Glacier National Park could provide climate haven for Canada Lynx

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Example of lynx identification by spots on the inner front leg gathered in Glacier National Park, Montana, USA, summer 2020. We present the same individual at 2 different locations (A, B) and 2 different individuals at different locations (C, D). We adjusted image contrast to enhance markings. Credit: *The Journal of Wildlife Management* (2023). DOI: 10.1002/jwmg.22383

Glacier National Park is home to around 50 Canada lynx, more than expected, surprising scientists who recently conducted the first parkwide occupancy survey for the North American cat.

The Washington State University-led survey reveals the iconic predator resides across most of Glacier's 1,600 square-mile landscape, although at lower densities than in the core of its range further north.

"The population in the park is still substantial and exceeded our expectations," said Dan Thornton, WSU wildlife ecologist and senior author of the study published in the *Journal of Wildlife Management*. "Our results suggest the park could provide a much-needed climate refuge for the cats in the future."

Canada lynx are known for their long, black ear tufts and ability to hunt almost ghost-like across the surface of deep snow. Historically, the predator's habitat extended from Alaska and Canada south down into much of the Northern United States. In the lower 48 today, the Canada lynx exists only in several disjunct populations in Maine, Minnesota, Montana, Colorado, Idaho and Washington.

As one of the few, large, protected areas located within Canada lynx range in the contiguous United States, Glacier represents a potentially important lynx stronghold in the northern Rockies. However, despite Glacier's potential importance from a conservation point of view, knowledge of lynx populations within the park is extremely limited.

"Most surveys for lynx happen in the winter when you can use bait to lure the animals to live traps," said Alissa Anderson, a recent WSU master's graduate and first author on the study. "Glacier is sort of unique in the sense that it is a difficult place to survey in the wintertime. There aren't really maintained roads and you can't use snowmobiles. It is extremely difficult to access compared to other areas."

To address this challenge, the WSU researchers decided to see if a camera trapping method they previously tested in Washington could be used to determine the presence and density of Canada lynx in Glacier over the summers of 2018-2021.

For the first part of the study, Anderson and National Park Service scientists set up an array of 300 motion-sensitive cameras about a kilometer apart on hiking trails across much of Glacier, including remote backcountry areas. Their analysis revealed that lynx are distributed not only across most of the park but also at lower elevations, which could prove useful as the climate continues to warm.

"The main question regarding the lynx's survival is climate change," Thornton said. "They are a cold-adapted species that needs deep snow. In Glacier at least, they have a lot of room to move up in elevation as the climate warms."

Another important aspect of the study was a more localized effort the scientists undertook to estimate lynx density in specific areas of the park by identifying individuals based off distinctive coat markings.

"Lynx have pretty subtle markings compared to other cats and only on the inside of their front legs," Anderson said. "So, we set up cameras on either side of the trail to attempt to get pictures of these markings that we could then use to identify individual cats in an area."

Despite the difficulties of poor lighting, image blur, vegetation and other factors, the researchers were able to link approximately 75% of the lynx they photographed to specific individuals. They then combined the results of the park-wide occupancy survey with their density analysis to extrapolate an overall population estimate for Glacier of about 1.28 lynx per 100 square kilometers of terrain.

Moving forward, the researchers hope the survey can serve as a baseline population estimate to help their collaborators with the National Park Service keep tabs on the numbers of Canada lynx in Glacier. Thornton is also continuing to use the methods the researchers proved effective in Glacier to determine the size of lynx populations in other areas. He is currently leading a long-term effort to survey populations of Canada lynx in Washington state, one of the most threatened habitats for the cats in the U.S.

"The methodological contribution of this study is really important in the sense that it gives us a better way to get at the number of individual lynx, which is really important for understanding recovery and how a population is doing," Thornton said. "The U.S. Fish and Wildlife Service has to develop a recovery plan for the cats so the more information you have on the status of the population the better."

More information: Alissa K. Anderson et al, Canada lynx occupancy and density in Glacier National Park, *The Journal of Wildlife Management* (2023). DOI: 10.1002/jwmg.22383

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