

# Is “Green” Energy Bad for the Environment?

## Renewable Energy Generation and Wildlife Conservation in the United States

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### <Abstract>

Efforts to reduce emissions of greenhouse gases in the United States focus in significant part on increasing generation of renewable energy. However, utility scale renewable energy generation facilities can themselves have significant environmental impacts, particularly on wildlife and wildlife habitat. These adverse effects include mortality of birds and bats caused by operations of wind turbines, alteration of aquatic ecosystems by hydroelectric dams, habitat destruction by large-scale solar projects, and harm to marine organisms and potentially even fishing due to tidal and wave energy installations. Federal laws protecting birds and endangered species, as well as environmental impact assessment requirements applicable to federal agency actions and approvals, have already affected approval and operation of renewable energy facilities. Particularly since these statutes include citizen suit provisions that allow any interested party to enforce them in court, laws enacted decades ago will continue to play a key role in future efforts in the United States to balance increasing generation of renewable energy with maintaining and restoring the country’s biodiversity resources.

Key words : Climate change, renewable energy, wildlife, law, balance

- I. Introduction
- II. Biodiversity impacts of renewable energy generation technologies
- III. Legal means to balance renewable energy generation and biodiversity conservation
- IV. Conclusion

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## I. Introduction

Most scientists and political leaders agree that developing a strategy to combat climate change and related phenomena such as ocean acidification is the defining environmental challenge of the 21<sup>st</sup> century. Ongoing changes to Earth's climate threaten human societies around the globe. Rising temperatures, decreased water supplies, and more extreme weather events have already proven to be both deadly and economically devastating; climate change also exacerbates political instability by decreasing availability of scarce natural resources and increasing the number of environmental refugees. Global warming also imperils biodiversity. It imperils many native species while often benefitting populations of invasive competitors and harmful diseases. Moreover, acidification caused by the ocean's absorption of greenhouse gases threatens to cause a cascade of adverse impacts to life in the marine environment.

To reduce emissions of greenhouse gases that cause climate change, many governments around the world put a priority on cutting use of fossil fuels to generate energy - or at least have focused on capping fossil fuel usage by meeting demands for additional energy with "renewable" generating technologies that eliminate or minimize greenhouse gas emissions. In the United States, generation of electricity from sources other than hydroelectricity has more than doubled since 1990, and all sources of renewable energy (including hydro) now account for over 12% of utility-scale electric generation in the United States.<sup>1)</sup>

Calls for even sharper increases in generation of renewable energy in the name of environmental protection come from many quarters, including President Obama and numerous environmental Non-Governmental Organizations (NGOs).<sup>2)</sup> U.S.

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1) U.S. Energy Administration, Electric Power Monthly, March 2013, available at [http://www.eia.gov/energy\\_in\\_brief/article/renewable\\_electricity.cfm](http://www.eia.gov/energy_in_brief/article/renewable_electricity.cfm)

2) For example, environmental NGOs recently criticized the administration of President Obama as supporting energy policies that are too reliant on fossil fuels; see <http://abcnews.go.com/Politics/wireStory/inside-washington-greens-hit-obama-energy-plan-22297874>. Leading environmental groups such as the Sierra Club (<http://content.sierraclub.org/coal/solutions>) and the Union of Concerned Scientists ([http://www.ucsusa.org/clean\\_](http://www.ucsusa.org/clean_energy/)  
[energy/](http://www.ucsusa.org/clean_energy/)) have called for the United States to greatly expand its use of renewable

citizens are also generally supportive of increasing energy generation with an emphasis on renewable sources, and a majority has even expressed a willingness to pay higher energy costs to accomplish this objective.<sup>3)</sup> Cast as a major part of the solution to climate change, the media and sometimes even environmental advocates often characterize significant increases in renewable energy generation as purely beneficial.

Contrary to this popular perception, however, renewable energy generation can lead to serious adverse impacts on the natural environment -particularly when energy production comes from utility-scale facilities. While such power plants cause noise, impair views, and according to some people even cause human health impacts<sup>4)</sup>, their most serious impacts are on wildlife and wildlife habitat. For example, a review of the scientific literature concluded that commercial wind generating turbines kill between 140,000-328,000 birds in the U.S. each year.<sup>5)</sup> Renewable energy facilities often occupy large areas of land, and thus their construction can destroy or adversely modify significant tracts of valuable habitat in addition to killing many individual animals by facility operations. Species facing extinction are especially vulnerable to such impacts.

Decades before scientists identified climate change as a threat, the United States Congress first crafted laws to protect wildlife and habitat from threats such as market hunting and resource development.<sup>6)</sup> In the 21<sup>st</sup> century, both government agencies as well as environmental plaintiffs using the laws’ citizen suit provisions are now applying these laws to development of renewable energy facilities. This article explores how federal legal protections for wildlife will play a key role in

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energy.

- 3) See J. Aldy, M. Kotchen, A. Leiserowitz, Willingness to pay and political support for a US national clean energy standard, *Nature Climate Change* 2, 596-599 (2012).
- 4) See E. Pederson, K. Persson Waye, Wind turbine noise, annoyance, and self-reported health and well-being, *Occup. Environ. Med.* 64: 480-486 (2007). **Wind turbine noise, annoyance and self-reported health and well-being in different living environments.**
- 5) S. Loss, T. Will, & P. Mara (2013). Estimates of bird collision mortality at wind facilities in the contiguous United States *Biological Conservation*, 168, 201-209, available at <http://www.sciencedirect.com/science/article/pii/S0006320713003522>.
- 6) For a good overview of wildlife law in the United States, see M. Bean and M. Rowland, *The Evolution of National Wildlife Law* 3d (1997).

achieving a balance between significant increases in large-scale renewable energy generation and protecting the United States' wildlife resources. Section II summarizes the impacts to wildlife and habitat stemming from to leading types of renewable energy generation facilities. Section III then provides an overview of key federal wildlife protection laws and examines how the federal government has applied these laws to renewable energy development. This section also describes instances in which environmental NGOs have made use of citizen suit provisions to oppose renewable energy developments due to their impacts on wildlife. Section IV concludes by addressing the challenging question of whether law can help policy-makers, agencies, energy producers, and environmental advocates find a workable equilibrium between substantially increasing generation of renewable energy and protecting biodiversity.

