant for motorized boats) than other parts of the lake.

Canoeists paddling the Northern Forest Canoe Trail will pass through the affected area (about 3.4 miles of the 18±-mile distance across Flagstaff Lake will be within 8 miles of the nearest turbine). The Trail's website recommends that paddlers travel from west to east to minimize upstream paddling. In this direction, paddlers would enter the project viewshed near the northern shore of the lake opposite Round Barn, but fairly soon afterward (in approximately 1.5 miles) would turn northward, and from that point on would have the Project to their backs. Under normal conditions the Project would not be viewed directly ahead of the paddlers, but rather off to the side, where turbines would be seen in the context of the Stewart Mountain and the lower slopes of Little Bigelow Mountain. According to the Northern Forest Canoe Trail website, a total of 29 paddlers have completed the full trail since 2000, though many others undoubtedly paddle pieces of it.

Maine Huts and Trails' Flagstaff lodge, on private land at the northeast shore of Flagstaff Lake, is a potential attraction for boaters. One of the pontoon boat tours includes a luncheon stop at the lodge. According to Maine Huts and Trails staff, few other visitors arrive by boat, although some guests borrow available canoes or kayaks at the site for an outing. To the extent that this activity occurs close to the lodge, primarily in the northern part of the lake, it is more than 8 miles from the Project.

Flagstaff has primarily a warm-water fishery, according to the Department of Inland Fisheries and Wildlife and web sites such as MaineOutdoors.com, and is known, for example, for the pickerel that it produces. Although water quality is marginal for coldwater game fish, there is a smelt run in the spring and some habitat for salmonids, especially in a deep hole above Long Falls Dam (beyond 8 miles from the Project) and at the western end of the lake where the North and South Branches of the Dead River enter the lake (beyond the Project's impact area). There are no known data on level of fishing activity on the lake.

Camping opportunities at the east end of Flagstaff Lake include a drive-to campground at Round Barn (9 individual sites and one group site) and five primitive sites on the eastern shoreline near Long Falls dam, outside the Bigelow Preserve. The Flagstaff Region Management Plan recommends several new walk-to campsites on the eastern shore of the lake near Bog Brook to meet the demands associated with the Appalachian Trail. A new primitive campsite was constructed in 2010. The Viewshed Maps (in Appendix A) indicate that the Project would not be visible from any of these sites.

Seasonal Camps located on Flagstaff Lake are concentrated in three general locations within or near the study area:

- Bog Brook. Approximately two dozen camps on Flagstaff Lake are located on inholdings in the Bigelow Preserve around a cove at the southeastern end of the lake. The majority of the properties, which would be 2.6± miles from the nearest turbine, are heavily wooded and do not have views beyond the foreground.
- Long Falls (Flagstaff Lake) Dam. There are several homes near the end of Long Falls Dam Road just east of the dam, situated to take advantage of the view toward Flagstaff Lake and the Bigelow Range. The nearest turbine would be beyond 8 miles of these camps and would appear as a very small object in the landscape.
- Safford Brook / Round Barn area. Several camps and other structures (including the Bigelow Lodge) are located in the woods near the shoreline. These buildings are generally oriented to the north, toward the lake, and would not have views of the turbines, which would be 6.1± miles away. Existing vegetation and topography will block views of the Project from this area.

Viewer Expectations. People who use Flagstaff Lake are likely to have moderate to high expectations of scenic quality, given the history of the Bigelow Preserve, the dramatic combination of mountain and lake scenery, and the descriptions available in guidebooks and other media. Their expectations will be tempered at certain times of the year by the fluctuating lake levels, the amount of exposed shoreline, and the reality that Flagstaff Lake is artificially created and part of a major renewable energy production project characterized by large-scale human manipulation of the natural river. The Scenic Lakes Character Evaluation discussed above deducted a maximum score (-20 points) for the fluctuating lake levels.

Project Impact. The viewshed map indicates that portions of up to 9 turbines would be visible above the horizon at the eastern end of Flagstaff Lake at distances of 3.8 to 8 miles. These turbines will be visible over approximately 15.5% of the lake at high water level, primarily as background views. The turbines will be seen as relatively small objects in a landscape that is dominated by the Bigelow range. The Project will not dominate the landscape nor will it block views of the primary focal points as seen from the water, and it will be oriented away from the dramatic profile of the range along the southern shore of the lake. See Flagstaff Lake Photosimulation in Appendix C for a midground view of the Project from a cove opposite Bog Brook at the southeastern end of the lake, where 8+/- turbines would be visible at high water level. See also (in Section 5 earlier in this VIA) the panoramic view of Flagstaff Lake, taken from a point near Long Falls Dam that shows the project location in relation to the Bigelow Range, which is the primary scenic focus of lake users.

Eastbound paddlers on the NFCT and boaters on the north side of the lake may see the top portions of several turbines as they pass opposite the Round Barn campsite at Safford Brook, 8 miles from the Project. At that point, and for most of the next 1.5 miles, the turbines would be visible in a notch between Stewart Mountain and the lower slopes of Little Bigelow Mountain. Eastbound paddlers on the NFCT would not be seeing the turbines directly ahead in the typical direction of travel. Views of the Project would continue to a point of land in Dead River Peninsula opposite Bog Brook. At that point, portions of nine turbines may be visible at a distance of 7 to 8 miles. Once the tip of land is passed, the NFCT turns north and heads toward Long Falls Dam, away from the Project, and the turbines would be out of sight.

Most of the campsites and summer camps are heavily wooded, and do not have views beyond the foreground and would not be affected by the project.

Most of the views from the lake would be in the background, where they would be seen in context with some of Maine's largest landforms. From most viewing locations the turbines will appear to be subordinate to Stewart Mountain and the adjacent Bigelow Range.

Potential Effect on Public Use. The views of the project will change the character of a portion of the eastern end of Flagstaff Lake by introducing a man-made element into a landscape that, while already altered and managed for energy production, has the appearance during much of the year of a natural landscape. The turbines will not interfere with views of the high peaks in the Bigelow Range, which are the primary focal points of the region. The Project will not be visible from most of the lake, from most existing campsites, or from any of the campsites that have been proposed or recently built on or near the shoreline. Midground views of the turbines will be limited to the small cove near Bog Brook. The turbines will be 6-8 miles from the normal path of travel of canoeists and boats headed to destinations at the northeast end of the lake, including Maine Huts and Trail lodge and the portage around Long Falls Dam. The Project should have a relatively minor impact on the public's continued use and enjoyment of Flagstaff Lake.

Conclusion. The Highland Wind Project will not significantly compromise views from Flagstaff Lake. The Project will not have an unreasonable adverse effect on its scenic character or the uses related to the scenic character of the lake.

► **Gilman Pond**

Context. Gilman Pond is a 1.4-mile long pond located 6.1 miles south of the Project in Lexington Township (LURC jurisdiction) and New Portland (DEP jurisdiction). It sits at the southern end of a 6-mile long, 1–2 mile-wide valley drained by Sandy Stream. Gilman Pond Mountain (el. 1400) is on the west side of the pond; Goodrich Hill (el. 1040) is on the east side. These two landforms frame the view of Peaked Hill (el. 1867), Bald Mountain (el. 2007), and Witham Mountain (el. 2299), which rise 1,400 to 1,900 feet above the valley to the north. Gilman Pond is described as Undeveloped and Accessible in the Maine Wildlands Lakes Assessment. However, there are over a dozen homes and seasonal cottages located at the southwestern end of the pond. While there are gravel roads leading to these cottages, they are private and gated. There is no apparent public boat landing or other public access point on the pond.

Significance. The Maine Wildlands Lakes Assessment notes that the lake has significant scenic resources. Gilman Pond is included in LURC Management Class 7.⁵⁰

Prior to the publication of the Maine Wildlands Lakes Assessment, the State Planning Office issued the Scenic Lakes Character Evaluation in Maine’s Unorganized Towns, which evaluated the scenic characteristics of all 1,509 lakes and ponds (with a surface area greater than 10 acres) in the area under LURC jurisdiction. The Evaluation was based on six criteria: relief, physical features, shoreline configuration, vegetation diversity, special features, and inharmonious development. A point system was developed to assign a rating to each of the criteria, depending upon their presence in the landscape. Table 5 provides a short description of each of the criteria and summarizes the findings for Gilman Pond (note the deduction for existing inharmonious development):⁵¹

A total of 118 lakes with a total of 50 or more points were identified as ‘Outstanding’ in the Evaluation. There were 162 lakes, including Gilman Pond, that achieved a score between 20 to 45 points and were identified as ‘distinctive’, which was the basis for the ‘Significant’ category.

Public Uses. Recreational use of the lake includes boating, fishing, swimming, snowmobiling, camping, and seasonal camps.⁵² The Maine Atlas and Gazetteer and the USGS topographic map indicate that there

⁵⁰ “Management Class 7 consists of all lakes not otherwise classified, including many lakes which have multiple outstanding or significant resource values identified in the Wildland Lakes Assessment. The Commission will manage these lakes for multiple use, including resource conservation, recreation, and timber production, giving specific consideration to identified resource values when evaluating the merits of lake-related rezoning and permit applications. It is the Commission’s intention that the majority of these lakes remain in Management Class 7 and be managed under applicable requirements.” Appendix C, LURC Comprehensive Land Use Plan. 2010.

⁵¹ Maine State Planning Office. Scenic Lakes Character Evaluation in Maine’s Unorganized Towns. December, 1986. The ratings in the chart – from None to High – are taken from the SPO document. Under Inharmonious Development 20 Points were deducted for lakes with drastic changes in water levels; 10 points were deducted if inharmonious development was rated as ‘high’; 5 points were deducted if inharmonious development was rated as ‘medium’.

⁵² TJD&A is unaware of data on public use of Gilman Pond, but it is likely very low. For example, an anecdotal description from the website www.trails.com notes Gilman Pond is “a delightful little out-of-the-way pond in the Rangeley Lakes region. Nestled into a valley surrounded by forested hills, this picturesque pond offers the

is a trailerable boat launch on the lake. However, field visits have failed to confirm its presence, and a sign on a private road off Gilman Pond Road informs visitors that there is no public access. The Bureau of Parks and Lands listing of its boat launches does not include any for Gilman Pond.

