

Working with citizen scientists in brown bear studies in Canada's Rocky Mountain National Parks

Sarah Elmeligi, PhD, Central Queensland University, Alberta Parks

Ian Convery, Prof, University of Cumbria

Owen Nevin, Prof, Central Queensland University

Research Goal

To integrate biological and social data to define management tactics that maximize brown bear (*Ursus arctos*) habitat security and meet trail user expectations of bear management in Canada's Rocky Mountain National Parks.

Research objectives

Biological: To quantify brown bear diurnal and seasonal habitat use in relation to trails of varying levels of human use.

Social: To determine trail user support for management options pertaining to brown bears in the vicinity of trails.



Research methods

Grizzly bear habitat use: GPS collars on 27 grizzly bears from 2012 to 2015.

Grizzly bear and human trail use: 423 remote camera sites on 82 randomly selected trail networks from fall 2013 to summer 2015.

Trail user expectations: 697 user surveys assessing support for management options disseminated at trailheads from fall 2013 to summer 2014.

Citizen Science Goal

To increase local knowledge and awareness of grizzly bear habitat use and research efforts by engaging local community members and park users.

Volunteer methods

Recruitment: Conducted in partnership with local hiking clubs, non-profit organizations, Parks Canada citizen science program, and through the research blog.

Training: Executed through an annual one-day workshop that described project objectives, safety protocols, and detailed methods. Training included hands-on activities with remote cameras and trail user surveys to provide volunteers with an opportunity to practice prior to going into the field.

Communication and feedback: Important information and field work successes/challenges was detailed in a weekly email. Overall project success and implications were provided through regular posts on the research blog. All volunteers were asked to complete an online survey pertaining to their experience annually.

Volunteer results

A total of 97 citizen scientists participated in this project; 23 volunteered for 2 or more years.

Data Source	Method of citizen science engagement	Volunteer contribution
Remote cameras	Set-up and take down on day use and back-country trails	506 full days
	Data entry of generated images	Estimated 215 work days
Trail user survey	Dissemination of surveys at trailheads	190 full days
	Data entry and checking	7 work days

Research results

Grizzly bear habitat use: Brown bears consistently selected for high quality habitat; most bears selected habitat close to roads and low use trails. Brown bears were more likely to be detected on trails during the spring; human use level was not a predictor of whether or not bears were detected on trails. Brown bear movement rates were higher during the day, but lower when bears were near high human use trails.

Trail user support for management options: Trail users were supportive of restrictive management options, particularly if a female bear with cubs was in the area. The most supported management options were to close the trail or to put a warning sign at the trailhead. The least supported management options were to apply aversive conditioning or relocate the bear.



Conclusion

Working with volunteers greatly increased the amount and diversity of data collected for this interdisciplinary research project. An increased investment of time was required by the research team to continually communicate with and train volunteers. The benefits of these efforts far outweighed any costs. Most volunteers expressed interest in participating in similar future research projects, thus demonstrating a growing commitment and awareness amongst local community members regarding brown bear research efforts.