## II. Biodiversity impacts of renewable energy generation technologies

Many renewable energy generation technologies can produce commercially viable amounts of electric energy without emissions of greenhouse gases, and use “fuel” sources that do not diminish over time. But like their cousin plants that burn fossil-fuels, utility-scale renewable energy generating stations are large industrial facilities that sprawl over hundreds or even thousands of acres of land - land that often provides important habitat for a wide variety of wildlife. Moreover, unlike most fossil fuel power plants, operations of renewable energy facilities often result in direct mortality of individual birds and animals. Therefore, while their contribution to climate change is negligible, even “green” power plants can result in serious environmental impacts. This section describes in greater detail some of the adverse impacts to biodiversity caused by the leading types of renewable energy generation facilities.

### A. Hydroelectric generation

Electricity generation by hydroelectric dams is the United States' leading source

of renewable energy, accounting for well over half of the country’s electricity produced from renewable sources. However, dams cause far-reaching changes to the aquatic environment of a river, impairing water quality, destroying riverine habitat and ecosystem functions, and impairing or completely blocking passage of fish and other aquatic species.<sup>7)</sup>

The decimation of once-abundant runs of Pacific salmon along the west coast of the United States provides an excellent example of such impacts. In the Pacific Northwest, the Columbia River was once harbored one of the world’s largest collection of wild salmon and steelhead runs, but dam construction eliminated some of these runs by blocking over a third of the Columbia Basin to migrating fish.<sup>8)</sup> Even when hydro dams have passage ways for migrating fish, they cause substantial mortality to remaining salmon populations by altering natural flow of the rivers and killing fish as adults when they attempt to bypass the dams on their way to spawn as adults and as they attempt to get to the ocean after hatching in inland rivers and streams. Wild runs in the Columbia Basin have suffered declines of around 98%,<sup>9)</sup> and more than a dozen have dropped to the point that they are now classified as threatened or endangered.<sup>10)</sup> While hydroelectric dams provide for much of the region’s electric energy, loss of salmon runs has had detrimental impacts on the ecology of the region, as well as harmed humans by eliminating fish harvests that are culturally important to Indian tribes,<sup>11)</sup> as well as economically valuable for commercial and recreational fishing.<sup>12)</sup>

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7) See M. Blumm and E. Erickson, Dam Removal in the Pacific Northwest: Lessons for the Nation, 42 *Environmental Law* 1043 (Fall 2012).

8) M. Blumm at al. Practiced at the Art of Deception: The Failure of Columbia Basin Salmon Recovery, 36 *Environmental Law* 709, 719-724 (2006).

9) *Id.*

10) For a complete account of salmonids listed as threatened or endangered in the Columbia Basin and elsewhere along the west coast of the United States, see National Marine Fisheries Service, Status of ESA listings and critical habitat designations for west coast salmon and steelhead, available at [http://www.westcoast.fisheries.noaa.gov/publications/protected\\_species/salmon\\_steelhead/status\\_of\\_esa\\_salmon\\_listings\\_and\\_ch\\_designations\\_map.pdf](http://www.westcoast.fisheries.noaa.gov/publications/protected_species/salmon_steelhead/status_of_esa_salmon_listings_and_ch_designations_map.pdf).

11) See V. Mulier, Recognizing The Full Scope of the Right To Take Fish Under the Stevens Treaties: The History Of Fishing Rights Litigation in the Pacific Northwest, 31 *Am. Indian L. Rev.* 41 (2007).

## B. Wind energy

Wind turbines harness the power of moving air to produce energy without greenhouse emissions, but both their construction and operation can have serious impacts on both avian and terrestrial wildlife and wildlife habitat. One of the first large wind generation facilities in the U.S., at Altamont Pass in California, has provided a cautionary tale of conflicts between birds and wind generation. Due to both the design of the facility's 1970s-era wind turbines and the area's importance for migrating birds - particularly raptors - the wind farm has killed thousands of birds and is often cited as an example of poor siting of such a facility.<sup>13)</sup> Together, even more carefully planned wind turbines facilities in total kill hundreds of thousands of birds in the United States each year.<sup>14)</sup> Less well known but just as deadly, turbines also strike and kill thousands of bats per year.<sup>15)</sup> Species of birds and bats harmed by wind turbines include a number of species facing extinction or undergoing population declines, including several species of bats as well as raptors such as California condors and golden eagles.

Wind turbine facilities typically cover large land areas and thus the roads, turbine units, and other associated facilities associated with their construction and operation destroy or disturb significant areas of wildlife habitat. Such habitat impacts are particularly a concern for species such as sage grouse, a species of ground bird requiring large open expanses of shrub-steppe habitat that has experienced severe declines and is now under consideration for protection as an endangered species.<sup>16)</sup>

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<sup>12)</sup> See M. Blumm, *Sacrificing the Salmon: A Legal and Policy History of the Decline of Columbia Basin Salmon* (2002).

<sup>13)</sup> B. Mensing, *Putting Aeolus to Work Without the Death Toll: Federal Wind Farm Siting Guidelines Can Mitigate Avian and Chiropteran Mortality*, 27 *J. Envtl. L. & Litigation*. 41, 50-52 (2012).

