

Bradbury, J.W., S.L. Vehrencamp, and R.M. Gibson. 1989. Dispersion of displaying male sage grouse. I. Patterns of temporal variation. *Behavior Ecology and Sociobiology* 24:1-14.

Summary: The distribution of lek sizes was examined in each of three populations of sage grouse in eastern California. Peak seasonal lek sizes collected over a 35 year period were found to covary among the three sites indicating that some global environmental or demographic features modulated male attendance in any given year. Despite these annual variations, the ranks of the three populations with regard to mean lek size remained stable. In all three populations, there was a persistent excess of small and large leks, compared to random settlement on the same number of sites, and a consistency in the ranking by size of particular sites in successive years. The sequential phenology of lek site occupation in each population was correlated with recolonization of habitats surrounding central wintering refuges each spring. Some lek sites utilized for display in early spring were regularly abandoned prior to the onset of mating as more peripheral leks became active. On top of population, site, and seasonal variations in lek size, pronounced daily fluctuations in attendance were common. Multivariate regressions indicated that an average 36% of the daily variation in male numbers was correlated with weather variables, female attendance levels, and prior raptor harassment. Several outcomes of the analyses support the notion that dispersion of males is partly determined by male settlement on current female traffic patterns (hotspot settlement). The analyses also suggest that display is sufficiently costly that variations in male attendance are in part a result of conflicts between strutting and thermoregulatory expenditures.