

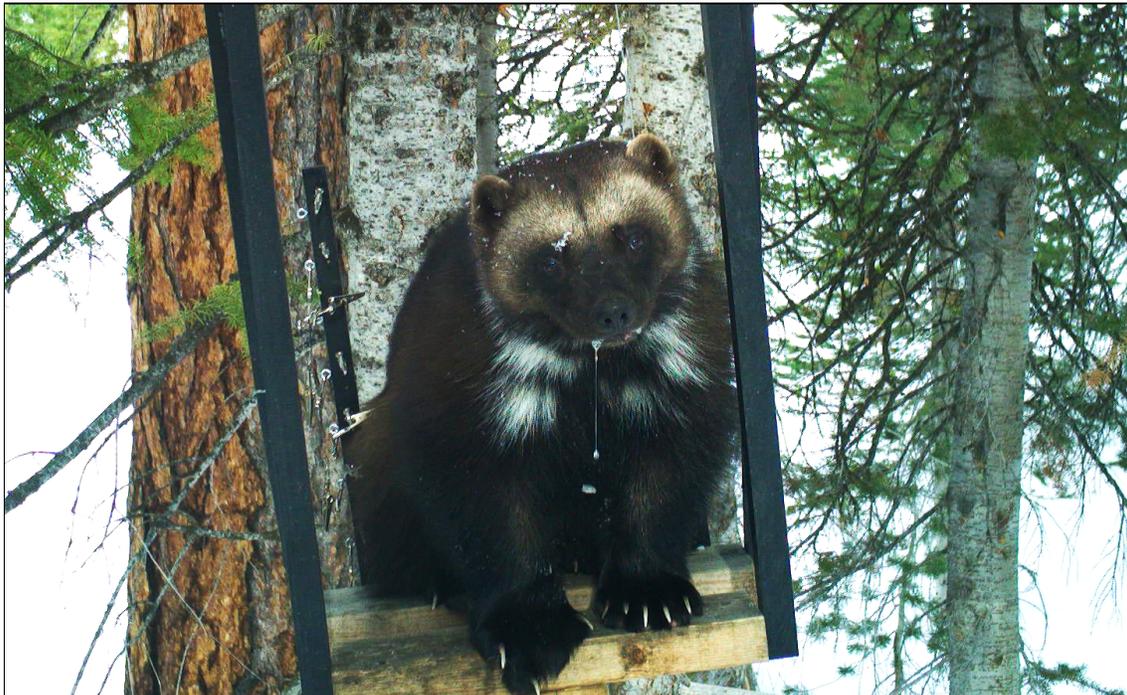
WALLOWA WOLVERINE PROJECT

AND FOREST CARNIVORE STUDY



SUMMARY REPORT 2020 - 2021

For the Oregon Conservation & Recreation Fund





ACKNOWLEDGEMENTS

We extend our most sincere thanks to our collaborators, supporters, funders, and the local community that helped this project achieve its goals in the 2020/2021 season. A special thanks to the Oregon Wildlife Foundation and the Oregon Conservation & Recreation Fund for their financial support. From the Oregon Department of Fish and Wildlife we would like to thank Brian Ratliff, Matt Keenan, Brehan Furfey, Kyle Martin, Roblyn Brown, Phil Perrine, Matt Wyatt, Justin Primus, Jenny Dalton, Shane Talley, Kalysta Adkins, and Scott Quigley for their help and support. From the USFS, Wallowa-Whitman National Forest we thank Jamie Ratliff, Sarah Riutzel, and Derral Thomas. A special thank you to Victor McNeil, Connelly Brown, and Rob and Emily Klavins. For all of their generous help in the field, we would like to thank Jackie Pagano, Mark Leffingwell, Ben and Kate Sweet, Kurt Zias, Michelle Huppert, Marwa Mahmoud, Nicole Freshley, Mike Hamann, Garik Asplund, Sage Brown, Nick Murphy, Killian Sump, and Nate Redon. You guys rock! And as always, we would like to extend our deepest gratitude to Audrey Magoun, Dale Pedersen, and Pat Valkenburg. Go Gulo!



