

Losing Ground:

Energy Development's Impacts on the Wildlife, Landscapes, and Hunting Traditions of the American West

A Report by the National Wildlife Federation and the Natural Resources Defense Council



Barbara Wheeler

The iconic game species of the American West are in perilous decline, as migratory animals lose ground to energy development and habitat destruction in southeast Montana and northeast Wyoming. Sage-grouse, mule deer, and pronghorn are facing decreasing herd sizes and downward long-term population trends, which threaten the continued viability of these species in the coming decades. Of the species considered, only elk populations are forecast to rebound and stabilize from historic lows, though there is significant concern that additional habitat loss or degradation from energy development could stall population growth and further displace the species. Simultaneously, big game

wildlife are an ecological marker for the health of non-game species, which are also becoming increasingly vulnerable to the effects of energy development.

Bountiful wildlife populations are a major part of the cultures and economies of Montana and Wyoming. Deteriorations in habitat quality associated with energy development can negatively affect wildlife populations and, in turn, impact hunters, wildlife-watchers, and the tourism industry as a whole, which brings millions of people and billions of dollars to the region every year. These impacts justify the need for land management reforms and for wide-scale investments in game and non-game wildlife protection



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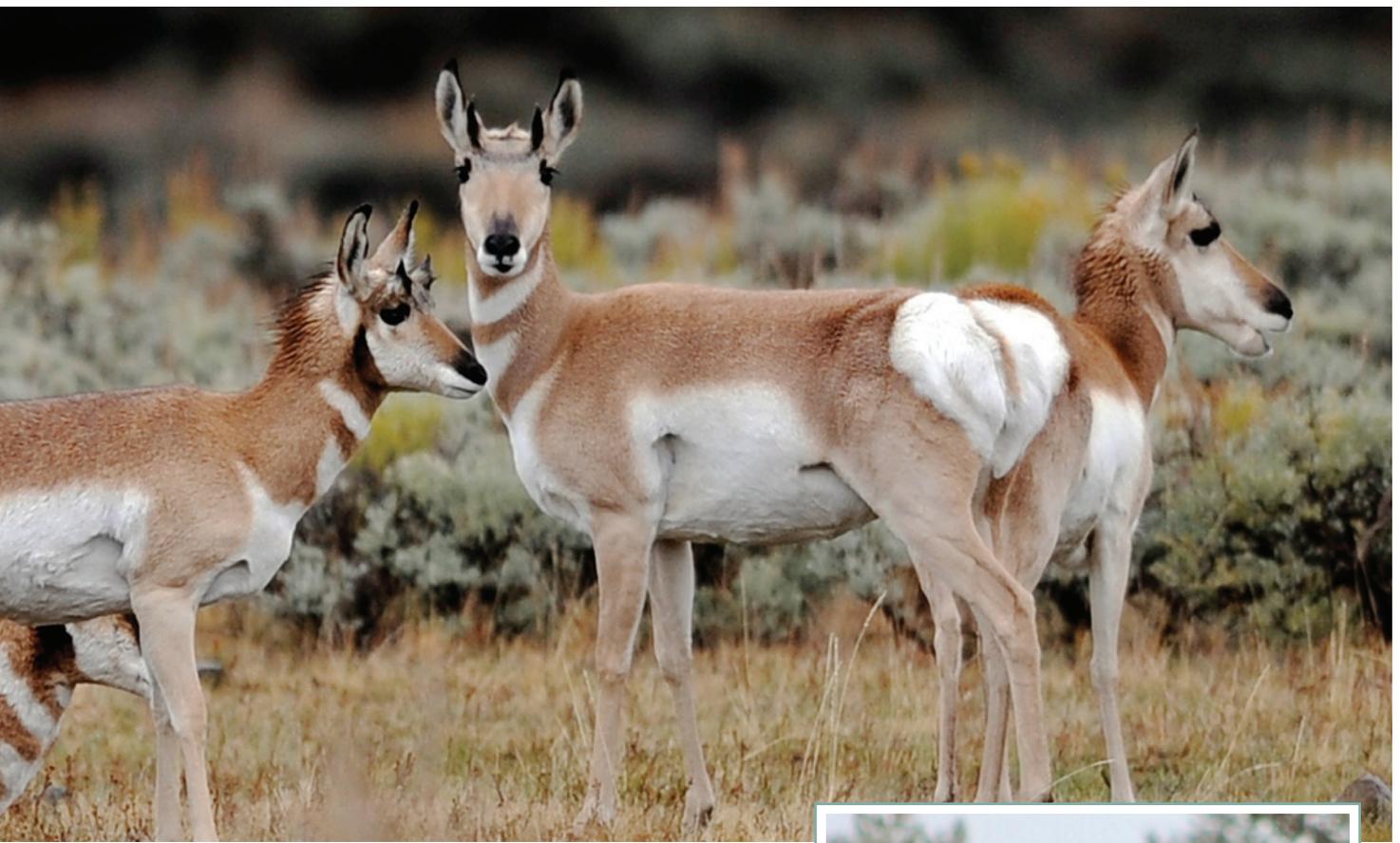
Jack Dempsey

A study commissioned by the National Wildlife Federation and the Natural Resources Defense Council analyzes trends in population and hunting opportunities for mule deer, pronghorn, elk, and greater sage-grouse.

at state and federal levels to offset the increasing impact on wildlife from energy development.

