Alberta Conservation Association

2022/23 Project Summary Report

Project Name: Furbearer Trends

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Partnerships

Alberta Environment and Protected Areas
Alberta Trappers Association
Lethbridge College

Key Findings

- Trappers submitted a total of 166 logbooks from the 2021/22 trapping season (up by 13 logbooks from the previous year).
- On average, trappers set 29 marten traps for about 49 days and harvested eight animals. The average catch-per-unit-effort was 0.85 marten per 100 trap nights (standard error [SE] = 0.11), which would be equivalent to setting approximately 17 traps for a week and catching one marten.
- Although provincial marten fur production declined from 2018 to 2022, 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.
- Lethbridge College completed 3D image processing 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). The premolars of these marten were used to obtain an exact age for each individual model.

Abstract

The Government of Alberta and Alberta Trappers Association (ATA) asked Alberta Conservation Association (ACA) to assist with the development of a logbook for trappers to record information about their activities and fur harvesting results. This resource-user-derived information provides an opportunity to track furbearer population trends over time at the provincial and natural region levels. The 2021/22 trapping season marked the fifth year of marten data collection and the third year for quota species (fisher, lynx, wolverine, and otter). During the 2021/22 trapping season, despite a continued low number of marten pelts being exported from the province, marten catch for an equivalent amount of effort remained similar to previous years at 0.85 marten per 100 trap nights. The number of logbook submissions increased by 13 logbooks in 2021/22 when compared to the previous year. This is a step in the right direction; however, we hope to expand logbook program participation as the information provides valuable insight into patterns of furbearer harvest and population indices. New logbook-related training resources are being developed for project participants and the format will continue to be adapted to maximize the value of the information for wildlife managers and trappers.

Introduction

In 2014, in collaboration with the Government of Alberta, Alberta Trappers Association (ATA) developed a detailed logbook for volunteer trappers to record trapping activities and species harvest. In 2017, Alberta Conservation Association (ACA) was invited to work alongside ATA to help continually improve their data collection and analysis process each year. We began focusing on marten data during the 2017/18 trapping season 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). Age class of harvested animals, when combined with harvest effort information, can be valuable for modelling population change over time (Skalski et al. 2011, Clawson et al. 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. In

2021/22, we included wolf trapping information in the logbook as part of ATA's wolf management program. Through the logbook program, Alberta's trappers are providing valuable information on furbearer populations within the province.

Methods

One logbook was submitted per trapline (Registered Fur Management Area [RFMA]). For each RFMA, we asked for an estimate of the number of hours spent conducting trapline-related activities each month. 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 marten traps set at any given time and the average length of time (days) that those traps would remain set. We used harvest information 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 RFMA. We summarized the results at the provincial, natural region, and fur management zone (FMZ) levels. Quota species (fisher, lynx, otter, and wolverine) and wolf data collection followed a similar method to marten; however, we did not collect age class information for quota species in 2021/22.

We collected a sample of marten heads from trappers in 2020 to use as part of a training initiative focused on aging marten 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 trapper education initiatives to demonstrate how to use the degree of muscle coalescence on top of the head to determine an animal's age class once it has been skinned. We also pulled teeth from these skull samples and had them analyzed to provide a lab-based age estimate for comparison.

Results

We received a total of 166 logbooks by July 31, 2022, from the 2021/22 trapping season (Figure 1).

