

**Review of the  
Spruce Mountain Wind Project  
Visual Impact Assessment**

**James F. Palmer**

Scenic Quality Consultants  
Burlington, Vermont

June 11, 2010

## Table of Contents

<b>1. Introduction.....</b>	<b>1</b>
<b>1.1 Legislative Background.....</b>	<b>1</b>
<b>2. Adequacy of the Report .....</b>	<b>6</b>
<b>2.1 Project Description.....</b>	<b>6</b>
<b>2.2 Landscape Character .....</b>	<b>6</b>
<b>2.3 Visibility Analysis.....</b>	<b>6</b>
<b>2.4 Significant Scenic Resources.....</b>	<b>7</b>
<b>2.5 Public Use and Expectations.....</b>	<b>8</b>
<b>2.6 Evaluation of Potential Scenic Impacts .....</b>	<b>9</b>
<b>2.7 Mitigation .....</b>	<b>12</b>
<b>3. Field Review and Additional Analysis.....</b>	<b>12</b>
<b>3.1 Field Review.....</b>	<b>12</b>
<b>3.2 Visibility Analysis.....</b>	<b>15</b>
<b>3.3 Visual Simulations.....</b>	<b>18</b>
<b>3.4 Interviews with Visitor on Bald Mountain.....</b>	<b>22</b>
<b>4. Discussion of Additional Issues.....</b>	<b>25</b>
<b>4.1 Selection of Simulation Viewpoints.....</b>	<b>25</b>
<b>4.2 Standardization of Analysis .....</b>	<b>26</b>
<b>4.3 Importance of Public Access to Potential Significant Scenic Resources.....</b>	<b>26</b>
<b>4.4 Lack of Levels of Significance for Scenic Resources .....</b>	<b>26</b>
<b>4.5 Lack of Information about Scenic Resource Users .....</b>	<b>27</b>
<b>4.6 Cumulative Scenic Impacts.....</b>	<b>27</b>
<b>4.7 Mitigation .....</b>	<b>28</b>
<b>5. Summary .....</b>	<b>28</b>
<b>6. Conclusions.....</b>	<b>32</b>
<b>7. References.....</b>	<b>33</b>
<b>Appendix 1. Viewshed Maps.....</b>	<b>37</b>
<b>Appendix 2. ArcScene Visualizations.....</b>	<b>42</b>

## 1. Introduction

On January 13 22, 2010, Patriot Renewables LLC submitted a Site Location of Development Act application for the proposed 18 to 20 megawatt (MW) Spruce Mountain Wind Project located on 2,879 acres in Woodstock, Oxford County, Maine. The generation facilities include:

- either 10 Gamesa (G90 or G87) 2.0-MW turbines or 11 General Electric (GE), 1.5-MW turbines. The height of the Gamesa turbines is approximately 78 meters to the center of the hub, plus 45 or 43.5 meters for the rotor blades. The height of the GE turbine is approximately 80 meters to the hub center plus 38.5 meters for the rotor blades. The turbines will be painted white. Red warning lights will be installed according to Federal Aviation Administration (FAA) guidelines.
- a 34.5-kilovolt (kV) underground collector line system buried within the ridgeline access road work limits, and continuing above ground on wooden poles from the vicinity of the southern most turbine for approximately 6,890 feet, traversing the southwest side of the mountain to Cushman Road. The transmission line will travel approximately 2.8 miles within west the right-of-way for Cushman Road, Route 26 and Route 232 to the existing Woodstock Substation.

Associated facilities include:

- an approximately 7,200-linear foot access road extending from Shagg Pond Road to where the turbines will be installed on Spruce Mountain.
- an approximately 1,750-square-foot Operations and Maintenance building and 8,000-square-foot parking lot located at the intersection of Shagg Pond Road.
- an overhead electric distribution line and fiber-optic cable will connect to the turbines.

The report entitled *Visual Impact Assessment Spruce Mountain Wind Project* by Terrence J. DeWan & Associates (2010) was submitted as part of this application. This review concerns the adequacy of the *Visual Impact Assessment* (VIA), plus supplemental simulations added to the report in May, and a visual survey of users on Bald Mountain conducted over the Memorial Day weekend (Mildner & MacBride 2010).<sup>1</sup>

The remainder of the Introduction summarizes the important changes the *An Act to Implement Recommendations of the Governor's Task Force on Wind Power Development* (hereafter referred to as the Wind Energy Act) made in evaluating scenic impacts from expedited grid-scale wind energy development and how this fits into a standard process of visual impact assessment. The second section evaluates the Adequacy of the Report by focusing on the completeness with which each of the steps in the VIA process are addressed in the *Visual Impact Assessment Spruce Mountain Wind Project*. The third section reports on the fieldwork and additional studies conducted for this review. The fourth section selectively expands on this through a Discussion of Additional Issues. The final section presents the Summary Conclusions.

### 1.1 Legislative Background

On April 18, 2008, Governor John Baldacci signed *An Act to Implement Recommendations of the Governor's Task Force on Wind Power Development* (the Wind Energy Act). It establishes a

---

<sup>1</sup> For the purposes of this review, aesthetic, scenic and visual impacts will be considered synonymous.

favorable State policy encouraging grid-scale wind energy development in appropriate locations. In particular, it designates a large portion of the state for expedited grid-scale wind energy development. While most environmental impacts are evaluated in the same manner as previously, special provisions are made for scenic impacts.

While the provisions of the Wind Energy Act can be viewed as an effort to simplify and clarify visual impact assessments, questions of interpretation still remain. There are several major determinations that effect how a visual impact assessment is to be conducted.

**What is the standard of scenic impact evaluation?** The standard is “Unreasonably Adverse,” and it only applies to views from significant scenic areas. “The primary siting authority shall 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;”<sup>2</sup> whether the development “fits harmoniously into the existing natural environment” is explicitly not required.<sup>3</sup>

**What evaluation criteria are to be used?** The Wind Energy Act lists six evaluation criteria:<sup>4</sup>

- A. **“Significance of...affected scenic resource;”** The Wind Energy Act does not explicitly describe how significance should be considered. One reasonable interpretation is that all scenic resources are equally significant. Another interpretation might be to distinguish between state and nationally designated scenic resources. However, this difference does not seem to have much to do with scenic quality, *per se*. Perhaps the most appropriate interpretation of this criterion is the significance of scenic quality in the identification and designation of a particular scenic resource. Sometimes the level of significance is indicated in the report responsible for the designation (i.e., *Maine’s Finest Lakes, Maine Rivers Study*, or a Nation Register of Historic Places nomination form).
- B. **“Existing character of surrounding area;”** The Wind Energy Act explicitly states that whether “a wind energy development fits harmoniously into the existing natural environment in terms of potential effects on scenic character and existing uses related to scenic character is not required.”<sup>5</sup> Since harmonious fit cannot be the criterion, perhaps it is whether perception of the landscape’s character type is significantly changed. For instance, does the visible presence of many wind turbines change the perceived landscape character from “wooded hillside with scattered residences,” to “industrial facility”?
- C. **“Expectations of the typical viewer;”** Viewers may have certain expectations for the visible character of certain scenic resources. For instance, they may expect that views from a particular state park or hiking trail be predominately natural appearing. However, it is reasonable to question the appropriateness of viewer expectations, such as when people describe lands intensively managed for timber as “wilderness.” In addition, viewer expectations change in reaction to changed circumstances. A few turbines may be approved because the project is small—once built people’s expectations change, making

---

<sup>2</sup> 35-A MRSA, § 3452, sub-§1

<sup>3</sup> 35-A MRSA, § 3452, sub-§1

<sup>4</sup> 35-A MRSA, § 3452, sub-§3

<sup>5</sup> 35-A MRSA, § 3452, sub-§1

it possible to build additional turbines. Consideration of this incremental cumulative change may be the point of the next criterion.

- D. **“Expedited wind energy development’s purpose and...context;”** The Wind Energy Act makes it clear that the Legislature believes tapping the state’s wind resource is desirable, and has set substantial wind energy generation goals.<sup>6</sup> In addition, the Legislature recognizes that “wind turbines are potentially highly visible landscape features that will have an impact on views.”<sup>7</sup> It seems reasonable that the Legislature intended that areas determined to be suitable for grid-scale energy development be utilized to their full capacity. This criterion may require consideration of the wind energy potential of the surrounding context, and evaluating the scenic impacts of fully building-out the area’s capacity to produce wind energy. The greatest impact comes from the initial wind turbines built in an area; additional turbines will add a smaller incremental scenic impact, making it very difficult to determine where to stop further development. It may be most responsible to consider potential cumulative wind development impacts to an area as part of an initial proposal.
- E. **“Extent, nature and duration of the...public use of the scenic resource...and the...effect...on the public’s continued use and enjoyment of the scenic resource;”** This evaluation criterion says that we need to know what activities are occurring at significant scenic resource sites, how many people engage in these activities, for how long, and what the impact of seeing the project will have on the enjoyment of these activities. Said another way, “Is an Adverse scenic impact Unreasonable if turbines are only visible from a rarely visited viewpoint, or seen by very few people. or only visible to people engaged in an activity for which scenic quality is not central to its enjoyment?”
- F. **“Scope and scale of the...effect of views of the generating facilities...including...number and extent of [visible] turbines, ...distance [to visible facilities] ...and effect of prominent features of the development on the landscape”** The issue is whether the generating facilities become dominating elements in the landscape, primarily because of the area they occupy in the visual field.

**What constitutes a significant scenic resource?** The Wind Energy Act specifies that only designated state or nationally significant scenic resources be evaluated and provides a list of qualifying designations. In this review further reference to scenic resources will assume that they are state or nationally significant. While a major step toward specificity, it is anticipated that interpretation of this list will be contested. For instance, this list includes resources typically designated for non-scenic reasons (e.g., national landmark or registered historic place), and only minor portions of resources designated for scenic reasons (e.g., only the turnouts of a scenic byway). In addition, “the public [must have] a legal right of access” if the significant scenic resources is not on public land (e.g., listed historic place or conservation land).<sup>8</sup>

**What is the area of potential effects (APE)?** The Wind Energy Act states that scenic impacts from generating facilities (i.e., turbines or transmission lines) located 8 or more miles from a

<sup>6</sup> 35-A MRS.A, § 3402, sub-§2

<sup>7</sup> 35-A MRS.A, § 3402, sub-§2(C)

<sup>8</sup> 35-A MRS.A, § 3451, sub-§9

scenic resource are “insignificant.”<sup>9</sup> The regulations presume that potential scenic impacts to scenic resources must be evaluated within 3 miles of generating facilities. The primary siting authority may also require the evaluation of potential scenic impacts to state and nationally significant scenic resources located between 3 and 8 miles from generating facilities.<sup>10</sup> As a result, it is anticipated that normally the visual impact assessment will study the area within 8 miles of the proposed generating facilities.

### **Process of Conducting a Visual Impact Assessment**

While the Wind Energy Act has focused which views are to be considered and established criteria and a standard for their evaluation, there is no apparent reason that the process by which a visual impact assessment (VIA) is conducted would be changed. While there are slight variations, a professionally conducted VIA includes the following:

1. **Project Description.** The purpose and context of the project must be described, as it is one of the evaluation criteria.<sup>11</sup> In addition it is necessary to describe the visible attributes of the generating and associated facilities.
2. **Landscape Character.** The description of the landscape character establishes the context for evaluating any visual change from introducing the proposed development.<sup>12</sup> What is the visual character of the landform and vegetation? What is the visual character of the settlement pattern and road network? How does the project site relate to the larger regional landscape context—is it unusual or mundane? The US Forest Service describes landscape character this way:

Landscape Character descriptions are a combination of the objective information contained within ecological unit descriptions and the cultural values that people assign to landscape. Together they help define the meaning of “place”, and its scenic expression (USDA FS 1995, page 1-1).

The regional landscape character is described first. Often there are several distinct landscape units to describe. The character (e.g., ecological zone) and scenic attractiveness (e.g., vividness, intactness, unity) of each landscape unit is summarized (USDA FS 1995, page 1-15). A somewhat more detailed description is given for the project site and its APE.

**Visibility Analysis.** A visibility or viewshed analysis identifies those areas with potential views of the proposed development. The minimum professional standard is to map the topographic viewshed for the highest point of each major project element. This shows those areas that have a potential view of the tip of an upright turbine blade if all land cover were removed. Since it is possible that views to a project could be opened by the removal of land cover, a topographic viewshed is considered a useful conservative assessment of the maximum area of potential project visibility.

Typically, a second visibility analysis includes the screening effect of forest cover. The three forest classes (deciduous, evergreen and mixed) of the National Land Cover Database are most commonly used. Forest height is typically set to a regionally

---

<sup>9</sup> 35-A MRSA, § 3452, sub-§3

<sup>10</sup> 35-A MRSA, § 3452, sub-§4

<sup>11</sup> 35-A MRSA, § 3452, sub-§3, criterion D

<sup>12</sup> 35-A MRSA, § 3452, sub-§3, criterion B

appropriate 40 feet for the analysis, though the minimum tree height for the three forest classes is 16 feet.

Addition visibility analyses might show how many turbines are visible, or the viewshed for larger portions of each project element (i.e., the nacelle rather than the upright blade tip).

Normally only views from scenic resources within the topographic viewshed are evaluated in detail (though the accuracy of the analysis must field checked). A visibility analysis may also be helpful in describing the potential number, extent, and distance of visible turbines.<sup>13</sup>

3. **Significant Scenic Resources.** Identify the state or nationally significant scenic resources within the study area, based on the list in the statute.<sup>14</sup> A description of each identified scenic resource needs to be presented in sufficient detail that the criteria for evaluating scenic impacts can be applied.<sup>15</sup> Each scenic resource will be documented as part of the fieldwork, include the general scenic character of the resource, the "worst case" potential views of the proposed development, and perhaps other views.
4. **Public Use and Expectations.** The extent, number and duration of public uses of the identified scenic resources, and the expectations of the "typical viewer" must be described.<sup>16</sup>
5. **Evaluation of Potential Impacts.** The findings from applying each of the criteria for evaluating scenic impacts should be reported.<sup>17</sup>

Accurate visual simulations are particularly useful when conducting this evaluation. The selection of viewpoints for the visual simulations is frequently a source of controversy. Opponents are likely to want simulations that represent "worst case" views, while the developer and other proponents will argue that "typical views" provide a fairer representation. Worst case views are closer, show larger portions of the project, represent situations where the project appears less compatible with its surroundings. Typical views normally do not show the project at its worst, but are at viewpoints that might have many viewers, or that are selected to represent a diversity of viewing conditions (e.g., distances from the project, types of screening, and levels of incompatibility). It is very unusual for a scientific method (i.e., random sampling) to be used to select the typical viewpoints—normally they are simply declared "typical" by the analyst. Both types of simulations are useful to decision makers. However, it is difficult to imagine why they would not want to be aware of the very worst case situations.

6. **Mitigation.** It is normal in a professional VIA that the approaches taken to mitigate adverse effects are described. Typically, if Unreasonably Adverse scenic impacts were found, approaches to further mitigation would be discussed. This might include revisions to project siting or design, or screening at impacted viewpoints. However, mitigation is

---

<sup>13</sup> 35-A MRSA, § 3452, sub-§3, criterion F

<sup>14</sup> 35-A MRSA, § 3451, sub-§9

<sup>15</sup> 35-A MRSA, § 3452, sub-§3, criterion A

<sup>16</sup> 35-A MRSA, § 3452, sub-§3, criteria E and C

<sup>17</sup> 35-A MRSA, § 3452, sub-§3

not one of the evaluation criteria for scenic impacts.<sup>18</sup> The Attorney General's Office has advised both DEP and LURC that it does not believe mitigation can be required for scenic impacts—if scenic impacts are Unreasonably Adverse, the project should be denied, otherwise it should be approved.

## 2. Adequacy of the Report

This section reviews what the *Visual Impact Assessment Spruce Mountain Wind Project* by Terrence J. DeWan & Associates (TJD&A 2010) reported for each portion of a standard VIA process. Since its original submission, several new photosimulations have been added to the report, and a visual survey was conducted of users on Bald Mountain over Memorial Day weekend (Mildner and MacBride 2010). This review is supported by a day of fieldwork on May 7, 2010 visiting the identified scenic resources within 8 miles of the proposed project. In addition, the geographic information system (GIS) data used for the VIA were reviewed and additional analysis conducted. In particular, a standard visibility analysis was performed using ArcMap software, and the visual simulations were compared to a three-dimensional ArcScene model to determine representational accuracy.

### 2.1 Project Description

The project's "generating facilities" are clearly described in some detail (TJD&A 2010, page 6-9). The visible characteristics that are described include turbine color, height to the hub center and tip of an upright blade, rotor movement, hazard beacons, and the electrical collection system. However, there are no scaled drawings of the turbines themselves. Maps (TJD&A 2010, figures 4 and 5) show the location of each turbine. "Associated facilities" include the operations and maintenance building, and access roads are also described.

### 2.2 Landscape Character

The VIA describes the landform, water resources, vegetative patterns and cultural character of the area surrounding the proposed project (TJD&A 2010, pages 9-15). The major features are identified, including each of the state or nationally significant scenic resources. This description is interspersed with comments about whether the project may be visible from particular areas. While the description is generally informative, more attention could be given to the appearance of the landscape and how it contributes to viewer experience.

### 2.3 Visibility Analysis

TJD&A used WindPRO to conduct the visibility analysis. WindPRO has online access to global elevation data from the Shuttle Radar Topography Mission (SRTM) (Segal 2010; EMD 2010). The SRTM data provides near global coverage with a 3 arc second spatial sampling (approximately 90-by-90 meters), with a 16 meter absolute vertical height accuracy (USGS 2008). These data were collected by NASA and are distributed by USGS. While an important source of elevation data, its primary value comes from its near global coverage.

---

<sup>18</sup> 35-A MRSA, § 3452, sub-§3

TJD&A did not use the National Elevation Dataset (NED), which is “the best available raster elevation data for the conterminous United States” (USGS 2009a). The NED most commonly used for visibility analysis in Maine has a 1/3 arc-second (about 10 meters) resolution with a with  $\leq 4$  meter absolute vertical height accuracy (USGS 2009b).

