

Alberta Conservation Association
2022/23 Project Summary Report

Project Name: Forest Grouse Monitoring Initiative

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Partnerships

Alberta Environment and Protected Areas

Alberta Trappers Association

Key Findings

- We summarized harvest data provided voluntarily by hunters pursuing spruce grouse from 2015 to 2021, who reported an average annual harvest of 6,127 birds by an average of 2,622 hunters per year over the seven-year period. We do not know the total number of individuals who hunted spruce grouse over this period, or the total number of grouse harvested.
- Voluntary-based harvest reports provide less information compared to mandatory reports, and these voluntary reports for game birds in Alberta lack the utility to detect meaningful trends as collected. Mandatory reporting by species would increase the utility of harvest reports for detecting trends for spruce grouse and other game birds.

Abstract

There is concern that spruce grouse (*Falcipennis canadensis*, *Canachites canadensis*) numbers may be trending lower in some areas of Alberta, although the information to validate this assumption is lacking. Alberta Environment and Protected Areas (EPA) asked Alberta Conservation Association (ACA) to develop an approach for gaining a better understanding of grouse trends over space and time. We began the effort in 2021 with three main tasks: 1) we summarized spruce grouse harvest data from 2015 to 2021 to better understand hunter success

spatially and among years; 2) we asked trappers to provide their insight on spruce grouse numbers using a brief survey to help detect problem areas for grouse; and 3) we trialled a methodology to detect occupancy based on the presence/absence of spruce grouse pellets. This method to detect grouse occupancy is viable, although it is very time consuming and logistically expensive. The data derived from voluntary hunter harvest reports are problematic for several reasons, especially for game birds where a specific species licence is not required in Alberta: 1) the total number of hunters pursuing spruce grouse and the total number of harvested birds within Alberta is not known, 2) it appears that at least some hunters struggle to differentiate spruce grouse from other grouse species within Alberta, and 3) it is likely that many hunters that pursue spruce grouse do so while primarily hunting other species, and therefore harvest metrics that factor in hunter effort may not be a reliable means of detecting trends.

From 2015 to 2021, the reported average annual harvest of spruce grouse was 6,127 birds taken by an average of 2,622 hunters, although we do not know the total number of hunters or the total harvest per year. From 2015 to 2019, spruce grouse harvest and hunter numbers were stable to increasing as suggested through voluntary reports; however, in 2020 and 2021, the number of voluntary reports decreased as did the reported number of spruce grouse harvested. It is not clear if these declines represent a decrease in those pursuing spruce grouse, a real decrease in harvest, or simply a decrease in the number of hunters willing to fill out the voluntary report.

Hunter harvest reporting systems can be extremely cost-effective tools for tracking population trends over time. Voluntary-based harvest reports provide less information compared to mandatory reports, and in the case of voluntary reports for game birds in Alberta, the reported data lacks the utility to detect meaningful trends for spruce grouse spatially and temporally. Mandatory reporting by species would increase the utility of harvest reports for detecting trends with game birds. This approach would track harvest and effort more accurately and provide an early warning indicator if grouse numbers are trending dangerously low over time in a particular geographic area. Moreover, these reports would provide much greater utility if hunters identified each bird harvested to species, as well as to sex and age class (young of year vs. adult).

Introduction

The spruce grouse (*Falcipennis canadensis*, *Canachites canadensis*) is one of seven resident game birds available for harvest in Alberta under the general Game Bird Licence. An Alberta Game Bird Licence allows an individual to hunt grouse (spruce, ruffed, blue [dusky], and sharp-tailed grouse), grey partridge, or ptarmigan (white-tailed and willow) with a daily limit of five for each species, except ptarmigan which has a combined daily limit of five birds. A Game Bird Licence is required to pursue any game bird within Alberta, including those with a separate species licence (e.g., turkey and pheasant), as well as migratory birds that also require a federal migratory Game Bird Licence. Hunters obtaining the general Game Bird Licence do not have to specify which species they intend to hunt, nor are they required to report which species they have harvested over a given season.

In general, the upland game bird season is long, running from early September to mid-January in most Wildlife Management Units (WMUs), except for the sharp-tailed grouse season which runs from October 1–31 in select WMUs.