A study commissioned by the National Wildlife Federation and the Natural Resources Defense Council analyzes trends in population and hunting opportunities for mule deer, pronghorn, elk, and greater sage-grouse. This report, written by NWF and NRDC, builds on the data in context of the intense energy development in the study area. Factors assessed in determining the ratings include population trends, harvest trends, hunter trends, and female to young ratios.¹ The top findings include:

¹ Criteria evaluated for each herd unit (Wyoming) and hunting district (Montana) included: 2012 values for young/100 female ratios and a comparison to the long-term average for young /100 female ratios; Long-term trend for young/100 female ratios; 2012 values for male harvest and a comparison to the long-term average for male harvest; Long-term trend for male harvest; 2012 values for total hunters and a comparison to the long-term average for total hunters; Long term trend for total hunters; To a lesser extent, estimates for population size were also assessed and were compared to established population objectives for each herd, when available. Ellenberger J. H. and A. E. Byrne. 2015. *Population status and trends of big game and sage grouse in Southeast Montana and Northeast Wyoming*. Unpub. Report for NWF. 244 pp.



Carolyn Malone

- Only one mule deer herd unit of the eight units evaluated, Wyoming herd unit 751 (Black Hills), received a healthy rating. Notably, the Black Hills unit is the only one without any energy development within its boundaries.
- 12 pronghorn herds were examined in this analysis, 11 were rated, and only 3 received a good rating.²
- The long-term trend for harvest of pronghorn has been decreasing for eight of the 12 herds examined. For example, Montana herd unit 704 recorded a total harvest of 222 pronghorn in 2012. This is the lowest harvest reported for the herd unit in 24 years, representing only 12% of the 1,800 animals harvested in 1994.

² One herd in Montana wasn't rated due to lack of data.

- In Wyoming, sage-grouse are a species in decline, as population numbers have been on a downward trend since 2006.

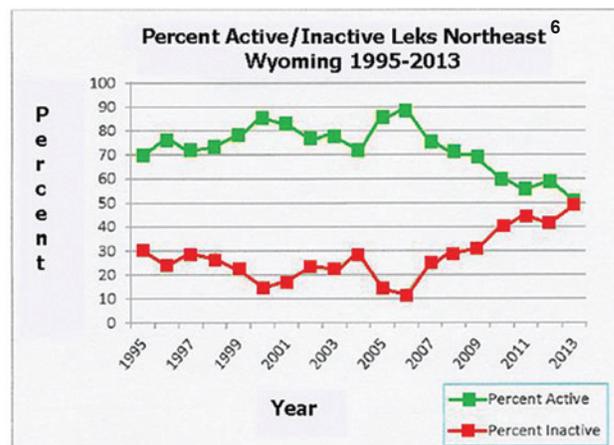
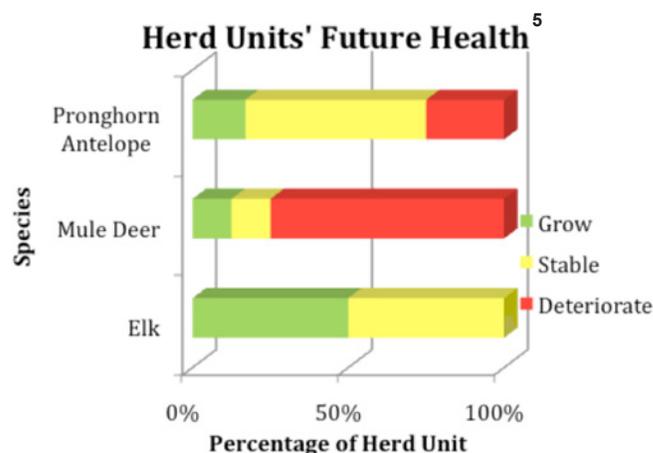
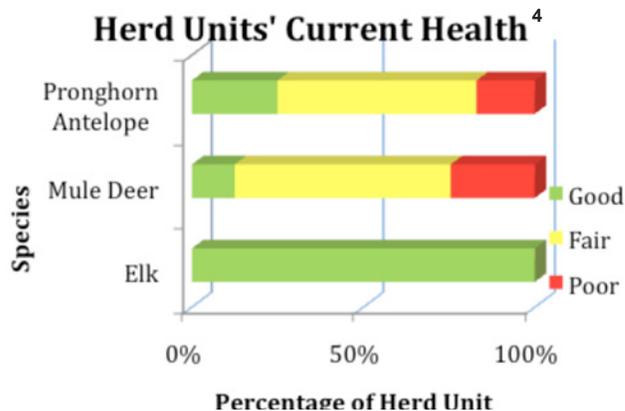
- Active sage-grouse leks, or “strutting grounds” used for mating, are twice as far from coal bed natural gas wells and 1.5 times as far from power lines as inactive leks.³

