

WILDLIFE-VEHICLE COLLISIONS IN CANADA | 2000-2020

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KEY FINDINGS

- > 570 persons were killed in wildlife-vehicle collisions between 2000-2020, representing 1.1% of all motor vehicle fatalities, according to the TIRF National Fatality Database.
- > Of these 570 fatal WVCs:
 - » 52% involved moose, 32% deer, and 6% other animals (i.e., bison, antelope, bears, foxes, ducks, coyotes, wolves, smaller mammals, and birds).
 - » Approximately 7 out of 10 fatalities (393) resulted from colliding with an animal.
 - » Approximately 1 in 3 (177) resulted from swerving to avoid hitting an animal.
 - » Approximately 2/3s of fatalities occurred in Summer and 1/3 in Fall with the largest number of fatal WVCs in July (87) and June (84).
- > The largest number of WVC fatalities occurred in Alberta (22% or 124 fatalities), followed by Ontario (17% or 95 fatalities) and Quebec (16% or 89 fatalities).

Introduction

Wildlife-vehicle collisions (WVCs) in Canada can have serious consequences, especially when larger animals are involved. Much can be learned from annual fatal WVC data which can assist researchers and practitioners in developing new approaches to road safety, wildlife management, road design, public education, and environmental impact. The importance of WVC data collection is supported by Ascensão et al. (2019). This study highlighted the absence of data does not indicate the absence of WVCs, which is a common misconception. As such, the collection and management of WVC data are important to track and understand trends in crashes, both fatal and non-fatal, as well as locations of crashes, and animals involved in crashes. This knowledge can help implement wildlife infrastructure and road safety strategies to prevent WVCs.



WVC fatality data are collected as part of **TIRF's National Fatality Database**. It was initially developed in the early 1970s as a comprehensive source of objective data on alcohol use among persons fatally injured in motor vehicle crashes occurring both on and off public highways in Canada. It contains records of persons fatally injured in any motor vehicle crash for seven provinces (from 1973 to 2020) and all Canadian jurisdictions (from 1987 to 2020). A motor vehicle fatality is defined as any person dying within 12 months as a result of injuries sustained in a collision involving a motor vehicle (Mayhew et al., 1999). These data are compiled using statistics from police reports, coroners, and medical examiners about persons fatally injured in motor vehicle collisions in all jurisdictions across Canada. Police-reported data include characteristics of the victim, such as their age and sex, in addition to details of the crash, including the type of vehicle and collision, the time of day, and the date (see Vanlaar et al., 2012 for more information).

Given there is a relatively small annual number of persons who are fatally injured in WVCs in Canada (i.e., only 30-40 cases per year), trend data are limited to the number of fatalities per year. To examine monthly and seasonal crash trends, data from 2000-2020 were combined to conduct an analysis of the number of persons killed in Canadian WVCs during this 21-year period. A total of 570 persons were killed in WVCs, representing 1.1% of all motor vehicle collision fatalities. Data were analyzed by examining the proportions and comparisons of trends.

Data presented in this fact sheet also provide information about the seasons and months when fatal collisions more often occur. This data provides important insight into factors such as migration, daylight, and road conditions that may heighten the risk of WVCs.

Persons killed in WVCs over time and by the time of the year

Trends. Between 2000 and 2020, 570 persons died in WVCs in Canada. From 2014 to 2016 there was a decline in fatal WVCs, followed by a spike in 2017 and 2018, and again a decline until 2020. As shown in Figure 1, there is a general downward trend in fatal WVCs with plenty of fluctuation (i.e., sharp increases in 2002, 2006, 2010, and 2018). While trends have remained stable between 2000 to 2020, there was a 38.2% decrease in fatal WVCs from 2000 (n=34) to 2020 (n=21).