There is conflicting information regarding the population trend of spruce grouse in Canada and Alberta. The Status of Birds in Canada (2019) report suggested populations had increased in Canada over the previous 30 years. Yet, spruce grouse has been identified as a priority for conservation in one or more bird conservation regions in Canada, since more than 80% of the global breeding population is located here (Status of Birds in Canada 2019). While the spruce grouse is considered *Secure* in Alberta (GoA 2017) and Canada (CESCC 2022), it has not to our knowledge been rigorously surveyed, and there is anecdotal evidence suggesting that numbers may be declining throughout the province. The Alberta Biodiversity Monitoring Institute (ABMI) reports that out of 1,126 biodiversity monitoring sites (camera traps), only nine sites detected spruce grouse, whereas ruffed grouse (*Bonasa umbellus*) were detected at 246 sites (ABMI and BAM 2019).

There is concern that spruce grouse numbers may be trending lower in Alberta, although the information to validate this assumption is lacking. We were asked by Alberta Environment and Protected Areas (EPA) to develop an approach to track their trends over time and identify areas that may be of particular concern. In the past, a subsample of Alberta game bird hunters was

surveyed randomly by direct phone contact. This involved a great deal of coordination and volunteer effort and therefore has been replaced with an online volunteer survey beginning in 2011. Since 2014/15, there have been voluntary harvest reports submitted for most WMUs in the province, although the reports do not help clarify the total number of hunters pursuing any one of the seven mentioned species. All those who purchase a Game Bird Licence are asked to fill out an online survey annually, although their participation is not mandatory and nor is the messaging personal like a phone call.

There are challenges with comparing metrics when switching survey approaches. For example, it is difficult to determine if the number of people participating through a volunteer survey remains proportional to the actual number of hunters pursuing spruce grouse from one year to the next. There may also be bias when translating metrics that involve measures of hunter effort, especially with grouse species that may be taken incidentally while pursuing other species. The volunteer survey does not clarify if hunters are primarily hunting spruce grouse, or primarily hunting big game and taking grouse as the opportunity occurs (Gregg et al. 2004). If the latter, then it is difficult to unravel the variation in grouse harvest from year to year if it is influenced by the effort hunters put toward their primary activity of hunting big game rather than grouse.

We investigated practical approaches to better understand the trend of spruce grouse across Alberta, with the intent of finding a reliable and efficient means of detecting trends over time and space. We explored the available voluntary harvest data to determine its utility for detecting trends. Volunteer harvest data do provide some useful information, although there are severe shortcomings as we discuss herein. We also trialled a field-based pellet sampling protocol in 2021 that enables an occupancy estimate of spruce grouse. This was completed last year (2021) although we briefly discuss this also.

Methods

Volunteer harvest data

During the 2022/23 fiscal year, we summarized the provincial game bird harvest data for spruce grouse. Since 2011, hunter harvest data have been submitted online; however, not until 2014/15 did hunters voluntarily supply reports with game bird harvest data for all WMUs within the province. The game bird harvest data set provides the aggregate harvest by WMU of those

hunters who voluntarily submitted their data, the number of respondents who voluntarily stated they hunted a particular species, and the number of days they reported hunting that species within a particular WMU. We summarized spruce grouse harvest data for each year from 2015 through 2021, and pooled harvests by WMU to compare harvest at the provincial scale. This information does not tell us how many people hunted spruce grouse; it only tells us how many hunters were willing to voluntarily provide this information, along with their voluntary information on harvest and WMU.

Results

Harvest summary

Approximately 50,000 hunters purchase a Game Bird Licence in Alberta each year. We do not know the portion of these licence holders that pursued spruce grouse, or any other of the seven game birds mentioned earlier.

The apparent aggregate harvest of spruce grouse shows a slight increasing slope from 2015 through 2019, with a downward trend suggested in 2020 and 2021 (Figure 1). The voluntary reports in 2021 returned a seven-year low of 2,998 spruce grouse harvested (Figure 1). The number of hunters participating in the voluntary survey was similar from 2015 to 2018, followed by a jump in participation in 2019, which then receded moderately in 2020. Participation reached a seven-year low in 2021 with 1,175 hunters completing the voluntary survey.