INTRODUCTION

The 2021 winter was the second season of expanded demographic monitoring of wolverines (*Gulo gulo*) in Northeast Oregon and the first season of pilot projects studying the effects of forest treatment on Pacific marten (*Martes caurina*) and the ecology of Rocky Mountain red fox (*Vulpes vulpes macroura*). This report outlines the goals, challenges, and achievements of wolverine monitoring during the 2020/2021 winter.

CONTEXT & STUDY AREA

Wolverines are exceptionally rare in Oregon and much of the American West. This is a product of historical predator control programs and unsustainable harvest rates. Through natural dispersal from Canada, wolverines have been recolonizing portions of their historic range in the contiguous United States. Due to the natural low densities and slow reproductive rates of wolverines, and the fragmented nature of their habitat in the lower 48 states, their recovery has been slow. Wolverines have large spatial requirements, and they rely on cold, snowy habitats for reproductive denning and intact forestland for dispersal. Climate warming is expected to disproportionately affect mountain ecosystems, reducing the potential denning and dispersal habitat for wolverines and sympatric carnivores, like marten and montane fox, thus their long-term persistence and continued reestablishment in more isolated habitat nodes is uncertain.

The wolverine is protected in Oregon and classified as an Oregon Conservation Strategy Species, or a species of greatest conservation need in the state. While wolverine research efforts in 2011 alluded to the presence of a small wolverine population established in the Wallowa Range of Northeast Oregon, monitoring in successive years indicated that only a single resident male has occupied this area since the conclusion of that study. The extent of wolverine establishment in Oregon in modern times has been limited to the Wallowa Range, which comprises the Eagle Cap Wilderness (ECW), the largest wilderness area in the state at 1462km². This area is characterized by peaks nearing 10,000', alpine lakes, high-elevation meadows, and forested valleys. The Eagle Cap Wilderness is flanked by sagebrush steppe, juniper woodlands, ranches, agricultural areas near the river valleys, and deep rock canyons. As wolverines continue to expand into historic habitat throughout Washington and Idaho, questions are raised as to why the Wallowa Range has yet to establish a functional wolverine population due to its near proximity (~60 miles) to reproductive populations in Idaho. Using a network of camera monitoring stations, this project aims to document the trends of natural recolonization of wolverine into Oregon. This long-term dataset will equip us with the science tools necessary to inform forest managers on how to best manage landscapes that support the recovery of wolverines. Managing landscapes for the continued presence of wolverines requires unique and novel approaches. As climate change transforms alpine ecosystems, it is critically important to monitor these systems and the cold-adapted species that inhabit them. By focusing our research on

understudied rare carnivores in remote landscapes, we contribute to science-based management decisions.

Our long-term project aims to assess the population and recovery dynamics of wolverines in the Blue Mountain Ecoregion. During 2020/2021, our objectives were as followed:

- a) Conduct the second of two years of expanded wolverine monitoring to photographically and genetically identify wolverines in Northeastern Oregon.
- b) Collect data on the general health and local movements of the wolverine resident(s) of the Wallowa mountain range.
- c) Increase the impact of our wolverine research efforts by developing new collaborative research objectives with federal, state, and non-profit agencies focusing on other climate-sensitive wildlife, such as the Pacific marten and Rocky Mountain red fox.

METHODS - MULTI-SPECIES MONITORING STATIONS

We deployed 16 Integrated Camera and Hair-snagging stations (runpoles) as described in Magoun et al. 2011 (Fig. 1) to identify wolverine individuals by unique gular (throat) and ventral (chest) markings and genetic signatures. 13 runpoles were deployed in or adjacent to the 1462km² ECW (Fig. 1). 1 runpole was deployed in potential dispersal habitat near Hells Canyon National Recreation Area directly East of the ECW, and 2 were deployed in the 1214km² Elkhorn Mountains, which lie approximately 30 miles southwest of the Wallowa Mountains and contain suitable wolverine habitat.

Our monitoring regime followed a spatial organization similar to previous wolverine studies in the Northwest, where monitoring sites are distributed in 225km² grid cells overlaid across modeled suitable wolverine habitat, predominantly informed by areas with persistent spring snowpack. In several grid cells where the long-term wolverine resident of the Wallowa Range, Stormy, had previously been detected, we included additional sites. Two additional camera monitoring stations without runpoles were deployed in areas outside of the habitat model where putative wolverine tracks had previously been documented.

