

The role of commercial bison production in conservation strategies in Canada

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Abstract: In Canada, numerous actors manage American bison (*Bison bison*) and assist in population restoration after bison near extinction in the late 19th century. The largest number of bison in Canada are managed by commercial bison farms. This research maps commercial bison farms and bison livestock as reported by the 2021 Census of Agriculture in Canada. The dispersion of commercial bison on the landscape depicts their important contribution to species restoration in Canada. Commercial bison producers, wildlife conservationists, and Indigenous communities need to be included to ensure full breadth of species restoration, especially at the landscape level.

Keywords: North American Buffalo, livestock farming, in situ conservation, census mapping

In Canada, multiple actors are involved in bison restoration. There are roughly 2,200 plains bison and 11,000 wood bison as a part of free-roaming and wildlife captive herds in Canada (Clifton-Ross, 2016). Elk Island National Park is considered the genetic storehouse, as they have two herds: pureblood plains bison (*Bison bison bison*) and pureblood wood bison (*Bison bison athabascae*), which are known to be disease free. For these reasons, Elk Island National Park animals are most often the seed herd for other bison reintroduction and restoration efforts in Canada. Other disease-free genetic pools have been identified, such as the Ronald Lake Wood bison Herd, which was identified by First Nation Indigenous communities (Ball *et al.*, 2016). Some Indigenous Nations within Canada have restored bison to their lands; often these animals derive as wildlife transfers from Elk Island National Park, or from commercial bison livestock producers. To date, it is understood that commercial production of bison has increased their numbers by the largest margins through the sectors creation of an ecologically and culturally relevant (niche) meat market in Canada and for exports. Bison meat is included under the Canada-European Union Comprehensive Economic and Trade Agreement.

This short communication outlines the spatial dispersion of commercial bison farms in Canada, according to 2021 Census of Agriculture in Canada (Ag Census) data while discussing commercial bison livestock production's continued role in the bison restoration movement in Canada. The Ag Census is carried out every five years in Canada and collects data on e.g., number of farms per spatial unit, farm size, farm type, animal populations on farm, and operator demographics. The Ag Census is voluntary to complete and is only requested from farms, as defined by an agricultural operation collecting revenues and/or accounting expenditures for tax purposes. Unfortunately, the Ag Census does not keep track of Indigenous participation within the sector at the regional and/or specific farm type level. Furthermore, the Ag Census is not disseminated within the northern territories of Canada, such as the Yukon, Northwest Territories, and Nunavut (most northerly geographical units from west to east). The two formers are home to wild bison herds and most certainly have commercial bison operations. The Yukon Territory invested in bison mobile abattoir outreach materials (Yukon Inc., 2006), which would imply that commercial bison farming is being carried out in the territory.

Nonetheless, according to the 2021 Ag Census data, approximately 0.5% of all farms reported bison as a part of their operation. However, farms reporting bison only account for 0.009% of privately-owned land. The median number of acres reported by Canadian farms with bison was 509 acres/farm. The median bison herd size per farm in Canada is 57 animals. The 2021 Ag Census reports 149,954 bison as livestock within Canada. The animals are dispersed amongst 989 farms.

Fig. 1 depicts the dispersion of bison farms across Canada. The spatial units are "census divisions" which often include one or more municipality within a federal province. The range of bison farms per census division spans from 0 (white) to 75 (black). As is apparent, most bison farms are located in what is often referred to as Western Canada, coinciding with the last remnants of bison historical range prior to extirpation in 1886.

The number of farms is not an ideal indicator to mapping the species itself. Fig. 2 highlights where the most concentrated areas of bison as livestock are located within Canada. Animal numbers within a census division range between 0 to 13,358 animal heads. The largest number of animals is found in the Peace River Region (most left black census division); yet this region only boasts 25 bison farms.

