

RESEARCH BRIEF

Unravelling the impacts of disturbance type and regeneration on movement of threatened species

The research outlined in this brief is not affiliated with the ARCKP and the content below provides a high-level summary of some of the key findings and discussion points. For full details, please view the full publication.

Summary

This study was a concurrent assessment of grizzly bear and woodland caribou response to anthropogenic disturbance in Alberta. The aim was to inform more efficient and cost-effective habitat recovery for two threatened species that may require different management tactics. Researchers examined how the presence, type and regeneration of disturbance influenced the daily movement patterns of both grizzly bears and woodland caribou. Researchers also assessed the seasonal impact on each species' movement response to disturbance. Findings from this project highlight the importance of limiting disturbance density in caribou range and linear features in grizzly bear range.

Key findings and implications to management

As expected, caribou generally avoided all disturbed areas. However, they were found to move more in the early winter to avoid non-linear disturbances, such as cutblocks and wellsites. This is likely to avoid the higher number of predators in these areas. The additional movement to avoid disturbed areas, and missed foraging opportunities, likely contribute to increased energy expenditures, which can negatively impact body condition and calf survival. In late winter, caribou moved further in valleys and areas of mixed deciduous habitat, where they are likely more protected from predators.

Grizzly bear movement was influenced by disturbance density and varied by season, age and sex. Generally, they were found to move up to seven times further in study areas with high disturbance densities. The seasonal variability was likely due to changes in availability of food and cover. Like caribou, increased movement in disturbed areas may result in more energy expenditure, while placing grizzly bears at greater risk of human caused death.

Methods

Caribou and grizzly bear data included GPS data collected from collared animals between 2003 and 2009. The data was split into early and late winter seasons for caribou and spring, summer and fall for grizzlies. Grizzly data was further divided by sex and age. Coarse-scale movement was calculated by measuring distance travelled each day and other analyses to assess the energetic costs of movements. Daily movement paths were assessed for links between different disturbance types and density. LiDAR imagery was used to assess vegetation height and the impact of regeneration on animal movement.

Limitations or remaining uncertainties

Lack of data resulted in the exclusion of several potentially influential variables. These included food availability, human activity, snow cover/depth, caribou predation risk, and the physical condition of individual animals. The coarse scale of the study may have also made it difficult to detect smaller movements. Overall, caribou models were found to perform more poorly than grizzly bear models. This may be because as prey species, caribou need to balance access to food with avoiding predators, potentially influencing the fine-scale decisions they make as they move through various habitat types. The researchers note that movement behaviour is just one aspect of interpreting animal response to disturbance and should be considered with other analyses at finer scales.



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Research Theme

Impact of various disturbances, their state of regeneration, and season, on the daily movement of grizzly bears and woodland caribou in Alberta.

Study Area

Low elevation parts of west-central Alberta provincial caribou ranges (outside of protected areas).

Caribou - Redrock-Prairie Creek central mountain caribou range

Grizzly bear - Bear Management Unit 2 (overlaps with Redrock-Prairie Creek, Narraway, A La Peche central mountain caribou ranges and Little Smokey caribou range)

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