Measuring Dispersal in Conservation Biology: Lessons from Studies in Grouse

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Grouse make up a subfamily of birds, Tetraoninae, in the family Phasianidae, which are generally heavily built like chickens. Grouse have a broad geographical distribution, spanning across North America, Europe, and Asia in habitats from grasslands to forests to tundra. Their wide geographical range and larger body size makes grouse ideal models for studying dispersal. Short seasonal dispersals (possibly coupled to their large body size) allow for relatively easy tracking of grouse in studies on dispersal as they can be monitored in a manageable, single study site. Many species of grouse, such as Black Grouse, are game birds and often exist in managed populations, while others such as the Chinese Grouse and Attwater's Praire Chicken are under threat and have become the focus of conservation efforts. Given their relatively easy to track dispersal habits, their intrinsic value as biodiversity, and their value as game birds to the hunting community, studies with applications for grouse conservation are widely relevant and in demand as increasing human development and thus habitat loss and fragmentation are becoming one of the biggest concerns for the future viability of these populations.

This project aims to create a compilation of data from past studies on grouse dispersal for an easy-to-read reference guide for future studies on grouse. The compilation table includes data on average dispersal distances and the range of recorded dispersals for adults and juveniles of both sexes of each surveyed species. The literature review, which includes data from 18 publications and covers nine of the 17 total species, is used also to begin assessing the emerging genetic methodology in the field of dispersal studies and to draw some general conclusions on barriers to grouse dispersal. The up-and-coming genetic approach to measuring dispersal is assessed by comparing published data from studies using genetic methodology with studies using the currently commonplace telemetry methods in cases where the species and habitat is constant across the compared studies. This particular data compilation and comparison is able to begin building support for the future use of genetic methods in measuring dispersal in grouse, as the results match closely; however, further comparisons are needed before this can be made standard practice. The table on dispersal data also shows discrepancies in the dispersal distances of species for which there is a large amount of published data, such as Hazel Grouse. These discrepancies allow for a comparison of the habitat matrix to determine what differences are present that may be causing variation in the dispersal distance. This comparison suggests that open spaces and agricultural areas present general barriers to grouse dispersal. However, further research is needed to determine what constitutes a universal barrier to dispersal, as in some cases open spaces were overcome in moving from one habitat patch to another.