

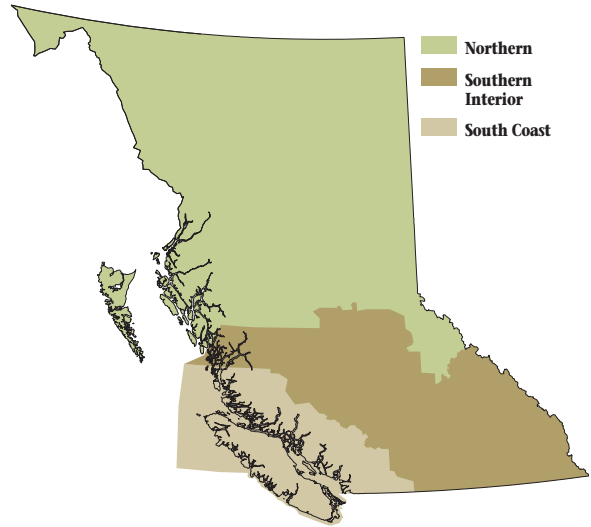
6.0 WILDLIFE ACCIDENTS BY REGION

Map 6.1

6.1 Regional Comparisons

Regional Overviews

The British Columbia Ministry of Transportation divides its operational administration into three Regions, South Coast, Southern Interior, and Northern. Each Region represents a large geographic area with distinct bioclimatic conditions and diverse wildlife habitats.



1. South Coast Region

The South Coast Region is approximately 118,000 km² in size, the smallest Region in the Province. It is primarily coastal, encompassing Vancouver Island and the southern portion of the British Columbia coast. Its weather is characterized by plentiful rainfall with mild winters and mild summers. Along the Pacific west coast, humid coniferous rain forests occur (Valentine et al., 1978). The ecosystems in this Region are some of the most productive areas in the Province. Black-tailed deer habitat is abundant (British Columbia Ministry of Forests, 1999).



Sea-to-Sky Highway

(Photo: Gord Smith)

2. Southern Interior Region

The Southern Interior Region is approximately 545,500 km² in size, the second largest Region in the Province. It is located between the Coast Mountains and the Rocky Mountains. Being in the lee of the Coastal Mountains, this Region is characterized by drier climates. These valleys provide critical winter and spring forage for bighorn sheep and white-tailed deer (British Columbia Ministry of Forests, 1999). At lower elevations, the Interior Plateau has some of the driest and hottest valleys



Okanagan Valley

(Photo: Tourism BC)

in the Province. The Region has open woodlands and steppe grasslands. Grass and forest fires are not uncommon. At higher elevations, this Region has significant habitat for mule deer and elk. At the highest elevations, the mountains present severe and hostile environments for wildlife.

3. Northern Region

The Northern Region is approximately 643,700 km² in size, the largest in the Province. It extends from the Pacific Ocean to the Peace River and the Alberta border, and from approximately the middle of the Province to the Yukon border. In the north, the climate is characterized by cold continental climate, with long, cold winters. The habitat is largely high latitude northern boreal forests, characteristic of Northern Canada and Euro-Siberia (Valentine et al., 1978).

This Region provides extensive moose, caribou and elk habitat. In the east, moose are abundant in the Peace River area. At higher elevations, the essentially treeless alpine tundra provides critical habitat for caribou, mountain goats and mountain sheep (British Columbia Ministry of Forests, 1999).



Monkman Falls

(Photo: Tourism BC)

6.2 Regional Wildlife Accident Comparisons

Given the size of the province and the dramatically different climatic and geographical regimes within each Region, variations between Regions may vary significantly. Table 6.1 provides a general breakdown of all wildlife accidents by Regions from 1983 to 2002. Although all Regions exhibit similar trends, the Provincial annual totals are heavily influenced by Region 2 where the largest number of wildlife accidents are reported. For the most part, the Provincial trend follows the trend observed for Region 2.

In particular, the general pattern of wildlife accidents for the entire Province is greatly influenced by the number of deer-vehicle accidents recorded in Region 2. This Region has disproportionately more accidents than any other Region. Region 2 has some of the highest deer populations in the Province. This Region has areas with steep mountainous terrain transected by Highways 1, 3, 16 and 97.



Warning sign

(Photo: Brent Persello)

When comparing 2002 wildlife-vehicle accidents by Region to those during previous years, it is important to note, the fluctuation between years can be considerable (Table 6.2).

When the monthly distribution of wildlife-vehicle accidents for all species in each Region for the period between 1993 and 2001 are compared, trends also appear. Collectively, the accident rate for all Regions peaks in May and November. Since deer represent approximately 80% of the animals killed, the patterns of accidents for other species is overshadowed by the pattern found for deer in all Regions.

For example, depending on weather patterns, Region 1 can experience a very wet winter but exhibit fewer wildlife accidents, while Regions 2 and 3 can experience heavy snowfalls with higher wildlife accidents as animals migrate from higher elevations to valleys where highways are located.

When the accident patterns for bear, deer, elk, and moose are examined, it is apparent the monthly accident distributions vary by species.

Figure 6.2.1 Total Wildlife Accidents by Region (1988 to 2007)

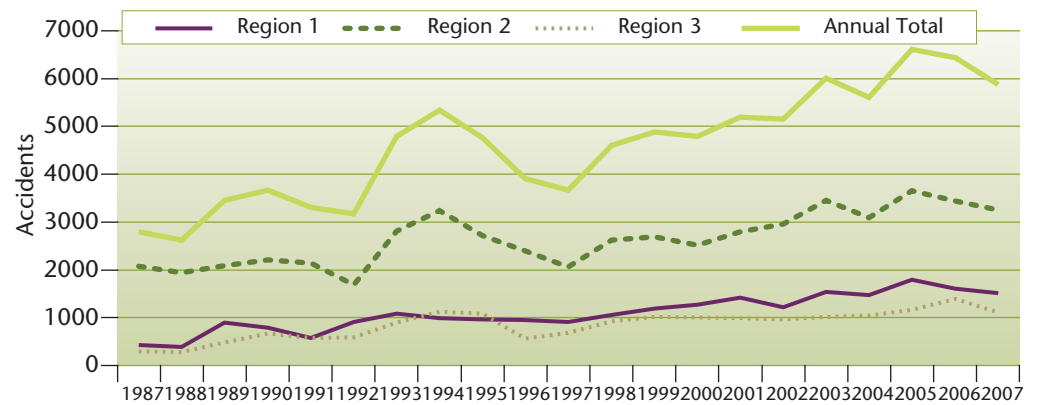


Figure 6.2.2 Total Monthly Wildlife Accidents by Region (1988 to 2007)

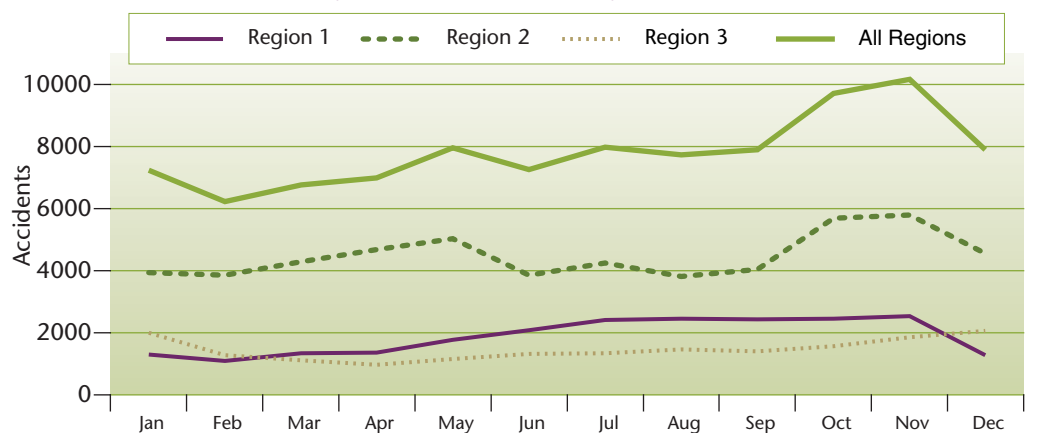


Table 6.1 Wildlife Accidents by Region (1988 to 2007)

