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Ministry of
Transportation

WARS 1983-2002

Wildlife Accident
Reporting and Mitigation
in British Columbia

Special Annual Report

Ministry of Transportation

Engineering Branch

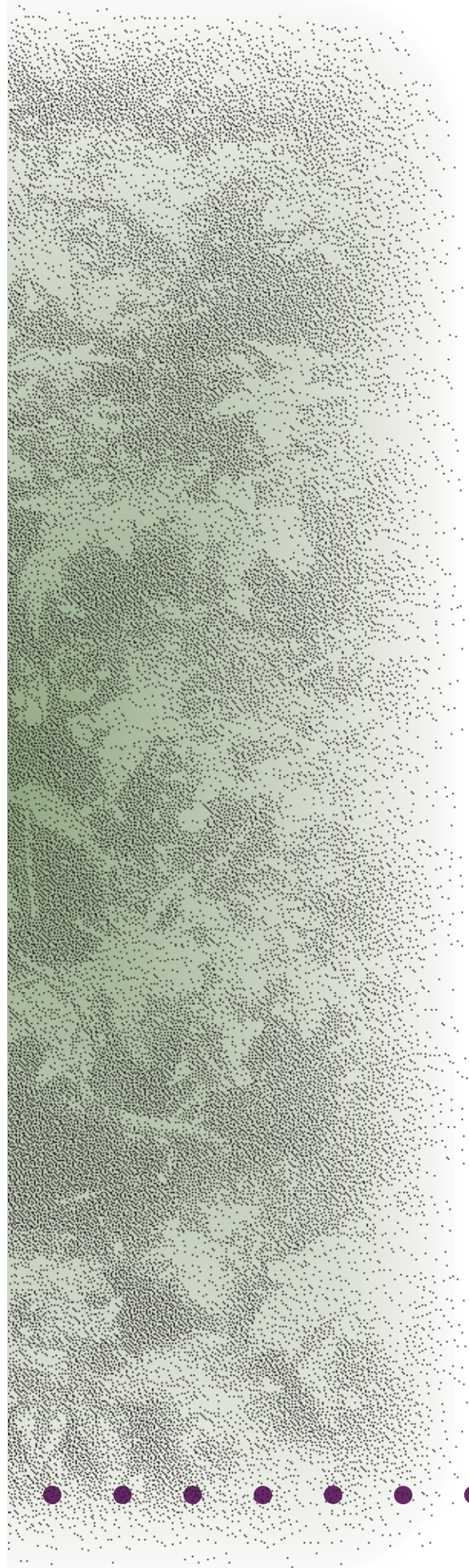
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WARS 1983–2002 Wildlife Accident Reporting and Mitigation in British Columbia Special Annual Report

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Abstract: The Wildlife Accident Reporting System (WARS) is designed to collect and store information on wildlife killed on highways in British Columbia. The WARS database contains over 78,000 records collected since 1978. Wildlife accident information is used by the Ministry to:

- 1) Identify accident-prone locations and accident trends;
- 2) direct cost-effective mitigation efforts;
- 3) evaluate the effectiveness of mitigation techniques;
- 4) provide data for highway planning purposes;
- 5) model and forecast accidents;
- 6) analyze traffic and climatic relationships for species-specific accident trends;
- 7) develop species-specific accident risk profiles for highway corridors; and
- 8) establish policies and strategies for accident issues and mitigation initiatives.

The success of the WARS system in British Columbia has made it a model for other agencies seeking to monitor wildlife-related motor vehicle accidents.

Comments: In 2002, Ministry Maintenance Contractors reported finding 5,032 dead wild animals on British Columbia highways. Approximately 80% of the animals reported killed were deer. The number of wildlife accidents reported to the Ministry decreased by 2.7% from 2001.

Keywords: WARS, wildlife, accident, reporting, system, road, kills, statistics, exclusion, fencing, British Columbia, risk, cost, deer, moose, elk, bear, sheep, mitigation, overpass, underpass, road ecology.



EXECUTIVE SUMMARY

The British Columbia Ministry of Transportation (BCMoT) administers the Wildlife Accident Reporting System (WARS). The WARS system is designed to analyze wildlife accident data collected by BCMoT Maintenance Contractors on numbered highways in British Columbia.

Since 1978, over 78,000 wildlife accidents have been reported on provincial highways. More than 90% of the accidents involved deer, moose and elk. Between 1995 and 2000, 13 people were reported killed in wildlife-related motor vehicle accidents in British Columbia. After weather, the Insurance Corporation of British Columbia (ICBC) rates wildlife as the next highest environmental contributing factor for police-attended accidents. Between 1997 and 2002, ICBC spent over \$118 million on wildlife-related motor vehicle accident claims.

In 2002, over 5,000 wildlife-related accidents were reported in British Columbia (table below). Between 2001 and 2002, the number of wildlife-related accidents reported decreased by 2.7%.

Wildlife Accidents by BCMoT Region (Year 2002)

	Region 1	Region 2	Region 3	Total
Wildlife Accidents	1,221	2,871	939	5,031

In 2002, it is estimated wildlife accidents cost the Province over \$20 million in motor vehicle accident claims; \$580,000 in highway accident clean-up costs; \$320,000 in lost provincial hunting license revenues; and \$30 million in lost value to residents and non-residents who view or hunt wildlife.