<sup>14)</sup> See footnote 5, *supra*.

<sup>15)</sup> U.S. Gov't Accountability Office, *Wind Power: Impacts on Wildlife and Government Responsibilities for Regulating Development and Protecting Wildlife* at 14 (2005); available at <http://www.gao.gov/new.items/d05906.pdf>

<sup>16)</sup> See Center for Native Ecosystems, *Sage Grouse and Wind Energy*, available at [http://rockymountainwild.org/\\_site/wp-content/uploads/Sage-Grouse-and-Wind-Energy.pdf](http://rockymountainwild.org/_site/wp-content/uploads/Sage-Grouse-and-Wind-Energy.pdf).

### C. Solar Electricity Generation

Commercially viable solar electricity generating facilities generally require thousands of acres of land on which to site mirrors that reflect the sun’s rays to a large central tower containing thermal generation equipment. To maximize heat capture, these generation stations are sited in desert areas. Far from wastelands, however, deserts are home to a surprisingly broad array of hardy plants and animals. A utility-scale solar generation station destroys essentially all delicate desert habitat within the boundaries of the facility.<sup>17)</sup> These generating stations also create both significant visual glare and a zone of high heat around the central tower itself that can disorient, injure, and even kill avian species.<sup>18)</sup>

### D. Offshore wave and tidal generation

Though few commercially viable facilities currently exist, there is growing interest in technologies that can generate electricity using the power of ocean waves and tides. To take advantage of maximum energy potential and economically transmit generated power to onshore users, these generating facilities must be located in near-shore environments. Such areas also provide important habitat and migratory corridors for a wide variety of marine species ranging from fish to whales. Marine generating facilities and associated anchors and transmission cables can affect transport and distribution of marine sediments, physically impact seafloor habitat, and possibly interfere with feeding and migration of marine mammals.<sup>19)</sup>

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<sup>17)</sup> See generally T. Tsoutsos N. Frantzeskaki, V. Gekas, Environmental impacts from solar energy technologies. *Energy Policy* 33:289-96 (2005); R. Chiabrande, E. Fabrizio, G. Garnero. The territorial and landscape impacts of photovoltaic systems: definition of impacts and assessment of the glare risk, *Renewable and Sustainable Energy Reviews* 13:2441-51 (2009).

<sup>18)</sup> See e.g. California Energy Commission, Staff assessment of Palen solar energy facility (2013), available at [http://docketpublic.energy.ca.gov/PublicDocuments/09-AFC-07C/TN200442\\_20130910T145445\\_Palen\\_Solar\\_Electric\\_Generating\\_System\\_FSA\\_Part\\_A.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/09-AFC-07C/TN200442_20130910T145445_Palen_Solar_Electric_Generating_System_FSA_Part_A.pdf).

<sup>19)</sup> See C. Huertas-Olivares, J. Norris, Environmental Impact Assessment, Chapter 8 in J. Cruz (ed.), *Ocean Wave Power-Current Status and Future Perspectives* (2008); see also

Operation of these generation stations can potentially directly kill or injure fish, seabirds, and other wildlife, as well as create underwater noise that can adversely affect these species.<sup>20)</sup> Commercial and recreational fishers have also expressed concerns that marine energy installations may decrease populations of valuable fish and shellfish, and may interfere with fishing activities by blocking access to valuable fishing grounds.<sup>21)</sup>

#### E. Transmission lines

Particularly since sites for renewable energy facilities are often far from cities and industry, energy produced through renewable generation must be transported long distances with overhead high voltage transmission lines. These lines can also have substantial adverse impacts on birds when individual birds hit the lines in flight or are electrocuted while perching on transmission towers, and transmission lines and associated roads and substations can destroy or disturb habitat through which they are built.<sup>22)</sup>

### III. Legal means to balance renewable energy generation and biodiversity conservation

The law will play a prominent role in determining the extent to which the United States can significantly increase renewable energy production without impairing the country's ongoing efforts to protect its wildlife resources and recover

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F. Neumann et al., Licensing and Environmental Issues of Wave Energy Projects, Proceedings of the POWER-GEN 2006 Europe Conference, Cologne, Germany, June 2006; available at <http://www.marinerenewables.ca/wp-content/uploads/2012/11/Licensing-and-environmental-issues-of-wave-energy-projects.pdf>.

<sup>20)</sup> *Id.*

<sup>21)</sup> See e.g. M. Plummer and B. Feist, Assessing Potential conflicts with Wave Energy Generation Along the Oregon Coast at 2-5, Appendix MS1 in NOAA Fisheries Marine Sciences Center *CCIEA Phase II Report* (2012).

<sup>22)</sup> See K. Bevanger, Biological and conservation aspects of bird mortality caused by electricity power lines: a review, 86 *Biological Conservation* 67-76 (1998).

species that are facing potential extinction. In light of congressional refusal to enact legislation designed to reduce U.S. greenhouse gas emissions, the Obama Administration has focused on using its authority under existing law to regulate such emissions and encourage development of renewable energy sources.<sup>23)</sup> At the state level, many individual states have mandated development of renewable generation of electricity by adopting renewable energy portfolio standards applicable to major utilities that sell power in their states.<sup>24)</sup>

On the other hand, there have already been a number of site-specific conflicts over the impacts on wildlife from both proposed and existing renewable energy facilities. Moreover, environmental NGOs have expressed broader concerns over the extent to which the steadily increasing pace of renewable energy development is consistent with long-term biodiversity conservation goals. A handful of key federal wildlife conservation laws are already influencing siting and operational decisions for renewable energy facilities. Laws protecting biodiversity will increasingly force developers of renewable energy resources to take into account the needs of wildlife when planning and building such plants, and in some cases will constrain or even preclude energy projects and thereby impose limitations on renewable energy generation capacity in the United States. This section identifies key federal statutes relevant to wildlife and habitat protections that affect renewable energy facilities. It also discusses controversies that have already arisen between specific types of renewable energy generation and wildlife conservation as a way to examine legal mechanisms that can help strike a balance between the two.