YEAR	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
Region 1	392	891	785	578	910	1090	984	965	945	907	1057	1184	1265	1413	1221	1540	1470	1791	1603	1517	22508
Region 2	1940	2083	2207	2147	1683	2810	3237	2716	2393	2067	2626	2694	2520	2799	2963	3451	3095	3657	3439	3289	53816
Region 3	286	476	669	581	583	898	1118	1083	564	687	928	1011	1000	987	969	1016	1045	1158	1394	1106	17559
Totals	2,618	3,450	3,661	3,306	3,176	4,798	5,339	4,764	3,902	3,661	4,611	4,889	4,785	5,172	5,031	6007	5610	6606	6436	5912	93883

Table 6.2 Regional Wildlife Accidents (Fluctuations 2003 to 2007)

Region	2003	2004	% Change	2004	2005	% Change	2005	2006	% Change	2006	2007	% Change
1	1540	1470	-4.5	1470	1791	21.8	1791	1603	-10.5	1603	1517	-5.4
2	3451	3095	-10.3	3095	3657	18.2	3657	3439	-6.0	3439	3289	-4.4
3	1016	1045	2.9	1045	1158	10.8	1158	1394	20.4	1394	1106	-20.7
Total	6007	5610	-6.6	5610	6606	17.8	6606	6436	-2.6	6436	5912	-8.1



Table 6.3 Wildlife Accidents in Region 1 (1988 to 2007)

Region 1	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Totals
Bear	4	14	10	8	13	24	18	16	33	16	20	29	16	24	26	28	47	41	29	27	443
Beaver	0	4	0	1	0	2	6	5	0	2	2	3	9	13	10	23	10	11	22	13	136
Bobcat	1	0	2	0	0	1	1	4	1	0	0	2	0	2	2	0	0	1	1	0	18
Caribou	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
Cougar	0	0	0	0	0	1	2	0	0	1	0	4	1	3	1	2	0	2	1	0	18
Coyote	6	28	24	7	66	59	61	49	42	35	55	26	40	44	50	71	74	45	41	43	866
Deer	356	840	743	554	817	992	850	875	820	821	932	1045	1098	1174	954	1142	1121	1449	1285	1266	19134
Elk	0	1	3	2	6	2	5	1	4	0	1	9	16	5	4	4	9	16	10	4	102
Fox	0	0	0	0	0	0	1	0	0	2	1	1	0	6	0	0	2	0	0	0	13
Moose	0	1	0	0	1	2	3	0	1	2	5	3	2	5	5	7	5	4	0	0	46
Otter	0	0	0	0	0	0	0	1	0	0	0	1	2	3	2	4	4	5	2	0	24
Porcupine	0	1	0	0	3	2	1	3	1	1	1	0	0	1	0	2	0	0	1	2	19
Possum	0	0	0	0	0	0	25	5	3	0	0	0	0	1	4	18	4	5	8	8	81
Rabbit	0	0	1	0	0	0	0	3	0	1	0	2	3	0	1	11	6	9	6	4	47
Raccoon	25	1	1	6	2	5	8	3	36	22	34	44	43	94	103	151	116	121	145	101	1061
Sheep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
Skunk	0	0	0	0	0	0	0	0	1	0	0	0	1	5	7	13	8	4	11	10	60
Wolf	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	1	0	4
Other	0	1	1	0	0	0	3	0	3	2	6	15	34	33	51	63	64	76	40	39	431
Totals	392	891	785	578	910	1090	984	965	945	907	1057	1184	1265	1413	1221	1540	1470	1791	1603	1517	22508

Table 6.4 Wildlife Accidents in Region 2 (1988 to 2007)

Region 2	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Totals
Badger	0	0	0	0	0	0	1	0	0	0	0	2	2	0	1	0	1	2	0	4	13
Bear	22	29	23	31	36	57	54	54	54	54	80	94	44	62	107	130	96	76	76	109	1288
Beaver	6	4	10	1	4	9	1	3	5	4	0	3	5	3	10	7	9	12	12	9	117
Bobcat	0	1	0	6	6	3	0	1	4	0	1	0	4	1	0	0	0	2	2	2	33
Caribou	0	0	0	1	1	0	4	4	3	1	3	0	0	0	2	2	0	0	0	0	21
Cougar	0	0	0	0	1	0	2	1	3	2	0	0	1	2	2	1	4	4	0	2	25
Coyote	28	28	44	36	35	79	50	59	50	40	59	42	41	48	50	63	55	78	73	79	1037
Deer	1749	1875	1966	1917	1495	2472	2888	2436	2053	1816	2269	2318	2153	2360	2418	2778	2536	3046	2866	2641	46052
Elk	77	62	68	54	48	69	109	76	95	62	86	109	133	154	193	206	208	231	230	205	2475
Fox	0	1	3	2	0	3	3	0	1	3	2	5	5	7	3	9	3	8	6	9	73
Moose	40	46	45	55	29	60	80	51	98	72	89	83	70	95	77	94	86	87	68	97	1422
Otter	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	1	5
Porcupine	6	9	33	38	18	33	17	11	7	3	6	4	4	1	0	42	2	6	7	10	257
Raccoon	0	3	0	1	1	3	0	2	8	0	2	2	7	6	4	9	11	12	13	29	113
Sheep	7	7	8	5	8	14	22	10	10	6	13	9	15	9	8	21	22	20	15	25	254
Skunk	0	0	1	0	1	6	4	7	2	1	1	0	9	13	10	17	18	18	18	17	143
Wolf	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	2	2	0	7
Other	5	18	6	0	0	2	2	1	0	3	14	23	27	36	77	72	42	52	51	50	481
Totals	1940	2083	2207	2147	1683	2810	3237	2716	2393	2067	2626	2694	2520	2799	2963	3451	3095	3657	3439	3289	53816



Table 6.5 Wildlife Accidents in Region 3 (1988 to 2007)

Region 3	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Totals
Bear	9	18	17	18	24	31	37	38	26	24	42	43	42	49	36	35	43	35	56	47	670
Beaver	3	3	4	2	0	0	2	5	2	12	7	3	6	7	3	8	4	9	8	9	97
Bison	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Bobcat	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Caribou	0	0	1	5	5	0	3	5	1	0	0	0	3	3	2	0	4	0	1	5	38
Cougar	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Coyote	1	3	8	5	18	27	23	21	12	15	21	21	24	14	11	23	15	16	21	24	323
Deer	131	232	241	274	273	528	637	606	301	369	512	536	589	509	557	570	591	661	758	600	9475
Elk	1	3	3	3	9	4	6	16	5	16	16	11	18	8	10	32	17	21	17	22	238
Fox	1	3	0	6	0	1	1	3	4	1	2	6	9	12	3	8	3	7	8	12	90
Lynx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	4
Moose	112	152	190	128	166	209	322	316	185	181	270	325	251	293	285	247	316	335	448	313	5044
Porcupine	26	58	200	136	87	88	85	62	25	66	54	55	46	44	43	64	18	51	47	37	1292
Raccoon	1	2	0	0	0	2	0	0	0	0	0	0	1	21	1	1	4	1	0	1	35
Sheep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	2	5
Skunk	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
Wolf	1	1	1	2	1	2	1	5	2	2	1	3	0	8	3	2	8	6	3	5	57
Other	0	1	4	1	0	2	0	5	1	1	3	8	11	19	15	24	21	16	23	27	182
Totals	286	476	669	581	583	898	1118	1083	564	687	928	1011	1000	987	969	1016	1045	1158	1394	1106	17559

Figure 6.2.3 – Region 1: Major Species Accident Comparison (1988 to 2007)

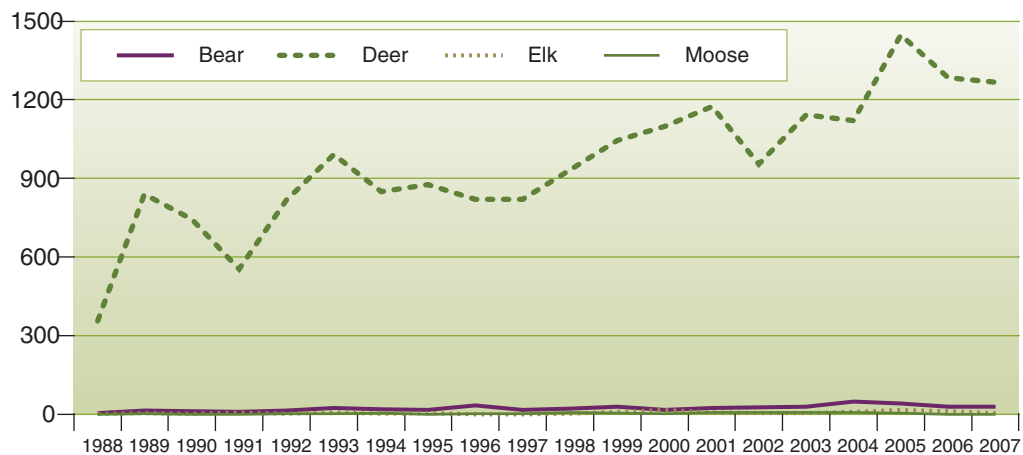


Figure 6.2.4 – Region 2: Major Species Accident Comparison (1988 to 2007)

