BRITISH COLUMBIA

Ministry of Transportation

WARS 2000

Wildlife Accident Reporting System

2000 Annual Report

(1991 to 2000 Synopsis)

Ministry of Transportation
Engineering Branch
Environmental Management Section

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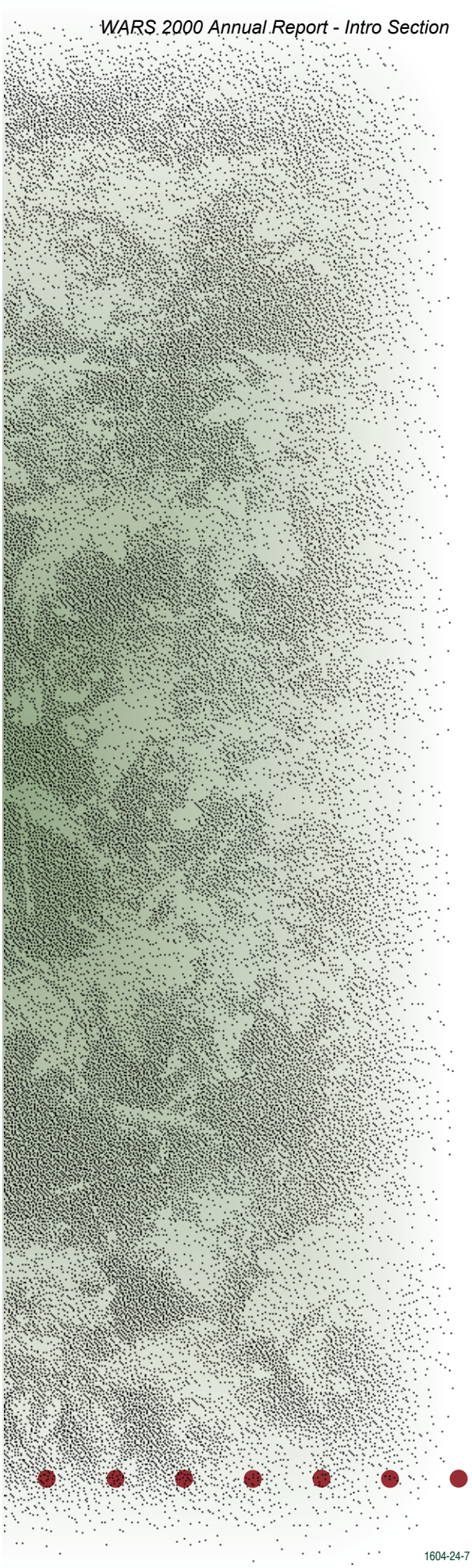

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WARS Wildlife Accident Reporting System

2000 Annual Report

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INTRODUCTION

Overview

The Environmental Management Section, Engineering Branch, British Columbia Ministry of Transportation (MoT), administers the Wildlife Accident Reporting System (WARS), a system designed to collect and analyze information on wildlife killed and retrieved on numbered highways in British Columbia (Map 1).

Wildlife accident information is used by the Ministry to compile statistics for detecting and evaluating accident trends. This data is particularly valuable for identifying highway sections that require wildlife mitigation and in establishing practical policies and strategies for the entire province. WARS is also used as an evaluation tool for the effectiveness of various mitigation methods. The Ministry's Regional Environmental Coordinators have direct access to the WARS system and provide wildlife-related motor vehicle accident information to Ministry Regional and District offices (Maps 2 and 3).

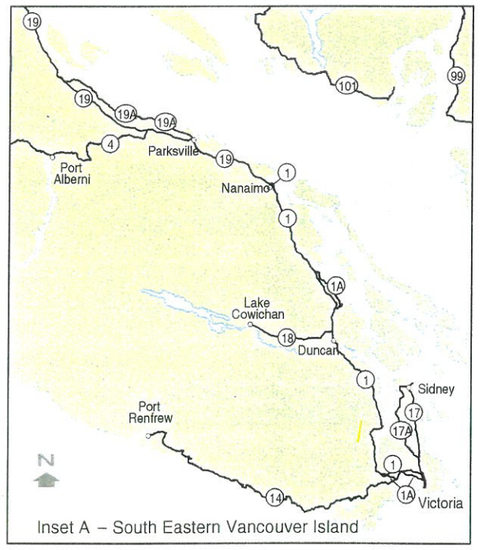
The Ministry of Water, Land and Air Protection (MWLAP) also uses the data to assess wildlife population trends in its management units. Data from the WARS system is used by the Insurance Corporation of British Columbia (ICBC) for identifying roads where mitigation measures can be targeted in joint Ministry/ICBC initiatives to reduce wildlife-related motor vehicle accidents.