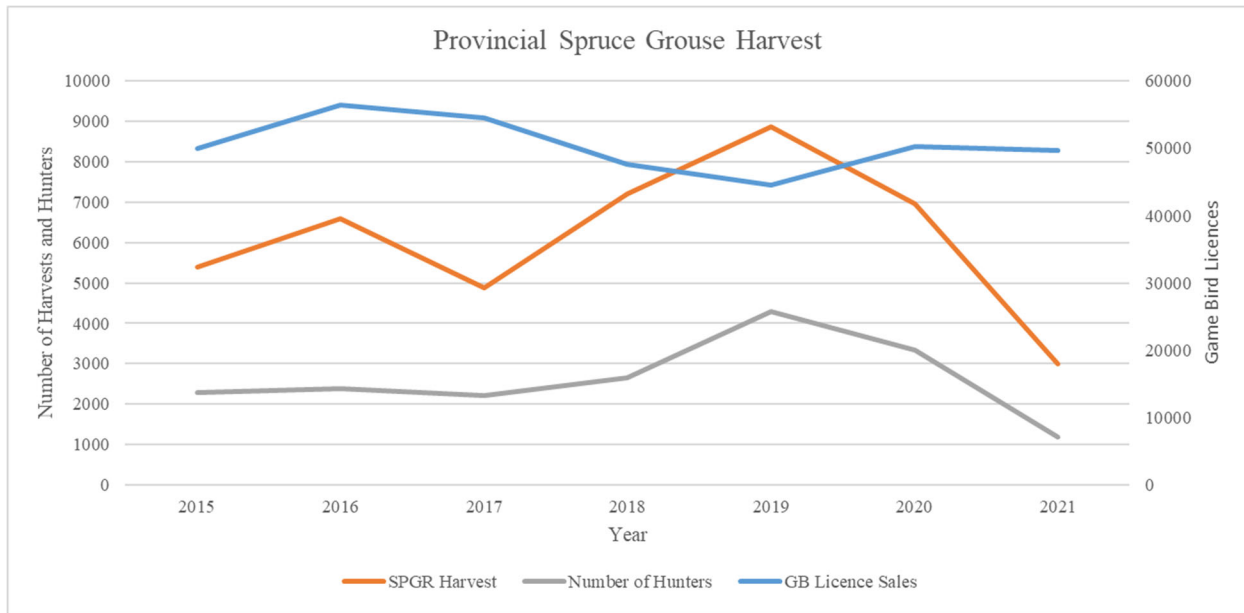


Figure 1. The aggregate harvest of spruce grouse (SPGR) across Alberta reported voluntarily by hunters from 2015 to 2021. The left axis is the number of grouse harvested and number of hunters, while the right axis is the number of Game Bird Licences sold. Game bird harvest reporting is voluntary and therefore we do not know the actual number of people that hunted spruce grouse in each year, or the total number of birds harvested. All hunters pursuing game birds are required to purchase a Game Bird Licence (GB) and these sales have remained stable over the seven-year period.

We pooled the reported spruce grouse harvests from 2015 to 2021 and mapped harvest by WMU. The rate of harvest reported through this voluntary survey varied among WMUs (Figure 2). Most prairie WMUs are very unlikely to have spruce grouse present; nonetheless, hunters indicated they harvested this species in many WMUs that lack coniferous forest habitat. Prairie WMUs were classified as low on Figure 2, whether hunters reported some degree of spruce grouse harvest or not, as the level of harvest was within the low category. We are not confident that these data are accurate and may be associated with entry errors or species misidentification (e.g., mistaking sharp-tailed grouse or ruffed grouse for spruce grouse). A small number of boreal WMUs also fell within the low category due to a lack of hunters submitting the voluntary reports, or low harvest.

