

3.0 COST OF WILDLIFE-RELATED MOTOR VEHICLE ACCIDENTS

3.1 Wildlife-related Motor Vehicle Accidents

The cost of wildlife-related motor vehicle accidents to the residents of British Columbia is substantial. The financial impact on the province can be broken down into the following:

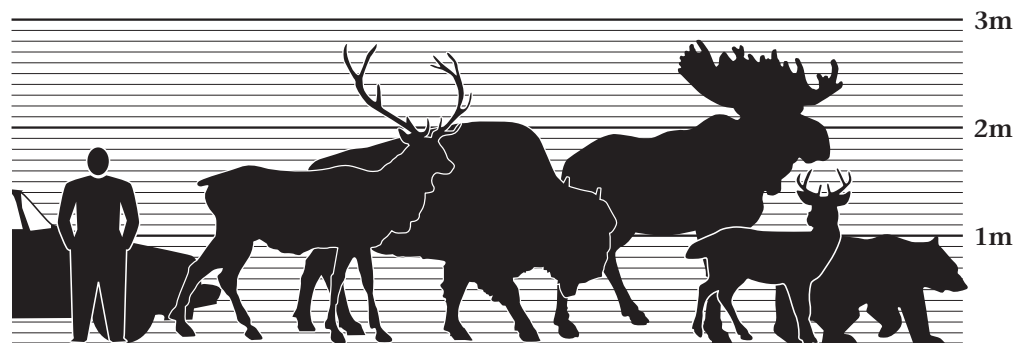
- Reported Accidents
- Unreported Accidents
- Accident Clean-up
- Lost Provincial Hunting License Revenues
- Lost Value of Wildlife

3.2 Reported Accidents

In addition to killing wildlife, wildlife-related motor vehicle accidents represent a serious threat to the motoring public. Accidents involving large ungulates and carnivores can result in human fatalities, injuries, and damage to motor vehicles (Figure 3.1 & Table 3.1).

Any accident may also result in multiple human fatalities.

Figure 3.1



Relative size of elk, bison, moose, deer and bear compared to 1.8m human and mid-sized automobile. (Adapted from Maine Interagency Work Group on Wildlife/Motor Vehicle Collisions, 2001)

Table 3.1 Wildlife-related Fatal, Injury and Property Damage Only Accidents

COLLISION SEVERITY				
YEAR	FATAL	INJURY	PDO	TOTAL
2000	0	198	617	815
2001	3	263	1,054	1,319
2002	2	293	1,212	1,507
2003	4	286	1,392	1,682
2004	6	267	1,312	1,585
2005	1	302	1,466	1,769
2006	3	304	1,276	1,583
2007	3	272	1,103	1,378
Total	21	2,185	9,432	11,639

Source: Collision Information System (CIS), Engineering Branch, BC MoT

In British Columbia, the majority of motor vehicles are insured by the Insurance Corporation of British Columbia (ICBC). On average, ICBC processes approximately 6600 wildlife-related accident claims a year¹. In 2000, the average cost of these claims was about \$2200. Between 1997 and 2007, ICBC paid out over \$278.9 million in animal-related motor vehicle accident claims (Table 3.2). In 2000, ICBC had over 8,800 wildlife-related accident claims.

Table 3.2 ICBC Animal-related Motor Vehicle Accident Claims (1997 to 2002)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Claims Cost* (in millions \$)	\$15.8	\$18.4	\$19.1	\$21.6	\$25.2	\$29.1	\$27.7	\$25.5	\$31.4	\$34.3	\$30.8

1 Source: Insurance Corporation of British Columbia, 2008

* Amounts have been rounded to the nearest hundred thousand.

ICBC estimates its accident claims capture 75% of the number of wildlife-related accidents that occur in British Columbia. Few people in British Columbia do not carry comprehensive insurance. With ICBC insurance policies, there is no penalty for a comprehensive claim so such claims do not affect policy premiums. Of the 25% of the number of British Columbia wildlife-related motor vehicle accidents ICBC estimates go unreported to it, ICBC estimates 10% involve out-of-province vehicles, 10% involve vehicles with less than \$100 in damage, and 5% of the accidents are reported to other insurance companies in British Columbia.

