



## Research Paper

# Effect size as a basis for evaluating the acceptability of scenic impacts: Ten wind energy projects from Maine, USA



James F. Palmer\*

Scenic Quality Consultants, 42 Killarney Drive, Burlington, VT 05408, United States

## HIGHLIGHTS

- 604 respondents to intercept surveys evaluate scenic impacts of 10 wind projects.
- Impact severity is assessed using standardized mean difference (Hedges'  $g$ ).
- Change in scenic quality is so large that public opposition is to be expected ( $g = -1.10$ ).
- Change in enjoyment of activities is small and not anticipated to be important ( $g = -0.31$ ).
- Change in continued use is so small that it may go unnoticed ( $g = -0.12$ ).

## ARTICLE INFO

## Article history:

Received 15 September 2014

Received in revised form 31 March 2015

Accepted 10 April 2015

## Keywords:

Landscape perception  
 Visual impact assessment  
 Wind energy development  
 Visual simulation  
 Intercept survey  
 Public acceptability

## ABSTRACT

Visual impact assessments generally lack a reliable and valid procedure to evaluate the impact's magnitude. *Stamps (2000)* proposed effect size thresholds that are adapted to evaluate judgments of scenic impact, effect on enjoyment and continued use of scenic resources affected by ten proposed wind energy projects in the State of Maine, USA. Users of scenic resources were interviewed at 15 locations evaluating 20 viewpoints. Overall, respondents found that the scenic impacts were very large (Hedges  $g < 1.1$ ), while the effect of the change on enjoyment was so small that it is difficult to distinguish ( $0.2 < g < 0.5$ ), and respondents say that the change will have a trivial effect ( $g < 0.2$ ) on their continued use of the scenic resource where they were surveyed. The implications of these results are discussed, including the congruence with permitting orders, the relative merits of using scenic impact or measures of impact acceptability in decision-making, problems of measuring cumulative scenic impacts, and issues concerning survey quality control.

© 2015 Elsevier B.V. All rights reserved.

## 1. Introduction

## 1.1. Visual impact assessment practice

Anyone who has attended a technical hearing for a large proposed development, such as a wind energy project, will have observed that scenic impacts are often among the most hotly contested issues about whether to permit the development or not. Each party has hired an expert to attest to the rightness of their client's position concerning the potential visual impacts from the development. Normal practice is for these experts to conduct fieldwork and desk analyses using GIS and photorealistic simulation technologies. There are several recognized expert-based approaches that could be employed to evaluate the project's potential visual impacts,

including procedures developed by the Landscape Institute and the Institute of Environmental Management and Assessment (LI & IEMA, 2013), the U.S. Army Corps of Engineers (Smardon et al., 1988), U.S. Department of Agriculture's Forest Service (USDA, 1974, 1995), the U.S. Department of Interior's Bureau of Land Management (USDI, 1984, 1986a, 1986b), and the U.S. Department of Transportation's Federal Highway Administration (USDOT, 1990).

The use of scientific approaches to develop evidence to inform important decisions with a significant impact on the public's welfare is widely expected by society. For instance, the U.S. Food and Drug Administration evaluates the efficacy of new medical procedures and drugs, the U.S. Environmental Protection Agency sets national standards for environmental pollutants to assure public health, and the Underwriters Laboratories test the safety of consumer products. There is growing support for using evidence-based approaches to make major planning and design decisions that have the potential to significantly affect public welfare (EDRA, 2014). The

\* Tel.: +1 802 735 5043.

E-mail address: [palmer.jf@gmail.com](mailto:palmer.jf@gmail.com)

foundation of these approaches is that their reliability and validity has been demonstrated and is regularly evaluated.

While official scenic impact assessment procedures may assert that they are reliable and valid (e.g., USDA, 1974, p. 2, 1995, p. 6 and 20; USDOT, 1990, p. 47 and 53), little to no supporting evidence is cited. What little research exists has found that the reliability and validity of these procedures as normally conducted do not meet the standards that one would expect to be employed for important decisions that affect the public landscape (Churchward, Palmer, Nassauer, & Swanwick, 2013; Feimer, Craik, Smardon, & Sheppard, 1979; Palmer, 2000; Palmer & Hoffman, 2001).

### 1.2. Public assessment of scenic impact

In contrast to the formalistic expert-based approaches, there is an extensive literature demonstrating the reliability and validity of having the public rate photographs and photorealistic simulations as a means to determine landscape scenic value or scenic impact (Churchward et al., 2013; Palmer & Hoffman, 2001; Stamps, 2000). The value of having the public evaluate the potential scenic impacts of a proposed project is recognized by U.S. federal agency procedures as particularly appropriate for large projects, such as commercial grid-scale wind energy development (Smardon et al., 1988, pp. 27–36; USDA, 1995, Chapter 3; USDOT, 1990, p. 12, 38–39). Force and Williams (1989) found that surveys were highly desired by agency, industry and environmental interest groups as a form of participation.

