



Release:

November 2013

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Greater Sage-Grouse Space-Use Models Inform Surface Use Designations

The greater sage-grouse (*Centrocercus urophasianus*) is a focal species in land use planning in the Great Basin. One tool land management agencies can use to reduce negative impacts of planned industrial development is assignment of surface use (SU) designations, which implement buffer zones of no-activity around greater sage-grouse breeding areas.

However, rationale for the size of buffers is often challenged. To clarify this issue, researchers from USGS, CDFW, NDOW and the University of Idaho studied space use of greater sage-grouse across seasons to identify the theoretical optimal size of a buffer zone. Their findings are published in *The Journal of Wildlife Management*.

Using telemetry equipment, researchers collected 11,878 sage-grouse locations from 193 greater sage-grouse in the Bi-State Distinct Population Segment bordering California and Nevada, during 2003-2009. Researchers quantified space use and the proportion of grouse nests within increasing concentric areas from the lek sites — grouse breeding aggregations — up to a radius of 30 km. They calculated the volume of utilization distribution (vUD) within this range of areas to identify the most appropriate buffer zone around leks — to identify areas that sage-grouse are most likely to utilize, and beyond which they are increasingly less likely to utilize.

Nearly 90% of vUD across all four seasons for sage-grouse were contained within approximately 5-km radius of each lek, suggesting this is a key threshold distance for sage-grouse space use. Further analysis indicates that sage-grouse nests have a 95% chance of being located within about 5-km radius of each lek. In an additional benefit-cost analysis, researchers found that optimal thresholds continues to extend to 7.5 km radius, but diminishes at distances >8 km.

Management Implications

- This study provides empirical support for distances between 5 and 7.5 km from leks for surface use designation.
- This Bi-State study may serve as baseline information for other populations in the Great Basin, and these thresholds may contribute to land use planning needs elsewhere.
- It is important to note that sage-grouse space use does not fully inform the extent of no-activity areas. Some industrial activities, such as those generating acoustic pollution, can contribute to negative impacts which extend beyond the physical footprint of each installation.

THIS BRIEF REFERS TO:

Coates, PS, ML Casazza, EJ Blomberg, SC Gardner, SP Espinosa, JL Yee, L Wiechman, BJ Halstead. 2013. Evaluating greater sage-grouse seasonal space use relative to leks: implications for surface use designations in sagebrush ecosystems. *The Journal of Wildlife Management* 77(8): 1598-1609. doi: 10.1002/jwmg.618

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4975>
<http://www.werc.usgs.gov/coates>



Breeding leks form the center of greater sage grouse social behavior and space use.