Global tracking devices negatively affect the survival rate of sage-grouses

August 13 2019

A new study in *The Condor: Ornithological Applications* finds that currently-available global positioning system (GPS) tracking devices, previously thought to not alter animal survival rates, can decrease greater sage-grouse survival.

The researchers monitored sage-grouse survival at 14 sites throughout California and Nevada. Between 2012 and 2017, VHF transmitters were attached to 821 female and 52 male sage-grouse. GPS devices were attached to 234 female and 125 male sage-grouse.

Researchers here combined the measured survival of the tracked sage-grouse throughout the duration of the study with models to estimate independent random effects and correlating fatalities, to determine differences in the survival rate for sage-grouse fitted with GPS devices versus those fitted with VHF transmitters.

The researchers recorded 316 mortalities in VHF-marked sage-grouses, and 261 mortalities were recorded in GPS-marked sage-grouse. Median annual survival estimates were higher for VHF-marked birds than GPS-marked birds for both sexes and all ages. Median seasonal survival estimates were 1.08-1.19 times greater for females marked with VHF devices rather than those marked with GPS devices. Seasonal survival estimates for males marked with VHF devices ranged from 0.98-1.32 times that of birds marked with GPS devices. The median annual estimate calculated across all age classes, for GPS-marked males and females was 0.58 and 0.61 times that of VHF-marked males and

females, respectively.

Researchers here found that females marked with VHF devices were expected to live 9.6 months longer than those marked with GPS devices. VHF-marked males were expected to live 10.5 months longer than those marked with GPS devices.

Differences in survival could be attributed to features associated with GPS devices, including greater weight, the rump position of the attachment as compared to the necklace positioning of VHF devices that might impair mobility, and a semi-reflective solar panel which results in a shiny glare that may potentially attract predators.

"We are researching the potential causes of GPS devices on decreased survival in the hope that future design and attachment modifications can minimize negative impacts, and lead to benefits to both the birds and to our understanding of their ecology," said one of the study's authors, Mark A. Ricca, Ph.D.

More information: John P Severson et al, Global positioning system tracking devices can decrease Greater Sage-Grouse survival, *The Condor* (2019). DOI: 10.1093/condor/duz032

Provided by Oxford University Press