Recommendations

Following our review of the study, here are **NRDC’s** and **NWF’s** recommendations:

- Accelerate implementation of the Department of Interior’s proposed land management reforms aimed at protecting areas of high wildlife conservation values, particularly the Bureau of Land Management Planning 2.0 program; use of Master Leasing Plans; and other initiatives that encourage a district-wide “look before you leap” approach to energy development and habitat protection. Encourage **cross-border planning** among state BLM offices to address impacts on migratory wildlife.

- Significantly expand the national level of wildlife conservation funding investments for game and non-game species at the scale that meets the devastating impacts caused by current and future energy development – including full funding for the Land and Water Conservation Fund, State Wildlife Grant programs, and others.



A dwindling percentage of active sage-grouse leks meets a rising percentage of inactive leks for the greater sage-grouse population in northeast Wyoming from 1995-2013.

³ Naugle et al 2006.

⁴ Ellenberger and Byrne 2015.

⁵ Projections made based on assumption of continued development.

⁶ NE Wyoming Local Working Group 2014.

- Substantially raise the federal coal and oil and gas royalty rates from the decades old level of 12½%, and redirect a portion for the mitigation of wildlife habitat impacts.

- Comprehensively reform the federal coal and oil and gas programs, especially concerning leasing compatibility with national climate policy, and to address weak reclamation and bonding requirements.

- Require individual bonds for all oil and gas operations set at a site-specific estimated cost of reclamation.

- Enact pending legislation to eliminate the oil and gas industry exemptions from important provisions of the Safe Drinking Water Act, Clean Water Act, and other environmental protection laws that have contributed to surface and underground water pollution, air pollution, and dangerous waste management methods that impact wildlife and communities.

- Enact the bipartisan Public Lands Renewable Energy Act that improves renewable energy facility siting to protect wildlife, and redirects a portion of the renewable industry’s federal royalties for the mitigation of wildlife habitat impacts.

