**Molecular Insights on Greater Sage-grouse Breeding Strategies in the Northwestern Great Basin

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**Topic:** Sage-grouse conservation
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 **Abstract:**Co-authors: Phillip Street, Jim Sedinger For sage-grouse, the annual breeding cycles begin on leks, areas where males produce visual and acoustic displays for females. Research using visual observations on leks suggests that a few males do most of the breeding. Intraspecific nest parasitism has also been documented in this species. Genetic analysis can reveal true parentage of resulting clutches. Using the vascularized membranes within eggshells, we extracted DNA from each egg. With the addition of adult samples, we verified maternity to determine nest parasitism, and paternity, to test for extra-pair copulations. We sampled the eggshell membranes of 350 eggs from 46 clutches from our study site in Northwestern Nevada. We used feathers collected from the incubating female as a unique genetic sample. We targeted 14 microsatellite loci developed for sage-grouse and one sex determination locus. These highly polymorphic loci are useful for parentage analyses as we can compare the alleles of the putative mother and each offspring. Using the program Cervus, we tested for matches and mismatches among each focal sample and the candidate parent. After matching the mother to her clutch, we compared the offspring genotypes to each other to determine paternity and nest parasitism. We reconstructed possible male genotypes and looked for matches among clutches to evaluate if a dominant male is doing most of the copulations, or if additional copulations are happening off of the lek. Multiple parentages in clutches may help maintain genetic diversity for the population. Females may also mate with multiple males to hedge their bets on male quality, and therefore the quality of offspring. These results provide important insights about sage grouse breeding behavior that observational studies cannot.