Arthropods of Canadian Grasslands Online
http://www.biology.ualberta.ca/bsc/english/grasslandarticles.htm

Biological Survey of Canada (Terrestrial Arthropods)

Entomological opportunities in Grasslands National Park – an invitation

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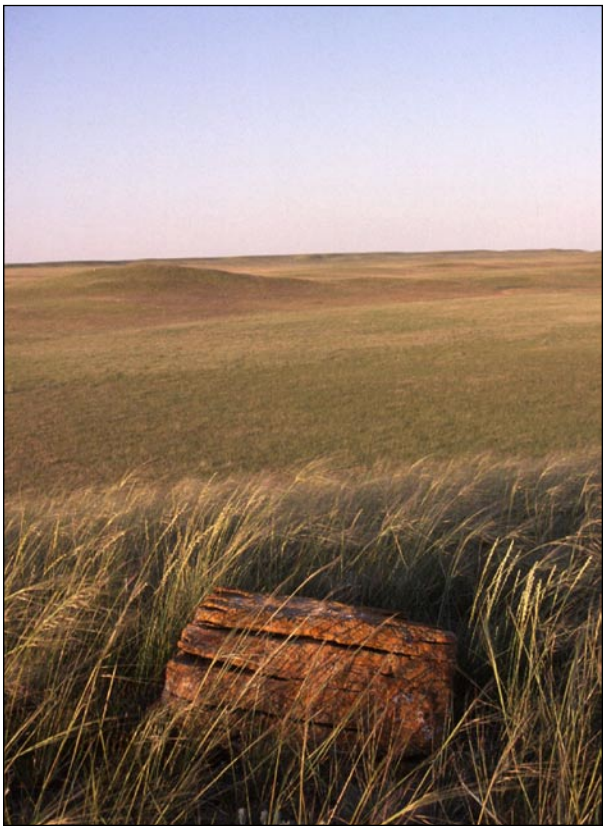
Beginning in summer 2006, two large-scale management experiments will begin in Grasslands National Park, both of which require long-term monitoring of many biological and environmental indicators. The carefully planned experiments are designed to support future park management, and provide data suitable for scientific publication. While the Park selected a few key indicators for staff to monitor, there were a number of other indicators for which funds and time were simply not available. Not wanting to waste an opportunity for public participation and a chance to gain valuable information, Grasslands National Park is inviting professional and amateur entomologists to get involved in monitoring arthropods under several grazing and fire treatments planned for both the West and East Blocks of the Park (see map below; for an overview of the Park go to http://www.pc.gc.ca/pn-np/sk/grasslands/index_e.asp).

A rare blue form of the red-legged grasshopper, *Melanoplus femurrubrum*, found in Grasslands National Park. (photo by D.L. Johnson)



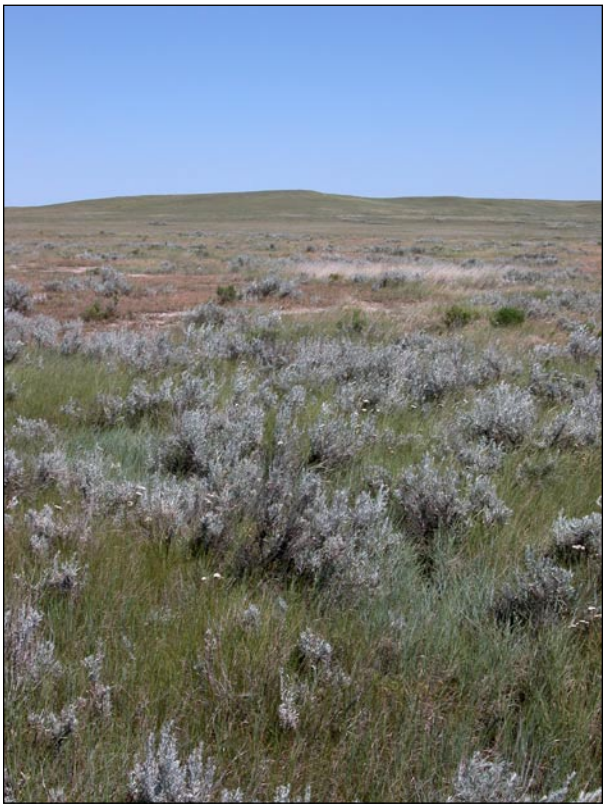
Upland grasslands dominated by needle and thread (*Stipa comata*), blue grama (*Bouteloua gracilis*), and wheatgrass (*Agropyron* spp.) blanket rolling hills of bouldery glacial moraine.