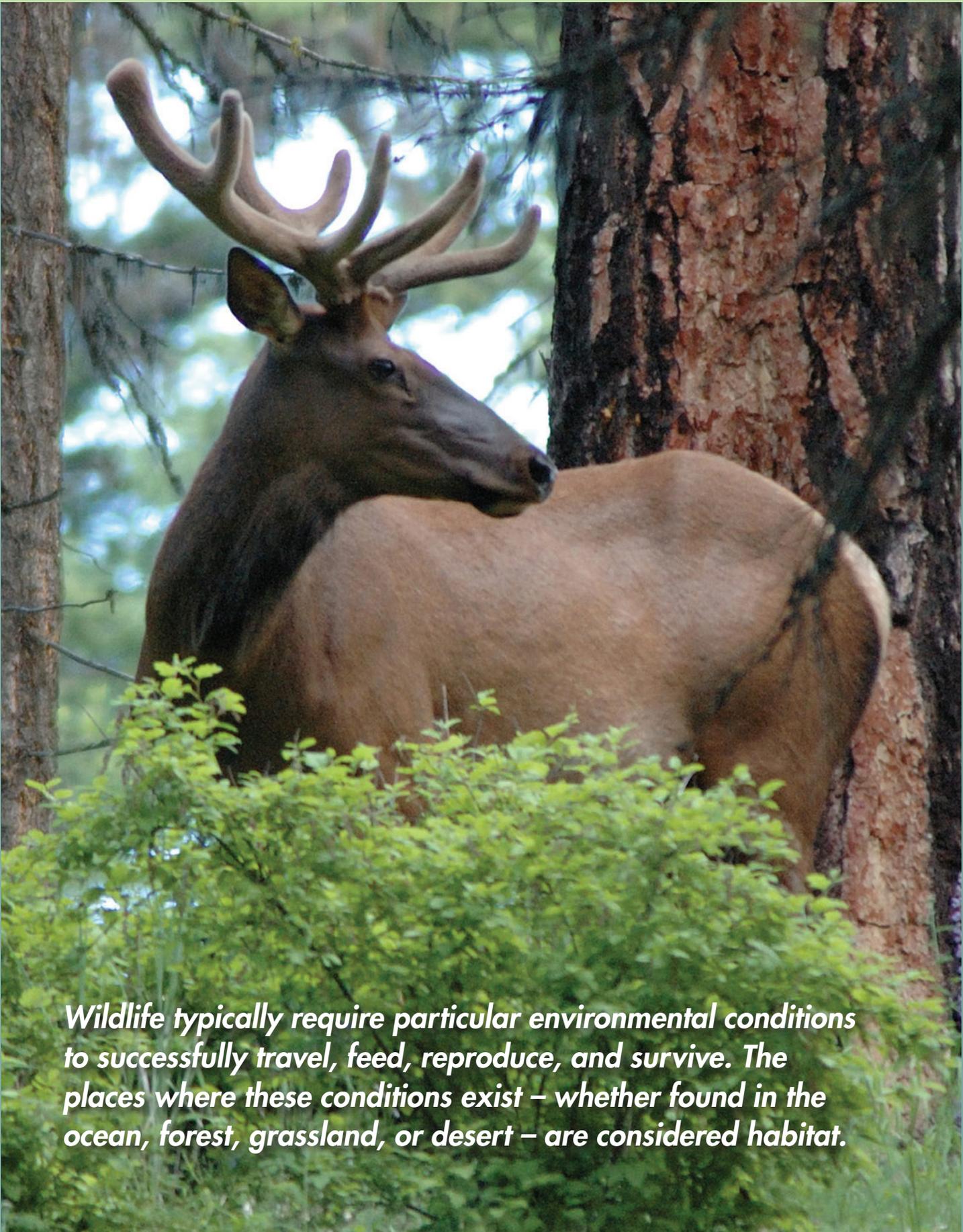
- Ensure consistent and sound implementation of the collaborative federal and state sage-grouse protection initiatives that will help rebuild greater sage-grouse populations and conserve sagebrush habitat, which supports more than 350 species, including pronghorn, mule deer, and elk.



Note: The study focuses on southeast Montana and northeast Wyoming. Within the study area, data was collected and analyzed on eight mule deer herds (three in Montana and five in Wyoming); seven elk herds (three in Montana and four in Wyoming); 12 pronghorn herds (three in Montana and nine in Wyoming); and two greater sage-grouse management areas (one in Montana and one in Wyoming). The data represents more than three decades of records from 1980 to 2013.

- Ensure the strong and consistent implementation of the Clean Water Rule, which will restore wildlife habitat protections for hundreds of thousands of miles of streams, tens of millions of acres of wetlands, and other vitally important waters that have been at risk since Supreme Court decisions in 2001 and 2006.

- Strengthen the Office of Surface Mining’s proposed Stream Protection Rule by fully protecting ephemeral streams, maintaining the stream buffer zone that has been in place since 1983, strengthening bonding requirements, and ensuring that water quality standards are directly enforceable under SMCRA.



Wildlife typically require particular environmental conditions to successfully travel, feed, reproduce, and survive. The places where these conditions exist – whether found in the ocean, forest, grassland, or desert – are considered habitat.

Energy Development and Habitat Loss

Habitat loss associated with energy development – coal mining, oil and gas fields, wind generation – particularly impacts mule deer, pronghorn, and sage-grouse populations. To the extent that energy development continues to destroy wildlife habitat, *all* species will be forced to exist on less and lower quality land, leading to declines in population and overall health. These downward trends don't just mean trouble for the species themselves, but also for the hunting tradition that permeates the American West.

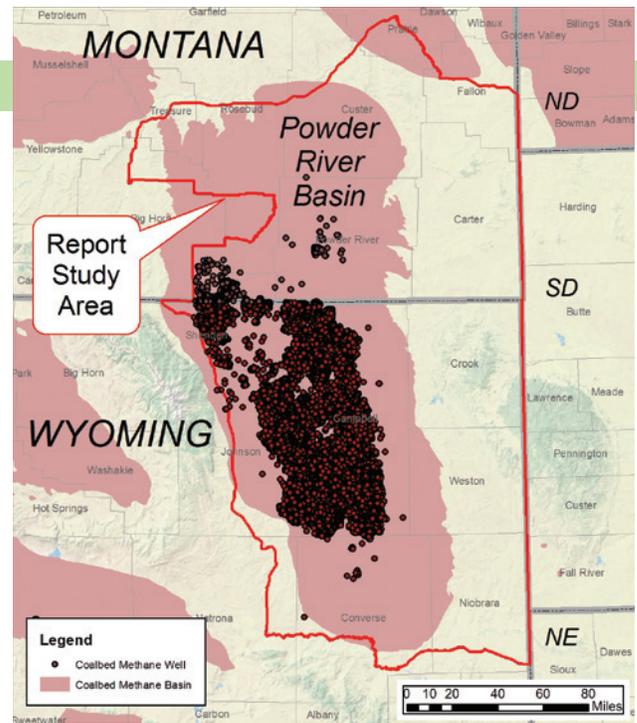
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When habitats are threatened, so are the animals within them. For example, sagebrush, the habitat of sage-grouse, is often cleared in large segments for energy projects. Removing sagebrush takes away the primary food source, shelter, and breeding grounds for sage-grouse, therefore jeopardizing their survival in that area.

