Alberta Conservation Association
2013/14 Project Summary Report

Project Name: Wildlife Habitat Initiative in Low Disturbance Zones – Habitat Resources and Movement Corridors in Southwest Alberta

Wildlife Program Manager: Doug Manzer

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Partnerships

Alberta Environment and Sustainable Resource Development
Anatum Ecological Consulting
Devon Canada Corporation
Parks Canada

Key Findings

- We captured nearly 4,700 images of bighorn sheep and 1,400 images of mountain goat using camera traps at four mineral lick sites to assess seasonal variation in use.
- Concentrations of calcium, iron, magnesium and sodium were greater at lick sites compared to reference sites.
- Iron was the most abundant mineral among soil elements at mineral licks, followed by calcium and then magnesium.

Introduction

An important step in conserving wild places and species is to identify their location and relative value. This is particularly important in low disturbed areas where human disturbance will erode these values, perhaps never to be recovered. In 2013/14, we monitored a subset of alpine mineral licks to determine seasonal variation in their use by bighorn sheep and mountain goat. We also collected soil samples from 18 mineral lick sites in summer 2013 to determine the chemical composition of soils. This information, once analyzed will be incorporated into our suggestions for buffer distances and timing restrictions for industrial disturbances near mineral licks.

Methods

In 2013/14, we set up trail cameras at four alpine mineral licks. We processed images manually to incorporate these into a database, and we summarized statistics on species assemblage, abundance, gender, age class (if possible), time of day and time of year.

We determined the chemical composition of soils at mineral lick sites by collecting soil samples and analyzing these for specific elements; 12 elements (including calcium, cobalt, copper, iron, potassium, magnesium, manganese, molybdenum, nitrogen, sodium, phosphorus and zinc) are considered to be attractants to wildlife at mineral licks (Jones and Hanson 1985 in Dormaar and Walker 1996). Multiple samples from each mineral lick site were collected and combined to form one composite sample. Reference sample sites were generally located more than 10 m away from the lick site. At forested sites, the area of each lick was simply defined by the edges of exposed soil. Alpine licks extended above the tree line where the sampling zone was defined by the area of highest use within an open, exposed area. We sampled from different microsites within the same lick where there were obvious signs of soil ingestion by wildlife (i.e., evidence of biting and licking, high density of wildlife prints, sizable impressions in the soil).

Results

We collected soil samples from 18 mineral lick sites. After outliers were removed, we found that mean concentrations of calcium, iron, sodium and magnesium were greater than at reference sites (Figure 1). Concentrations of the other eight elements tested were not significantly different between the lick and reference sites. Iron was the most abundant mineral among soil elements at mineral licks, followed by calcium and then magnesium.

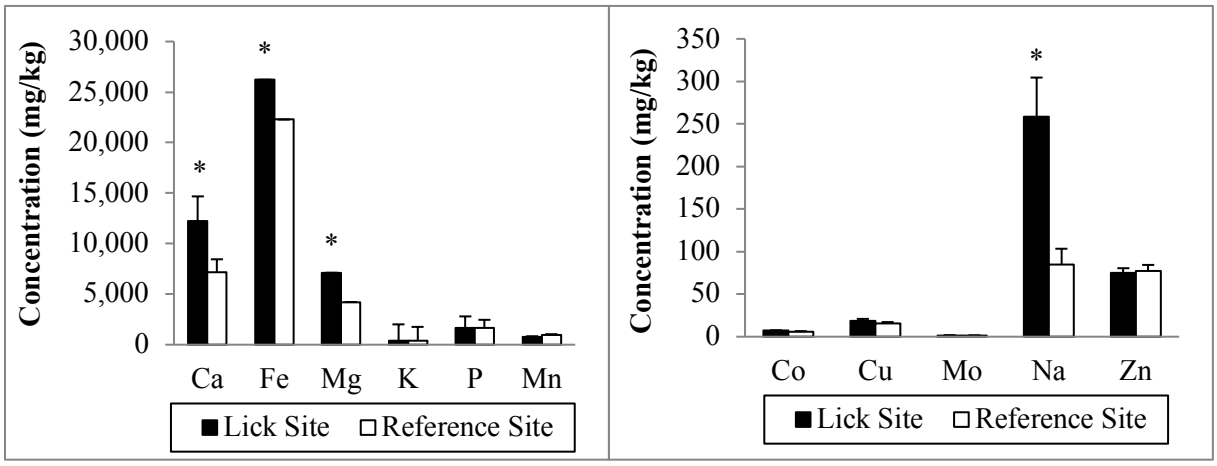

Figure 1. Mean concentrations (and standard errors) of elements in soil samples taken from 18 mineral licks and 18 reference sites in southwest Alberta, 2013. Asterisk (*) indicates significant difference.

Conclusions

Ungulates using mineral licks between 2011 and 2013 included mule deer, white-tailed deer, elk, moose, mountain goat and bighorn sheep. We also captured images of several carnivores, including black bear, grizzly bear, cougar, wolf, coyote, fox and wolverine. The development of a mineral lick inventory and results from the seasonal variation of use will be tremendously valuable for land-use planning in Alberta. We view this work as a first step in a process of identifying key habitat features in low disturbance zones and working to conserve these wild places and the wild species that occupy them.

In 2014/15, we will incorporate results from the chemical composition of mineral lick soils and the additional images of bighorn sheep and mountain goats into a report series. This series will summarize our work to date on the seasonal variation in use of species using mineral licks. Additionally, we will provide suggestions, such as buffer distances and timing restrictions for industrial disturbances, by completing a report on the ecological importance of mineral licks and considerations for land-use planning.

Communications

- Delivered presentation "Monitoring Mineral Licks in Southwest Alberta" as part of the Beauvais Lake Provincial Park Speakers Series.
- Participated in mineral lick working group discussions (Alberta Conservation Association, Alberta Environment and Sustainable Resource Development, and Anatum Ecological Consulting).

Literature Cited

Dormaar, J.F., and B.D. Walker. 1996. Elemental content of animal licks along the eastern slopes of the Rocky Mountains in southern Alberta, Canada. Canadian Journal of Soil Science 76: 509–512.

Photo Captions

Alberta Conservation Association staff member Mike Jokinen extracts a soil sample from a mineral lick located on an exposed slope in the alpine. Photo: Alberta Conservation Association [filename: Photo1_WHILDZ Hab_2013-14_ACA.jpg]

This old goat doesn’t mind getting dirty as it buries its nose into the mud, consuming substrate at a high-altitude mineral lick. Photo: Mike Verhage
[filename: Photo2_WHILDZ Hab_2013-14_Mike Verhage.jpg]

Throughout the season, a group of bighorn sheep carved a small opening into the side of a mineral lick by digging, licking and chewing the soil. This ram nearly sticks its entire head into the cavity; presumably it's going straight to the source of the highest concentration of minerals. Photo: Mike Verhage
[filename: Photo3_WHILDZ Hab_2013-14_Mike Verhage.jpg]