

Efficacy of bison management studied at Badlands

FROM THE BRINK OF EXTINCTION TO ABUNDANCE, the iconic plains bison (*Bison bison*) has rebounded so well in many national and state parks that it has become a potent symbol of conservation in the American West. This recovery is due largely to restoration efforts like the reintroduction of bison into Badlands National Park in 1963, which has been by all accounts a success. As a sort of biological exemplar, or keystone species, that has a “disproportionate” effect on the quality of surrounding flora and fauna, bison have the potential to alter grassland habitats. This is especially true in areas like the 26,000-hectare (64,246 acre) Sage Creek Unit of the Badlands Wilderness Area, a mixed-grass prairie ecosystem where this South Dakota herd is contained by steep cliffs and a fence and lacks natural predators, the wolf and the grizzly bear. In typical ungulate fashion, bison could overpopulate and deplete the native grasslands. Thus, almost every year, resource managers at Badlands National Park have a roundup to remove animals from the herd. In a review of this practice from 2002 to 2007, Pyne et al. (2010) find that managing the herd through annual culling is an effective management strategy.

Over the course of five years and the capture of 3,281 bison, investigators tested various hypotheses related to demographic analysis of the herd and survival rates as they apply to sex and age of individuals; they also reviewed the effects of climatic change on the herd, because management is based on vegetation productivity in drought years. Observing the park’s mark-recapture model for maintaining the bison, Pyne et al. (2010) were able to estimate biologically meaningful transition rates, such as the transition from breeding to nonbreeding status, while correcting for recapture rates. This analysis shows that Badlands bison have a high survival rate and high chance of breeding. In other words, the herd is not at “carrying capacity” for the landscape and could be allowed to grow. This is good news for park managers. The park is currently in the process of fencing other areas where bison will be able to expand their range and increase in numbers. Park staff plans to maintain a population of at least 1,000 animals to prevent loss in genetic heterozygosity or diversity. Researchers have found that populations of 1,000 animals sustain genetic health for more than 200 years.

Reference

Pyne, M. L., K. M. Byrne, K. A. Holfelder, L. McManus, M. Buhnerkempe, N. Burch, E. Childers, S. Hamilton, G. Schroeder, and P. F. Doherty. 2010. Survival and breeding transitions for a reintroduced bison population: A multistate approach. *Journal of Wildlife Management* 74(7):1463–1471.

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