

LIGHTS, CAMERA, MOOSE

USING TRAIL CAMERAS TO SURVEY MOOSE ABUNDANCE AND CALF RECRUITMENT ON THE BLACKFEET INDIAN RESERVATION AND GLACIER NATIONAL PARK IN MONTANA

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PHOTOS COURTESY OF JOHN STEMBER

Understanding population changes through time is critical to wildlife conservation and management. Thus, wildlife biologists often prioritize collecting demographic data to inform wildlife management decisions, especially for species with recreational/economic value and threatened and endangered species. Demographics like abundance, survival, and recruitment provide valuable information and allow managers and researchers to better evaluate populations of interest. Demographic information is especially important when deciding harvest management objectives, as managers must decide how many hunting tags a population can support.

Moose (sikihtsisoo) are often considered an iconic species, with some arguing they are a keystone species in their native range. Many hunters are eager for the opportunity to hunt a moose,

and wildlife enthusiasts of all kinds value the opportunity to view moose in the wild. Unfortunately, moose populations are exhibiting declines in their populations across much of their native range. These declines are most prevalent along the southern portion of their range, including areas in Montana, Idaho, Wyoming, North Dakota, and even Alberta and Saskatchewan. Potential limiting factors of these populations include climate change, habitat loss or degradation, parasites and disease, predation, and unregulated harvest. It has become imperative that we begin to monitor our moose populations in the face of these challenges. If populations decline, their inability to persist within their original range may signal a broader ecological problem.

Moose management in North America is a complex task with various challenges that require ongoing

attention and improvement. Many conservation efforts and research projects focus on threatened and endangered species and species of economic value, like deer and elk. The study and management of moose are more limited by comparison for various reasons. First, agencies routinely lack sufficient funds to monitor moose populations regularly and effectively. Moose hunting does not generate sizeable revenue when compared to other species, such as deer and elk, and moose harvest decisions tend to be conservative, lessening the need for annual data collection on demographics. Additionally, it can be difficult and costly to monitor moose populations due to aspects of their ecology. Moose are naturally elusive and shy animals and tend to avoid large aggregations. They also rely heavily on thick canopy cover areas, which limits their ability to be detected. Furthermore,

moose have no natural markings that allow for individual identification. These underpinnings of moose ecology make them one of the more difficult ungulates to survey. Most agencies tend to rely on periodic collared moose data, harvest statistics, or aerial surveys, which can be expensive in both time and money and often result in relatively unreliable data.

MOOSE IN NORTHWEST MONTANA

The Blackfeet Indian Reservation, which sits south of the Canadian Border and east of Glacier National Park, is part of one of the largest intact ecosystems in the world. Moose are a key species in this ecosystem and warrant attention, given the declines observed in moose populations across the southern portion of their range. A culturally important species, moose also provide a significant source of revenue for the Blackfeet Fish and Wildlife



A lone cow moose within the study area on the Blackfeet Reservation.

As a member of the Amskapi Piikani (Blackfeet), I acknowledge that the land on which my wildlife research is conducted is the ancestral homeland of the Blackfeet Nation. I honor and respect our Blackfeet history and our deep connection to this land, which has sustained us for generations. I remain committed to conducting my research with respect for our sovereignty and preserving this environment for future generations.

B&C UNIVERSITY PROGRAMS

The mission of the Boone and Crockett Club University Programs is the development of a diverse community of high-impact wildlife conservation leaders.

MEET LANDON

Oki Nistoo Nitankinoo Landon Magee. Hello my name is Landon Magee. I am a member of the Blackfeet Nation (Amskapi Piikani). Growing up, I forged a deep connection with the land through hunting and fishing adventures with my dad, embracing the remarkable beauty of the reservation and its surrounding areas. My profound passion for the great outdoors led me to pursue a degree in wildlife biology. I recently graduated from the University of Montana with a B.S. in wildlife biology and am continuing my education to pursue a master's degree in the same field. The project outlined in this article is the basis for my thesis.

