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Review of *Energy Development and Wildlife Conservation in Western North America*. Edited by David E. Naugle.

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Energy Development and Wildlife Conservation in Western North America. Edited by David E. Naugle. Foreword by Mark S. Boyce. Washington, DC: Island Press, 2011. xviii + 305 pp. Maps, graphs, tables, illustrations, photographs, reference lists, index. \$80.00 cloth, \$40.00 paper.

Wildlife populations across the West have been challenged with direct loss and degradation of habitats tied to cultivation, settlement, and livestock operations. Coupled with this, exponential human population growth has created an unparalleled human demand for energy. Current and pending energy developments are likely to alter nearly 100 million hectares of wildlife habitat. David Naugle has compiled the inaugural synthesis of energy development impacts on wildlife populations across western grassland, shrubland, and forested systems. Part 1 sets the stage, characterizing energy development in the West.

In part 2 ("Biological Responses"), Johnson and St-Laurant (chapter 3) propose a unifying experimental framework to monitor and assess consequences of energy development, urging proactive rather than reactionary science, conducted as experiments rather than observations, better informing both science and management. Chapters 4–6 discuss effects of energy development on wildlife populations, beginning with sage-grouse. Naugle and others primarily review their existing publications, showing negative behavioral and demographic consequences for grouse in energy fields, and broader population declines with lagged effects. Hebblewhite's literature synthesis of ungulate responses (chapter 5) is compelling. Understanding is limited by poor study designs, "aimed at merely appeasing the small-scale regulatory process," and more proactive adaptive management studies are needed to address energy-wildlife impacts.

Bayne and Dale summarize effects on songbirds within both forested and grassland systems (chapter 6), linking behavioral responses to energy developments and, in turn, population declines, reinforcing the need for coordinated studies across large spatial extents. Evangelista and others (chapter 7) link energy development to establishment and spread of invasive plants, resulting in ecosystem changes with impacts on wildlife. They echo prior calls for coordinated studies, moving beyond small spatial-scale and short-term observational studies, and emphasize prioritization and restoration of disturbed sites. While alternative or renewable energy sources such as wind, solar, and biofuels appear "green," they don't come without costs for wildlife. Johnson and Stephens (chapter 8) review consequences of alternative energy for species such as lesser prairie chicken, passerines, and bats; yet with strategic placement and planning, these sources may represent viable alternatives to conventional energy, potentially limiting wildlife impacts.

The book's final section (part 3) contains four chapters aimed at solutions to energy-wildlife conflicts. Kiesecker and others (chapter 9) review existing publications focused on avoiding impacts on important wildlife habitats before secondarily restoring habitat both on and off site. Similarly, Copeland

and others (chapter 10) summarize their publications using sage-grouse distributions and spatial energy development projections to prioritize landscapes and evaluate mitigation options and tradeoff scenarios. With over 81% of federal lands already leased for oil and gas development, conservation planning will require a collaborative effort involving many stakeholders, implemented across large landscapes, to be effective. Benson (chapter 11) highlights how current legislation, such as the Mineral Leasing Act of 1920, with its requirements for managing conflicting multiple uses, limits our ability to protect wildlife and their habitats. There is a need for legislation and management to be more amenable to adaptive strategies, particularly on public lands. To facilitate this, Neudecker and others (chapter 12) argue for prioritization of conservation efforts through collaborative, community-based conservation, rooting conservation within society. They eloquently conclude that "this book is a wake-up call to those who reject prioritizing landscapes for conservation and instead continue to work in highly degraded landscapes because they deny inevitable impacts of energy development." To save our western landscapes, prioritization, conservation, and protection of key wildlife resources will be necessary, with restoration and reclamation important but secondary components. The volume outlines novel ways to accomplish these lofty but attainable goals across the West.

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