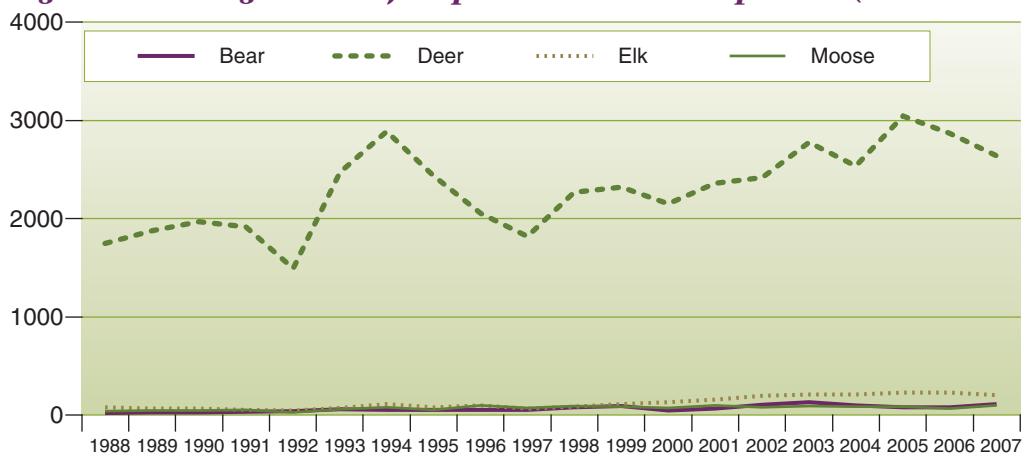
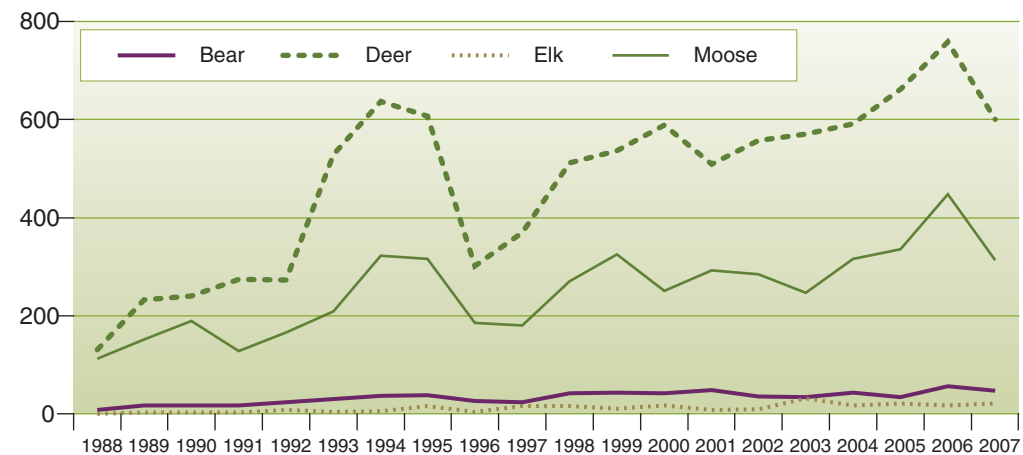


Figure 6.2.5 – Region 3: Major Species Accident Comparison (1988 to 2007)





6.3 BEARS

Bear-related motor vehicle accidents have been generally increasing over the last 20 years. The greatest fluctuations in accident numbers has been in Region 2, where the greatest potential for bear-motor vehicle interaction exists. The pattern of bear accidents between 1993 and 2002 appears similar in all three Regions. In Regions 2 and 3, bear-related motor vehicle accidents occur more frequently in September. This peak coincides with the end of summer and the depletion of the bears' natural food sources in more remote locations. At this time, bears appear to migrate toward food sources located near human settlements. Consequently, the number of bear-motor vehicle accidents increases at the same time bear-human conflicts also increase. The peak in bear-related accidents occurs a month later, in October, in Region 1. This is a reflection of the later onset of fall and winter in the southwestern corner of the Province. Although common belief suggests all bears hibernate uninterrupted during the winter months, WARS data shows a small number of bears are killed between November and March. On warmer winter days, some larger male bears awake from hibernation and roam about. (Austin, 1999)



Grizzly

(Photo: BC Parks)



Black Bear

(Photo: Tourism BC)

Figure 6.3.1 Regional Comparisons – Total Annual Bear Accidents (1988 to 2007)

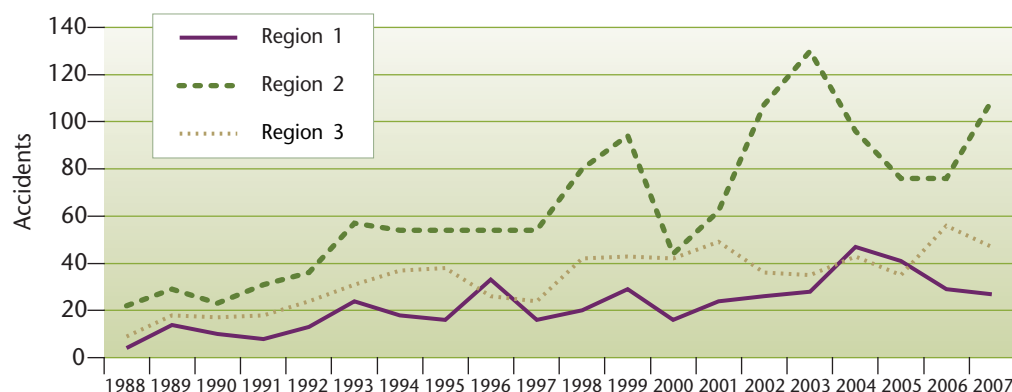


Figure 6.3.2
Region 1: Total Monthly Bear Accidents – (1988 to 2007)
10 Year Comparisons – 1988 to 1997 and 1998 to 2007

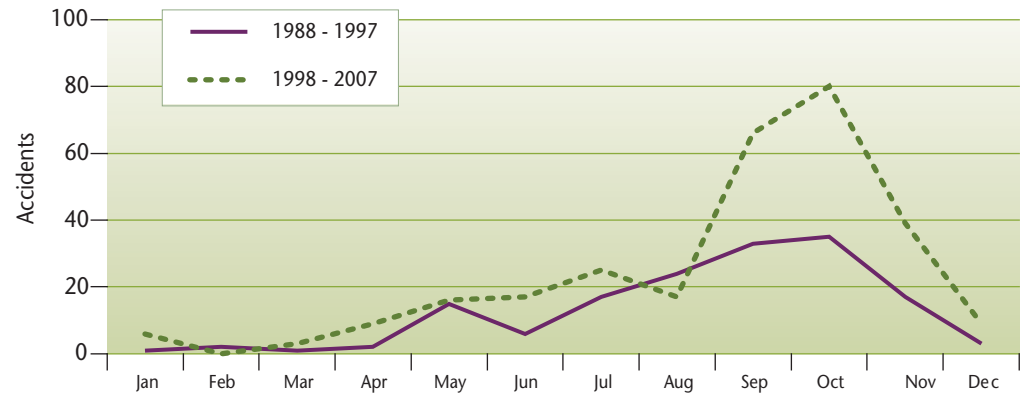


Figure 6.3.3
Region 2: Total Monthly Bear Accidents – (1988 to 2007)
10 Year Comparisons – 1988 to 1997 and 1998 to 2007