#### A. National Environmental Policy Act (NEPA)

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<sup>23)</sup> For example, in early 2014 the Environmental Protection Agency proposed emission standards applicable to new stationary sources that would essentially ban construction of new conventional coal-fired electric power plants in the United States. *See* 79 Federal Register 1429 (January 8, 2014).

<sup>24)</sup> *See* D. Hurlbut, State Clean Energy Practices: Renewable Portfolio Standards, National Renewable Energy Lab *Technical Report* 670-43512 (July 2008); L. Davies, State Renewable Portfolio Standards: Is There A “Race” and is it “To The Top”? 3 *San Diego Journal of Climate & Energy Law* 3 (2012).

One of the first comprehensive federal environmental protection statutes, NEPA<sup>25)</sup> sets forth requirements for environmental impact assessment of federal actions. It applies only to actions taken, funded or approved by federal agencies, so it will not affect renewable energy projects with no connection to federal funding or authorization. However, many renewable energy facilities and potential sites for these facilities, particularly in the western U.S., are located on federal land. Off shore facilities also require federal permission, and many renewable energy facilities on state or private land require transmission lines that cross federal land.

In addition to its required assessments of federal projects' environmental impacts, NEPA contains other provisions that affect decisions about renewable energy development. The law requires federal agencies to evaluate alternatives to a proposed action, including a "no action" alternative.<sup>26)</sup> NEPA is purely procedural, however, so a federal agency need not choose to implement the least environmentally harmful alternative, and even if an Environmental Impact Statement(EIS) concludes that a proposed project will cause serious adverse environmental impacts the relevant federal agency is free to undertake the action.<sup>27)</sup>

NEPA also affords interested stakeholders and members of the general public many opportunities to participate in the environmental assessment process, as well as in enforcement of the statute itself. The NEPA process allows the public to participate in identifying likely environmental impacts for analysis, propose alternatives for evaluation, and comment on draft environmental assessment documents.<sup>28)</sup> Through the Administrative Procedure Act, a party can also challenge in court a federal agency's compliance with the requirements of the statute. Opponents of a federal project often file lawsuits challenging an agency's compliance with NEPA procedures or the adequacy of an agency EIS. Such lawsuits are "strategic" in that they generally do not seek better environmental

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25) 42 U.S.C. 4321 et seq. (1970).

26) 40 C.F. R. 1502.14.

27) See, e.g. *Robertson v. Methow Valley Citizens Alliance*, 490 U.S. 332, 350 (1989)(the U.S. Supreme Court noted that "it is now well settled that NEPA itself does Not mandate particular results [and] simply prescribed the necessary process").

28) M. Blumm, Pluralism and the Environment Revisited: The Role of Comment Agencies in NEPA Litigation, 32 *Vermont Law Review* 5, 9-11 (2012).

impact assessment documents, but rather use lawsuits under NEPA to stall and draw public attention to projects they oppose in the hope that more public scrutiny or the additional costs associated with delay will result in changes to, or even abandonment of, the targeted projects.

The environmental assessment procedures set forth by NEPA will apply to many future renewable energy generation projects. NEPA applies whenever a federal agency must permit a specific action. Therefore, federal permits for incidental take of eagles under BGEPA,<sup>29)</sup> federal permission for siting renewable energy projects on land owned by the federal government, and required federal agency permits for siting wind or ocean wave and tidal generating facilities offshore will have to undergo some form of environmental assessment procedure under NEPA, most typically preparation of an EIS. NEPA’s extensive public involvement procedures will provide environmental advocates, as well as others potentially adversely affected by development of renewable energy facilities such as fishermen who may oppose offshore energy facilities, opportunities to express their concerns to federal agencies during the relevant agencies’ processes for considering whether to approve these facilities. Assessments pursuant to NEPA will also force federal agencies to consider alternative sites and designs for renewable energy facilities that could reduce these projects’ impacts on wildlife and the environment generally.

It is difficult to judge the impacts of NEPA procedures on the substantive decisions of federal agencies related to renewable energy development. However, the law’s public involvement requirements and mandate to analyze alternatives most likely are influential to at least some degree in encouraging federal agencies to make efforts to minimize adverse impacts on biodiversity and other environmental amenities due to renewable energy facilities on public land or those that must otherwise receive federal approval. Environmental organizations have used already NEPA claims against federal agencies as a means to challenge proposed development of renewable energy facilities in court,<sup>30)</sup> and will inevitably continue

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<sup>29)</sup> See Section III.B., *infra*.

<sup>30)</sup> For example, in *Western Watersheds Project v. BLM*, 774 F.Supp.2d 1089 (D. Nev. 2011), environmental organizations unsuccessfully used NEPA in an effort to enjoin construction of a wind energy facility approved for siting on federal land by the Bureau

to use this statute as a legal means to oppose such project they believe lead to environmental impacts that are too severe. NEPA will thus continue to play an important role in the future of renewable energy development in the United States.