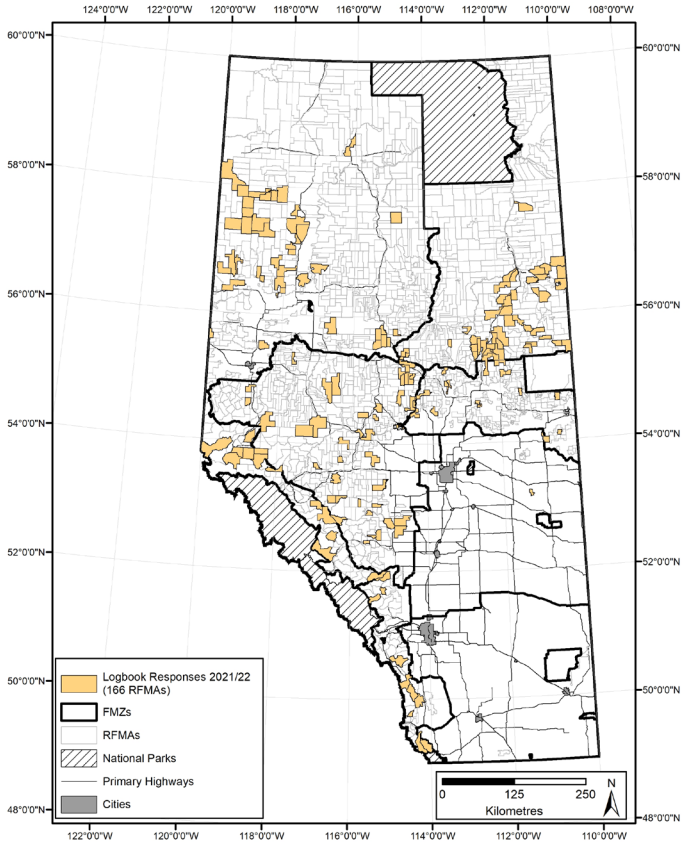

Figure 1. The number of logbooks submitted provided robust marten data for the 2021/22 trapping season at the provincial scale. A similar number of logbooks came from fur management zones 1, 2, and 4.

The mean monthly time spent on trapping activities by logbook participants ranged from eight hours in June to 74 hours in December, with a combined annual average of 396 hours spent per trapline on all trapping-related activities in 2021/22. For the trappers participating in the logbook initiative, the total hours spent conducting trapping-related activities has remained relatively consistent among years (Figure 2), with the greatest deviation from the five-year average (approximately 15% higher) occurring during 2020/21, which was the first trapping season to take place during the COVID-19 pandemic. 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.

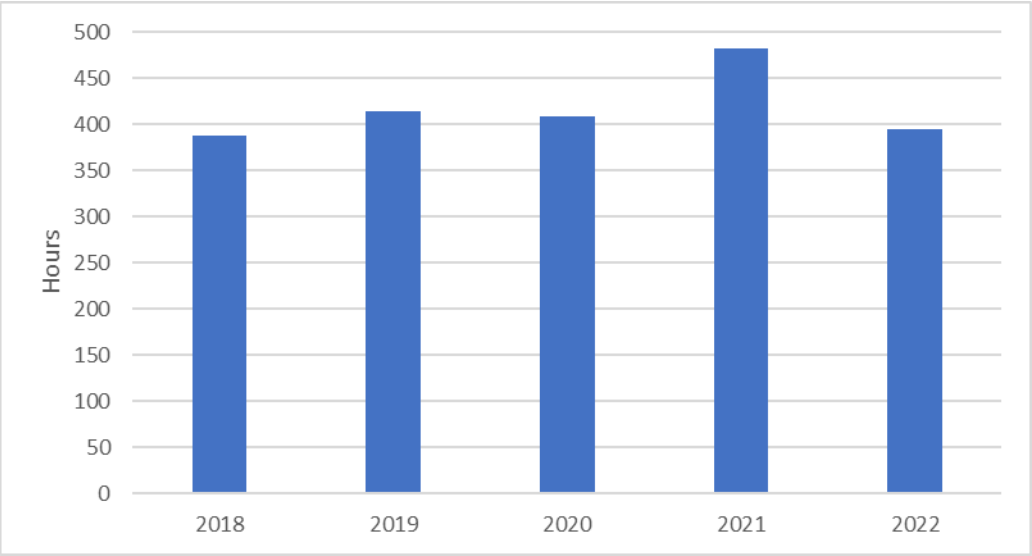

Figure 2. Average total hours spent per logbook participant on all trapping-related activities from the 2017/18 to 2021/22 trapping seasons.