During the summer months, I work for the Blackfeet Fish and Wildlife Department's Threatened and Endangered Species Program, addressing the complex challenges posed by human/bear conflicts. My future aspirations revolve around serving as a biologist within the Blackfeet Fish and Wildlife Department. Additionally, my career interests extend beyond Tribal boundaries, encompassing opportunities with federal or state agencies and non-governmental organizations, focusing on population dynamics and the conservation of significant big game species and predators.



Landon with a moose dead head found while setting a camera on the Blackfeet Reservation.

Landon and a University of Montana graduate student and Boone and Crockett fellow, Daniel Bird, hiking into an area on the Blackfeet Reservation to deploy trail cameras.

Department (BFWD) through the sale of hunting permits. To date, the BFWD has had minimal population data available for moose and has no formal monitoring efforts or management plans. Similarly, Glacier National Park, which abuts the Blackfeet Reservation to the west, has very limited moose population data and has not conducted a moose study in nearly 60 years. Although formal demographic data is lacking, residents of the Blackfeet Reservation have reported seeing fewer calves and total moose in recent years, consistent with the declining trends noted regionally. This anecdotal information has led the BFWD director to list moose as a species of priority, given its cultural and economic significance to the tribe. Likewise, Glacier National Park has identified moose as a species of interest, with increased interest in understanding their status.

Like most wildlife agencies, the BFWD takes a conservative approach to issuing moose tags because of the lack of population data. This conservative approach to moose tag allocation is common and

allows management agencies to avoid the potential for overharvest while still meeting the public's desire for the opportunity to harvest moose. However, when moose provide a significant source of income as they do for the BFWD, a conservative approach may unnecessarily restrict recreational harvest and the potential for an agency to increase its revenue, limiting its ability to fund monitoring efforts and conservation practices.

In response to these circumstances, I initiated a study on the Blackfeet Reservation and adjacent Glacier National Park to test the efficacy of trail cameras and newly developed statistical models to estimate moose abundance and calf recruitment rates. The results of my study will be useful to all management agencies responsible for monitoring and managing moose while

Landon setting one of the trail cameras deployed in the Blackfeet Reservation and Glacier National Park study area. This has been a collaborative project between the Blackfeet Fish and Wildlife Department, Glacier National Park, and the University of Montana. Data collected will inform management decisions and provide important demographic information. All camera equipment was graciously provided by the Boone and Crockett Club Wildlife Conservation Endowment at the University of Montana.



also providing the Blackfoot Tribe with baseline biological data that will help inform management decisions for moose. Although the use of trail cameras in wildlife research has exploded in the last century, their use in estimating demographic parameters for moose has yet to be robustly evaluated. Not only do trail cameras provide a reliable, non-invasive, and cost-effective approach, but they also allow for the collection of data for multiple species at a time.

During the summer of 2022, I deployed 100 trail cameras at random locations distributed through a portion of the Blackfoot Reservation and along the east side of Glacier National Park. These cameras were left out on the landscape from June to November, which generated over two million photos. More recently, another 62 trail cameras were deployed beginning in May 2023, with collection in October.

Although data from the first field season is still being processed, this data will provide an accurate estimate of the moose population size and the number of moose calves being recruited into the population, providing a framework for reliably surveying moose. This data will also help to inform the implementation of proper management plans within Glacier National Park and on the Blackfoot Reservation. A sound monitoring and management plan is especially important given the Blackfoot Tribe has partnered with Montana Fish, Wildlife & Parks to implement a lottery system for non-tribal members for moose tags, in addition to their existing auction for non-tribal members and lottery system for tribal members. ■

Trail camera photos taken during the 2022 field season. Images like these will help to estimate the number of moose on the reservation and along the east side of the park and provide insight into potential population changes.

TOP: A bull moose within the Blackfoot Reservation study area. MIDDLE: A cow moose and a young bull moose within the Blackfoot Reservation study area. BOTTOM: Two moose calves at the heel of their mother within the Glacier National Park study area. Images like this will also help to estimate the recruitment rates of calves in this particular geographic area.



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