#### B. Migratory Bird Treaty Act& Bald and Golden Eagle Protection Act

Passed in 1918, the Migratory Bird Treaty Act (MBTA)<sup>31)</sup> is one of the oldest wildlife protection laws in the United States; the Bald and Golden Eagle Protection Act also predates most other federal environmental laws. The MBTA makes it illegal to kill most native birds in the United States, regardless whether the deaths are intentional or not. It provides for criminal penalties for violators, which can include fines and even time in prison. Similarly, the Bald and Golden Eagle Protection Act (BGEPA)<sup>32)</sup> broadly bans action that kill and even “disturb” the two species of eagle found in the United States. While these statutes make it illegal for renewable energy facilities to kill birds or eagles even unintentionally, the two laws do not have citizen suit provisions. This means that only the federal government can use these laws to prosecute operators of wind facilities that kill birds, or use the law to prevent siting of renewable energy generation plants in areas of special importance to birds.<sup>33)</sup>

Rather than aggressively taking such actions, however, federal regulators have preferred to emphasize a more cooperative approach. Until 2012, FWS - the federal agency that implements both MBTA and BGEPA - had encouraged both existing and proposed wind generators to engage in discussions with the agency with the aim of devising informal agreements to site and operate facilities in a manner that minimizes impacts on eagles and other birds. In exchange for cooperation from wind generators, FWS provided informal assurances that it would not use its authority to prosecute the companies for bird deaths that occur at their

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of Land Management.

<sup>31)</sup> 16 U.S.C. 703-712 (1918).

<sup>32)</sup> 16 U.S.C. 668-668(d) (1940).

<sup>33)</sup> See J. McKinsey, *Regulating Avian Impacts Under The Migratory Bird Treaty Act and Other Laws: The Wind Industry Collides With One of its Own*, the Environmental Protection Movement, 28 Energy L.J. 71 (2007).

facilities.

In March 2012, FWS added a degree of formality to what had previously been ad hoc negotiations between the agency and individual wind generators. After an extended process that included input from interested citizens, environmental groups, and the wind energy industry, FWS formally adopted its “Land-Based Wind Energy Guidelines.”<sup>34)</sup> The Guidelines contain detailed steps for minimizing the impacts on birds from construction and operation of wind energy facilities, including site investigations designed to identify and avoid areas with high value to avian species, pre-construction monitoring at a chosen site to enable detailed planning and project design that minimizes bird impacts, and post construction monitoring and research to identify turbine operating strategies that reduce bird deaths and injuries.

FWS characterizes compliance with the Guidelines by the wind industry as “voluntary.” However, as it did in the past, the agency draws a very clear connection between wind energy developers’ compliance with the Guidelines and FWS’ use of its enforcement authority under federal laws protecting birds. The agency notes that “the Office of Law Enforcement focuses its resources on investigating and prosecuting those who take migratory birds without identifying and implementing reasonable and effective measures to avoid the take. The Service will regard a developer’s or operator’s adherence to these Guidelines, including communication with the Service, as appropriate means of identifying and implementing reasonable and effective measures to avoid the take of species protected under the MBTA and BGEPA.”<sup>35)</sup> In effect, therefore, wind generators that ignore the new Guidelines run a significant risk of being the target of a FWS enforcement action under the MBTA, BGEPA, or both statutes if their facilities kill a significant number of birds and/or eagles.

FWS underscored its enforcement powers under federal laws protecting birds in late 2013, when it announced settlement of the agency’s first-ever prosecution of a wind energy generator.<sup>36)</sup> The agency had charged Duke Energy Company with

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<sup>34)</sup> The Guidelines are available at [http://www.fws.gov/windenergy/docs/weg\\_final.pdf](http://www.fws.gov/windenergy/docs/weg_final.pdf).

<sup>35)</sup> Id. at 6.

<sup>36)</sup> A press release from the U.D. Department of Justice describing this case and its

criminal violations of both MBTA and BGEPA for its operations at two wind generation facilities in Wyoming, which killed over 160 protected birds and 14 golden eagles over a three year period. Under terms of the settlement, Duke agreed to pay \$1 million and develop plans for four of its wind facilities to install new bird-spotting technology and change operations to minimize bird deaths. The plan also includes protections for bats, and will likely cost the company about \$600,000 per year to implement. The prosecution should send a message to other wind energy companies that failure to comply with FWS' "voluntary" Guidelines for minimizing harm to birds could prove costly.

FWS also finalized and has begun to implement a permit scheme under BGEPA that will allow wind facilities to receive permission to incidentally kill bald and/or golden eagles while operating wind generation facilities.<sup>37)</sup> This permit scheme will likely primarily apply to wind facilities in the western United States, where scientists believe that populations of golden eagles are declining. In order to receive a permit, applicants must develop an Eagle Conservation Plan with advanced conservation measures designed to minimize eagle mortalities. FWS also must determine that the permitted deaths at a wind facility will lead to "no net loss" of the breeding population of eagles in an affected area; this will require permittees to pay money into a fund to pay for projects to prevent eagle deaths from other sources.<sup>38)</sup> Such mitigation projects will likely include paying to retrofit power transmission poles that can electrocute eagles, and possibly cleaning contaminants such as lead from eagle habitat.

FWS recently generated significant controversy by modifying its incidental take permit regulations under BGEPA to allow wind companies to receive permits with a 30 year duration, up from only 5 years under the agency's initial permit rule.<sup>39)</sup> This change was actively sought by the wind industry because investors in the expensive facilities want certainty that turbines will be able to operate over a long period of time in order to recover their initial investment costs. Conservation

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resolution is available at <http://www.justice.gov/opa/pr/2013/November/13-enrd-1253.html>.

<sup>37)</sup> See 50 C.R.F. 22 (2009).

<sup>38)</sup> *Id.* at section 22.26.