We amended protocols in Magoun et al. 2011 to incorporate an additional camera and bait targeting Rocky mountain red fox and other carnivore species that would otherwise go undetected below the runpole and out of view of the primary camera (Fig. 2). Runpole monitoring stations were baited with a cow femur and elk heads collected by the Oregon Department of Fish and Wildlife for Chronic-Wasting Disease testing. After testing had completed, the heads were stored by ODFW for use in this project. Runpole stations were predominantly deployed in October or November with several remaining unchecked until the following spring or summer. 9 accessible stations received between 1 and 4 midseason checks during winter and spring. At these visits, new bait was added and camera data was downloaded. To increase the detection of red fox, we used either deer legs harvested locally from road-kill or a PVC container filled with cat-food.

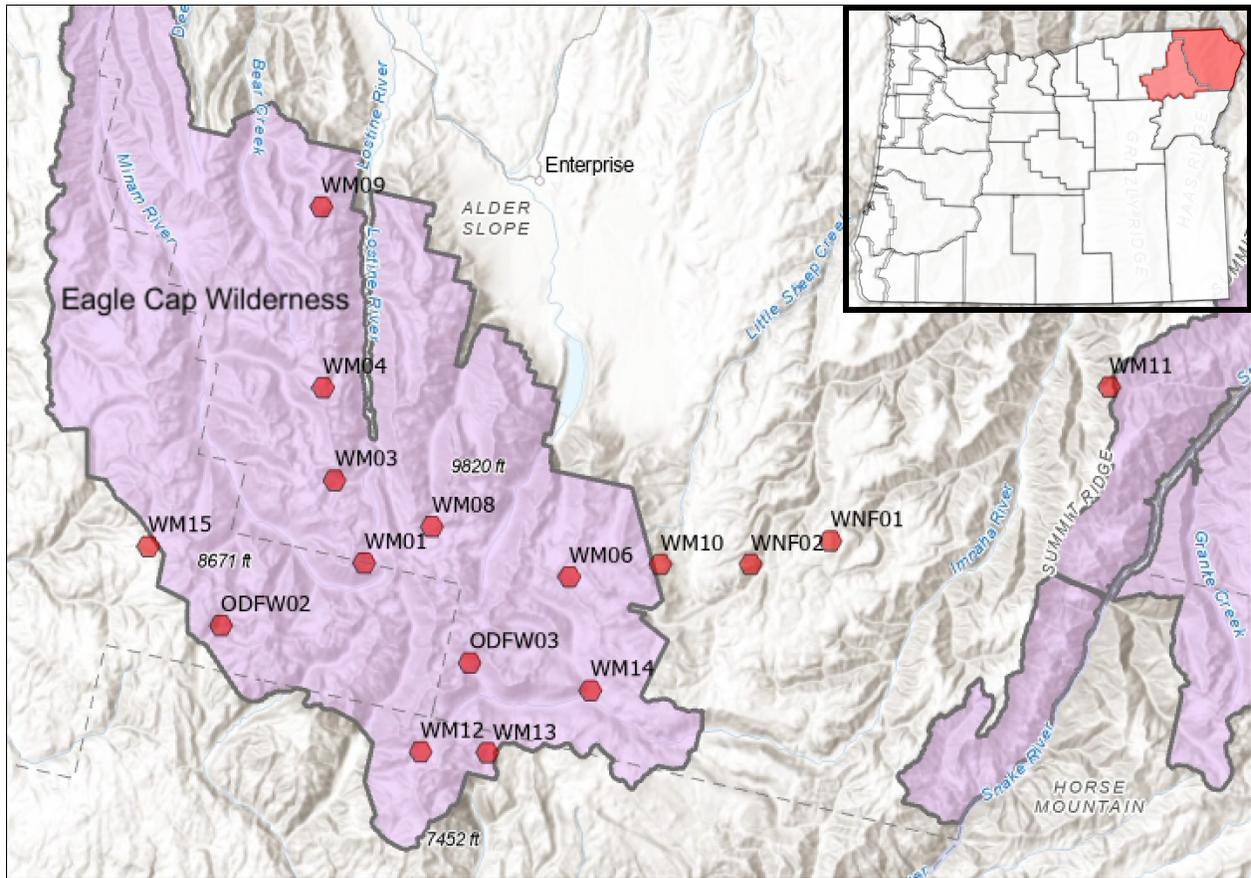


Figure 1. Wolverine monitoring stations in and adjacent to the Eagle Cap Wilderness (pink) and extending east near the Hells Canyon Wilderness (pink).

