

SUSCEPTIBILITY OF GREATER SAGE-GROUSE TO EXPERIMENTAL INFECTION WITH WEST NILE VIRUS

Larry Clark, Jeffrey Hall, Robert McLean, Michael Dunbar, Kaci Klenk, Richard Bowen and Cynthia A. Smeraski

ABSTRACT: Populations of greater sage-grouse (*Centrocercus urophasianus*) have declined 45–80% in North America since 1950. Although much of this decline has been attributed to habitat loss, recent field studies have indicated that West Nile virus (WNV) has had a significant negative impact on local populations of grouse. We confirm the susceptibility of greater sage-grouse to WNV infection in laboratory experimental studies. Grouse were challenged by subcutaneous injection of WNV ($10^{3.2}$ plaque-forming units [PFUs]). All grouse died within 6 days of infection. The Kaplan-Meier estimate for 50% survival was 4.5 days. Mean peak viremia for nonvaccinated birds was $10^{6.4}$ PFUs/ml ($\pm 10^{0.2}$ PFUs/ml, standard error of the mean [SEM]). Virus was shed cloacally and orally. Four of the five vaccinated grouse died, but survival time was increased (50% survival=9.5 days), with 1 grouse surviving to the end-point of the experiment (14 days) with no signs of illness. Mean peak viremia for the vaccinated birds was $10^{2.3}$ PFUs/ml ($\pm 10^{0.6}$ PFUs/ml, SEM). Two birds cleared the virus from their blood before death or euthanasia. These data emphasize the high susceptibility of greater sage-grouse to infection with WNV.