

**Alberta Conservation Association**  
**2021/22 Project Summary Report**

**Project Name:** Furbearer Trends

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**Primary ACA staff on project:** Robert Anderson and Mike Jokinen

**Partnerships**

Alberta Environment and Parks

Alberta Trappers' Association

Lethbridge College

**Key Findings**

- Trappers submitted a total of 153 logbooks from the 2020/21 trapping season (down by 26% from the previous year).
- On average, trappers set 25 traps for about 37 days and harvested eight marten. The average catch-per-unit-effort was 0.79 marten per 100 trap nights ( $SE = 0.07$ ), which would be equivalent to setting 18 traps for a week and catching one marten.
- Although provincial marten fur production declined from 2018 to 2021, logbook data showed that the catch rate for a given amount of effort did not decline over that time. This highlights the value of logbook information, collected over a series of years.
- We continue to collaborate with the Lethbridge College on creating 3D images of trapper-provided marten heads. The realistic examples will be used in trapper education initiatives to demonstrate how to accurately identify marten to age class (adult or juvenile).
- When we analyzed trail camera data from the Boreal Forest Natural Region, we found a negative relationship between marten presence at a site and the amount of conifer forest in the surrounding area, opposite to what we expected based on the scientific literature.

## **Abstract**

Alberta Environment and Parks and Alberta Trappers' Association asked ACA to assist with the development of logbooks for trappers to record information about their activities and fur harvesting results. After revisions to the initial logbook and a concerted communication effort with trappers, the number of logbooks submitted increased substantially over a series of years, providing an adequate sample to track trends over time at the province and natural region levels. Since 2017/18, the logbook entries have focused on marten harvest and effort. During the 2020/21 trapping season, despite a continued decline in the export of marten pelts from the province, marten catch for an equivalent amount of effort remained similar to previous years at 0.79 marten per 100 trap nights. The number of logbook submissions dropped 26% in 2020/21 when compared to the previous year. We hope to expand logbook program participation as the information provides valuable insight into patterns of furbearer harvest and population indices.

## **Introduction**

In 2014, Alberta Trappers' Association (ATA) developed a detailed logbook for volunteer trappers to record trapping activities and species harvest, which will help to track population trends over time. Starting in 2017, Alberta Conservation Association (ACA) began working alongside ATA to continually improve their data collection and analysis process each year. Beginning with the 2017/18 season, logbook entries have focused on marten given their universality, widespread distribution, and a harvest pattern that is uncomplicated by a set quota. ATA adopted a method for trappers to determine the age class of marten based on size of the temporal muscles of the skull (Magoun et al. 1988; Flynn and Schumacher 2016). We are assisting trappers with testing the accuracy of this method as applied by a diverse citizen science group. The four quota species in Alberta (i.e., fisher, lynx, otter, and wolverine) were added to the logbooks in 2019/20, to collect the data necessary to potentially expand the analysis of population trends to these species. We also continue to use data collected during the wolverine project to explore habitat associations for marten, fisher, lynx, and wolverine.

## Methods

Data collected with the logbook included location (Registered Fur Management Area [RFMA] number), contact information, and an estimate of the number of hours spent conducting trapline-related activities each month. One logbook was submitted per trapline. Trappers were also asked to document their harvested marten by gender (male/female) and age (juvenile/adult) using the skull muscle method (Magoun et al. 1988; Flynn and Schumacher 2016), as well as their trapping effort by providing an estimate of the average number of traps set at any given time and the average length of time (days) that those traps would remain set. Harvest information was used to calculate ratios of males to females and juveniles to adult females in the harvest. From the estimate of trap nights (number of traps set multiplied by number of days set), we calculated a catch-per-unit-effort (CPUE; number of marten caught per 100 trap nights) for each trapper. Results were summarized at the provincial, natural region, and fur management zone (FMZ) levels. Quota species (fisher, lynx, otter, and wolverine) data collection followed a similar method to marten; however, age class information was not collected for quota species.