Two runpole sites were deployed with cellular equipped trail cameras that relayed real-time images of the station to a mobile app when wildlife was detected. We intended to use cellular equipped cameras to maximize genetic sample collection. If a wolverine or red fox triggered a cell camera, we would aim to visit that site within 1-3 days, or while snow tracks still remained, to collect information on space use and genetic samples. Wolverine scat samples are notably difficult to opportunistically collect due to their large-home ranges and likely infrequent use of manmade trails or roads. We piloted these methods as a means to collect scat samples from Stormy for diet and parasite analyses. Upon collection of putative wolverine or red fox scats, 1-2mL of scat was preserved in ethanol for nuclear DNA genotyping and the remainder of the scat was frozen for future diet analysis using mitochondrial DNA metabarcoding.

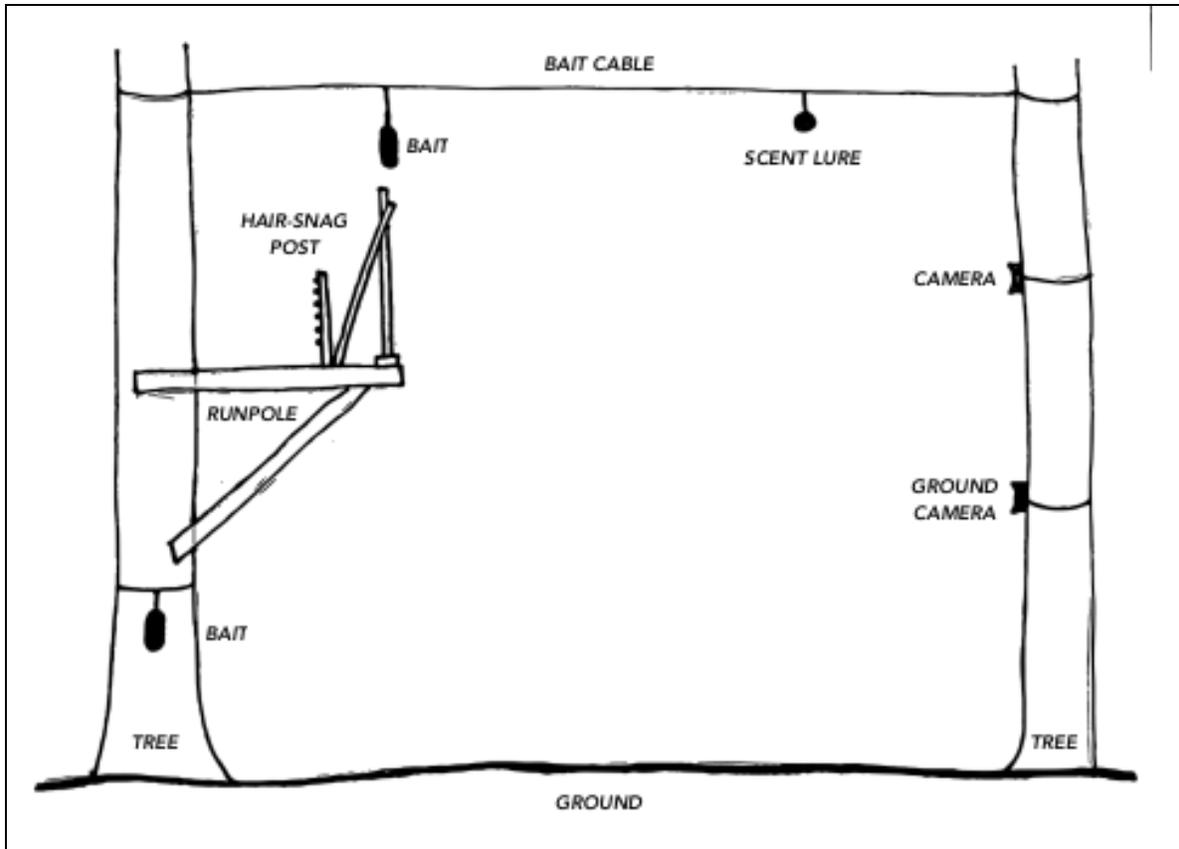


Figure 2. An Integrated Camera and Hair-Snagging station, as described in Magoun et al. 2011, to identify individual wolverines with genetics and chest and gular patterns. Modifications to improve the detection of montane fox are displayed.