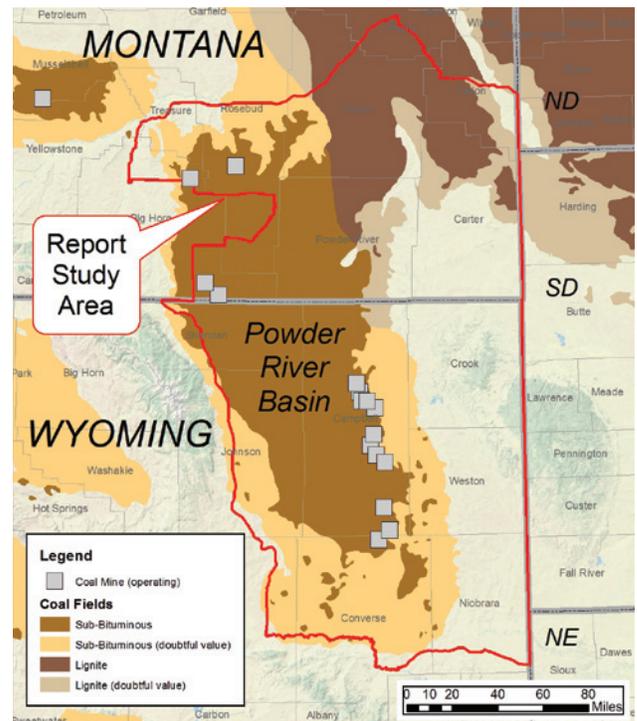
Energy development is expanding across the West. While this study considers what impact energy expansion and the resulting habitat loss could have on some of our native species, it is not known what the energy development impact could mean for hunting or the economic benefits hunting brings to communities in the West.

** Coalbed Methane well data were obtained from the Montana Board of Oil and Gas Conservation and the Wyoming Oil and Gas Conservation Commission.*

*** Map data sources used were the U.S. Geological Survey's "Coal Fields of the Conterminous United States" and the U.S. Energy Information Administration's "Coal Mines, Surface and Underground."*



In Wyoming, over 11,000 producing gas wells are shown in this map, along with more than 10,000 shut-in and abandoned wells. Coalbed methane has undergone a boom-and-bust cycle but extensive production infrastructure remains in place.*



The Powder River Basin is a major U.S. coal producing area and one of the world's largest deposits of coal, including the nation's largest surface mine: Black Thunder in Campbell County, Wyoming.**



Ken Miracle

Habitat: The Most Important Component of Greater Sage-Grouse Conservation

Vast expanses of sagebrush are home to lek sites, or strutting grounds, for male sage-grouse. Here, in order to attract partners, sage-grouse commence their signature head-bobbing, neck-shaking, feather-fluffing dance that leads to breeding. Long-term monitoring of leks provides a wealth of invaluable historical and biological data as male sage-grouse tend to return year after year to the same area.

Energy Development 101

Energy development can be devastating to the landscape. Surface vegetation and soils are often removed. Water sources can be altered or depleted. Transmission lines and roads can fragment habitat, displace wildlife, and increase predation and accidental wildlife deaths. Additionally, the infrastructure (e.g., roads, pipelines, etc.) and increased human presence on the landscape can have devastating effects on wildlife in the area.