The VIA includes a topographic viewshed map as Figure 2 that indicates areas where as many as 1 to 5 and 6 to 11 turbine blade tips may be visible. Of course much more of the turbine may also be visible, but this map does not help to identify those areas where the turbines will have a greater visual presence. It is also unfortunate that the viewshed map does not show the location of the significant scenic resources. However there are tables that list all of the great ponds and the places listed on the National Register Historic Places, whether they have a potential view of the project, how many turbines are potentially visible, and the distance to the nearest turbine.

The concept of distance zones is presented in section 5.2 of the VIA. The thresholds that are listed were developed by the USDA Forest Service for the more arid western part of the country, and may not be appropriate for the more humid conditions in the northeast. In any case, the perceptual definition of distance zones is what really matters, and wind turbines confound these traditional thresholds. So, the foreground for a wind turbine may be less than a half-mile because they are composed of smooth materials without much apparent texture. However, the middle distance may extend further than 4 miles because the basic elements of a turbine are so large that they remain recognizable at distances where most naturally occurring landscape elements (e.g., trees) have ceased to be individually recognizable. I believe that this is fundamentally the reason why the threshold where wind turbines were determined to no longer have a significant potential impact was set at 8 miles by the Wind Energy Act. While turbines may be visible beyond 8 miles, they will be relatively indistinct and it may not be possible to detect the motion of the blades.

#### **2.4 Significant Scenic Resources**

As part of the Project Study Area, Existing Character of the Surrounding Area (section 5.1), the VIA identifies local as well as state and nationally significant scenic resources within 8 miles of the proposed wind turbines. The state and nationally significant scenic resources include 6 great ponds with either outstanding or significant scenic quality (listed in Table 1), and 8 sites listed on the National Register of Historic Places (listed in Table 2). However, some of the historic sites do not meet the public’s legal right of access (e.g., Dreamhome and Stearns Hill Farm).<sup>19</sup> In addition, there are two areas of state land identified by statute as State Parks—Little Concord Pond (which includes Bald Mountain) and Speckled Mountain. These two State Parks are not listed on The Department of Conservation’s Find Parks & Lands webpage Maine DOC 2009a). However, they are so identified in the Conservation Lands GIS data layer, and their status was verified by Alan Stearns, Deputy Director of Bureau of Parks and Lands (Stearns 2010b).

Information about the scenic resources identified in the VIA is provided in tabular form, including name, town, distance to nearest turbine, and number of turbines potentially visible. This information is summarized in Table 1 below for the state and nationally significant scenic resources. A brief description of those scenic resource within the topographic viewshed is

---

<sup>19</sup> 35-A MRSA, § 3451, § 9

included in the VIA section 6.0 Visual Impacts on Scenic Resources of State or National Significance. However the scenic resources are not located on Figure 2: Viewshed Map.

**Table 1. Summary of Scenic Resources of State and National Significance Identified by TJD&A\***

Scenic Resources of State or National Significance in the Surrounding Area	Significance State (S) National (N)	Distance to Nearest Turbine	Number of Turbines Visible
<b>Great Ponds</b>			
Abbotts Pond	S	1.7	7 (portions of blades)
Joes Pond	S	7.5	0
Labrador Pond	S	6.6	11
Little Concord Pond	S	1.2	3 (portions of blades)
Little Labrador Pond	S	7.1	0
Shagg Pond	S	0.9	7
<b>Historic Sites</b>			
Arthur L. Mann Memorial Library	N	5.5	0
Dreamhome †	N	4.8	4
First Universalist Society Church	N	5.9	2 (leaf off)
Greenwood Cattle Pound	N	7.1	0
Greenwood Town Hall	N	6.9	0
Rumford Point Congregational Church	N	7.8	0
Stearns Hill Farm †	N	7.4	0
Whitman Memorial Library	N	4.2	0
<b>State Parks*</b>			
Little Concord Pond SP (Bald Mtn.)	S	1.4	11
Speckled Mountain SP	S	1.9	11

\* Two State Parks are not identified as such by TJD&A: Little Concord Pond (Bald Mountain) and Speckled Mountain. However, photosimulations from the "worst case" viewpoints are prepared and discussed in the VIA.

† Dreamhome and Stearns Hill Farm are privately owned and the public does not have a legal right of access, so they do not qualify as nationally significant scenic resources under 35-A MRSA, § 3451, § 9.

## 2.5 Public Use and Expectations

Section 6 of the VIA attempts to provide a description of the extent, nature, and duration of public uses, and the typical viewer's expectations for scenic resources that the topographic visibility analysis indicated had the potential of views to the Project. However, these descriptions are very brief, and do not include information about the number of users or their length of stay. The nature of the use appears to be based on common sense or perhaps brief descriptions located through an internet search. Similarly, the description of viewer expectations appears to be based on conventional wisdom rather than any systematic investigation—at least the VIA does not cite any sources to substantiate the assertions of public use and viewer expectations.

This lack of real information is not surprising. It is unusual to find a park or other scenic resource with accurate visitation numbers, let alone length of stay, types of activities, the nature of visitor expectations, or the quality of their experience. The Maine State Comprehensive Outdoor Recreation Plan (SCORP) primarily reports statewide statistics rather than statistics for specific parks (Maine DOC BPL 2009c).

Recognizing the lack of information to responsibly address the Wind Energy Act's Evaluation Criteria concerning public use and expectations, Department of Environmental Protection's requested that Spruce Mountain Wind conduct a survey of visitors to Bald Mountain over the Memorial Day weekend. This site was chosen because it has the most prominent views of the project, and it was anticipated that there might be more visitors at locations where the project will be visible than in nearby ponds. Fifteen interviews were conducted by Market Decision on the ridge of Bald Mountain on May 29 and 30, 2010 with a clear view toward the Spruce Mountain Wind site (Mildner and MacBride 2010). The general reported findings include:

- Ten groups with a median size of 2.5 people were intercepted during two days on Bald Mountain. However, one large group of 21 people raised the total number to 51 visitors. Two additional groups of average size were not interviewed.
- In general, the scenic rating of the actual view was comparable to the photograph of the view.
- The apparent scenic impact the proposed turbines reduces the scenic rating by nearly 1 point on a 7-point scale. This scenic impact is statistically significant.
- In general, visitors thought that the proposed turbines would have a little effect on their recreation experience.

Further review and analysis of this study are included later in this review.

## 2.6 Evaluation of Potential Scenic Impacts

Logically, the information about the project, surrounding area, and scenic resources' character and use should be presented first in a VIA. Then the scenic impact and whether it is Not Adverse, Adverse, or Unreasonably Adverse can be systematically evaluated by applying the Evaluation Criteria to what is presented about each scenic area and their views of the proposed development. By and large this is the way that the *Visual Impact Assessment Spruce Mountain Wind Project* presents the information and evaluation using the following framework, which rearranges the Evaluation Criteria slightly but retains their substance.

- **Context.** The existing character of the surrounding area and the context of the proposed activity. (§ 3452.3.B and 3452.3.D).
- **Significance.** The significance of the potentially affected scenic resource of state or national significance (§ 3452.3.A).
- **Public Uses.** The extent, nature and duration of potentially affected public uses of the scenic resource of state or national significance. (§ 3452.3.E).
- **Viewer Expectations.** The expectations of the typical viewer who would be using or enjoying the scenic resource of state or national significance. (§ 3452.3.C).

- **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).
- **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).
- **Conclusion.** A determination 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). (TJD&A 2010)

This approach seems to work well and is to be recommended to future authors of expedited grid-scale wind energy projects.

The VIA evaluates 8 of the 16 significant scenic resources within 8 miles of the project. The primary criterion of whether to evaluate a scenic resource or not appears to be whether it falls within the Project's topographic viewshed (i.e., whether turbines are potentially visible based on a topographic viewshed analysis, as summarized in Table 1).

**Dreamhome.** The description for the Context criterion emphasizes that three cell towers are visible, but fails to describe the scenic quality of the view over Bryant Pond. The Significance criterion is limited to a statement that it is on the National Register of Historic Places, without identifying why it was nominated, and what role the greater landscape scenic quality may have played in the nomination. In the case of Dreamhome, it appears that the siting of the house and the design of the gardens takes advantage of the scenic view over Bryant Pond, which is not itself a significant scenic resource.

Though it is on the National Register of Historic Places (NRHP), the NRHP nomination form clearly states that Dreamhome is of local, and not national or statewide historical significance (MHPC 1996, section 3). "Dreamhome is eligible for nomination to the NRHP under Criterion C for its local significance in the areas of architecture and landscape architecture" (MHPC 1996, section 8, continuation page 2). It would therefore seem appropriate that the lowest level of significance under the Wind Energy Act be attributed to this scenic resource

Since Dreamhome is a private residence without any public access, it is not a significant scenic resource under the terms of the Wind Energy Act, and the criteria concerning public use and expectations are not relevant. The description of Project Impact does not consider the "scope and scale of the potential effect of views of the generating facilities on the scenic resource," as required by this criterion.<sup>20</sup> A description of the "scope and scale" of the turbines, perhaps in relation to other visual intrusions (e.g., the cell towers) is needed. Such a description would benefit from direct references to Photosimulations 9 and 9A.

---

<sup>20</sup> 35-A MRSA, § 3452, sub-§3, criterion F

**First Universalist Society Church.** The VIA dismisses the need to evaluate scenic impacts to the First Universalist Society of West Sumner by stating that “the views of two turbines during leaf-off season in the background from First Universalist Church should have a minimal visual impact on the church and its setting” (TJD&A 2010, page 16). Since the topographic viewshed map indicates that there are potential views of the turbines, this scenic resource should have been evaluated in the same manner as the other scenic resources with potential views. For instance the Context criterion needs to describe how the site is situated, and why there are no views of the project from the property. The Significance criterion needs to describe if scenic values played a role in the NRHP designation. In this case the designation is for architectural integrity and views from the church or site do not appear to play any role in its designation.

Though it is on the National Register of Historic Places (NRHP), the NRHP nomination form clearly states that First Universalist Society of West Sumner is of local, and not national or statewide historical significance (MHPC 1996, section 3).

The issue of public access to the building is unclear. It is a privately-owned building, but is still active as a church

**Little Concord Pond State Park (Bald Mtn.).** The VIA states that “there are no state parks within eight miles of the Project” (TJD&A 2010, page 17). However, Little Concord Pond is a State Park (Stearns 2010b). Even though it was acquired in 1990, it is not so indicated in places one would expect to find all state parks listed (e.g., DeLorme 2000, page 6; Maine DOC 2009a). It therefore seems reasonable that it has a lower scenic resource “significance” than State Parks that are widely identified (e.g., Baxter State Park).

**Speckled Mountain State Park.** The VIA states that “there are no state parks within eight miles of the Project” (TJD&A 2010, page 17). However, Speckled Mountain is a State Park (Stearns 2010b). Even though it was acquired in 1990, it is not so indicated in places one would expect to find all state parks listed (e.g., DeLorme 2000, page 6; Maine DOC 2009a). It therefore seems reasonable that it has a lower scenic resource “significance” than State Parks that are widely identified (e.g., Baxter State Park).

**Little Concord Pond.** Little Concord Pond was identified in Maine’s Finest Lakes study as having “significant” scenic value; this is the lower level of significance (Parkin 1989). There is no description of why it received this recognition.

**Shagg Pond.** Shagg Pond was identified in Maine’s Finest Lakes study as having “significant” scenic value; this is the lower level of significance (Parkin 1989). There is no description of why it received this recognition.

**Abbotts Pond.** Abbotts Pond was identified in Maine’s Finest Lakes study as having “outstanding” scenic value; this is the higher level of significance. “Abbotts Pond has high dramatic relief and complex relief. The surrounding mountains picturesquely frame the pond. Scenic cliffs, although not on the lake, are within view. The pond shoreline is completely forested with a mixture of white pine and hardwood forests” (Parkin 1989, page 33).

**Labrador Pond.** Labrador Pond was identified in Maine's Finest Lakes study as having "significant" scenic value; this is the lower level of significance (Parkin 1989). There is no description of why it received this recognition.

There is little or no evaluation for the 8 scenic resources which appear not to have any views toward the project, as listed in VIA Tables 1 and 2.

- Joes Pond
- Little Labrador Pond
- Arthur L. Mann Memorial Library
- Greenwood Cattle Pound
- Greenwood Town Hall
- Rumford Point Congregational Church
- Stearns Hill Farm
- Whitman Memorial Library

It appears that the determination of no visibility from these scenic resources was made after considering both the visibility analysis and field work.

### 2.7 Mitigation

Mitigation related to scenic impacts is not explicitly addressed, and it is unclear whether it is required.

## 3. Field Review and Additional Analysis

The first section of this review describes how the standards and criteria established by the Wind Energy Act fit with a normal approach to visual impact assessment process. The second section of this review considers the adequacy with which the *Visual Impact Assessment Spruce Mountain Wind Project* follows this process. This, the third section, reports the findings of the fieldwork and additional analyses conducted as part of this review.

### 3.1 Field Review

I was able to visit some of the significant scenic resources on May 7, 2010, a beautiful spring day with excellent visibility. The primary purpose of this field work was to check the landscape character and viewing condition from significant scenic resources with the greatest apparent visual impact (i.e., Bald Mountain) and where photosimulations were not prepared, but there appeared to be a potential for turbine views (e.g., First Universalist Society Church).

**Little Concord Pond.** Access is along rough dirt road; there is pull-off parking for perhaps half a dozen cars. Little Concord Pond is about 0.6 miles from this parking area. To the left from the point where the trail reaches Little Concord Pond were four canoes and a small fishing boat

chained to trees, suggesting at least modest water recreation using hand launched watercraft. A short way to the right the trail leads to a "diving rock," suggesting some use as a local swimming hole. There is the potential to see two turbine hubs from the area of this rock. The trail may continue all the way around the pond, but becomes very difficult to distinguish past the canoes and diving rock at the southern end of the pond. No one was observed on the pond this morning (approximately 10:30 am).

Teens jumping from the big boulder will be facing toward the turbines, and will likely be able to see them (additional simulations prepared by TJD&A May 13, 2010). I am unaware of any studies investigating the role played by the surrounding landscape's scenic quality in the swimming-hole experience of America's youth. One suspects that the most important characteristics are being away from the supervision of adults and a pond with appropriate attributes for swimming; not the scenery. It is not clear if people would go on the water just to paddle or to fish, or both. There is the potential to see turbines from a large are of pond, if one is looking in the right direction. In general, people who engage in campcraft recreation (e.g., canoeing, hiking or gathering edible plants) are more sensitive to scenic impacts from forest management than those engaging in motorized (e.g., power boating, ATVs) or prey (e.g., fishing, hunting) recreation (Palmer 1999). A similar pattern may apply for sensitivity to seeing wind turbines. However, it seems reasonable that someone who is fishing and does not want to look toward the turbines, will just arrange their boat so they are looking the other way.

#### **Little Concord Pond State Park (Bald Mountain)**

The trail to Little Concord Pond continues on to Bald Mountain. The trail appears to receive sufficient use to keep it from becoming over grown. There is a note from the trail's surveyor dated 1916 scored into a rock as one gets close to the ridge.

Along the ridge top there is a magnificent panoramic view that will include the proposed turbines. Viewers are about 1.4 miles from the closest turbines. At this distance, the closest turbine occludes an arc of approximately 1.74 degrees. To put this in perspective, the "visual angle of [the] thumb's width is about 2 degrees" (O'Shea 1991). While the turbine will be clearly visible, it will appear to a viewer to be a bit less than the width of a thumb held at arm's length. A reasonable person could not conclude that an object of this relative size was visually dominant in the landscape.

Depending on where one stands the panorama view from the top of Bald Mountain may extend 150 to more than 200 degrees, with the project spreading across approximately 15 degrees of the panoramic view (see TJD&A Photosimulation 3). This might be equivalent to approximately the width of both hands held at arm's length. The visual presence of the turbines taken as a whole (i.e., the "power plant") is clearly a prominent (i.e., very noticeable) visible element in the landscape and may reach the level of being visibly co-dominant (i.e., a commanding presence) for some viewers. Other co-dominate elements are the in the panoramic view include the horizon line of mountains and Shagg Pond. An exacerbating situation is that the viewer cannot simply walk to the other side of the "bald" to see a different panoramic view without the turbines (as one easily could if fishing on Little Concord Pond).

It is unknown why this parcel was designated a State Park, however the panoramic views from the peak are magnificent. Based on research concerning the visual experience of the Appalachian Trail, it is reasonable to expect that one of the reasons to hike up Bald Mountain is to see the view (Palmer 1983). Panoramic views such as this were the most highly prized along the AT. However, we saw only one other person during the two hours we were in this area; a young woman resting in the sun with her eyes closed on the top of Bald Mountain. As we left there were three cars in the parking area.

**First Universalist Society Church.** While the visibility map indicated the potential for visibility, the field visit indicated that trees will screen views of the Project from the First Universalist Society Church property. During the winter there may be a heavily filtered view through deciduous tree branches, but at almost 6 miles distance, it would be difficult to distinguish a turbine. However the building is closed in the winter: "the church is only used during the summer when preachers, many of whom summer in the town, serve on a rotating weekly basis. In the off-season, a monitor heater installed about five years ago provides enough heat to allow funerals to be held in the church" (Dixon 2007). Public use would be primarily parishioners, and scenic impacts would be in the context of their coming and going from religious activities.

On the other hand, one or two turbines could be seen by drivers looking straight ahead down the road in front of the church. However, while this road is a public place, it is not considered a significant scenic resource by the Wind Energy Act.

**Labrador Pond.** There are a number of well kept residences around Labrador Pond, but we did not observe any people on the pond, nor does there appear to be a public boat launch. There will be a clear view of all or most project turbines. At over 6.25 miles away, the turbines will be relatively faint. The closest turbine's height occludes an arc of approximately 0.39 degrees, or a fifth the width of a thumb held at arm's length. However, the Project will occupy approximately 13 degrees of horizontal view. As a result, the individual turbines may be just apparent; however once noticed by a viewer, the Project may appear prominent on the ridgeline.

