

ZOOLOGY

The Ecological Buffalo: on the Trail of a Keystone Species

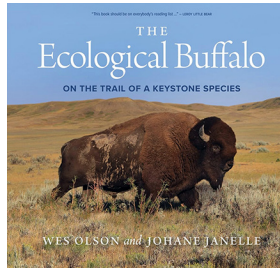
By Wes Olson. Photography by Johane Janelle. 2022. University of Regina Press. 304 pages, 39.95 CAD, Paper.

I thought I knew quite a lot about Bison (*Bison bison*, but referred to as buffalo in this book) until I attended a public lecture that Olson gave in 2022 in Banff, Alberta (see note at the end of this review for a link to the online recording). He painted a wonderful picture of the intricate web of relationships in the native grasslands of North America, making connections that I would have never considered—seriously, who else could draw a line from buffalo eating grass to a dung beetle (*Stenothorax badipes*) that only lives in Northern Flying Squirrel (*Glaucomys sabrinus*) poop? (In the aspen parkland, Bison dung supports ants that are eaten by Northern Flickers [*Colaptes auratus*], which excavate nest cavities that the flying squirrels use. The squirrels use separate cavities for rearing young, socializing, escaping from predators, and for their toilet business ... where the specialized dung beetle lives. See note at the end of this review for more.) If you buy one book about buffalo, make it this one.

This is a large coffee-table book full of more than 180 wonderful photos (taken by Olson's wife, Johane Janelle) that range from double-page spreads to small portraits of the many other species that share a habitat with buffalo. There is even a close-up photo of a buffalo defecating! After all, fresh dung attracts at least six different guilds of arthropods (p. 84). Many detailed pen-and-ink sketches by Olson illustrate ecological concepts that it would be difficult to photograph, such as the extensive underground burrows of Northern Pocket Gophers (*Thomomys talpoides*).

The text is accessible and written in clear prose, but Olson does not shy away from using technical terms—such as “inquilines”, which are “species that use dwellings built or used by another species” (p. 149). These terms are often explained in sidebars and can also be found in a five-page Glossary. There are 14 chapters—ranging from eight to 28 pages long—with more photos than text throughout the book. The chapters often include interesting and useful sidebars with photos, historical quotes, or additional information. Many of the captions are lengthy and full of information, which makes this book ideal for casual browsing.

Olson begins the book by describing the slaughter of millions of buffalo in the 18th and 19th centuries,



making the case that this was not only disastrous for Indigenous peoples but also for grassland ecosystems. The maps showing the historical range of buffalo and native grasslands could have benefitted from including current provincial, territorial, and state lines. The first map might have been more poignant if it showed isoclines of extinction dates (a few terminal dates are given in its caption).

Olson then goes on to explain why buffalo are considered a keystone species and their vital connection to native grasslands. Here I learned some new terms: “zoochory”, which is seed dispersal by animals; “endozoochory” is dispersal by internal transport (i.e., eating the seeds and defecating them in a different area); and “epizoochory” refers to external transport, such as seeds caught in a buffalo’s hair (pp. 49–50). Buffalo hooves also scarify the prairie, assisting in the germination of seeds. Olson explains the concept of a “grazing lawn”, where intensive buffalo grazing creates an island of short grass in a sea of taller grasses, providing a diversity of habitats for other species to use (p. 42).

The next six chapters discuss the relationships between buffalo and many other taxa—insects, birds, small mammals, amphibians, reptiles, and ungulates—as well as predators. One example is the commensalist relationship between buffalo and Brown-headed Cowbirds (*Molothrus ater*). Historically, cowbirds consumed insects stirred up by buffalo hooves, becoming so dependent on following the moving herds that they could not take time to tend a nest: thus, they parasitized other birds’ nests, laying their eggs in them and moving on. In the last century, cowbirds have expanded their range, now feeding alongside domestic cattle. As another example of these relationships, buffalo wallows form ephemeral wetlands in the spring and are used by amphibians and insects to lay their eggs. I enjoyed Olson’s reference to “read[ing] the signatures of other species as they stopped to sign the prairie guest book on the dusty pages of a wallow” (p. 1).

Olson also devotes a chapter to efforts to return buffalo to their ancestral lands. For decades he was involved in work moving Plains Bison (*Bison bison bison*) across the Great Plains and Wood Bison (*Bison bison athabasca*) to Alaska and Siberia. There are many cultural underpinnings to the story of buffalo, and there is a short Afterword by Dr. Leroy Little Bear. However, this book is the ecological story of buffalo, not their cultural story. Their cultural story is best told by Indigenous peoples themselves in other books.

For readers who want more information there are appendices for the *Buffalo Treaty* (signed in 2014), a list of species discussed in the book, and a list of native terrestrial mammals that share habitat with buffalo. Besides the aforementioned Glossary, there are also 16 pages of Notes organized by chapter, and a 14-page Bibliography.

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Notes from Book Reviewer:

The public talk by Wes Olson in 2022 is available

online at: <https://bowvalleynaturalists.org/public-programs/the-ecological-buffalo-on-the-trail-of-a-key-stone-species/>.

For a deep dive into insects that live in cattle dung (which has replaced buffalo dung ecologically on most of the prairies), see:

Floate, K. 2023. Cow patty critters: an introduction to the ecology, biology and identification of insects in cattle dung on Canadian pastures. Agriculture and Agri-food Canada, Lethbridge, Alberta, Canada. Accessed 23 October 2024. https://publications.gc.ca/collections/collection_2023/aac-aafc/A59-90-2022-eng.pdf.

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