

Power lines restrict sage grouse movement in Washington

August 25 2015, by Michelle Ma



A male sage grouse displaying during mating season. Credit: Michael Schroeder/Dept. of Fish and Wildlife

Transmission lines that funnel power from hydroelectric dams and wind turbines across Eastern Washington affect greater sage grouse habitat by isolating fragile populations and limiting movement, a new study finds.

The paper, which looks at how features in the landscape limit the species' distribution and gene flow, is the first to show that power-line corridors are an obstacle for sage grouse as they move across the landscape to feed and reproduce. The study was published early online this summer in the journal *Landscape Ecology*.

Power lines and future development across the Columbia Plateau could further weaken the species, which is listed as threatened in Washington state. The entire U.S. population that spans 11 western states is up for listing under the federal Endangered Species Act and a decision on whether to officially designate the population as endangered is expected by the end of September.

The impact of [power lines](#) may be a new consideration when making that calculation.

"With only a fraction of pre-settlement habitat left in the state for this species, it's key that all of that habitat be connected in order for the population to be viable in the future," said lead author Andrew Shirk, a research scientist with the University of Washington's Climate Impacts Group.

"The best way to keep sage grouse genetically viable is to keep the population connected across all the available habitat. Habitat connectivity is also essential for the species to shift its range over time as climate change alters the distribution of its habitat."



Transmission lines in Douglas County, Washington. Credit: Michael Schroeder/Dept. of Fish and Wildlife

The greater sage grouse is a large bird that lives mainly on the ground and relies on sagebrush plants for food and shelter. Each spring, male [birds](#) congregate in breeding areas known as leks and perform strutting displays to attract females. Even though the iconic bird is the focus of many conservation efforts, its population across much of the West is still declining.

The research team looked specifically at the Washington population of approximately 1,000 birds. The species has three distinct groups spread out across the Columbia Plateau, which stretches from the cities of Wenatchee, Ellensburg and Yakima on the western edge to east of Moses Lake. Interstate 90 runs directly through their home range, and

the birds have lost more than 90 percent of their historic habitat to roads, development, wheat fields and power operations.

Using genetic data collected from feathers and blood, and by observing whether birds were present in about 70 different breeding areas, the team developed a model for how birds move and to predict how they will move in the future. The animals must be able to travel among sub-populations to prevent inbreeding, which causes a loss of genetic diversity across the entire population.

The result is a model that's more accurate than any other existing method for predicting how sage grouse move across the landscape under different future scenarios. The findings also point to transmission lines as barriers that limit the birds' movement between patches of habitat.

"The power-line transmission corridor barriers were very strong and somewhat unexpected," said co-author Samuel Cushman, a research landscape ecologist with the U.S. Forest Service. "These corridors crisscross the landscape throughout the range of the sage grouse and they appear to be very impactful to the population's connectivity."



A male sage grouse from the Moses Coulee population in Douglas County during mating season. Credit: Michael Schroeder/Dept. of Fish and Wildlife

Researchers say the birds avoid the tall transmission towers and power lines, which stand out in their usually expansive landscape. Some grouse have collided with the towers, and the structures attract predator birds that perch on the lines, targeting grouse eggs or even the birds themselves.

In Washington, two of the sub-populations are only 3 miles apart, but they have to cross rivers, a major highway, steep terrain and fruit orchards to reach each other. Restoring more natural habitat between the groups is key to their survival.

The new study suggests placement of power lines is another important

factor.



Power lines in Washington's Douglas County. Credit: Michael Schroeder/Dept. of Fish and Wildlife

"We really want to recover these populations so they're not only sustainable, but also healthy," said Michael Schroeder, a research scientist with the Washington Department of Fish and Wildlife who has worked with grouse for about 35 years. "We want to make these functioning landscapes and not always have to think about first-aid solutions for these populations."

The new model is based on Washington birds and data and can't be directly extrapolated to other states' grouse populations. But the study's authors say the negative impact of [transmission lines](#) on habitat connectivity is a robust result and they believe it is likely to impact all of the [sage grouse](#) in the West.

More information: "Empirical validation of landscape resistance models: insights from the Greater Sage-Grouse (*Centrocercus urophasianus*)." *Landscape Ecology* [DOI: 10.1007/s10980-015-0214-4](https://doi.org/10.1007/s10980-015-0214-4)

Provided by University of Washington

Citation: Power lines restrict sage grouse movement in Washington (2015, August 25) retrieved 4 July 2024 from <https://phys.org/news/2015-08-power-lines-restrict-sage-grouse.html>

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