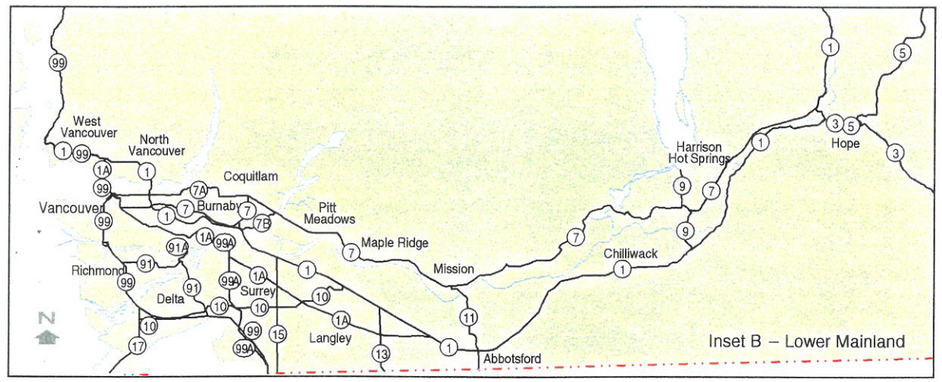
Methodology

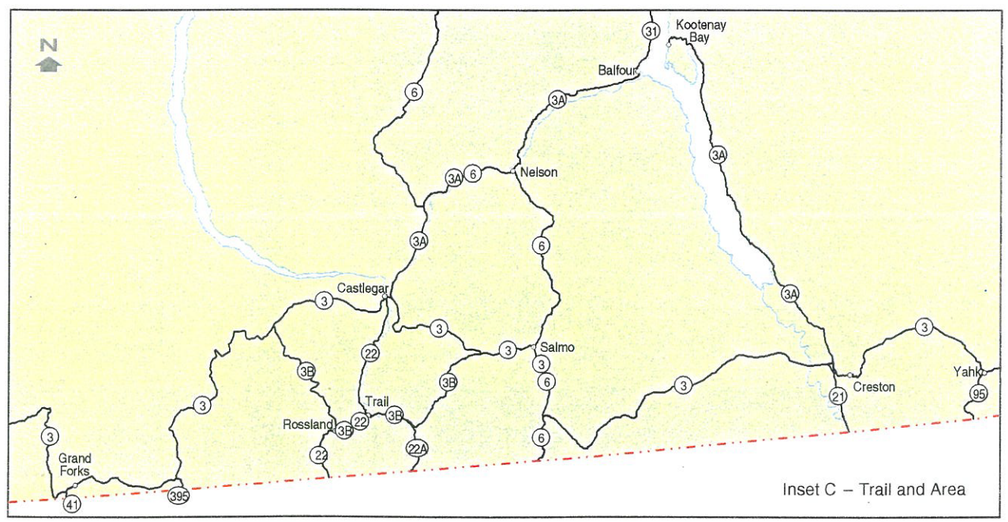
Wildlife accidents are recorded by the Ministry's Road and Bridge Maintenance Contractors located throughout British Columbia (Map 4). Data regarding wildlife-vehicle accidents, such as species and location, by Landmark Kilometre Inventory (LKI), are recorded on WARS forms H-107 (1999/01) (Appendix A). These forms are compiled by each Highway District office and then sent on a monthly basis to the Engineering Branch, HQ. The forms are screened, coded and then entered into the WARS database.