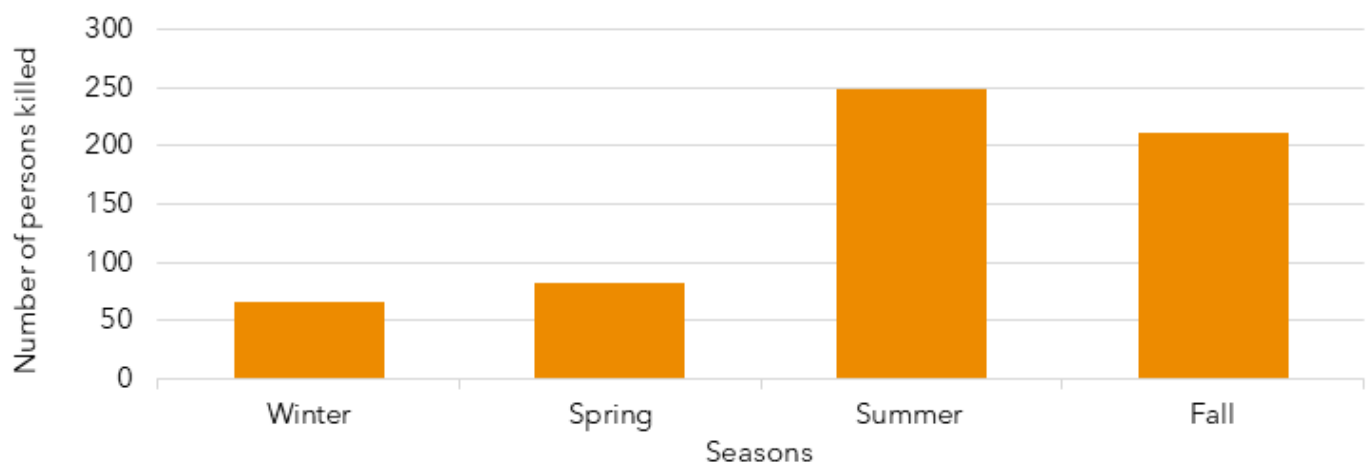
Season of crash. The number of persons killed in WVCs was analyzed by season from 2000 to 2020. The seasons were classified as winter (December to February), spring (March to May), summer (June to August), and fall (September to November). Figure 2 shows that two-fifths (42%) of fatalities occurred in the summer, followed by fall (33%).

The higher frequency of reported collisions in the fall corresponds to the greater likelihood of encountering wildlife at this time of year due to increased animal movement for winter migration, mating season, and hunting season.

Figure 1 | Persons killed in WVCs by year of the crash, Canada, 2000-2020



Figure 2 | Persons killed in WVCs by season of the crash, Canada, 2000-2020



The high frequency of fatalities during the summer likely is due to more people travelling for vacation, particularly through more rural or summer vacation areas where many animals are active during the summer months (Meister et al., 2016). The higher frequency of reported collisions in the fall corresponds to the greater likelihood of encountering wildlife at this time of year due to increased animal movement for winter migration, mating season, and hunting season (Ellis et al., 2016).

Month of crash. Figure 3 shows the number of persons killed per month in WVCs in Canada from 2000 to 2020. The months with the largest number of fatal WVCs are July (87) and June (84). By comparison, fewer persons are killed in WVCs from December until March, with 80 total fatalities during that timeframe.

Jurisdiction of crash. Figure 4 depicts the number of persons killed in WVCs by province and territory from 2000-2020. It shows the largest number of WVC fatalities occurred in Alberta (22% or 124 fatalities), followed by Ontario (17% or 95 fatalities) and Quebec (16% or 89 fatalities). The larger number of crashes in Quebec is perhaps not surprising since this