To analyze photos collected for species identifications, we used Wildlife Insights camera trap photo management program (<https://www.wildlifeinsights.org>). In our commitment to furthering data driven wildlife conservation, uploading our photos to Wildlife Insights allows a global community of researchers to access data on the species we detect to increase the scale and impact of research studies. All sensitive location data for wolverine detections are withheld.

RESULTS & PROGRESS

We collected over 200,000 photos at our wolverine monitoring sites. Wolverines were detected at 9 of 16 runpole monitoring sites. All wolverine photos were conclusively identified as Stormy (Fig. 3). The integration of ground cameras at runpoles was successful, enabling us to detect Rocky Mountain red fox at the majority of runpole sites, including several areas where they had not been previously documented.



Figure 3. Territorial male, Stormy, is identified at three monitoring stations by his unique gular and ventral markings and the missing inner toes on his right foot.

Cell-equipped cameras enabled field crews to follow fresh snow tracks on 4 days in January and February for a combined 7 miles. These snow tracking efforts yielded the collection of wolverine scat samples that will be analyzed through DNA metabarcoding for diet contents and screened for intestinal parasites. After processing, a portion of the scat will be subsampled and archived and the remainder will be donated to Rogue Detection Dog Teams for their use in training scat detection dogs.

Additionally, we are working to synthesize Rocky Mountain red fox occurrence detections via genetic samples and camera detections to better understand their distribution in Northeast Oregon. Montane red fox subspecies like the Sierra Nevada red fox (SNRF, *Vulpes vulpes necator*) and the Cascade red fox (CRF, *Vulpes vulpes cascadenis*) are considered especially at-risk of extirpation due to changing dynamics in alpine ecosystems affecting their prey species, competition with lowland predators with increased access to alpine areas during the winter and spring, and the introgression of genetic material of less snow-adapted, non-native lowland red fox subspecies. The SNRF was listed as a federally endangered species in summer 2021. The genetic landscape of red fox in the Wallowa Range is a combination of native Rocky Mountain red fox at higher elevations and red foxes of non-native origin. This provides a unique opportunity to study how the effects of introgression of non-native genetics affects the functionality and resource selection of montane foxes. By combining genetic, diet, and spatial analyses, we can better quantify how introgression affects fox behavior and functionality on a diverse landscape and apply these findings to better predict how introgression will affect more at-risk montane fox populations, such as Sierra Nevada or Cascade red foxes. We will continue aggregating camera detections and scat samples for these analyses.

Through our collaborative effort to study Pacific marten in forest treatment areas, we successfully deployed 34 camera stations in 3 survey areas of different treatment levels. Stations consisted of a chicken leg, elk or deer meat, and were deployed for up to 30 days, or until marten occupancy was confirmed. This study is expected to span multiple years and is primarily administered by the Wallowa-Whitman National Forest, but through this collaboration, we offered our field presence and expertise to initiate a research study that has long been conceptualized, but lacked sufficient resources to launch. Our partners at Wallowa-Whitman National Forest are synthesizing these marten occurrences into a larger dataset to construct an ecoregion-wide occupancy model.

DISCUSSION

From 2019 through 2021, one wolverine was detected in our extensive survey efforts. To continue studying the persistence of wolverines in Northeast Oregon, we will maintain monitoring stations outside of the Eagle Cap wilderness boundary and conduct two years of expanded monitoring every 5 years to periodically conduct a thorough reassessment of wolverine presence. It is imperative to continue monitoring the Wallowa Range for the persistence of wolverines, as this is the only region in the state where wolverines are currently known to occur. Consistent camera monitoring efforts have the capacity to better understand dispersal dynamics of wolverines from nearby populations into this critical linking habitat and to help land managers to continually reevaluate the conservation needs of wolverines in Northeast Oregon.