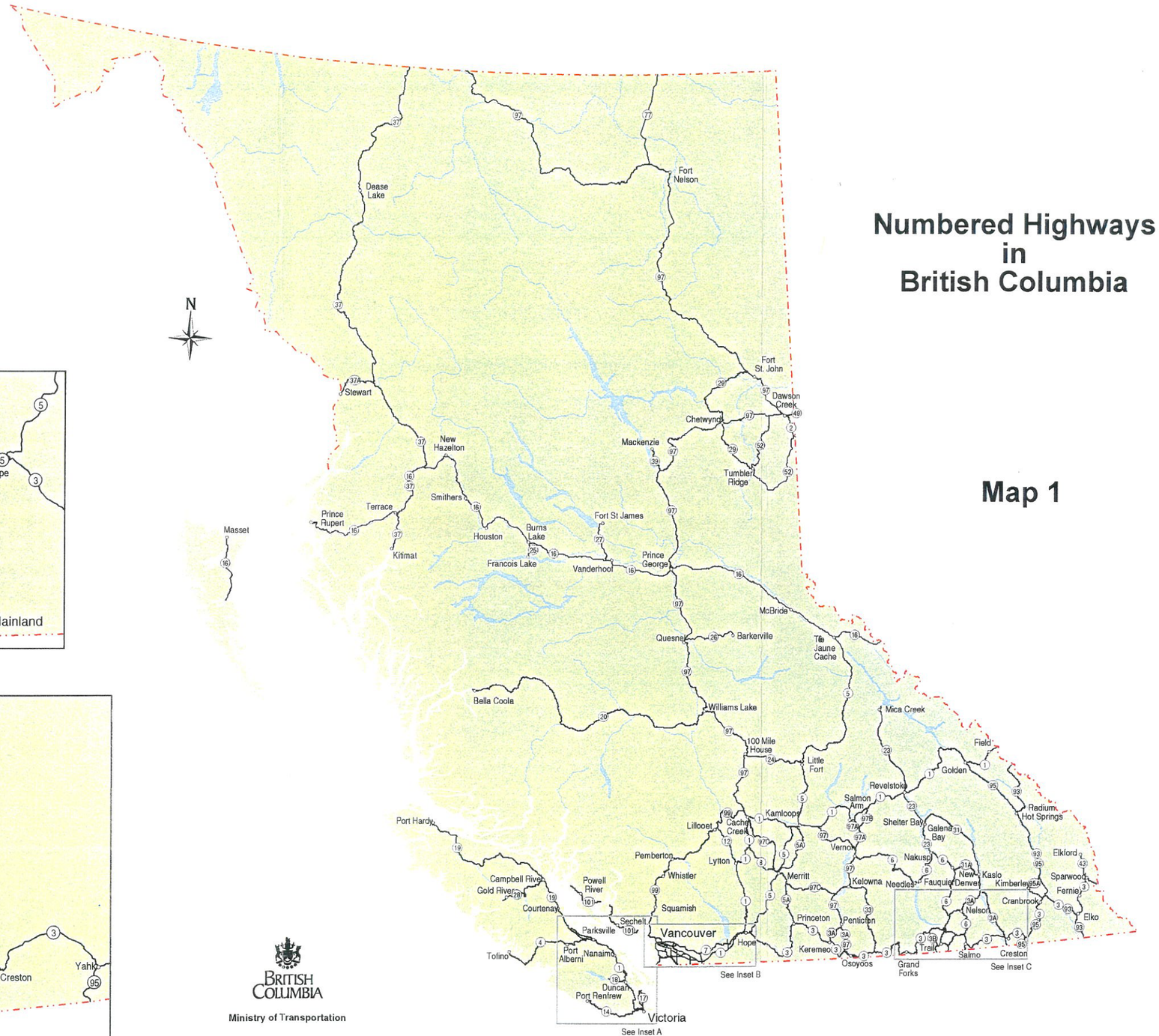
WARS forms are not completed for highways maintained by the Federal Government or the Yukon Government under agreements with the British Columbia Government. These are:

Highway 1 – Glacier National Park
Highway 1 – Mt. Revelstoke National Park
Highway 1 – Yoho National Park
Highway 4 - Pacific Rim National Park,
Highway 93 – Kootenay National Park
Highway 97 - Alaska Highway (to Yukon Border)
Highway 97 - Alaska Highway (Watson Lake to Iron Creek)
Highway 1 - Alaska Highway (Morley to Swift River)
Haines Highway
Skagway Highway





