

## **Energy Development and Wildlife Conservation in Western North America**

Author: Fargione, Joe

Source: BioScience, 61(12) : 1022-1023

Published By: American Institute of Biological Sciences

URL: <https://doi.org/10.1525/bio.2011.61.12.12>

---

BioOne Complete ([complete.BioOne.org](https://complete.BioOne.org)) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at [www.bioone.org/terms-of-use](https://www.bioone.org/terms-of-use).

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

---

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

## Keeping the West Wild: Conservation and Rapid Energy Development

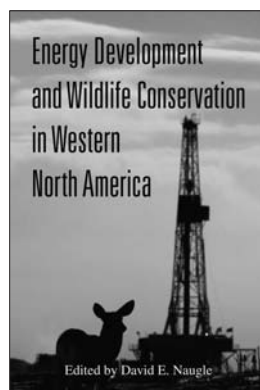
**Energy Development and Wildlife Conservation in Western North America.** David E. Naugle, ed. Island Press, 2010. 357 pp., illus. \$40.00 (ISBN 9781597266581 paper).

The road to conservation ruin is paved with the unintended consequences of development, and the consequences of energy development are no different: The moving blades of wind turbines create pressure drops that kill passing bats—their lungs bursting, just like those of scuba divers who surface too quickly; seismic survey roads that permeate Canadian forests are used by wolves to increase their hunting efficiency, contributing to population declines in woodland caribou; oil and gas development discourage sage grouse nesting, causing the birds to abandon otherwise suitable habitat. In *Energy Development and Wildlife Conservation in Western North America*, editor David Naugle presents not only a thorough assessment of the impacts and risks of energy development but also—more importantly—a roadmap of how the biological sciences community can address these risks. Twenty-three contributors, including landscape and natural resource ecologists, conservationists, and wildlife biologists, approach the issue of energy development and its effects on wildlife in the western United States from three angles: energy sprawl, impacts, and solutions.

The book's first section quantifies the sprawl of likely energy development by projecting that this trend could affect 96 million hectares of land, or 21 percent of western North America. These projections are especially useful because they are spatially explicit and are also categorized by energy sector. For example, hydrocarbons (coal, oil, and gas) make up 69 percent of the expected footprint; renewables (wind, solar, and geothermal) 29 percent; and

nuclear (uranium mining), 2 percent. The book clearly demonstrates that the pace and scope of energy development in the West continues to be dramatic in its reshaping of both human and natural communities.

The second section thoroughly reviews—and again quantifies—how energy development affects sage grouse, ungulates, songbirds, and invasive plants. The first chapter describes how human development affects



wildlife and explains important concepts such as ecological traps, apparent competition, and trophic cascades, albeit briefly. Ecological traps occur when species occupy seemingly suitable habitat that actually results in more mortality than offspring. Causes of increased mortality may be direct (e.g., road traffic or wind turbines) or indirect (e.g., more efficient predation or apparent competition). Apparent competition occurs when an increase in one species (e.g., moose) leads to a decrease in another species (e.g., caribou) because of indirect interactions with a common predator (e.g., wolves). Another chapter nicely summarizes the research on the impacts of wind turbines and bioenergy.

As the contributing authors of this volume note, these important impacts on wildlife can be measured at various scales—from the behavior of individual animals to the physiological responses

of individuals to cumulative population and community responses. From a conservation standpoint, population-level impacts are of the greatest concern, and increased efforts to evaluate responses at this level are needed. However, impacts at this scale can be more difficult and more costly to study; therefore, significant behavioral effects observed at the individual level can serve to target and justify funding for larger studies of cumulative population-level impacts.

Although *Energy Development and Wildlife Conservation* echoes the common lament about the shortage of the research that is needed to adequately inform management decisions, each chapter is able to draw important conclusions about the likely impacts of energy development on wildlife. For example, the research on woodland caribou highlights how to address population-level, cumulative-impact issues. Similarly, research on the effects of oil and gas development on sage grouse has moved beyond studies of the impacts of single wells to provide an understanding of the larger-scale, cumulative effects of well density (and time lags). For instance, development at typical well densities in the Powder River Basin in Wyoming and Montana were found to reduce the probability of *lek* (display and mating congregation areas) persistence in sage grouse from 87 percent to 5 percent.