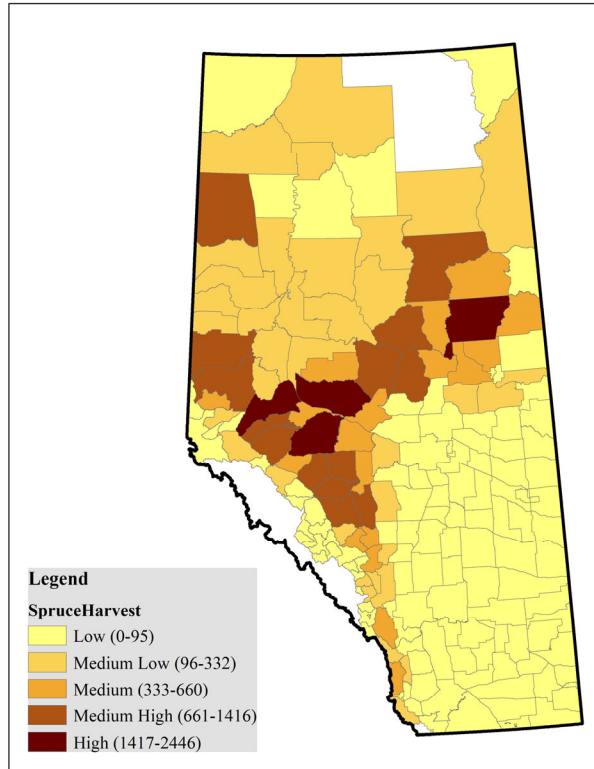


Figure 2. Total spruce grouse harvest summed for each WMU from 2015 to 2021. These data were voluntarily provided by a portion of hunters and do not necessarily reflect all those that hunted spruce grouse during this period.

The average annual harvest was 6,127 spruce grouse (range 2,998–8,856) over seven years (2015 through 2021) and were taken by an average of 2,622 hunters (range 1,175–4,301) who were willing to voluntarily report this information through the online process. However, we do not know the actual number of hunters who pursued spruce grouse each year nor the actual total harvest figure. The aggregate number of days hunting spruce grouse each year averaged 18,072 days, which is approximately seven days per hunter per season. WMUs with the greatest harvest counts ranged from 300 to 500 spruce grouse taken per season in 2020. However, in 2021, these same WMUs had fewer hunters reporting, and as a result, spruce grouse harvest was also down. We recognize that the harvest data contain errors and we do not know actual harvest of spruce grouse in any given year. Moreover, hunters volunteering this information may not be consistent from year to year and fluctuations in harvest may not reflect actual trends.

Conclusions

Understanding forest grouse population trends is quite complex and voluntary harvest numbers can be misleading if not calibrated with other data sources. Several factors can influence spruce grouse harvest data, such as the number of hunters in each WMU, the number of days hunted, the total area covered, the proximity to an urban centre, or even a hunter's experience in hunting grouse. Moreover, if harvest commonly occurs while a hunter is primarily pursuing a different species (e.g., moose, or even other grouse species), then annual differences in the total harvest and the total number of hunters engaged with spruce grouse may be more influenced by the availability of the primary species being hunted. In the case of spruce grouse, areas with greater harvest may be driven by the number of big game hunters on the landscape. It is possible that most spruce grouse are harvested as opportunistic events while hunting big game or targeting ruffed grouse.

In 2021, about 3,000 spruce grouse harvests were voluntarily reported by 1,200 hunters; in comparison, approximately 14,000 ruffed grouse were harvested by 3,700 hunters who voluntarily reported this information. In 2020, 61,000 ruffed grouse were harvested by 19,000 hunters. There was a noticeable decline in both spruce and ruffed grouse harvest and hunters reporting between 2020 and 2021, while Game Bird Licence sales remained stable.

For WMUs with low spruce grouse harvest, it is difficult to tease apart if this reflects low densities associated with sub-optimal habitat, or if numbers are kept low from continuous hunting pressure year to year. We also find it difficult to assess if lower harvest reflects actual grouse numbers or the time spent pursuing big game. The average effort to harvest a spruce grouse is approximately three days and hunters are spending an average of seven days hunting spruce grouse in total, which seems to suggest that hunters are not pursuing spruce grouse as their primary target species. Harvest rates of spruce grouse would be more meaningful if the time spent pursuing spruce grouse was teased apart from activities primarily pursuing other game. The number of hunters participating in the voluntary survey displayed an increasing trend until 2019, although it is not possible to determine if fewer hunters pursued spruce grouse in 2020 and 2021, or if simply a smaller proportion of hunters filled out the survey. The same can be said of aggregate harvest levels year to year. As such, a harvest rate—harvest divided by hunter days

calculated for each WMU and compared spatially and over time—may be the most meaningful and comparable metric at this time with these voluntary data (Figure 3).

