

Research Report Kusawa**Interim Report – May 2026****Project title: Response of collared pika to climate-mediated habitat changes in the Yukon****Yukon S&E License No.:** 25-45S&E**PI:** Isla Myers-Smith¹,**MSc:** Angelina Kellas¹**Research Staff:** Anya Boardman¹, Pauline Deschodt¹¹*University of British Columbia***Research funding:** CERC in Global Change Ecology of Northern Ecosystems (NSERC)
Discovery Grant (NSERC)

This interim report provides a summary of the research conducted by Dr. Isla Myers-Smith and her research group (Team Shrub) from the University of British Columbia in Kusawa Territorial Park over the summer of 2025 (for more information see <https://teamshrub.com/>).

In 2025, Team Shrub conducted research under the following Scientists and Explorers Act Licenses: 25-60S&E, 25-41S&E, 25-42S&E, 25-44S&S, 25-45S&E, 25-46S&E. See previous research reports (<https://teamshrub.com/research-reports/>).

Purpose and objectives of the project

1. To contribute to long-term pika occupancy and habitat monitoring in Kusawa Territorial Park, established by the Yukon Government in 2009¹.
2. To expand on existing pika research in Kusawa Territorial Park by using audio recorders called autonomous recording units (ARUs) to determine the amount and timing of pika vocalizations across habitat types.
3. To describe and monitor vegetation change occurring in pika habitat to predict how climate-driven vegetation changes may impact pika behaviour, abundance and distribution in the future.

Background

Team Shrub, a research group led by Dr. Isla Myers-Smith at the University of British Columbia in Vancouver, studies climate-driven changes in vegetation, and the cascading effects of these changes on ecosystems. For nearly 20 years, Team Shrub has been working in the Yukon, primarily in the Kluane Lake region and on Qikiqtaruk-Herschel Island. In 2024, Team Shrub began conducting pika habitat and abundance research near Kluane Lake and Tombstone Territorial Park. Since then, we have worked with the Yukon Government to conduct pika occupancy surveys in Kusawa and Tombstone Territorial Park, and we developed a new method for studying pika using audio recorders. In 2025, we used the audio recorder method in Kusawa Territorial Park to study the impacts of shrub increases on pika abundance and behaviour.

The collared pika (*Ochotona collaris*) is a herbivorous, alpine-dwelling mammal. Pikas are a cold adapted alpine mammal with a narrow temperature niche, and are considered climate sensitive, particularly to heat²⁻⁴. Pikas retreat into cooler subsurface spaces among the talus under high temperatures, limiting foraging and potentially affecting survival^{5,6}. Given their limited physiological

ability to tolerate warmer temperatures, collared pika have been listed as a species of special concern under the Canadian Species at Risk Act⁷.

Quantifying the influence of heat events on the activity and heat-avoidance behaviours of pika will improve our understanding of whether pikas can persist under warming alpine conditions. This research will contribute to Yukon Government's long-term pika monitoring in the Kluane and Kusawa regions of the southern Yukon and Tombstone Territorial Park in the central Yukon.

Another objective of this research is to examine population-level responses of pikas to increasing shrub cover and resulting changes to local forage species composition. Pikas selectively feed on vascular plants such as forbs and graminoids, as well as some small shrubs⁵. We expect that sites with encroaching shrublines will have lower pika occupancy relative to historical baselines due to a loss in forage availability.

After the 2024 field season, we created a "recognizer" program that can identify pika vocalizations (meeps) from the audio recordings. Using this program, we are able to determine the volume and timing of pika calls in each study site. This will help us to understand how shrub encroachment, temperature and other climate driven changes may be impacting pika habitat, behaviour and abundance.

Project: Monitoring pika habitat and abundance using audio recorders

Objective: Monitor the influence of warming temperatures and shrub increase on pika populations. In 2025, we visited 10 sites across the central and southern Yukon (Figure 1). Four sites were located in Kusawa Territorial Park at established Yukon Government collared pika monitoring sites.

At each site, we set up five audio recorders (ARUs) in a 50 by 50 metre diamond shape, with one ARU in the centre (Figure 2). We recorded audio over a period of at least three days to capture pika vocalizations continuously over 24 hours. Alongside ARUs, temperature loggers were deployed above and below the talus at each site. Next, vegetation and rock talus size surveys were conducted in addition to drone surveys (Figure 3, Figure 2).

With these data, we plan to build a species distribution model for collared pika by integrating site-level information with broader-scale remote sensing and climate datasets. Pika occurrence records (presence and absence) from the Yukon Government, community science data, and occurrence data we collected in 2025 will be used to assess factors shaping current and future pika distribution across the Yukon.