With the conservation problem starkly framed by the book's quantification of threats to both land and wildlife, the final section turns to conservation solutions. Three chapters broadly address the need to improve the mitigation hierarchy, the need to forecast development scenarios for cumulative-impact analyses, and the need for policy changes to support adaptive management. The book

doi:10.1525/bio.2011.61.12.12

closes with a manifesto for community-based conservation. These solutions are diverse, but all are advocated with an unspoken message: The answer to energy development in the West is not *no* but rather *where*.

The hierarchy of “avoid, minimize, offset” is commonly used to mitigate development impacts. However, determining where to avoid and how much to mitigate is a task fraught with complication. *Energy Development and Wildlife Conservation* offers an approach called *energy by design*, which blends landscape conservation planning with the mitigation hierarchy. Landscape conservation planning sets explicit conservation goals for habitat area and population sizes and occurrences, based on what is necessary to maintain viable wildlife populations and natural communities. According to energy by design, when development is incompatible with achieving or maintaining these explicit goals, development should be avoided. This metric helps provide a framework for implementing the “avoid” step of the mitigation hierarchy. An example of this approach is provided in the chapter that forecasts oil and gas development’s likely impact on the sage grouse, which, depending on the development scenario, is likely to result in a 7-percent to 19-percent population decline. Protecting key strongholds of the sage grouse population is necessary in order to avert population declines and to prevent a full listing of the species under the Endangered Species Act and will require shifting development away from these core areas.

Conservation success requires the implementation of the scientific tools necessary to protect wildlife in the face of energy development, and the final chapters of this book on policy- and community-based conservation suggest ways to do this. To begin, changes in how the National Environmental Protection Act is implemented could “provide the much-needed regulatory home for adaptive management” (p. 210). Encouragingly, the book argues that many of these recommended changes

could be brought about through rulemaking and without the need for legislative action. The argument for community-based conservation is particularly strong: “The real key to implementing lasting conservation is in working with people to maintain rural ways of life that are compatible with biological goals” (p. 211). The goal of community inclusion demands a broad skill set, and this book provides a helpful list of 12 key traits of community-based conservation practitioners.

---

*Conservation success requires the implementation of the scientific tools necessary to protect wildlife in the face of energy development, and the final chapters of this book on policy- and community-based conservation suggest ways to do this.*

---

A concluding chapter to tie together the work presented in the book would have been helpful; in particular, an explanation of a game plan for how to gain momentum in the implementation process of these science-based approaches to conservation would have been welcome. Otherwise, *Energy Development and Wildlife Conservation* describes the necessary steps for maintaining healthy wildlife populations in the face of rapid and expansive energy development. The authors herald, “With one resounding voice, the conservation community needs to indicate which landscapes are most valuable to wildlife if they expect their interests to be heard. To date, we have no such game plan” (p. 229). This book presents the outlines of such a plan. Will society use it to protect our wildlife?

JOE FARGIONE

*Joe Fargione (jfargione@inc.org) is a lead scientist with The Nature Conservancy’s North America Region, based in*

*Minneapolis, Minnesota. He is an author of “The ecological impact of biofuels” in the Annual Review of Ecology, Evolution, and Systematics (2010; doi:10.1146/annurev-ecolsys-102209-144720).*

---

## EMPOWERING THE VOICE ON THE LEFT: DEFINING PROGRESSIVE BIOETHICS

**Progress in Bioethics: Science, Policy, and Politics.** Jonathan D. Moreno and Sam Berger, eds. MIT Press, 2010. 308 pp., illus. \$30.00 (ISBN 9780262134880 cloth).

Jonathan D. Moreno, a senior fellow at the Center for American Progress (CAP) and professor at the University of Pennsylvania’s Center for Bioethics, and Sam Berger, JD and former fellow at the CAP, have edited a thoughtful collection of essays entitled *Progress in Bioethics: Science, Policy, and Politics*. The purpose of Moreno and Berger’s volume is twofold: First, the collection is intended to address the issue of defining progressive bioethics; second, it is designed to identify the key principles and values that progressive bioethicists endorse.

As the field of bioethics has become increasingly more politicized, conservative values have increasingly been a dominant force in the public arena—perhaps because their views are vociferously expressed and, in many cases, unified. This has not been the case, however, for more liberal perspectives in bioethics, apart from those belonging to the Academy and the annual conferences held by professional scientific organizations—two sorts of venues that are, arguably, some distance from the public eye. *Progress in Bioethics* contributes to the greater bioethical discussion by spelling out the principles that guide progressive thinking on bioethical issues. I think the hope of its editors is that this pursuit of clarity will be instrumental in securing a place for progressive bioethicists to have greater presence in public policy