The societal costs of motor vehicle-related accidents have also been estimated by the British Columbia Transportation Financing Authority and the impact to the Province is considerable (Table 3.3).



Vehicle damage from accident with elk (Photo: Deborah Webster)



Wreckage from vehicle accident with elk (Photo: Deborah Webster)

Table 3.3 Societal Costs of Motor Vehicle Accidents (BCTFA)

Accident Severity Class	Societal Cost
Fatality	\$4.17 million
Injury	\$97,000
Property Damage	\$6,000

Source: Highway Safety Improvement Program Manual, BCMoT (1999)

1 Gilfillan, G., 2001 Personal Communication, Project Manager, Winter Road Research & Development, Kamloops, B.C.

2 Perkins, M., 1999, Highway Safety Improvement Programs Manual, British Columbia Ministry of Transportation and Infrastructure

3.3 Unreported Accidents

Except for fatal accidents, not all wildlife-related motor vehicle accidents which occur in British Columbia are reported in the province. Some accidents involve tourists or visitors from outside British Columbia. In such cases, many wildlife-related accidents are reported in other jurisdictions. Other accidents involve minor damage vehicle owners either ignore or pay for the repairs privately.

If one assumes the 6600 accidents reported to ICBC represent 75% of the actual number of vehicle damaging, wildlife-related accidents that occurred on Provincial highways, one can estimate an additional 1650 vehicles were damaged in wildlife-related accidents.

If one assumes these motor vehicles accidents incurred an average of \$2200 in damages, the total unreported damage incurred by motor vehicles in British Columbia in 2007 totaled approximately \$4.0 million.

3.4 Accident Clean-up

Ministry Maintenance Contractors incur costs due to staff and equipment time required for the clean-up of wildlife-related accidents and the disposal of animal remains. Depending on the size of the animal involved and the location of the accident, the cost of clean-ups can vary dramatically. While smaller animals, such as porcupine and skunks, may be handled by a single person in one vehicle, larger animals, such as moose, elk, and caribou, often require two or three people with two vehicles and a hydraulic boom.

If one assumes the following staff and equipment time costs:

- \$25 for small-sized animals (fox, porcupine, skunks, etc),
- \$100 for medium-sized animals (bear, cougar, deer, mountain sheep, etc), and
- \$350 for large-sized animals (caribou, elk, moose, etc);

Ministry Maintenance Contractors spent over \$700,000 dealing with wildlife-related accident clean-up and disposal in 2007.

Between 1998 and 2007, it is estimated Ministry Maintenance Contractors spent over \$14 million on wildlife-related accident clean-up and disposal. These expenditures do not include the costs incurred by the Maintenance Contractors for insurance premiums and lost employee productivity or the Workers' Compensation Board for compensation payments when workers get injured dealing with wildlife-related accidents.



Accident clean-up

(Photo: Alan Dibb)

3.5 Lost Provincial Hunting License Revenues

In British Columbia, hunting license sales generate millions of dollars for the Provincial Government each year. The value of hunting licenses varies greatly between species and whether or not the hunter is a British Columbia resident (Table 3.4).

If every wild game animal reported killed on provincial highways represented an opportunity to sell a hunting license, the Province of British Columbia lost between \$90,000 and \$760,000 in hunting license revenues in 2007. If a 3 to 1 factor of unreported to reported animals killed is used, the Province of British Columbia could have lost between \$360,000 and \$3.0 million in hunting license revenues in 2007.