When mapping out the animals as a unit of measurement per census division, it becomes clear that bison does have a presence within Canada, geographically. Although bison may still be considered a niche livestock market, just based on the immense amount (approx. 12 million) of beef cattle within

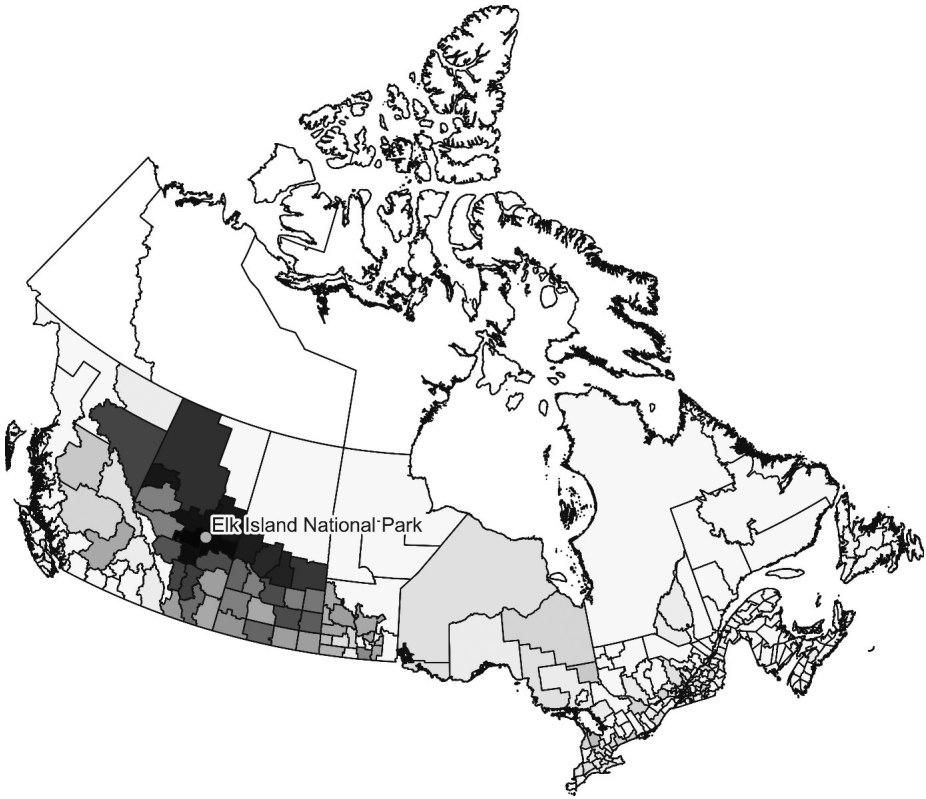


Fig. 1: Spatial distribution and density of bison farms per census division in Canada (greyscale range; white = 0 farms, black = 75 farms)

Canada (2021 Ag Census). Bison’s wide dispersion across Western Canada is an example of how diversifying livestock production and ecologically-based farming (e.g. high nature value farming) can contribute to, and even drive, *in situ* conservation and species restoration.

As exemplified by their wide-spread distribution throughout Western Canada and the large number of livestock animals comparatively to conservation animals, we argue that commercial bison livestock production needs to be acknowledged for its role in contributing to species restoration within bison’s historical range. In addition, the number of bison livestock speaks to the importance of the species and its restoration as a food source. This evidence contradicts Pejchar *et al.* (2021) conclusions that bison are likely to be supported as wildlife and cultural animals, rather than livestock.

Bison production in Canada is largely based on extensive low-input grazing and browsing, with occasional hay supplementation throughout the winter months (Galbraith *et al.*, 2014). The extensive management system related