In the West Block, a combination of prescribed fire with short-duration, high-intensity livestock grazing will be implemented on native mixed prairie and exotic crested wheatgrass vegetation between 2006 and 2007. The Park is primarily interested in the seed production response, because past experience indicates thrips (Thysanoptera) and possibly other insects damage much native seed in the ungrazed and unburned parts of the Park. Currently, the Park wants to know how grazing, fire and the combination of both affects seed production and seed damage by insects. Although Grasslands National Park has

internal expertise in plant ecology, this experiment is in particular need of an entomological research partner. The experimental site is located just a few miles south of the community of Val Marie, SK and can be accessed by all-weather roads – a pleasing advantage for those familiar with the area! In practical terms, the information generated here is of value to the seed collection and restoration program at Grasslands National Park, and also to the native seed production industry as a whole.

In the East Block, a gradient of grazing intensity treatments will be implemented on a large scale (12 experimental units, each 300 ha in size), in a before–after, control–impact design. Many indicators of ecosystem composition, structure and function will be monitored for two years before treatments are introduced (2006 and 2007), and for ten years after treatments have been implemented (2008 to 2017). Each experimental unit includes more than 1 km of lotic habitat with riparian shrublands, nearly 100 ha of valley floodplains of mixed grass and sagebrush (*Artemisia cana*), and about 200 ha of rolling upland grasslands. Arthropod variables to be sampled using EMAN-SAGE protocols include grasshopper (Orthoptera: Acrididae) and carabid beetle (Coleoptera: Carabidae) species richness and abundance. The density of mounds created by ants (Hymenoptera: Formicidae) will also be recorded in 20 x 50 m vegetation plots. These were the only invertebrate variables that could be annually sampled, sorted and enumerated given all other indicators to be measured. More than $200 K is being invested in experimental infrastructure, and $100 K annually will be spent operating grazing treatments and the monitoring program in this remote area of the Park.

