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Canadian Forest Service – Great Lakes Forestry Centre

Boreal Caribou Habitat and Behaviour Research

INTRODUCTION

Forest-dwelling caribou, also known as woodland or boreal caribou (*Rangifer tarandus caribou*), are a subspecies of caribou that are found within the boreal forests of Canada, and in the open taiga forests along Hudson Bay. It is estimated that in Ontario, the area occupied by boreal caribou has decreased by 40-50% since the mid-1800s, and as a result, they are listed as threatened (species/population) by both the Provincial Endangered Species Act and the Federal Species at Risk Act.

Image 1. Radio-collared boreal caribou.

Boreal caribou behaviour

Boreal caribou that inhabit the boreal forest (unlike those that inhabit the tundra) do not migrate long distances between seasons and instead spend all of their time in the forest, living alone or in small groups. The species is adapted to an ecosystem in which forest fires are the main natural disturbance and cause of habitat change. They thrive in large contiguous areas of suitable habitat with no human disturbances, where individual caribou can spread out across their range and minimize their exposure to predators, such as wolves and black bears. The most important elements of their diet are tree and ground lichens in winter but in summer they also eat sedges, grasses, horsetails, and leaves of shrubs. They tend to avoid cleared areas where shrubs favoured by moose and deer are more abundant.

Threats to boreal caribou

The main threats to boreal caribou are increased predation rates and habitat loss, degradation and fragmentation. Many kinds of disturbances, such as forest harvesting and road networks, create fragmented habitat and extensive young forests that are generally not preferred by caribou. These young forests and open areas tend to attract species such as moose and deer, which in turn attract increased numbers of predators. Other factors such as overharvesting (hunting and poaching), noise and light disturbance from resource industry developments, parasites and disease, and changes in weather and climate may also be negatively affecting caribou populations.

Field Study

An increased social and economic interest in resource development within Ontario's northern regions contributed to the initiation, in 2009, of a large field study to investigate the effects of various habitat disturbances on boreal caribou populations. Data detailing caribou behaviour and habitat use will be collected across various boreal forest conditions and will be used to develop predictive models that will help to better understand and estimate how population levels vary in relation to habitat composition and human influence. These data will in turn help in establishing management guidelines to protect boreal caribou populations in Northern Ontario. Results of the study will also be useful to support land use decisions, the development of habitat management plans, and the establishment of possible future stewardship agreements with resource users.

GREAT LAKES FORESTRY CENTRE (GLFC) RESEARCH

GLFC research scientist, Dr. Ian Thompson, provides valuable knowledge of ecology and wildlife populations and behaviour that is used to identify critical caribou habitat requirements. He works collaboratively with a research team from the Ontario Ministry of Natural Resources and the University of Guelph. He also provides his expertise as a member of both the Environment Canada and Province of Ontario scientific advisory committees on boreal caribou.

The study is tracking boreal caribou in three 10,000 km^2 areas of Ontario that border the current northern limit for commercial forestry activity in the province. The first study area, near Pickle Lake, exhibits fewer signs of human influence and is dominated by older forests and has few forest access road networks, and low moose and wolf populations. The second study area, near Geraldton, is more typical of a managed forest, having supported commercial forestry operations for the last 60 years. The third study area, near Cochrane, was added because of the contrast in forest ecosystems. This latter study area is a lowland black spruce forest, which is wetter, and quite different than other two study areas.

More than 100 boreal caribou and about 40 wolves are being tracked over a 3-year period using satellite radio-telemetry to determine patterns of movement, home range use, predation risk, survival, and number of offspring. For this study, boreal caribou and wolves were captured from helicopters by specialized crews using net guns;

the collars were applied without the need for any sedation and the animals released unharmed, after taking various measurements of body condition. (Image 1) The radio collars are programmed to collect location data every hour, to develop an understanding of the fine scale movement of caribou. The collar data are uploaded regularly to satellites and then sent to biologists for analysis. Some caribou are also being equipped with video cameras in an effort to determine their preferred food choices. The data will help generate maps track-ing their movements and illustrating their habitat preferences.

Data collected from this study will be used to determine how boreal caribou populations are influenced by forest composition, age and origin (fire or commercial forest harvesting), as well as road density, food availability and predator/prey densities. A predictive behaviour computer model will be tested for its capacity to estimate potential caribou response over time to various forest disturbances and alternative forest management policies. The model will also be used to evaluate the cumulative effects of various human and natural disturbances, as it is unlikely that boreal forest-dwelling caribou populations have decreased due to a single factor.

CONCLUSION

Natural Resources Canada continues to invest in the development of science-based tools to help ensure the long-term sustainability of forest biodiversity, including species such as boreal caribou. The data gathered from this study will help to provide important baseline information on boreal caribou and the factors influencing their survival, particularly within the northern forest areas of Ontario. The predictive models created will contribute to management decisions aimed at furthering efforts to protect this species. While the province of Ontario is responsible for the management of boreal caribou within its jurisdiction, a national strategy for boreal caribou management and recovery across Canada is also being developed and will consider the results of this study.

PRINCIPAL COLLABORATORS

- Ontario Ministry of Natural Resources
- University of Guelph
- Forest Ecosystem Science Cooperative

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