A sample of marten heads was collected from trappers in 2020 to use as part of a training initiative focused on using the skull muscle method. The Centre for Teaching, Learning and Innovation at Lethbridge College kindly offered to create 3D models from these marten heads. The 3D models will ultimately be used in future trapper education initiatives, since age class (adult versus juvenile) of marten can be determined by observing the degree of muscle coalescence on top of their heads once they are skinned by the trapper.

We used data from trail cameras (collected between 2011 and 2016 as part of the wolverine citizen science project) to examine species-habitat and co-occurrence patterns for wolverine, fisher, marten, and lynx in the Boreal Forest Natural Region of Alberta. We used statistical models to investigate how landcover type (conifer, deciduous, and mixedwood forest), forest harvest history, climate, and human disturbance in the surrounding area (1,500 m and 5,000 m) was related to the pattern of where we detected each species. We then looked to see if this pattern was associated with the presence of each of the other species or the common prey species (squirrels, grouse, and snowshoe hares).

## Results

We received a total of 153 logbooks by July 31, 2021, from the 2020/21 trapping season (Figure 1).

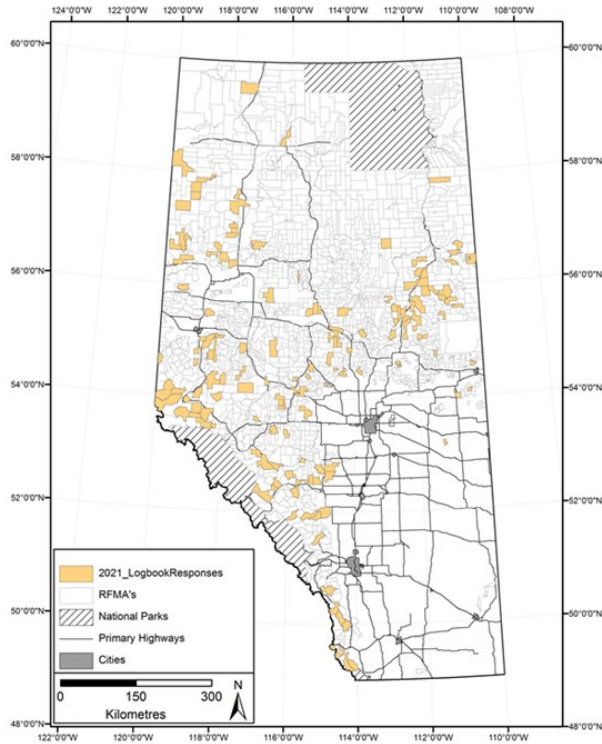


Figure 1. The spatial distribution of logbooks provided robust marten data for the 2020/21 trapping season at the provincial scale. The greatest number of logbooks came from FMZ 4.

The mean monthly time spent on trapping activities by logbook participants ranged from 12 hours in July to 87 hours in December, with a combined annual average of 480 hours spent per trapline on all trapping-related activities in 2020/21. For the trappers participating in the logbook initiative, the total hours spent conducting trapping-related activities has remained relatively consistent among years (Figure 2). The voluntary logbook program captures data from a dedicated group of active ATA members. As such, this sample may not accurately reflect trapping effort across all registered traplines. Activity peaked each year during December when trapline access is good and most pelts reach prime condition.