Developing long-term monitoring strategies for wolverines in remote areas has limitations, as core habitat falls within federally protected wilderness areas where monitoring structures cannot be maintained permanently. We have selected 4-6 non-wilderness monitoring sites that fall within modeled potential wolverine habitat that we will continue to operate between periods of expanded monitoring. This monitoring is supplemented by bolstering community engagement in the region by conducting outreach and education to the local winter recreation community. By investing the local community in the success of wolverine recovery in the Wallowas, we increase our power to detect changes in the wolverine population. The Wallowa Mountains has a strong backcountry ski community that brings recreationists from across the country for remote backcountry ski tours through the Eagle Cap Wilderness. We and our partners consistently receive reports of wolverine sightings or tracks in the region, but few reports have been supplemented with verifiable evidence, such as photos of tracks taken in a way that allow us to confidently ID them as likely wolverine. In fall 2021, we distributed educational information printed onto ceramic mugs to backcountry ski huts maintained by Wallowa Alpine Huts and Eagle Cap Mountain Guides. These mugs are placed in the huts to educate visitors on how to recognize and report wolverine track and sign. Additionally, we are compiling our extensive photo reference collection of carnivore winter track and sign to develop a tracking guide for carnivores in the Blue Mountain Ecoregion for distribution to the public in a downloadable format.

Through long-term monitoring of wolverine presence in the Wallowa Range, we gain critical insights on the dispersal dynamics of wolverines from nearby populations and we better understand the conservation needs of wolverines in Northeast Oregon. Stormy is now the longest monitored solo male wolverine, having been tracked for 11 years.

COMMUNITY ENGAGEMENT & MEDIA

This report is accompanied by a timelapse representation of 10 months at a multi-species monitoring station.

Timelapse at a wolverine monitoring site in Northeast Oregon

<https://www.youtube.com/watch?v=Qkg3rOY2L6A&t=34s>

Early-Career wildlife professional winter fieldwork experiences - We provided four early-career wildlife professionals with winter field work experience, covering topics such as snow-safety, avalanche awareness, snowmobile and trailer safety, snow tracking, orienteering, and genetic sample collection.

Instagram - We reached thousands of new wolverine enthusiasts across the globe through the sharing of photos to our instagram account. <https://www.instagram.com/wallowawolverineproject/>

Wolverine(s) of Oregon, Oregon Wild - In October 2020, we presented a summary of the 2019/2020 season findings in an hour-long virtual presentation and Q & A session through Oregon Wild.

Where are the Wolverines? Oregon Wildlife Foundation - In December 2020, we had a virtual discussion and Q & A on wolverines in Oregon as part of the Oregon Wildlife Foundation's Community Conservation series.

Grass Journal Podcast - In April 2021, Project Coordinator Scott Shively discussed wolverine conservation in the Anthropocene with the Oregon-based Grass Journal Podcast.

Wolverines in Wallowa County, Wallowa County Lodge - We delivered a presentation on wolverines in Wallowa County and wildlife tracking to the Wallowa Lake Lodge on July 29th, 2021.

The Lone Wolverine of the Wallows, TLP Media - *In Development*. Additional filming by TLP Media for their documentary short finished in October 2020. We continued to collect high-quality videos of wolverines via remote cameras during the 2021 winter. The 20 minute film is now in post-production and is expected to be released in 2022. <https://tlpmediafilms.com/our-work/>

Carnivore Tracking Guide - *In Preparation*. We are currently developing informational winter tracking materials for carnivores of Northeast Oregon to be made available publicly.

Wolverine Lesson Plan by Bear Trust International - We contributed photos and data to a lesson plan for elementary school students in development by Bear Trust International. Once completed, we will help this lesson plan reach local schools in Northeast Oregon.

Thank you for reading. Further photos and non-target species detection histories are available upon request. Supplementary photos continue on the following pages.

Magoun, A. J., Long, C. D., Schwartz, M. K., Pilgrim, K. L., Lowell, R. E., & Valkenburg, P. (2011). Integrating motion-detection cameras and hair snags for wolverine identification. *The Journal of wildlife management*, 75(3), 731-739.



“Lake Crossing” - inspired by a spring ski into the Eagle Cap Wilderness to service a wolverine monitoring station. Courtesy of Nicole Freshley at Magic Woodland Studios, painting wild and rural landscapes in Wallowa County. <https://www.magicwoodlandstudio.com/>

Stormy visits wolverine monitoring stations in November 2020.



A wolverine monitoring site is visited in April and wolverine photos are retrieved. Courtesy of Sage Brown



A Pacific marten and Rocky Mountain red fox stay vigilant while feeding on a carcass beneath the snow.