Hunter with deer

(Photo: Stock Photo)

Table 3.4 Provincial Hunting License Fees for Residents and Non-residents

Species	Resident fees (\$)	Non-resident fees (\$)
Bison	70	700
Black Bear	20	180
Bobcat	8	40
Caribou	20	230
Cougar	30	230
Deer	15	125
Elk	25	250
Grizzly Bear	80	1,030
Lynx	8	40
Moose	25	200
Mountain Goat	30	275
Mountain Sheep	50	620
Wolf	No Licence	125
Wolverine	8	40

Source: British Columbia Ministry of Environment (MOE), 2004

3.6 Lost Provincial Trapping Royalties

In British Columbia, trapping royalties generate thousands of dollars for the Provincial Government each year. The value of trapping royalties vary greatly between species. (Table 3.5)

Table 3.5 Schedule of Trapping Royalties per Pelt or Skin

Species	Royalty (\$)
Bison & Beaver	0.72
Black Bear	4.15
Bobcat	1.82
Coyote	0.79
Fisher	1.15
Fox	0.83
Lynx	2.69
Marten	1.22
Mink	0.49
Muskrat	0.07
Otter	2.88
Raccoon	0.32
Skunk	0.09
Squirrel	0.05
Weasel	0.16
Wolf	3.05
Wolverine	7.75

Source: British Columbia Ministry of Environment (MOE), 2009

If every furbearing wild game animal reported killed on provincial highways represented an opportunity to collect a fur royalty, the Province of British Columbia lost about \$1,000 royalty revenues in 2007. If a 3 to 1 factor of unreported to reported animals killed is used, the Province of British Columbia could have lost about \$4000.

3.7 Lost Value of Wildlife

The Wildlife Branch of the British Columbia Ministry of Environment (MOE) has done extensive analysis of the economic value of wildlife resources in the province.³ In British Columbia, participants in hunting and viewing make estimated current expenditures of about \$466 million each year that are directly associated with their wildlife-related recreation.

The expenditures by participants in wildlife-related activities and their impacts on income and employment are spread throughout the Province and make important contributions to many rural economies. In 1996, MOE estimated expenditures on resident hunting and wildlife activities supported about \$205 million of Provincial Gross Domestic Product and \$136 million of household income.⁴

³ Reid, R., 2001 Personal Communication, Economist British Columbia Ministry of Environment (MOE), Wildlife Program, Victoria, B.C.

⁴ Ibid

3.8 Lost Value of Wildlife for Resident and Non-resident Hunters

Approximately 100,000 British Columbia residents purchase hunting licenses annually and spend an estimated 1.5 million days hunting in the province each year.⁵ Approximately 4,500 non-residents spend about 46,000 days hunting in British Columbia each year.⁶

One measure of the value of wildlife lost due to motor vehicle-related accidents can be estimated by determining how much hunters are willing to pay to hunt.

MOE surveyed thousands of resident hunters in 1996 to determine their “willingness to pay” in order to obtain an animal from a certain species (Table 3.6). According to MOE, the “willingness to pay” by British Columbia hunters to obtain a certain species of animal can be considered the equivalent of the “true net market value” of that species. For non-resident hunters, the “net return” to the Province is determined to be the value of their expenditures less the cost to the Province for supplying the services they need.⁷

Table 3.6 Resident and Non-resident Hunters Net Value to British Columbia

Net Value to British Columbia		
Species	Resident Hunters (\$)	Non-resident Hunters (\$)
bear	950	2,340
caribou	2,960	2,930
cougar	2,050	3,400
deer	1,270	7,450
elk	3,250	3,290
moose	1,250	1,680
mountain sheep	4,700	4,170

Source: British Columbia Ministry of Water, Land and Air Protection (MWLAP), Wildlife Program

For every wild game animal reported killed on provincial highways in 2007, the Province of British Columbia would have earned over \$7.3 million in the market value of the animals to resident hunters. If a 3 to 1 factor of unreported to reported animals killed is used, the Province of British Columbia would have lost over \$29.2 million from resident hunters in 2007.

The value of non-resident hunting in British Columbia is significant. Non-resident hunters contribute to the provincial economy by purchasing hunting licenses and supplies, and hiring hunting guides. If every wild game animal reported killed on provincial highways represented an opportunity for non-resident hunters to hunt in the Province, the Province of British Columbia would have lost over \$35.6 million in net returns in 2007. If a 3 to 1 factor of unreported to reported animals killed is used, the Province of British Columbia would have lost over \$142.5 million in net returns from non-resident hunters in 2001.

