

Impacts of Crude Oil and Natural Gas Developments on Wildlife and Wildlife Habitat in the Rocky Mountain Region

A Technical Review published by The Wildlife Society

Citation: Riley, T. Z., E. M. Bayne, B. C. Dale, D. E. Naugle, J. A. Rodgers, and S. C. Torbit. 2012. Impacts of crude oil and natural gas developments on wildlife and wildlife habitat in the Rocky Mountain region. The Wildlife Society Technical Review 12-02. The Wildlife Society, Bethesda, Maryland, USA.

The Rocky Mountain region plays a significant role in meeting the growing energy needs of North America as well as supporting a variety of the fish and wildlife species relied upon by many stakeholders, including sportsmen, nature enthusiasts, and tourist-dependent businesses.

The Wildlife Society convened an expert committee to analyze the latest scientific literature on the impacts of crude oil and natural gas developments on wildlife and habitat in the Rocky Mountain region of the U.S. and Canada, examine the extent of these developments and processes used, and provide recommendations to wildlife professionals grappling with these challenges.

This Technical Review considers ungulate species, greater sage-grouse (*Centrocercus urophasianus*), waterfowl, and songbirds. A PDF of this review can be downloaded for free at: wildlife.org/publications/technical-reviews. Key findings and recommendations of this review are provided below.

FINDINGS:

- ◆ **Ungulates lose suitable habitat and expend precious energy avoiding development activities.** For mule deer, alert and flight reactions have been detected up to 0.3 miles from a disturbance, and habitat avoidance responses can extend to distances of 2.5-4.3 miles (p. 19).
- ◆ **Studies show breeding populations of sage-grouse have been affected severely at well densities commonly permitted (8 pads per square mile) in conventional oil and gas fields** in Montana and Wyoming (p. 24). Areas currently under development contain some of the highest densities of greater sage-grouse.
- ◆ **Sage-grouse populations decline when birds avoid infrastructure in one or more seasons.** Of leks active in 1997, only 38% inside gas fields remained active as of 2004-2005, compared with 84% outside energy development areas (p. 24).



Pronghorn need suitable, expansive rangelands where they can forage and migrate without impediments to quality seasonal habitat. Credit: Marilyn Gregory/USFWS



Open-air tailings ponds, like this one near Fort McMurray in Alberta, Canada, create hazards for waterfowl that land here to rest and become lethally coated in oil. Credit: Todd Powell/Alberta Fish and Wildlife Division

- ◆ **Exposure of waterfowl to oil can affect reproduction.** Small quantities of oil on mallard eggs reduced hatchability to 21%, compared to 80% for un-oiled eggs (p. 29).
- ◆ **Open pits containing waste fluids from oil and gas developments kill an estimated 500,000 to 1 million birds per year in the U.S.** A survey of such waste fluid stores found mortalities from 172 species, mainly ground-foraging songbirds that are already in decline (p.27).
- ◆ **Grassland birds exhibit avoidance of energy-related disturbances.** One study found that Baird's sparrows and Sprague's pipits were found, on average, 150 meters from oil and gas wells. Brewer's sparrows and other sage-related songbirds showed reduced abundance within 100 meter of narrow, low traffic well-access trails (p. 27).

RECOMMENDATIONS:

- ◆ **The 2010 Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats (WGFD 2010)** are recognized as relevant, science-based recommendations for application, planning, and mitigation.
- ◆ **Disturbance footprints should be minimized and human presence on production fields limited, particularly during sensitive times of year.** One study verified the benefits of using liquid gathering systems that do not require frequent human entry, decreasing indirect loss of mule deer habitat in Wyoming by 38%-63% (p. 16).
- ◆ **Migration corridors for ungulates demand special mitigation attention when proposed for oil and gas development.** Within narrow migration corridors less than 0.5 miles wide, there should be no surface occupancy for oil and gas developments (p. 32).



Netting appears to be the most effective method of excluding birds and other wildlife from entering waste pits containing produced water. *Credit: USFWS*

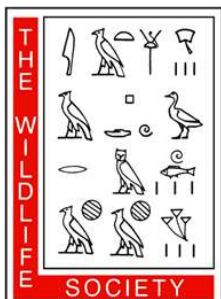
- ◆ **Storage of contaminated produced water should be eliminated.** The efficiency of oil and water separation before produced water is stored in pits, ponds, and tanks should be maximized. A fail-safe solution is to remove such pits, ponds, and tanks to prevent waterfowl and other wildlife mortalities (p. 33).



Ground-foraging songbirds like this Sprague's pipit are threatened in Canada and a candidate for listing as endangered in the U.S. *Credit: Doug Backlund/Wild Photos*

- ◆ **Noise suppression should be encouraged on all energy-sector disturbances.** Retrofitting compressor stations and certain types of wells is far more expensive than building them to minimize noise in the first place (p. 34).
- ◆ **Additional restriction on activities generating noise more than 10 decibels above background levels during the breeding season of songbirds should be employed** (p. 33).
- ◆ **Core areas containing clumped distributions of sage-grouse populations should be utilized by decision makers to assist in prioritizing conservation targets.** The use of core areas will allow the forecasting of development scenarios to be used as a tool for conservation design (p. 32).
- ◆ **Sage-grouse conservation should focus on prioritizing and conserving remaining intact landscapes.** Scientists need to work with managers to develop proactive decision-support tools that identify priority landscapes that will maintain large populations and connectivity among them (p. 22).
- ◆ **The amount of oil discharged into lakes, rivers, streams, and wetlands should be minimized.** Proper maintenance and operation of equipment used to separate oil from the produced water will minimize the amount of oil entering lakes, rivers, streams, and wetlands used by fish and wildlife (p. 33).

As oil and gas development continues in North America, biologists must continue to better understand and mitigate this industry's impacts on wildlife and develop feasible mitigation strategies to minimize these impacts. This review analyzes the strengths and shortcomings of current management of such development projects and provides guidance on steps needed to improve management going forward.



The Wildlife Society
5410 Grosvenor Lane, Suite 200
Bethesda, MD 20814-2144
P: (301) 897-9770
F: (301) 530-2471
TWS@wildlife.org
www.wildlife.org



Male sage-grouse gather in leeks to take part in competitive mating displays, but the presence of adjacent oil or gas wells decreases male attendance. *Credit: Jeremy R. Roberts/Conservation Media*