<sup>39)</sup> See 78 Federal Register 73,704 (2013).

organizations, on the other hand, were strongly opposed to the change, fearing that long term permits will foreclose FWS’ ability to force wind facilities to improve their operations if needed to reduce high-than-anticipated eagle mortalities. Environmental NGOs may sue to overturn the extended permits, so the future of the changes to incidental taker permits for eagles is still somewhat uncertain.

Finally, location of wind facilities on land owned by federal agencies may provide environmentalists with additional legal claims with which to challenge proposed wind generating facilities that may have significant adverse impacts on birds. Courts have held that the MBTA applies to federal agencies, and the Administrative Procedure Act allows NGOs to file lawsuits against federal agencies if they do not comply with all requirements of federal law.<sup>40)</sup> This may allow environmentalists to sue federal land management agencies such as the Bureau of Land Management and U.S. Forest Service if they permit construction of wind generation facilities on federal land. In fact, such a lawsuit is underway involving a proposed offshore wind generation facility that would be sited on submerged land owned and controlled by the U.S. government. In that case, federal defendants contend that federal permission to construct the wind turbines cannot be linked to bird deaths that may occur in the future at a facility that is operated by a private company.<sup>41)</sup> This argument has never been made before by a federal agency, so the outcome of this case could be important for determining whether bird conservation advocates can challenge other wind facilities proposed for sites on federal land.

### C. Endangered Species Act

The Endangered Species Act (ESA)<sup>42)</sup> sets forth procedures for identifying species that are facing extinction and listing them as either “threatened” or “endangered.” These two lists now include over 1,500 species in the United States, including many species likely to be affected by various types of renewable energy

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<sup>40)</sup> See *Humane Society v. Glickman*, 217 F.3d 882 (D.C. Cir. 2000).

<sup>41)</sup> See [http://www.masslive.com/news/index.ssf/2010/06/environmental\\_groups\\_sue\\_to\\_st.html](http://www.masslive.com/news/index.ssf/2010/06/environmental_groups_sue_to_st.html).

<sup>42)</sup> 16 U.S.C. 1531-1543 (1973).

development. The law prohibits federal agencies from taking, approving, or funding actions that can “jeopardize” listed species or destroy habitat identified as “critical” for these species.<sup>43)</sup> The law also bans killing and even causing “harm” to all endangered species and most threatened species, restrictions that apply to virtually all individuals, landowners, companies, and government actors.<sup>44)</sup> Like the protections for birds and eagles, these prohibitions apply even if adverse impacts to protected species are the unintended result of otherwise lawful actions such as production of renewable energy. The ESA’s citizen suit provision allows any party with standing to sue to enforce the law against the government or even private entities.<sup>45)</sup>

Due to the significant number of listed species and their broad distribution, the ESA has affected - and will certainly continue to affect - development and operation of renewable energy facilities. The statute’s strong substantive protections for species, coupled with the law’s citizen suit provision, also make it one of the most common causes of action for plaintiffs using the court system to oppose construction and/or operation of renewable energy plants. Long-running controversy and legal battles over operation of hydroelectric dams and conservation of salmon and steelhead in the Columbia Basin in the northwestern United States provides an excellent case study of how the ESA influences tradeoffs between renewable energy generation and endangered species protection.

Hydroelectric generation remains the most common type of renewable energy generation in the U.S., and accounts for the majority of U.S. renewable energy production. After an era of widespread dam-building to develop much of the country’s hydroelectric generating potential, both the policymakers and the public have become concerned about dams’ significant impacts on rivers and aquatic ecosystems - in fact, the 21<sup>st</sup> century has seen significantly more hydro dams removed than built in the United States.<sup>46)</sup> In fact, some state laws requiring

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<sup>43)</sup> Id. at 1536(a)(2).

<sup>44)</sup> Id. at 1538(a)(1)(B).

<sup>45)</sup> Id. at 1540(g).

<sup>46)</sup> See M. Blumm and A. Erickson, *supra* note 7; P. Levigne, Dam(n) How Times Have Changed, 29 *William and Mary Environmental Law and Policy Review* 451 (2005).

increases in renewable energy generation (such as in the State of Oregon) do not allow consideration of hydropower in reaching the required level of renewable energy.<sup>47)</sup>

Some hydroelectric dams have contributed to the decline of fish and other aquatic species to the extent that these species have been listed as threatened or endangered under the ESA. In those cases, protections for these species under the ESA can affect ongoing operations of hydroelectric dams and the amount of power they produce. For example, the Columbia River basin contains 40% of hydropower generation potential in the entire U.S., but development of this system has led to many species of fish being listed as threatened or endangered, including over a dozen runs of the Basin’s iconic salmon and steelhead runs.<sup>48)</sup>

Listing of these fish species in the Columbia Basin triggered protections that have been the basis for significant controversy and litigation under the ESA that has imposed some limitations on hydropower production. Federal agencies must avoid actions that jeopardize the continued existence of listed species or destroy or adversely modify their critical habitat. Much of the hydropower generation in the Basin stems from dams owned and operated by federal agencies, so listing of salmon runs in the Columbia has forced the federal agencies that operate hydropower dams to consider the impacts of these operations on fish. Some of these protections have come from the ESA’s Section 7 consultation process, which gives a federal agency responsible for fish conservation authority to order modifications to dam operations to better protect listed species. Conservation groups, tribes, and the state of Oregon have also used the ESA to challenge federal dam operators in court for not adequately protecting salmon, resulting in court decisions that have imposed limits on power generation to better protect these fish.<sup>49)</sup> Lastly, a number of Indian tribes in the Northwest signed treaties with the federal government in 1855 in which they reserved the right to continue

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<sup>47)</sup> See Oregon Revised Statutes, Section 469(A) (2007).

