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Citizen Scientists**

**Mobile Apps  
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By Joshua Rapp Learn

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Credit: Mark Vandever



Credit: Shevenell Webb

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# Trappers as Citizen Scientists

## COLLABORATIVE EFFORTS ARE PROMOTING WOLVERINE CONSERVATION

By Shevenell Webb and Robert Anderson



Credit: Robert Anderson

▲ A volunteer trapper checks a camera at a wolverine research site. When the fur harvest season ends, participants continue visiting their sites to replenish bait, check camera batteries and change memory cards. These individuals donate their time, equipment and travel expenses.

On a mild day in March, a male wolverine (*Gulo gulo*) catches the scent of beaver in the boreal forest of northern Alberta and decides to investigate. It follows a trapper's snowmobile trail to a small clearing where an odd, yet intriguing device stands. The wolverine is wary and examines the bait from all sides. Suspended between two trees is a beaver carcass, and the only way for the stealthy animal to get at it is to jump onto a pole sticking out of a tree. The agile wolverine climbs up, approaches the meat slowly then hears the sound of snapping metal. The trap's jaws only take a small clip of hair from the animal's hind leg — not enough to dissuade it from eating its fill of the bait left by a trapper. When the wolverine is finished, it jumps down, loping off into the dark forest with a last piece of meat to cache.

Three days later, a trapper is traveling the same trail, checking for animal tracks as he goes. Most of the prime trapping season has passed, but he has one last location to check. The little opening in the forest is covered in tracks, the beaver carcass he left has been devoured and a tuft of hair hangs from the

alligator clip by the side of the pole. The fur doesn't look like that of a lynx or fisher, and a quick peek at the trail camera confirms the visitor: a wolverine.

As this story illustrates, tracking down the largest land-dwelling member of the family *Mustelidae*, or weasels, is tricky business. The stocky, muscular carnivores are solitary animals with a well-earned reputation for killing prey many times larger. Even today, wolverines remain one of the least understood carnivores in North America as they occur at very low densities, live in remote places and have massive home ranges comparable to larger carnivores such as wolves and grizzly bears. They are found primarily in remote reaches of the northern boreal forests, and in alpine and tundra habitats within the subarctic and arctic regions of the Northern Hemisphere.

These characteristics make the so-called ghosts of the boreal forest difficult to study. But volunteer trappers are now helping fill the knowledge gaps by deploying fur snags and trail cameras as part of a collaborative effort in Alberta.



Credit: Alberta Conservation Association

▲ A male wolverine sports a radio collar from Alberta's wolverine conservation project. Over the past four winters, the Alberta Conservation Association has worked with 50 trappers who deployed 140 non-invasive camera sites in the Rocky Mountains, foothills, and boreal forest of Alberta. Thousands of images of wolverines and numerous other wildlife species have been collected thanks to their efforts.





## Mutual Interests

Although trapping wolverines is legal in the province, Alberta Environment and Parks considers the furbearers data deficient because wildlife managers lack basic information for determining their distribution, population trends and conservation needs. But in 2011, a group of trappers approached our staff at the Alberta Conservation Association, asking that we consider starting a project that would not only provide useful information about the species, but that would also directly involve trappers in data collection. Wolverines are usually associated with mountainous habitats where their numbers are thought to be declining; however, the trappers urged us to consider conducting the project in the boreal forest, an ecoregion where they said wolverines were far more common than wildlife managers realized.

Together, our organization and the Alberta Trappers' Association developed a unique wolverine inventory program that relied on volunteer trappers who collected data using non-invasive camera traps set up to take highly detailed pictures of wolverines that approached specialized traps. Our objectives were to determine the broad-scale distribution and habitat associations of the wolverine population, thereby helping to update the carnivores' status assessment in the province.

But wolverines are notoriously difficult to find, catch and follow. This led veteran wolverine researcher Audrey Magoun, of Wildlife Research and Management, to develop a unique camera trap that documents presence, gender, behavior and DNA, and visually identifies individual wolverines based on unique throat and belly markings.

Her setup consists of a pole set perpendicular to a tree about four feet off the ground. It includes a fur snag device at the end of the pole with multiple alligator clips that close when an animal comes in contact with them. The trap is designed so that the wolverine has to jump onto the pole and walk past the rows of alligator clips to get close to the bait that is suspended just above and slightly out from the end of the run pole. However, the animal must first put its front feet on a guiding bar that puts the wolverine in a perfect spread-eagle position. As the animal attempts to eat the bait and moves around the site, the trail camera located a few meters in front of the pole, quietly snaps pictures. Although this trap was made with wolverines in mind, we

have found that many other species of carnivores such as fishers and martens attempt to snag the bait, which in most cases is a rotting beaver carcass, a favorite of wolverines.

With this setup, the trappers who know much about traditional fur harvesting become citizen scientists by collecting photos and hair samples of wolverines that visit the traps.

## Furbearer Management

Fur trapping is woven into the history of North America, especially in Canada. In fact, the beaver is recognized as a national symbol of Canada, with its importance in the fur trade dating back to the late 1600s when the European demand for beaver felt hats was high. Starting in the late 1920s, Canada established trapping areas that gave exclusive rights for individuals to trap on specific public land areas. This trapping system limits competition among trappers, reduces the risk of overharvesting and allows trappers to effectively manage furbearers in their area. These trapping areas have remained consistent over time and have great value for tracking furbearer harvest trends.

Despite its history, the number of trappers in Canada has declined in recent years. However, trapping is still an important way of life for those who participate (Webb and Boyce 2008). Contrary to the profit motivations during the early fur industry, many trappers today simply enjoy being out on the land with their family and hope to break even with expenses. Yet, trappers sometimes have a reputation for being grizzled, highly independent

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▼ Author Shevenell Webb and a trapper discuss wildlife observations during a field visit. These kinds of collaborative partnerships increase knowledge, trust and respect for wildlife management and conservation needs.



