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## Response to Jon Boone's Critique

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## Response to Jon Boone's Critique

Yuriko Saito

It has been two years since I became interested in the Cape Wind project and examined the role of aesthetics involved in the controversy surrounding it. If approved, this will be the first offshore wind project in the United States and the largest of its kind, so it is no surprise that it continues to create a lively public debate. Op-ed articles and letters to the editor from both sides on this issue appear almost weekly in newspapers. It is uncommon for this kind of public debate to appear in an academic journal, such as *Contemporary Aesthetics*, but it is a welcome sign, as I believe that philosophy, in particular aesthetics, must be engaged in real-life issues rather than dealing with purely conceptual ones. For this reason, I appreciate and welcome Mr. Boone's critique of my essay on the aesthetics of windfarm published here a year ago.

Currently (August, 2005), both sides of the debate eagerly await the final report of the environmental impact study by the US Army Corps of Engineers, expected to be completed sometime next year. This report will be based upon a review of comments and feedback solicited by the Corps on its 4,000+ pages of Draft Environmental Impact Statement (DEIS) published in Nov. 2004, which was prepared in cooperation with 12 federal agencies and 7 state and local agencies, following the rules and guidelines established by the National Environmental Policy Act, Massachusetts Environmental Policy Act, and Cape Cod Commission Regional Policy Act. DEIS examined a number of issues, including needs, environmental ramifications, socio-economic impact, and comparison with alternative strategy, among others. One section dealing with alternative site analysis alone spans over 200 pages in which 17 alternative sites were considered, 8 onshore and 9 offshore, based upon 5 criteria. Among those 17, 4 were selected for further review, with the conclusion that "Horseshoe Shoal was shown to be technically, environmentally and economically preferable to the other two Nantucket Sound alternatives for the proposed Project"(1-3).<sup>[1]</sup>

Boone offers several criticisms of my argument for the aesthetics of windfarms, most of which have to do with my premise on the effectiveness and environmental soundness of wind power technology. He is correct in pointing out that my positive aesthetic argument is dependent upon this premise and provides several reasons for questioning it. His challenge to my premise, as I read it, consists of the following: (1) ineffectiveness of wind power; (2) harm to humans and non-humans (noise and avian mortality); (3) the industrial windfarm as a get-rich scheme because of tax credits, and (4) not-so-promising historical precedents for renewable energy. In my response, I will first argue against his skepticism of the environmental soundness and efficiency of wind power, and then address what I think are some important issues that his critique raises for environmental aesthetics in general.

### 1. Question of Effectiveness

The first concern about the ineffectiveness of wind power is that electricity generated by wind power amounts to a drop in the bucket and cannot make a significant dent in meeting our electricity demand predicted to increase 2% annually. In addition, the use of fossil fuel for generating electricity is less than half of our total use of fossil fuel, and the problem of depleting this source of energy as well as pollution cannot be adequately addressed by converting some electricity to come from wind source. We are therefore better off trying to solve the impending depletion of oil and environmental problems related to oil production and consumption by conservation measures and reducing the harmful effects of oil consumption.

I do not agree that the electricity produced by wind power is nothing but a drop in a bucket. By generating on the average of 170 MW, with the maximum output of 454KW, this project can provide almost three quarters of 230MW average demand of Cape Cod, Martha's Vineyard, and Nantucket. DEIS section on "No Action Alternative/Permit Denial" states that "under the No-Action Alternative the New England regional fuel supply portfolio is likely to remain heavily dependent on natural gas and foreign oil availability, and not likely to experience any marked change in diversity of fuel supply or self sufficiency, which would be experienced with the addition of a utility scale renewable energy facility powered by an abundant local resource" (3.3) One may point out that in the overall picture, this amounts to half of the Massachusetts State Legislature's Renewable Portfolio Standard which mandates that 4% of electricity to come from new renewable generation by 2009. However, the benefit of wind power should not be held hostage to an "all or nothing" form of challenge that suggests that, if the project does not make a significant contribution, we should not do it at all. I don't think building of windfarm is aiming to replace all the existing coal- and oil-burning plants; rather, the aim is *reduction* of our reliance on those plants *on the local level*.

