

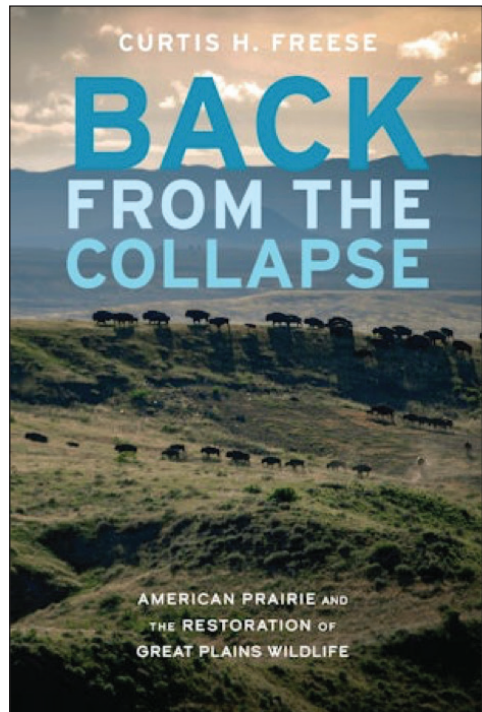
**Back from the Collapse: American Prairie and the Restoration of Great Plains Wildlife**, by Curtis H. Freese. 2023. University of Nebraska Press, Lincoln, Nebraska, USA. 351 pages + x. \$26.95 (paper). ISBN: 978-1496231321.

In 2002, Curtis Freese and other conservationists cofounded American Prairie, a non-profit organization with the mission to establish a 1.29-million-ha reserve in northeastern Montana to support the region's native wildlife. Could a book written by a founder of a prairie preserve be more than a thick promotional brochure? I considered myself a skeptic as I read *Back from the Collapse: American Prairie and the Restoration of Great Plains Wildlife*. Yet, overall, I was impressed with an engaging and well-written synopsis on prairie ecology made more thorough via sections on histories of deep geologic events, biogeography, evolutionary perspectives, and Euro-American colonization.

*Back from the Collapse* is replete with in-depth backgrounds on key prairie taxa, including *Putorius nigripes* Audubon and Bachman (black-footed ferret), *Cynomys pyrrorhynchus* Elliot (black-tailed prairie dog), *Castor canadensis* Kuhl (American beaver), *Lontra canadensis* Schreber (North American river otter), ungulates, carnivores, grassland birds, *Scaphirhynchus albus* Forbes and Richardson (pallid sturgeon), and even *Melanoplus spretus* Walsh (Rocky Mountain locust). However, the philosophies and processes of grassland restoration are touched on only at a coarse level in *Back from the Collapse*. Missing for me were discussions of problems and barriers to the near idyllic representation of grassland restoration.

To increase success, modern wildlife management must blend science and art in relation to dynamic human circumstances, values, and expectations (WMI 2024). And discussion of management within the current context seems to be missing throughout this book, as only reintroductions and the removal of fences and dams are discussed as steps in restoration. The use of vaccinations and insecticides to protect prairie dogs and ferrets was discussed, but no such interventions for the management of *Bison bison* Linnaeus (American bison) or plant communities were mentioned. What of pervasive changes (e.g., diseases, invasive plants, hydrology, climate, etc.) since Euro-American colonization that greatly affect the chances for restoration and true ecological restoration? Introduced diseases associated with livestock, such as brucellosis, bovine tuberculosis, and malignant catarrhal fever, need to be considered. Alien grasses have altered forage and fire ecology in the region; these include *Agropyron cristatum* Linnaeus (crested wheatgrass), *Bromus tectorum* Linnaeus (cheatgrass), other bromes, and *Poa pratensis* Linnaeus (Kentucky bluegrass). Similarly, introduced forbs have changed habitat structure and composition; these include *Melilotus* Mill. (sweetclover), *Euphorbia esula* L. (leafy spurge), *Centaurea* L. (knawweed), and *Arcticum* L. (burdock). How will these non-native plant species be managed?