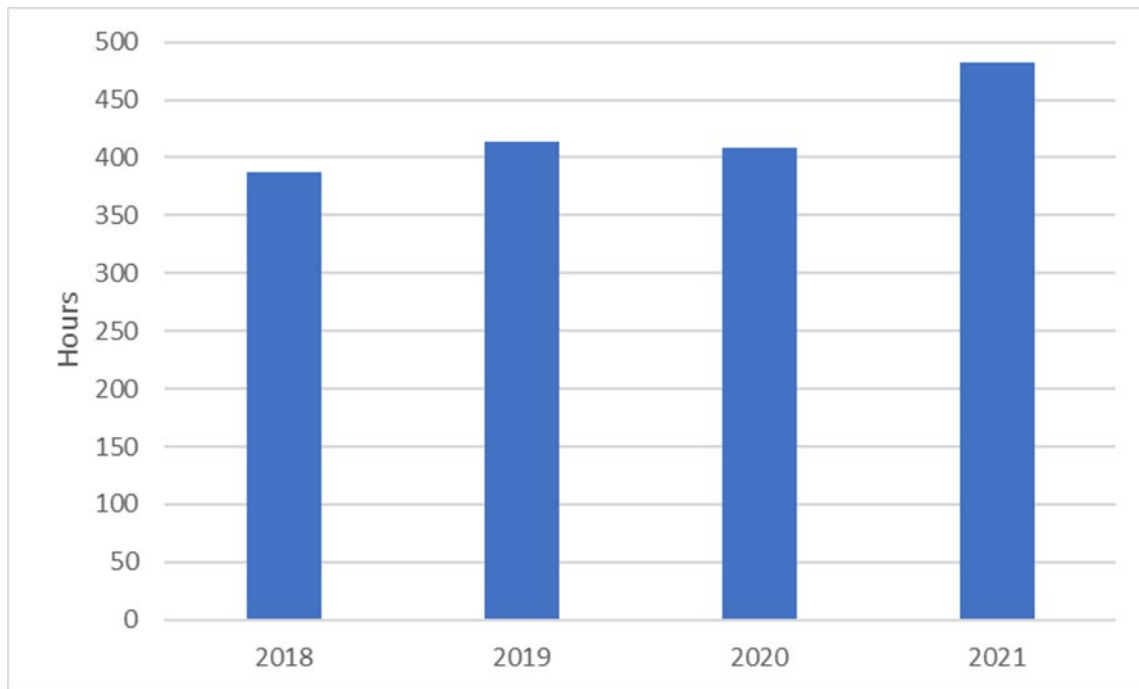


Figure 2. Average total hours spent per logbook participant on all trapping-related activities from 2017/18 to 2020/21.

Based on the past four years of logbook data, we observed the marten catch rate across the province for an equivalent amount of effort has stayed consistent or increased slightly (Figure 3). The level of precision at the provincial scale met standard wildlife monitoring objectives ( $\pm 20\%$  at a 90% confidence interval). However, due to sample size limitations, the variation associated with dividing the data into natural regions and FMZs produced a lower level of precision. At current levels, we cannot reliably detect changes over time for all natural regions or FMZs.