Certainly we should work toward reducing emission from existing plants with better technology, in any event. However, even with cleaner coal- and oil-burning facilities, we can never achieve zero emission, while wind power guarantees zero emission from the outset: no carbon dioxide, carbon monoxide, nitrogen dioxide, mercury, sulfur dioxide, or hot water discharge. DEIS estimates that "once on-line the Project could displace equivalent energy production from fossil plants that would otherwise annually emit on the order of 1,000,000 tons of carbon dioxide (a greenhouse gas which is a major contributor to global warming)"(1-23). And the issue is not only greenhouse gas but also health problems. According to DEIS, "the beneficial health effects from the Cape Wind project that could be realized every year in the New England region" will be significant reduction in various health problems caused primarily by two nearby power plants at Salem Harbor and Brayton Point in Somerset, resulting in estimated \$53 million dollars saving in cost related to public health problems (5.16.3.3.and 5.16.4.3 as well as 3.3). Although DEIS discusses this point as a socioeconomic benefit, needless to say, the most pertinent concern here is the reduction of premature deaths, bronchitis, and asthma attacks (5.16.4.3).

Furthermore, coal and oil are, practically speaking, non-

renewable resources at the rate we are using them up. Even with developing new sites for extracting these resources (such as the Arctic National Wildlife Refuge in Alaska), they do not provide infinite supply; in addition, developing new sites has its own environmental problems, such as negative effects on their eco-systems, not to mention energy and problems associated with transport and storage. One consequence of the no-action alternative stated in DEIS is "secondary environmental impacts related to fossil fuel production, transportation and storage," such as "mining of coal, LNG transportation safety, oil spills from marine barges, natural gas pipeline construction, etc."(3.3).

The nuclear alternative, even with improved safety measures, has to face perhaps its most serious challenge of where and how to store its waste, not to mention how to transport it. In contrast, wind *is* a limitless *and* free supply, needing neither harvesting, transport, nor storage. Even with variation of its output, it provides us with a generally steady supply and its cost will never fluctuate the way other resources do (and as I am writing this we are becoming increasingly alarmed by the ever-rising price of oil, which is not predicted to go down or become steady because of the volatile Middle East situation, as well as the increasing demand from China and India).

Furthermore, supporting windfarms *in no way* denies the importance of conservation efforts and reducing existing energy plants' environmental effects. Not only Boone but other opponents of windfarms point out that wind energy simply gives us a false sense of security without addressing the core of the problem: our excessive consumption of electricity.[\[2\]](#) So, what we as a society should work on is reducing our demand rather than taking 2% annual increase in our demand as given and scramble around to meet this demand.

The same line of argument is often used against recycling. Among the 3 R's of environmental responsibility (reduce, reuse, recycle), "recycle" should be the last priority. Some critics even call it "downcycle" because each time plastic gets recycled, for example, the material gets degraded and so it cannot be recycled forever; in addition, recycling is an industrial process that itself uses resources for energy and produces waste byproduct.[\[3\]](#) Recycling, the easiest for us consumers to engage in, gives us a false sense of "feel good," when in fact what we should be working on is the hardest but the most important of all: reducing our consumption. I wholly agree that the most serious problem we have to tackle is our consumption, whether it be electricity or material goods. However, this most difficult project is not incompatible with, or excluded by, switching to cleaner energy or recycling efforts. Unfortunately, reducing our consumption does not seem achievable anytime soon, so in the meantime we have to rely on whatever measures are available to lessen the environmental problems in some way.

## **2. Harm to Humans and Non-Humans**

As for the harm to our ears, according to DEIS's finding based upon modeling (5.11), people onshore or area boaters are not expected to hear any sound from the turbines. Foghorns when used for marine safety will have a range of one half mile. The report was more concerned about the noise during the

construction phase, but concluded that its temporary nature and its low sound levels heard from onshore "would not interfere with any activities"(1-17). Newer wind turbines are quieter, which is confirmed by people who visit them or work/live near them.[4] Furthermore, we have to keep in mind that the proposed Cape Wind project is 4.7 miles from the closest land, Point Gammon in Yarmouth.

DEIS also addresses the avian mortality issue. Through an analysis of bird activity over Nantucket Sound with radar, boat and aerial observation, it concludes that there is less bird activity over Horseshoe Shoal than in many other areas of Nantucket Sound and "the estimated small number of birds killed by wind turbines is unlikely to cause bird population declines"(1-13). Unlike the earlier, smaller turbines which were responsible for causing some avian mortality, the turbines proposed here are taller with longer blades, with the rotation appearing slower, making it easier for birds to detect the movement and avoid flying into them.