BCMoT is committed to protect the safety of the motoring public; stem the rising societal cost of human fatalities and injuries, motor vehicle damage, and highway maintenance; and reduce the loss of wildlife on provincial highways. Consequently, BCMoT uses the WARS system to:

- 1) identify accident-prone locations and accident trends;
- 2) direct cost-effective mitigation efforts;
- 3) evaluate the effectiveness of mitigation techniques;
- 4) provide data for highway planning purposes;
- 5) model and forecast accidents;
- 6) analyze traffic and climatic relationships for species-specific accident trends;
- 7) develop species-specific accident risk profiles for highway corridors; and
- 8) establish policies and strategies for accident issues and mitigation initiatives.

The WARS system is becoming an increasingly valuable information resource for BCMoT, and other government agencies, consultants, researchers, wildlife associations, special interest groups and members of the general public. The Ministry of Water, Land and Air Protection uses WARS data to assess provincial wildlife population trends. ICBC uses WARS data for identifying highway locations where joint BCMoT/ICBC initiatives, such as exclusion fencing, warning reflectors, and infrared camera detection systems, can be targeted to reduce wildlife-related motor vehicle collisions. The success of the WARS system in British Columbia has made it a model for other agencies seeking to monitor wildlife-related motor vehicle accidents.



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The timely assembly and proofing of the WARS monthly reports, vital for keeping the WARS system current and complete, was done by Ministry's District Staff:

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WARS 1983-2002

Wildlife Accident
Reporting and Mitigation
in British Columbia

Special Annual Report



5.0 PROVINCIAL ACCIDENT STATISTICS

5.1 Overview

In 2002, BCMoT Maintenance Contractors reported 5,031 wildlife-vehicle accidents. This is a decrease of 1.8 % from 2001 (Table 5.1). The increase can be attributed to a variety of factors including seasonal climatic variations, increasing animal populations, and changes in migratory patterns.

With the decrease in 2002, it appears the accident rate has begun to cycle down. The highest number of accidents in the last decade occurred in 1994. A second peak occurred in 2001. These peaks may be attributed to correlated longer term climatic patterns, seasonal animal behavior, or fluctuating traffic volumes. However, since 1983, 59% to 85% of all accidents reported annually have involved deer, so the cycle of deer accidents represents the single largest factor in the cycle of total wildlife accidents in British Columbia (Table 5.2).

The following total accidents and accidents/km/year maps for the time periods, 1983 to 1992 and 1993 to 2002, show the distribution of wildlife accidents by species most commonly found on Provincial highways. The species, which include primarily large ungulates and carnivores, are:

1. Bear,
2. Caribou,
3. Cougar,
4. Coyote,
5. Deer,
6. Elk,
7. Moose,
8. Porcupine,
9. Sheep, and
10. Wolf

These maps enable the Ministry to identify changing patterns in wildlife accidents. It should be noted that due to increased reporting vigilance by the Ministry's Maintenance Contractors and improvements in the WARS system, the information provided in the 1993 to 2002 maps may provide a more complete picture of the wildlife accident situation in the Province. In addition.

Over the last two decades, the growing provincial population has resulted in a corresponding increase in the number of drivers and vehicles using Provincial highways. British Columbia's population increased from 3.4 million to 4.1 million between 1981 and 2001. (Figure 5.1) This was an increase of 20% in twenty years. The number of licensed motor vehicles operating in the Province increased from 1.98 million to 2.35 million between 1991 and 2001 (Figure 5.2). This was an increase of 18% in the last 10 years. The increase in the number of motor vehicles operating on Provincial highways is believed to play a significant role in the incidence of wildlife accidents.

Table 5.1 – Wildlife Accidents (Total and selected major species)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
All Species	1678	1987	2109	2078	2797	2618	3450	3661	3306	3176	4798	5339	4764	3902	3661	4611	4889	4785	5171	5031	73811
Bear	27	25	41	67	44	35	61	50	57	73	112	109	108	113	94	142	166	102	135	169	1430
Deer	1028	1281	1263	1443	1732	2236	2947	2950	2745	2585	3992	4375	3917	3174	3006	3713	3899	3840	4028	3858	58012
Elk	56	74	46	53	72	78	66	74	59	63	75	120	93	104	78	103	129	167	159	179	1848
Moose	128	167	141	177	143	152	199	235	183	196	271	405	367	284	255	364	411	323	392	351	5144
Other Species	439	440	618	338	806	117	177	352	262	259	348	330	279	227	228	289	284	353	457	474	7077

Table 5.2 – Wildlife Accidents (%) (Total and selected major species)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
% All Species	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Bear	1.6	1.3	1.9	3.2	1.6	1.3	1.8	1.4	1.7	2.3	2.3	2.0	2.3	2.9	2.6	3.1	3.4	2.1	2.6	3.4
% Deer	61.3	64.5	59.9	69.4	61.9	85.4	85.4	80.6	83.0	81.4	83.2	81.9	82.2	81.3	82.1	80.5	79.8	80.3	77.9	76.7
% Elk	3.3	3.7	2.2	2.6	2.6	3.0	1.9	2.0	1.8	2.0	1.6	2.2	2.0	2.7	2.1	2.2	2.6	3.5	3.1	3.6
% Moose	7.6	8.4	6.7	8.5	5.1	5.8	5.8	6.4	5.5	6.2	5.6	7.6	7.7	7.3	7.0	7.9	8.4	6.8	7.6	7.0
% Other Species	26.2	22.1	29.3	16.3	28.8	4.5	5.1	9.6	7.9	8.2	7.3	6.2	5.9	5.8	6.2	6.3	5.8	7.4	8.8	9.4