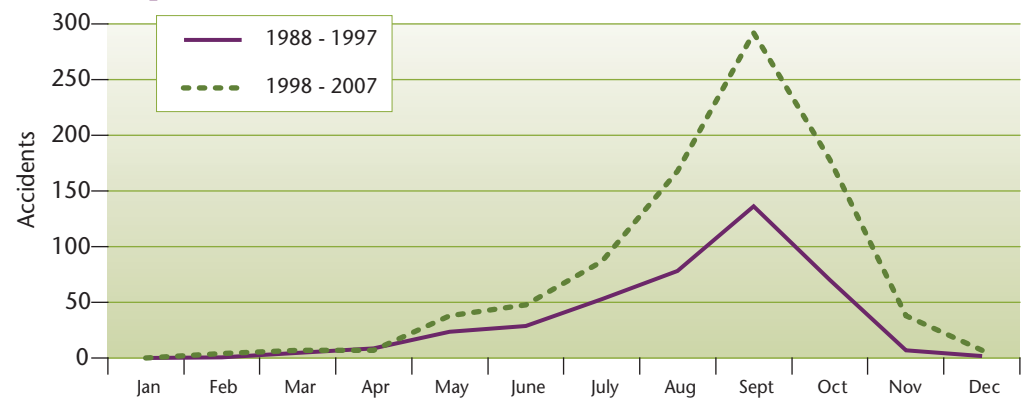
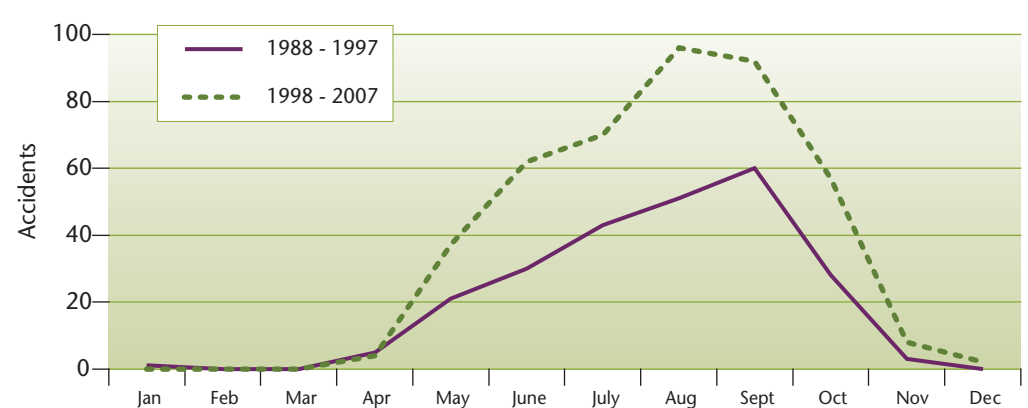


Figure 6.3.4
Region 3: Total Monthly Bear Accidents – (1988 to 2007)
10 Year Comparisons – 1988 to 1997 and 1998 to 2007



6.4 DEER

The general trend shows an increase in the number of accidents over the last 20 years. Although the magnitude of deer accidents in Region 2 is significantly greater than those found in the other Regions, Regions 2 and 3 exhibit relatively similar patterns. Region 1, with its milder climate, and fewer migratory herds, has more deer-related accidents in the summer months. In Regions 2 and 3, deer are more inclined to move to higher ground, further from highways located in valley bottoms, to feed during the summer months.

When comparing monthly deer accident rates over the last two decades, it appears the number of November accidents in all Regions has been increasing in the period between 1993 and 2002.



Deer in spring

(Photo: BC Parks)



Deer in winter

(Photo: BC Parks)

Figure 6.4.1 Regional Comparisons – Total Annual Deer Accidents (1988 to 2007)

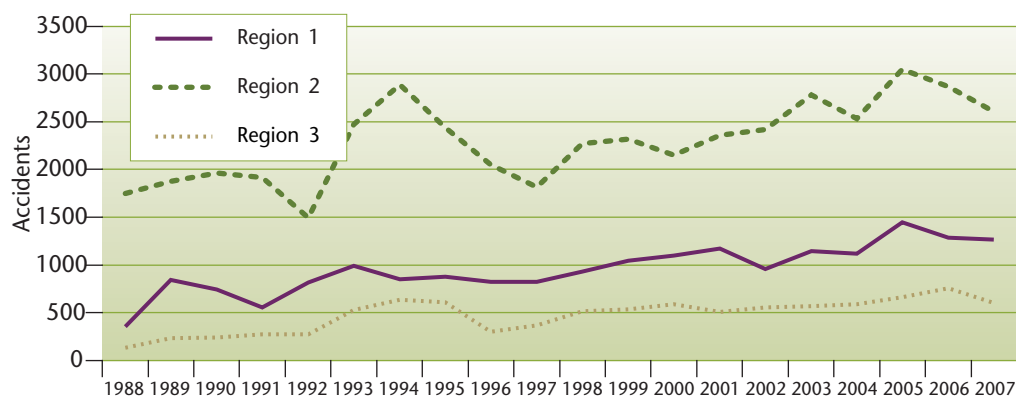


Figure 6.4.2
Region 1: Total Monthly Deer Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007

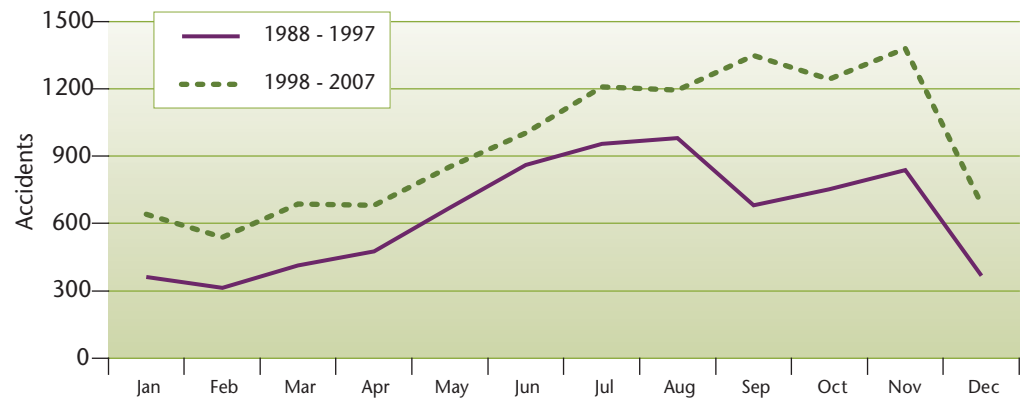


Figure 6.4.3
Region 2: Total Monthly Deer Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007

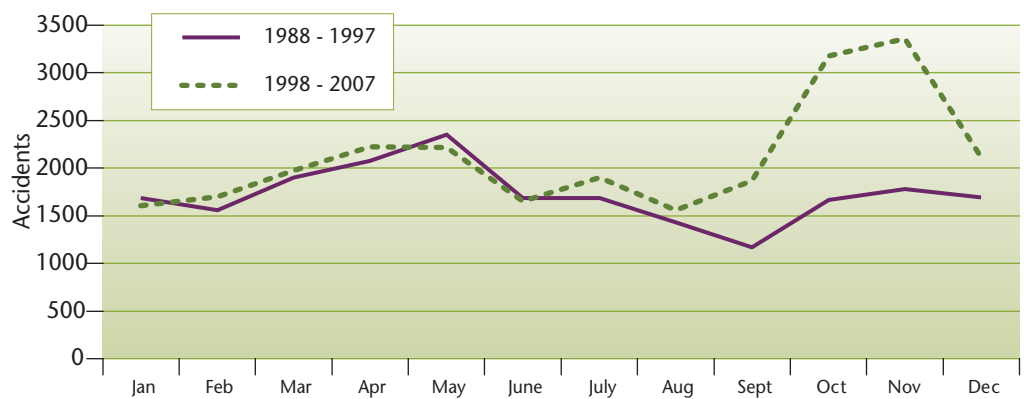
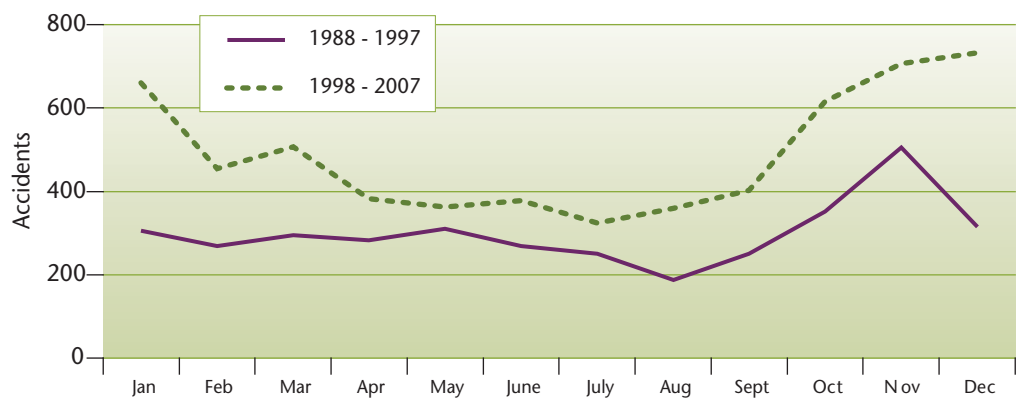