We certainly should not be indifferent toward even the small number of birds killed, and DEIS proposes many measures for mitigating this problem (1-13). However, we should also keep in mind that the possible bird kill by wind turbines, even by the older ones, is extremely small, compared to other stationary structures and objects. David Suzuki points out that "in Toronto alone, it is estimated that 10,000 birds collide with the city's tallest buildings every year." He continues that "the real risk to birds comes not from windmills but from a changing climate, which threatens the very existence of bird species and their habitats." [5] Indeed, Lefteris Pavlides explains that the greatest threat to bird lives is mercury pollution, which damages their motor skills and ability to hatch adequately, causing regional extinction of for loons and raptors. He also points out that acid rain is responsible for the extinction of song birds in many regions, including parts of Vermont, because it kills snails critical for bird diet to produce hard viable eggs.[6]

The dramatic and grizzly image of hapless birds flying into the blades and getting killed is gut-wrenching and stirs our heart. In contrast, it is difficult to visualize avian decimation because of habitat loss, which results in turn, from climate change. The dramatic always has more persuasive power than the less dramatic, just as we are moved by the photos of birds and sea creatures covered with black oil after an oil spill, though there are more serious causes of water pollution than oil spill from big tankers.[7] The avian mortality issue, therefore, must be examined not as an isolated phenomenon caused by wind turbines but as a part of a bigger picture.

### **3. The Financial Incentive**

How about the charge that the Cape Wind project is a get-rich scheme for making profit from tax credits? Although financial gain/loss may be a major motivator for what we do, citing the fact that the wind power industry receives tax credits and those who are pushing for windfarm are simply pursuing their own profit does not make a good argument against the project itself. It is like condemning charitable contributions by individuals or corporations because they do so simply to get tax write-offs. Some of us may indeed be motivated only by a

monetary incentive when we donate money and other resources to charitable organizations and humanitarian causes, but should this profit motive be a reason to discontinue our donation or tax deduction? After all, Massachusetts' Renewable Portfolio Standard mandates that electricity come from new renewable sources with an annually increasing rate, with target of 4% by 2009, and this is the minimum standard. Doesn't it make sense that some monetary incentive is needed to support measures to help us meet the goal?

I don't find this *ad hominem* form of argument to be helpful because it can be used equally against some of the opponents who have vested financial interests regarding this project, whether it be their relationship with oil and mining industries or the property value of their coastal houses.<sup>[8]</sup> Furthermore, for the record, contrary to Boone's claim that "those who would grow richer from these wind 'constructs,' and the politicians who enable them, live hundreds of miles away," the President of Cape Wind, Richard Gordon, lives in Yarmouth where the windfarm will be visible. Theodore Roosevelt IV, a great-grandson of our 26th President, who is helping with financing for this project, also has a summer house on Martha's Vineyard with a view of the plant site. As such, I don't find this line of argument against either side constructive. The judgment on the merit or demerit of the project should be separated from the judgment of the motive both of the proponents and opponents.

Furthermore, although the small wind turbines installed in California twenty years ago at 40 cents per KWH were an investment success because of the generous subsidies, at 3.5 cents per KWH wind energy is currently less expensive than natural gas.<sup>[9]</sup> DEIS also points out the economic benefits of Cape Wind project *to the customers*. It states that "energy produced by the Cape Wind Project will displace an equivalent amount of energy from the next available, more expensive fossil fuel fired unit(s) in the bid stack" and "the Project would save money for natural gas customers by helping stabilize volatile gas price fluctuations" with the estimated average annual savings amounting to "\$25 million for New England customers, including \$10 million annually for Massachusetts customers, during the first five years of operation" (1-21). It seems to me that the discussion of the financial aspect of the project should focus on how the customers, hence the region's economy, will be affected.

#### **4. Past Examples**

The last and, from the aesthetic point of view, the most interesting challenge is the past history regarding renewable energy, hydropower in particular. It is true that dams were regarded with awe because of their sheer size and spectacle, not to mention their inexhaustible supply of power. Supporters of damming up Hetch-Hetchy even invoked an aesthetic argument, accompanied by a touched-up photograph, to foster their cause (although the primary reason for building Hetch-Hetchy was not for hydropower but as a water reservoir for the residents of San Francisco, who suffered from a perennial water shortage).<sup>[10]</sup> So, Boone is right to raise the question whether my aesthetic argument for windfarm will suffer the

same fate as such historical precedents. I have two responses, the second of which I would like to develop into a general issue in environmental aesthetics.

