KANSAS STATE UNIVERSITY

Division of Biology Presents:

Keystone Bison and Keystone Beetles: What Happened to Dung Beetles After the Near Extinction of America's Native Bison?

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Drivers of global change include the extinction of keystone species resulting in cascading effects on nutrient cycling and changes in the physical environment. In the Great Plains, the herbivore community has been restructured due to European settlement, extirpation of native bison, and replacement with European cattle. Before extirpation, dung beetles depended on bison and efficiently recycled the high volumes of dung that great herds of bison produced. What happened to dung beetle communities when bison were extirpated and replaced with cattle? Did the dung beetle communities go extinct due to lack of suitable food resources (bison dung), or did they avoid extinction by transitioning to a new food resource, cattle dung? We examined dung beetle communities on bison-grazed, cattle-grazed, and ungrazed pastures in the Kansas Flint Hills using baited pitfall traps. We show that bison-grazed and cattle-grazed pastures support different dung beetle communities. The community associated with bison dung in bison-grazed pastures (entirely associated with bison) is greatly constrained, whereas the community associated with cattle dung in cattle-grazed pastures (entirely associated with cattle) is much broader. Additionally, bison and cattle share a narrow subset of the beetle community. Because this community is quite constrained, our results indicate a loss of dung beetles associated with bison. Our results may also indicate that, following extirpation of native bison, dung beetle communities were forced to switch hosts in order to persist, a pattern that has been observed in other insect-host relationships such as the extinct American Chestnut tree and its former insect herbivores.

If you would like to visit with Dr. Mary Liz Jameson, please contact Dr. Ellen Welti at elwelti@ksu.edu.

Coffee & snacks served preceding the seminar in Ackert Hall, Room 225