Figure 3 | Persons killed in WVCs by month of the crash: Canada, 2000-2020

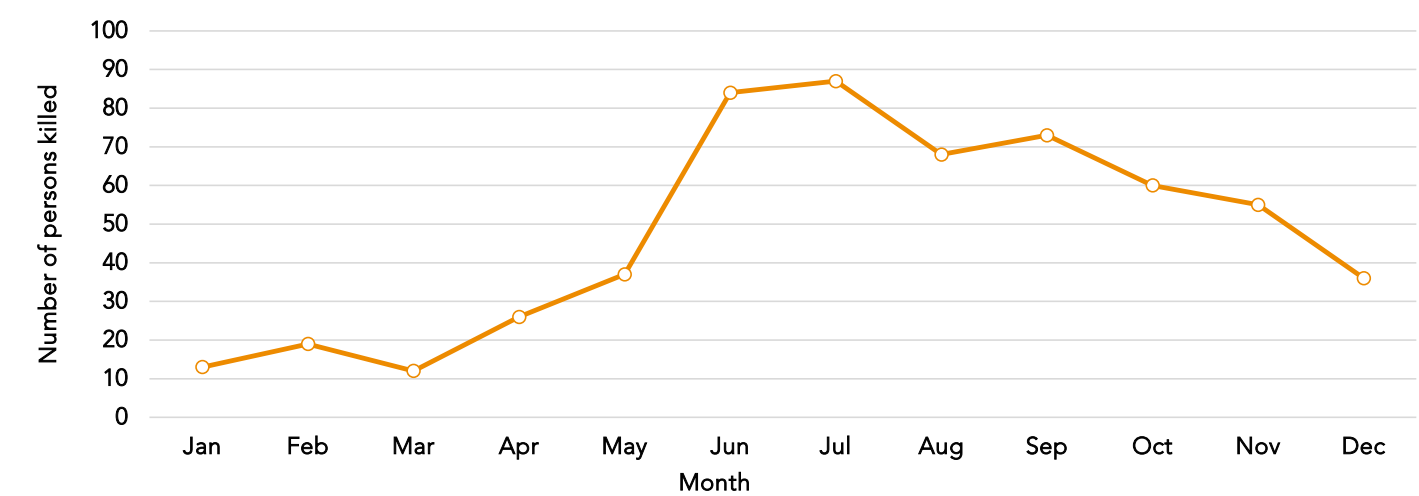
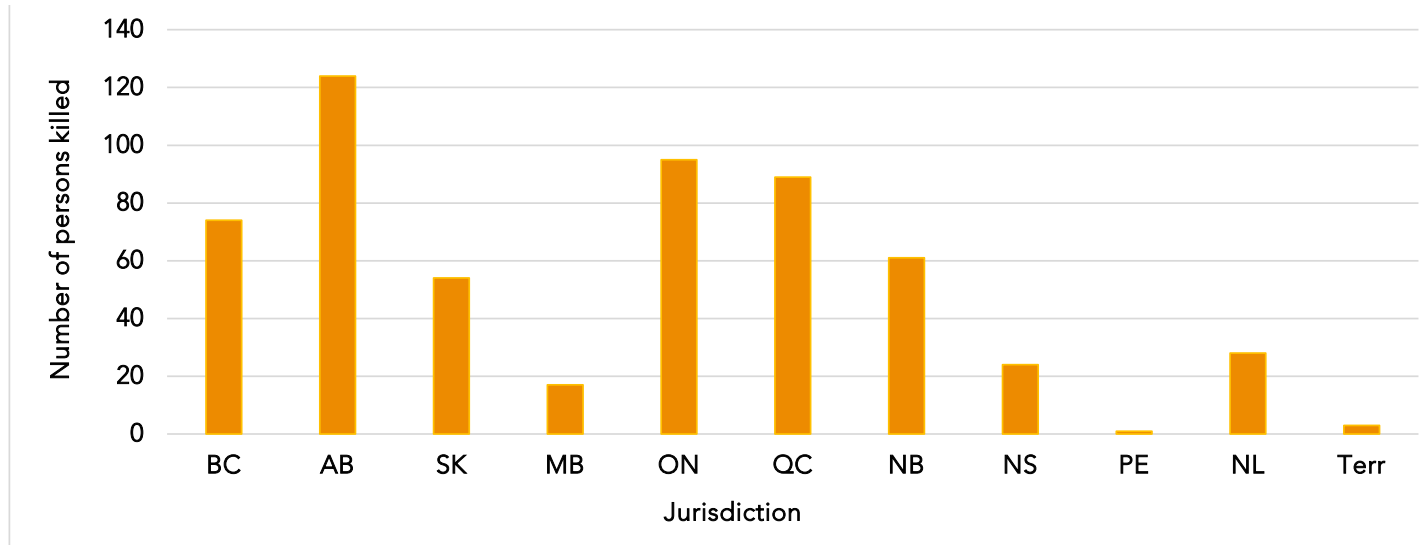


Figure 4 | Persons killed in WVCs by jurisdiction: Canada, 2000-2020



province has dense forest coverage compared to other jurisdictions in Canada. In Quebec, forests cover 45.6% of the province and are home to many large mammals, including white-tailed deer, moose and caribou (Gouvernement du Québec, 2019).