My first response is that, compared to those historical precedents that took place when our environmental awareness was not raised to today's degree, the various environmental repercussions were neither considered nor anticipated. In his account of the history of Hetch Hetchy, Alfred Runte comments that "perhaps increased knowledge of its plants and animals, coupled with scientific evidence corroborating the requirements for survival, could have swayed a few proponents of development to reconsider their stance. Even so, the argument was in the future."<sup>[11]</sup> One could say that people should have predicted the decimation of salmon population, for example, when they were busily constructing dams in the West, but we didn't even know the harm caused by DDT until Rachel Carson pushed the alarm button in 1962, nor did we understand for a long time the environmental harm of losing wetlands, which are now recognized to have at least twenty ecological functions.<sup>[12]</sup>

Even John Muir, like the majority of conservationists at the time, argued for suppression of any fire in all Sierra forests, contrary to the long-standing practice by the resident native Americans who, through periodic burning, maintained the health of redwood forests.<sup>[13]</sup> Today, we are much more aware of environmental ramifications of our projects and, because of these past precedents, we proceed cautiously with environmental impact studies, such as the one prepared for Cape Wind. When people were enthralled with dams, the environmental impact was unfortunately not on their radar screen. Can we then feel confident that we know once and for all all the environmental impact, positive and negative, of today's projects? Of course not. There may be unforeseen consequences that none of us have even dreamed of, but that is true of any "knowledge" we hold. It is always subject to revision with new discoveries.

## **5. Challenge to Environmental Aesthetics**

One may then ask whether it is wise to decide on the environmental value or disvalue of something and adapt our aesthetic sensibility to it, when it may possibly be subject to revision. This raises an important question, particularly in environmental aesthetics, because so much of our aesthetic evaluation seems to be dependent upon what we perceive to be the object's social, political, and environmental value. An extreme skepticism would render any aesthetic evaluation impossible, because we can never have omniscient knowledge regarding all possible future ramifications. However, is it the most reasonable stance to take the position that we should never engage in assigning aesthetic values, positive or negative, to any objects that have possible ramifications, environmental or otherwise? This would be similar to making it impossible for us to decide or act on anything because we can never have complete knowledge about all the possible consequences of the contemplated action, because, as a good Cartesian would claim, nothing is indubitable except for *Cogito*. However, there has to be a middle ground between reckless disregard or complete ignorance and omniscience, and we

conduct our everyday lives, decision-making processes, and academic pursuits on that middle ground, that is, on the basis of best available evidence.

Such extreme skepticism would certainly impoverish our aesthetic life, as well as depriving us of the opportunity to tap into the power of aesthetic persuasion that I will discuss shortly. But Boone's critique is valid insofar as it is a cautionary warning for us to educate us with available materials and data before formulating an aesthetic judgment. I believe that our aesthetic estimation of an object is subject to modification and revision with newer findings, just like everything else. We cannot but change our perception and judgment of a painting if it turns out to be a forgery. Similarly, once we are educated about the environmental harm resulting from maintaining a velvety-smooth, weeds-free, green carpet lawn, our attraction to the lawn will never be the same (although I don't think it will make it ugly all of a sudden, either).

In a sense, our aesthetic perception is fragile, vulnerable to influenced by associated facts, or to borrow David Suzuki's phrase, "we see beauty through filters shaped by our values and beliefs."[\[14\]](#) So, although I currently hold the windfarm project in the positive light and hence argue for its positive aesthetic value, I do reserve the possibility of revision and modification if new, unexpected harms inherent in the technology and structure were to occur or be discovered in the future. At the same time, it seems to me that the same reserved attitude should be advised for all parties to the debate.

Finally, Boone characterizes my aesthetic argument as a "*deus ex machina*" as well as Cinderella's stepsisters' attempt to force their feet into a slipper. To a certain extent he is correct, because I am motivated by coming up with an aesthetic that is in alignment with what I believe to be sound environmental value. He is also correct in pointing out that "bridging matters of epistemology with commensurate notions of aesthetics is difficult" and "melding form with function - finding the proper aesthetic integration between the natural and built environments. . . is one of the greatest human challenges." One may be tempted to suggest that because of this difficulty and controversy, aesthetics, which is notorious for producing diversity of opinions because it is considered simply "a matter of taste," should stay out of the fray and let scientists, engineers, and environmentalists battle it out.