Figure 6.4.4
Region 3: Total Monthly Deer Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007



6.5 ELK

The patterns of elk-related motor vehicle accidents in the three Regions have been relatively consistent in each Region over the last 20 years. The number of accidents has increased between 1993 and 2002. In Region 1, the greatest number of accidents occurs in May and June, followed by a smaller peak in October. Region 2 has the greatest number of elk-related motor vehicle accidents. As a result, the monthly pattern for Region 2 is more well established, and has been consistent over the last two decades. While both Regions 2 and 3 have the greatest number of accidents in the winter, between October and February, Region 3 has a secondary peak in May and June.

In to the other large ungulates, primarily deer and moose, significantly fewer elk are reported found on Provincial highways. As a consequence, the pattern of elk-related motor vehicle accidents is less established. The winter peak appears to coincide with times of high snowfall in the Regions, when elk are found alongside highways that are actively kept cleared of snow. Elk appear to be influenced by the same snow conditions which affect moose.



Solitary Elk

(Photo: BC Parks)



Elk herd

(Photo: BC Parks)

Figure 6.5.1 Regional Comparisons – Total Annual Elk Accidents (1988 to 2007)

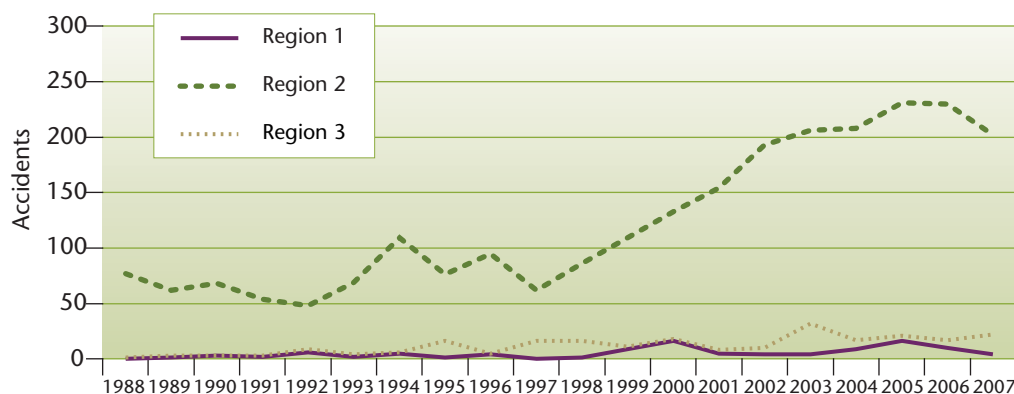


Figure 6.5.2
Region 1: Total Monthly Elk Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007

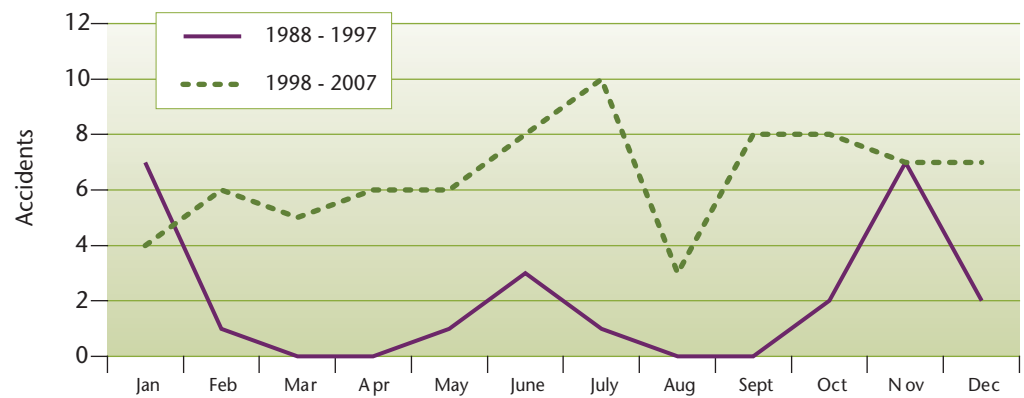


Figure 6.5.3
Region 2: Total Monthly Elk Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007

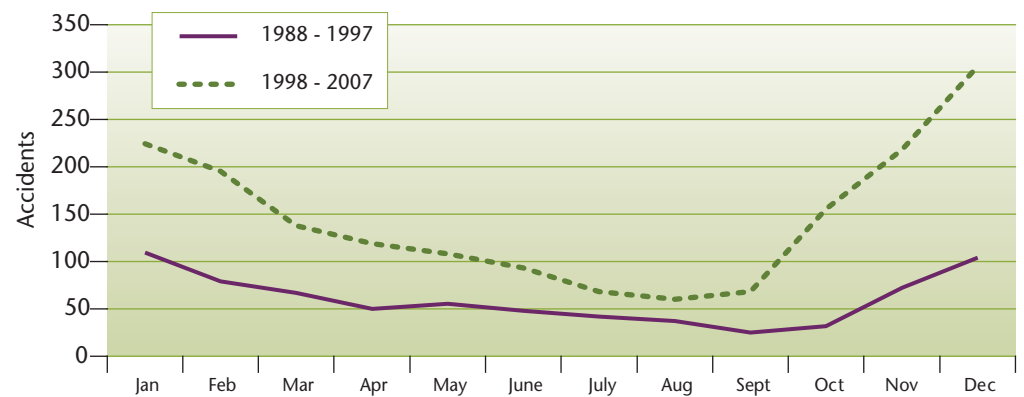
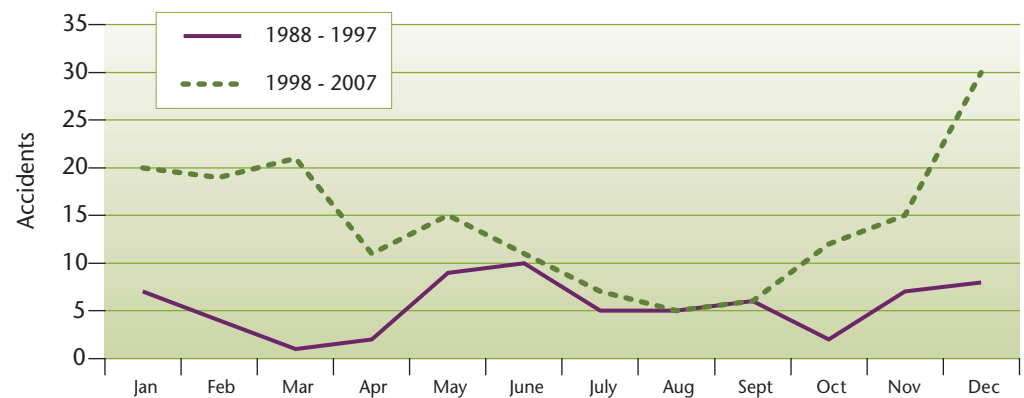


Figure 6.5.4
Region 3: Total Monthly Elk Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007



6.6 MOOSE

The number of moose-related motor vehicle in Region 1 has been relatively low over the last twenty years. There has been a gradual increase in the number of these accidents in Region 2. The greatest number of accidents, and the most dramatic increase in the number of accidents has occurred in Region 3. This increase has not been a steady one, as great fluctuations in the numbers of accidents appears to occur every 3 to 4 years. In both Region 2 and Region 3, the fluctuation can be as much as 90% in a single two year period. The causes of such dramatic fluctuation require further study.