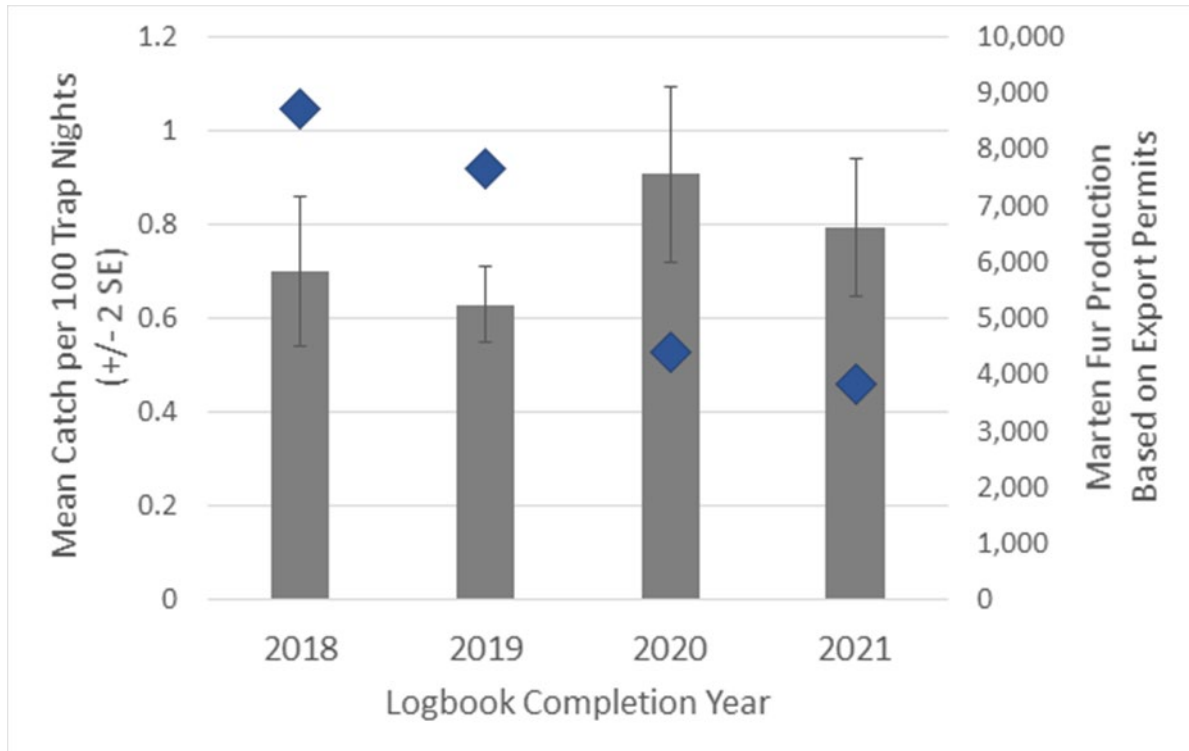


Figure 3. Provincial marten fur production (blue diamonds) has declined from 2018 to 2021, but the catch rate for an equivalent amount of trapping effort (grey bars) has remained consistent.

On average, it took about 126 trap nights per marten harvest in 2020/21 (Mean CPUE of 0.79, 90% confidence interval [CI] = 0.67–0.91, and standard error [SE] = 0.07). That is under the four-year average of 132 trap nights per harvest. For comparison, that would be equivalent to setting 18 traps for a week and catching one marten.

RFMAs within the Foothills and Rocky Mountain natural regions had a similar average CPUE: both were higher than the Boreal Forest Natural Region (Figure 4). The Rocky Mountains, which had the lowest number of logbooks, had the most uncertainty associated with its average.

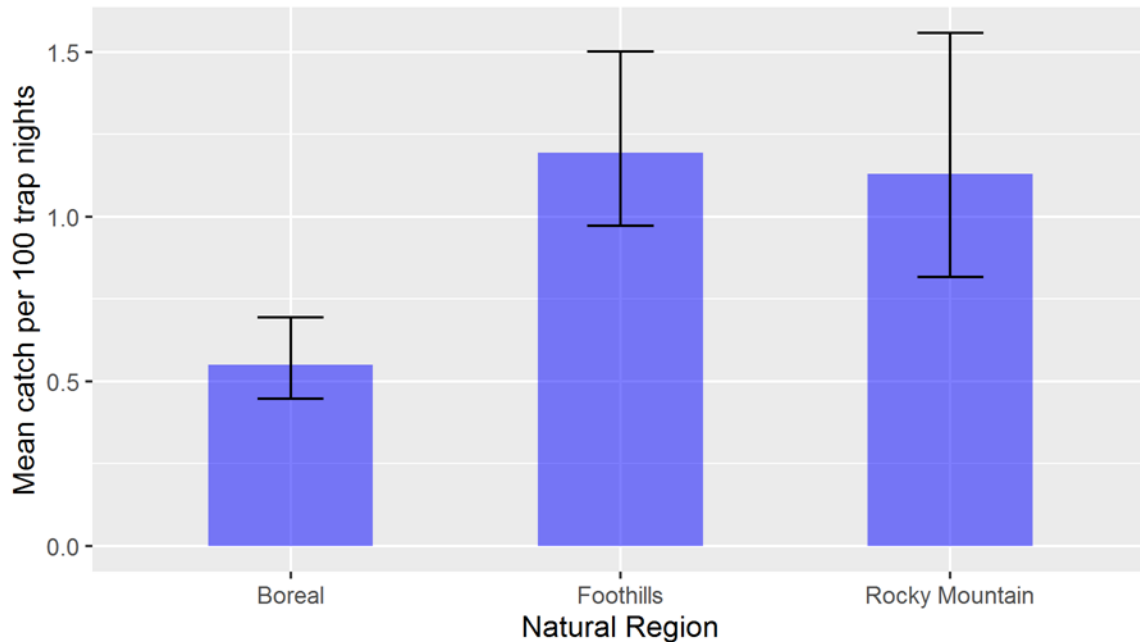


Figure 4. Average marten CPUE (mean  $\pm$  90% confidence interval) in each natural region during the 2020/21 trapping season.