In all, 135 trappers submitted information on their marten trapping effort and harvest in 2021/22. Based on the past five years of logbook data, the marten catch rate across the province for an equivalent amount of effort has stayed consistent or increased slightly (Figure 3). We were satisfied with the level of precision at the provincial scale to meet wildlife monitoring objectives. 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.

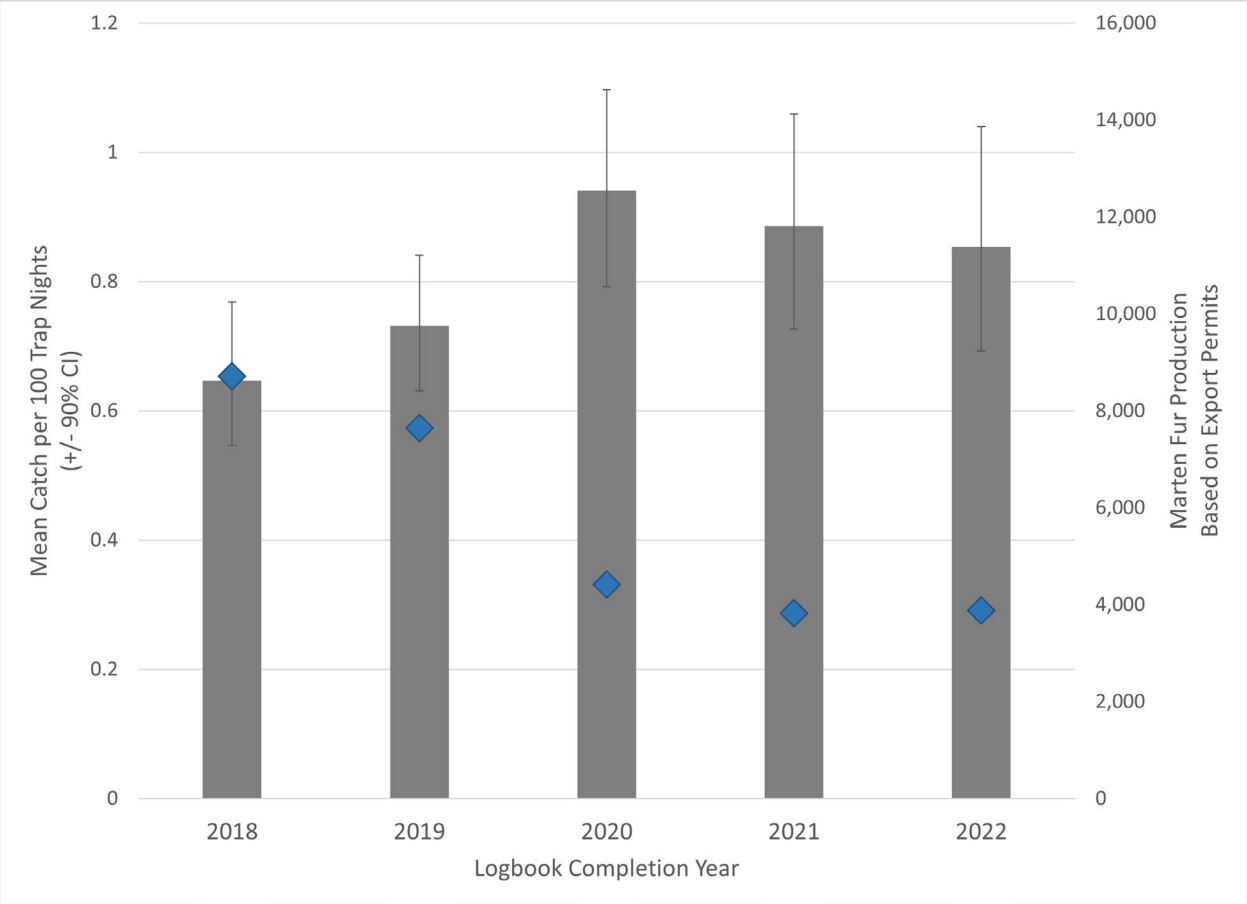

Figure 3. Provincial marten fur production (blue diamonds; AEP 2022) has declined from 2017/18 to 2021/22, but the catch rate for an equivalent amount of trapping effort (grey bars) has remained consistent or increased slightly.