Table 5: Visual Characteristics of Gilman Pond

FACTOR	DEFINITION	RATING	MAX. PTS.	SCORE
Relief	Complexity of relief Dramatic relief	Low	30	10
Physical Features	Cliffs, vertical ledges, slab ledges, rockslides, boulders, islands, beaches.	Medium	25	15
Shoreline Configuration	Relative complexity of the shoreline.	Low	15	5
Vegetation Diversity	Four possible types were identified: mixed hardwood/softwoods; softwoods; marsh; super-story trees.	Low	15	5
Special Features	Water clarity Opportunities for wildlife viewing	Medium	15	10
Inharmonious Development	Residential development, visible roads, powerlines, etc.	High	-20	-10
TOTAL				35

The dozen± summer cottages are located on the wooded shoreline. The majority are located on the west side of the pond, oriented to the east toward Goodrich Hill and Hackett Hill, and ninety degrees from the Project. The Project would generally not be within the focal point of most of these camps per se, since the turbines would be ninety degrees to the north and blocked by vegetation along the shoreline.

Viewer Expectations. People who gain access to Gilman Pond and use it for boating, camping, and summer camps likely have high expectations of scenic quality, but knowing that summer cottages already exist on the Pond.

Project Impact. The turbines on the ridges to the north would be highly visible in the background from most locations on the waters of Gilman Pond. At the far northern end of the pond 23± turbines would be visible. At the southern end of the pond (the location of the Gilman Pond Photosimulation), 7± turbines would be within 8 miles. From a point near the northern, end of the pond (see Map B: Viewshed in Appendix A), 19 turbines within 8 miles would be visible, with the closest turbine 6.30 miles away. The 12± cottages on the western shoreline extend over approximately 2,000 linear feet of shoreline; from the midpoint of this group, there would be 9 turbines visible within 8 miles.

The Project would be perceived as a significant object in the larger landscape, due to the presence of the turbines over several ridges. The 440-foot tall turbines will be subordinate to the 1,800-foot mountains that they would be located on. See the Gilman Pond Photosimulation in Appendix C for a view of the Project from the southern end of the pond.

□ opportunity for several hours of quiet paddling, especially if you paddle all the way down to Route 16...The fact that it has a good flow of water but is choked with impenetrable sedges indicates that boats do not ply these waters in great numbers.” From www.trails.com/tcatalog_trail.aspx?trailid=CGN022-052

Visual impacts from lighting will occur, where the turbine lights will be visible on the Project ridgeline to someone on Gilman Pond after dusk. The light on the closest turbine would be seen at an angle greater than 3° below the horizon, which will have an intensity that is considerably less than lights seen at a higher elevation.

Potential Effect on Public Use. Because public access to the lake appears to be very limited and there is no widespread public use, the potential impact of the Project on public use will be low. Further, although the Project will be visible from much of Gilman Pond, because of the distance of the turbines from the lake, its visual impact on users of the lake is diminished.

Conclusion. The Highland Wind Project will not have an unreasonable adverse effect on its scenic character or the uses related to the scenic character of Gilman Pond.

6.1.E. A segment of a scenic river or stream identified as having unique or outstanding scenic attributes listed in Appendix G of the "Maine Rivers Study." (35 M.R.S.A. §3451.9.E.)

► Kennebec River

The Kennebec River is the only river within the study area that is listed in the Maine Rivers Study and qualifies as a scenic resource of statewide or national significance. The “river” is not actually a free-flowing river within the 8-mile radius that defines the study area, but is rather an artificial impoundment, Wyman Lake, created by Wyman Dam. However, because the Maine Rivers Study did not differentiate between free-flowing vs. impounded sections, it is included in this assessment.

Context. The Kennebec River, one of the largest rivers in the State, parallels Route 201 on the east side of the study area. The river is largely undeveloped in this section, with sloping wooded banks. The Wyman Dam in Moscow and Pleasant Ridge Plantation impounds the Kennebec River, forming the 15±-mile long Wyman Lake. The dam was built for power generation (Wyman Station) and for log driving. Route 201 is designated as a National Scenic Byway and is part of the Kennebec-Chaudiere Heritage Corridor. See Photographs in Appendices C and D.

The Kennebec River is also the location of a portion of the Arnold Trail, described in more detail in 6A above. At the time of Arnold’s march in 1775, prior to the construction of the Wyman Dam, the Kennebec River was a free flowing river and a very different environment than it is today.

Significance. The 87-mile segment of the Kennebec River between Augusta to The Forks is noted in Appendix G of the Maine Rivers Study as a Scenic River. The 45-mile segment of the Kennebec River between Madison and The Forks is rated as a "B" River in the Maine Rivers Study, which means that it has a composite of natural and recreational resource values with outstanding statewide significance. None of its resource values within the segment between Madison and The Forks are of greater than statewide or national significance.⁵³ The Study describes the scenic resources in this segment as having “a unique and diverse range of views related to a variety of spatial enclosures and topographic diversity.”⁵⁴ While the Maine Rivers Study notes that the Kennebec River has significant scenic resources, the Maine Wildlands Lakes Assessment does not consider Wyman Lake to have significant or outstanding scenic resources.

⁵³In addition, the Maine Rivers Study also identifies this segment of the Kennebec River as having unique / significant geologic/hydrologic, critical/ecologic, inland fishery, canoe touring, and historic resource values.

⁵⁴Maine Rivers Study. Maine Department of Conservation and US Department of the Interior, National Park Service. May 1982. p. 137.

Public Uses. There are two Department of Conservation boat launches on the Kennebec River off Route 201 within 8 miles of the Project: the Moscow Boat Launch located 1.9 miles south of the Moscow/Caratunk town line, and the Caratunk Boat Launch 4.4 miles north of the Moscow/Caratunk town line. These areas are also used for swimming and picnicking, and afford open views of the lake. Florida Power and Light's Wyman Lake Recreation Area in Pleasant Ridge Plantation provides facilities for swimming, picnicking, and boating. None of these facilities will have views of the Project.

The fishery in Wyman Lake is composed principally of salmon, lake trout, Rainbow trout, yellow perch, pickerel, and smelt. There is a tailwater fishery below Wyman Dam that includes Rainbow, Brown and Brook trout and landlocked salmon. There is no known source of data on the number of users of these fisheries.

Viewer Expectations. People who use Wyman Lake for boating, fishing, and swimming likely have a moderate to high expectation of scenic quality, tempered by the presence of Route 201, with its high volume, high speed traffic immediately adjacent to it. The lake itself is the result of a large hydro power facility, and a wind power project may be seen as a next generation form of renewable power that is not out of context with the setting. The dam's infrastructure is within the of sight from Wyman Lake for up to 3.5 miles upstream of the dam, including the 2.8 miles upstream that constitutes the portion of Wyman Lake from which any turbines are visible. Thus, a viewer in a location who is able to see the turbines from Wyman Lake will also be seeing infrastructure associated with Wyman Dam.

Project Impact. The viewshed analysis indicates that the Project would be visible from approximately 2.8 miles of the Kennebec River on Wyman Lake, immediately upstream from the Wyman Dam. The number of turbines that would be seen varies from approximately 6 near the dam to 22 in an area approximately 0.5 miles long and 2.5 miles northwest of the dam.⁵⁵ In most other locations turbines would be screened from view by intervening topography and streamside vegetation. The Project will not be visible from either boat launch due to intervening topography and vegetation. While the turbines would not be visible below Wyman Dam, the generator lead line leading to the Wyman substation would be seen paralleling the existing 115 kV transmission line that crosses the Kennebec River. See Appendix D for photographs of Wyman Dam and substation.

Potential Effect on Public Use. The Project will have a minor impact on the public's continued use and enjoyment of Wyman Lake and the Kennebec River. Since the turbines would be visible from a relatively small portion of the lake where there are other visible signs of human development and energy development, users will still be able to enjoy the same types of recreational activities they now participate in. From portions of the lake (and the river below the dam), the impacts from the turbines and the generator lead line will not be out of character with the nearby hydropower facility that created the lake, and less impacting on recreationists' use of the lake than the vehicle traffic immediately adjoining the impoundment on Route 201.

Conclusion. The Highland Wind Project will not significantly compromise views from Wyman Lake and will have a low impact on the views from the Kennebec River below Wyman Dam. The Project will not have an unreasonable adverse effect on its scenic character or the uses related to the scenic character of the lake and river.

⁵⁵ Map B in Appendix A shows the number of visible turbines at three selected viewpoints in Wyman Lake near Wyman Dam.

6.1.F. A scenic viewpoint located on state public reserved land or on a trail that is used exclusively for pedestrian use, such as the Appalachian Trail, that the Department of Conservation designates by rule adopted in accordance with section 3457. (35 M.R.S.A. §3451.9.F.)

► **Appalachian Trail**

As a significant linear feature in the landscape, this VIA subjected the Appalachian Trail within the study area to an analysis of its context, the surrounding area, viewer expectation, and use patterns. An extensive, multi-visit field analysis was conducted which concentrated on viewpoints along the AT, i.e., those places on or adjacent to the AT where there were views beyond the immediate foreground in any direction, regardless of whether Project turbines could or could not be seen (hereinafter referred to as “viewpoints”). A total of 20 viewpoints were identified within 8 miles of the project, and the field investigation examined and measured the following variables at each of these 20 viewpoints:

View Description: focal points, mountains, lakes, cultural features, other objects of interest.

Type of View: panoramic, focused, filtered

Complexity of View: high, moderate, low

Intactness: high, moderate, low

Length of View: paced and/or gps waypoints

Angle of View: measured with a protractor at most open vantage point; accurate to 10°±

Visible Use Patterns: locational signs, evidence of human use, visible changes to the landscape

Spatial Dominance: evaluation of how dominant the turbines would be in the view

Position of Project in View: center, to one side, to the far side, not visible

Competition with Focal Point(s): dominant/co-dominant; secondary; incidental

Other Impressions and Observations.

The results of these observations are included as Table 6: Summary of Viewpoints from Appalachian Trail. These observations are summarized in the following description of the AT. The purpose of compiling this description is to gain an accurate understanding of the hiker’s experience at these viewpoints and then to be able to represent it with graphics and photographs. In addition, a separate document is included as Appendix B, which describes and illustrates the viewpoints experienced when hiking portion of the AT within eight miles of the Project. Appendix B provides photographs of the views as they presently exist, and photosimulations of the same view with turbines added for certain viewpoints where turbines are visible within eight miles. This document is based on observations made during several field visits, photographic records from these trips, and map analysis using WindPRO and Google Earth.

Context. For the northbound hiker, the Appalachian Trail enters the Bigelow Preserve at its southwest side, ascending the south slope of Bigelow Mountain on the Bigelow Range Trail. The AT follows the ridgeline of the Bigelow Range, starting east of Cranberry Peak and extending east over The Horns, West Peak, Myron H. Avery Peak, and Little Bigelow Mountain, where it then descends down to East Flagstaff Road and Long Falls Dam Road. The portion of the AT within eight miles of the Project begins approximately 0.55 miles east of Myron Avery Peak (Avery Peak is more than 8 miles from the project) and 0.25 miles west of Old Man’s Head. The only major peak within the 8-mile study area crossed by the AT is Little Bigelow Mountain (el. 3,040), which is the lowest of the five peaks in the Bigelow Preserve and the lowest of the four peaks crossed by the AT.⁵⁶ Figure 7 provides a profile of the AT within the Bigelow Preserve. The limit of the 8-mile study area falls on the lower slope of Bigelow Mountain, just west of Old Man’s Head.