It certainly would be easier for aesthetics to stay out, but I believe that the involvement of aesthetic discourse is important particularly for environmental issues for the following reason. Speaking of historical precedents, the effect of aesthetic persuasion is quite powerful, as the bird kill imagery mentioned above suggests.[\[15\]](#) We are more inclined to protect, support, and take care of what we find aesthetically appealing than what we simply know to be valuable. Environmental persuasion becomes much more effective if it is accompanied by aesthetic persuasion. This observation makes Stephen Jay Gould lament that "environmentalists continually face the political reality that support and funding can be won for soft, cuddly, and 'attractive' animals, but not for slimy,

grubby, and ugly creatures (of potentially greater evolutionary interest and practical significance) or habitats."[\[16\]](#) The challenge is whether what may at first appear to be an eyesore or aesthetically negative can be made aesthetically positive with appropriate facts and attitude.

Consider the following examples. The change of people's reaction toward wetlands, once decried as mosquito-infested swamps that need to be "improved" through filling and paving, is well documented and it was brought about by our awareness their invaluable environmental role. Gardens consisting of indigenous wildflowers, an environmentally preferable alternative to green lawns, used to be considered messy, disorderly, unkempt, in short, unattractive, so much so that sometimes the property owners were fined for creating an eyesore for the neighborhood. Because of our increasing awareness of their environmental benefit, however, our perception of this "messy, wild" look is changing.[\[17\]](#) A similar change is taking place in our customary negative reaction to the appearance of burned forest with charred stumps and fallen trees. After witnessing catastrophic, uncontrollable fires that result from suppressing fire and with a better understanding of forest ecology, today we not only "let burn" fires in national parks but sometimes periodically start them to maintain the proper function of forest eco-system. We are now beginning to appreciate this once deplored charred look, as a part of the natural cycle.[\[18\]](#)

One may point out, however, that these examples address the change of our aesthetic judgment regarding natural materials rather than an industrial structure like a windfarm. Does this fact distinguish these examples from the case of the windfarm? I do think it makes it more challenging, as we seem to have more resistance to something perceived as "intruding on" or "invading" the otherwise pristine-looking natural environment, in comparison with a natural environment or a built environment constructed with natural materials like wildflowers, which was initially considered to be ugly. However, as I stated in my original paper, the examples of the Golden Gate Bridge and Eiffel Tower indicate that it is not impossible. I can add the changed perception regarding the Statue of Liberty here, which I was not aware of. Leteris Pavlides points out that its "installation was resisted and delayed because, as newspapers declared, it 'was neither an object of art (n)or beauty.'"[\[19\]](#)

Furthermore, for each criticism of a windfarm as an eyesore that spoils the pristine landscape, I find a positive aesthetic account of these machines for being graceful, elegant, inspirational, and dancer-like, indicating that the prospect of cultivating such an appreciation is neither unrealistic nor unreasonable. In fact, Pavlides, Professor of Architecture at Roger Williams University, who has been working to install wind turbines in the State of RI, shared with me that he is encountering more and more "YIMBYism (Yes In My BackYard)" rather than "NIMBYism." Furthermore, contrary to the often-held perception that the view of a windfarm has an adverse effect on the property value, a study of 25,000 real estate transactions in America between 1998 and 2002 found that "for the great majority of projects the property values actually rose more quickly in the view shed than they did in

the comparable community." [20]

Certainly, our positive aesthetic appreciation of a windfarm should be based upon an understanding of its extra-aesthetic factors and the aesthetic context *specific to each project*. Hence, the extreme size of the turbines proposed in the Cape Wind project that Boone points out, I agree, will be inappropriate in certain contexts, not only aesthetically but probably psychologically as well. I would imagine that, if a series of them is erected near where we live, we and our dwellings and other buildings will be dwarfed in their shadow and we will feel threatened, not to mention that their size makes the structures incongruous in such a context. But the Cape Wind project is 4.7 miles out in the ocean at its closest proximity to land whose view from onshore will measure half an inch or two-thirds of a thumbnail. So in *this* case, I don't think their super-size will be aesthetically inappropriate.

