Estimating Population Size of Grand Canyon Bighorn Sheep with Scr (Poster)

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Desert bighorn sheep are a species of conservation concern and management importance for their symbolism, role as the only ungulate in the desert nutrient cycle, and as a prey and carrion source. The bighorn population in the Grand Canyon (GRCA) represents the largest population managed by the National Park Service on the largest protected habitat on the Colorado Plateau. Bighorn sheep are highly susceptible to pneumonia from contacts with domestic sheep and the first documented occurrence of pneumonia in the GRCA caused a significant decline in survey counts between 2011 and 2014. The disease outbreak occurred during a large-scale, multi-year study of bighorn sheep movement and connectivity by sampling fecal pellets. This created an opportunity to conduct the first estimate of bighorn abundance and disease impacts for the entire GRCA. Thirteen hundred samples from five years were genotyped and analyzed with spatial capture-recapture models to estimate abundance while modeling detection and incorporating environmental constraints. We will discuss top models for detection and density, and describe our approaches for accounting for a linear sample design in this population, reducing the size of confidence intervals with auxiliary data, and estimating movement through the system.