⁵⁶ North and South Horn sometimes are mentioned as separate peaks and sometimes as a single peak (“The Horns”).

Approximately 19.4 miles of the Appalachian Trail are located within eight miles of the Project turbines. Of this distance, 9.1± miles are within the Bigelow Preserve. The remaining 10.3± miles are on Roundtop Mountain, east of Long Falls Dam Road, and in the wooded lowlands around West, Middle, and East Carry Ponds.⁵⁷

Figure 7: Profile of the AT in the Bigelow Preserve



For the purpose of this analysis the AT within the Bigelow Preserve and within 8 miles of the Project is divided into three distinct segments:

- **Old Man's Head Segment:** from a point west of Old Man's Head (at the outermost boundary of the 8-mile radius from the nearest turbine) to the Safford Brook Trail. This segment has 4 viewpoints (referred to as Viewpoints 1-4 in Appendix B), of which one has a view of the Project within 8 miles. At this viewpoint, the one visible turbine within 8 miles would be seen at a distance of 7.93 miles.
- **Little Bigelow Mountain Ridge Segment:** the length of Little Bigelow Mountain, which runs in a general east-west orientation from Safford Brook to the eastern summit of the mountain. Most of the mountain ridge is located in forestland, with limited views. Of the five viewpoints that were identified in the Little Bigelow Ridge Segment (and referred to as Viewpoints 5-9 in Appendix B), the only views of the Project are from a point near the eastern peak of Little Bigelow Mountain (what is referred to as Viewpoint 9 in Appendix B). From this location there is actually no view of the project from the AT footpath itself (marked A on Figure 8) because the trail is at the base of a 10±' high ledge that rises next to it on the south side of the path. At the top of this rock outcrop (marked B on the sketch) there are outstanding views with three major focal

⁵⁷ The Carry Ponds section of the Appalachian Trail is part of a 17-mile stretch that is characterized by low, wooded ridges and large ponds. "There's not a lot of elevation gain and no great views," said Mark Simpson, overseer of the Carry Ponds section for the Maine Appalachian Trail Club. "It's a fairly easy hike, and there are nice ponds to spend the night at. Hikers will find plenty to their liking here: an exciting crossing of the Kennebec River, three spectacular ponds, two great campsites and even a bit of history. You may spot a moose or two, and at this time of year will likely bump into a "thru-hiker," one of those storied characters hiking the entire AT. The Carry Ponds section makes an appealing two- or three-day hike for backpackers desiring an extra measure of solitude."

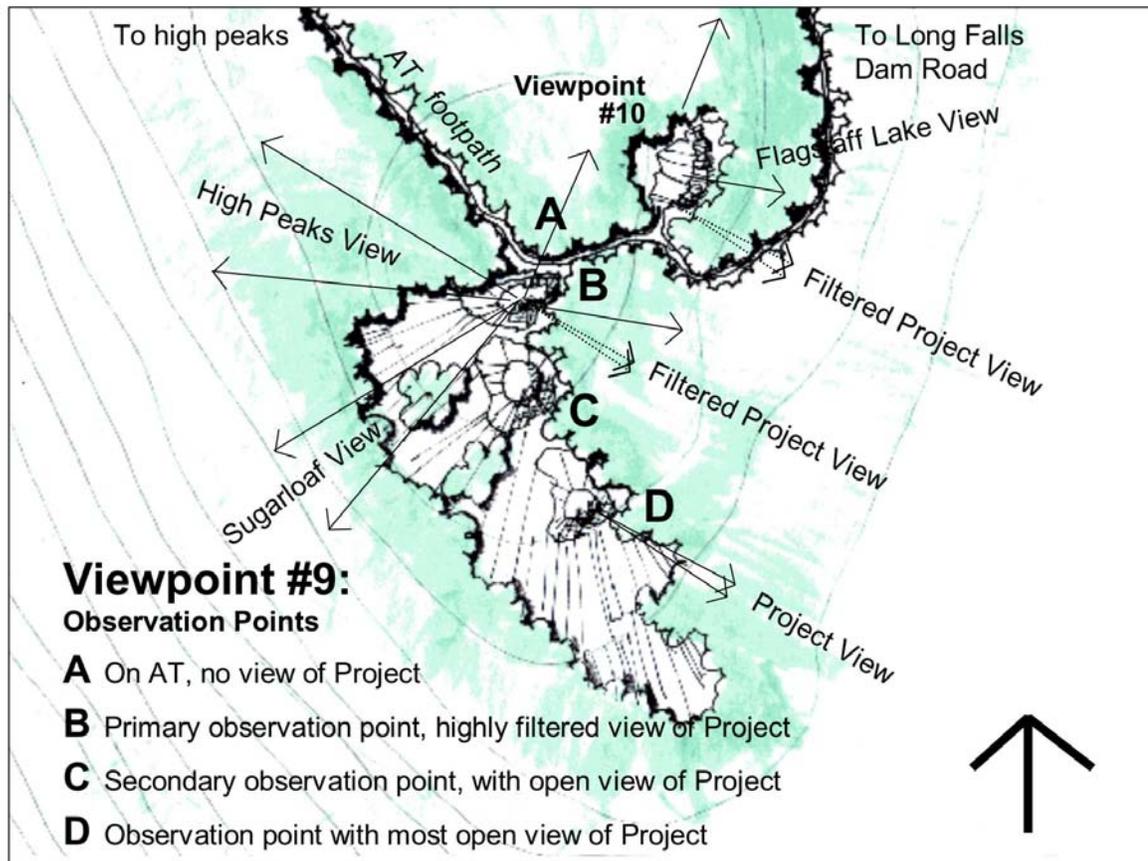
From: <http://outdoors.maintoday.com/hiking/trails/carryponds.shtml>

points: the high peaks of the Bigelow Range to the west, dominated by the sharp profile of Myron Avery Peak; the eastern end of Flagstaff Lake to the north; and Sugarloaf Mountain to the south. The view is particularly noteworthy because of the expansiveness of Carrabassett Valley between the two dominant peaks (Avery and Sugarloaf), and the presence of a significant, highly configured waterbody (Flagstaff Lake). Views to the southeast and east (toward Stewart Mountain and the Project) are almost entirely blocked by trees. There will be highly filtered views of several of the turbines to the southeast. (See photographs and photosimulations in Appendix B.)

Table 6: Summary of Viewpoints from Appalachian Trail

VP	EL	ORIENT	TURB'S W/I 8 MI.		VIEW LENGTH	VIEW TYPE	VIEW ANGLE	% TURB	COMMENTS
			#	DIST.					
1	3,151	NW – S	0		120'	PANORAMA	210°	0	Sign directs hikers to 'Excellent view' from Old Man's Head, 0.1 mile off AT.
2	2,964	N – SW	0		10'	FILT PAN	150°	0	Signed 'viewpoint' 30' off AT
3	2,796	S	0		10'	PANORAMA	60°	0	Signed 'viewpoint' 230' off AT
4	2,336	E – S	1	7.93 mi.	10'	FILT PAN	1°/170°	<.5%	Signed 'viewpoint' 80' off AT
5	2,411	E – S	0		20'	FILT PAN	180°	0	West end of Little Bigelow Mountain
6	2,996	NE – SE	0		25'	FILT PAN	110°	0	Middle of Little Bigelow Mountain
7	3,008	SE – W	0		125'	PANORAMA	160°	0	Dramatic southerly view of Sugarloaf
8	3,035	S – SW	0		20'	FILTERED	45°	0	Southerly view
9B	3,040	E to S	8	5.04 mi.	50'	PANORAMA	5°/300°	2%	Dramatic panorama of Bigelow high peaks, Sugarloaf, Flagstaff Lake from ledge off AT.
9CD	2,985	SE – NW	17	5.04 mi.	50'	PANORAMA	15°/200°	8%	Secondary viewpoint below AT; no lake view.
10	2,957	N – E	17	5.04 mi.	5°/50'	PANORAMA	15°/150°	10%	Panorama view of Flagstaff Lake
11	2,695	SE	0		30'	FILTERED	25°	0	Heavily filtered view to southeast
12	2,711	E – SE	18	4.82 mi.	10°/75'	FILTERED	9°/25°	36%	Short filtered view of project
13	2,479	NE – SE	18	4.80 mi.	65°/250'	COMPLEX	20°/160°	12%	3-part view; project visible for 65' in middle section
14	2,433	NE – SE	17	4.81 mi.	30°/150'	COMPLEX	9°/100°	9%	3-part view; project visible for 30' in middle section
15	2,317	E	0		100'	PANORAMA	100°	0	Panoramic view to Roundtop Mt.
16	2,244	NNE–SSE	16	4.69 mi.	125°/225'	COMPLEX	10°/160°	6%	3-part view; project visible for 125' in middle section
17	2,213	E	0		50'	FILTERED	45°	0	Brief filtered view to east mountains
18	2,137	E	0		150'	FILTERED	45°	0	Brief filtered view to east mountains
19	2,091	E	13	4.67 mi.	50°/200'	COMPLEX	10°/140°	7%	3-part view; project visible for 10' in upper section
20	2,058	E	0		20'	FILTERED	40°	0	Brief filtered view to east mountains
<p>VP: Viewpoint on the AT, from Appendix B. EL: Elevation above MSL. View Length: Horizontal length of trail or width of overlook where turbines are visible. XX/YYYY: XX is Length of Project view and YYY is Total view length. View Angle: XX/YYYY: XX is the horizontal arc described by turbines and YYY is the horizontal angle of the total view. % Turb: Percent of view occupied by turbines COMPLEX: Multiple viewing areas at different levels of the trail; some open, some filtered.</p>									
Viewpoints with heavily filtered views of turbines									
Viewpoints with open / lightly filtered views of turbines									

Figure 8: Viewpoint 9 on Little Bigelow Mountain



The first open view of the Project is from a secondary observation point, marked observation point C on the sketch, a lower rock outcrop below point observation B. From here the views that dominate the hiker's experience still are west toward the high peaks and south toward Sugarloaf Mountain, rather than east/southeast toward the Project. Due to the elevation drop, there is no view of Flagstaff Lake from this point.