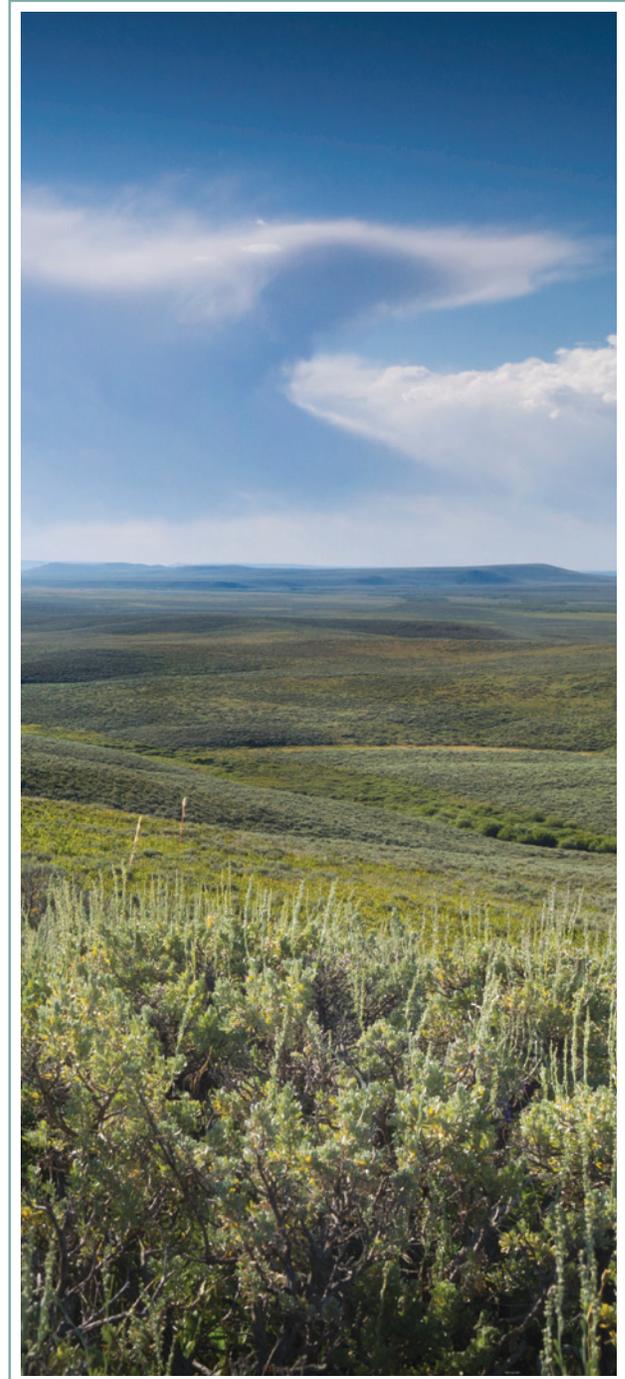
Typical development of an area for oil and gas exploration and production consists of the construction of drill pads, roads, pipelines, compressor stations, and wastewater ponds. In densely developed areas, with one drill pad per 10 acres, the pads and infrastructure can destroy up to 175 acres of habitat, the equivalent of 133 football fields. In this development scenario, habitat loss is both direct and indirect. Direct loss includes the loss of land and forage due to the actual construction of the oil or gas field

infrastructure. Indirect loss is due to animal avoidance of a larger area around the zones of drilling activity and infrastructure in an attempt to keep away from human disturbance.⁷

Indirect loss of habitat due to animal avoidance of human activity and structures is difficult to measure. A study conducted near Pinedale, Wyoming, however, involving mule deer and energy development shows significant indirect impacts. In this study, 41% of the areas previously reported as high use areas by deer had changed to medium-low or low use.⁸ In addition, areas with the highest deer use were at least 2.7 km away from drill pads.⁹

While the impacts of poorly sited wind energy on birds are well-documented, the impacts of wind energy development on other wildlife are not as well known. Few studies have been conducted on the impacts of wind energy development on big game. This is of particular concern considering the magnitude of development that is proposed in some areas in Wyoming.¹⁰ Given that wind energy development includes road building, construction activities, and increased human activity, it will likely have significant temporary impacts similar to those occurring as a result of oil and gas development, and displacement of game species is likely to result,¹¹ especially during the construction phase.

Impacts of surface mining for coal on big game and greater sage-grouse are significant and localized, and, like other types of industrial development, the concepts of direct and indirect habitat loss apply. By definition, habitat is destroyed in a surface mining operation by the removal of topsoil to access the underlying coal. Additional habitat is disturbed by the construction of infrastructure, which includes



Jeremy Roberts/Conservation Media, LLC.

⁷ Ellenberger and Byrne 2015.

⁸ Id.

⁹ Sawyer, H., R. M. Nielson, F. Lindzey, and L. McDonald. 2006. Winter habitat selection of mule deer before and during development of a natural gas field. *Journal of Wildlife Management* 70: 396-403.

¹⁰ The ChokeCherry Sierra Madre Wind Project is sited in Carbon County, Wyoming, on 7,733 acres.

¹¹ Kuvlesky, W. P. Jr., L. A. Brennan, M. L. Morrison, K. K. Boydston, B. M. Ballard and F. C. Bryant. 2007. Wind energy development and wildlife conservation: challenges and opportunities. *Journal of Wildlife Management* 71(8):2487-2498.