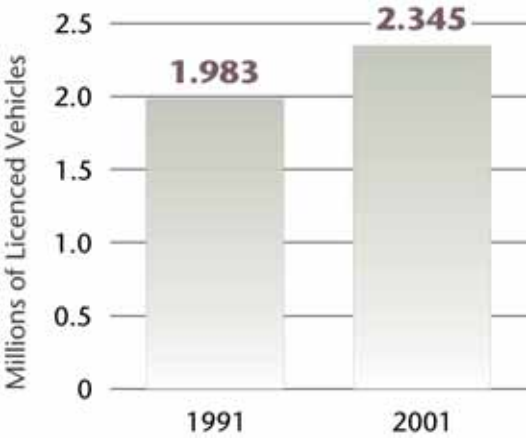
Figure 5.1 BC's Population – Up 22% in a Decade



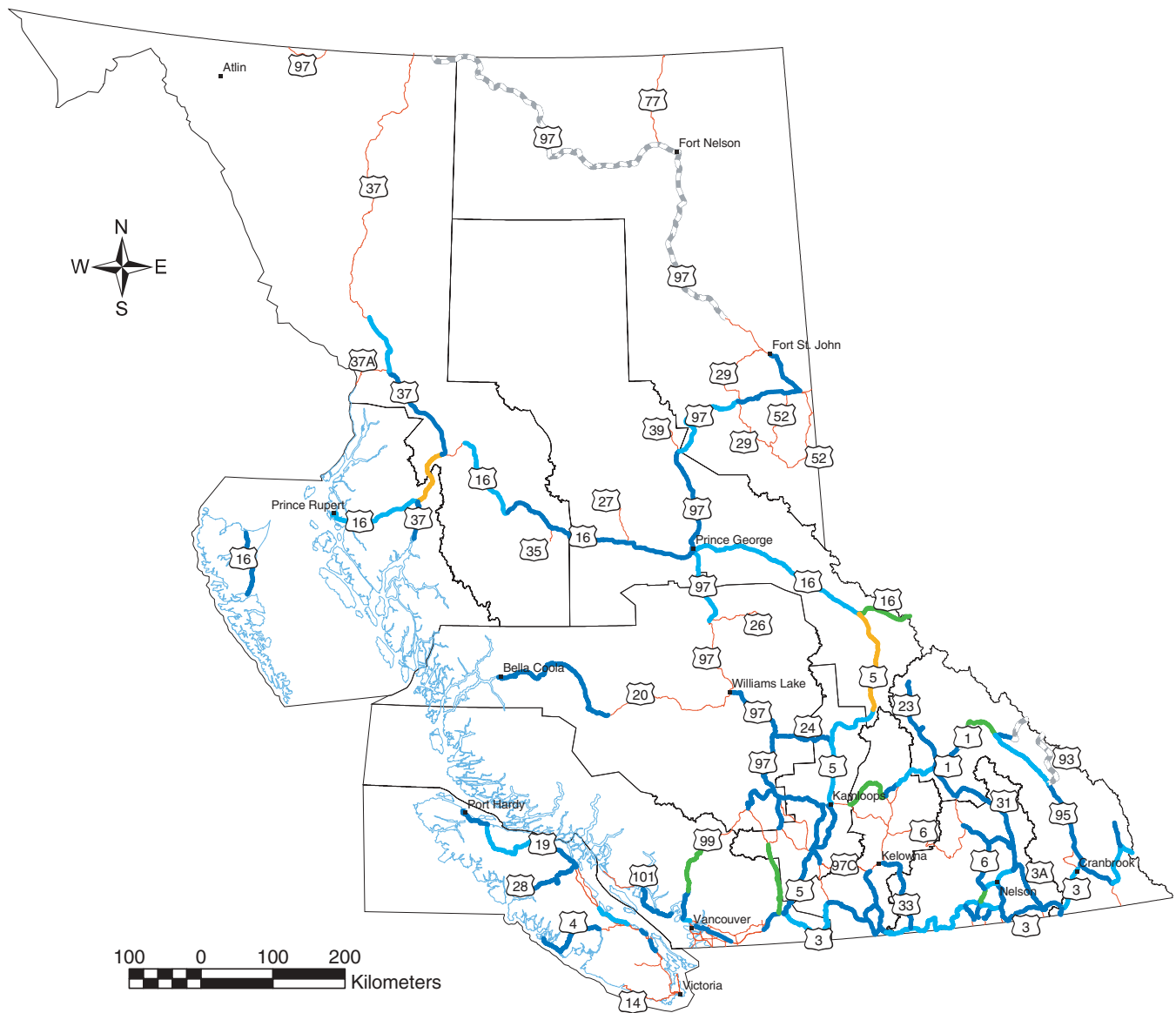
British Columbia Traffic

(Photo: BC Ministry of Transportation)

Figure 5.2 BC's Traffic – Up 18% in a Decade



*Adapted from: British Columbia Ministry of Transportation, 2003, *Opening Up BC. A Transportation Plan for British Columbia*



Map 5.1

Total Bear Accidents (1983 - 1992)