For the Project turbines and ridgeline roads to be most visible, the hiker must descend a lower level on the ledge outcrop (marked observation point D on the site map), which requires walking around the trees approximately 125 feet from point B. From here, a total of 17 turbines would be visible at distances of 5.04 miles to 8.0 miles away. (See photosimulations in Appendix B.) However, Portland Research Group, which was on site for five days to observe hikers' behavior on Little Bigelow and to conduct a survey of hikers there on behalf of Highland Wind, found that no hikers venture across the ledge and around the trees to this lower observation point (observation point D). Because the upper observation points (B and C on the site map) form an amphitheater of sorts with dramatic views west and south and with natural seating areas for lunch or rest, there may be little motivation to move farther down and around the ledge to view the less prominent landforms to the east/southeast.

- **The Ledges Segment:** the lower slopes of Little Bigelow Mountain, below Viewpoint 9, include a series of bald and partially wooded ledges that afford periodic views to the north, east, and south. This segment of the trail has 11 viewpoints (referred to as Viewpoints 10 – 20 in Appendix

B) that afford both open, panoramic views and filtered, narrow views of the surrounding landscape. The Project would be visible in varying degrees from 6 of these views at distances of 4.69 miles to 5.04 miles to the closest turbine. In most of these views the turbines would be seen in conjunction with the adjacent Stewart Mountain and the existing transmission line. In none of these views would the Project become the dominant element in the view, due to its distance, relative turbine size, and location. Many of the views from the ledges are broad panoramas, where the focal point is the eastern end of Flagstaff Lake and/or Roundtop Mountain. The turbines, where visible, would be seen at the outer edge of the panorama and would not significantly detract from the major focal points. Throughout most of the trail where the Project may be visible, it would not be viewed directly ahead, but rather would be seen off to the side of the direction of travel. See Appendix B for a photographic record of the views from the AT in this section.

As illustrated in Appendix B and described in Table 7, the majority of the 9.1 miles of the AT within the Bigelow Preserve and within 8 miles of the project is located in softwoods and mixed woodland with infrequent viewing opportunities. Fieldwork by TJD&A has shown that there are approximately 1,700 linear feet of openings along the trail that afford distant views (both filtered and unobstructed) of the landscape beyond the immediate foreground within the 8-mile study area.⁵⁸ Within these 1,700 linear feet there are approximately 350 feet of openings that contain views of the Project.

Table 7: Appalachian Trail within the 8-Mile Study Area

	Miles	Feet
Length of AT within 8 miles of Project	19.4	102,400
Length of AT within 8 miles and within Bigelow Preserve	9.1	48,048
Length of AT with openings with views (both filtered and unobstructed)	0.32	1,710
Length of AT with openings and views of Project	0.07	350

Hikers on the AT within the study area also see several existing, highly visible cultural modifications in the surrounding natural landscape with ample evidence of human activity, making it quite evident that they are not in a wilderness or wild area. These modifications include:

- Flagstaff Lake: a man-made impoundment that was created by the construction of the Long Falls Dam on the Dead River. During low water conditions, it is sometimes possible to see the remnants of the villages of Flagstaff, Dead River, and Bigelow that were displaced by the construction of the impoundment.
- Sugarloaf USA ski resort in Carrabassett Valley. Several of the views include multiple ski trails, access roads, parking lots, and the lodge, hotel, resort homes, and condominium development at the base of the mountain. From some viewpoints the 18-hole Sugarloaf golf course is also visible.
- Sugarloaf Regional Airport (2.7 miles to the south of Little Bigelow Mountain) in Carrabassett Valley adjacent to Route 27.

⁵⁸ As noted in Appendix B, several of these viewpoints are off the AT footpath; some have signs directing hikers to overlooks.

- A 115 kV transmission line within a 110± to 150± foot wide cleared corridor, 0.6-mile from the eastern peak of Little Bigelow Mountain and running parallel to the base of the Bigelow Range, extending to the east and west horizons. The transmission corridor crosses the north end of Stewart Mountain where it is highly visible from the ledges on the east side of Little Bigelow Mountain.
- Recent timber harvesting on Stewart Mountain. The view also includes extensive patch cuts on the western slope of Stewart Mountain, below the northern end of the proposed Highland Wind Project.
- Residential development activities. Roads, reflective roofs, and gravel pits are visible from viewpoints in the Ledges segment of the AT, on the east side of Flagstaff Lake.

Weather conditions also are part of the context of this scenic resource, with implications for both the number of hikeable days and for visibility from viewing points. The weather conditions can be highly unpredictable, with frequent storms and high winds coming in from the north. The following description of climate in this part of the state is excerpted from Mountain Areas in Maine:

“The climate of mountain environments is generally more severe than the surrounding lowlands. It becomes increasingly severe in the higher elevations to a point where altitudes over 2,500 feet in Maine generally experience a subarctic climate... While the average temperature and number of annual frost-free days are reduced with elevation, precipitation increases substantially... Fog and low lying clouds frequent the mountain tops, increasing the humidity. Conifers in the Spruce-Fir zone actually collect several inches of precipitation each year from the fog. In addition to the low temperatures, high precipitation level and the frequency of fog, strong surface winds are often found in the mountain regions... Wind velocities exceeding 100 miles per hour are not uncommon on the summits of many Maine mountains.”⁵⁹

Publicly available meteorological data are unavailable for the Bigelow Range itself. However, certain historical data series from the National Weather Service are available for a few stations that may be relevant. Climatological data are collected at Long Falls Dam on the northeast side of Flagstaff Lake. These data are not broken down by hour, but they do show that for the period from May 1 to October 31 during the five-year period from 2005 through 2009 – a total of 920 days during the hiking seasons of those five years – measurable amounts of rain (greater than a trace) were recorded sometime during the 24-hour period on nearly one-half (47%) of those days.⁶⁰

Significance. The Appalachian Trail is a scenic resource of national significance, by virtue of its designation as a National Scenic Trail.

Public Use

Extent and nature of potentially affected public uses. The public’s use of the segment of the AT within 8 miles of the project (from Old Man’s Head east to Little Bigelow Mountain and East Flagstaff Road) is primarily for seasonal hiking, with the opportunity for overnight stay in a lean-to at the foot of Little Bigelow Mountain. It also is used as a snowshoe trail.

⁵⁹ Mountain Areas in Maine: Report No. 1 – Background and Work Program. T. Hanstedt for the Maine State Planning Office, Augusta. IN The Natural Regions of Maine, Maine Critical Areas Program, Maine State Planning Office, Center for Natural Areas, South Gardiner, Maine. Paul R. Adamus. December, 1978.

⁶⁰ National Weather Service, Record of Climatological Observations, Long Falls Dam, Somerset County, downloaded from the Internet on Oct. 15, 2010

Data on the use of the AT along this segment is sparse. Public agencies do not keep records of use. The Flagstaff Region Management Plan does not include user data. The Maine Appalachian Trail Club (MATC) has log books at shelters and registration boxes along the trail, but primarily for building mailing lists, providing a means of communications between hikers or with the club and similar reasons, and not in order to estimate number of hikers. It does not attempt to do so. MATC has a summer caretaker at Horns Pond tent site in the western part of Bigelow Preserve, who each year estimates the number of visitors to and passing by that site. However, many who hike in the vicinity of Horns Pond (other than AT through- and Bigelow Preserve ridge-hikers) do not make their way as far east as Little Bigelow, and by itself this is of limited use to estimating number of users of the Little Bigelow section of the AT.⁶¹ No other estimates are available from these sources.

In 2002 BPL's Bigelow Preserve Manager made the last formal estimate of use of the different trails in the Preserve. The estimates are for "user days" rather than visitors, but based on certain assumptions such as the distribution of overnight vs. day visitors using the AT in the vicinity of Little Bigelow, the result translates to on the order of 2,100 visitors to this section of trail from May to October, or roughly 13 total users per day on average.⁶²

This is somewhat higher than an estimate based on counts by Highland Wind consultants over eight separate days during May – October 2010. Counts were conducted by Portland Research Group on five of the days and by Evan Richert on three of the days. The days included one Friday in late May, one Saturday in June, two Saturdays in July, one Friday and one Saturday in August, one Sunday at the beginning of October, and one Thursday in late October. None of the days included potentially high-use holidays or, except for the Thursday in October, low-use weekdays. One of the days, though comfortable for hiking, was "socked in" with clouds at the top of Little Bigelow. The other seven days ranged from partly sunny to clear. During these eight days, a total of 62 persons (adults and children) were counted on the trail from East Flagstaff Road to the peak of Little Bigelow Mountain (including the AT lean-to at the base of the mountain), or an average of about 8 per day. It is reasonable to adjust upward for the possibility of having missed very early morning or evening hikers and to account for scouting or other organized groups who use the trail but were not encountered during the eight days of counts. With an adjustment of 25% to 10 users per day – and generously assuming that every day is hikeable, regardless of rain or other inclement weather – this translates into around 1,700 hikers for a season.

Thus, it is reasonable to estimate that the number of users averages 10 to 13 per day during a hiking season that extends from mid-May to mid-October. This represents low-to-moderate use. For context, within the Bigelow Preserve itself, it is approximately one-half the use of the AT in the vicinity of Horns Pond, which, according to MATC, averaged at least 24 persons per day during the 2010 season. Compared to trails in Baxter State Park, this is about one-sixth the number of users on the most used trail (Chimney, with an average of 70-75 per day from May-October 2009) and about one-half the number of users on the fifth most used trail (Abol, with an average of nearly 25 per day from May-October 2009).⁶³

⁶¹ BPL's Bigelow Preserve Manager, Steve Swatling, collected questionnaires completed by hikers from 1993-1997 and found that on the order of half of visitors to Horns Pond were AT northbound or southbound hikers. These by definition pass over the Little Bigelow section of trail at some time. According to MATC, from 1999 to 2010 (excluding 2004, for which data were not reported), the number of thru-hikers passing through Horns Pond averaged 310 per year. However, this probably is not entirely accurate, since some of the reported data appears to be inconsistent and because the caretaker is not on-site 100% of the time and may also miss some early and late season hikers. Looking only at 2005-2009 data from Horns Pond and thru-hiker data from the Appalachian Trail Conservancy's web site for the same period, the average number of thru-hikers recorded at Horns Pond was 385, and by the ATC web site, 396.

⁶² Calculated in cooperation with S. Swatling, Nov. 8, 2010.