Given the low number of moose-related accidents in Region 1, the pattern appears sporadic. In Regions 2 and 3, the accident patterns are far more defined, as considerably more accidents have been recorded in these Regions. For the most part, both Regions experience accident peaks in the summer (June and July) and in the winter (November, December and January). The summer peak may be due to pregnant cows moving to calving grounds in the early summer or licking salt on or along the highway. The winter peak appears to coincide with times of high snowfall in the Regions, when moose are found alongside highways that are actively kept cleared of snow.



Moose

(Photo: BC Parks)



Pair of Moose on highway

(Photo: Richard Ross, Sr.)

Figure 6.6.1 Regional Comparisons – Total Annual Moose Accidents – (1988 to 2007)

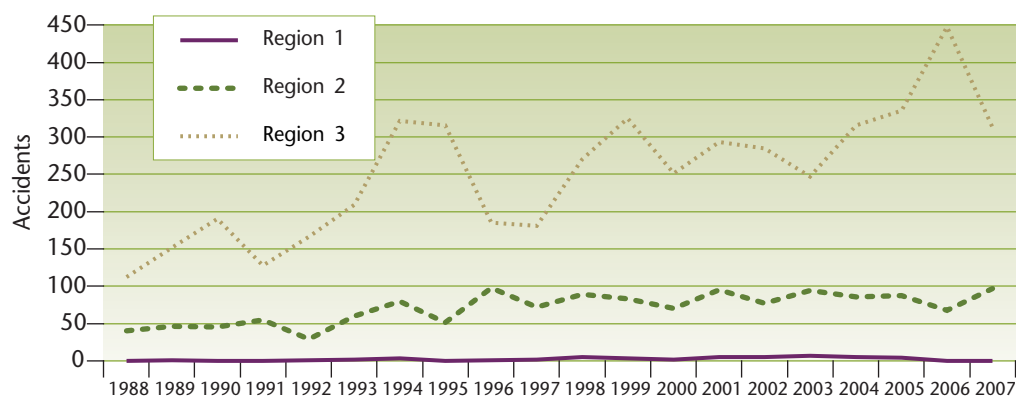


Figure 6.6.2
Region 1: Total Monthly Moose Accidents – (1988 to 2007)
10 Year Comparisons – 1988 to 1997 and 1998 to 2007

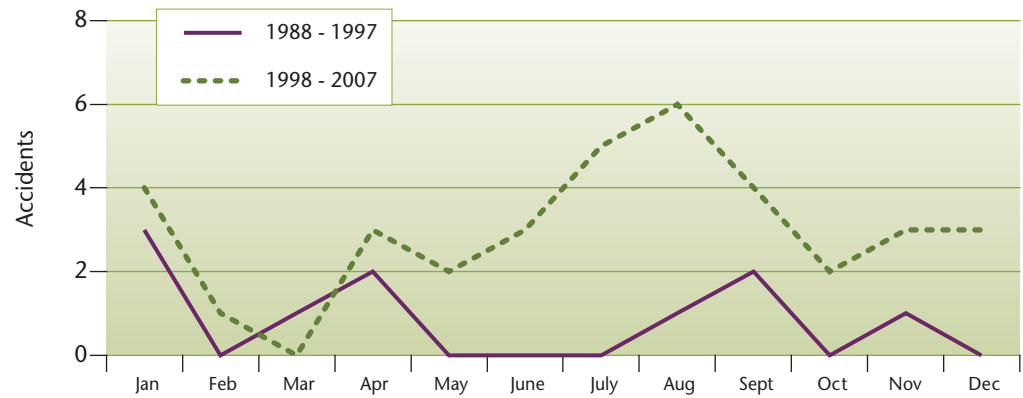


Figure 6.6.3
Region 2: Total Monthly Moose Accidents – (1988 to 2007)
10 Year Comparisons – 1988 to 1997 and 1998 to 2007

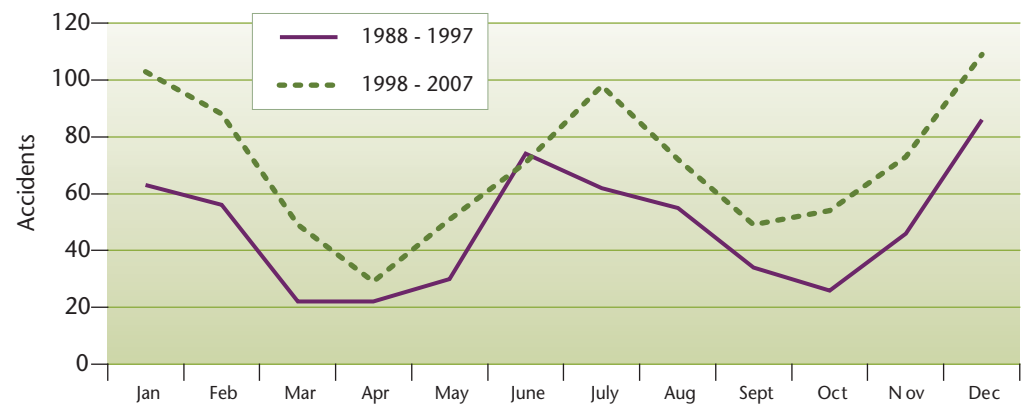
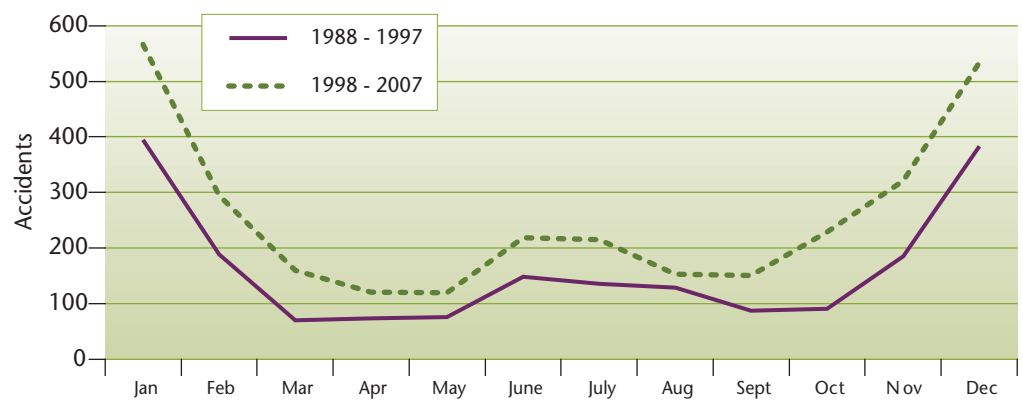


Figure 6.6.4
Region 3: Total Monthly Moose Accidents – (1988 to 2007)
10 Year Comparisons – 1988 to 1997 and 1998 to 2007



6.7 SHEEP

Sheep accidents primarily occur in Region 2. Except for a single sheep reported found in Region 1 in August of 2002, all sheep accidents reports have been located in Region 2.

While most sheep accidents occur between November and February, intermittent peaks occur in April, June and September. In late winter, as snow levels at higher elevations increase, sheep migrate to valley bottoms where highways are typically located. In early summer, sheep begin moving out of the valleys, feeding near highways, on their way to higher elevations for lambing. In late summer, they begin moving back in preparation for the rutting season, which usually occurs in October or November.



Sheep

(Photo: Tourism BC)



Sheep and bus

(Photo: Alan Dibb)

Figure 6.7.1 Regional Comparisons: Total Annual Sheep Accidents (1988 to 2007)

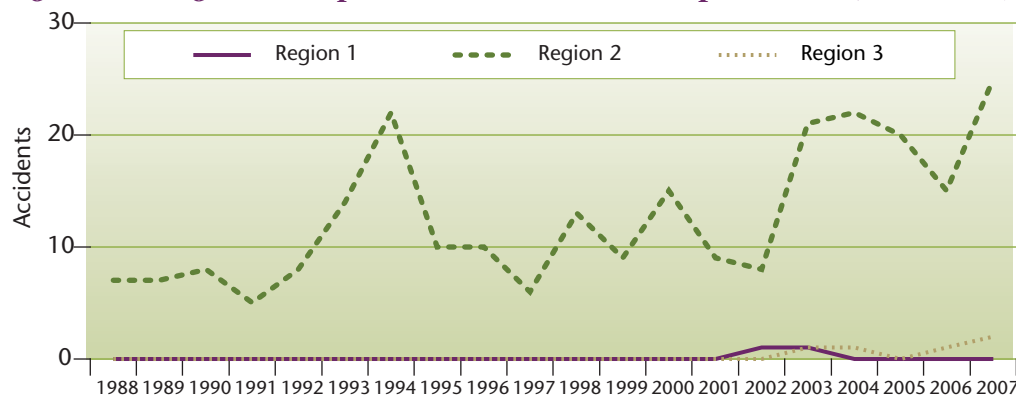


Figure 6.7.2
Region 1: Total Monthly Sheep Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007