<sup>48)</sup> See M. Blumm & A. Simren, The Unraveling of the Parity Promise: Hydropower, Salmon, and Endangered Species in the Columbia Basin, 21 *Environmental Law* 657, 663 (1991).

<sup>49)</sup> See *National Wildlife Federation v. National Marine Fisheries Service*, 524 F.3d 917 (9<sup>th</sup> Cir. 2008) (a case that has continued into 2014 after the federal district court again found NMFS’ 2010 revised biological opinion illegal in 2012).

to fish; these treaties also give the tribes legal leverage to limit activities such as power production that cause decline of the Columbia's fishery.<sup>50)</sup>

Some hydroelectric dams were developed by private companies or non-federal government entities, but even these dams require a federal license from the Federal Energy Regulatory Commission (FERC) under the Federal Power Act. These licenses must be renewed, usually every 50 years. The Federal Power Act gives federal fish and wildlife agencies the power to require that a dam owner construct fishways in the dams to allow for adequate fish passage as a condition of license renewal. For some older dams, the cost of constructing fishways is more than the economic value of power produced by the dams, and the relicensing process has therefore led to removal of the dams rather than constructing fishways and continuing to use the dams for power production.<sup>51)</sup>

The ESA has legal mechanisms for balancing the needs of protected species with activities that adversely affect these species. These provisions have already had a significant influence on operation of hydroelectric dams in the Columbia Basin, and will continue to be important for balancing development and operation of renewable energy facilities with the need to protect imperiled species of both fish and wildlife.

Section 7(a)(2) of the statute bans federal agencies from jeopardizing the continued existence of listed species, or destroying or adversely modifying their critical habitat.<sup>52)</sup> This provisions also sets forth procedural requirements for agencies to “consult” with federal wildlife agencies about their actions, specifically the U.S. Fish and Wildlife Service (FWS) or National Marine Fisheries Service (NMFS). (collectively referred to as “the Services”). The process effectively gives the Services power to demand changes to, or in rare cases even halt, projects in

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<sup>50)</sup> See M. Wood, The Tribal Property Right to Wildlife Capital (Part II): Asserting A Sovereign Servitude to Protect Habitat of Imperiled Species, 25 Vermont Law Review 355 (2001).

<sup>51)</sup> See C. Scoones, Let the River Run: Strategies To Remove Obsolete Dams and Defeat Resulting Fifth Amendment Taking Claims, 2 *Seattle Journal Of Environmental Law* 1 (2012); C. Bonham, The Condit Dam Removal And Section 18 Of The Federal Power Act: A Coerced Settlement, 14 *Journal Of Environmental Law & Litigation* 97 (1999).

<sup>52)</sup> 16 U.S.C. 1532(a)(2).

order to protect threatened and endangered species. Since many renewable energy facilities in the U.S. will either be sited on land owned by the federal government or, particularly in the case of energy projects offshore, licensed by the federal government, this provision of the ESA will likely play an important future role in developing and operating renewable energy facilities. For example, the Bureau of Land Management recently decided to allow for development of a wind energy facility on federal land that could potentially kill or injure California condors, one of the rarest birds in North America. The agency imposed a number of requirements on the permittee that affect construction and operation of the wind turbines in order to minimize the likelihood that they will kill condors.<sup>53)</sup>

Section 9 of the ESA also makes it illegal for anyone - including federal government agencies, state and local governments, and private companies, from taking actions that result in “take” of (meaning to cause death or injury to) individual members of protected species.<sup>54)</sup> Operations of hydroelectric dams of course kill and injure many threatened and endangered salmon and steelhead. However, the ESA also allows the Services to issue “incidental take permits” that allow for otherwise lawful actions such as renewable energy production to kill or injure a specified amount of listed species. In order to qualify to receive such a permit, a developer must write a plan for minimizing and mitigating take of affected species.<sup>55)</sup>

Several non-federal operators of hydroelectric dams in the Columbia Basin have applied for and received incidental take permits to kill and injure salmon as part of their dam operations. To do so, they adopted measures to reduce the impacts of their dams on protected fish, which has resulted in some reduction in hydropower generation.<sup>56)</sup> Other non-federal entities that propose to build renewable energy

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<sup>53)</sup> See U.S. Bureau of Land Management, Record of Decision for East Alta Wind Project (2013), available at [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/ridgecrest/alta\\_east\\_wind.Par.61021.File.dat/AEWP\\_ROD\\_Signed\\_052413.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/ridgecrest/alta_east_wind.Par.61021.File.dat/AEWP_ROD_Signed_052413.pdf).

<sup>54)</sup> 16 U.S.C. 1538(a)(1)(B); 1532(19).

<sup>55)</sup> See *id.* at 1539(a)(2).

<sup>56)</sup> Public utility districts that own and operate hydroelectric dams on the Columbia hold permits to incidentally take listed salmon and steelhead; see National Marine Fisheries Service letter extending incidental take permits (September 20, 2013); available at

projects that may kill or injure listed species will likely also have to apply for such permits, and in the process develop means to reduce impacts on protected species. Such protective measure may include limitations on siting and operating generation facilities, or payment of funds for off-site measure to mitigate direct impacts on threatened and endangered species.