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Another consideration is the cultural keystone species, *Equus caballus* Linnaeus (horse). Horses are second to bison in cultural importance to many indigenous peoples of the Great Plains. Although gone from North America for 11,000–14,000 years, *Equus* returned in 1493 and might be considered a part of the Great Plains ecosystem as ~300,000 horses occur in western states, many managed by Federal agencies (Schoenecker et al. 2021). Somewhat similarly, several species, like *Vulpes vulpes* Linnaeus (red fox) as mentioned by Freese, were once restricted to habitats with more mesic woodlands and have expanded their distributions and increased their abundance and impact in the northern Great Plains. Such species include medium-sized predators, like *Didelphis virginiana* Kerr (Virginia opossum), *Procyon lotor* Linnaeus (raccoon), and *Mephitis mephitis* Schreber (striped skunk). Also, fully exotic species (*Phasianus colchicus* Linnaeus [Ring-necked Pheasant] and *Perdix perdix* Linnaeus [Gray Partridge]) have been introduced in the area. These changes force difficult questions that Freese does not address. What criteria do we use for the inclusion of a species in ecological restoration? Are exotic species removed? Do endemic diseases and parasites qualify for restoration or management? *Bacillus anthracis* Cohn (anthrax) crossed the Bering Land Bridge about 13,000 years ago (Kenefic et al. 2009). Should bison be vaccinated for anthrax and other livestock diseases?

I cringed at the necessary, but seemingly not well-considered, names for the project (American Prairie-Russell Refuge) and region (American Prairie-Russell Region). These names reflect the blended landscape that comprise the protected area and the Charles M. Russell National Wildlife Refuge. These names are presumptuous and self-serving. The ill-conceived naming conventions also harken to issues that many have with colonizer mentalities. Why not engage with surrounding communities and incorporate their views on what the area might be called? Similarly, the discussion of the success of African refuges and the analysis of refuges large enough to support viable, genetically diverse bison populations lacks a realistic discussion of examples that include working with local people, particularly landowners. It is understandable that the American Prairie effort has critics; on a recent trip between Bozeman and Malta, Montana, I saw a total of eight “Save the cowboy” and “Stop American Prairie” signs along the roadways.

At 129.5 million ha, the Great Plains represent about one-quarter of the historic distribution for the Plains bison. The planned 12.9-million-ha reserve that is the American Prairie project in Montana has been underway for over 20 years and has protected 51,031 ha (discounting 136,258 ha of public lands that are already protected). Meanwhile, 12.9 million ha of Great Plains grasslands were plowed and converted to mostly agriculture production since 2012. Losing >404,000 ha of grasslands per year is sobering. We need to stabilize or curtail the loss of grasslands as soon as possible. To do this at scales meaningful for conservation and ecological function, it is imperative that we work with livestock producers and Tribal Nations that own and manage more than 70% of the land in this region. Indeed, livestock producers have maintained a vast majority of the remaining grasslands and their livelihoods have helped maintain ecosystem benefits and biodiversity that would likely have been lost without them. They were also key players in early wildlife protection attempts and reintroductions (Picton and Lonner 2008).

Freese touches on the growing world population of 8 billion people and associated livestock, which are the main barriers to large-scale habitat restoration. These are not trivial factors, and ecologists need to consider such limitations. Often missing from global dietary discussions is the fact that the soils of many lands are not suited for crop production, and these lands are where ruminants such as cattle and bison can convert grasses into protein for human consumption. With human population growth projected to peak at

10.4–10.8 billion people near 2100 (Baillie and Zhang 2018), society needs to balance diet and land-use options.

Ecological restoration can provide valuable insights and paths to more resilient and productive ecosystems that can help feed and sustain humans. However, I feel that landscapes of the future will not include full historical restorations as posed in *Back from the Collapse*. This is, in part, because historically, grassland ecosystems functioned through wide swings in population sizes with mass die-offs of varied taxa, at levels that human lives and livelihoods will not tolerate. Unfortunately, although biodiversity can be preserved, turning back the clock to 1800 would entail cycles of drought, overgrazing, dust storms, and economic and food sacrifices by humans. I feel that society could tolerate herds of cattle co-occurring with bison, especially with a focus on some management, including food production without widespread animal suffering and die-offs (e.g., due to preventable diseases, mass drownings, etc.).

As an ornithologist, I remain on a virtual fence for bison restoration and cattle ranching models—management of either herbivore can provide the necessary grassland habitats that are required by imperiled endemic grassland wildlife species. I stress that how these herbivores are managed plays a larger role in maintaining prairie vegetation than differences between these species. Given that bison and domestic cattle have shared the open range for about 150 years, it seems reasonable that both species can be used as tools to accomplish restoration. The Nature Conservancy and Nature Conservancy Canada, for example, use one or both herbivore species to effectively manage prairie ecosystems on their lands. Turner Enterprises manages thousands of bison at large scales and produces a sustainable harvest of meat. These types of models can better engage ranching communities without negatively affecting rural economies. It is new thinking that will shape our New West into the “Next West” (Lybecker 2020) of the future, and Freese and the American Prairie have certainly contributed to the melting pot of ideas. Time will tell which ideas take root. I recommend *Back from the Collapse* for those interested in prairie and restoration ecology, but with the acknowledgment that a more holistic approach requires information beyond that provided in this book.

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