The true market value of wildlife may be more accurately determined by public auction, but only if all hunting opportunities were auctioned. As a fund raising initiative supported by the Alberta Provincial Government, the Rocky Mountain Elk Foundation has auctioned one non-resident elk hunting permit (“tag”) and one non-resident bighorn sheep tag between 1995 and 2004. The successful bids on the tags are shown in Table 3.7.

5 Reid, R., 2001 Personal Communication, Economist British Columbia Ministry of Water, Land and Air Protection (MWLAP), Wildlife Program, Victoria, B.C.

6 Ibid

7 Ibid



Table 3.7 Rocky Mountain Elk Foundation Elk and Bighorn Sheep, Non-Resident Tag Auction Results

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Elk tag (non-resident)	\$28,564	\$19,870	\$17,793	\$20,874	\$26,235	\$31,992	\$35,037	\$31,592	\$31,554	\$19,229	\$16,793	\$8,402
Bighorn sheep tag (non-resident)	\$315,000	\$231,506	\$236,232	\$502,054	\$412,167	\$297,600	\$276,588	\$356,323	\$263,986	\$194,417	\$62,698	\$83,737

Source: Rocky Mountain Elk Foundation, Edmonton, Alberta

Since 2000, the British Columbia Ministry of Environment (MOE) has auctioned off mountain sheep hunting licenses in Reno, Nevada (Table 3.8).⁸ The auction is used as a fund raising initiative for the British Columbia Habitat Conservation Trust Fund (HCTF) to help support mountain sheep management.⁹



Elk

(Photo: Tourism BC)

Table 3.8 HCTF – Wild Sheep/Roosevelt Elk Permit Fund

Auction Item	2004	2005	2006	2007	2008	2009
Bighorn Sheep	\$151,757	\$157,718	\$121,605	\$127,020	-	\$99,565
Roosevelt Elk	\$46,142	\$43,109	\$23,386	\$33,221	\$30,554	\$21,105

Note: Auction amounts shown here are in \$CDN. Auction proceeds were converted from \$US to \$CDN at time of deposit based on going FRx rates.

Source: British Columbia Ministry of Environment

The Rocky Mountain Elk Foundation has also auctioned off mountain sheep hunting licenses for Alberta residents (Table 3.9). The auction results are indicative of what a Canadian may be willing to pay for an elk or bighorn sheep hunting opportunity.



Bighorn Sheep

(Photo: Mike Brown)

⁸ Reid, R., 2002 Personal Communication, Economist British Columbia Ministry of Environment (MOE), Wildlife Program, Victoria, B.C.

⁹ Ibid

Table 3.9 Rocky Mountain Elk Foundation Elk and Bighorn Sheep Alberta Resident Tag Auction Results

Auction Item	1998	1999	2000	2001	2002	2003
Elk tag (resident)	\$9,560	\$8,690	\$10,500	\$10,510	\$12,290	\$8,050
Bighorn Sheep tag (resident)	\$16,490	\$16,650	\$24,500	\$25,000	\$39,090	\$22,140

Source: Arychuk, D., 2004, *Personal Communication*, Rocky Mountain Elk Foundation, Edmonton, Alberta

Although the successful bids in the auctions for British Columbia and Alberta wild game animals continue to be considerably higher than the value MOE has generally determined for these types of animals, the auction results show certain species wildlife are considered very valuable by some hunters. One should note these auction results are extreme values and they are not representative of typical hunter values.