⁶³ Source: 2009 Annual Report, Baxter State Park

This modest level of use has several explanations. Little Bigelow is the lowest of the major peaks in the Bigelow Preserve, more than 1,000 feet lower than Avery and West Peaks, and less dramatic. It is not featured as prominently in various hiking guides as other trails and destinations in the Preserve (see “Viewer Expectations” below and the summary of guide descriptions in Appendix E). Further, Little Bigelow’s trailhead is farther from Route 27 than others in the Preserve, such as the Fire Warden’s Trail in Carrabassett Valley and the Bigelow Range Trail in Stratton. And because Little Bigelow is separated from Bigelow Mountain and its higher peaks by a deep notch, the trailhead for this section of trail is significantly farther in hiking distance (8.7 miles) to the closest of the high peaks than all other trailheads, including Safford Brook (4.6 miles to Avery Peak), Fire Warden’s (4.6 miles to Avery, 4.9 miles to The Horns), and Bigelow Range Trail (3.2 miles to Cranberry Peak). It is very arduous, and for most people not possible, to reach the higher peaks via Little Bigelow and then return on a day trip.

Duration of use. The duration of use of the AT as it crosses Little Bigelow appears to vary by type of user. The lengths of exposed areas along the semi-open summit ridge where views are available are relatively brief, as noted in Table 5: AT Viewpoint Summary. Many of the viewpoints are less than 25’ in length; the longest views are 100’ to 250’ in length. The viewpoints at the top of the eastern peak of Little Bigelow (off the AT) are a series of rock outcrops approximately 50’ in diameter.

Many thru- and multi-day hikers who are either coming from or going to the high peaks in the main part of the Bigelow Range tend not to linger on Little Bigelow. If traveling the AT from the south and west, they have already experienced the dramatic views from the high peaks at the top of the range (e.g., Myron Avery Peak, 5 miles away) and are moving through and on to other destinations without stopping. If traveling the AT from the north and east, they are heading west toward the higher peaks. Portland Research Group reported that about half of the thru- and multi-day hikers they encountered stopped at Little Bigelow and about half continued without stopping. They observed no thru- or multi-day hikers who ventured beyond the primary observation point (observation point B on the site map) on Little Bigelow. Thus, none of these thru- or multi-day hikers would have had an open view of the Project’s turbines and ridgeline roads from the top of Little Bigelow before moving off the mountain.

Day hikers are more likely to stop at least briefly for the views from the openings along the so-called blueberry ledges below Little Bigelow and to stop for lunch or to rest at the top of the east peak of the mountain, where the views are expansive. Portland Research Group reported that these visitors tended to eat lunch, rest, and take in the views from observation points B and C on the site map. However, no day hikers ventured to observation point D on Little Bigelow, where views toward Stewart Mountain are unobstructed by foreground trees.

Viewer Expectations. A sense of visitor expectations can be gleaned from the hiking guides that both reflect and shape those expectations. Appendix E summarizes eight of the best known hiking guides for Maine and New England. Little Bigelow Mountain and the section of the AT that crosses it do not have the same prominence in the guides as other trails in a) the Bigelow Preserve, b) western Maine, or c) Maine generally. While all eight of the guides include the AT and other trails and loops that serve the high peaks of the Preserve and typically use expectation-creating adjectives to describe them, the Little Bigelow section is included in only three of the eight guides, and in descriptive language that is considerably more subdued (e.g., Little Bigelow’s “semi-open ridge” versus the “good,” “excellent,” and “outstanding” views from the other AT peaks). In general, based on the presence or absence of the Little Bigelow hike in the guides and by the adjectives used to describe the hikes it is reasonable to conclude that the expectations for Little Bigelow as reflected in the guides are positive but less than those for the higher peaks in the main Bigelow Range or for a number of other hikes in western Maine and statewide.

Viewer expectation is also reflected and derived from on-site cues. The sign at the top of Little Bigelow Mountain is not prominent and does not entice the hiker to any particular viewpoint. By contrast, the hike from the Safford Brook Trail to Old Man's Head contains several small signs placed in prominent locations that direct hikers off the trail to scenic overlooks. The sign for Old Man's Head says "Old Man's Head, 0.1 miles, Excellent View, M.A.T.C." The signs atop Myron Avery Peak and the other high peaks are prominently displayed and appear in many hiker's on-line journals and photo-logs.

An understanding of viewer expectations also comes directly from hikers. Why do they hike? To the extent that views are the motivation and expectation, which places come first to mind as the most scenic outdoor destinations (when asked in an open-ended manner, without prompting)? And what do hikers do once they arrive at or cross the top of Little Bigelow?

- *Reasons for mountain hiking:* Past survey research in western Maine involving proposed wind farms (Spruce Mountain 2010; Redington Mountain 2003) found that summit views are one expectation held by hikers but that large percentages of hikers also cite other motivations. Getting outdoors, physical exercise, and sense of accomplishment tend to be the principal reasons hikers say they hike, along with views and beautiful scenery.

Preliminary results of surveys conducted for Highland Wind by Portland Research Group are consistent with these findings. Among hikers in the western Maine mountains generally, Portland Research Group found, in open-ended questioning, the top reasons for hiking are exercise and health, then scenery and views, being outdoors in nature and fresh air, nature and wildlife, and relaxation and solitude. For those hiking Little Bigelow specifically, it found that the top reasons are being outdoors, exercise and health, and views/scenery, in that order, followed by being part of an AT through-hike.

- *Scenic destinations:* Those who have recently hiked in the western Maine mountains – including those who have hiked in the Bigelow Preserve and those who have not – most frequently cite Acadia and Baxter/Katahdin as highly scenic destinations, according to Portland Research Group's surveys, with small numbers naming a wide variety of coastal and western Maine locations, including the AT.

Among hikers who were surveyed while in the Bigelow Preserve, Bigelow itself or places within it are the second-most frequently mentioned, top-of-mind, as a destination having high scenic value, according to Portland Research Group. Baxter/Katahdin is the most frequently mentioned, and Acadia and places within Acadia are the third-most mentioned. Many other western Maine peaks and trails (Saddleback, Crocker, Goose Eye, Tumbledown, Mt. Blue, Mt. Abram, etc.) also are mentioned top-of-mind by Bigelow Preserve hikers.

Among hikers who were surveyed on Little Bigelow Mountain itself, Little Bigelow was mentioned, top-of-mind, by fewer than one in 10 as a destination having high scenic value, and was not mentioned by any hikers surveyed elsewhere in the Preserve.

- *Hiker viewing activity at top of Little Bigelow:* The most open views from Little Bigelow are at the eastern end of the ridge, below the AT, which is referred to as Viewpoint 9 in this VIA. As shown on the site map of this viewpoint above, the primary vantage point is the high point of a bald rock outcrop immediately above the trail (labeled observation point B on the site map), where there is a nearly circular view that includes the Bigelow Ridge, Sugarloaf Mountain, Poplar Mountain, and Flagstaff Lake but virtually excludes the east/southeastern view toward the proposed Project. As indicated earlier, whether hikers take time to climb to this vantage point and take in the view appears to vary according to whether they are thru- or multi-day hikers or day hikers. Those who

leave the trail and climb atop the outcrop focus on the views to the west and south, which is consistent with comments in the AT Guide (on the back of Map 5 of that guide), which state that the most “striking” views from this observation point are in these directions, i.e., toward Avery Peak and Sugarloaf Mountain and the valley between.⁶⁴

Portland Research Group’s survey of Little Bigelow hikers confirmed the hierarchy of views from this observation point (observation point B on the site map): the scenic value of the high peaks in the west received the highest rating; of Sugarloaf Mountain and Carrabassett Valley in the south, the next highest rating; and of the landscape to the east, the lowest rating – still positive but only modestly above a “neutral” rating. (See photographs of Viewpoint 9 in Appendix B.)

As described in Appendix B, views from the bald ledges of this peak of Little Bigelow Mountain continue for a distance downslope and around a cluster of trees to a 200° overlook (observation point D) that includes Stewart Mountain and Witham Mountain, but not Flagstaff Lake. This is the worst-case viewpoint in terms of the visual impact of the Project, with no trees in the foreground. However, during five days of observations by Portland Research Group, no hikers moved into that viewing position.

In general, people who hike the section of the Appalachian Trail in the Bigelow Preserve within 8 miles of the proposed Project likely have high expectations of scenic quality. However, the expectations for Little Bigelow appear to be lower than for other sections of the AT in the Bigelow Preserve; are shaped by multiple motives and not only summit views; and their viewing experience is strongly influenced by elements of the landscape that are oriented to the west and south, away from the proposed project and, if thru- or multi-day hikers, by their focus on the high peaks in the Preserve. Expectations for a scenic experience are tempered by the presence of four-season recreation development in Carrabassett Valley – including Sugarloaf ski area, Sugarloaf golf course, Sugarloaf Regional Airport, and development along Route 27 – that is directly across the valley from Avery Peak and highly visible from Little Bigelow Mountain; and by a major transmission line that is part of the views to the south and east.

Project Impacts. The Project would be visible (both open and filtered views) from approximately 350 feet (0.07 mile) of the AT within the Bigelow Preserve within an 8-mile radius. From Little Bigelow Mountain most of the turbines would be seen in the background, against the dark color and fine texture of the surrounding mountains and ridges. While the white color of the turbines would be somewhat neutralized to a light gray at that distance by the effects of atmospheric perspective, they would still have a moderate-to-strong color contrast with the surrounding vegetation, except during winter months. The amount of contrast would vary considerably with different atmospheric and light conditions.

Table 6: Summary of Viewpoints from AT, presents the results of Appendix B in tabular form. Of the 20 viewpoints that were identified along the AT within the Bigelow Preserve, 8 would have views of the Project. Of these 8, two and a portion of a third (observation points C and D at Viewpoint 9) would have open views; three would have filtered views; and two and a portion of a third (observation point B at Viewpoint 9) would have highly filtered views.

The length of viewing area is only one measure of potential impact on the AT. If the most important viewpoint had a relatively small viewing area but the view was dominated by a wind energy project, the impact may be high. All along the ledges below Little Bigelow Mountain, however, viewing lengths are brief and the portion of the view occupied by the project will nearly always be small. As shown in Table 6, the percent of viewing angle occupied by the Project will typically be 10% or less of the view.

⁶⁴ The Official Appalachian Trail Guide to Maine. Maine Appalachian Trail Club. 15th Edition. Augusta. 2009.

In general, where there are open views of the Project, it would be perceived as a significant object. However, this is a very large-scale landscape and the Project will be similar in scale to the recreational and community development on Sugarloaf Mountain. The 400-foot tall turbines will be subordinate to the 1,800-foot mountains on which they would be sited and will not appear to dominate the view from any of the viewpoints along the AT.