**Rumford Point Congregational Church.** This site was not evaluated in the VIA, but the Forested Viewshed map indicates that there may visibility of the Project. The site is on the north side of the Androscoggin River and riverside trees will screen views of the project. The only possible views of the project in the area appear to be from the Martin Memorial Bridge, which is outside the boundary of the scenic resource.

The State Historic Preservation Officer did not complete the Certification section of the NRHP nomination form, so it is not known whether this historic property is of national, state or local significance (MHPC 1985, section 12). However, it is clear from the Statement of Significance that the church was nominated for its architecture, particularly interior trompe l'oeil frescoes, and not its relationship to the surround landscape and scenic views.

**Stearns Hill Farm.** Though it is on the NRHP, the nomination form clearly states that Stearns Hill Farm is of local and not national or statewide historical significance (MHPC 2008, section 3). In addition, the Stearns Hill Farm "reflects its significance through an intact field system,

agricultural buildings with a high degree of integrity, and a set of buildings that are associated with a diversified, traditional approach to farming, including orcharding, maple sugar processing, lumbering, the production of crops, and animal husbandry” (MHPC 2008, section 8, page 2). There is no indication that scenic views toward the proposed Project played any part in its nomination. It would therefore seem appropriate that the lowest level of significance under the Wind Energy Act be attributed to this scenic resource.

Stearns Hill Farm is also instructive because it is a privately owned site without public legal right of access, it does not qualify as a significant scenic resource under the Wind Energy Act.

### 3.2 Visibility Analysis

Visibility analysis determines whether a line of sight exists between two specified points. Typically a geographic information system (GIS) is used to map the viewshed from which specified targets are visible. In principle this is an objective exercise in geometry highly suited to a computer application. In practice however, since the data are only approximations of the actual condition and may include errors, the resulting viewshed maps are best considered a preliminary analysis of potential visibility under simplified conditions. The maps are useful for providing a preliminary investigation of the overall potential visual impact, and particularly for comparing alternatives. If potential visual impacts appear to exist for significant scenic resources, they need to be confirmed through field investigation and other visualization techniques.

For this review, visibility analyses were performed using ArcInfo 9.2 software (ESRI 2006). The digital data were provided by Tetra Tech EC (2010) and appear to be the same as those available from the Maine Office of GIS. The analysis procedure is relatively standardized, though analysts can reasonably make different assumptions about the analysis variables, and the results can be presented in a variety of ways.

As discussed in the Section 2: Adequacy of the Report, the VIA used elevation data sampled on a 90-by-90 meter grid, and have  $\leq 16$  meter absolute vertical height accuracy. The elevation data used for this review are sampled on a 10-by-10 meter grid, and have  $\leq 4$  meter absolute vertical height accuracy. In addition, the VIA only conducted a topographic visibility, which most certainly over estimates the visibility of the Project's power generation elements. For this review, both a topographic and a forested visibility analysis are conducted. The forested visibility analysis assumes a solid 40-foot high visual screen where forested land cover occurs. Forty feet is commonly used by professionals in the northeast as a conservative, but reasonable forest canopy height in a visibility analysis.

**Visibility of the Spruce Mountain Wind Project.** The four viewshed maps prepared to investigate several issues associated with the Spruce Mountain Wind Project are included in Appendix 1. The first two maps investigate the greatest possible area from which a part of any turbine could possibly be visible. In this case it is an upraised blade tip 403.5 feet (123 meters) above the ground. Two different constraints on visibility are considered: (1) just bare topography, and (2) topography with forest cover. The resulting viewshed maps are:

Map 1: Spruce Mountain Topographic Viewshed for Blade Tip

Map 2: Spruce Mountain Forested Viewshed for Blade Tip

While there may be a line of sight to just an upraised blade tip, it may not be noticeable and would certainly not be visually dominant. Therefore another analysis investigates the area from which a significant portion of a turbine could possibly be visible. In this case it is visibility of the turbine hub, located 256 feet (78 meters) above the ground. The same two constraints on visibility resulted in the following viewshed maps:

Map 3: Spruce Mountain Topographic Viewshed for Turbine Hub

Map 4: Spruce Mountain Forested Viewshed for Turbine Hub

Table 2 summarizes the maximum number of Spruce Mountain blade tips and turbine hubs that may possibly be visible within 8 miles of the significant scenic resources using the topographic and forested visibility constraints.

The topographic viewshed map included in the VIA appears to indicate a slightly wider area of visibility than does this review's Map 1: Spruce Mountain Topographic Viewshed for Blade Tip. It is presumed that this is the result of using different elevation data. In the end however, these slight difference do not have any important effect.

In this analysis there is relatively little difference between the topographic and forested viewsheds of the tip of an upright blade. However, the forested viewshed is much more limited than the topographic viewshed for the center of the turbine hub. The bottom line is that forest cover is making a substantial difference in how much of the turbine is visible, but much less in whether it is visible.

**Table 2: Maximum Number of Spruce Mountain Wind Turbines Visible**

Significant Scenic Resource	Nearest Turbine (miles)	Blade Tip Visible			Turbine Hub Visible	
		VIA <sup>†</sup>	Topographic	Forested	Topographic	Forested
<b>Great Ponds</b>						
Abbotts Pond	1.73	7	11	11	11	11
Joes Pond	7.55	0	5	0	2	0
Labrador Pond	6.23	11	11	11	11	11
Little Concord Pond	1.07	3	11	9	9	5
Little Labrador Pond	7.15	0	11	0	10	0
Shagg Pond	0.89	7	11	11	9	8
<b>Historic Sites</b>						
Arthur L. Mann Memorial Library	5.55	0	0	0	0	0
Dreamhome	4.83	4	5	5*	4	4*
First Universalist Society Church	5.89	2	8	8	6	6
Greenwood Cattle Pound	7.15	0	6	0	5	0
Greenwood Town Hall	6.92	0	0	0	0	0
Rumford Point Congregational Church	7.85	0	3	3	3	3
Stearns Hill Farm	7.27	0	6	0	6	0
Whitman Memorial Library	4.24	0	0	0	0	0
<b>State Parks</b>						
Little Concord Pond SP (Bald Mtn)	1.4	11	11	11	11	11
Speckled Mountain SP	1.9	11	11	11	11	11

\* Actual value from viewshed is "NoData". Value shown gathered from the adjacent viewshed raster cell located 10' to the north.

† The number of visible turbines is taken from the VIA's Tables 1 and 2. It is not clear from the text how this determination was made, but it appears to be based on the viewshed map and field verification.

### 3.3 Visual Simulations

Visual simulations are a primary tool to investigate the impact to significant scenic resources. Flying balloons to calibrate the size of project elements in a visual simulation is very much a thing of the past (though it still may be a useful public participation tool). The current best professional practice in static simulation incorporates a three-dimensional model of the proposed project using computer-aided design (CAD) or similar software and matches it to a photograph taken in the field. For this to work properly, it is necessary to know the location of the viewpoint photography with a high degree of precision, which is provided by global positioning system (GPS) device. To match the CAD model to the photograph, it is also necessary to know the elevation of the viewpoint and project elements, the focal length of the camera lens, and the location and height of some elements in the photograph.

A somewhat different, but closely related approach was used to prepare the photosimulations for the VIA. TJD&A employed WindPRO, a software program developed specifically for the needs of the wind energy industry, to prepare the visual simulations. WindPRO creates a computer model of the terrain and wind turbines, and provides tools to register a photograph to this model. The resulting image is exported for final editing and refinement in PhotoShop or other image editing software program. The only obvious down side to this approach is that the data used to create the computer model are coarser than normally used to create simulations, though this is not apparent in the final product. This is similar to the data differences discussed in the section on visibility analysis.

In general, adequate documentation was provided to evaluate the general accuracy of the VIA simulations. For this review we checked the original photography to verify the lens focal length, which is used with the size of the printed photograph to determine the viewing distance that puts the photosimulation into proper perspective. A significant difficulty was that many of the "photographs" used in the VIA are created by stitching together parts of different photographs, and the final photosimulations all appeared to be cropped smaller than the original photographs. As a result, the printed photosimulations all should be viewed from a distance of about 22 to 24 inches, rather than the 17 inches indicated in the photosimulations' captions. The practical affect of this error is that the overall the reader is instructed to view the VIA simulations a bit too close, which increases their apparent visual magnitude. Table 3 summarized the parameters that determine the proper viewing distance for each of the photosimulations.

The primary means to evaluate the accuracy of the photosimulations is the construction of a perspective visualization in ArcScene (ESRI 2006). While not as realistic as the photosimulations, they are geometrically accurate, and use the turbine locations, photosimulation viewpoints, and other landscape data provided by Tetra Tech EC and TJD&A. The forest canopy in these visualizations is set to 40 feet. Visualizations were created from the significant scenic resources and are included in Appendix 2 of this review.

**Table 3. Establishing Viewing Distance for the VIA Photosimulations**

View point	Location	Camera	Focal Length	Equivalent Focal Lens†	Horizontal Angle	Simulation Width*	Viewing Distance
1A	Concord Pond	D70	35 mm	53.4 mm	37.3°	14.625"	21.7"
2A	Speckled Mountain	D70	38 mm	58.0 mm	34.5°	14.625"	23.6"
3A	Bald Mountain	D70	38 mm	58.0 mm	34.5°	14.625"	23.6"
4A	Shagg Pond‡	D300	35 mm	53.4 mm	37.3°	14.625"	21.7"
4A rev	Shagg Pond	D300	35 mm	53.4 mm	37.3°	14.625"	21.7"
5A	Labrador Pond	D300	35 mm	53.4 mm	37.3°	14.625"	21.7"
6A	Route 26, West Paris	D70	35 mm	53.4 mm	37.3°	14.625"	21.7"
7A	Trap Corner	D70	38 mm	58.0 mm	34.5°	14.625"	23.6"
8A	Hadley Auto Sales	D70	34 mm	51.9 mm	38.3°	14.625"	21.1"
9A	Dreamhome‡	D70	35 mm	53.4 mm	37.3°	14.625"	21.7"
10A	Abbotts Mill	D70	35 mm	53.4 mm	37.3°	14.625"	21.7"
11A	Rumford Point	D70	38 mm	58.0 mm	34.5°	14.625"	23.6"
12A	Little Concord Pond VP1	D300	35 mm	53.4 mm	37.3°	14.625"	21.7"
13A	Little Concord Pond VP2	D300	35 mm	53.4 mm	37.3°	14.625"	21.7"
14A	Abbotts Pond	D300	35 mm	53.4 mm	37.3°	14.625"	21.7"

† Using Nikon's DX format (23.6mm-by-15.7mm). <http://www.isotton.com/misc/lens-angle-calculator/>

\* Adjusted simulation widths from 13.75" to 14.625" to account for cropped portions of image

‡ Image stitched from multiple portrait-format images.

Each photosimulation is presented as a series of sheets of images, including a panoramic view that incorporates the project, a "normal" view of the existing condition, and a "normal" view showing how the Project will appear. Instructions about the appropriate viewing distance for the panoramic view are not provided. The "normal" photographs are all said to be taken with the equivalent of a 50 mm lens on a full frame 35 mm single reflex camera. As listed in Table 3, this is only approximately correct—focal length equivalents range from approximately 52 mm to 58 mm. Following are specific comments and observations about each of the photosimulations presented in the VIA.

**Photosimulation 1: Concord Pond.** The main road access to the turbines and related tree clearing and grading would perhaps be more visible than shown in the simulation, namely at the top of the highest peak. Additional clearing would be visible to the right side of the image, just outside the view of the simulation, where views up the length of the access road would be possible. While it is difficult to see, the panoramic simulation appears to do a better job of portraying this access road. However, the small size of the elements in the panorama significantly limit, making it difficult to discern the proposed tree clearing for the access road as well as clearing at the peak. The turbines seem to be accurately sized and represented, though the lighting seems to be stark. This viewpoint is not from a significant scenic resource.

**Photosimulation 2: Speckled Mountain.** Turbine heights, total number of visible turbines, and all associated tree clearing and roads seem to be accurately sized and represented. Compare Photosimulation 2 to Visualization 8 in Appendix 2 of this review.

**Photosimulation 3: Bald Mountain.** Turbine heights, total number of visible turbines, and all associated tree clearing and roads seem to be accurately sized and represented. Compare Photosimulation 3 to Visualization 9 in Appendix 2 of this review.

**Photosimulation 4: Shagg Pond.** This simulation appears to be in error. If one compares it to Visualization 4 in Appendix 2 of this review, it is clear that the horizontal angle of view in the photosimulation is wider than the 37-degrees that it should be. It may be that the photograph was not properly scaled and registered in WindPRO. This diminishes the apparent impact of the turbines from this viewpoint. It is a serious error and needs to be corrected.

**Photosimulation 4 revised: Shagg Pond.** This Photosimulation was created in late May. This revision corrects the registration error in the original simulation. The scale and location of the turbines now appears correct. Compare Photosimulation 4 to Visualization 4 in Appendix 2.

**Photosimulation 5: Labrador Pond.** Turbine heights, total number of visible turbines, and all associated tree clearing and roads seem to be accurately sized and represented. Compare Photosimulation 5 to Visualization 2 in Appendix 2 of this review.

**Photosimulation 6: West Paris.** Turbine heights and all associated tree clearing and roads seem to be accurately sized and represented given the distance. The total number of turbines listed as visible does not account for the single turbine being screened by foreground vegetation; if the image was taken 10 feet to the right, 5 turbines could potentially be visible. Additionally, four turbines not depicted could have blades that break the ridgeline. This viewpoint is not from a significant scenic resource.

**Photosimulation 7: Trap Corner.** Turbine heights and all associated tree clearing and roads seem to be accurately sized and represented given the distance. The total number of turbines listed as visible does not account for up to three additional turbines that would be visible to the right of the simulated image, as well as potential clearing. It is important to note that these three additional turbines would not be visible in the simulation if the simulated image was not cropped. The existing met tower to be removed does not appear to be removed in either simulated image. Are these just regular communication towers? This viewpoint is not from a significant scenic resource.

**Photosimulation 8: Hadley Auto Sales.** Turbine heights and all associated tree clearing and roads seem to be accurately sized and represented given the distance. The total number of turbines listed as visible does not account for up to four additional turbines that would be visible if the image was taken from across the road. This viewpoint is not from a significant scenic resource.

**Photosimulation 9: Dreamhome.** This photosimulation is spliced from two images, making it difficult to determine the appropriate viewing distance. Turbine heights, total number of visible

turbines, and all associated tree clearing and roads seem to be accurately sized and represented given the distance. There is an existing cell tower in the view not shown on the visualization. Compare Photosimulation 9 to Visualization 5 in Appendix 2 of this review. This viewpoint is not from a significant scenic resource.

**Photosimulation 10: Abbotts Mill.** Turbine heights, total number of visible turbines, and all associated tree clearing and roads seem to be accurately sized and represented given the distance. It should be noted that if the picture were taken from the road in the foreground, one additional turbine would be visible. Also, one turbine blade is visible above the ridgeline in the simulation but is not considered visible in the description. This viewpoint is not from a significant scenic resource.

**Photosimulation 11: Rumford Point.** Turbine heights and all associated tree clearing and roads seem to be accurately sized and represented given the distance. There are 10 turbines visible in the simulation, though the statement at the bottom says all 11 turbines will be visible. After checking, it appears that one of the turbines is behind an intervening ridgeline from this exact location. This viewpoint is not from a significant scenic resource.

**Photosimulation 12: Little Concord Pond Viewpoint 1.** This photosimulation was created in late May. The two visible turbines appear to be appropriately scaled, with the other turbines screened by shoreline vegetation. In part this is a limitation of creating simulations from photographs taken on shore under the tree canopy. In addition, I was not able to achieve the same placement of the turbines relative to the topography in the photosimulation; in the visualization the turbines appear a bit to the north of the placement in the photosimulation. Compare photosimulation 12 to Visualization 3.1 in Appendix 2 of this review.

**Photosimulation 13: Little Concord Pond Viewpoint 2.** This photosimulation was created in late May. The turbines appear to be appropriately scaled and located. Some of the more distant turbines are screened by shoreline vegetation that is not represented in the visualization. Compare photosimulation 13 to Visualization 3.2 in Appendix 2 of this review.

**Photosimulation 14: Abbotts Pond.** This photosimulation was created in late May. The white turbines offer very little contrast against the cloudy sky. While this may be accurate (or not), they would be more visible with a clear blue sky. The photosimulation shows that shoreline vegetation is obscuring the turbines more than is indicated in the visualization with the tree canopy set at 40 feet. Adjusting the tree canopy to 50 feet to reflect the height of the shoreline vegetation reported by TJD&A (DeWan 2010) brought the photosimulation and visualization into better agreement. Compare Photosimulation 14 to Visualization 1 in Appendix 2 of this review.

In general, the VIA's photosimulations and this review's visualizations are very similar to each other, though there was a need to correct the photosimulation for Shagg Pond, and the shoreline vegetation along Abbotts Pond needed to be raised to an estimated 60 feet. In particular, the photosimulations and visualizations show a similar scale for the turbines. However, the turbines in the photosimulations often have too a low contrast to represent the "worst case" condition, making it difficult to distinguish them. It may be that the lighting and atmospheric condition

being represented in the WindPRO simulation accurately reflect the visual condition when the photograph was taken. However, it is generally best practice for the simulations to represent the "worst case" condition, even when it is not strictly representative of the conditions when the photo is taken. The obvious alternative is for the VIA team to return to the viewpoints in question until they take a photograph that does represent the worst case condition.

All things considered, the conclusion of this review analysis is that any shortcomings of the visibility analysis and creation of the simulations (except for the Shagg Pond photosimulation) are relatively minor and well within the current standards of professional practice. The number and relative size of the represented turbines are portrayed within the limits of the simulation technology used. Finally, it is important to remember that all simulations need to be viewed from the proper distance to produce the appropriate perspective effect. Simulations should include a statement describing this distance—in the case of the printed VIA this is about 22 to 24 inches or a little more than 1.5 times the simulation's width.