Species of animal involved in WVCs

The following section examines the species of animals involved in fatal WVCs in Canada from 2000-2020.

Number of persons killed in collisions by animal species. Of the 570 fatal WVCs from 2000 to 2020, 52% involved moose, 32% involved deer, and 6% involved other (i.e., bison, antelope, bears, foxes, ducks, coyotes, wolves, smaller mammals, and birds). In 2020, of the 21 people who died in WVC, over half (62%) involved moose. This is an increase compared to fatal WVC data trends from 2015 to 2019, where of the 118 fatal WVCs, 45.8% involved deer, and 39.8% involved moose.

When looking at trends from 2000-2020, moose accounted for 62.2% of fatal WVCs compared to deer at 37.8% (Figure 6). In 2014, there were 20 fatal moose-vehicle

Figure 5 | Persons killed in WVCs by species of animal involved in crashes: Canada, 2000-2020

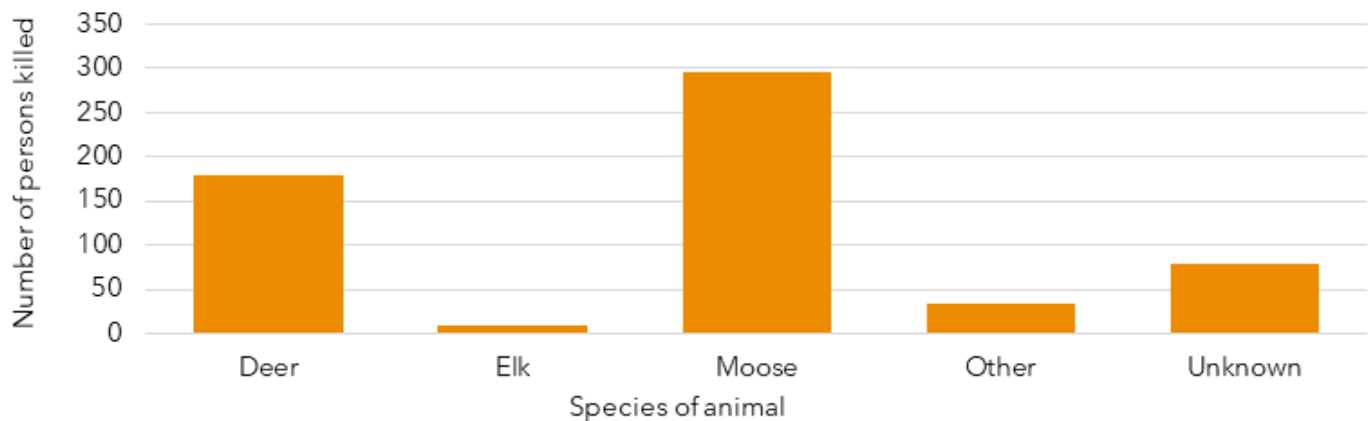
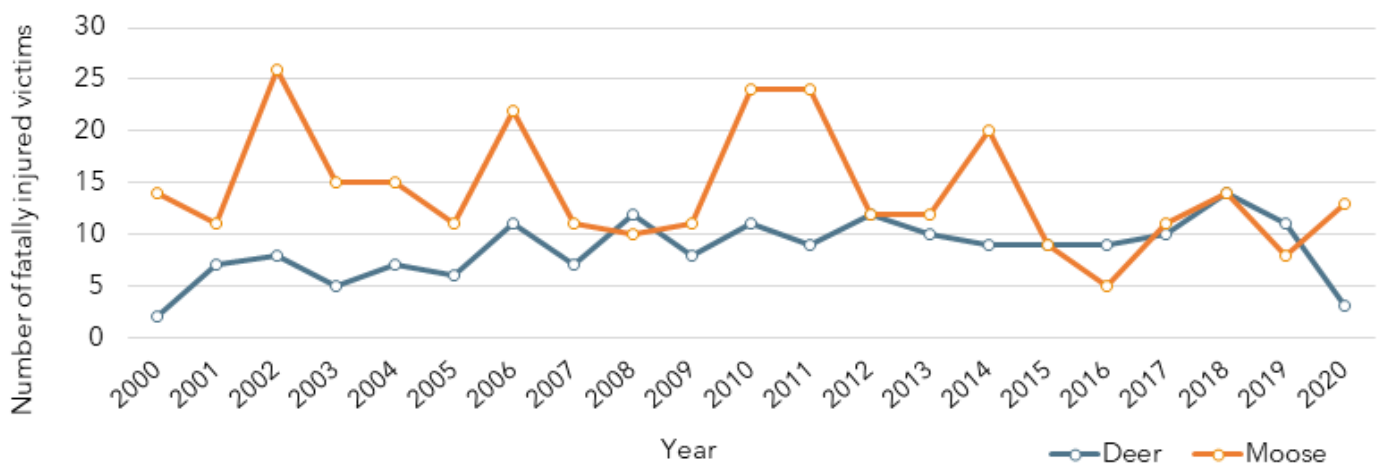