The ESA's citizen suit provision allows any interested party to file a lawsuit to enforce the ESA's ban on "take" of listed species. This provision allows environmental organizations to challenge renewable energy developers even if the federal government is reluctant to use the ESA to limit impacts of these facilities on listed species. While such cases can be difficult and expensive because they require a plaintiff to marshal evidence proving that a facility is killing or is reasonably certain to kill or injure protected species, For example, environmental groups filed a lawsuit against a wind power facility that they alleged would kill or injure endangered bats. Though the developer denied that its project would kill or injure protected bats, the court ruled that bats were indeed likely to be killed by operation of the turbines.<sup>57)</sup> The developer eventually settled the case by agreeing to make operational changes to minimize bat mortality, as well as apply for an incidental take permit under the ESA.<sup>58)</sup>

Currently, environmental NGOs are using the ESA to challenge several renewable energy projects under development in the United States. Two organizations unsuccessfully attempted to stop a wind energy facility under construction in Nevada near Great Basin National Park due to concerns about the project's impacts on endangered bats and sage grouse, a species of bird under consideration for listing as threatened or endangered; the groups later settled the case after the developer agreed to conduct additional studies on the project's effects on a large colony of Mexican free-tailed bats.<sup>59)</sup> Another group has notified the

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<http://www.douglaspud.org/HCP%20Documents/NMFS%20extension%20of%20permits%201196,%201347%20and%201395%20on%209-20-2013.pdf>.

<sup>57)</sup> See *Animal Welfare Institute v. Beech Ridge Energy LLC*, 675 F. Supp. 2d 540 (D. Md. 2009).

<sup>58)</sup> See B'More Green, WV wind farm bows to bats (September 1, 2010), available at [http://weblogs.baltimoresun.com/features/green/2010/02/wv\\_wind\\_farm\\_pulls\\_back\\_for\\_ba.html](http://weblogs.baltimoresun.com/features/green/2010/02/wv_wind_farm_pulls_back_for_ba.html).

<sup>59)</sup> See *Western Watersheds Project v. BLM*, *supra* note 30.

U.S. Bureau of Land management of their intent to file a lawsuit seeking to prevent construction of two large solar generating stations on land owned and managed by the agency, one in southern California’s Mojave Desert and the other in Nevada; together the projects will displace over a thousand endangered desert tortoises, as well as block migratory corridors between larger tortoise populations.<sup>60)</sup>

#### IV. Conclusion

Development of renewable energy facilities presents environmental advocates - along with society as a whole - with a significant dilemma. On one hand, increasing levels of pollution from energy generation harms people, wildlife, and the environment. Even more importantly, climate change caused by greenhouse gases produced in significant part from fossil fuels combustion linked to human energy demands threatens virtually all life on Earth. On the other hand, however, though renewable means of energy generation largely avoid emitting pollution and greenhouse gases, such facilities can have significant adverse impacts on the environment, particularly on biodiversity and wildlife habitat.

In the United States, environmental laws aimed at conserving biodiversity, along NEPA’s required procedures for public participation, consideration of alternatives, and assessment of environmental impacts of proposed federal agency actions, provide a means for arriving at a balance between producing energy without greenhouse gas emissions and providing for conservation of birds and other wildlife as well as recovering endangered species. While differences of opinion on exactly what constitutes the proper balance of these interests will continue to lead to litigation, the judicial system plays an important role - at least in the United States - in assisting society reach decisions that are made in accord with the

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<sup>60)</sup> On November 6, 2013, Defenders of Wildlife filed a 60 day notice of intent to challenge BLM’s approval of the Stateline and Silver State South solar projects; such notice required by the ESA’s citizen suit provision prior to actually filing a lawsuit in federal court. A copy of the notice letter is available at <http://www.defendersblog.org/wp-content/uploads/2013/11/November-6-2013-Letter.pdf>.

requirements of the law.

The conflicts and tradeoffs involved in increasing renewable energy generation and protecting wildlife and wildlife habitat from adverse impacts of renewable energy facilities has many of the hallmarks of what scholars have termed “wicked” environmental problems, described as involving “a high degree of scientific uncertainty and a profound lack of agreement on values, combined with the absence of a perfect solution.”<sup>61)</sup> Despite lack of a perfect solution that maximizes both renewable energy generation and protection of biological diversity, effective implementation of federal laws described in this article - the ESA, MBTA, BGEPA, and NEPA - will allow the United States to make progress society toward further increasing production of renewable energy by means that do not lead to undue harm to wildlife and the environment.

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<sup>61)</sup> See preface in Peter J. Balint (Ed.), *Wicked Environmental Problems: Managing Uncertainty and Conflict*, Island Press (2011).

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<국문초록>

## “그린” 에너지는 환경에 해로운가? 미국에서의 신재생에너지 생산과 야생 동물 보호

Daniel Rohlf\*

미국의 온실가스 배출을 줄이기 위한 노력은 신재생 에너지의 생산 증가에 상당 부분 집중된다. 그러나, 공익사업 규모의 신재생에너지 생산 설비는 그 자체로 환경, 특히 야생동물과 그 서식지에 심각한 영향을 줄 수 있다. 이러한 부작용에는 풍력발전용 터빈에 의한 박쥐와 조류의 죽음, 수력발전용 댐에 의한 생태계 변화, 대규모 태양광 프로젝트에 의한 서식지 파괴, 조력에너지와 파력에너지 설비로 인한 해양생물 피해 및 잠재적 어획의 피해가 있다. 환경영향평가에 관한 연방정부 법은 연방정부기관의 조치와 승인에 적용할 것을 요구하고 있는데, 이는 조류와 멸종위기 종 보호법도 신재생에너지 설비의 승인과 운용에 있어 당연히 적용되어야 하는 것이다. 특히 이러한 법령들은 이해당사자가 법정에서 주장할 수 있게 하는 시민소송조항을 포함하고 있기 때문에, 수십 년 전 제정된 법들은 ‘신재생에너지 생산 증가’와 ‘미국의 생물다양성 유지 및 복원’ 사이의 균형에 대한 앞으로의 노력에 지속적으로 핵심적인 역할을 할 것이다.

주제어 : 기후변화, 신재생에너지, 멸종위기종보호법, 시민소송, 과학적 불확실성

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