### **3.4 Interviews with Visitor on Bald Mountain**

Visitors to Bald Mountain in Little Concord Pond State Park were interviewed over the 2010 Memorial Day weekend (May 29 and 30, 2010) to determine how seeing the Spruce Mountain Wind project might affect their recreation experience. The intercept interviews were conducted by Marketing Decisions of Portland, Maine (Mildner and MacBride 2010).

The Evaluation Criteria mandated by Maine's Wind Energy Act require knowledge about visitors to state or nationally significant scenic resources and the potential impact to their experience that is not normally available. This study provides unique information directly relevant to the Spruce Mountain Wind Project, and indirectly relevant to other proposed wind projects in Maine. The study sample is small, making it marginal for conducting the simple tests report in this review. However, these are the data that are available. While the value of the analysis presented here is limited by this sample size, it illustrates the type of analysis that might be performed to address the Wind Energy Act's Evaluation Criteria.

The major limitations of the study are that it is limited to one significant scenic resource (Bald Mountain), the sample size is small (15 interviews), the sample procedure is not strictly random (intercept of first adult to the top in a group—not the members who are slower because they stop too long to look at something or became tired by the climb. Some groups also had more than one interview.), and it did not sample days throughout the recreation use season (only Saturday and Sunday over Memorial Day weekend). Nonetheless, similar limitations are commonly encountered in marketing research, and there do not appear to be any obvious biases being introduced into the study.

**Public use.** The weather for these two days was very suitable for a day hike. Twelve groups made the climb to Bald Mountain between 9 am and 6 pm over these two days, and individuals from ten of these groups were interviewed. A total of 32 adults and 27 children were observed. However a single group accounted for 21 of these people, which is likely an anomaly that cannot be tested because of the limited sample. The median group size was 2.5—no one was observed hiking alone. If the unusually large group were not included, the mean group size was 3.6 people.

If a particularly nice holiday weekend attracted six groups in a day, then allowing for rainy days it seems likely that the annual use may be close to 1,000 people. All of these users could be described as "hikers," though the survey did indicate that the nature of the experience was not uniform across all participants in this activity (see the discussion about "serious hikers" and "casual walkers" below). The survey did not attempt to ascertain how long people stayed on Bald Mountain.

**Validity of Photograph.** The measurement of scenic impact is reliant on a static photosimulation with a limited horizontal cone of vision. It is therefore important to establish that the scenic value rating of the Actual View is comparable to the rating of the Photograph used in the Photosimulation—this is a question of validity. The mean rating is 4.87 for the Actual View and 4.53 for the Photograph, with 1.0 being the lowest and 7.0 being the highest scenic value. There is no statistically significant difference between these two values, which supports the validity of this study's methods (Paired  $t = 1.05$ ,  $p = .313$ ). Nonetheless, there is quite a bit of variability in the relationship between the two ratings. For some respondents the actual view is more scenic, while for others the photo is more scenic.

**Apparent Scenic Impact.** The difference between the scenic value of the Photosimulation and the Photograph is the apparent Scenic Impact. It can range between negative impact of -6.0 and a positive impact of 6.0, with 0.0 indicating no scenic impact. The mean scenic value rating of the Photograph is 4.53, and of the Photosimulation it is 3.63, therefore the apparent Scenic Impact is -0.900, which is statistically significantly ( $t = 3.47$ ,  $p = .004$ ).

**Effect on Experience and Likelihood to Return.** The relevant Evaluation Criterion from the Wind Energy Act is less the apparent Scenic Impact, *per se*, and more about its Effect on the Experience of users at significant scenic resources. Another possible indicator of how users of Bald Mountain might be affected by the project is their Likelihood to Return if the project were built. The study report provides the simple mean values for ratings of Effect on Enjoyment (mean = 3.9) and Likelihood to Return (mean = 4.1). Neither of these ratings differ significantly from a rating of "no change" (respectively  $t = -0.27$ ,  $p = .793$  and  $t = 0.52$ ,  $p = .612$ ).

A useful additional analysis is to investigate the relationship of apparent Scenic Impact with Effect on the Experience and Likelihood to Return. Linear regression is one approach to such an analysis. There is a very weak relationship between apparent Scenic Impact and the Effect on the Experience (adjusted  $R^2 = -5.5\%$ ,  $t = 0.56$ ,  $p = .583$ ). However, apparent Scenic Impact is a strong predictor of the Likelihood to Return (adjusted  $R^2 = 45.0\%$ ,  $t = 3.41$ ,  $p = .005$ ). In other words, those who see a very negative Scenic Impact are much less Likely to Return, irrespective how they believe the project will Effect their Enjoyment; those who see a more positive scenic impact are more Likely to Return.

The comments about how respondents anticipated the project would Effect their Enjoyment of Bald Mountain are instructive. Several people (about 5) indicated that they would "feel good" because the project was an indication of Maine taking positive steps to provide itself with clean energy. Some people (about 3) indicated that the view already has significant negative elements, including housing ("giant log cabin"), radio towers, and the Sugarloaf ski area. Interestingly, two people mentioned the negative affect of turbine noise. However, half indicated that the turbines

would not significantly Effect their Experience (about 8) with comments such as that it was “not so bad, it’s not a power plant,” “nothing aesthetically offends me,” or “doesn’t affect [my experience] at all.” These comments suggest that many people disconnect this particular type of impact from enjoying their experience of being on Bald Mountain.

**Local Interests and Others.** While strictly accurate, the report’s conclusion that no one interviewed was from the “local communities of Woodstock or Locke Mills” is slightly misleading (Mildner and MacBride 2010, page 4). However, seven respondents indicated they had a local connection: two had camps on Shagg Pond, one was looking at buying a camp on Shagg Pond, one had a camp presumed to be nearby, and three appear to regularly visit family locally. These seven respondents might be considered to have a “local interest” compared to the other respondents.<sup>21</sup> All five respondents who had a -2 apparent scenic impact rating were in this “local interest” group. This group tended to rate the photograph higher and the simulation lower than the other respondents. The result is that they see a greater apparent Scenic Impact due to the proposed turbines ( $F = 4.569, p = 0.052$ ).

**Table 4: Comparison of Ratings by Local Interests and Others**

	Mean Rating		ANOVA
	Local Interest	Others	
Actual view	4.86	4.88	$F = 0.00, p = .973$
Photograph	4.86	4.25	$F = 1.25, p = .285$
Photosimulation	3.43	3.81	$F = 0.49, p = .498$
<b>Scenic Impact</b>	<b>-1.43</b>	<b>-0.44</b>	<b><math>F = 4.57, p = .052</math></b>
Effect on experience	4.29	3.57	$F = 1.92, p = .191$
Likelihood of return	3.71	4.57	$F = 2.77, p = .122$
Support for wind	5.71	5.75	$F = 0.00, p = .950$

Local Interest (n = 7); Others (n = 8)

These results suggest that there is a possible NIMBY (i.e., not in my back yard) reaction influencing some users of Bald Mountain, even though there is no difference between the group’s support for wind power development in Maine.

**Serious Hikers and Casual Walkers.** I believe that it was a very good idea to leave the activity question open ended. Interestingly, only six of the respondents indicated their reason for being on Bald Mountain had something to do with the view. If a standard list of recreation activities had been used to understand why they were on Bald Mountain, then most would have checked “go for a hike.” However, there appear to be two types of “hikes.” Some appear to be more serious or enthusiastic about hiking as a sport, while the others appear to see this as a vacation “activity” and an opportunity to get members of their group (e.g., kids playing video games) outside into the fresh air. One might divide the respondents in half, where “serious hikers” are

<sup>21</sup> Respondent IDs of Serious Walkers are 1, 9, 11, 12, 13, 15, and 17.

the eight who hike two weeks or more a year. The “serious hikers” rate the Actual View higher, but the Photograph, Photosimulation and apparent Scenic Impact ratings are virtually the same as by casual walkers. “Serious hikers” tend to be less Likely to Return if the turbines are build (not statistically significant), and their Effect on Enjoyment will be negatively affected ( $F = 4.848, p = 0.048$ ). Casual walkers are more likely to support wind development in Maine ( $F = 5.87, p = 0.032$ )

**Table 5: Comparison of Ratings by Serious Hikers and Casual Walkers**

	Mean Rating		ANOVA
	Serious Hikers	Casual Walkers	
Actual view	5.29	4.50	$F = 2.62, p = .129$
Photograph	4.57	4.50	$F = 0.02, p = .902$
Photosimulation	3.64	3.63	$F = 0.00, p = .975$
Scenic Impact	-0.929	-0.875	$F = 0.01, p = .922$
<b>Effect on experience</b>	<b>3.33</b>	<b>4.38</b>	<b><math>F = 4.85, p = .048</math></b>
Likelihood of return	3.67	4.5	$F = 2.52, p = .138$
<b>Support for wind</b>	<b>5.29</b>	<b>6.13</b>	<b><math>F = 5.87, p = .032</math></b>

Serious Hikers (n = 7); Casual Walkers (n = 8)

In order to responsibly address the Wind Energy Act’s Evaluation Criteria, it is going to be necessary to survey users of a greater number of significant scenic resources who are engaged in a greater variety of activities.

#### 4. Discussion of Additional Issues

The *Visual Impact Assessment Spruce Mountain Wind Project* raises a number of issues that are worth considering. They are presented below in no particular order.

##### 4.1 Selection of Simulation Viewpoints

One of the major decisions in any VIA is selecting viewpoints to use for visual simulations. The Wind Energy Act has established that only views from significant scenic resources need be considered. Since there will be relatively few significant scenic resources with potential views to most projects, it is reasonable that a VIA provide simulations from each of them. However, there is little need to consider areas without any reasonable probability to see project elements. The exception might be to demonstrate that a particularly important resource does not have a view of the project. Typically preference should be given to viewpoints normally frequented by people, especially people more sensitive to scenic quality.

The final and most important criterion for selecting simulation viewpoints is to represent the “worst case” situation at each significant scenic resource. The logic of selecting “worst case” viewpoints is that those responsible for making decisions need to know how bad the impacts can

get. What decision maker wants to face a constituent and tell them, "I'm sorry I didn't know it was going to be that bad!"? Sometimes VIA analysts disagree with this criterion, saying that it is too negative and not representative. The "worst case" does show the most negative impacts; there is no denying that. There is nothing preventing the VIA analysis from also simulating views with lesser impacts, or even photos of views without impacts. What is important is that the worst impacts to each of the significant scenic resources is shown and understood. As for representativeness, it is difficult to be sure what a VIA analyst means. The only scientific way to identify a representative sample is through random selection. Random selection of views is rarely used in landscape perception research, and is unlikely to have ever been used in a VIA. It is simply too inefficient since most randomly selected views are not of interest. Typically what VIA analysts mean by "representative" is a selection of viewpoints that they make to avoid investigating the worst cases. There may be a reasonably sounding process for selecting the representative views, but in the end the VIA analyst selects those viewpoints she wants and this redirects her attention from scenic resources that may be more severely impacted.

#### 4.2 Standardization of Analysis

DEP has not established a formal set of guidelines for conducting and presenting a wind energy project VIA. The Wind Energy Act settles some of the important variables in conducting a VIA, for instance, a turbine's visual impact is insignificant beyond 8 miles, and only impacts to state and nationally significant scenic resources need to be considered. However, it also requires explicit consideration of viewers' expectations, and the extent, nature and duration of potentially effected public uses. Further, the two primary siting authorities, DEP and LURC, have somewhat different approaches to considering the scenic impacts. It may be appropriate for LURC and DEP to determine a uniform procedure for considering scenic impacts associated with grid-scale wind energy projects.

#### 4.3 Importance of Public Access to Potential Significant Scenic Resources

The Wind Energy Act clearly states that "'Scenic resource of state or national significance' means an area or place owned by the public or to which the public has a legal right of access."<sup>22</sup> Some non-public sites might include properties listed on the National Register of Historic Places,<sup>23</sup> trails,<sup>24</sup> coastal viewpoints,<sup>25</sup> and perhaps other "outstanding natural and cultural feature."<sup>26</sup> However, the requirement of public accessibility may not be available for all non-publicly owned sites. In the case of the Spruce Mountain Wind Project, Dreamhome and the Stearns Hill Farm are privately owned historic sites on the National Register, but the public does not have a legal right of access. Similarly, public access to the large "Bear Paw" conservation parcel owned by The Nature Conservancy is informal; the public does not have legally guaranteed access (Sferra 2010). By the standards of the Wind Energy Act, Dreamhome, the Stearns Hill Farm, and Bear Claw do not meet all the criteria to be significant scenic resources.

#### 4.4 Lack of Levels of Significance for Scenic Resources

---

<sup>22</sup> 35-A MRSA, § 3452, sub-§9

<sup>23</sup> 35-A MRSA, § 3452, sub-§9(B)

<sup>24</sup> 35-A MRSA, § 3452, sub-§9(F); 35-A MRSA, § 3457, sub-§1

<sup>25</sup> 35-A MRSA, § 3452, sub-§9(H); 35-A MRSA, § 3457, sub-§2

<sup>26</sup> 35-A MRSA, § 3452, sub-§9(A)

The first Evaluation Criterion is "The significance of the potentially affected scenic resource of state or national significance."<sup>27</sup> However the Wind Energy Act does not seem to identify any way to meaningfully determine comparative significance among the various scenic resources that it designated as significant. It may be that different degrees of significance can be determined by a close reading of the materials that led to the site's designation. For instance, scenic quality may not have played a role in a resource's designation; therefore it is reasonable that under the first Evaluation Criterion it receive a lower level of significance. Similarly, the nomination forms to the national Register of Historic Places require that the resource be certified as having local, state or national significance. This certification could be considered under the first Evaluation Criterion. Great Ponds and rivers had two levels of significance. Finally, it may be possible to characterize a resource's significance through the importance that others have placed on its scenic quality through writing, art, or other form of recognition.

#### **4.5 Lack of Information about Scenic Resource Users**

The Wind Energy Act clearly intends that the determination of whether scenic impacts are Unreasonably Adverse must involve (1) the "extent, nature and duration" public uses, (2) the expectations of the typical viewer," and (3) "the potential effect of the generating facilities' presence on the public's continued use and enjoyment of the scenic resource." However, information about the use, expectations, and potential affects on enjoyment is simply not available. It may be reasonable that the developer conduct user surveys at the most sensitive scenic resources (e.g., Mildner and MacBride 2010; Robertson and Madden 2004; Robertson 2003). The potential value of such surveys may be severely limited by small sample size and very short sampling periods.

It might also be beneficial for the primary parties involved in the wind development issue to come together around a procedure to estimate public use, expectations and potential effects on enjoyment. Such a system might be based on the Recreation Opportunity Spectrum (ROS) (USDA FS 1987; More, et al. 2003), gross estimates of public use, and the relation of recreation activity to sensitivity to scenic quality (USDA FS 1995, Appendix F; Palmer 1999).

#### **4.6 Cumulative Scenic Impacts**

Within the area of environmental impact assessment, cumulative impacts are an understudied topic. In the area of visual impacts, research generally indicates that smaller changes have a smaller impact. What is not well studied is if 100 wind turbines were going to be built, would the total scenic impact be different if the turbines were built in one single area, or in three separate areas? The closest investigation of this type of problem of which I am aware involved the intensity, size and distribution of clearcuts in the White Mountains (Palmer 2008). The result indicated that the first visible clearcut had a large adverse scenic impact. Each additional clearcut contributed incrementally to the overall scenic impact, but never as much as each preceding clearcut. The evaluation was limited to scenarios that provided a sustainable yield of timber, and they stopped before the point where additional clearcuts no longer had a significant incrementally adverse scenic impact. The implication for wind energy development seems to be that concentrating wind energy development may have a lower overall impact on the state than distributing it throughout the state. This does not mean that we should not be concerned about scenic impacts. On the contrary, we should do planning studies that identify those areas that are

---

<sup>27</sup> 35-A MRSA, § 3452, sub-§3, criterion A

optimally suited for wind energy development and have the lowest potential for significant scenic impacts. Once an area is deemed appropriate for wind development, then from a scenic impact perspective it may make the most sense to fully develop its potential rather than move on to another area.

#### 4.7 Mitigation

The description of mitigation actions taken and the consideration of further potential mitigation is normally part of a VIA. The Wind Energy Act seems to accept the inevitability of Adverse scenic impacts from grid-scale wind development in most cases, and it does not mention mitigation among its scenic impact Evaluation Criteria.

It has been suggested that the requirement for Tangible Benefits supports the concept of using natural resource conservation areas to balance or compensate for scenic impacts (Stearns 2010a). However, mitigation of scenic impacts is not included among the Wind energy Act's examples of Tangible Benefits.<sup>28</sup> Rather it appears that natural resource conservation may be a way to compensate for non-scenic environmental impacts. Maine's Attorney General has advised both DEP and LURC not to require or consider compensatory or other mitigation in a response to scenic impacts. If the scenic impacts are Unreasonable, then the project should be denied.

## 5. Summary

Based on the information presented in the VIA, the intercept interviews on Bald Mountain, and this review, it is possible to respond the Wind Energy Act's scenic impact Evaluation Criteria. This summary shows the extent to which each Evaluation Criterion contributes to an Unreasonably Adverse scenic impact to each significant scenic resource. The scenic impact Evaluation Criteria are:<sup>29</sup>

- A **Significance of resource:** Consider the role of scenic quality in designation, and the level of significance relative to similar designations.
- B **Character of surrounding area:** Consider contrasts with existing landscape and the presence of other contrasting elements.
- C **Typical viewer expectation:** Consider the resource's scenic reputation, and the centrality of scenic quality in designation. Distance traveled may be an indicator of expectations.
- D **Development's purpose and context:** This criterion incorporates the Wind Energy Act's goal of achieving significant wind energy development into consideration of scenic impacts. Consider site quality—wind suitability, proximity to transmission line, and potential power generation if all potential building sites in the area are used. Low evaluation means that if all sites in the area are developed, it makes a

---

<sup>28</sup> 35-A MRSA, § 3451, sub-§10 and 35-A MRSA, § 3454

<sup>29</sup> 35-A MRSA, § 3452, sub-§3

major contribution to Wind Energy Act's goals. High evaluation means the area makes a minor contribution when all potential sites are developed.