On average, it took about 117 trap nights per marten harvest in 2021/22 (mean CPUE of 0.85 marten per 100 trap nights, 90% confidence interval [CI] = 0.69–1.04, and standard error [SE] = 0.11). That is under the five-year provincial average of 125 trap nights per harvest. For comparison, that would be equivalent to setting 17 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).

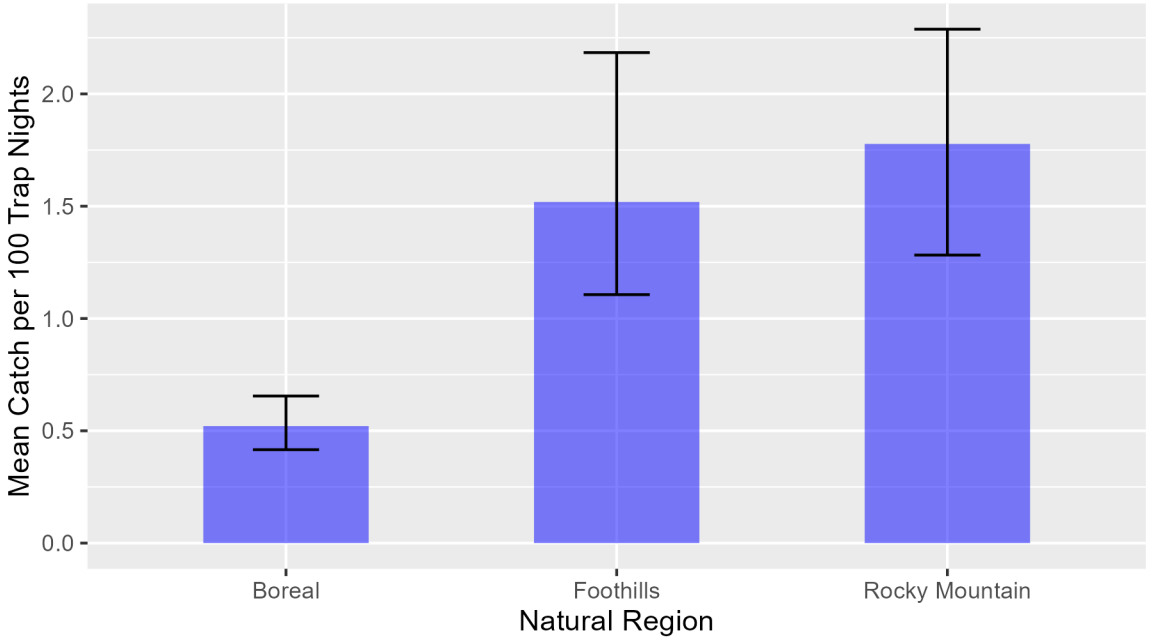

Figure 4. Average marten CPUE (mean +/- 90% confidence interval) in each natural region during the 2021/22 trapping season.

Of the 102 logbook participants who set lynx traps and reported their harvest, 82 caught at least one lynx (average of just under four per trapline) in 2021/22. On average, it took about 130 trap nights per lynx harvest in 2021/22 (mean CPUE of 0.77 lynx per 100 trap nights, 90% CI = 0.57–1.0, and SE = 0.13). Although the level of precision for CPUE at the provincial scale showed promise, we would like to improve on it going forward. We are keen to see if we can track a population cycle for this naturally fluctuating species, particularly in the Boreal Forest Natural Region (Figure 5) where we have the greatest sample size.