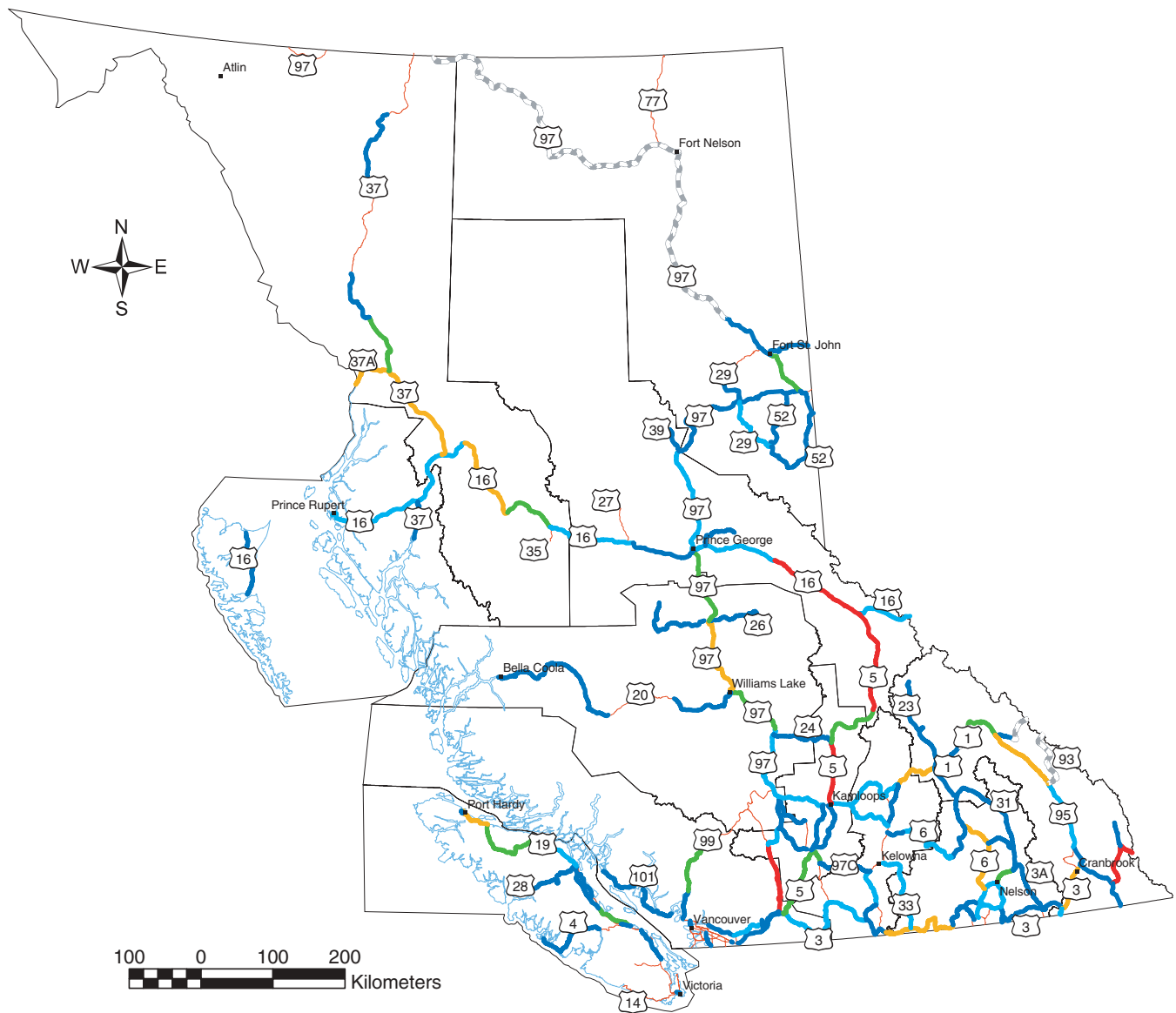
Legend

- 1 - 5
- 6 - 10
- 11 - 15
- 16 - 25
- 26 - 47
- No Accidents Reported on LKI Segment
- - - No WARS Data (Federally-Maintained)

Notes:

- (1) Reported Species not verified by wildlife specialist.
- (2) Discrepancies between the reported accident location and the normal range of the species may exist.

WARS 2002, Wildlife Accident Reporting System
2002 Annual Report.
British Columbia Ministry of Transportation,
February 2004; maps produced by Ministry
of Sustainable Resource Management.



Map 5.2

Total Bear Accidents (1993 - 2002)

