

Vulnerability assessment of the multi-sector North American bison management system to climate change

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Climate change may present the next major challenge to bison. North American bison (*Bison bison*) are a native wild species in North America and they have significant cultural and economic importance. Some Native American groups have a cultural attachment to bison and rely on the animals to revive their connections to the prairies. Bison are sometimes privately raised for agricultural production. And non-profit conservation organizations use bison to restore native prairie habitats. The current bison population of North America is approximately 400,000 animals. Currently, 85% of the bison population is privately owned as is 90% of the grasslands on which they rely. This ownership structure creates a serious need for robust private land conservation to maintain the iconic species and its grassland habitats.

We refer to this complex system of ownership and use of both bison and their habitat as the “Bison Management System” (BMS). It is a self-assembled, multi-sector system that comprises bison managers from across the private, public (Federal and state), non-governmental organizations (NGO), and tribal sectors — it is a unique animal management system in the world.

We conducted a vulnerability assessment of the BMS to increasing climate variability to further clarify the challenges that bison conservation and production may face in future climates. We surveyed 132 bison managers from the BMS, who mostly reside in the northern and central mixed-grass prairies of North America and manage bison herds averaging 51-100 animals. Results from the survey revealed that the bison management system is vulnerable to climate change and is susceptible to losing sustainability if the BMS does not prepare adaptation strategies for impending climate changes such as warming, increasing drought and a resulting decline in productivity of grasslands. Particularly, the study showed

that access to grazing leases, varied external income, use of management plans and information exchange are variables that present sustainability stumbling blocks for many bison managers across the private, public and NGO sectors. However, the experiences and shared environmental values and attitudes of bison managers across the bison management system are foundational to enhanced collaboration across sectors. We believe it would be beneficial for the bison management system to form a bison coalition to instigate enhanced coordination of knowledge sharing.



Visitors enjoy grazing bison at Theodore Roosevelt National Park, North Dakota USA. Photo credit: Perry S. Barboza.

Plain language summary from article:
Martin JM, Briske DD, Barboza PS.
Vulnerability assessment of the multi-sector North American bison *Bison bison* management system to climate change.
People Nat. 2021;00:000-000.
<https://doi.org/10.1002/pan3.10209>