

****Estimating Abundance of Dusky Grouse for Population Monitoring**

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Dusky grouse (*Dendragapus obscurus*), are a forest grouse species found throughout mountainous regions of western Montana. Despite being a game species, population monitoring has been inconsistent in recent years. Our objective is to develop, test, and evaluate sampling and statistical methods for unbiased population monitoring to inform management. We developed a spatially explicit model of dusky grouse relative habitat suitability in Montana to identify suitable survey sites for population monitoring. Prior to sampling in the field, we conducted statistical simulations to evaluate efficacy of potential survey protocols. Results from the simulations suggested that a minimum of 100 independent sites surveyed three times within a period of closure had the potential to yield unbiased and reasonably precise estimates for regional population abundance. During a pilot study in 2019, we conducted surveys during two sampling periods, spring and summer, within Montana, Fish, Wildlife, and Parks administrative region 3. Field methods included point counts with and without the use of electronic playback and walking transect surveys. We used N-mixture models and distance sampling to estimate abundance, density, and detection for each of the survey methods in each sampling period. We observed significantly more grouse during spring surveys than summer surveys, which yielded more precise estimates of abundance and density. The use of electronic playback calls increased detection probability during spring surveys but had no effect on summer detectability. Future work includes evaluating current and other potential survey protocols using simulations and estimates produced from the pilot study.