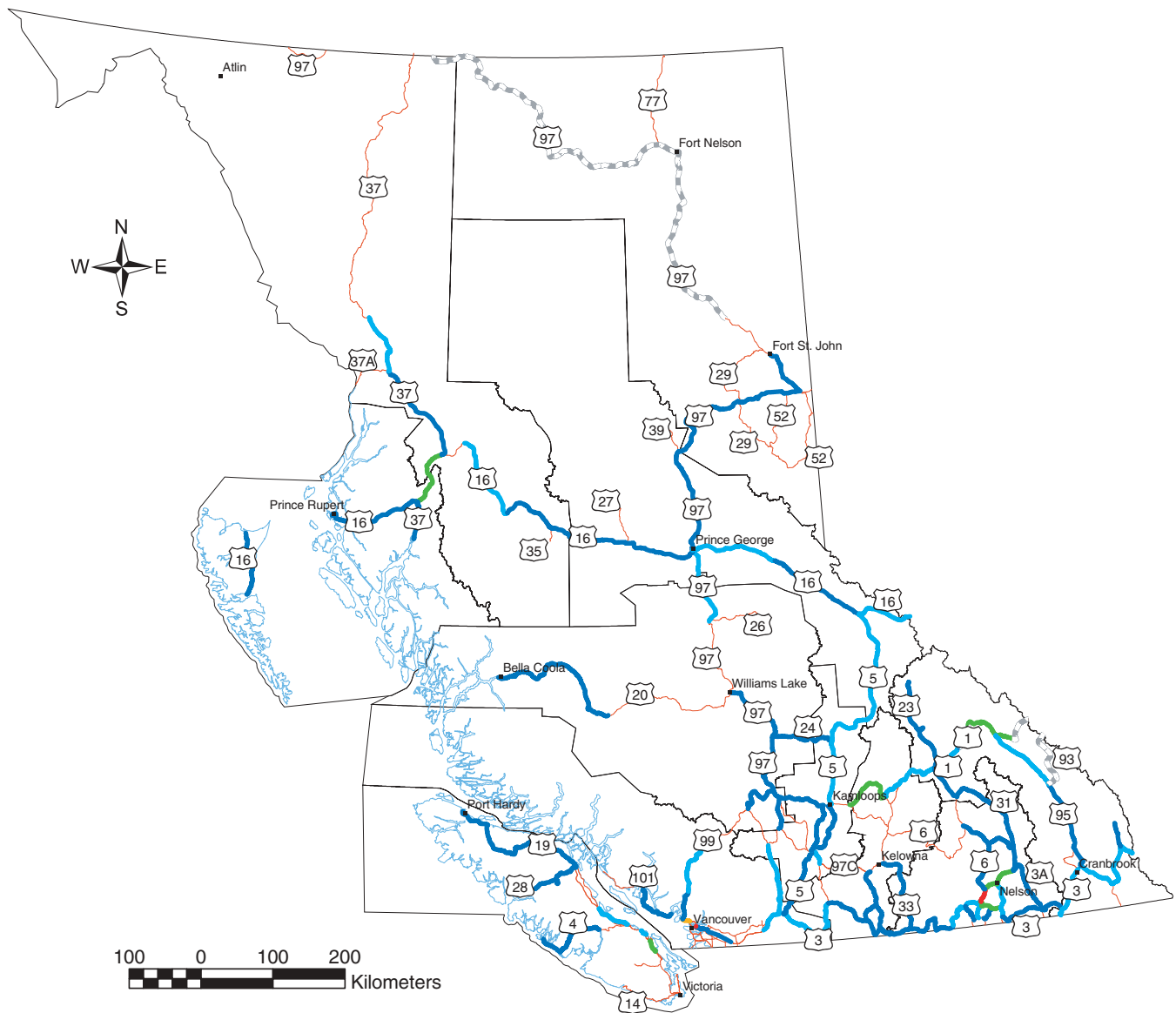
Legend

- 1 - 5
- 6 - 10
- 11 - 15
- 16 - 25
- 26 - 47
- No Accidents Reported on LKI Segment
- No WARS Data (Federally-Maintained)

Notes:

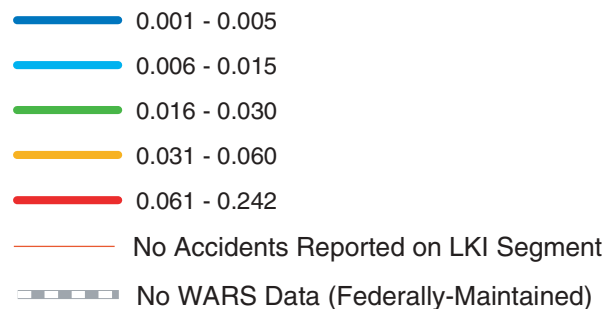
- (1) Reported Species not verified by wildlife specialist.
- (2) Discrepancies between the reported accident location and the normal range of the species may exist.

WARS 2002, Wildlife Accident Reporting System
2002 Annual Report.
British Columbia Ministry of Transportation,
February 2004; maps produced by Ministry
of Sustainable Resource Management.



Map 5.3
 Bear Accidents
 per Kilometre per Year
 (1983 - 1992)