3.9 Lost Value of Wildlife for Non-hunting Residents

No species-specific figures are available for the value of wildlife to non-hunting residents.¹⁰ Regardless, the presence of wildlife generates considerable economic activity in British Columbia. MOE estimates 863,000 provincial residents spent 18 million days in direct wildlife activities with the main purpose of watching, photographing, feeding and studying wildlife in the field in 1996.¹¹

The impact of motor vehicle-related accidents on wildlife species with critically low populations can have serious implications on wildlife viewing activities. Species, such as mountain goats and mountain sheep, which attract viewing attention, have low reproduction rates and limited areas of habitat. Consequently, the loss of even a few members of a small herd in motor vehicle-related accidents can threaten the survival of the herd and reduce the long-term provincial economic benefits generated by residents viewing the herd.

MOE estimates British Columbia residents participating in direct wildlife activities, where the main purpose of a trip was to see wildlife in the field, spent almost \$392 million in 1996, contributing over \$174 million to the Provincial Gross Domestic Product.



Dead mother bear and cubs

(Photo: Sylvia Campbell)

¹⁰ Reid, R., 2001 *Personal Communication*, Economist British Columbia Ministry of Environment (MOE), Wildlife Program, Victoria, B.C.

¹¹ Ibid

3.10 Injured Wildlife and Orphans

In addition to the loss of wildlife as a result of motor vehicle-related accidents, there are other issues which arise, in particular the welfare of injured animals and orphaned offspring.

Injured Wildlife

While the most severely injured animals are euthanized as humanely as possible by conservation officers of the British Columbia Ministry of Water, Land and Air Protection or law enforcement personnel, most often the Royal Canadian Mounted Police in rural areas, the recovery of less severely injured wildlife is a growing concern in British Columbia.



Wildlife accident fatality – Elk

(Photo: Brent Persello)

In British Columbia, wildlife rehabilitation requires a specific permit to possess, treat, release, and euthanize if necessary, wildlife. In general, to obtain a permit for a designated rehabilitation facility there must be a need in the community for such services and the individuals must have approved facilities for the species to be admitted, demonstrated training or experience, an established relationship with a veterinarian, liability insurance, and submit annual records of all wildlife treated. Individuals can also apply for permits to temporarily house and transport wildlife to designated rehabilitation facilities. Annual permits for B.C. rehabilitators are administered by Federal and Provincial agencies.

The Wildlife Rehabilitators Network of British Columbia, a non-profit volunteer-run organization, was founded in 1989 to assist in the recovery of injured wild animals, including those involved in motor vehicle accidents. The Network's membership includes licensed rehabilitation facilities and individual rehabilitators, rehabilitation volunteers, wildlife researchers, government and humane association representatives, veterinarians and other animal care personnel, and interested members of the public. The Network has provided valuable assistance to injured wild animals.

One example of the Network's relentless efforts is the Wildlife Rehabilitation Centre (Wild ARC) operated by the BC Society for the Prevention of Cruelty to Animals (BC SPCA) in Victoria, on Vancouver Island. As a member of the International Wildlife Rehabilitation Council and the National Wildlife Rehabilitators Association, Wild ARC is constantly involved in the latest research in wildlife rehabilitation and wildlife medicine.

At this time, Wild ARC is privately funded and operates as the only wildlife rehabilitation centre on southern Vancouver Island, treating wild animals from throughout the region. Wild ARC's mission is to provide humane care to injured, orphaned, sick and distressed wildlife based on established national and international rehabilitation standards and each animal's natural history. Wild animals are treated individually and assessed ultimately for release back into the wild. Wild ARC also has an active public education component because over 80% of the wild animals treated at Wild ARC are impacted by human activity.

Wild ARC is permitted annually by the British Columbia Ministry of Environment to rehabilitate raptors, mammals, amphibians and reptiles; and by the Canadian Wildlife Service,

to treat migratory birds. The facility does not have the appropriate caging nor is it permitted to handle large carnivores such as bears and cougars.

Since opening in 1997, Wild ARC has treated more than 12,000 wild animals, from over 140 different species, including mammals, like raccoons and deer, and raptors, like owls and eagles. The centre operates 24 hours a day and admits about 1,600 injured wild animals each year. A majority of the animals treated arrive at the centre between May and August. The spring and summer are the busiest periods because many baby animals need both medical care for injuries and supportive care when their mothers are killed. Many of the animals admitted to the centre are severely injured after being hit by a motor vehicle. A significant number of young animals are also orphaned when mothers succumb to a fatal trauma.