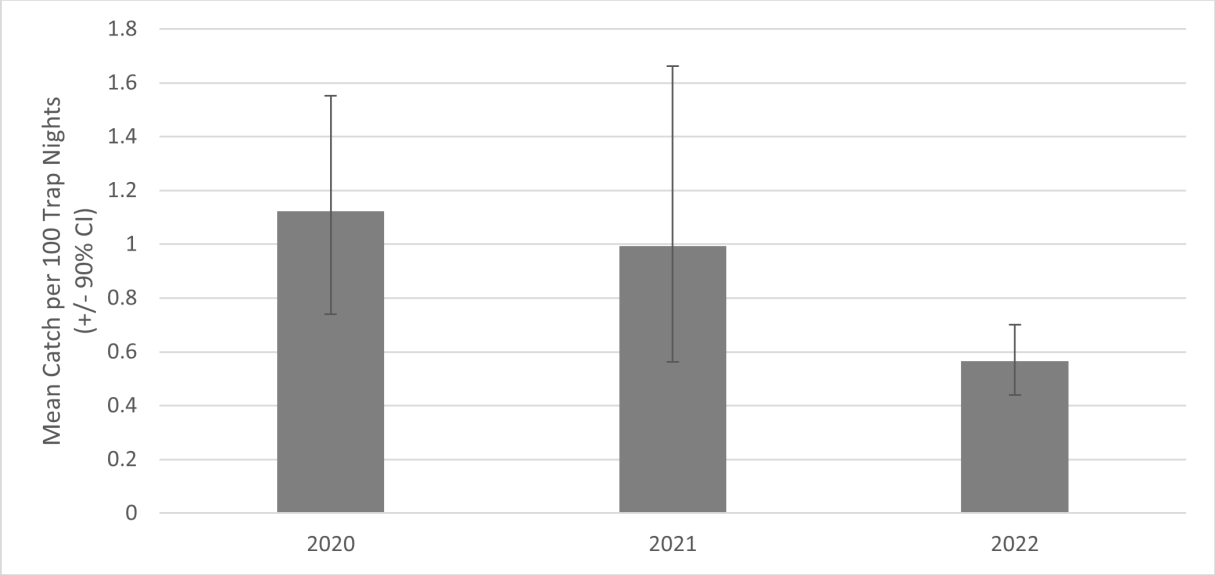

Figure 5. Lynx harvest rate for an equivalent amount of trapping effort in the Boreal Forest Natural Region, from the 2019/20 to 2021/22 trapping seasons.

A total of 86 participants set traps and reported their harvest for fisher from the 2021/22 season, while 70 of them harvested one or more. The average across all participating trappers was two fishers per RFMA in 2021/22, taking an average of 182 trap nights per fisher harvest. Sample sizes for otter and wolverine were too low to confidently track change in CPUE over time and likely will remain that way as they are not as widespread and numerous. Logbooks from 21 RFMAs reported harvesting otter, while 11 reported harvesting wolverines. However, a larger number of trappers did provide their perspective on population numbers and trend for these species based on local knowledge from their traplines, which could prove useful as an early indicator of population change. If enough trappers continue to report their activities, the winter of 2022/23 will give us four 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 were then processed using Agisoft Metashape photogrammetry software, resulting in a single 3D image/model. We have twenty 3D models in total, ten of each sex with varied examples of muscle coalescence for each. We have loaded the completed 3D models onto an online platform called Sketchfab, where anyone will have online access to them. A premolar was collected from each marten. These teeth were aged by a lab

using the cementum annuli technique (Matson's Laboratory 2023). Cementum is a calcified substance deposited on the roots of teeth and the layers produce annual rings like those in trees.

Conclusions

Logbook participation level has allowed us to follow marten trends at the provincial level and within the Boreal Forest Natural Region. We will need to increase sample size before we can consider all marten indices at the FMZ level. To this point, we have not seen trends in the provincial marten data that cause concern in terms of harvest sustainability. On its own, a decline of 55% in the provincial marten fur production index from 2017/18 to 2021/22 (AEP 2022) could have been worrying; however, our estimate of catch per 100 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. With time, we anticipate that harvest and trapping effort data for quota species will also prove valuable for population monitoring.

Communications

Presentations

- ATA AGM, September 2022, logbook highlights from 2021/22.

Other

- Individual trapper summaries were sent to all those who submitted a logbook by the deadline.

Literature Cited

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Photos

Not applicable