The potential impact of the project has been minimized by revising this application to remove all turbines from Stewart Mountain, which had been originally slated to have eight additional turbines on its ridge. Stewart Mountain is the highest (el. 2,670'), largest, and closest landform to the east of Little Bigelow. It is oriented to Little Bigelow at such an angle that the originally proposed turbines created the appearance of evenly spaced structures aligned parallel to the AT. In contrast, the Witham and Bald Mountain ridges, with the remaining turbines within 8 miles of the AT, are oriented at nearly a 90-degree angle to Little Bigelow. As a result of this now very different alignment, the turbines will appear over a substantially smaller horizontal area. Moreover, because these ridges are lower than and layered behind Stewart Mountain, the turbines visible from the AT are clearly subordinate to Stewart and appear to be contained by its rising southern flank. As a result, the Project occupies only a 15° arc of view from observation points 9C and 9D (the worst-case viewpoint), within a total 200° horizontal angle of view. The turbines would only be seen in one of the three components of Viewpoint 9; the other two are the more memorable views toward the high peaks in the Bigelow Range and toward Sugarloaf Mountain.

While the impact of turbines on Stewart Mountain in the original layout may not have been “unreasonably adverse,” the present layout is consistent with best practices in the siting of a large-scale project such as this.⁶⁵ Removing the eight turbines from Stewart Mountain results in a Project where the turbines are subordinate to the mountain and creates greater distance between the viewpoint and the turbines.

As noted on the photosimulations from Little Bigelow Mountain in Appendix B, portions of the access roads, cuts and fills, and clearings surrounding the turbines would be visible and appear as changes in color and texture, compared to the surrounding forestland. The new openings from these associated facilities will be considerably smaller and much less visible than the existing patch cuts on the western flank of Stewart Mountain.

If there were hikers on Little Bigelow Mountain after dark, they would see the turbine lights in a relatively tight cluster (within an arc of less than 9°). The Project lighting would be seen in conjunction with lights from roadways, parking areas, the airport, Sugarloaf ski area, and the commercial activity on Route 27 in Carrabassett Valley. No evidence has been found of significant after-dark hiking at viewpoints in which turbines are visible within eight miles. There are no campgrounds or shelters within eight miles of the Project from which turbine lights would be directly visible.

East of Bigelow Preserve. The only view of the Project east of Long Falls Dam Road would be in the vicinity of a small beach near Arnold Point on West Carry Pond, where hikers may be able to see upper portions of up to 15± turbines, mostly near the horizon. The majority of the trail is in forestland and would not have visual contact with the Project. The West Carry Pond Photosimulation in Appendix C illustrates the view from a point on the pond near Arnold Point, approximately 0.25 miles west of the AT and 4.9 miles from the closest turbine.

Potential Effect on Public Use. Past surveys in western Maine of hikers that asked about the impact that a wind power project in a mountain viewshed may have on future use and enjoyment of that resource have consistently found that the impact would be slightly negative to neutral. These past surveys

⁶⁵ See, e.g., Vissering, J, Sinclair, M., and Margolis, A, (Oct. 2010 draft), A Visual Impact Assessment Process for Wind Energy Projects, Clean Energy States Alliance, pp. 15-21.

presented photosimulations of a potential wind power facility, typically from the viewing point where the impact of the project would be greatest.

In evaluating the possible impact of a wind project proposed for Redington Mountain, a 2003 survey found that overall the visual impact on users of Saddleback, Crocker, and Sugarloaf mountains would be “slightly negative,” and that the effect on respondents’ hiking experience would be “slightly negative to no impact.” It found, further, that the impact of the wind project on the quality of the hiking experience was “not as negative as the impact of other evidence of human activity.”⁶⁶

A recent survey of the possible impact of a wind project proposed for Spruce Mountain in Woodstock, Maine, on users of Bald Mountain found that the impact would cause the rating of the viewshed to drop from “slightly above...neutral” to “slightly below...neutral.” It also found that “most respondents thought that the addition of a wind project to the view from Bald Mountain would have no effect on their enjoyment.”⁶⁷

Preliminary results from Portland Research Group’s survey of hikers on Little Bigelow Mountain are consistent with this pattern. The rating of the scenic quality of the view from Little Bigelow to the east indicates a drop from slightly positive to neither positive nor negative when the turbines are added. According to Portland Research Group’s findings, the overall effect on the enjoyment of hiking to Little Bigelow would be in the neutral range (neither positive nor negative); and, overall, the effect on hikers returning to Little Bigelow in the future would be neither positive nor negative.

Conclusion. The Highland Wind Project will introduce large-scale man-made elements into an expansive landscape that is characterized by dramatic landforms, wide valleys, significant recreational development, and other cultural modifications. A majority of AT viewpoints within 8 miles of the Highland Wind Project – 12 of 20 viewpoints – will not have any views of the Project; and at three of the remaining viewpoints, visibility will be so minor or so far to the edge of the view that in some cases they may be easily missed. Where the Project will be visible, important steps have been taken to avoid or minimize the impacts. As a result the Project would occupy a non-prominent location in the landscape and a relatively small part of the view, without interfering with focal points, views of significant mountains, or open ridgelines.

The Project will not have an unreasonable adverse effect on its scenic character or the uses related to the scenic character of the Appalachian Trail. The presence of the Project and associated facilities will have a medium impact on several of the views from the Appalachian Trail within 8 miles. The Project will have a low impact on the public’s continued use and enjoyment of the Appalachian Trail in the Bigelow Preserve, and most who presently enjoy the affected section of trail will continue to return to it when the Highland Wind Project is in place. Overall the scenic impact on the AT within 8 miles of the Project will be low to medium.

6.1.G. A scenic turnout on a scenic highway constructed by the Department of Transportation. (35 M.R.S.A. §3451.9.G.)

As noted in Section 5 above, there are no scenic turnouts on scenic highways constructed by the Maine Department of Transportation from which the Project would be visible.

⁶⁶ Market Decisions, Inc., *The Mount Redington Wind Farm Visual Analysis Survey*, October 2003, p. 5.

⁶⁷ Market Decisions, Inc., *Spruce Mountain Wind Project Intercepts*, June 2010, p. 1.

6.1.H. Scenic viewpoints located in the coastal area. (35 M.R.S.A. §3451.9.H.)

The Project is approximately 66 miles from the coastal area and well outside its zone of visibility. There will be no visual impacts on scenic viewpoints located in the coastal area.

6.2 VISUAL IMPACT OF ASSOCIATED FACILITIES

The associated facilities for the Project are the access roads, the ridgeline roads, the electrical collector line, the generator lead lines, the meteorological towers, the collector substation, and the O&M facility.

6.2.1 Access Roads

Where possible access to the project site will be over existing logging roads, which will be extended and improved to accommodate the necessary equipment and machinery. The primary access will be from the Long Falls Dam Road in Highland Plantation. The access road leading up to the Project site should not be visible to the general public beyond its immediate intersection with Long Falls Dam Road and will not be visible from any scenic resource of state or national significance. See Appendix D for photographs of existing conditions in the vicinity of the access road.

The proposed access road will be very similar in location, character, and width to the many existing logging roads in the surrounding area. Its presence will not cause an unreasonable adverse visual affect on the scenic character of the study area. Adequate provisions have been made for fitting the access road harmoniously into the existing natural environment to ensure that there will be no under adverse effect on the scenic character of the surrounding area.

6.2.2 Ridgeline Roads

Each wind turbine pad will be linked by a 32 foot± wide temporary gravel road constructed on the ridgelines. Following installation, the ridgeline roads will be reduced in width to 16 feet and the wider shoulders allowed to revegetate naturally.

In most locations these roads have been sited out of the viewshed of scenic areas of state or national significance or will be screened by existing vegetation on either side of the road and will not be visible from outside the immediate area. Some of the clearing, road cuts, and downslope fill sections for the ridgeline roads on the western turbine string will be visible from viewpoints 9C, 9D, 12, 13, 14, and 16 on Little Bigelow Mountain. From these viewpoints, this construction activity will be seen amongst a backdrop of forestland that has visible patterns from timber harvesting (i.e., on Stewart Mountain and the Watering Tub). Viewpoints 12, 13, and 14 will have filtered views of the Project, including the ridgeline roads for turbines W10-12. Viewpoint 16 may have a view of some of the road construction in the vicinity of turbines W10-12, although its lower elevation will reduce the amount of cuts and fills that will be visible.

The photosimulation from observation point 9D in Appendix B illustrates the anticipated change resulting from the ridgeline roads. The cuts, fills, and cutting will result in a low overall scenic impact, based upon an evaluation of the following visual elements:

- **Color:** The edge of the clearings for the turbine pads and the stabilized, revegetated fill slopes, will appear as gray green to bright green areas, different in color than the surrounding vegetation in the immediate area. The color should resemble the new vegetation that is appearing in the recent timber cutting activities visible on Stewart Mountain. With time, the new vegetation will

mature and the color contrast will greatly diminish. At distances of 5-8 miles, the effects of atmospheric haze will greatly diminish the color contrast.

- **Form:** The openings created by the ridgeline roads will be similar in form, but somewhat wider, to other roads created for timber harvesting in the study area. Half of the road width will be allowed to revegetate, which will minimize the contrast in form with time.
- **Line:** Several of the road openings are aligned with Little Bigelow Mountain and will be visible from the upper viewpoints along the AT. In most locations the openings created by the roads are discontinuous and do not appear as discrete linear elements in the landscape. One exception is the view from Gilman Pond, where the roads that service the eastern string of turbines will be visible. As seen in the photosimulation from Gilman Pond, this new line will parallel and resemble an existing line in the vicinity of the turbines, thus diminishing the potential contrast in line.
- **Texture:** There will be some contrast in texture caused by the fill slopes and the rock exposed by the road cuts, which will be seen against the wooded texture of the surrounding mountains. The areas that will be visible are small and dispersed throughout the Project. The contrast in texture seen from distances of 5-8 miles will be minimal. As revegetation occurs, the contrast in texture will greatly diminish.
- **Scale Contrast:** At distances of 5-8 miles, the ridgeline roads will appear as small elements in a very large scale landscape.
- **Spatial Dominance:** The access roads will be visible amongst the Project turbines and will not be highly visible from the AT viewpoints. They will not be prominently located in the landscape as viewed from the AT.

In summary, the proposed ridgeline roads will be visible from several scenic areas of state or national significance. While the roads will be visible, their presence will not create an undue adverse visual effect on the scenic character of the surrounding area, due to their dispersed nature and location, the screening effect of the surrounding forests, and the distance to the viewpoints. Their presence will not cause an unreasonable adverse visual effect on the scenic character of the study area. Adequate provisions have been made for fitting the ridgeline roads harmoniously into the existing natural environment.