Initial data analysis from one site (Mt. Adney in Tombstone Territorial Park) shows that meeps, short, high-pitched alarm calls made by pikas, have a gradual increase with increasing temperature (Figure 4). This research is ongoing and will be completed over 2027-2028.

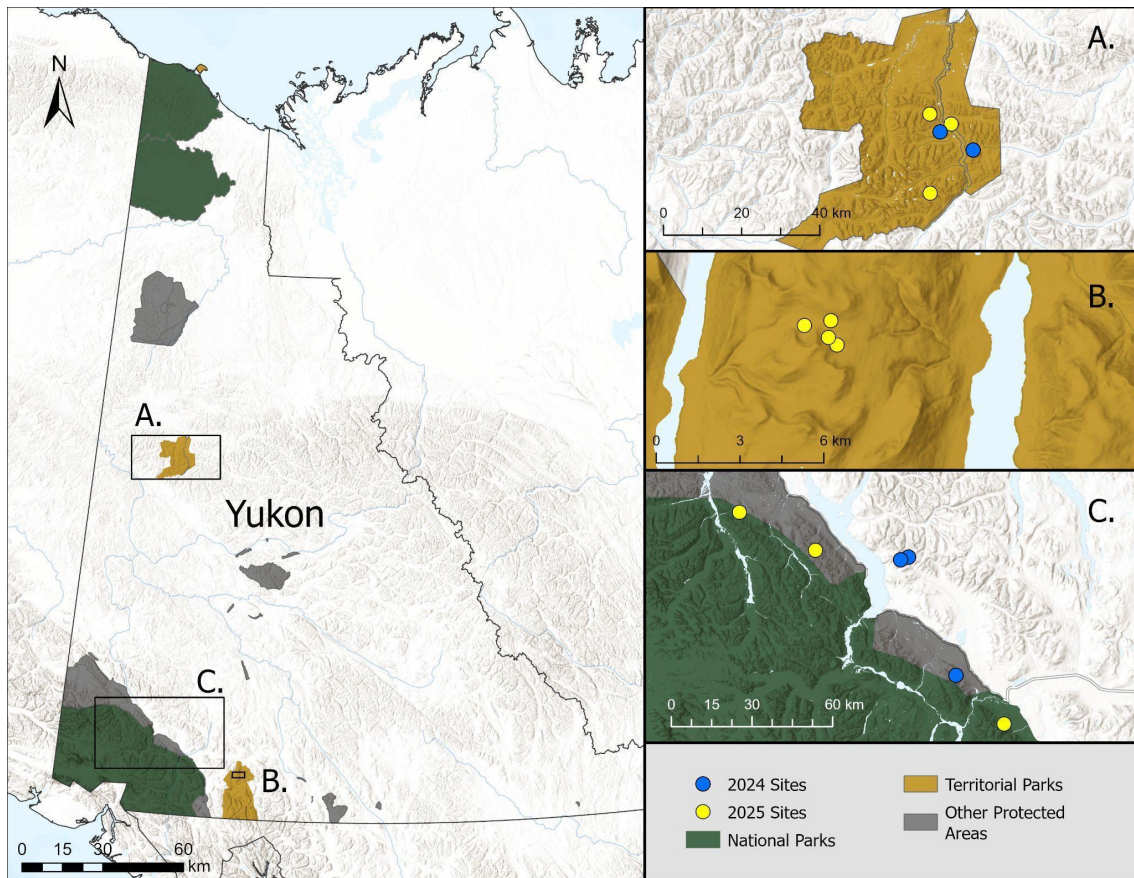


Figure 1. Map of the field sites across the Yukon visited during the 2024 and 2025 field seasons: (A) Tombstone Territorial Park, (B) Kusawa Territorial Park, and (C) the Kluane Lake region.



Figure 2. Example of the audio recorder setup in a diamond-dice formation (left), Mavic 3 drone preparing for a survey flight (right).



Figure 3. Recording plant species and talus rocks size data along a transect (left) and an audio recorder elevated off the ground by a tripod (right).