In Wild ARC, as is typical of rehabilitation centres across North America, approximately 30% of the animals die in care within hours or days of being admitted or before they even reach the centre. The average release rate for rehabilitated wild animals approaches 40%. Most of the remaining animals, suffering from severe injuries, illness, or emaciation to the extent that they never recover sufficiently to survive and return to the wild, are humanely euthanized. In a few rare cases, some non-releasable wildlife are placed in breeding or educational programs.

There is some discussion about the purpose and utility of wildlife rehabilitation programs. While the principal of avoiding interference with “natural” selection process is sometimes given as a reason to question rehabilitation activities, most wild animals treated by rehabilitation centres are injured, or otherwise adversely impacted, by human activities, not natural ones. Consequently, rehabilitation centres attempt to compensate for the unnatural adverse effects of humans, such as wildlife-related motor vehicle accidents.

While the general mandate of rehabilitation centres focuses on improving the welfare of individual wild animals and not saving a species, in some cases they treat rare or locally threatened wildlife and directly contribute to species survival. Rehabilitation centres also provide a rare and unique opportunity to develop expertise and knowledge in wild animal husbandry suitable for caring for species at risk or wildlife affected by oil spills or forest fires. Peregrine Falcons represent one example of an endangered species successfully re-established with the assistance of rehabilitators and falconers benefiting from knowledge gained by caring for birds kept in captivity.

Adapted from BC SPCA Wild ARC website, <http://www.wildarc.com/home/index.php>, accessed June 3, 2006.

Orphaned Offspring

One of the most heart rendering impacts of wildlife accidents is the orphaning of young offspring when adult females are killed. Of the orphaned wildlife species, orphaned bears have received the closest attention by the BC Provincial Government. The majority of orphaned bear cub occurrences involve Black Bears as British Columbia has one of the largest



Black bear cubs

(Photo: Chad Tenney)

populations of Black Bears in North America. Although the Province has the second largest population of Grizzly Bears in North America, orphaned Grizzly Bear cubs are encountered less often.

At present, there are no approved programs or protocols in North America to re-introduce orphaned grizzly bears cubs back into the wild. Upon the loss of their mother, most often due to human related activity, orphan grizzlies cubs are either reluctantly destroyed by conservation officers or relegated to a life in captivity (Macquisten, K, 2004). Historically, Provincial policy in British Columbia required that orphaned bears cubs be euthanized. Existing provincial policy states that orphaned bear cubs are not good candidates

for translocation and should be killed in all situations. This policy exists for the following reasons:

- orphaned bear cubs are believed to be unlikely to survive and to be successful on their own if left in the wild;
- large predators such as bears are difficult for wildlife rehabilitators to deal with in captive environments;
- there is a public safety concern regarding the release of large and potentially dangerous predators that have been raised in a captive environment, if they rely on humans for food and lose their fear of people;
- there is a lack of agreement in the scientific community on whether bear rehabilitation is successful in returning bears to the wild; and,
- Black Bears are not a species of conservation concern and the Ministry of Environment, Lands and Parks has limited resources. These resources are more appropriately aimed at managing species that are at risk.

Despite this policy, however, Conservation Officers, wildlife staff or members of the public took 102 bears to rehabilitation facilities between 1990 and 2000, with the majority of these bears being cubs. There are a complex set of reasons leading to Conservation Officers placing bear cubs in rehabilitation facilities, including the public interest in this procedure, a change in some regional policy direction on this issue, more wildlife rehabilitators becoming interested, and the development of bear cub rearing and rehabilitation protocols in the U.S. (Orphan Bear Cub Review Committee, 2000)

To deal with this difficult situation, and to address public concerns, the British Columbia Ministry of Water, Land and Air Protection has been reviewing its policy and procedure on the handling of orphan bear cubs.



Mother bear with cub

(Photo: Tourism BC)