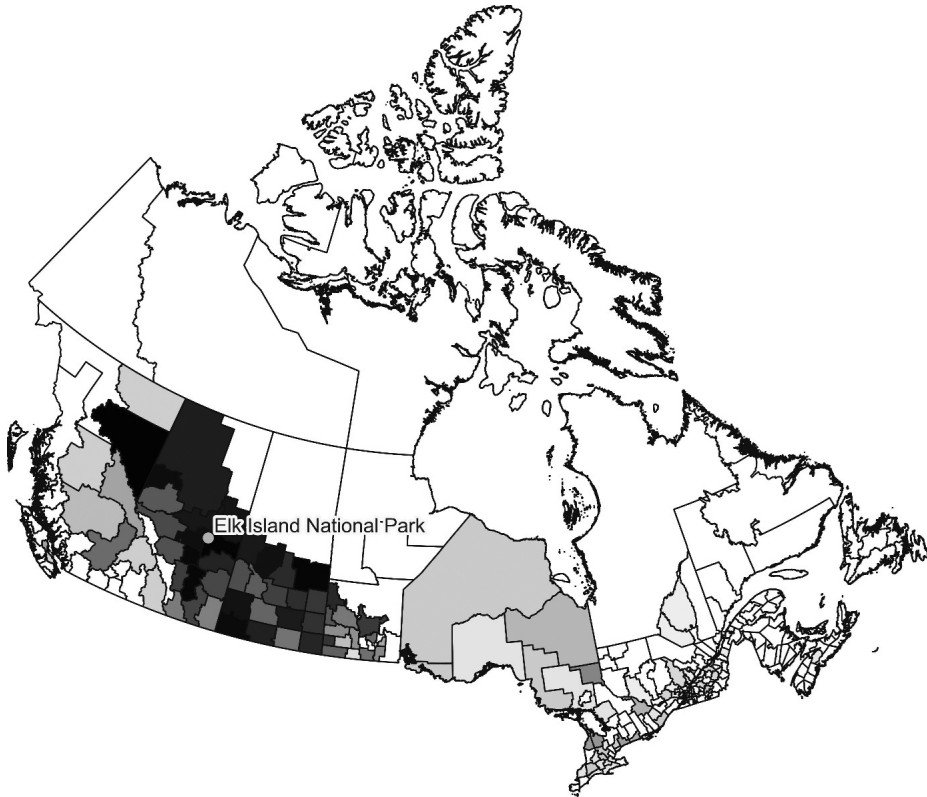


Fig. 2: Spatial distribution and density of bison (animal livestock head per census division) in Canada (greyscale range; white = 0 animals, black > 10,000 animals)

to bison farming provides benefits for plant and animal biodiversity (Tielkes & Altmann, 2021) while maintaining resilient drought-tolerant ecosystems (Ratajczak *et al.*, 2022) and sequestering carbon (Teague *et al.*, 2016). Commercial bison farming in Canada would be comparable from a natural ecosystem maintenance standpoint to wildlife captive herds within wildlife and national parks. Shamon *et al.* (2022) support bison reintroduction founded on ecological restoration for climate change resilience and socio-economic opportunities, especially within Indigenous communities and on their lands.

Although our data is not able to identify the number of Indigenous bison farms, and those on Indigenous managed lands, we do acknowledge that a number of such bison farms exist, and this number is increasing, providing economic opportunity and local culturally-appropriate food production for Indigenous communities. At the same time, we acknowledge that the current legislative and regulatory system in Canada does not allow for Indigenous

communities to fully make decisions regarding bison restoration and bison as a food source in Canada.

To further bison restoration in North America, wildlife conservationists, Indigenous communities, and commercial bison livestock producers will all need to work together (Martin *et al.*, 2021). The Buffalo Treaty (Buffalo Treaty, 2014) is a grassroots movement bringing all actors, but specifically sovereign nations, together to restore bison in North America. Although only sovereign nations may sign the Buffalo Treaty outlining bison agency and a shared vision of bison expansively returning to their homelands to contribute to climate change adaptation and mitigation, circular economies, and ecological restoration; industry associations and research institutions and wildlife conservation organizations have all signed on as supporting signatories. Contributing vast animal numbers throughout Canada, commercial bison farming has an important role to play in wholistically restoring bison as an ecological and cultural keystone species, while assisting in providing wholesome food for North Americans.

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Rola komercyjnego wykorzystania w strategiach ochrony bizona w Kanadzie

Streszczenie: W Kanadzie wiele osób i instytucji jest zaangażowanych w hodowlę i ochronę bizona (*Bison bison*) i pomagają w odbudowie populacji gatunku będącego mocno zagrożonego wyginięciem pod koniec XIX wieku. Największą liczbę bizonów w Kanadzie mają komercyjne farmy. Celem pracy była analiza komercyjnej hodowli i produkcji bizonów na podstawie wyników spisu rolnego przeprowadzonego w 2021 roku w Kanadzie. Rozprzestrzenienie ferm zajmujących się hodowlą bizona dowodzi, jak ważny jest wkład w odbudowę gatunku w Kanadzie. Komercyjni producenci, działacze na rzecz ochrony przyrody i rdzenne społeczności muszą połączyć swoje działania, aby zapewnić pełny zakres odtwarzania gatunku, zwłaszcza na poziomie regionalnym.