Credit: Jim Potter



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hermits who don't know much about technology. Our work on this project has dispelled these myths and has demonstrated the value of working closely with stakeholders who may have a different perspective but still share the same passion for natural resources as wildlife professionals.

### Mutual Benefits

Trappers are not new to research and have often provided assistance by securing bait, training biologists in wildlife capture techniques, providing carcasses for study, conducting animal damage control or predator removal, contributing trapper knowledge questionnaires and harvest data, and providing members to advisory councils and working groups. But these roles have often relegated trappers to the sidelines when the real research and furbearer management decisions are made.

In the wolverine study, which is not only citizen science but also citizen-initiated science, trappers were the initial catalyst and cornerstone, providing grassroots participation and colorful observations earned from years spent in the bush. In many cases, these observations have been worked into the modeling or competing hypotheses of the project. Our unique partnership used everyone's best assets: wildlife biologists coordinated the study design, analysis, reporting and overall management of the project; while trappers provided fundraising efforts, the bulk of the manpower, backcountry skills and intimate knowledge of their trapping areas.

This engagement has a number of mutual benefits for all stakeholders as well as the research program, and ultimately wolverine conservation. Some of these benefits for trappers include learning about the scientific process and new technology and developing increased trust in wildlife research. They also develop a sense of ownership and pride while collecting data to inform wildlife management. Biologists benefit from becoming familiar with the motives and value system of trappers and other people who work close to the land, thereby improving mutual understanding and respect. Overall, the project itself helps promote the positive values of furbearers and trappers to the general public and contributes to the maintenance of social licence for this natural resource industry.

In addition to these intangible benefits, the tangible benefits of working with trappers have exceeded our expectations. With their help, we have increased our boots on the ground, which allowed us to expand the study area, access remote areas in winter, acquire hundreds of beavers as bait and stretch out our budget. Last winter, we collected 148,000 camera trap images, with trappers operating 83 percent of the sites. We will be using the data to determine wolverine occupancy across a gradient of climate, disturbance and land cover variables.

### Engage Your Stakeholders

Our project is just one example of the value of collaborative efforts in wildlife conservation. Nowadays, stakeholder involvement has become an increasingly important tool in wildlife (Decker et al. 2001) and fisheries (Hartley and Robertson 2006) management.

Making the connection from research to management is always a challenge; but we have learned that important components of a stakeholder engagement program are built on simplicity, communication and longevity. Convincing trappers that their data will be used to influence management is the next step, which will be tested when Alberta wildlife officials re-assess the status of wolverines.

It is important to mention that communication has been the glue that has held the project together. Our initial partnership established a common ground that relied on the strengths of all stakeholders and shared language and terminology. We tried to keep our field protocol rigorous, yet simple and easy to follow to ensure consistency. Monthly conference calls and biannual

▼ Trappers and biologists work side-by-side during the wolverine partnership program designed to collect important baseline data that will contribute to an update of Alberta's wolverine status assessment in the future.



Credit: Shevenell Webb



face-to-face meetings with the project leadership team, which includes members of the trapper's association, also helped keep communication lines open. We check in monthly by phone or email with volunteers during the winter and visit trappers at least once during the field season to inspect run poles, travel the trapper's trails and stay overnight in remote cabins.

However, communication also involves listening to complaints. One of the biggest criticisms we've received from trappers is that researchers fail to communicate the results altogether or that the results from a study are unclear. Many researchers who have interacted with trappers are graduate students who come and go and may be under pressure to publish in peer-reviewed journals but overlook more accessible popular publications. We took extra steps to make sure that the trappers involved in the study received results on a regular basis and in several different forms. One type of information trappers seem to enjoy most is a simple spreadsheet of identified, individual wolverines, other species that visited their sites and unique photos of the animals. Our regular communications also include articles about the results in trappers' magazines, a quarterly project newsletter, and report summaries and presentations at local trapper meetings throughout the year.

### A Durable Solution

Some of the most successful citizen science initiatives — such as the Christmas Bird Counts conducted across North America by hundreds of volunteer birders — have been around for many years. For the data to be meaningful over a long period of time, it's important to have the large sample sizes that this type of effort produces. Yet, the challenge of a limited budget is a real constraint for most scientists and likely the reason so many short-term studies are conducted on wildlife.

Designing sustainable and long-lasting research programs is a challenge, but having additional manpower can help researchers achieve that goal. We have been fortunate in our study to secure sufficient financial resources at the project's start to purchase camera equipment and construct the baited camera stations. The commitment of trappers to set up and maintain these sites over the winter and their additional fundraising efforts to supplement the expenses associated with the study have far exceeded our expectations.




Credit: Shevenell Webb

◀ Trappers have always supported research by way of training, harvest data, questionnaires and bait. Communicating results in popular wildlife magazines and newsletters as well as at trapper meetings helps support stakeholder involvement in the research and develops mutual respect.


From our experience on this project, we believe engaging trappers in studies involving furbearing species is a win-win situation. Not only do we anticipate that the expanded data collection will lead to improved wolverine management decisions in the future, but also that it will help make decisions that trappers support because they were a part of the process.

Even though researchers may be wary of involving citizen groups that may not seem like compatible partners, we encourage wildlife biologists to reach out to stakeholders and to be receptive of those who want to contribute to data collection. Just as we found, you may discover you have more in common with these stakeholders than you thought. The result is likely to be a research study with more robust data collection and better wildlife management and conservation decisions for the species being studied. ■


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Credit: Felicia Kasprzak



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