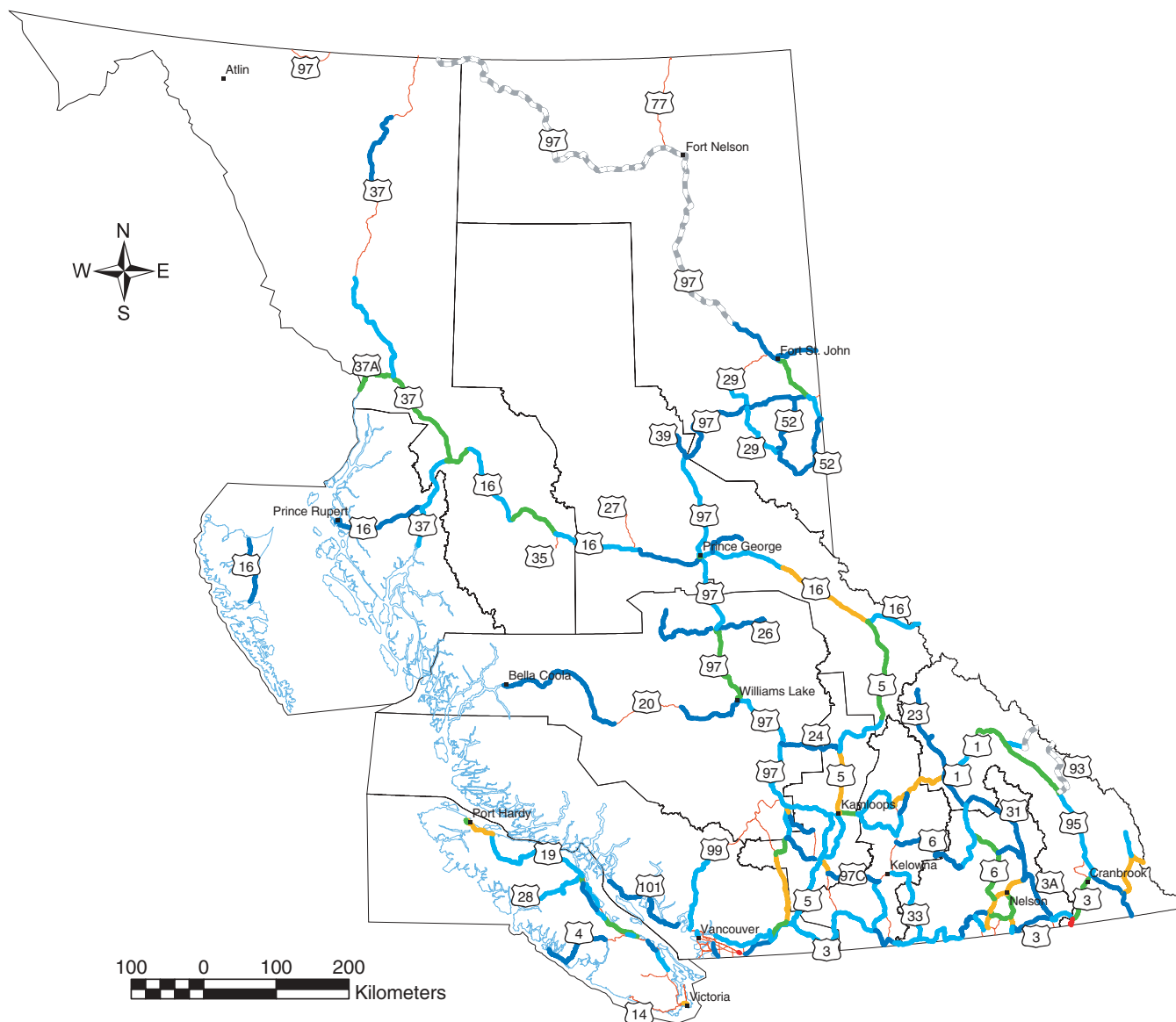
Legend



Notes:

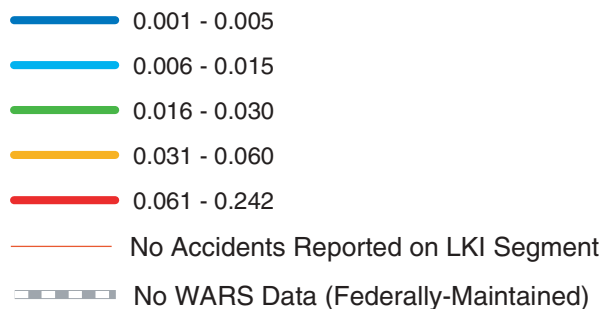
- (1) Reported Species not verified by wildlife specialist.
- (2) Discrepancies between the reported accident location and the normal range of the species may exist.

WARS 2002, Wildlife Accident Reporting System
 2002 Annual Report.
 British Columbia Ministry of Transportation,
 February 2004; maps produced by Ministry
 of Sustainable Resource Management.



Map 5.4
Bear Accidents
per Kilometre per Year
(1993 - 2002)