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haul roads, conveyor belt systems, administrative and maintenance buildings, and piles of top soil. The cumulative impacts of various types of energy development across a landscape can wreak havoc on wildlife. Oil and gas fields and coal surface mines can extend over large segments of habitats. In these situations, human-caused habitat fragmentation is a serious concern.¹² Fragmentation has two primary components: (1) loss of natural habitat within a larger landscape, and (2) division of the remaining natural habitats into isolated patches.¹³ Effects of habitat fragmentation on biological resources can include:

1. Wildlife deaths at both individual and species levels.¹⁴
2. Migration barriers and habitat isolation.¹⁵
3. Overcrowding of wildlife on remaining lands.¹⁶
4. Declines in population density.¹⁷

This means that projections for expanded energy development in the study area are a significant concern for wildlife managers, and should be for hunters, too. Intensive development for oil, natural gas, wind, and coal has the potential to drastically alter wildlife habitats in Montana and Wyoming.

¹² Ellenberger and Byrne 2015.

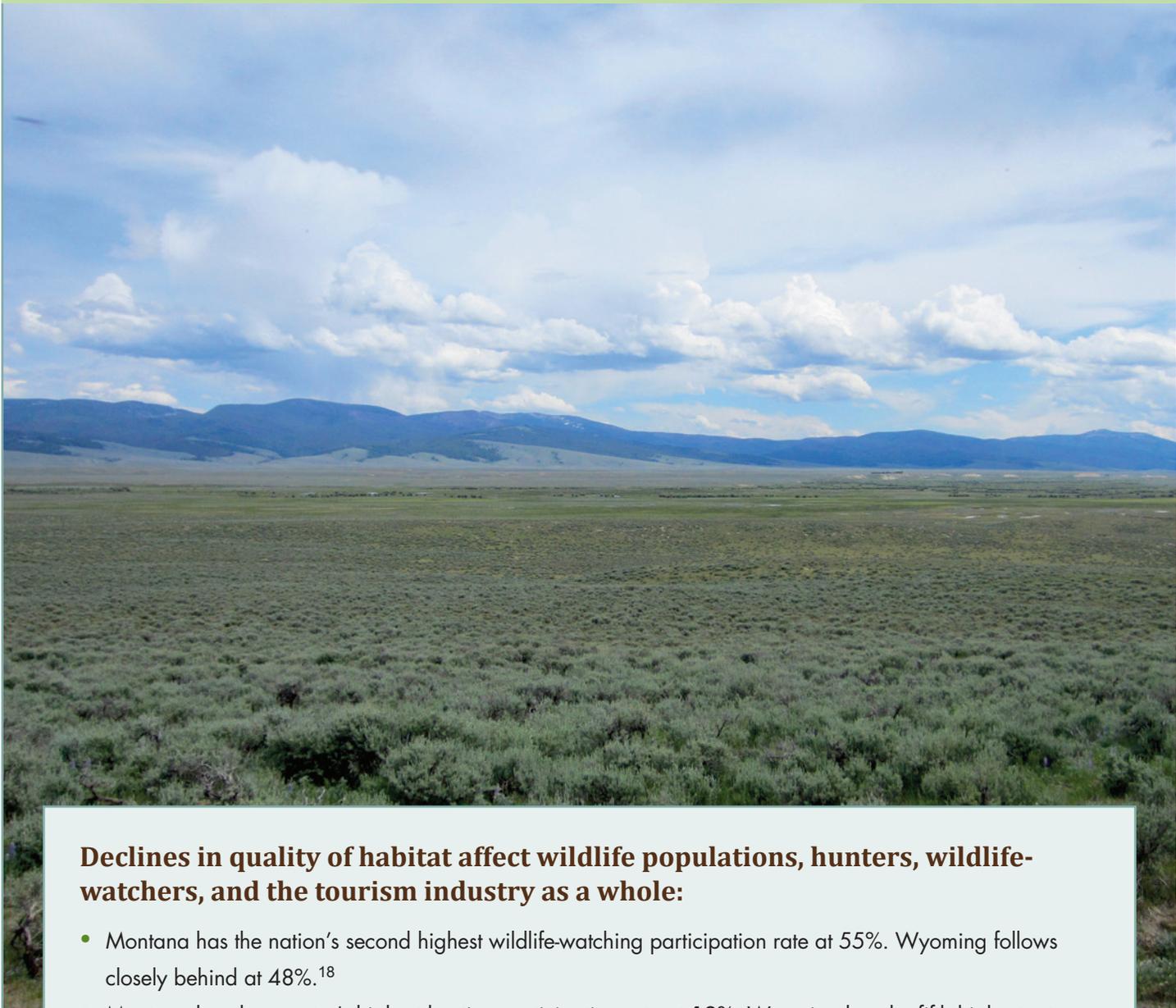
¹³ Wilcove, D. S., C. H. McLellan, and A. P. Dobson. 1986. Habitat fragmentation in the temperate zone. Pages 237-256 in: M. E. Soule, ed. *Conservation Biology. The Science of Scarcity and Diversity*. Sinauer Associates. Sunderland, Massachusetts; Bureau of Land Management (BLM). 2003. Powder River Basin Oil and Gas Final EIS/Proposed RMP Amendment. Buffalo District, WY.