If my original paper gave the impression that wind turbines are aesthetically positive regardless of context, I need to correct it. I generally agree with Boone's proposal at the end regarding the kind of issues that need to be raised with each wind power project (except for the implied premise that the structures are an "intrusion" on and a "disturbance" to a culturally important and little-disturbed natural view and nearby residents). Certainly the siting and placing of turbines should be made as harmonious and appropriate to the surrounding environment as possible. While driving in the mountainous area of Vermont this summer, our family was rather startled by what appeared to be a gigantic lone tree sticking out on the top of a small mountain, which turned out to be a telecommunication tower disguised as a tree. Though it was not a wind turbine and I don't quite know what to make of the aesthetic implication of such facilities made to look like nature, in this case the object was clearly incongruous with the surrounding mountainscape, as it literally stuck out like a sore thumb. So, some siting and placing of these structures are clearly aesthetically negative in the "thin" sense.

The same attention and sensitivity should be given to the environment's cultural, historical character, as Boone insists. DEIS does indeed point out the loss of historic character of several nearby places, specifically two NHL properties, four historic districts and ten individual historic properties, that will result from the Cape Wind project. "The visual alteration to the historic Nantucket Sound settings of these properties, caused by the addition of the W(ind) T(urbine) G(enerator)s and related structures, will constitute an alteration of the historic character, setting and viewshed of the properties and will have an adverse visual effect on them"(1-16). The question and challenge becomes how to weigh this aesthetic loss with the aesthetic gain that I argued for in the original article.

The conflict of two or more important values, aesthetic or otherwise, pervades our life and society. In the legal sphere, we can list affirmative action, euthanasia, gay rights, and eminent domain, to name only a few contemporary examples. Conflicting aesthetic values also give rise to controversies over the previously mentioned wildflower garden, various local ordinances regulating the aesthetics of private property (e.g.,

pink flamingo lawn ornaments), and the dress code of companies or organizations. [21] Similarly, our differing social and political orientations give rise to conflicting aesthetic perceptions of commercial strips or gated communities: hard work or crass commercialism, comfort and affluence or social injustice? In all these cases, whatever decision is made incurs a price, since supporting one value necessarily sacrifices the competing value. The conflict of aesthetic values regarding Cape Wind project is no exception.

I think the relative weight of the loss of historic character of several places affected by the windfarm depends upon the degree of significance of the oceanscape to their historic import. For example, to what degree is the ocean view integral to the historic value of the Kennedy Compound, one of the historic places that DEIS identifies as being adversely affected by the windfarm? Granted the Kennedy family is well-known for its enthusiasm for sailing, but is the historic legacy of the site going to be completely ruined by the windfarm? Or, is it rather going to be compromised without being destroyed altogether? Will the several proposed measures for mitigation (1-16) help ameliorate the predicted adverse visual effect on those historic sites?

The negative effect on cultural and historic values is an important aesthetic consideration and Boone is correct in calling attention to it. However, recognizing these negative aesthetic values does not necessarily lead to nullifying or outweighing the positive aesthetic values based upon its environmental value that I argued for. Each case has to be examined in its specific context, and on this point Boone and I are on the same page; we disagree about the thick sense of aesthetic value regarding wind turbines and the aesthetic judgment on this specific case.

In addition to considering the aesthetic appropriateness of each project in its respective context, however, we should also re-examine our generally negative reaction toward machines in the garden or ocean. While many machines symbolize wanton disregard for the environment and the well-being of humans and non-humans, others symbolize enhancing our well-being and environmental conditions. Furthermore, in light of the recent debate over wilderness ethics and wilderness aesthetics, [22] the notion of untouched nature itself as well as its perceived value and the price we pay for preserving it deserve critical reflection. Above all, all of us should appreciate both the opportunity and responsibility we share in literally shaping the world for both the near and distant futures. [23]

### Endnotes

[1] Horseshoe Shoal is the proposed site. DEIS is available at <http://www.nae.usace.army.mil/projects/ma/ccwf/deis.htm>. I gave citation reference within parentheses in the text. Most of the quoted passages, like this one, come from Section 1, "Executive Summary," and the page number is indicated following "1" for Section 1. Reference from other sections is given by section and subsections numbers.

[2] For example, George Monbiot writes in *The Guardian* (April 26, 2005) that "wind farms, while necessary, are a classic example of what environmentalists call an 'end-of-the-pipe

solution.' Instead of tackling the problem - our massive demand for energy - at source, they provide less damaging means of accommodating it." Also see Eric Rosenbloom's "'Feel-Good' Technology: Windmills Dodge the Top Energy Issues," in *Providence Journal* (July 14, 2005).