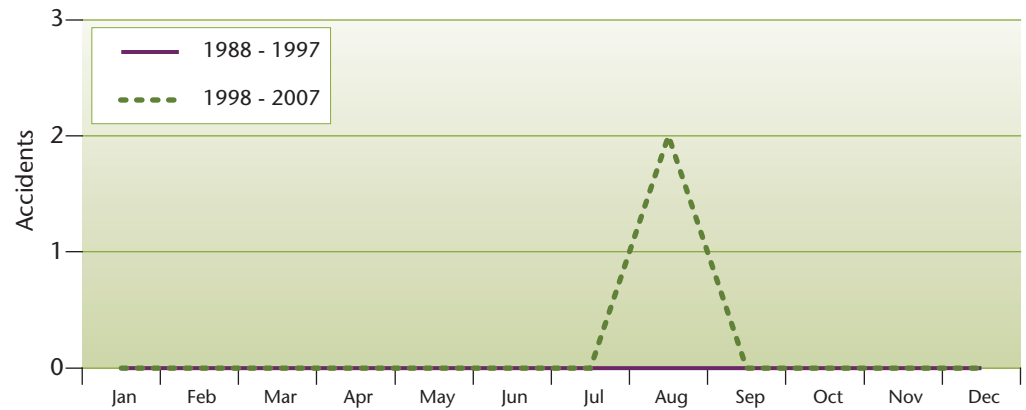


Figure 6.7.3
Region 2: Total Monthly Sheep Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007

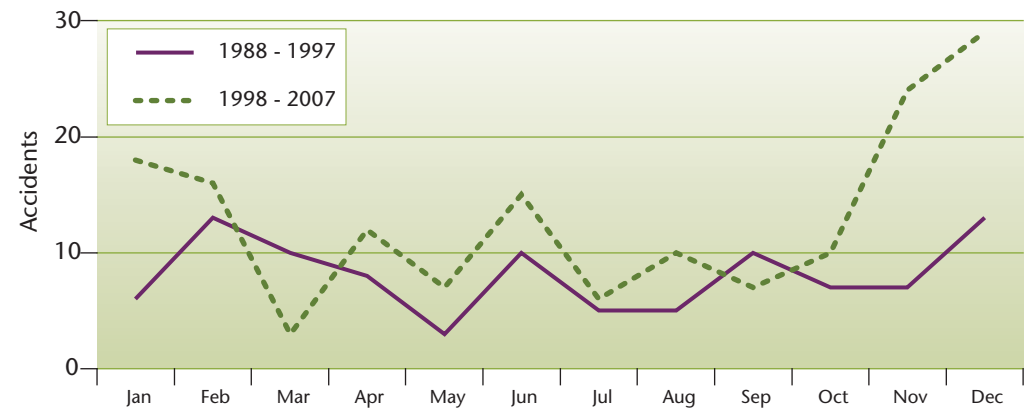
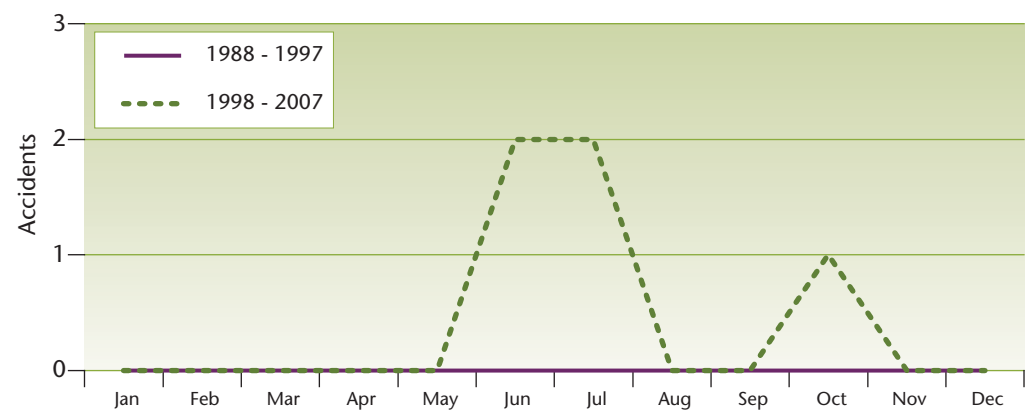


Figure 6.7.4
Region 3: Total Monthly Sheep Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007



6.8 COYOTE

For all three Regions, a large number of coyote accidents occurred between August and October between 1993 and 2002. Unlike Regions 2 and 3, Region 1 had marked increases in coyote accidents between November and February. This may be related to the milder winters experienced in Region 1, which enable coyotes to search for food at greater distances when food is scarcer, thus increasing their likelihood of being involved in an accident. In all Regions, coyote accidents tend to decline between March and June. In Regions 2 and 3, there is a small peak in May, coinciding with the end of gestation for females when they begin to hunt to feed their pups. The small April peak in Region 1 may be indicative of an earlier end to gestation due to milder climate. Detailed analysis by sex is limited because the sex of over 80% of the coyotes reported was unknown. For the months July through October, coyote accidents peak at about the same time bear accidents do in Regions 2 and 3. Coyotes may be following bears onto roads in order to benefit from the remains of the animals bears kill or the remains bears find on the road or in the road right-of-way.



Coyote

(Photo: W. Scott Elliot)



Coyote

(Photo: W. Scott Elliot)

Figure 6.8.1 Regional Comparisons: Total Annual Coyote Accidents (1988 to 2007)

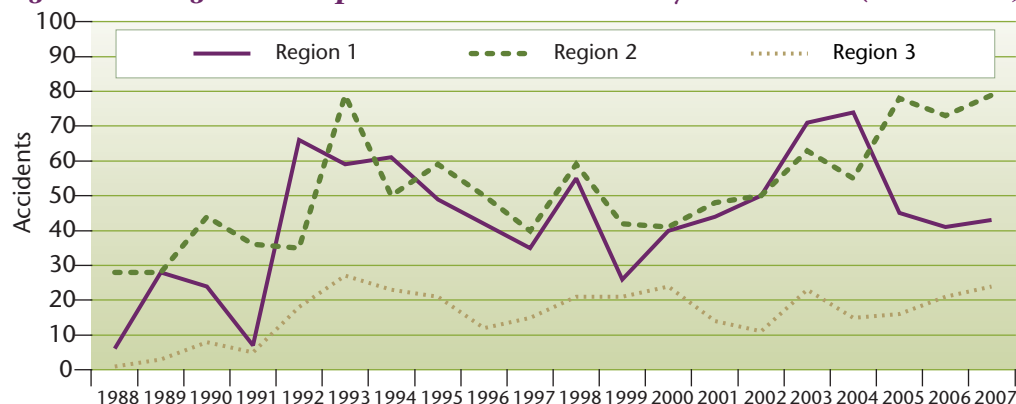


Figure 6.8.2
Region 1: Total Monthly Coyote Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007

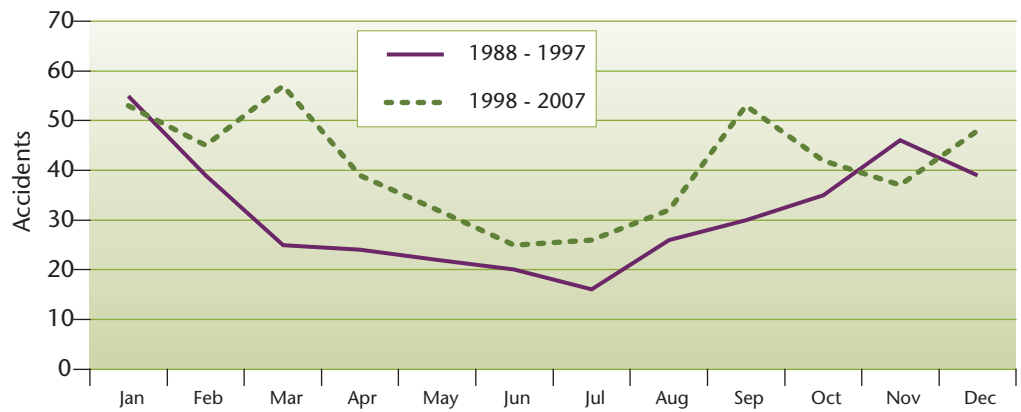


Figure 6.8.3
Region 2: Total Monthly Coyote Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007

