

# ARTHROPODS OF CANADIAN GRASSLANDS VOL. 5: BEETLE DIVERSITY OF A CANADIAN PRAIRIE HOMESTEAD

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In late 2022, my partner Annie and I had the opportunity to visit the home of entomologist David Larson and his wife Margaret in the Cypress Hills south of Maple Creek. In addition to a belly full of pancakes, I left the property with a deep respect for Larson's seemingly boundless knowledge of the wildlife, history and hydrology of his quarter section of land. Specifically, I remember my amazement that he had identified more than a thousand species of beetles on his property since he and Margaret retired there in the late 1990s.

As of the publication of Larson's *Arthropods of Canadian Grasslands Vol. 5: Beetle Diversity of a Canadian Prairie Homestead*, that number is in fact 1,178 species in 65 families, representing 42 per

cent of all known Saskatchewan beetle species and 79 per cent of families. This staggering array of species is found on an area that Larson calculated as 0.000001 per cent of the total area of the province.

Beetles are Larson's area of expertise, and they take centre stage in this e-book, published by the Biological Survey of Canada. However, they are couched within a sweeping natural history of the property that also includes a unique recommendation for conservation policy. I have no expertise whatsoever when it comes to entomology, so my review of this book should be taken in terms of interest for the casual reader.

Beetles, like all creatures, will require certain habitat and nutrient conditions to survive and reproduce, and the family/species descriptions in the book describe the ways in which the Larson Ranch provides the "stuff" needed to support them. Given the property's

location, some types of beetles (such as forest species) are underrepresented, whereas others such as grassland species are overrepresented compared to the province as a whole.

Many species of beetles are rarely seen, even when sought out. Thankfully, Larson has catalogued the beetle diversity of his property with many images that illustrate the various shapes, sizes and colours of different species and families. These range from Carabidae — largely, but not exclusively, the well-known "black and living under a rock" family — to the typically more brightly coloured blister beetles, which can be found on flowers. Some beetles are so rare or hard to find that they have been found on Larson Ranch and nowhere else in Saskatchewan — one, *Oligota inflata* has not been found anywhere else in North America.

Though the book primarily focuses on beetles, the other flora and fauna that inhabit Larson Ranch are also described. This ranges from flowers such as prairie crocuses, to other insects such as ants, to mammals such as coyotes, white-tailed deer and beavers, whose lodges are required for certain beetle species to exist. In one memorable description, the near-mythical cougar's presence is known mostly from tracks and the occasional porcupine hide dragged back to the yard by the Larsons' dogs.

Despite this variety of wildlife, Larson contends that his land may not be a true biodiversity hotspot, as no other similar property has been so extensively studied. The Cypress Uplands is marked by significant elevation changes, meaning a relatively small area can be hospitable to a variety of creatures who prefer different elevations. Biodiversity on the Larson Ranch site has also increased because of human activity.

On that note — one may be tempted to say that Larson has left no stone unturned in his more than two decades surveying his property, but that is not



On the open prairie you can see everything. So where are the beetles? All photos courtesy of David Larson.



The prairie has experienced many changes. What is the next threat on the horizon?



Brightly coloured leaf beetles (Chrysomelidae) occur on a variety of plants.

quite true. Teepee rings on the property remain intact and offer a lasting reminder of the long history of human activity on the site. The property has been occupied by European settlers for roughly 150 years, and while the majority has remained native grass used as pasture, the homestead has resulted in some changes to the area that have affected local biodiversity.

The introduction of industrial agriculture dramatically changed the great plains, and the vast majority of native prairie has been lost. Southwest Saskatchewan has experienced an unprecedented 12 consecutive years of drought, which is taking a toll as well. Invasive species, including insects such as the rose stem girdler, which has stunted the wild rose bushes, and the emerald ash-borer which threatens to destroy the ash population are also a pressing concern.

Larson challenges the popular notion that the rancher is the best steward of the land, which has been a consistent justification of the Government of Saskatchewan's policy of privatizing native prairie and grazing lands. Ultimately, the primary relationship between the rancher and the land is economic, and the land is being preserved for the benefit of the livestock without specific regard for biodiversity. This may chafe some, but Larson is not speaking as an outside observer — he manages a herd of Galloway cattle and understands the potential negative impacts that livestock can have on the land. For example, soil disturbance and pollution by manure from cattle reduce

biodiversity along the banks of ponds and springs, and Larson points to Switzerland, where these natural waterbodies are often fenced off, with clean water piped to livestock for drinking.

In spite of daunting and mounting challenges, Larson believes that the diversity of flora on his land is mostly unchanged from the time of the buffalo, and that the area as a whole continues to support biodiversity well in spite of human impacts. It turns out that surprisingly little is required to allow nature to flourish.

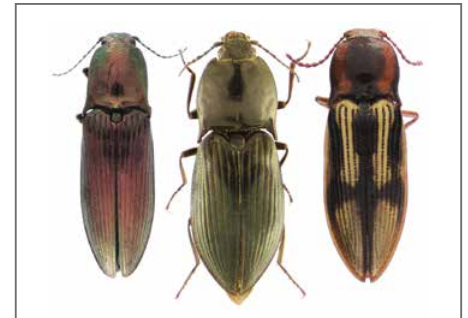
The Government of Canada has set a target of preserving 25 per cent of wild spaces in the country, but Larson points out that it will do little to preserve biodiversity if the protected lands are in vast arctic national parks rather than in the more populated and biodiverse south. Instead, he presents an argument for what he calls an Environmental Reconciliation Levy, which would require landowners to dedicate 5 to 10 per cent of their land to nature, effectively creating a distributed network of nature preserves that would increase the resilience of biodiversity to local catastrophes.

Nearly all observations and images in *Beetle Diversity of a Canadian Prairie Homestead* were taken at Larson Ranch, and the limited nature of the book is also its strength. His documentation of the persistence of so many species, beetle and otherwise, on his land is a strong example of the resilience of nature, and the fact biodiversity can even benefit from well-managed human activity.

This book will no doubt be of interest to biologists and other specialists, but as



Some of the leaf beetle (Chrysomelidae) species that occur on roses.



Adult click beetles (Elateridae). The larvae of a few species are pests on the roots of some crops.



Individual variation in colour patterns of the two-spot lady beetle.

a non-specialist myself I can recommend it as a strong if not comprehensive guide to beetle species in Saskatchewan and a fine example of natural history and conservation advocacy for the general audience.

The e-book can be viewed in PDF form through the monographs page of the Biological Survey of Canada website, or at [https://www.researchgate.net/publication/382705561\\_Arthropods\\_of\\_Canadian\\_Grasslands\\_vol\\_5\\_Beetle\\_Diversity\\_of\\_a\\_Canadian\\_Prairie\\_Homestead](https://www.researchgate.net/publication/382705561_Arthropods_of_Canadian_Grasslands_vol_5_Beetle_Diversity_of_a_Canadian_Prairie_Homestead). 🐦

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