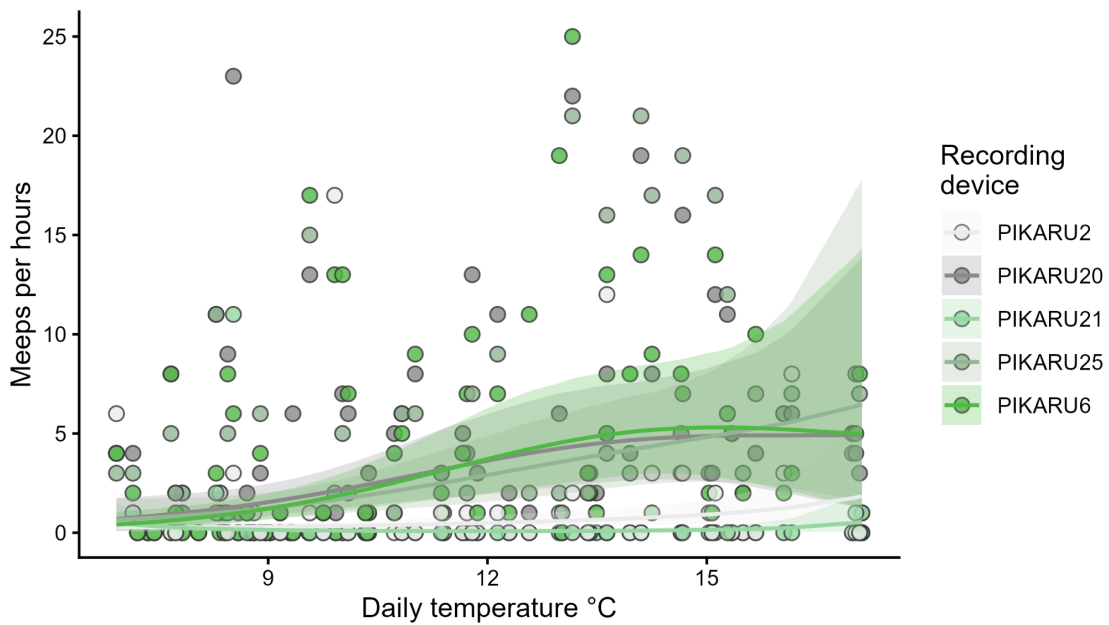


Figure 4. Meeps increase with increasing temperature for Mt. Adney site in Tombstone Territorial Park from August 2nd - 5th, 2025. Analysis conducted with a Bayesian model.

Additional information

Team Shrub at the University of British Columbia <https://teamshrub.com/>
The High Latitude Drone Ecology Network <https://arcticdrones.org/>
International Tundra Experiment <https://www.gvsu.edu/itex/>
Canadian Airborne Biodiversity Observatory: <https://www.caboscience.org/>
Herbivory Network <https://herbivory.lbhi.is/>
Team Shrub on Twitter <https://twitter.com/TeamShrub/>
Team Shrub on Instagram <https://www.instagram.com/teamshrub/>
Photography websites: <http://vanishingislandphoto.com/>, <https://arcticabove.com/>
Media coverage: <https://teamshrub.com/media/>
Team Shrub Blog Posts: <https://teamshrub.com/lab-blog/>

References

1. Kukka, P. M., Thomas, J. P., Benjamin, J. E., & Jung, T. S. (2020). Rapid assessment of site occupancy by collared pika (*Ochotona collaris*) at the leading edge of their range. *European Journal of Wildlife Research*, 66(4). <https://doi.org/10.1007/s10344-020-01406-w>
2. Otto, H. W., *et al.* (2015). Facing a Changing World: Thermal Physiology of American Pikas (*Ochotona princeps*). *Western North American Naturalist*, 75(4), 429–445.
3. MacArthur, R. A., & Wang, L. C. H. (1973). Physiology of thermoregulation in the pika, *Ochotona princeps*. *Canadian Journal of Zoology*, 51(1), 11–16.
4. Stewart, J. A. E., *et al.* (2015). Revisiting the past to foretell the future: Summer temperature and habitat area predict pika extirpations in California. *Journal of Biogeography*, 42(5), 880–890.
5. Staffl, N., & O'Connor, M. I. (2015). American Pikas' (*Ochotona princeps*) Foraging Response to Hikers and Sensitivity to Heat in an Alpine Environment. *Arctic, Antarctic, and Alpine Research*, 47(3), 519–527.
6. Yandow, L. H., *et al.* (2015). Climate Tolerances and Habitat Requirements Jointly Shape the Elevational Distribution of the American Pika (*Ochotona princeps*), with Implications for Climate Change Effects. *PLOS ONE*, 10(8), e0131082.
7. Environment and Climate Change Canada. Management Plan for the Collared Pika (*Ochotona collaris*) in Canada. Species at Risk Act Management Plan Series. 31 (2023).