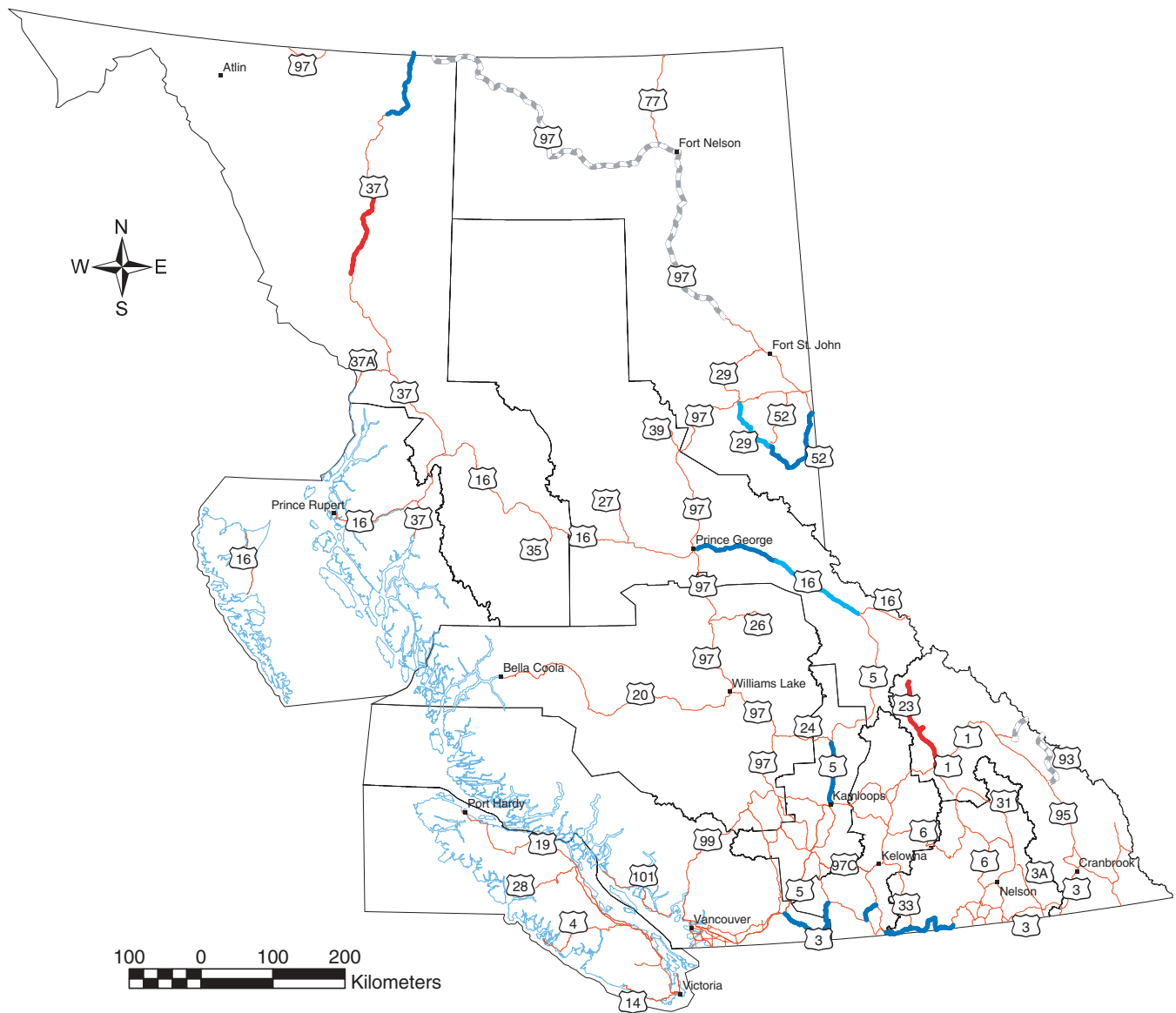
Legend



Notes:

- (1) Reported Species not verified by wildlife specialist.
- (2) Discrepancies between the reported accident location and the normal range of the species may exist.

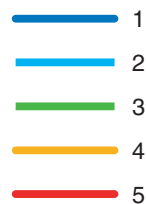
WARS 2002, Wildlife Accident Reporting System
 2002 Annual Report.
 British Columbia Ministry of Transportation,
 February 2004; maps produced by Ministry
 of Sustainable Resource Management.



Map 5.5

Total Caribou Accidents (1983 - 1992)

Legend

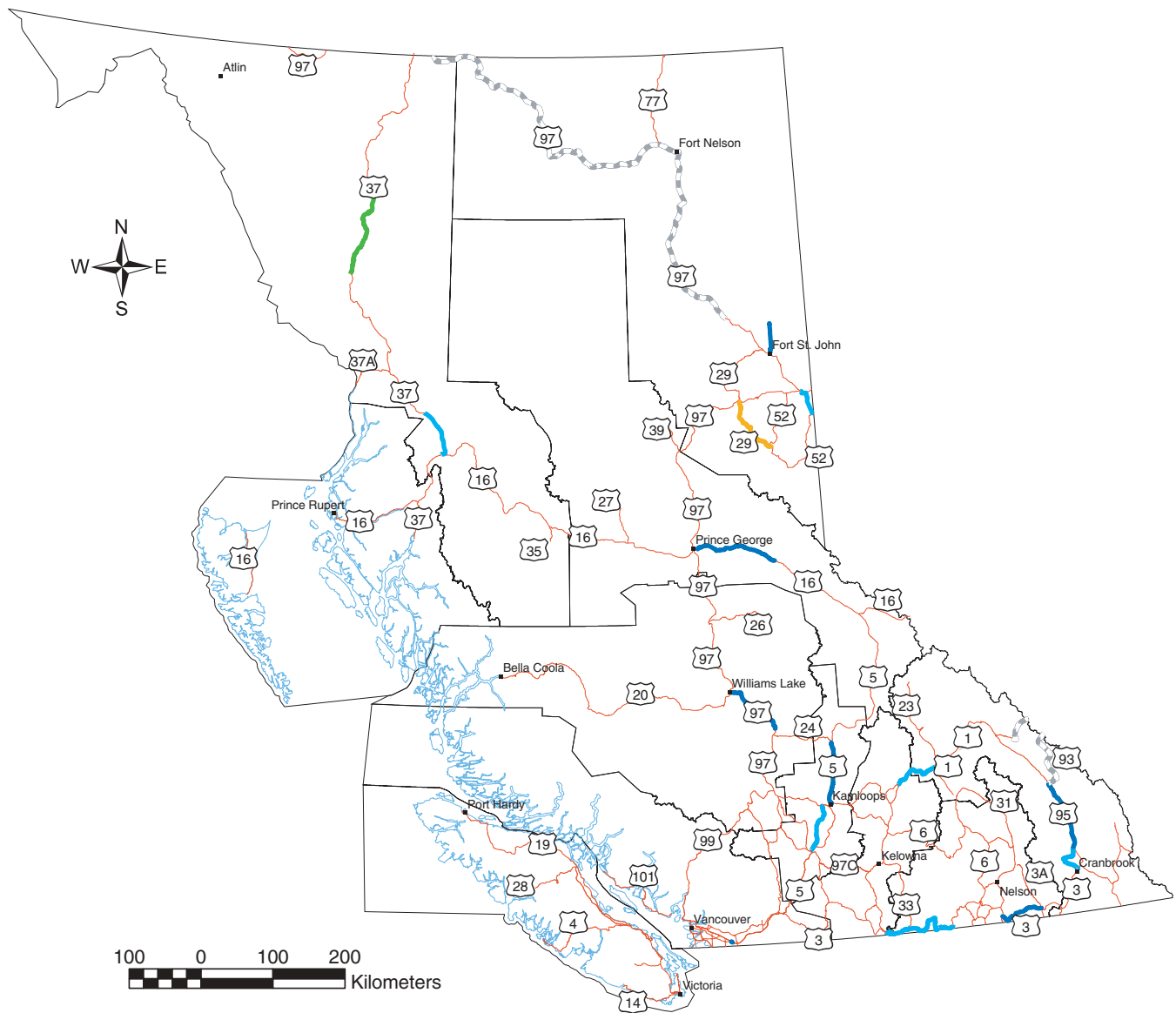


- No Accidents Reported on LKI Segment
- - - No WARS Data (Federally-Maintained)

Notes:

- (1) Reported Species not verified by wildlife specialist.
- (2) Discrepancies between the reported accident location and the normal range of the species may exist.