[3] For example, Paul Hawken, the author of *The Ecology of Commerce: A Declaration of Sustainability* (New York: HarperCollins, 1993) and co-author of *Natural Capitalism: Creating the Next Industrial Revolution* (Boston: Little, Brown and Company, 1999), points out that "if the items used in households in America were all recycled, this would reduce our solid waste by only 1 to 2 percent," and such an effort is comparable to "bailing out the Titanic with teaspoons." (p. 147 and p. 5 of *Ecology*). He advocates changing the economic system so that the price of goods reflect their true "cost," including what is now referred to as external cost or intangibles, which will force the industry to change its manufacturing process to eliminate waste and toxic emission.

[4] Stephen Hesse reports on his visit to a wind turbine in the town of Hull, MA, that a high school teacher whose building is 100 meters away from the turbine explained to him that she never hears any sound inside the school. ("Power Answers Blowing in the Wind," *The Japan Times* (March 24, 2005).)

[5] David Suzuki, "The Beauty of Wind Farms," *New Scientist* (April 16, 2005).

[6] Personal correspondence.

[7] Edward Tenner discusses this point in *Why Things Bite Back: Technology and the Revenge of Unintended Consequences* (New York: Alfred A. Knopf, 1996), pp. 88-92.

[8] The irony is that, as I point out later in this discussion, the value of property with the view of windfarm has been generally found to go up faster than the comparable property without the view.

[9] Pointed out by Pavlides in personal correspondence.

[10] Various issues associated with Hetch Hetchy are discussed by Nancy Lee Wilkinson in her "No Holier Temple: Responses to Hodel's Hetch Hetchy Proposal," *Landscape* (31.1: 1991), pp. 1-9 and it is accompanied by a number of photographs, including the touched-up photograph used by supporters to show its positive aesthetic effect. Its historical accounts can be found in Alfred Runte's *National Parks: The American Experience* (Lincoln: University of Nebraska Press, 1989), *Yosemite: The Embattled Wilderness* (Lincoln: University of Nebraska Press, 1990), as well as Roderick Nash's *Wilderness and the American Mind* (New Haven: Yale University Press, 1982).

[11] Runte, *Yosemite*, p. 82.

[12] The sorry history of American wetlands is chronicled by Ann Vileisis in *Discovering the Unknown Landscape: A History of American's Wetlands* (Washington, D. C.: Island Press, 1997).

[13] Runte, *Yosemite*, p. 60.

[14] Suzuki, *op. cit.*

[15] I explored this issue in "The Greening of Aesthetics," *Cogen* ([http://www. publicnature.com/co-gen](http://www.publicnature.com/co-gen)) (2004).

[16] Stephen Jay Gould, "The Golden Rule - A Proper Scale for Our Environmental Crisis," included in *Environmental Ethics: Divergence and Convergence*, ed. Susan J. Armstrong & Richard G. Botzler (New York: McGraw Hill, 1993), p. 312.

[17] For a discussion regarding this point as it applies to urban parks, see "Defining the Sustainable Park: A Fifth Model for Urban Parks" by Galen Cranz and Michael Boland in *Landscape Journal* (23:2, 2004): 102-120.

[18] For an historical account of the fire policy in national parks, see Runte, *Yosemite*.

For an exploration of the aesthetics involved in burned forest, see Paul H. Gobster's "An Ecological Aesthetic for Forest Landscape Management," *Landscape Journal* (18.1: Spring 1999): 54-64.

[19] Lefteris Pavlides, "The Aesthetics of Wind Power," *The Providence Journal* (March 5, 2005).

[20] George Sterzinger, et al., "The Effect of Wind Development on Local Property Values" (Washington, D.C.: Renewable Energy Policy Project, 2003), p. 2. This study was cited by DEIS (1-23) and Pavlides also makes reference to this in his argument for the aesthetic value of wind power (*op. cit.*). I thank Pavlides for this material.

[21] Some examples are discussed by Virginia Postrel in *The Substance of Style: How the Rise of Aesthetic Value is Remaking Commerce, Culture, & Consciousness* (New York: HarperCollins, 2003).

[22] Various issues related to the notion of wilderness are discussed by a number of authors in *The Great Wilderness Debate*, ed. J. Baird Callicott and Michael P. Nelson (Athens: University of Georgia Press, 1998) and *Uncommon Nature: Rethinking the Human Place in Nature*, ed. William Cronon (New York: W. W. Norton, 1996).

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