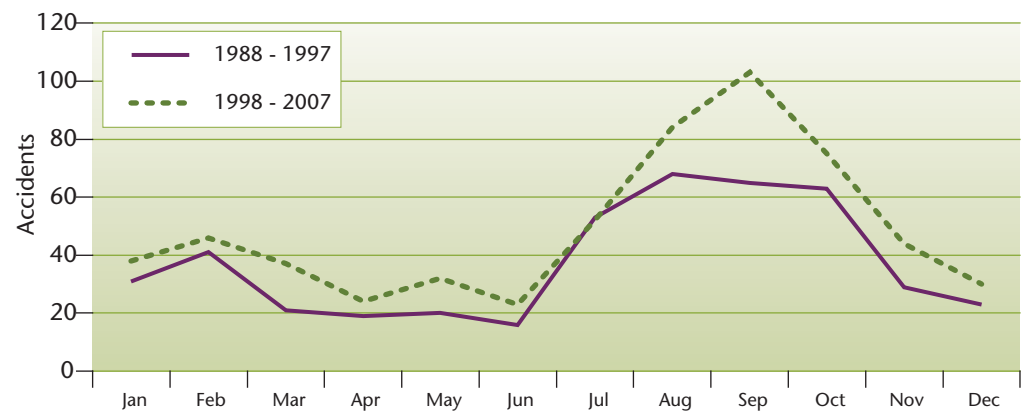
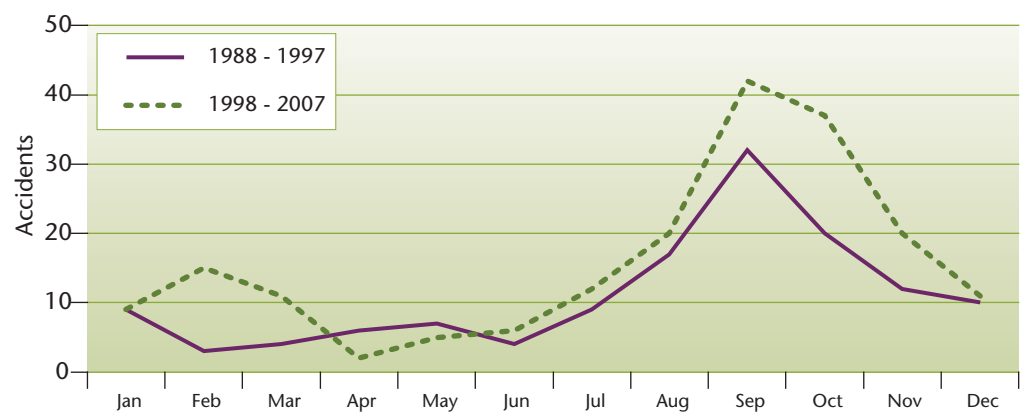


Figure 6.8.4
Region 3: Total Monthly Coyote Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007



6.9 PORCUPINE

In Region 1, the very small number of porcupine accidents reported limits analysis as no trend appears. Conversely, the increased reporting of these accidents in Regions 2 and 3 show that porcupine accidents are most common between May and October, with a peak occurring in August. In Regions 2 and 3, porcupine accidents appear to exhibit two peaks, the first, a small peak in May, followed by a large peak in August. Although porcupines are not the largest animals found on provincial highways, they constitute a safety hazard as their quills can puncture motor vehicle tires and increase the severity of an accident. (Zacharias, 1999)



Porcupine

(Photo: BC Parks)



Porcupine

(Photo: Bolten Studios)

Figure 6.9.1 Regional Comparisons: Total Annual Porcupine Accidents (1988 to 2007)

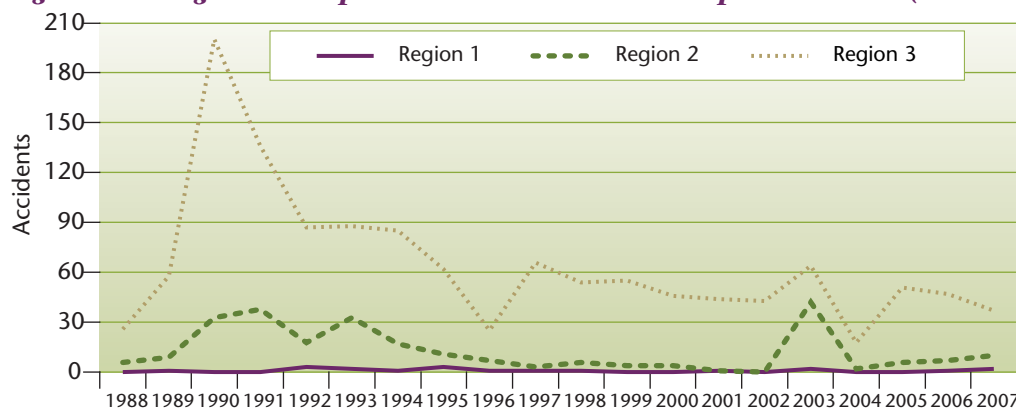


Figure 6.9.2
Region 1: Total Monthly Porcupine Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007

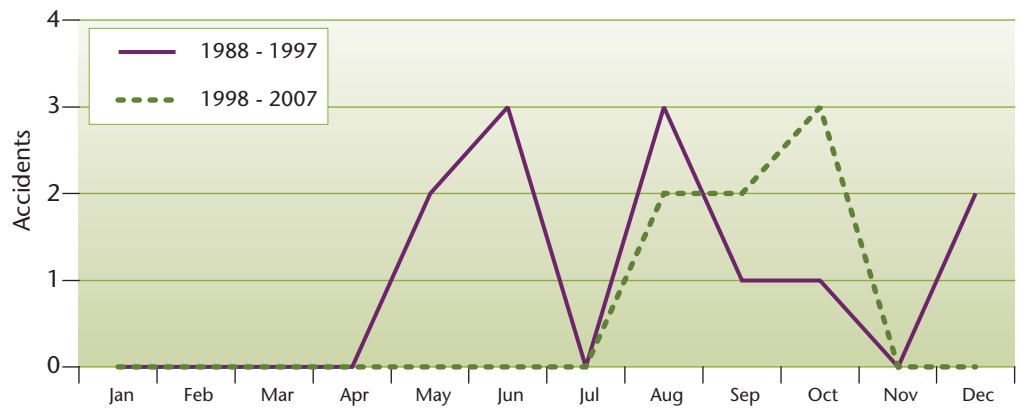


Figure 6.9.3
Region 2: Total Monthly Porcupine Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007

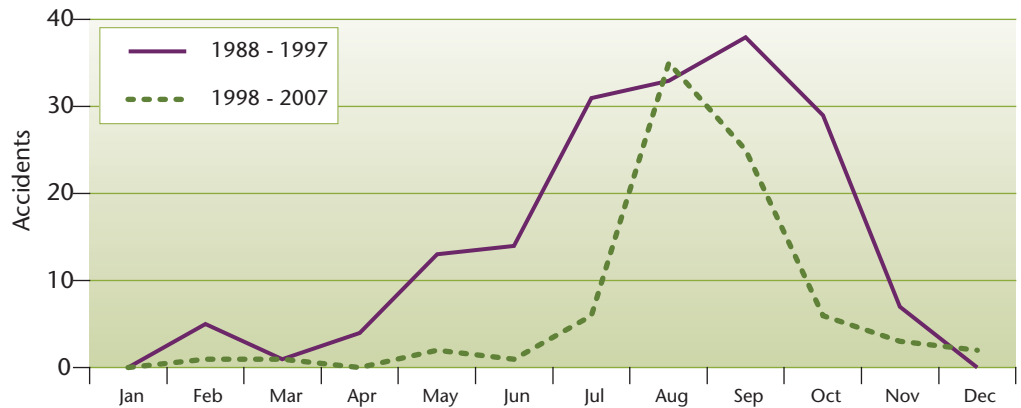


Figure 6.9.4
Region 3: Total Monthly Porcupine Accidents – (1988 to 2007)
 10 Year Comparisons – 1988 to 1997 and 1998 to 2007