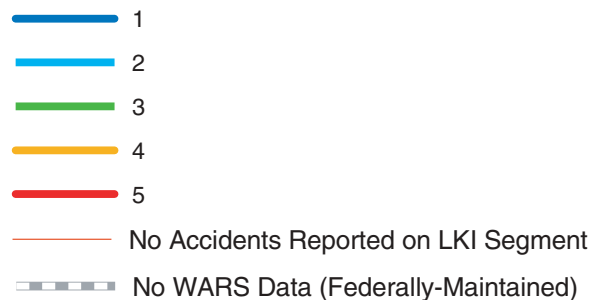
WARS 2002, Wildlife Accident Reporting System
2002 Annual Report.
British Columbia Ministry of Transportation,
February 2004; maps produced by Ministry
of Sustainable Resource Management.



Map 5.6

Total Caribou Accidents (1993 - 2002)

Legend



Notes:

- (1) Reported Species not verified by wildlife specialist.
- (2) Discrepancies between the reported accident location and the normal range of the species may exist.

WARS 2002, Wildlife Accident Reporting System
2002 Annual Report.
British Columbia Ministry of Transportation,
February 2004; maps produced by Ministry
of Sustainable Resource Management.

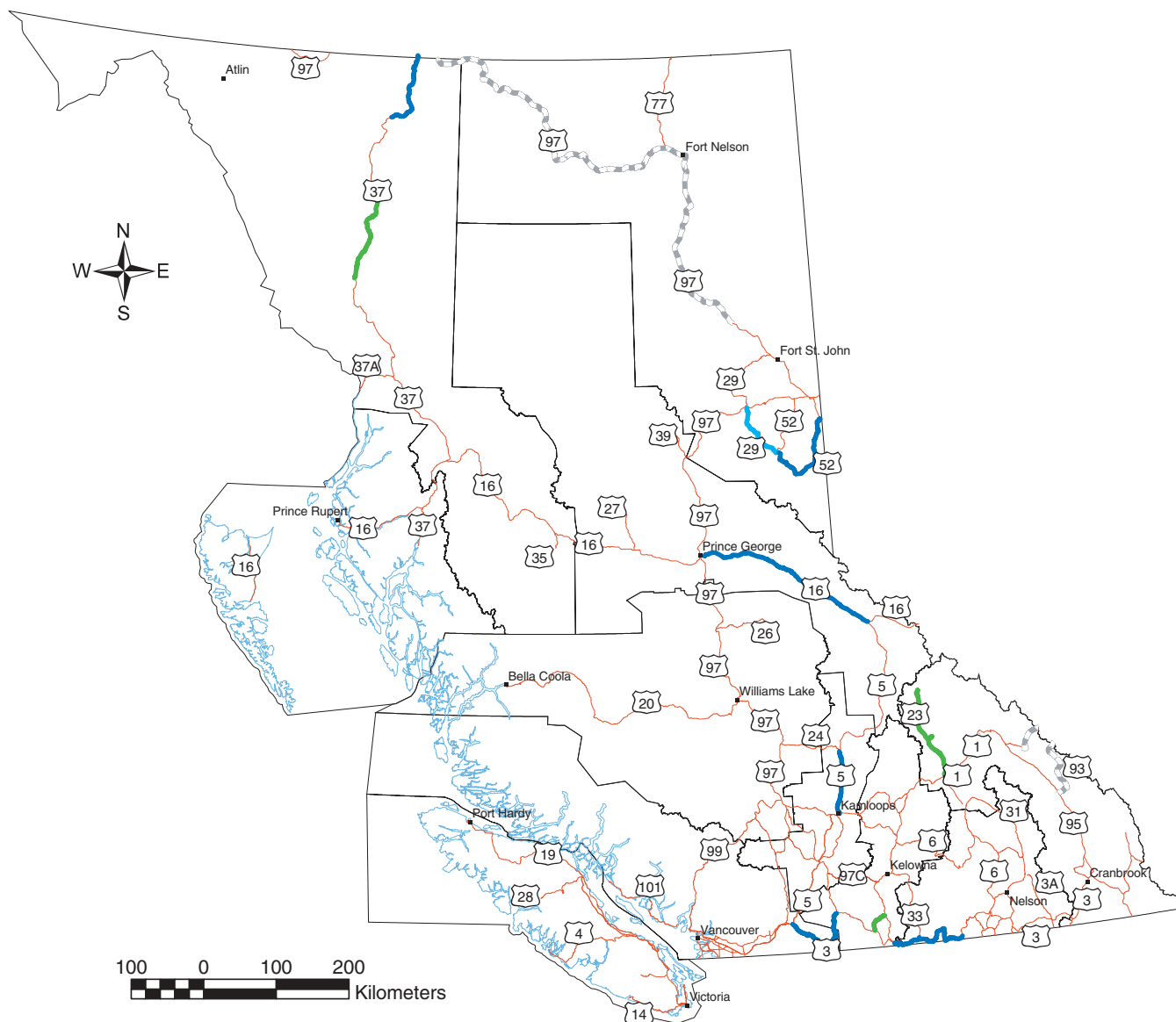


Figure 5.7

Caribou Accidents
per Kilometre per Year
(1983 - 1992)

Legend

- 0.001
- 0.002
- 0.003
- No Accidents Reported on LKI Segment
- - - No WARS Data (Federally-Maintained)

Notes:

- (1) Reported Species not verified by wildlife specialist.
- (2) Discrepancies between the reported accident location and the normal range of the species may exist.

WARS 2002, Wildlife Accident Reporting System
2002 Annual Report.
British Columbia Ministry of Transportation,
February 2004; maps produced by Ministry
of Sustainable Resource Management.