Well conducted surveys that employ probability sampling methods to target the affected public often contribute to a very different and perhaps more nuanced understanding of the conflict than the polarity that is often experienced at public meetings (Palmer & Smardon, 1989). Intercept surveys capture people when and where they are engaged in their recreation experience, providing contextual validity that does not require a reliance on introspective recall and reimagining the original experience and context. This is important, since research suggests that the ability to accurately recall the qualities of the experience rapidly diminish over time (Stewart & Hull, 1992) and are not the same for onsite and offsite evaluations (Manfredo, 1984).

It is the position taken by this paper that intercept surveys conducted at locations with potential views of development projects have greater ecological validity than internet, telephone or mailed surveys of people in their homes. All respondents to an intercept survey are at the affected location and are engaged in normal activities for the site, thus avoiding problems of ecological validity. In addition, since they are intercepted while recreating, there is no recall bias. Respondents are experiencing the affected environment, which allows them to better understand the context represented in the photographs. Because of this, well conducted intercept surveys provide unbiased and specifically targeted information.

### 1.3. Maine's scenic impact evaluation criteria

Maine became one of the leading states in the U.S. on April 18, 2008, when Governor John Baldacci signed *An Act to Implement Recommendations of the Governor's Task Force on Wind Power Development* (the Act). It establishes a favorable policy encouraging grid-scale wind energy development in appropriate locations. In particular, it created very aggressive wind energy generation goals and designated a large portion of the state for expedited grid-scale wind energy development. The Act also established a unique approach to evaluate the scenic impacts from wind projects.

The Act acknowledges that “generating facilities are a highly visible feature in the landscape . . . [but this] is not a solely sufficient basis for determination that an expedited wind energy project has

an Unreasonable Adverse effect on the scenic character and existing uses related to scenic character.” It further specifies that “determination that a wind energy development fits harmoniously into the existing natural environment. . . is not required”—harmonious fit being the traditional standard for judging scenic impacts in Maine. The new standard is whether “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” (SRSNS). There are six evaluation criteria used to determine whether the scenic impacts are not adverse, adverse, or unreasonably adverse.

- A. The significance of the potentially affected scenic resource of state or national significance;
- B. The existing character of the surrounding area;
- C. The expectations of the typical viewer;
- D. The expedited wind energy development's purpose and the context of the proposed activity;
- E. The extent, nature and duration of potentially affected public uses of the scenic resource of state or national significance and the potential effect of the generating facilities' presence on the public's continued use and enjoyment of the scenic resource of state or national significance; and
- F. The scope and scale of the potential effect of views of the generating facilities on the scenic resource of state or national significance, including but not limited to issues related to the number and extent of turbines visible from the scenic resource of state or national significance, the distance from the scenic resource of state or national significance and the effect of prominent features of the development on the landscape. (35-A M.R.S.A., § 3452, sub-§3)

This paper is concerned with Criterion E, concerning “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.”

The Act's authors recognize the centrality of scenic impacts to the whirlwind of conflict that is occurring over wind energy development. However, scenic impact is treated by the Act as a dependent variable that is not to be directly measured, but rather inferred from carefully selected and well defined indicator criteria, including the effect on enjoyment and continued use of the SRSNS.

This paper summarizes what has been learned to date from the user surveys conducted for grid-scale wind energy projects being permitted under the Act. The objective is to evaluate the reliability of the surveys responses, and demonstrate how effect size can be used to determine when a project will have an adverse or unreasonable adverse scenic impact.

## 2. Methods

### 2.1. Source of the data

One survey of hikers who had panoramic views toward a proposed wind project was conducted before the Act's passage. Since then, nine visual impact studies for grid-scale wind energy projects have conducted surveys of users at or near a viewpoint within a SRSNS where the proposed project's wind turbines are expected to be clearly visible. At a minimum, respondents were asked to rate a photograph of a nearby existing view and a photorealistic simulation with the project turbines of the same view using a rating scale of lowest to highest scenic value. Additional questions addressed the Act's criteria about how the proposed project would affect their enjoyment at the viewpoint, and whether they would continue to use the area if the project were built. Some surveys included

Download English Version:

<https://daneshyari.com/en/article/7461140>

Download Persian Version:

<https://daneshyari.com/article/7461140>

[Daneshyari.com](https://daneshyari.com)