Through previous logbook comments and follow-up meetings, trappers expressed their interest in providing multi-species information; therefore, beginning in 2019/20 the logbooks included quota species (fisher, lynx, otter, and wolverine) as well as marten. Naturally, these species are not as abundant or widespread as marten, and we understood it would be a challenge to gain a large enough sample size, but the number of logbooks that contain lynx data is encouraging ( $n = 94$ ). Of the 94 logbook participants who set lynx traps, 77 reported harvesting at least one lynx (average of four per trapline). On average this year, it took about 136 trap nights per lynx harvest (Mean CPUE of 0.73, 90% CI = 0.62–0.89, and SE = 0.08). The level of precision at the provincial scale met the target; however, due to sample size limitations, precision declined at the natural region level (Figure 5).

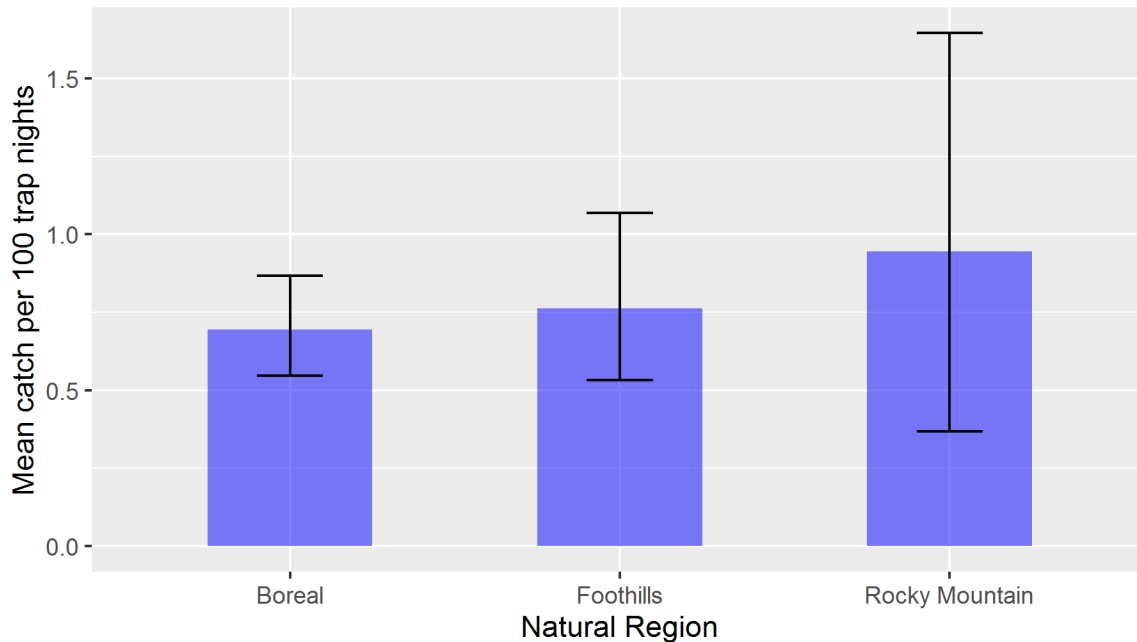


Figure 5. Average lynx CPUE (mean +/- 90% confidence interval) in each natural region during the 2020/21 trapping season.

A total of 68 participants set traps for fisher while 54 harvested one or more. The average across all participating trappers was two fishers per RFMA (taking an average of 312 trap nights per fisher harvest). Sample sizes for otter and wolverine were too low and likely will remain that way as they are not as widespread and numerous. Logbooks from 25 RFMAs reported harvesting otter, while nine reported harvesting wolverine. If enough trappers continue to report their activities, the winter of 2021/22 will give us three years of data to investigate quota species trends at the provincial level.