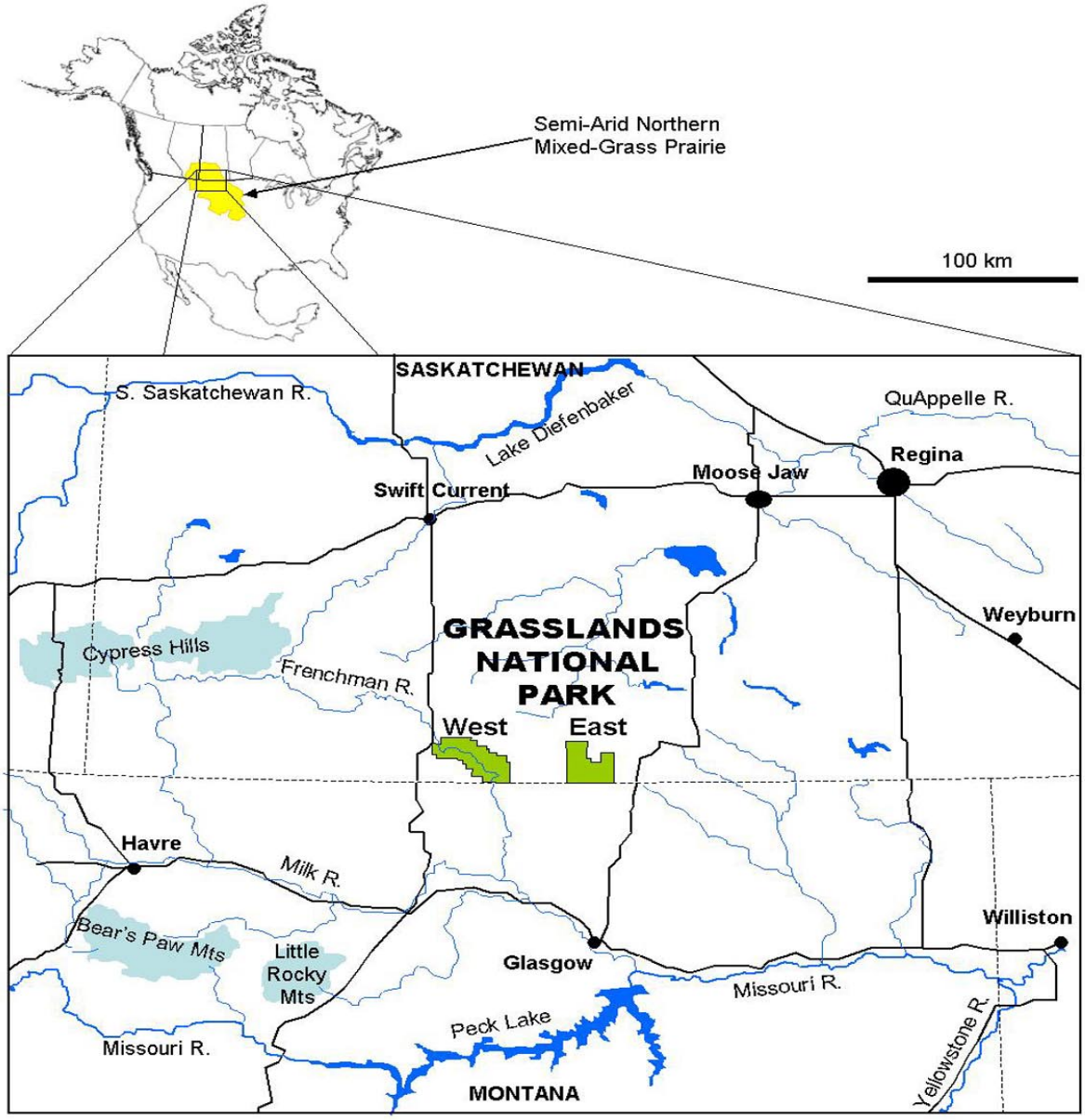
A considerable by-catch, or "residue", of arthropods is expected in both pitfall traps and sweep nets, and there are no plans for keeping, nor space to store, this material. Disposal of this by-catch would be a tremendous lost investment in sampling effort, and lost opportunity to document arthropod biodiversity and responses to controlled



Broad valley bottoms support a mixture of salt-tolerant prairie grasses and shrubs like silver sagebrush (*Artemisia cana*), greasewood (*Sarcobatus vermiculatus*), and salt bushes (*Atriplex* spp.).

experimental treatments; in particular, large numbers of leafhoppers (Homoptera: Cicadellidae), ants, and spiders. The only way to avoid this loss is for some entomologists to take-on the storage, sorting, enumeration and reporting. Parks Canada is making a substantial investment in the experimental infrastructure and monitoring program that can leverage additional grants to carry-out this work in support of multiple graduate student theses, journal articles and other publications.

If sorting someone else's by-catch is not your fancy, additional sampling efforts could be made to easily monitor Odonates in riparian zones, or dung beetles (Coleoptera: Scarabaeidae) and Lepidopterans throughout each grazing treatment. Perhaps even a "BioBlitz" event could be conducted in the experimental area in 2006 or



Grasslands National Park is separated into a West and East Block along the Montana border in Saskatchewan. The Park office is located in the village of Val Marie, approximately 110 km directly south of Swift Current.

2007 to document the 'before' conditions, and several years later to document the 'after' conditions. Events like these could contribute directly to the documentation of biodiversity and the measurement of effects of experimental treatments. Grasslands National Park staff would be excited to help develop these projects or host these events, and all it takes is for some qualified and committed people to step forward.

If you or your organization are interested in participating in any of the above projects, please contact Mr. Robert Sissons - Conservation Biologist; Grasslands National Park; POB 150 Val Marie, SK; S0N 2T0; phone 306-298-2166; email Robert.Sissons@pc.gc.ca.

Aquatic habitat in Grasslands National Park is limited to semi-permanent, meandering streams with little shrub cover. Streams do support populations of turtles, frogs, fish, and innumerable aquatic invertebrates.

Photographs (except where noted) and map by D. Henderson