¹⁴ Noss, R. F., and B. Csuti. 1994. Habitat fragmentation. Pages 237-264 in: Meffe, G. K., and C.R. Carroll, eds. *Principles of Conservation Biology*. Sinauer Associates. Sunderland, Massachusetts; Bureau of Land Management (BLM). 2003. Powder River Basin Oil and Gas Final EIS/Proposed RMP Amendment. Buffalo District, WY.

¹⁵ Id.

¹⁶ Lovejoy, T. E., B. O. Bierregaard, Jr., A. B. Rylands, J. R. Malcolm, C. E. Quintela, L. H. Harper, K. S. Brown, Jr., A. H. Powell, G. V. N. Powell, H. O. R. Schubart, and M. B. Hays, 1986. Habitat fragmentation in the temperate zone. Pages 257-285 in: M. E. Soule, ed. *Conservation Biology. The Science of Scarcity and Diversity*. Sinauer Associates. Sunderland, Massachusetts; Bureau of Land Management (BLM). 2003. Powder River Basin Oil and Gas Final EIS/Proposed RMP Amendment. Buffalo District, WY.

¹⁷ Id.



Declines in quality of habitat affect wildlife populations, hunters, wildlife-watchers, and the tourism industry as a whole:

- Montana has the nation's second highest wildlife-watching participation rate at 55%. Wyoming follows closely behind at 48%.¹⁸
- Montana has the country's highest hunting participation rate at 19%; Wyoming has the fifth highest rate with 13%.¹⁹
- 10.6 million tourists travel through Montana annually,²⁰ supporting 38,200 jobs and bringing in \$3.9 billion to the economy.²¹
- In 2014, tourism in Wyoming created 31,510 jobs and generated a total of \$3.33 billion.²²

¹⁸ U.S. Fish and Wildlife Services, "Montana Leads States for Percentage of Hunters U.S. Fish and Wildlife Services", *Billings Gazette*, August 15, 2007.

¹⁹ U.S. Fish and Wildlife Services, "Montana Leads States for Percentage of Hunters U.S. Fish and Wildlife Services", *Billings Gazette*, August 15, 2007.

²⁰ Lorna Thackeray, "Montana Tourism Revenue Takes Hit" *Missoulian*, 10/19/2008.

²¹ Montana Office of Tourism, 2014, <http://www.voicesoftourism.com/tourisms-value/>

²² Wyoming Office of Tourism, <http://www.wyomingofficeoftourism.gov/media/110455/2014-Preliminary.pdf>

Conclusion

Western wildlife species can face drought, severe winters, and other naturally occurring factors that can impact their populations. Today, energy development and associated infrastructure pose an ever-growing threat, as they drastically affect wildlife by destroying habitat, interrupting migration paths, and removing key food sources. This kind of activity can lead to isolation of remaining habitat, crowding of species onto remaining patches of viable habitat, and even the elimination of species or individual animals that depended on the destroyed habitat.

Of the species addressed in the report, mule deer, sage-grouse, and pronghorn appear to be the most vulnerable to energy development in the study area. The mule deer and pronghorn populations analyzed have shown declines in population size, productivity, or both over the last three decades, and sage-grouse populations have deteriorated so drastically that they were recently considered for listing under the Endangered Species Act.

These declines have direct impacts on hunters and hunting opportunity in the form of lower hunter success rates, decreased harvest, possible decreases in trophy quality of harvested animals, and more conservative hunting seasons. Continued habitat loss due to energy development can be expected to result in further reductions in populations and productivity of the mule deer and pronghorn herds in question, which will likely result in increasingly conservative hunting seasons and lower numbers of available licenses.²³

As development continues to destroy wildlife habitat, these species are all forced to exist on less and lower quality land. Continued, unconstrained energy exploration, development, and production throughout Montana and Wyoming will lead to further declines in game populations and overall health as well as reduced hunting opportunities. To counteract these threats, greater land management reforms must be put in place, and it is imperative that state and federal governments increase their commitment to avoid or eliminate the impacts to wildlife and invest in wildlife recovery and sustainability.



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For More Information



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²³ Ellenberger and Byrne 2015.