- E.1 **Extent, nature & duration of uses:** Consider the number of users, role of scenic quality in use of the resource, and typical length of stay. Potential accessibility may be an indicator in the absence of empirical data.
- E.2 **Effect on continued use and enjoyment:** If project is built, what is the likelihood of users returning, and the impact on their enjoyment of the scenic resource.
- F **Scope and scale of project views:** Consider the relative magnitude of project elements, and the proportion of total angle of view occupied by project.

The levels of severity for the Evaluation Criteria are as follows:

- 0 **None:** The Evaluation Criterion makes no contribution to scenic impact. For some criteria a rating of None means that there is No Adverse Impact (e.g., there are no people present—Criterion E, or the project is not visible—Criterion F).
- 1 **Low:** There severity of the contribution is low. While the scenic impact may be Adverse, it appears to be within the acceptable range for any type of development (e.g., only one or two turbines will be partially visible at a distance of nearly 8 miles—Criterion F).
- 2 **Medium:** The severity of the contribution is medium, which is Adverse but typical of wind energy development, and within the range of impacts that the Wind Energy Act anticipates (e.g., other towers or large scale structures are present that contrast highly with the surrounding landscape).
- 3 **High:** The severity of the contribution is high from this criterion, which in association with other criteria may make the overall scenic impact Unreasonably Adverse (e.g., the scenic resource is a national icon—Criterion A is High, though there are only a few viewers—Criteria E.1 is Low—and to a person their enjoyment will seriously decline—Criteria E.2 is High).

Table 6 summarizes the Evaluation Criteria ratings for the Spruce Mountain Wind Project, based on my interpretation of the information available in the VIA, intercept interview report and this review.

**Criterion A: Significance of resource.** Abbotts Pond is a scenic resource of state significance with a reported scenic value rating of "Outstanding." All other resources seem to have simply met the minimum threshold for significance.

**Criterion B: Character of surrounding area.** The surrounding area is generally of natural character, though it is not "pristine," as evidenced comments in the intercept interview report (Mildner and MacBride 2010). The rating for all listed resources is Medium.

**Criterion C: Typical viewer expectation.** There is little empirical research about the sensitivity people engaged in different recreation activities to scenic quality and impacts. However, one study did find that people who fish or hunt are less sensitive to scenic value and impacts than people who hike and canoe (Palmer 1999). In addition, the intercept interviews on Bald Mountain (Mildner and MacBride 2010) suggested that while the view was important for some, the experience was more about being outside in the fresh air and getting some exercise. For this summary, the Great Ponds and State Park sites were given a Medium rating, the historical sites were given a Low rating.

**Criterion D: Development's purpose and context.** The Spruce Mountain Wind Project is a small development, only 10 to 11 turbines, with no apparent room for expansion. This development will make a minor contribution toward achieving the Wind Energy Act's goal, and therefore receives a High rating. Said another way, this project could be thought of as contributing to wind energy visual "sprawl."

**Criterion E.1: Extent, nature & duration of uses.** Shagg Pond apparently has the best boat launch among the ponds, but over the Memorial Day weekend there were only 5 boats observed. Similarly, the Bald Mountain interviews found that a modest number of people hiked there on one of the biggest weekends of the year. Finally none of the historic sites host large numbers of people where scenic quality is central to the activity. Therefore, all the sites receive a Low rating.

**Criterion E.2: Effect on continued use and enjoyment.** Among all of the significant scenic resources, Bald Mountain had the best project visibility and users who were anticipated to be most sensitive to scenic impacts. However, the intercept interviews found that people did not expect the visual presence of the turbines to change their enjoyment of or decision to return to Bald Mountain. Since Bald Mountain was anticipated to be the most sensitive site, all sites received a Low rating.

**Criterion F: Scope and scale of project views.** The proximity to the turbines, and the number and extent of turbine visibility suggests that the rating for Bald Mountain, Speckled Mountain, and Shagg Pond is High. Little Concord and Abbotts Ponds have close proximity, but significantly less visibility of the turbines, so their rating is Medium. Even though all of the turbines may be visible, their distance from Labrador Pond requires a rating on Low. The turbines will not be visible from the other significant scenic resources.

If Criterion F: Scope and scale of project views is rated as None (i.e., the project will not be visible), then there can be no Overall Scenic Impact. Most of the other scenic resources have a Low Overall Scenic Impact, because their significance is Low, there are Low numbers of users,

**Table 6: Summary of Evaluation Criteria Ratings for Spruce Mountain Wind Project**

Scenic Resources of State or National Significance in the Surrounding Area	Scenic Impact Evaluation Criteria							Overall Scenic Impact
	A	B	C	D	E.1	E.2	F	
<b>Great Ponds</b>								
Abbotts Pond	2	2	2	3	1	1	2	Low
Joes Pond	1	2	2	3	1	1	0	None
Labrador Pond	1	2	2	3	1	1	1	Low
Little Concord Pond	1	2	2	3	1	1	2	Low
Little Labrador Pond	1	2	2	3	1	1	0	None
Shagg Pond	1	2	2	3	1	1	3	Low-Med
<b>Historic Sites</b>								
Arthur L. Mann Memorial Library	1	2	1	3	1	1	0	None
Dreamhome †	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
First Universalist Society Church	1	2	1	3	1	1	0	None
Greenwood Cattle Pound	1	2	1	3	1	1	0	None
Greenwood Town Hall	1	2	1	3	1	1	0	None
Rumford Point Congregational Church	1	2	1	3	1	1	0	None
Stearns Hill Farm †	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Whitman Memorial Library	1	2	1	3	1	1	0	None
<b>State Parks*</b>								
Little Concord Pond SP (Bald Mtn.)	1	2	2	3	1	1	3	Low-Med
Speckled Mountain SP	1	2	2	3	1	1	3	Low-Med

Notes: † Non-public site without public legal right of access.

and the anticipated effect on user experience is Low. The exceptions are Shagg Pond, Little Concord Pond State Park Bald Mountain) and Speckled Mountain State Park which are Low tending toward Medium, due to the scope and scale of the project views.

## 6. Conclusions

This review considers how the criteria and standards in Maine's Wind Energy Act can be integrated into a standard visual impact assessment (VIA) process. The Wind Energy Act establishes some useful limits: (1) facilities seem from 8 miles away or further are insignificant, and (2) only impacts to eight types of state or nationally significant scenic resources need be considered. However, the Wind Energy Act also requires consideration of the extent, nature and duration of affected public uses of the scenic resources and viewer expectations—information that is not readily available. The old standard of harmonious fit with nature is explicitly abandoned and a new undefined standard of "Unreasonably Adverse" is introduced. While the Wind Energy Act simplifies and clarifies some aspects of the VIA process; in other ways it raises new questions about how to fulfill both the letter and the spirit of the Wind Energy Act. However, there is nothing in the Wind Energy Act that challenges the appropriateness of using a standard VIA organization that involves describing: (1) Project Description, (2) Landscape Character, (3) Visibility Analysis, (4) Significant Scenic Resources, (5) Public Use and Expectations, (6) Evaluation of Potential Impacts, and (7) Mitigation.

The adequacy of the *Spruce Mountain Wind Project Visual Impact Assessment* is reviewed. Overall, it clearly addresses the criteria and standards established by the Wind Energy Act. The visibility analysis uses data that are coarser than the data most commonly used. However this does not appear to create any major misrepresentations. This VIA identifies all significant scenic resources within 8 miles of the wind turbines, as specified by the Wind Energy Act, but it does not always identify the basis of their scenic value, which may be important for applying the "Significance" evaluation criterion. The public use of the scenic resources and how viewer expectations may be impacted are not documented. No substantiated systematic approach to evaluating potential scenic impacts is presented, though the conclusion reached is that "while the visual impact on several resources is anticipated to be moderate to strong, the Project should not have an unreasonable adverse impact on scenic values and existing uses of scenic resources of state or national significance" (TJD&A 2010, page 7).

Fieldwork and additional analyses were conducted as part of the review. These analyses confirm that the primary potential scenic impacts will be to Bald Mountain in Little Concord Pond State Park and Speckled Mountain State Park. The simulations were compared to perspective visualizations and generally found to be accurate, except for the photosimulation from Shagg Pond, which was corrected. However, the turbines in several of the simulations appeared to have lower contrast than would be indicated under the principle of representing the "worst case" view. In addition, it is necessary to indicate the proper viewing distance on all simulations.

This review did not find any examples of serious errors or misrepresentations, except for the Shagg Pond photosimulation. It is important that the public use of the scenic resources and how viewer expectations may be impacted are not documented, but this information is not readily

available for scenic resources in this area. It is expected that the visual simulations from Bald Mountain and Speckled Mountain State Parks will be particularly helpful in evaluating the seriousness of the scenic impacts.

This review raises several issues that might be beneficially considered at this early stage of implementing the Wind Energy Act.

1. It might be helpful to consider standards for selecting simulation viewpoints, and it is recommended that a "worst case" viewpoint be simulated for each significant scenic resource.
2. At this time there is no standardized way to conduct a wind energy VIA. It may be appropriate for LURC and DEP to determine a uniform procedure for considering scenic impacts associated with grid-scale wind energy projects.
3. For privately owned scenic resources to be considered significant by the Wind Energy Act, the public must have a legal right of access. This criterion needs to be clarified, and then systematically addressed in future VIAs.
4. One of the evaluation criteria is "the significance of the potentially affected scenic resource." The Wind Energy Act has identified 8 types of designation to determine significant scenic resources. However, it has not established levels of significance. In addition, several of these designations can be for reasons other than scenic value, making it unclear why they should be considered significant "scenic" resources. Clarification seems to be needed.
5. The practice of not considering visual impacts to neighbors concentrates undesirable impacts near the borders of jurisdictions. Perhaps the scenic resources of our neighbors should also be respected.
6. Maine has established ambitious wind energy goals. It may be useful to consider how to manage the cumulative scenic impacts of this development. In particular, the expedited wind energy development area is very extensive. Is it better to distribute development evenly throughout this area, or concentrate it in a smaller identified area?
7. The Wind Energy Act does not mention mitigation, and it might be appropriate to clarify standards for mitigation.

## 7. References

- DeLorme. 2000. *The Maine Atlas and Gazetteer*. Twenty-third edition. Yarmouth, ME: Delorme.
- DeWan, Terry. 2010. Telephone conversation, June 10, 2010.

- Dixon, Leslie H. 2007. Society preserving landmark. Lewiston, Maine, **Sun Journal**, August 7, 2007. [http://findarticles.com/p/articles/mi\\_8028/is\\_20070807/ai\\_n44682120/](http://findarticles.com/p/articles/mi_8028/is_20070807/ai_n44682120/) (accessed May 12, 2010).
- EMD International A/S. 2010. *WindPRO / ONLINE: Remote Sensing Data and Other Data for Download in WindPRO*. Aalborg, Denmark: EMD International A/S.
- ESRI. 2006. *ArcGIS Desktop*. Redlands, CA: ESRI.
- Expedited Permitting of Grid-Scale Wind Energy Development*. MRSA Title 35-A, Chapter 34-A. <http://www.mainelegislature.org/legis/statutes/35-A/title35-Ach34-A.pdf> (accessed February 23, 2010).
- Maine, Department of Conservation. 2009a. Designated Scenic Viewpoints of State or National Significance, Located on Public Reserved Land or on a Publicly Accessible Trail Used Exclusively for Pedestrian Use, for Consideration in the Permitting of Expedited Wind Energy Development. <http://www.maine.gov/doc/DraftRule/DraftScenicRule.pdf> (accessed March 11, 2010).
- Maine, Department of Conservation. 2009b. Find Parks & Lands. <http://www.maine.gov/cgi-bin/online/doc/parksearch/index.pl> (accessed May 5, 2010).
- Maine, Department of Conservation, Bureau of Parks and Lands. 2009c. *Maine State Comprehensive Outdoor Recreation Plan 2009-2014*. <http://www.maine.gov/doc/parks/programs/SCORP/contents.html> (accessed March 3, 2010).
- Maine, Department of Environmental Protection, Bureau of Land and Water Quality. 2003. *Guidance for Assessing Impacts to Existing Scenic and Aesthetic Uses under the Natural Resources Protection Act*. (DEPLW0541-A2003) <http://www.maine.gov/dep/blwq/docstand/nrpa/sopscenic.pdf> (accessed March 3, 2010).
- Maine Historic Preservation Commission. 1985. National Register of Historic Places Registration Form: Rumford Point Congregational Church. [Tetra Tech EC, Inc. 2010a. Appendix A: National Register of Historic Places Registration Forms.]
- Maine Historic Preservation Commission. 1996. National Register of Historic Places Registration Form: Dreamhome. [Tetra Tech EC, Inc. 2010a. Appendix A: National Register of Historic Places Registration Forms.]
- Maine Historic Preservation Commission. 2002. National Register of Historic Places Registration Form: First Universalist Society of West Sumner. [Tetra Tech EC, Inc. 2010a. Appendix A: National Register of Historic Places Registration Forms.]
- Maine Historic Preservation Commission. 2008. National Register of Historic Places Registration Form: Stearns Hill Farm. [Tetra Tech EC, Inc. 2010a. Appendix A: National Register of Historic Places Registration Forms.]

- Mildner, Curtis, and Jennifer MacBride. 2010. Spruce Mountain Wind Project Intercepts Research Report. Portland, ME: Market Decisions.
- More, Thomas A.; Bulmer, Susan; Henzel, Linda; Mates, Ann E. 2003. Extending the Recreation Opportunity Spectrum to nonfederal lands in the Northeast: an implementation guide. Gen. Tech. Rep. NE-309. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station.
- Nikon. 2004. *The Nikon Guide to Digital Photography with the D70 Digital Camera*. [http://www.nikonusa.com/pdf/manuals/dslr/D70\\_en.pdf](http://www.nikonusa.com/pdf/manuals/dslr/D70_en.pdf) (accessed April 11, 2010).
- Nikon. 2007. *The Nikon Digital Camera D300 User's Manual*. [http://www.nikonusa.com/pdf/manuals/dslr/D300\\_en.pdf](http://www.nikonusa.com/pdf/manuals/dslr/D300_en.pdf) (accessed May 4, 2010).
- O'Shea, Robert P. 1991. Thumb's rule tested: visual angle of thumb's width is about 2 deg. *Perception* 20(3): 415-418. <http://www.perceptionweb.com/abstract.cgi?id=p200415> (Accessed January 15, 2010).
- Palmer, James F. 2008. The perceived scenic effects of clearcutting in the White Mountains of New Hampshire, USA. *Journal of Environmental Management* 89(3):167-183.
- Palmer, James F. 1999. Recreation participation and scenic value assessments of clearcuts. In *Proceedings of the 1998 Northeastern Recreation Research Symposium*, edited by H.G. Vogelsong. Gen. Tech. Rep. NE-255. Radnor, PA: USDA, Forest Service, Northeastern Forest Research Station. pp. 199-203.
- Palmer, James F. 1983. A visual character approach to the classification of backcountry environments. *Landscape Journal* 2(1):3-12.
- Parkin, Drew, John Lortie, Robert Humphrey, and Fred DiBello. 1989. *Maine's Finest Lakes*. Planning Report No. 90. Augusta, ME: Maine Critical Areas Program, State Planning Office.
- Robertson, Brian. 2003. The Mount Redington Wind Farm Visual Analysis Survey. South Portland, ME: Market Decisions.
- Robertson, Brian, and Patrick Madden. 2004. The Mount Redington Wind Farm Visual Analysis Survey. South Portland, ME: Market Decisions.
- Segal, Amy Bell. 2010. FW: Spruce model info. Email dated April 20, 2010.
- Sferra, Nancy. 2010. Land in Milton Township, Maine. Email dated April 19, 2010.

- Sheppard, Stephen R.J. 1989. *Visual Simulation: A User's Guide for Architects, Engineers, and Planners*. New York: Van Nostrand Reinhold.
- Stearns, Alan. 2010a. BPL review & comment re DEP Spruce Mountain Wind (Town of Woodstock). Memo dated March 5, 2010.
- Stearns, Alan. 2010b. Re: question RE Spruce Mountain Wind. Email dated May 4, 2010.
- Terrence J. DeWan & Associates. 2010. *Visual Impact Assessment Spruce Mountain Wind Project*.
- Tetra Tech EC, Inc. 2010a. *Spruce Mountain Wind Project, Woodstock, Oxford County, Maine: Historical Architecture Reconnaissance Survey*.
- Tetra Tech EC, Inc. 2010b. Spruce Mountain GIS Data. CD-ROM dated April 1, 2010.
- USDA, Forest Service. 1987. Project Planning ROS User's Guide Chapter 60. USDA, Forest Service.
- USDA, Forest Service. 1995. *Landscape Aesthetics: A Handbook for Scenery Management*. Agricultural Handbook Number 701. <http://www.esf.edu/es/via/> (accessed March 11, 2010).
- USGS. 2009a. *National Elevation Dataset (NED)*. [http://eros.usgs.gov/#/Find\\_Data/Products\\_and\\_Data\\_Available/NED](http://eros.usgs.gov/#/Find_Data/Products_and_Data_Available/NED) (accessed April 26, 2010).
- USGS. 2009b. *Vertical Accuracy of the National Elevation Dataset*. [http://ned.usgs.gov/downloads/documents/NED\\_Accuracy.pdf](http://ned.usgs.gov/downloads/documents/NED_Accuracy.pdf) (accessed April 26, 2010).
- USGS. 2008. *Shuttle Radar Topography Mission: Quick Facts*. <http://srtm.usgs.gov/Mission/quickfacts.php> (accessed April 26, 2010).

# Appendix 1

## Viewshed Maps

Map 1: Spruce Mountain Topographic Viewshed for Blade Tip

Map 2: Spruce Mountain Forested Viewshed for Blade Tip

Map 3: Spruce Mountain Topographic Viewshed for Turbine Hub

Map 4: Spruce Mountain Forested Viewshed for Turbine Hub

Visibility analysis determines whether a line of sight exists between two specified points. The Topographic Viewshed map indicates visibility over bare landform. The Forested viewshed map indicates visibility that takes into account the screening effect of forest land cover assumed to be 40 feet high.