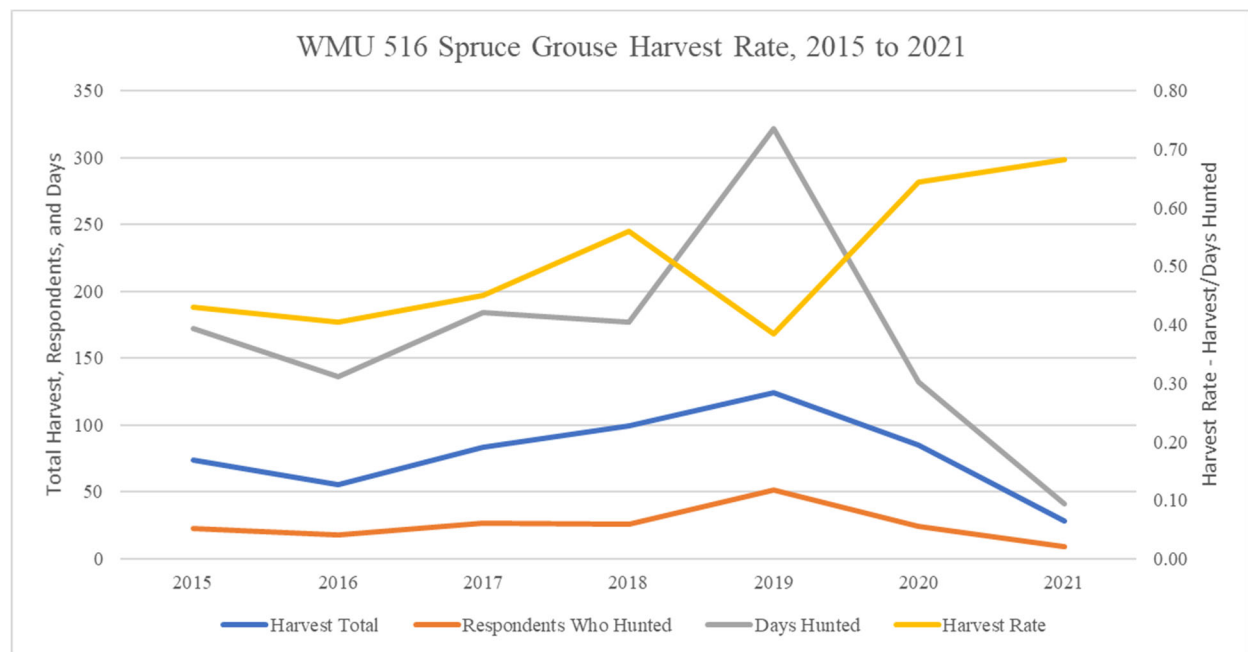


Figure 3. An example of spruce grouse harvest rate in WMU 516 reported voluntarily by hunters from 2015 to 2021. The left axis is the number of grouse harvested, number of hunters, and days hunted, while the right axis is the harvest rate (harvest divided by days hunted). Game bird harvest reporting is voluntary and therefore we do not know the actual number of people that hunted spruce grouse in each year, or the total number of birds harvested.

There are several approaches that would provide more resolution for detecting trends with game birds using hunter harvest surveys. Harvest surveys take time and effort for hunters to provide accurately, and these data are vitally important for tracking widespread cryptic game bird species that cannot be tracked efficiently through other means. There are several approaches that could be applied to improve the utility of harvest data: 1) make harvest reports mandatory for each game bird species; 2) ask hunters to sex and age each individual (similar to reports on ungulates harvested with a draw); 3) ask hunters to record the hours spent hunting on a given day rather than using an entire day as the metric; and 4) have hunters clarify (binary question) if their primary activity that day was pursuing that particular game bird, or if their primary hunting

activity focused on a different game species (e.g., big game). This information could easily be recorded on a harvest card throughout the hunting season, like those used in other jurisdictions for steelhead where more detailed information is desired (e.g., wild vs. hatchery steelhead, kept or released, and hours fished).

Hunter harvest reporting systems can be extremely cost-effective tools for tracking population trends over time. Voluntary-based harvest reports provide less information compared to mandatory reports, and in the case of voluntary reports for game birds in Alberta, the reported data lacks the utility to detect meaningful trends as collected. Mandatory reporting by species as suggested above would increase the utility of harvest reports for detecting trends with game birds. This approach would track harvest and effort more accurately and provide an early warning indicator if a game bird species were to trend dangerously low over time in a particular geographic area. Moreover, the effort expended by hunters in providing these data would be rewarded by them knowing that their input is valued and contributing toward managing these species sustainably.

Communications

- Conservation Works article published in the fall/winter 2022 issue of *Conservation Magazine*.

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Photos



Photo 1. Spruce grouse hen. Photo: Michael Jokinen



Photo 2. Ruffed grouse harvest. Photo: Michael Jokinen