To acquire suitable images for 3D processing (images without shadows), we used a photo light box and captured 50 – 60 images of each marten head, taking images at all angles and turning the head slightly each time. All 60 images are then processed using Agisoft Metashape photogrammetry software, resulting in a single 3D image/model. We will have twenty 3D models in total, ten of each sex with varied examples of muscle coalescence for each. We have started loading completed 3D models onto an online platform called Sketchfab, where anyone will have online access to them. This initiative is still a work in progress as restrictions during the COVID-19 pandemic has impacted its completion.



Analysis of trail camera data revealed a negative relationship in the Boreal Forest Natural Region between the average annual temperature expected at a site and wolverine occurrence. This is similar to what we learned from trapper local ecological knowledge collected at the beginning of the project (Webb et al. 2019). Additionally, both lynx and prey presence were significant predictors of wolverine occurrence. In a similar fashion, lynx occurrence was best explained by the presence of wolverines and the common prey species. Surprisingly, marten were negatively associated with the amount of conifer in the surrounding area. They were positively associated with expected snow depth. Fisher were more likely to be found at sites that had a warmer average annual temperature. The only species whose presence showed a relationship with forest harvest history in the surrounding landscape was wolverine. Wolverines were less likely to be detected as the amount of intermediate-aged cutblocks (11 to 25 years old) increased.

## **Conclusions**

Logbook participation level has allowed us to follow marten trends at the provincial level and within the Boreal Forest Natural Region. We still need to increase sample size before we can consider all marten indices at the FMZ level. Producing robust estimates for quota species will require even greater logbook participation by RFMA trappers. We would like to see 300 or more logbooks submitted per year. We determined that a target of 300 logbooks would be enough to split the marten data into FMZs if they are distributed well across the province, and most of these logbook participants harvest a variety of sex and age classes. A few years ago, we were progressing toward that target, going from 10 to 214 logbooks submitted between 2017 and 2019. However, in 2020, the total dropped to 208 logbooks submitted; and in 2021, only 153 logbooks were submitted. If we want to continue having good information to track furbearer trends, we need to increase logbook submissions significantly.

To this point, we have not seen anything in the data at the provincial or natural region level that causes us concern in terms of harvest sustainability for marten. In the absence of any other data, a decline of 56% in marten fur exports from 2017/18 to 2020/21 (AEP 2021) could have been cause for concern. However, our estimate of catch per one hundred trap nights has not declined over that same period, suggesting that factors beyond population size may have resulted in the declining number of exported pelts. This demonstrates the value of collecting logbook data over

the long term. In the future, combining demographic information of harvested marten with trapping effort should allow us to conduct population and trend monitoring. We may never reach a large enough sample size for the quota species to analyze data beyond the provincial level but having an estimate of effort for each species is key to begin interpreting species-specific fluctuation over time.

Data collected during the wolverine project have proven valuable for investigating questions about habitat associations for a variety of furbearer species. We will continue to make use of this resource to answer additional questions over the coming year.

## **Communications**

### *Presentations*

- ATA AGM, September 2021, logbook highlights from 2020/21.
- ATA local chapter meetings (online): West Country Trappers (September 2021); Calgary, AB (December 2021).

### *Other*

- *Trapline* newsletter highlighting project progress in November 2021 and March 2022.
- Individual trapper summaries were sent to all those who submitted a logbook by the deadline.

## Literature Cited

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- Magoun, A.J., R.M. Gronquist, and D.J. Reed. 1988. *Development of a field technique for sexing and aging marten*. Alaska Department of Fish and Game. Final report.
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## Photos



Photo 1. Spending time with trappers on their lines is an important part of building the relationships that foster co-designed citizen science projects. Here, ACA biologist, Mike Jokinen, discusses marten habitat with ATA member, Darcy Chambers, on a trapline. Photo: Robert Anderson



Photo 2. Local knowledge from trappers has taught us a lot about wolverine habitat associations. And now, trapper local knowledge is causing us to reconsider our ideas about what makes for good marten habitat in Alberta. Photo: Robert Anderson



Photo 3. A variety of trapping boxes sit ready for the coming season. Although the amount of marten trapping effort has declined in recent years, trappers that participated in the logbook program had similar productivity for an equivalent amount of effort.

Photo: Robert Anderson