Figure 6 | Number of fatally injured victims in collisions involving deer and moose: Canada, 2000-2020



collisions which were followed by a sharp decrease to 9 in 2015 and 5 in 2016. Although there was an increase to 11 in 2017 and 14 in 2018, there was another sharp decrease in 2019, followed by an increase to 13 in 2020. Moose-vehicle collisions appear to fluctuate over time, whereas deer-vehicle collisions appear more consistent.

Nature of collision. Of the 570 fatal WVCs from 2000-2020, 68.9% (393) resulted from colliding with an animal and 31.1% (177) swerved to avoid hitting an animal. How drivers react to wildlife on the road is critical to the safety of both road users and wildlife. In most cases, with the exception of moose, the safest response to wildlife is for drivers to slow down in a controlled manner and steer straight, even if the animal is in the pathway of the vehicle. The safest response to moose is for drivers to steer their vehicle at the flanks (rear) of the moose. Most animals are not likely to remain still and since their behaviour is unpredictable, drivers cannot anticipate which direction the animal will move. This is especially true of deer whose natural defence is to dart and zig-zag to avoid predators. Therefore, swerving to avoid animals is often much more dangerous for drivers and animals, and is not recommended in most situations (Insurance Information Institute n.d.; Vanlaar et al., 2019). Many collisions are caused by drivers who swerve to avoid striking an animal and instead lose control of their vehicle and/or collide with other road users or hazards.



Conclusion

The data contained in this fact sheet examined WVCs in Canada from 2000 to 2020. Within these twenty-one years, there has been a general downward trend in fatal WVCs with a lot of fluctuation (i.e., sharp increases in 2002, 2006, 2010, and 2018). While trends have remained stable between 2000 to 2020, there was a 38.2% decrease in fatal WCVs from 2000 (34) to 2020 (21). The data indicated that June and July are the months in which the most WVC fatalities occurred. This is largely attributed to the fact that during the summer months, there are more vehicles on the road as people are travelling for vacation, and road conditions are typically safer than in the winter months, which may increase the speed of vehicles.

Collisions between wildlife and vehicles can be extremely hazardous and have deadly consequences for both people and animals. As such, the collection and interpretation of WVCs are critical in helping researchers and practitioners formulate new approaches to road safety, wildlife management, road design, public education, and environmental impact.

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Fatality Database Disclaimer

Data from TIRF's National Fatality Database may be subject to change as the closure of cases is ongoing. As such, there may be minor differences in this document compared to previous documents reporting on the same topic.



TRAFFIC INJURY RESEARCH FOUNDATION

The vision of the Traffic Injury Research Foundation (TIRF) is to ensure people using roads make it home safely every day by eliminating road deaths, serious injuries and their social costs. TIRF's mission is to be the knowledge source for safe road users and a world leader in research, program and policy development, evaluation, and knowledge transfer. TIRF is a registered charity and depends on grants, awards, and donations to provide services for the public.

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