6.2.3 Electrical Collection System

The electrical collector system will transfer power from the turbines to the proposed collector substation located northwest of Burnt Hill. The collector lines will be located underground along the ridgeline, so there will be no visual impact on any scenic resources of state or national significance. The 9.5±-mile long 115 kV generator lead will connect the on-site collector station to the existing Wyman Dam substation in Moscow.

The substation will be located north of Burnt Hill on an upgraded gravel logging road and will not be visible to the general public or from any scenic resources of state or national significance.

The lead line has been sited to avoid impacting significant viewpoints along the Appalachian Trail or other scenic resources of state or national significance. It has also been sited to minimize impacts on local roads and residential areas. For most of its length, the proposed lead line parallels an existing 115 kV transmission line. (A section of this existing transmission line is located on the north side of Stewart

Mountain, which is highly visible from several locations on Little Bigelow Mountain. The proposed lead line will be located on the east side of Stewart Mountain, out of the Project viewshed.)

The lead line will be visible at the Wyman Dam, where it will parallel the existing 115 kV transmission line that crosses the Kennebec River and ties into the Wyman Dam substation. The landscape immediately below the Wyman Dam is highly disturbed by the existing generating facility and not used by the public for recreational or scenic pursuits. The incremental change to the transmission line will have a low visual impact on the landscape surrounding the Kennebec River at this location. See photographs of Wyman Dam and the surrounding area in Appendix D.

6.2.4 Meteorological Towers

The five permanent meteorological towers will be 80-meters (262 feet) in height, which is approximately the same as the mounting height of the nacelles. The towers are expected to be of a guyed lattice construction with a triangular cross section approximately 18 inches across. While the towers will be within the viewshed of several scenic resources of state or national significance (e.g., the AT, Flagstaff Lake, Gilman Pond), their slim profile and light color will greatly reduce their visibility at distances greater than one mile. At distances greater than one mile, meteorological towers are generally not visible to the unaided eye. Since there are no viewpoints on these scenic resources of state or national significance within one mile of the towers, there will be no adverse visual impacts. The towers will not cause an unreasonable adverse visual affect on the scenic character of the study area. Adequate provisions have been made for fitting them harmoniously into the existing natural environment.

The towers will be lit in accordance with the same FAA regulations that apply to the wind turbines. At night the lights from the meteorological towers will not be distinguishable from those on the turbines, since they will be located at the same elevation and will use the same wattage light fixture.

6.2.5 Operations and Maintenance Facility

The O&M facility will be located approximately 450 feet off Long Falls Dam Road in Highland Plantation. This single-story structure will have a dark roof and be painted a neutral color to minimize contrast in color. Clearing for the structure, parking area, and associated exterior storage will be the minimum required for project needs. The O&M facility will not be visible from Long Falls Dam Road or any scenic resources of state or national significance. Its presence will not cause an unreasonable adverse visual affect on the scenic character of the study area. Adequate provisions have been made for fitting the O&M facility harmoniously into the existing natural environment.

7.0 SUMMARY OF VISUAL IMPACT ANALYSIS

Criteria: The Maine Wind Power Law established six criteria (35-A MRSA §3452 (3) (A through F) to determine whether expedited wind energy development significantly compromises views from a scenic resource of state or national significance such that the development has an unreasonable adverse effect on the scenic character or existing uses related to scenic character of the resource. For the purpose of this summary analysis, one of the six criteria (subparagraph E in the statute) has been divided into two, resulting in seven criteria for analysis. The summary presented in Table 8: Summary of Evaluation Criteria, is based upon the information provided in this VIA, and is based upon the approach recently used by LURC scenic impact consultant James F. Palmer in (1) his *Review of the Spruce Mountain Wind Project Visual Assessment by James F. Palmer*, prepared for the Maine Department of Environmental June 11, 2010, and (2) his *Summary Review of the Amended Kibby Expansion Wind Project Aesthetic Impact Assessment*, prepared for the Land Use Regulation Commission, October 2, 2010.

Four of the seven criteria evaluate existing conditions and use patterns in the study area. These are lettered as listed in the Act, with criterion E divided into E.1 and E.2:

- A. Resource Significance:** This criterion reflects the designation of scenic significance by the State or Federal Government. All the resources on the table have been identified as Scenic Areas of State or National Significance, and all scenic resources of state or national significance within 8 miles of any turbine have been listed.
- B. Character of Surrounding Area:** This criterion evaluates the setting of the resource and its surrounding area, taking into account landform, vegetation patterns, water bodies, and cultural features.
- C. Viewer Expectation:** This criterion takes into account the designation and significance of scenic quality by state agencies, the intrinsic scenic character of the resource, the presence of cultural modifications, assessments of the resource by surveyed hikers and their motivations for using the resource, the manner in which the resource is publicized, and other factors.
- E.1 Extent, nature & duration of uses:** This criterion looks at the relative number of users, the accessibility of the resource for public use, the types and extent of facilities and of views, typical length of stay, and information on use patterns from the intercept survey.

One of the criteria addresses the purpose of the project:

- D. Purpose and Context:** This criterion is a reflection of how much the Project contributes to the state's goals for energy as per the Wind Energy Act (installed capacity of 2000 megawatts by 2015), proximity to existing infrastructure (i.e., transmission lines, substations, and roads), and how efficiently a particular location is used to take advantage of the wind after consideration for avoiding or minimizing visual impacts.

Finally, two of the criteria address the potential visual impact of the project on use of the scenic resource of state or national significance and on the surrounding landscape:

- E.2 Effect on continued use and enjoyment:** Findings under this criterion are largely based on the intercept surveys to determine if the Project would significantly affect their continued use and enjoyment of the resource.
- F. Scope and scale of project views:** This criterion looks at the number of turbines visible, their position in the landscape relative to the viewers, the horizontal angle of view that they are seen over, and the distance from the observer. As directed by the Wind Energy Act, only turbines within eight miles of the resource are considered.⁶⁸

Summary Analysis of Visual Impacts: Table 9 summarizes the evaluation of the Highland Wind Project against these criteria in a summary chart format, based on the analysis in this Visual Impact Assessment. Table 8 consists of a key that explains the ratings, followed by the summary analysis.

⁶⁸ "The primary siting authority shall consider insignificant the effects of portions of the development's generating facilities located more than 8 miles, measured horizontally, from a scenic resource of state or national significance." (35-A MRSA §3452 (3))

Table 8: Key to Summary Evaluation of Criteria Ratings

CONTRIBUTION TO SCENIC QUALITY	RESOURCE/VIEWERS CRITERIA: A, B, C, E.1	PURPOSE CRITERIA: D	SCENIC IMPACT CRITERIA: E.2, F	OVERALL SCENIC IMPACT
	No contribution to scenic impact			None: Project makes no contribution to scenic impact.
	Areas where landforms, water bodies, vegetation patterns, and/or cultural patterns are of significant visual quality; recognized state-wide significance; moderate expectations of scenic value; low visitor use.	Significant contribution to meeting state energy goals. Takes advantage of existing infrastructure.	Small number of turbines visible, partial visibility, longer distances to turbines, surroundings already strongly modified, incidental presence in landscape, relatively low use of resource, neutral or positive effect on use and enjoyment of the resource.	Low. While the scenic impact may be adverse, it is within an acceptable range for any type of development.
	Areas where landforms, water bodies, vegetation patterns, and/or cultural patterns are of outstanding visual quality; of statewide or greater significance; moderate-high expectations of scenic value; moderate visitor use.	Moderate contribution to meeting state energy goals. Moderate infrastructure extensions required.	Greater number of turbines, more fully visible, medium distances, somewhat modified surroundings, contrast with surrounding landscape, notable presence in landscape but does not displace natural focal points, neutral to slightly negative effect on use and enjoyment of the resource.	Medium. The impact is adverse but typical of wind energy development and within the range of impacts that the Wind Energy Act anticipates.
	Areas where landforms, water bodies, vegetation patterns, and cultural patterns are all of outstanding visual quality; iconic imagery of national significance; high expectations of scenic value; high visitor use.	Insignificant contribution to meeting state energy goals. Extensive infrastructure extensions required.	Many turbines are fully visible at short to medium distances, dominating the landscape or competing with natural focal points; resulting in a clearly negative effect on use and enjoyment of the resource.	High. High impact that, in association with other criteria, may make the overall scenic impact unreasonably adverse.

Table 9: Summary of Evaluation of Criteria Ratings for Highland Wind Project

	Resource/Viewers Criteria				Purpose	Impact Criteria		Overall Scenic Impact
	A: Resource Significance	B. Character of Surrounding Area	C: Viewer Expectation	E.1: Extent, Nature, Duration of Use		E.2: Continued Use and Enjoyment	F: Scope and Scale of Project Views	
6A. Nat'l Natural Landmark								
Bigelow Preserve, within 8 miles of HWP								Low-to-Medium
6B. Historic Sites								
Arnold Trail, w/in 8 miles								Low
Bingham Free Meetinghouse								None
6D. Great Ponds								
Flagstaff Lake, w/in 8 miles								Low-to-medium
Gilman Pond, w/in 8 miles								Low-to-medium
Jackson Pond								None
6E. Scenic River Segment								
Kennebec River, w/in 8 miles								Low
6F. Scenic Viewpoints								
Appalachian Trail, w/in 8 miles								Low-to-Medium
6F. Scenic Turnouts								
Route 27, Carrabassett								None

Summary Explanation (See Section 6 for detailed discussion):Criteria concerning existing resources and viewers:

- A. Resource Significance:** The Bigelow Preserve, overall, is a highly significant scenic resource, providing a wide range of recreational opportunities on its 35,843 acres. Only the eastern quarter of the Preserve is within 8 miles of the Project, and the only peak in this section is Little Bigelow Mountain, the lowest of the peaks within the Preserve. At just over 3,000 feet, it is an important but not a unique resource in western Maine. On its own, the scenic significance of this section of the Preserve does not achieve the significance of the Bigelow Preserve as a whole and the high peaks for which it is best known; therefore, it is given a medium/high rating. The same may be said about the stretch of AT within 8 miles of the Project, but because it is a specific recreational resource recognized as a national scenic trail, it is assumed to have high resource significance.

Flagstaff Lake is a large, important recreational lake but is an artificial body of water created to generate energy and is subject to significant drawdowns and the resulting exposed shoreline and fluctuating conditions. State assessments consider it to have “significant,” but not “outstanding,” visual quality. The Arnold Trail has historical military significance, but its designation is silent on its significance as a scenic resource. Gilman Pond was rated in state lake assessments as having “significant”, but not “outstanding” scenic resources, with deductions for “inharmonious development.” Each of these resources receives a medium rating for resource significance.

