

****Behavior-Season Mapping of Sage Grouse use Intensity to Define Habitat**

Trapper Haynam*, Montana State University, Bozeman

Michael Borgreen, Bureau of Land Management

John Carlson, U.S. Fish and Wildlife Service

Lance McNew, Montana State University - Wildlife Habitat Ecology Lab, Bozeman

*Indicates Presenter

**Indicates Student Presentation

The greater sage grouse (*Centrocercus urophasianus*) is a focal species in the effort to conserve imperiled sagebrush ecosystems and associated organisms. As sage grouse numbers decline and populations become more isolated, populations in different regions must cope with unique combinations of stressors and are less likely to be replenished by surrounding populations. Therefore, it is critical that we understand and delineate local habitat to inform management decisions. Wildlife-habitat responses are typically inferred from seasonal population-level resource selection models without regard for detailed individual-level phenologies and behaviors. A more comprehensive suite of inferences and predictions may be gained by linking landscape-condition responses with specific behavior-seasons derived from movement data and expert knowledge. Our primary goal was to quantify sage-grouse landscape-condition responses relevant to management and map use-intensity for 7 distinct behavior-seasons. We attached a 22-g solar powered GPS satellite transmitter to 86 female sage grouse in north-central Montana and have collected 188,786 geographic coordinates during 2018-04-24 – 2021-12-28. We monitored females, analyzed movement behaviors, and mapped use-intensity using a combination of field observations, nonlinear-regression movement models, a time-local convex hull approach, and generalized additive models. The relationship and magnitude of associations among sage grouse use-intensity and landscape conditions varied among the 7 behavior-seasons which indicates that behavioral and temporal context is important for understanding habitat physiognomy and use for sage grouse.