



Informing Bison Conservation Strategies Using Population Viability Analyses for Department of the Interior Bison Herds

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The Department of the Interior (DOI) is the primary conservation steward of North American plains bison. Currently 19 herds, totaling around 12,000 bison, live on DOI lands. The National Park Service (NPS) manages 10 of these herds, the Fish and Wildlife Service (FWS) manages seven, and the Bureau of Land Management (BLM) manages two. Together, these 19 herds are crucial to the long term preservation of the species. Yet only one of these herds has over 1000 animals, 12 are kept behind fences, and almost all are culled to maintain low population densities. Given these circumstance, concerns have been raised about the long term genetic viability of the DOI herds. Compounding these concerns is the fact that in recent years the DOI herds have primarily been managed in isolation from one another, with each herd treated as an independent population (DOI 2014). The ecological restoration of bison is a priority for the Wildlife Conservation Society (WCS), making WCS a natural partner in the development of shared management strategies for these conservation herds.

The objective of this joint NPS/WCS project is to use the best available science to build a meta-population viability model of plains bison on DOI lands, and to use this model as a guide for developing a management strategy to maintain or increase genetic variation of bison across all herds. Specifically, we are working with the FWS, BLM, the International Union for the Conservation of Nature Conservation Breeding Specialist Group, the University of California Davis Veterinary Genetics laboratory, and state agencies from Alaska, Arizona and Utah to gather and analyze up-to-date genetic and demographic data for all 19 DOI herds. We will use these data to establish a common, standardized baseline of genetic information across all herds, develop a population viability analysis (PVA) for each individual herd under current management, and explore the outcome of proposed metapopulation management scenarios across all herds (Lacy 2000).

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The management scenarios we explore include determining optimal augmentation strategies to maintain or increase the genetic diversity of small herds. For example, what data should be monitored to determine whether an augmentation is needed to increase the genetic diversity of a herd? How many bison need to be moved, which herd or herds should be the source of the transplanted bison, and does the age or sex ratio of the transplants matter? The ultimate goal of this project is a continent-wide conservation strategy for the long-term viability of plains bison in North America. This management strategy will utilize well-established scientific methods in analysis and modeling, will eventually encompass the entire existing range of plains bison, and will be based on the collaborative efforts and shared stewardship of federal agencies, state agencies and tribal nations.

References

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