The Kennebec River segment within 8 miles of the Project is impounded for large-scale hydropower and is incorporated into Wyman Lake, which itself is not considered to have either outstanding or significant scenic value by state assessments.

The Project is not visible from Bingham Free Meetinghouse, Jackson Pond, or the Route 27 scenic turnout, and these are not further analyzed.

- B. Character of Surrounding Area:** The surrounding area is characterized by its largely natural quality, with significant topographic variety, highly configured lakes, extensive woodlands, most of it intact. From some vantage points and in some directions, the surrounding area has a pristine appearance. However, this is not universally the case: from other vantage points and in other directions – including the southern and eastern views from the ridges in the Bigelow Preserve – there are several large-scale manmade developments within the same viewshed, including a ski area, airport, and transmission line corridor, as well as signs of other human intrusions, including gravel pits and forest harvesting operations.

The ratings given by hikers to different views from Little Bigelow Mountain during the intercept interviews are indicative of the variability of the character of the surrounding area. Views to the north and west were given high scenic value ratings, while views to the south and east received considerably lower (but still positive) ratings. In most instances, the character of the surrounding area is medium to high. The scenic character of the area surrounding the Arnold Trail in the project area is almost entirely woodlands without distant views; thus, it receives a low rating.

- C. Viewer Expectation:** Based on past surveys of hikers who might be affected by proposed wind energy projects (e.g., Spruce Mountain, Redington Mountain), it is evident that expectations of visitors are multifaceted. Some put highest value on views, while others are more strongly motivated by being outside in the fresh air, by exercise, for family activity, or by sense of accomplishment. In its survey research for Highland Wind, Portland Research Group made similar

findings, with most respondents motivated by a combination of these. Diminishment of one factor does not necessarily ruin the experience and would not necessarily cause visitors' experiences to fall short of expectations.

Further, expectations vary by location: hiking guides and the survey results both indicate that in the Bigelow Preserve and on the AT as it crosses the Preserve, the highest expectations are associated with the western part of the Preserve and the trails leading to the high peaks. The eastern end of the Preserve and Little Bigelow Mountain have somewhat lesser expectations. Viewer expectations on Flagstaff Lake likely are high, given its surroundings, but tempered by fluctuations in water levels. Overall, viewer expectations of the major scenic resources are estimated to be medium-to-high.

E.1 Extent, nature & duration of uses: Recreational uses of the scenic resources tend to be non-motorized, although not exclusively. Uses are centered on hiking, camping, fishing, snowshoeing, and similar pursuits, with some motor and tour boats on the lakes and winter snowmobiling. Within the 8-mile radius of the Project area, the relative numbers of users of the different scenic resources are low-to-moderate. In the cases of Arnold Trail and Gilman Pond, public access either is limited or difficult to find. In the case of Little Bigelow and the section of AT that crosses it, use is low to moderate both in absolute terms, compared with elsewhere in the Preserve, and compared, for example, to outdoor destinations in Maine such as Baxter State Park. In the portions of the Preserve and along the section of AT where the Project would be most visible, the openings for views typically are brief or intermittent and to the side, so that the hiker likely will make only relatively brief note of the Project. At the eastern peak of Little Bigelow, the hikers who stop for lunch, rest, or the views, are drawn first (and often only) to a primary vantage point that offers outstanding panoramic views of the Bigelow Range, Sugarloaf Mountain, and Flagstaff Lake. From this viewpoint the Project is highly filtered by trees and will not be prominently visible. Some hikers appear to move to a secondary vantage point from which the Project will be visible; virtually none appears to move to a third vantage point that has the most open view of the Project and its surrounding landscape.

Flagstaff is a moderately active recreational lake with a variety of uses that are enhanced by the presence of the dramatic profile of the high peaks of the Bigelow Range. The Project will be visible from about one-sixth of the lake, all in the southeastern section that appears to have fewer users than in the western part of the lake near Stratton. The affected area may have less use due to the winds and waves that can challenge canoeists and kayakers in this part of the lake, which is generally wider and less protected than the western end.

In general, there are low-to-moderate uses of the scenic resources of state or national significance within 8 miles of the Highland Wind Project.

Criterion concerning purpose and context:

D. Purpose and Context: The Highland Wind Project, with 39 turbines and an installed capacity of 90 to 117 megawatts, will account for about 4.5% to 6% of the statewide goal of 2000 megawatts of installed wind power capacity by 2015. It takes efficient advantage of the available wind along its two proposed turbine strings.

By excluding Stewart Mountain – an adjacent high value wind location – it reduces the potential installed capacity by about 20 - 24 megawatts, but balances the efficient use of wind to produce energy with the need to avoid and minimize visual impacts to scenic resources of state and national significance.

Further, the Project is located to take advantage of an existing, proximate transmission line corridor and existing roads so that inordinate extensions of this infrastructure are avoided. Overall, the Highland Wind Project makes a major, efficient contribution to the Wind Energy Act's goals.

Criteria concerning impact on public's use and the landscape:

E.2 Effect on continued public use and enjoyment: Survey findings by Portland Research Group, which will be reported in full in a separate report, indicate that the impact of the Project will be neutral on the continued use and enjoyment of the section of the Appalachian Trail and Bigelow Preserve in the vicinity of Little Bigelow Mountain. The viewpoint at the eastern end of Little Bigelow Mountain has multiple view components, only one of which (toward the southeast) includes the Project. Considering that viewing opportunity on its own, the rating of its scenic value drops from somewhat favorable overall to neutral overall when the Project is introduced. Respondents overall said the Project would not affect them either positively or negatively in returning to Little Bigelow Mountain in the future. These results are consistent with findings of other intercept surveys that analyze the visual impact of wind power projects on future use and enjoyment. The rating in Table 8 Summary reflects this neutral effect. In the context of the Wind Energy Act, this is a key, outcome-based finding: that the scale, location, and configuration of the project will not discourage continued use and enjoyment of the scenic resources it is affecting.

The Project is not expected to have a significant effect on the existing use and enjoyment of the Arnold Trail. The few people who follow Arnold's route are drawn to the area for its historic resources, which will not be affected by the Project. The turbines will only be visible from a very short segment of the trail near West Carry Pond, a waterbody that has a significant number of cottages lining its shore.

Gilman Pond has virtually no public use, since the roads into the pond are signed and gated, and there is no public boat launching facility available. The presence of the turbines should have no impact on the general public's continued use of this resource.

By all accounts, public use of the southeastern end of Flagstaff Lake where turbines would be visible is light. The majority of the use is by canoeists and kayakers, who are drawn to the lake by the presence of the Bigelow Range and the opportunities for lakeside camping. The Project will not be visible from most of the southern shore of the lake, with the exception of the area near Bog Brook, nor will it be visible from the newly constructed campsite near Bog Brook.

F. Scope and scale of project views: The Project will not become the dominant feature of the landscape as seen from any of the scenic resources of state or national significance within 8 miles of the Project. Several factors enable the project to be absorbed in the larger landscape without dominating it:

- **Stewart Mountain.** Stewart is the largest and highest landform in the immediate vicinity of the Project (i.e., east/southeast of the Bigelow Range). As such it serves as a partial topographic buffer between some of the scenic resources (such as Flagstaff Lake) and the Project. In other places its position in the landscape helps to diminish the scale of the Project from these viewpoints. Finally, the south slope of Stewart visually contains the extent of those turbines seen from the AT and Little Bigelow. As a result, the turbines appear to be clustered, occupying a relatively small horizontal field of view.
- **Distance to turbines:** From most of the viewpoints that are part of scenic resources of state or national significance, the turbines will be seen in the far mid-ground or background, where they

will appear as relatively small objects in a very large-scale landscape. In addition, distance increases atmospheric effects that tend to gray the turbines and reduce color contrast with the surrounding landscape.

- **Narrow horizontal field of view:** From the AT the Project is generally seen over a horizontal arc of 10° to 20°. In those few viewpoints where the turbines are visible, they are seen in the context of a much wider panorama, occupying a relatively small percentage of the overall view. In all cases where there are views of the turbines, they do not interfere with the dominant points of interest, such as the Bigelow Range, Sugarloaf Mountain, or Flagstaff Lake.
- **Short lengths of views:** The Appalachian Trail, the Arnold Trail, Wyman Lake, and Flagstaff Lake (Northern Forest Canoe Trail) are all linear scenic resources. Within the 8-mile study area, the Project will be visible along relatively small fractions of their trails or surfaces. These include 8 of 20 viewpoints covering 350 feet of 1,710 feet of viewing area on or near the 9.1 miles that the AT is within the Bigelow Preserve; approximately 2.5 miles of the 18± miles of Northern Forest Canoe Trail on Flagstaff Lake; and a short segment of the 12-mile Great Carrying Place Portage Trail. When the Project is visible from the AT, the trail is rarely oriented directly at the turbines, and thus it will not present itself as a focal point and will not be seen for extended periods of time.
- **Limited number of turbines visible within 8 miles:** While the Project consists of 39 turbines, the rolling to mountainous terrain and the nature of the viewing opportunities limit the number of turbines visible from any given scenic resource of state or national significance.
- **Associated Facilities:** Roads and transmission lines have been sited to avoid visual impacts from scenic resources of state or national significance at higher elevations, such as Little Bigelow Mountain.

8.0 CONCLUSION

There are several scenic resources of state or national significance within the viewshed of the Highland Wind Project. Within the 8-mile study area the most significant scenic resources are the views from Little Bigelow Mountain on the Appalachian Trail in the Bigelow Preserve, the eastern end of Flagstaff Lake, and Gilman Pond. A portion of the Arnold Trail, a nationally significant historic resource, runs from Wyman Lake to Flagstaff Lake within the study area.

Within the study area, the project will not be visible from any state parks, MDOT scenic turnouts, or scenic viewpoints located in the coastal area. Throughout the majority of the study area, views of the wind turbines (“generating facilities”) are blocked by topography and roadside vegetation.

The associated facilities for the Project (i.e., the access road, ridgeline road, the underground electrical collection system, the above-ground electrical transmission line, and the O&M facility) will have limited impact on views from scenic resources of state or national significance. The associated facilities will not be of a location, character, or size to cause an unreasonable adverse visual affect on the scenic character of the study area.

This VIA examined the criteria established by the Wind Energy Act: i.e., the context, significance, existing public use, viewer expectations, project impact, and the potential effect on public use and enjoyment for each of the scenic resources of state or national significance. This information was used to

make a determination of whether the project would significantly compromise views from any of these resources such that it would have an unreasonable adverse effect on its scenic character or the existing uses related to its scenic character. While the Highland Wind Project will have adverse visual impacts on several of these resources, these impacts will not be unreasonable and will be within the range expected and allowed under the Act.