

The Biodiversity Benefits from Extensive Livestock Production

Event

Livestock producers manage diverse grasslands providing habitats for wildlife and plant species. Improvements to grassland surface area, productive capacity and management significantly improve food security and economic and environmental outcomes. The [Food and Agriculture Organization](#) defines a sustainable food production system as “one where food is nutritious and accessible for everyone and one where natural resources are managed in a way that maintains ecosystem functions to support current as well as future human needs”. Biodiversity within the Canadian prairies benefits from the current state of extensive livestock production and could be advanced through expansion of these lands onto a greater area of marginal land while concomitantly improving management practices.

Significance

The protection of biological diversity across Canada’s vast landmass is a policy priority. At the United Nations 15th Biodiversity Conference held in Montreal in 2022, Canada agreed to protect 30% of its lands and oceans by 2030. The production of livestock is [heavily criticized](#) as a biodiversity threat, even though grasslands represent 5% of Canada’s land base. Conservation, biodiversity and productivity are [unequivocally interrelated](#) in grassland ecosystems and it is rare one metric can be improved without precluding or subsequent increases in others.

Analysis

Livestock production land differs significantly from grain and oilseed land. For economic and logistical performance, livestock producers utilize native rangeland and improved perennial land alongside annual cropping systems. In improved forage systems, legumes and grasses are often grown within the same field, developing symbiotic relationships that [increase yield and carbon sequestration](#) while [providing ecosystem services](#) and a biodiverse rich habitat. Timely reseeded of forages in improved systems ensures [economic and environmental benefits are maximized](#). In combination, timely rejuvenation, reclamantion of marginal farmland to perennial forages and grassland conservation may [meaningfully improve biodiversity prospects](#).

Within extensive systems, grazing provides animals with nutrients while supporting the maintenance and health of natural grasses and plants and [limiting the encroachment](#) of invasive species. Proper grazing is one method of ensuring invasive species that pose significant threats to grassland biodiversity are contained. Moderate grazing ensures plant height is [conducive to the nesting](#) of grassland birds that regulate pest populations. Through habitat provision, numerous herbivorous mammals are supported by the maintenance of grasslands, including deer, moose and elk. Grasslands provide habitats for pollinating species with positive externalities for neighboring crops. Proper management is vital to ensure positive impacts on biodiversity. Studies have found that low to moderate grazing retaining [55%](#) of forage matter positively impacted grassland biodiversity to the greatest degree.

Below the surface, perennial rangeland soil hosts a thriving ecosystem of living organisms. The expansive rooting system of native grasslands can extend up to 2 metres into the soil, largely impacting [diversity and ecology in the rhizosphere](#). Mite abundance is one metric of significant importance to soil biodiversity and health, as [mites facilitate nutrient cycling while activating bacteria and fungi](#). Mite density can exceed [120,000 per metre squared in grasslands](#) and may extend [1.5 metres](#) deep into the soil profile, highlighting the vast and complex ecosystem operating beneath grassland ecologies. Manure from grazing animals serves as the primary [habitat for numerous beneficial mite species](#), supporting the importance of extensive livestock production in maintaining biodiversity. Despite their importance to biodiversity and the healthy function of grassland ecosystems, research on mites within the context of Canadian grasslands is [largely underexplored](#).

Conclusion

The importance of a sustainable agricultural industry is growing rapidly, with biodiversity serving as an important component of the overarching sustainability discussion. The ability of livestock operations to maintain and promote biodiversity are often overlooked. However, the importance of improved forage lands, natural rangelands and grazing livestock in the preservation and advancement of biological diversity must be considered in all sustainability discussions. Biodiversity, carbon sequestration, productivity and economic welfare are indisputably related in the context of grasslands and the bolstering of any one of these metrics is likely to spillover to the others, creating greater environmental and economic sustainability in the agricultural sector. Considering the contributions of livestock production, alongside the potential for further improvements needs to be an important component of Canadian biodiversity policy as it relates to agriculture and the environment.