A geographic information system (GIS) is used to map the viewsheds from which the Spruce Mountain wind turbines are potentially visible. In principle this is an objective exercise in geometry highly suited to a computer application. In practice however, since the data are only approximations of the actual condition and may include errors, the resulting viewshed maps are best considered a preliminary analysis of potential visibility under specified conditions. The maps are useful for providing a preliminary investigation of the overall potential visual impact. If potential visual impacts appear to exist for significant scenic resources, they need to be confirmed through field investigation and other visualization techniques.

# Map 1 Topographic Viewshed for Blade Tip

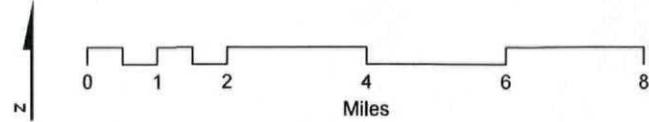
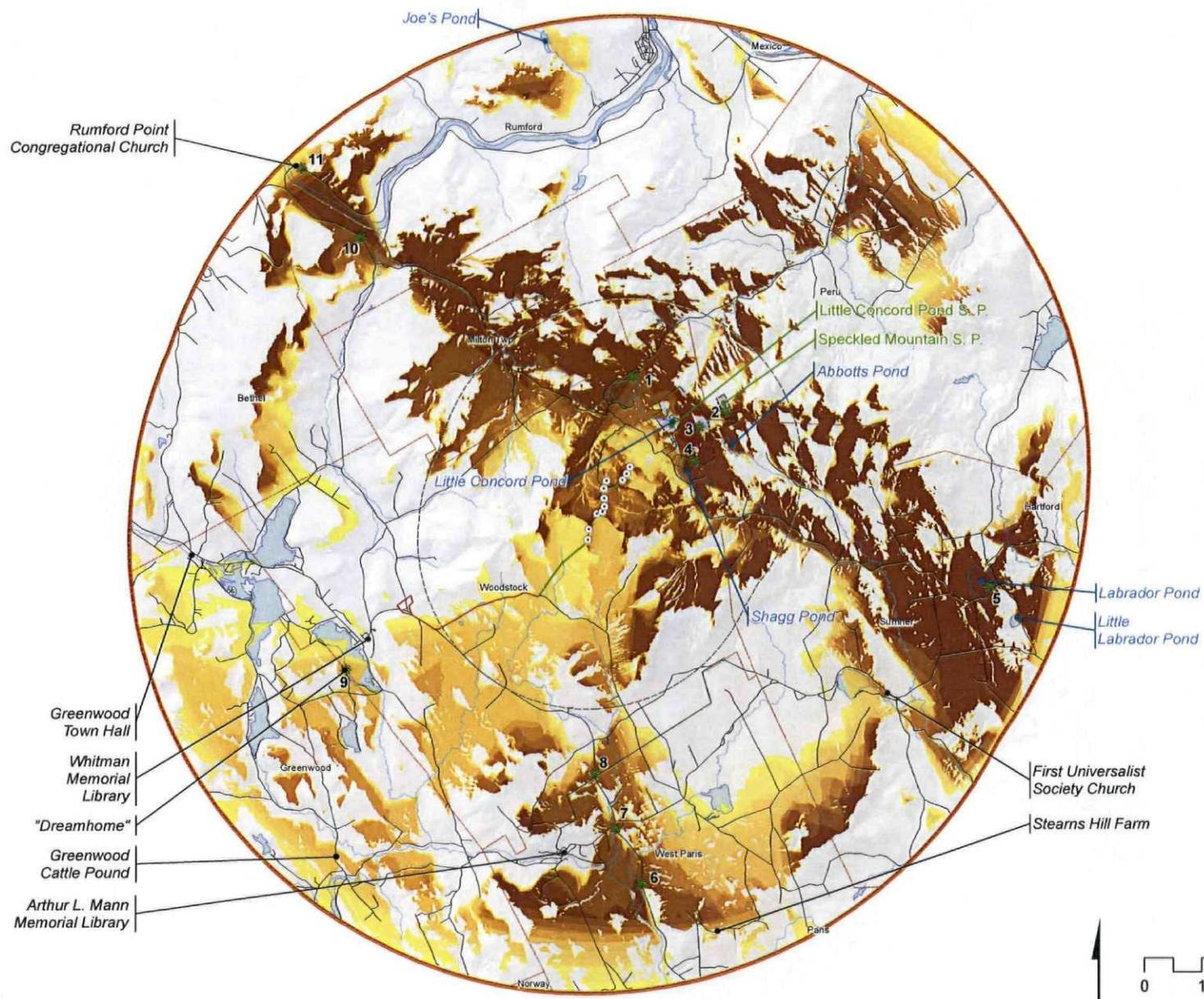
## Spruce Mountain Wind Project

Woodstock, Maine

GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field

### Legend

- ⊙ Turbine Locations
  - \* TJD&A Simulation Locations
  - Roads
  - Rivers/Streams
  - Lakes
- Number of Blade Tips Visible (123 Meters)
- |   |   |   |   |   |   |   |   |   |    |    |
|---|---|---|---|---|---|---|---|---|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|----|----|
- Lake listed in "Maine's Finest Lakes"
  - National Register of Historic Places
  - Conserved Land

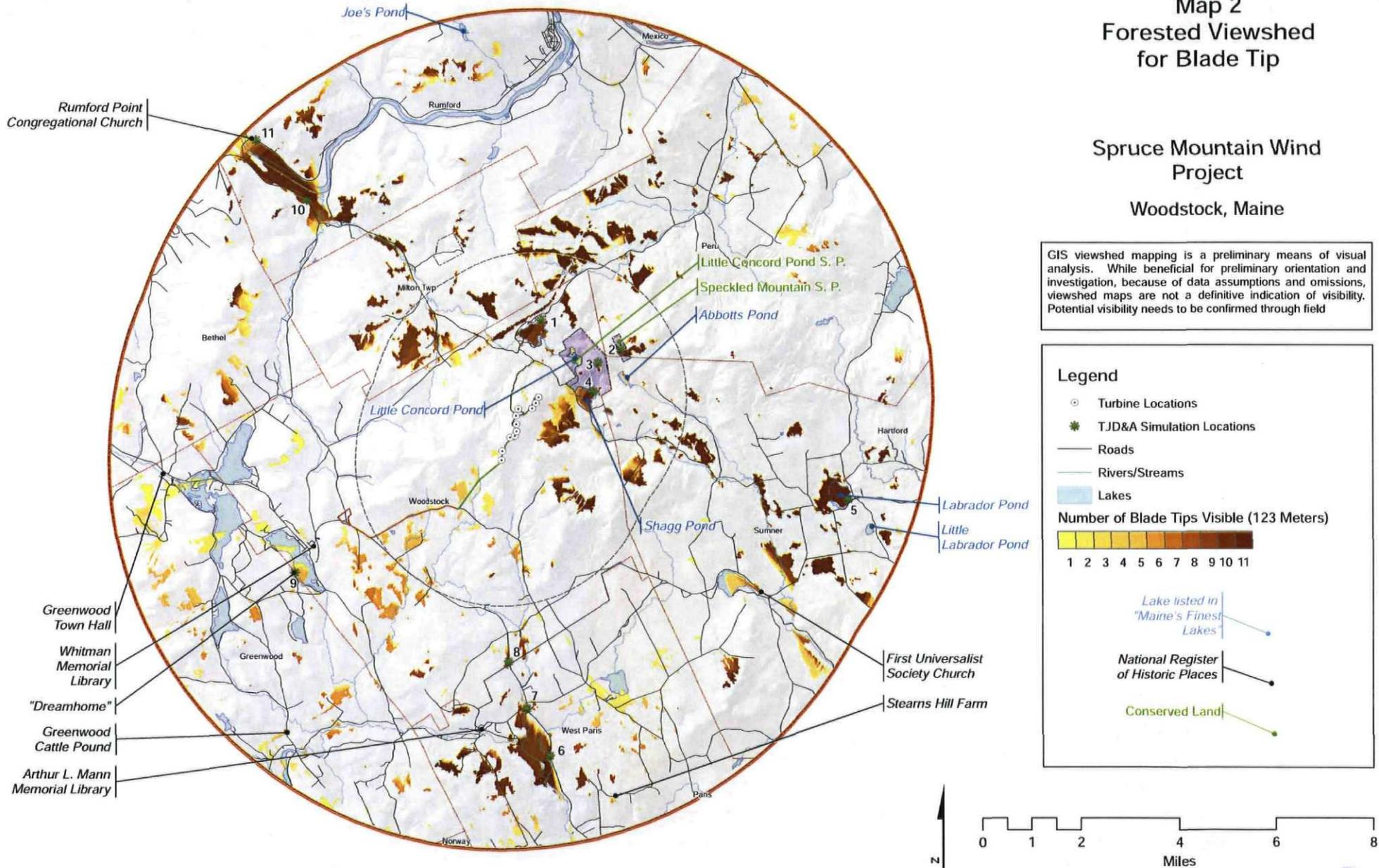


# Map 2 Forested Viewshed for Blade Tip

## Spruce Mountain Wind Project

Woodstock, Maine

GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field

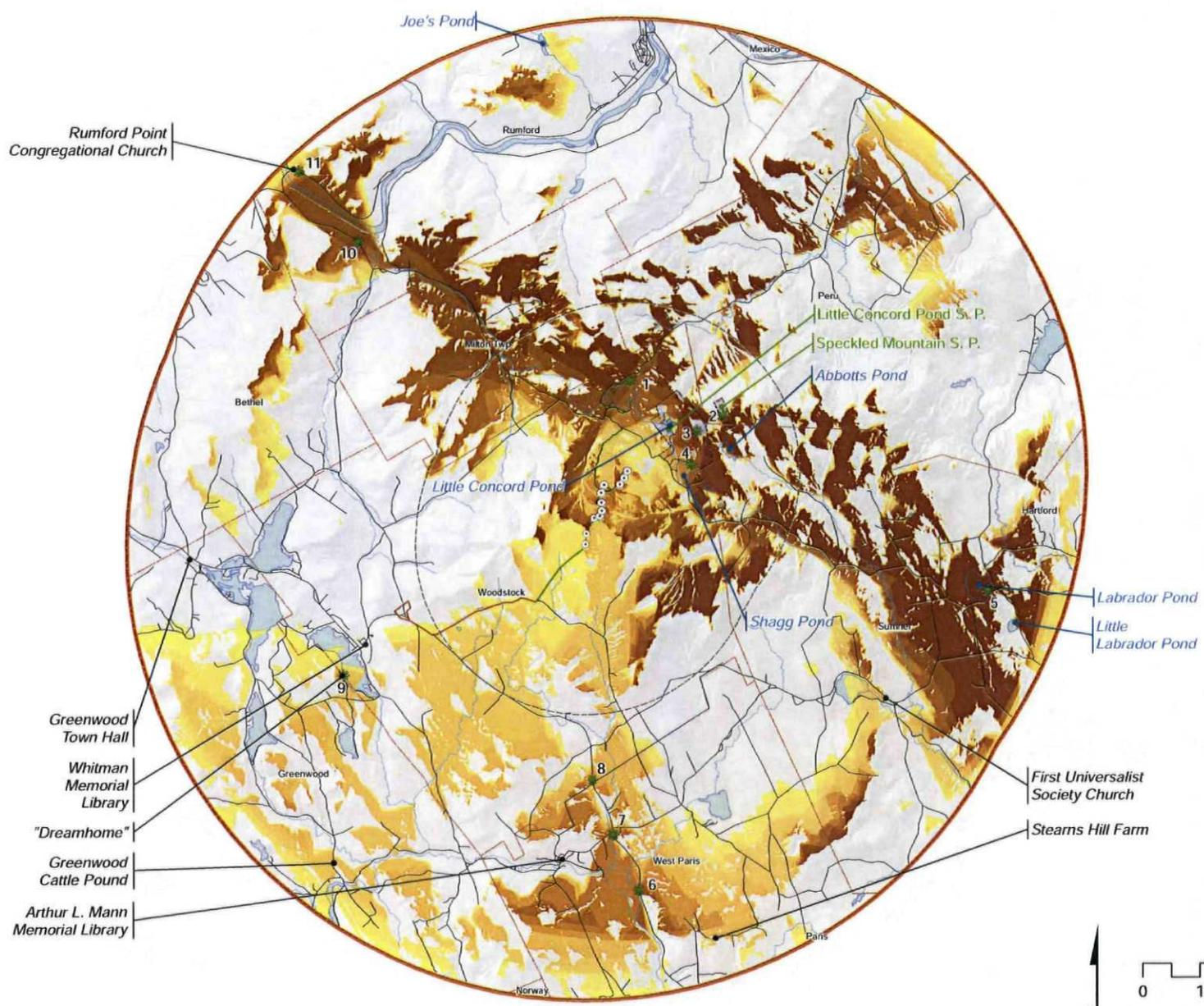


1599

1688

### Map 3 Topographic Viewshed for Turbine Hub

### Spruce Mountain Wind Project Woodstock, Maine



GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field

**Legend**

- Turbine Locations
- ✱ TJD&A Simulation Locations
- Roads
- Rivers/Streams
- Lakes

**Number of Turbine Hubs Visible (78 Meters)**

1	2	3	4	5	6	7	8	9	10	11
---	---	---	---	---	---	---	---	---	----	----

- Lake listed in "Maine's Finest Lakes"
- National Register of Historic Places
- Conserved Land

Rumford Point Congregational Church

Joe's Pond

Mexico

Rumford

11

10

Peru

Little Concord Pond S. P.

Speckled Mountain S. P.

Abbotts Pond

Bethel

Little Concord Pond

Woodstock

Shagg Pond

Labrador Pond

Little Labrador Pond

First Universalist Society Church

Stearns Hill Farm

Greenwood Town Hall

Whitman Memorial Library

"Dreamhome"

Greenwood Cattle Pound

Arthur L. Mann Memorial Library

Greenwood

8

West Paris

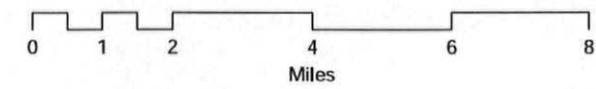
6

6

West Paris

Paris

Norway



# Map 4 Forested Viewshed for Turbine Hub

## Spruce Mountain Wind Project

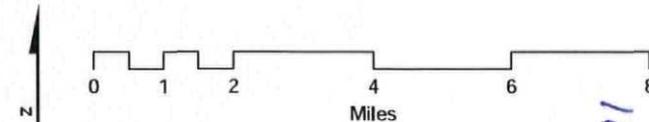
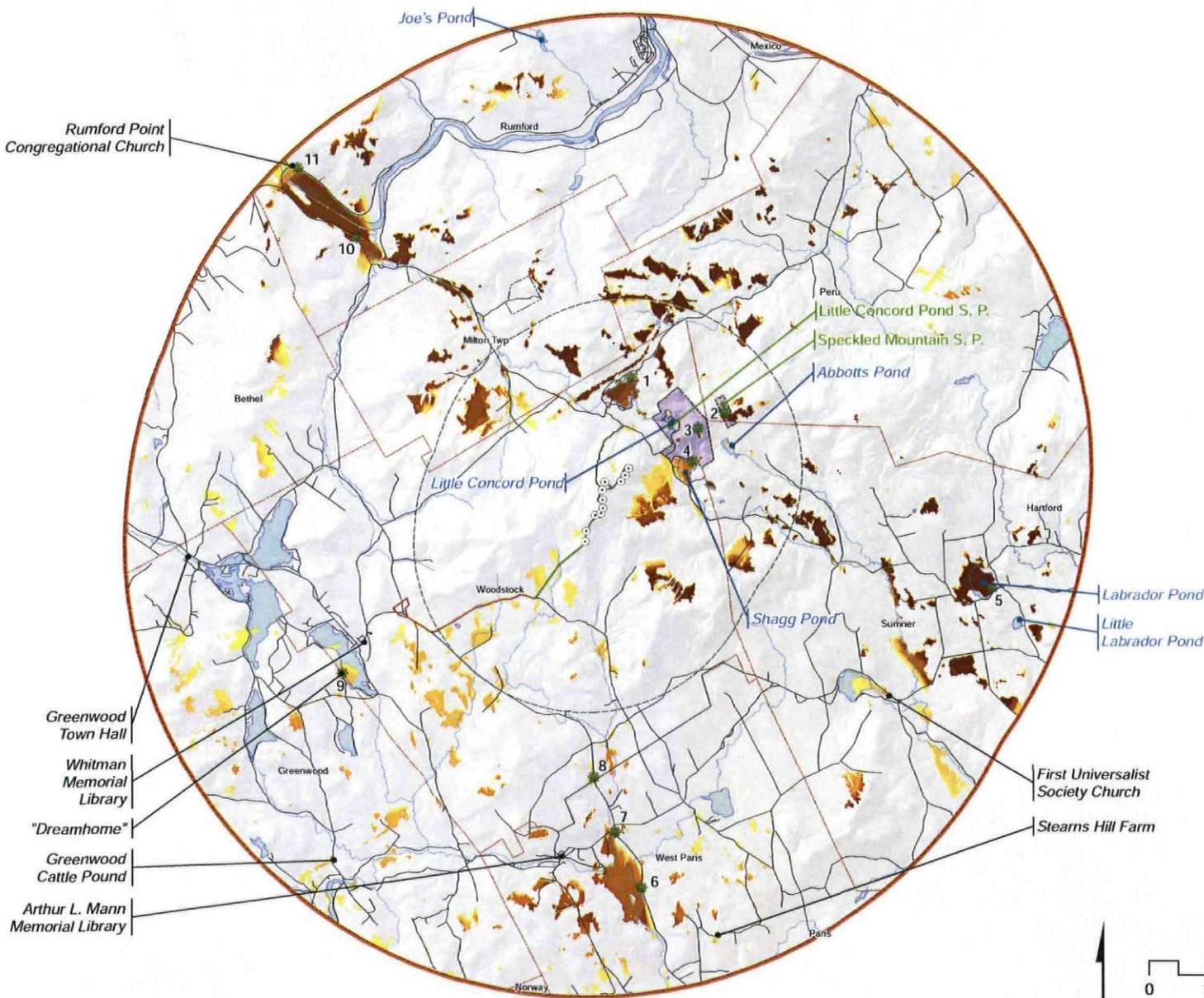
Woodstock, Maine

GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field

### Legend

- Turbine Locations
  - ★ TJD&A Simulation Locations
  - Roads
  - Rivers/Streams
  - Lakes
- Number of Turbine Hubs Visible (78 Meters)**
- |   |   |   |   |   |   |   |   |   |    |    |
|---|---|---|---|---|---|---|---|---|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|----|----|

- Lake listed in "Maine's Finest Lakes"
- National Register of Historic Places
- Conserved Land



1691

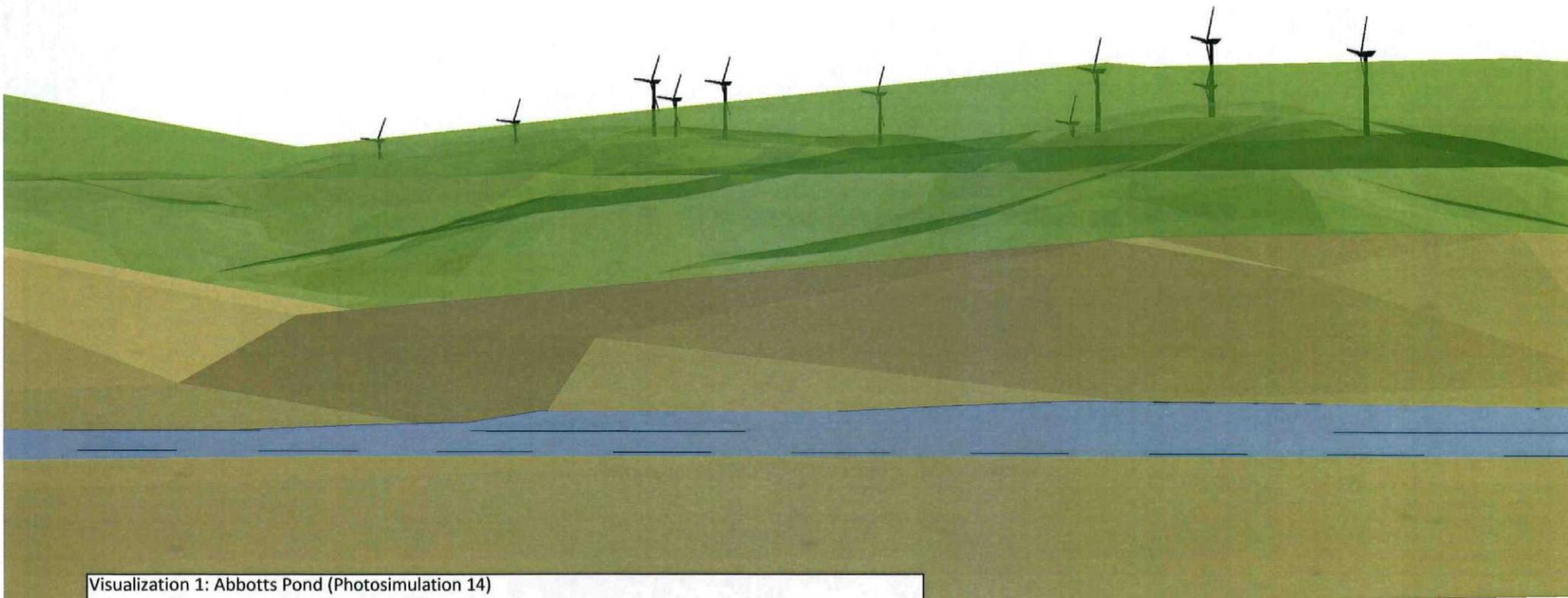
## Appendix 2

### ArcScene Visualizations

- Visualization 1: Abbots Pond (Photosimulation 14)
- Visualization 2: Labrador Pond (Photosimulation 5)
- Visualization 3.1: Little Concord Pond VP 1 (Photosimulation 12)
- Visualization 3.2: Little Concord Pond VP2 (Photosimulation 13)
- Visualization 4: Shagg Pond (Photosimulation 4)
- Visualization 5: Dreamhome (Photosimulation 9)
- Visualization 6: First Universalist Society Church (no Photosimulation)
- Visualization 7: Greenwood Cattle Pound (no Photosimulation)
- Visualization 8: Rumford Point Congregational Church (no Photosimulation)
- Visualization 9: Stearns Hill Farm (no Photosimulation)
- Visualization 10: Speckled Mountain State Park (Photosimulation 2)
- Visualization 11: Little Concord Pond State Park (Bald Mtn) (Photosimulation 3)

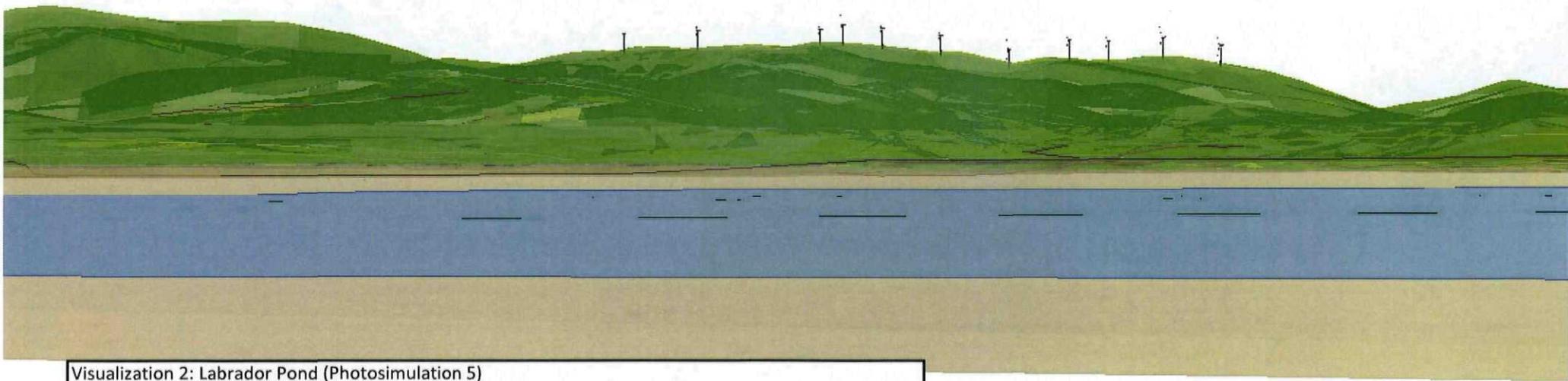
The purpose of these visualizations is to validate the relative accuracy of the *Visual Impact Assessment Spruce Mountain Wind Project* photographic simulations from state or nationally significant scenic resources. Where photosimulations were not created, the visualizations present a sense of the turbines' visual scale and scope, though they should not be considered a substitute for a photographic simulation.

These visualizations are created using the same location and camera information from the photograph metadata and GIS database that were used to prepare the *photographic simulation*. Forest cover is set to 40 feet and immediate vegetation not visible in the photograph is removed. The visualization is in proper perspective when viewed from a distance of approximately 1.5 times its width.



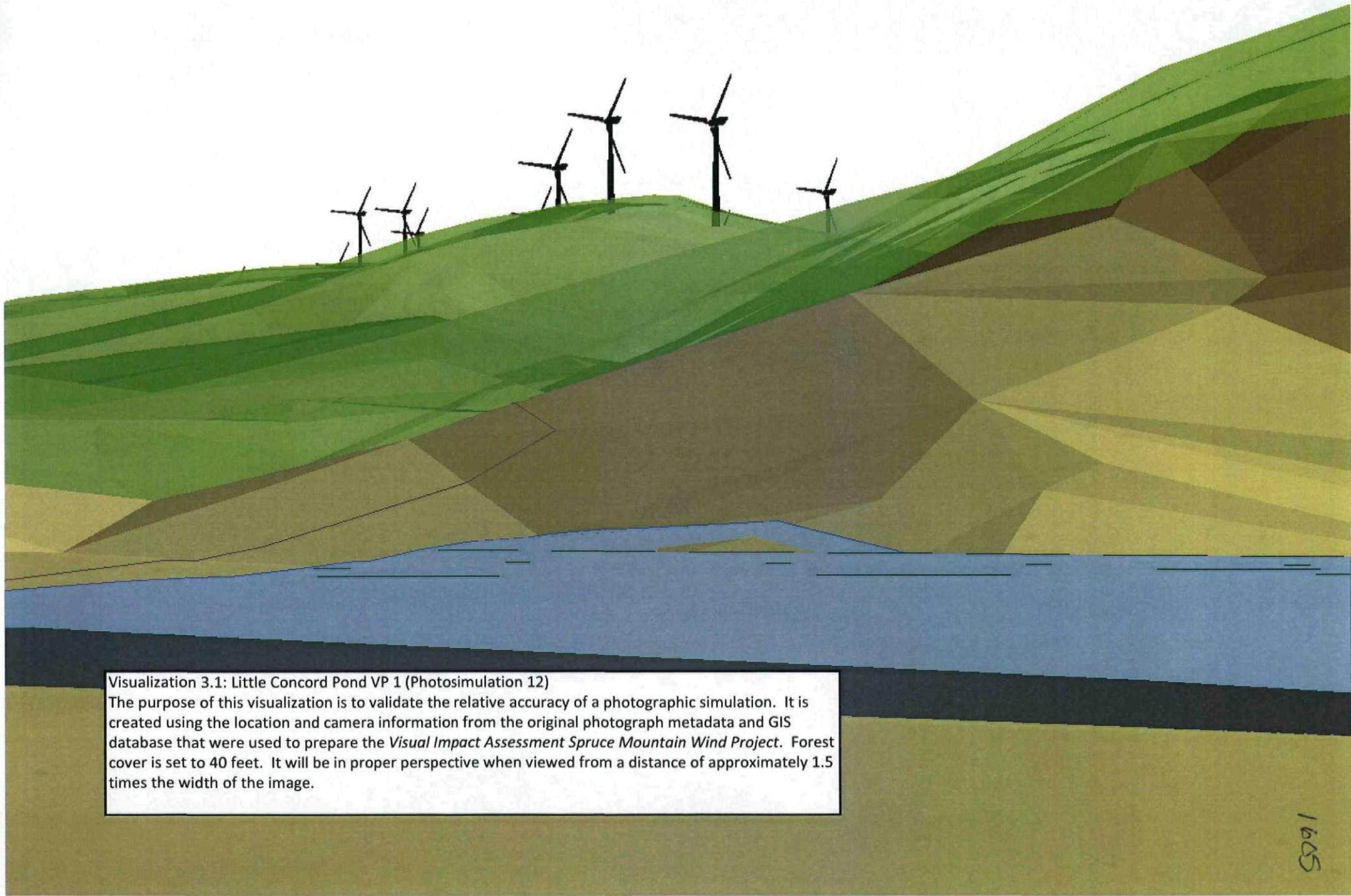
Visualization 1: Abbotts Pond (Photosimulation 14)

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the original photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment Spruce Mountain Wind Project*. Forest cover is set to 50 feet. It will be in proper perspective when viewed from a distance of approximately 1.5 times the width of the image.



Visualization 2: Labrador Pond (Photosimulation 5)

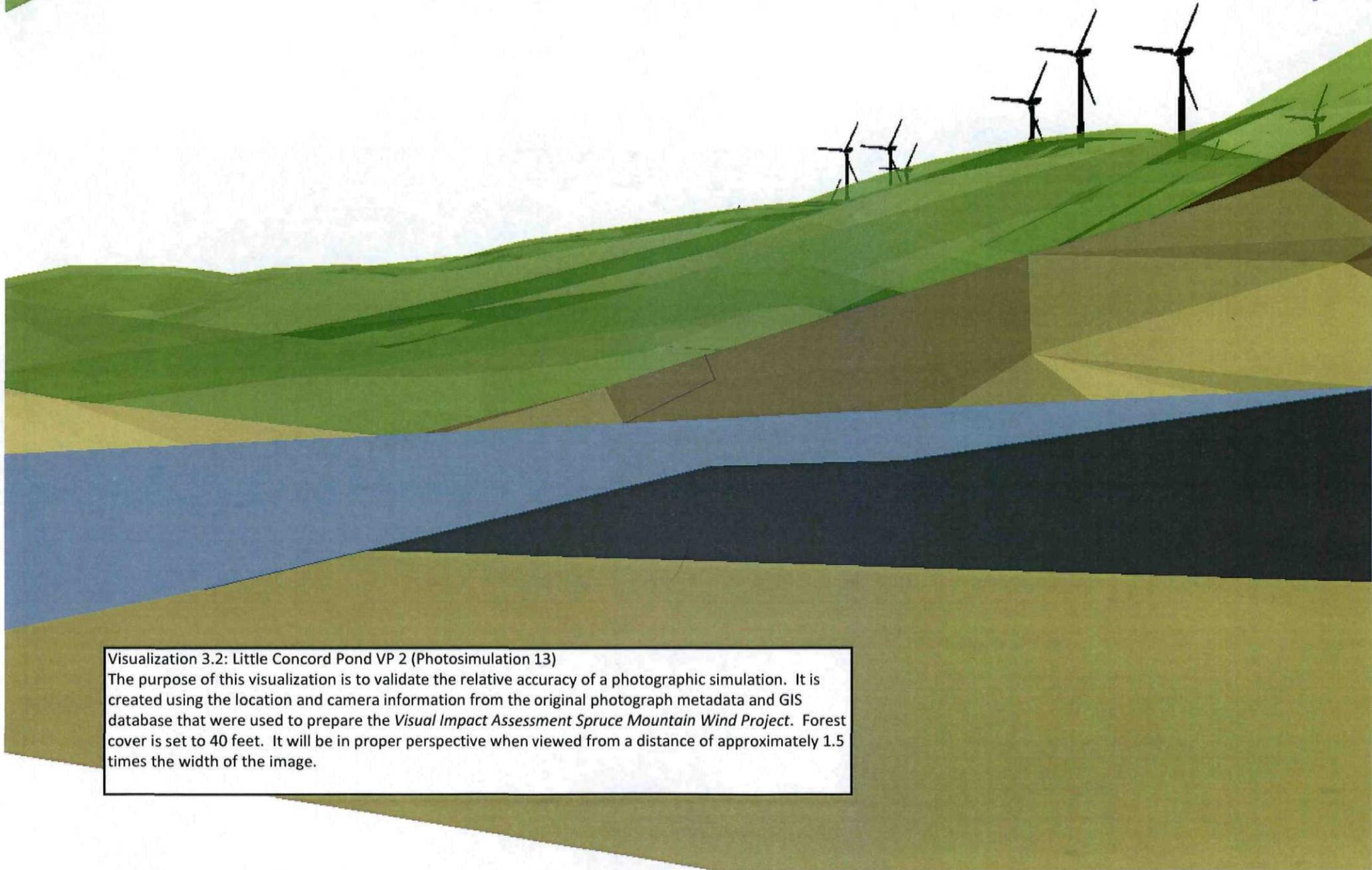
The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the original photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment Spruce Mountain Wind Project*. Forest cover is set to 40 feet. It will be in proper perspective when viewed from a distance of approximately 1.5 times the width of the image.



Visualization 3.1: Little Concord Pond VP 1 (Photosimulation 12)  
The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the original photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment Spruce Mountain Wind Project*. Forest cover is set to 40 feet. It will be in proper perspective when viewed from a distance of approximately 1.5 times the width of the image.

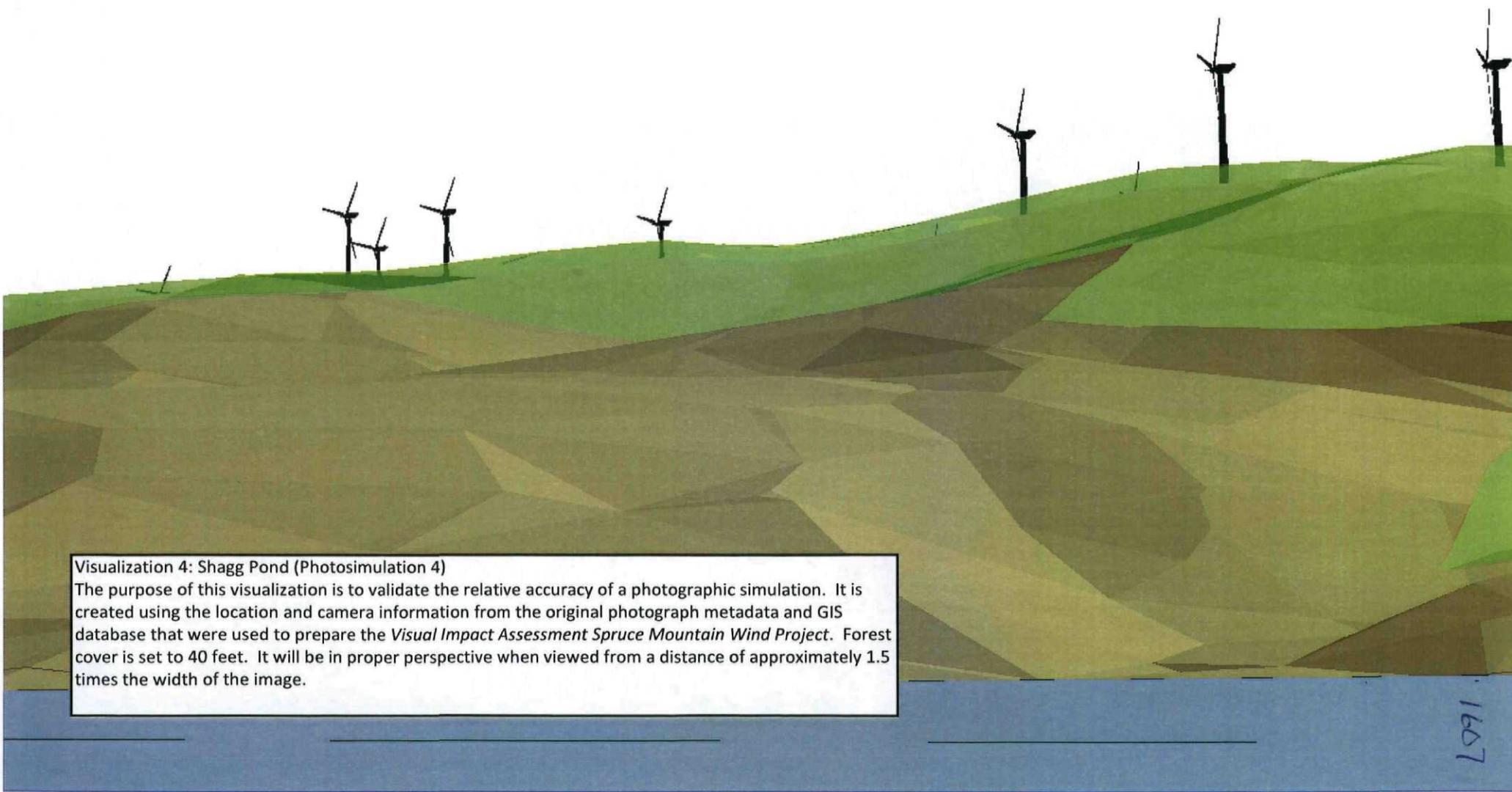
1605

1606



**Visualization 3.2: Little Concord Pond VP 2 (Photosimulation 13)**

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the original photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment Spruce Mountain Wind Project*. Forest cover is set to 40 feet. It will be in proper perspective when viewed from a distance of approximately 1.5 times the width of the image.



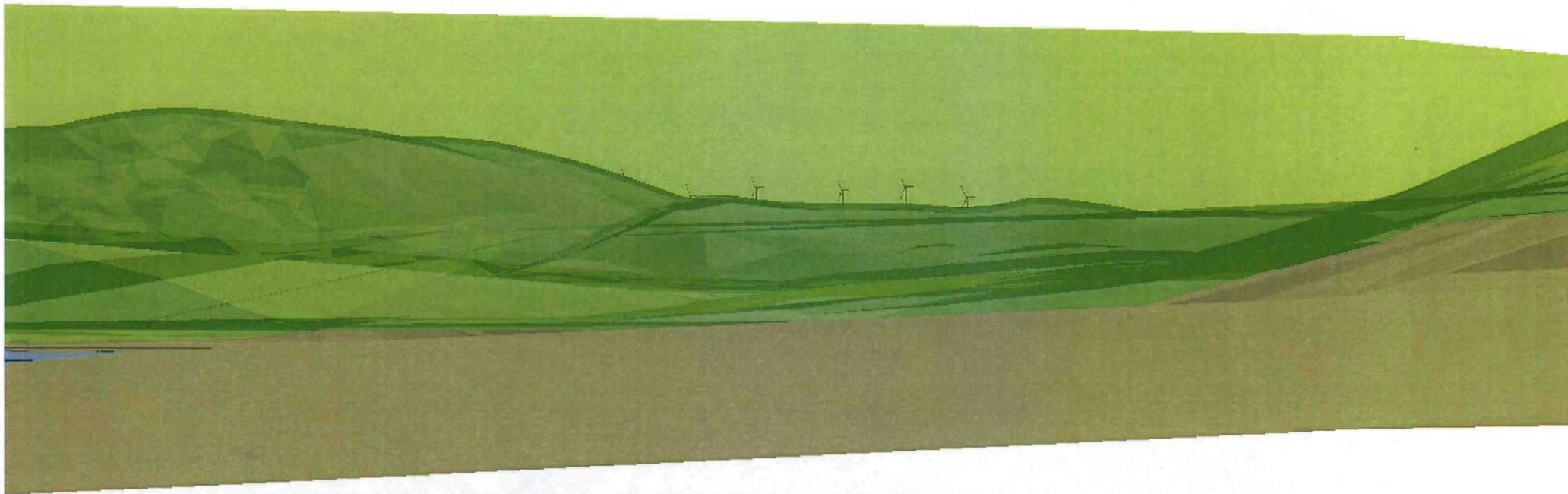
**Visualization 4: Shagg Pond (Photosimulation 4)**

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the original photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment Spruce Mountain Wind Project*. Forest cover is set to 40 feet. It will be in proper perspective when viewed from a distance of approximately 1.5 times the width of the image.



Visualization 5: Dreamhome (Photosimulation 9)

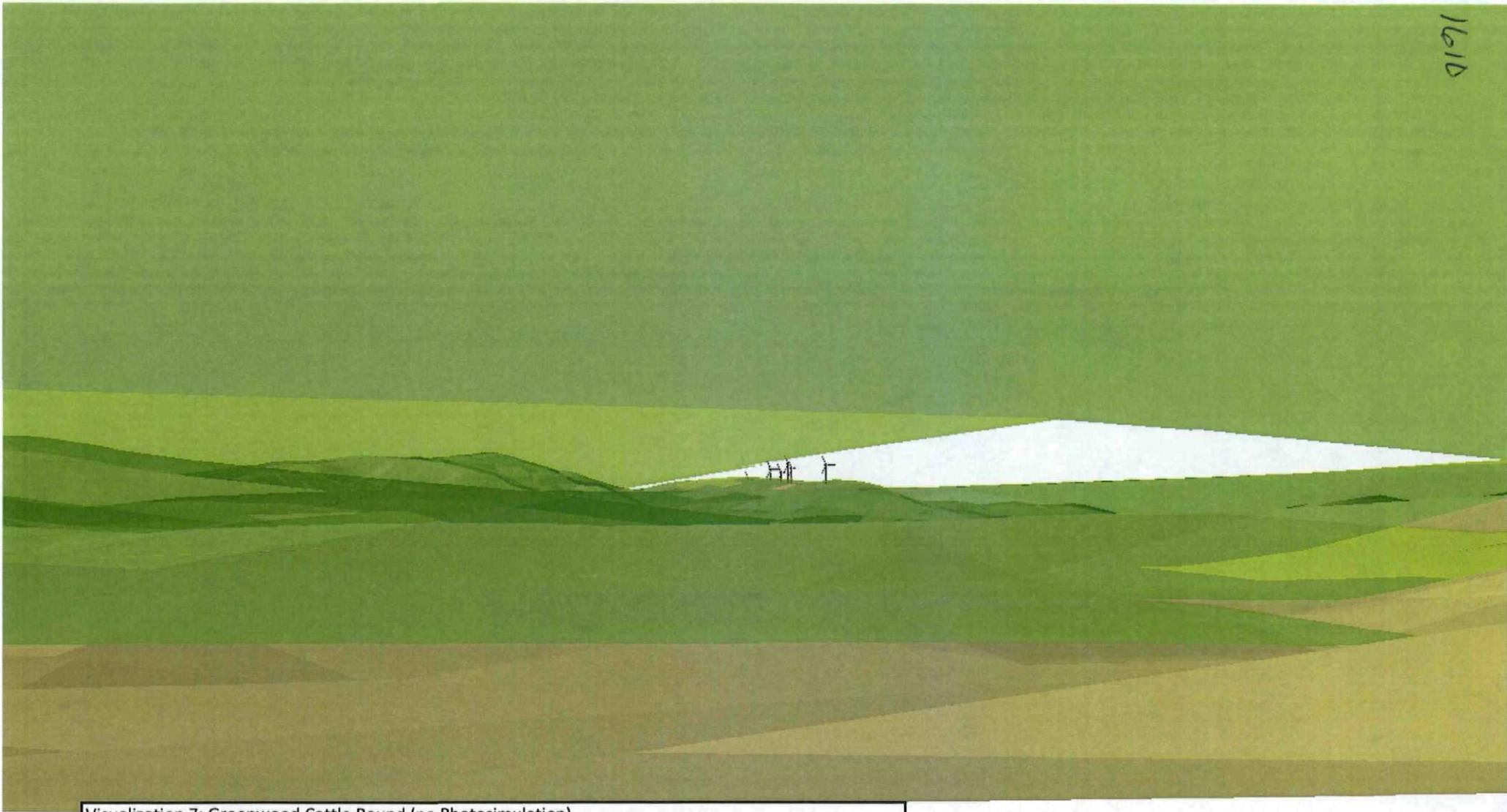
The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the original photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment Spruce Mountain Wind Project*. Forest cover is set to 40 feet. It will be in proper perspective when viewed from a distance of approximately 1.5 times the width of the image.



**Visualization 6: First Universalist Society Church (no Photosimulation)**

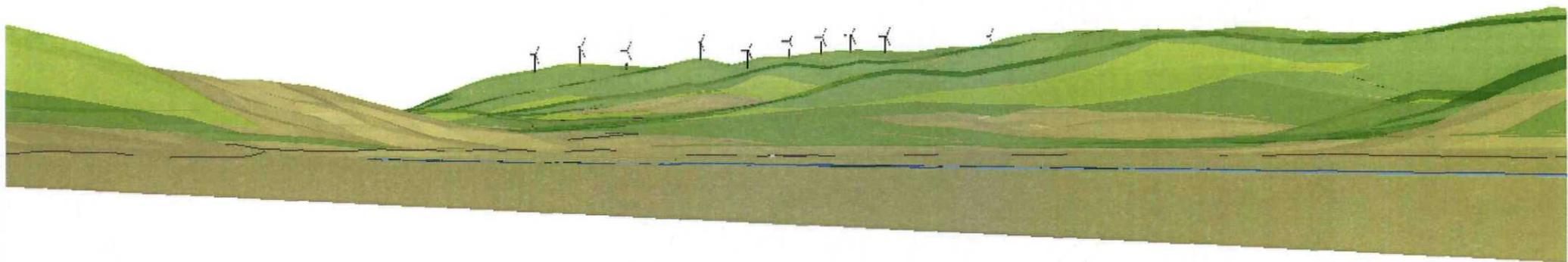
The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the original photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment Spruce Mountain Wind Project*. Forest cover is set to 40 feet. It will be in proper perspective when viewed from a distance of approximately 1.5 times the width of the image.

1610



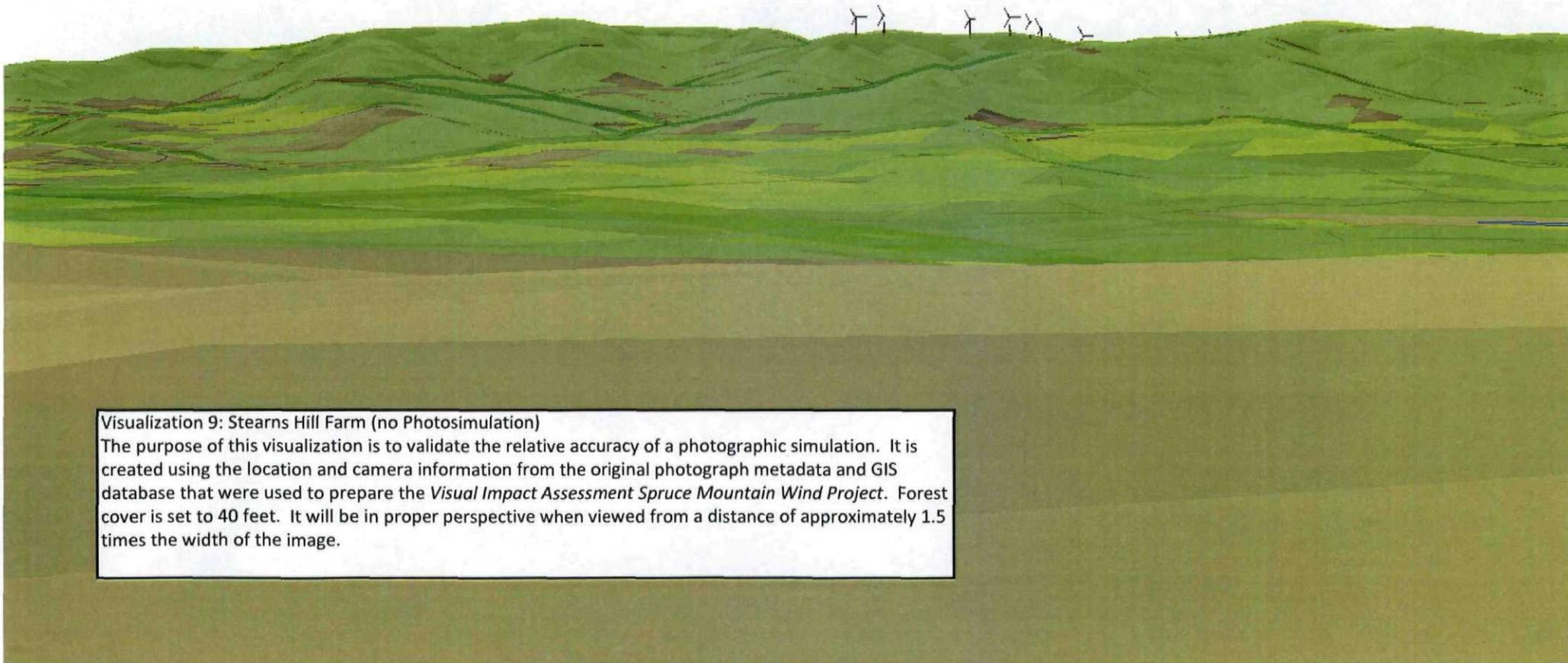
**Visualization 7: Greenwood Cattle Pound (no Photosimulation)**

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the original photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment Spruce Mountain Wind Project*. Forest cover is set to 40 feet. It will be in proper perspective when viewed from a distance of approximately 1.5 times the width of the image.



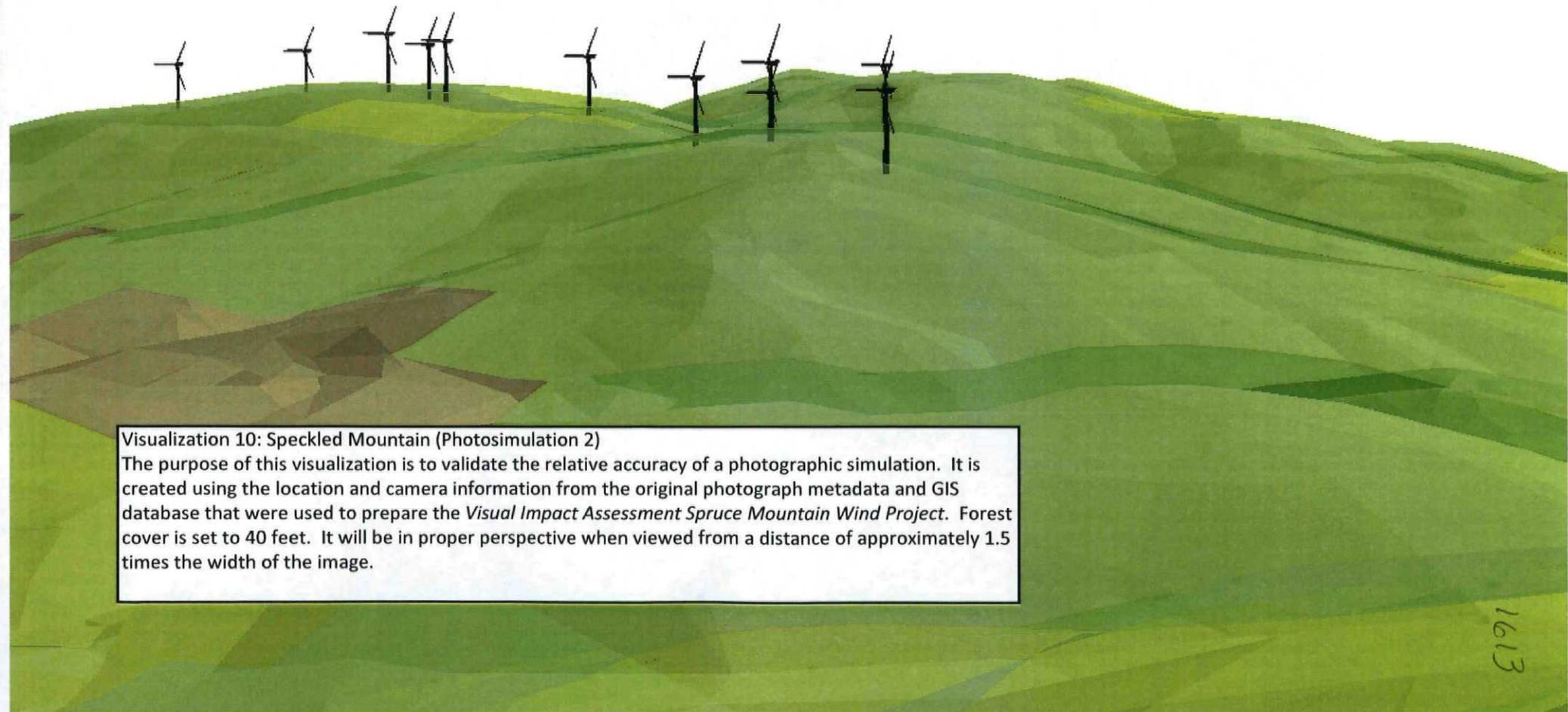
Visualization 8: Rumford Point Congregational Church (no Photosimulation)

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the original photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment Spruce Mountain Wind Project*. Forest cover is set to 40 feet. It will be in proper perspective when viewed from a distance of approximately 1.5 times the width of the image.



**Visualization 9: Stearns Hill Farm (no Photosimulation)**

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the original photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment Spruce Mountain Wind Project*. Forest cover is set to 40 feet. It will be in proper perspective when viewed from a distance of approximately 1.5 times the width of the image.



Visualization 10: Speckled Mountain (Photosimulation 2)  
The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the original photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment Spruce Mountain Wind Project*. Forest cover is set to 40 feet. It will be in proper perspective when viewed from a distance of approximately 1.5 times the width of the image.

1613



**Visualization 11: Little Concord Pond State Park (Bald Mountain) (Photosimulation 3)**

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the original photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment Spruce Mountain Wind Project*. Forest cover is set to 40 feet. It will be in proper perspective when viewed from a distance of approximately 1.5 times the width of the image.