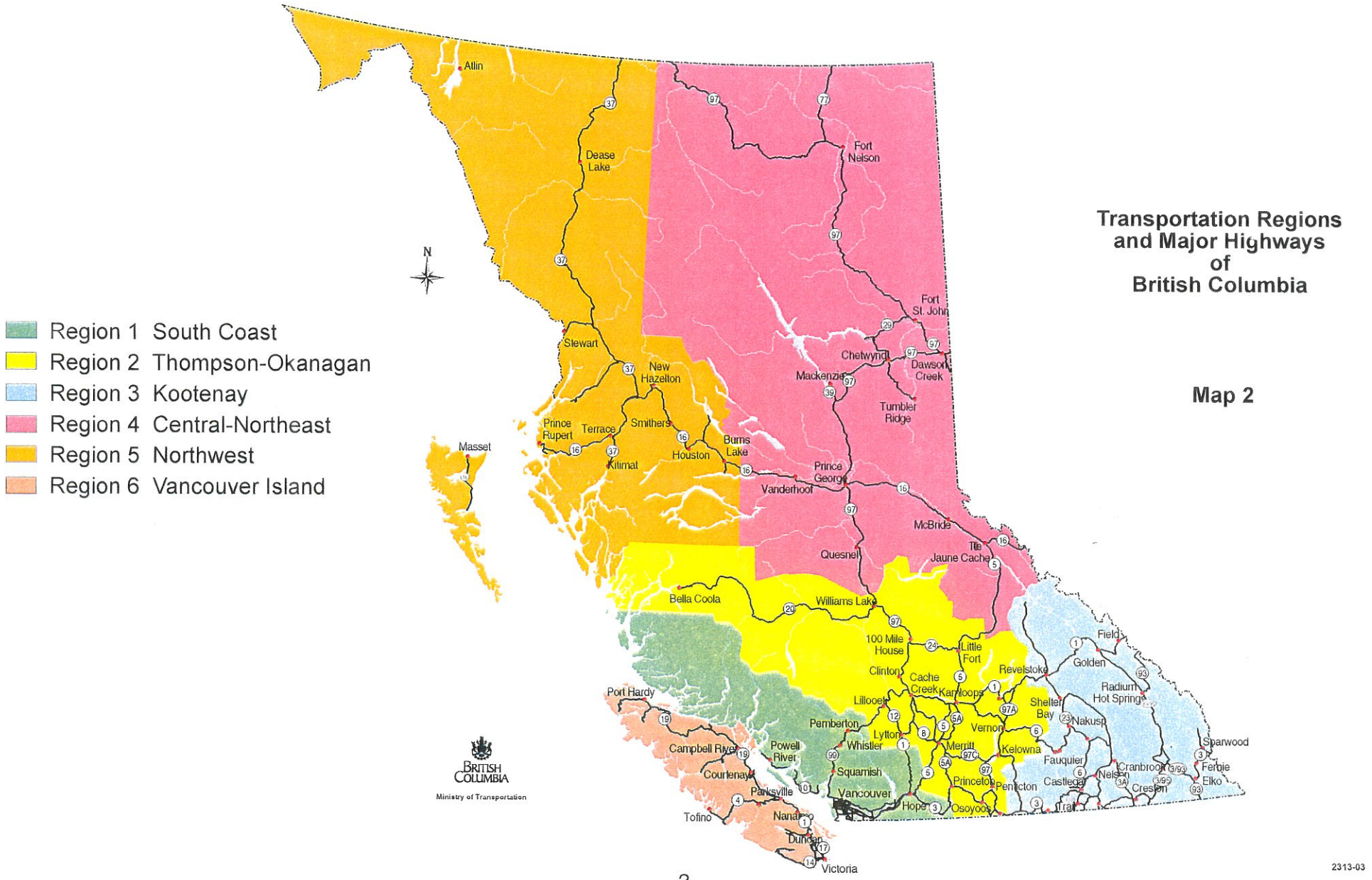




Numbered Highways in British Columbia

Map 1

BRITISH COLUMBIA
Ministry of Transportation



Transportation Regions and Major Highways of British Columbia

Map 2

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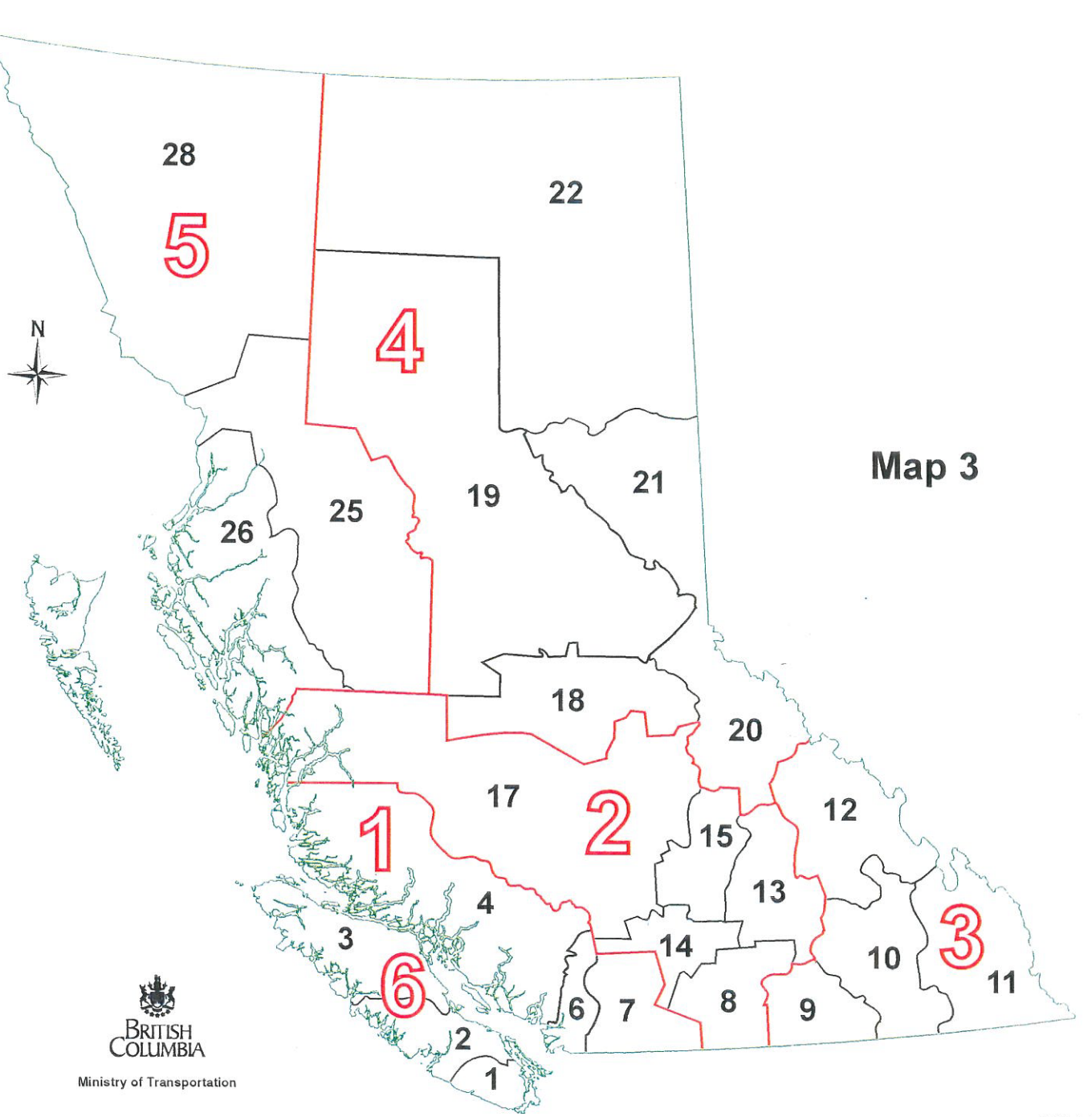
Regional and District Boundary Map

WARS 2000 Annual Report - Intro Section

1.	South Coast Region
2.	Thompson-Okanagan Region
3.	Kootenay Region
4.	Central-Northeast Region
5.	North West Region
6.	Vancouver Island Region

1.	South Island
2.	Central Island
3.	North Island
4.	Howe Sound
6.	Lower Mainland
7.	Fraser Valley
8.	South Okanagan
9.	Kootenay Boundary
10.	Central Kootenay
11.	East Kootenay
12.	Selkirk
13.	Okanagan-Shuswap
14.	Nicola
15.	Thompson
17.	Central Cariboo
18.	North Cariboo
19.	Fort George
20.	Robson
21.	South Peace
22.	North Peace
25.	Bulkley Nass
26.	Skeena
28.	Stikine



Map 3

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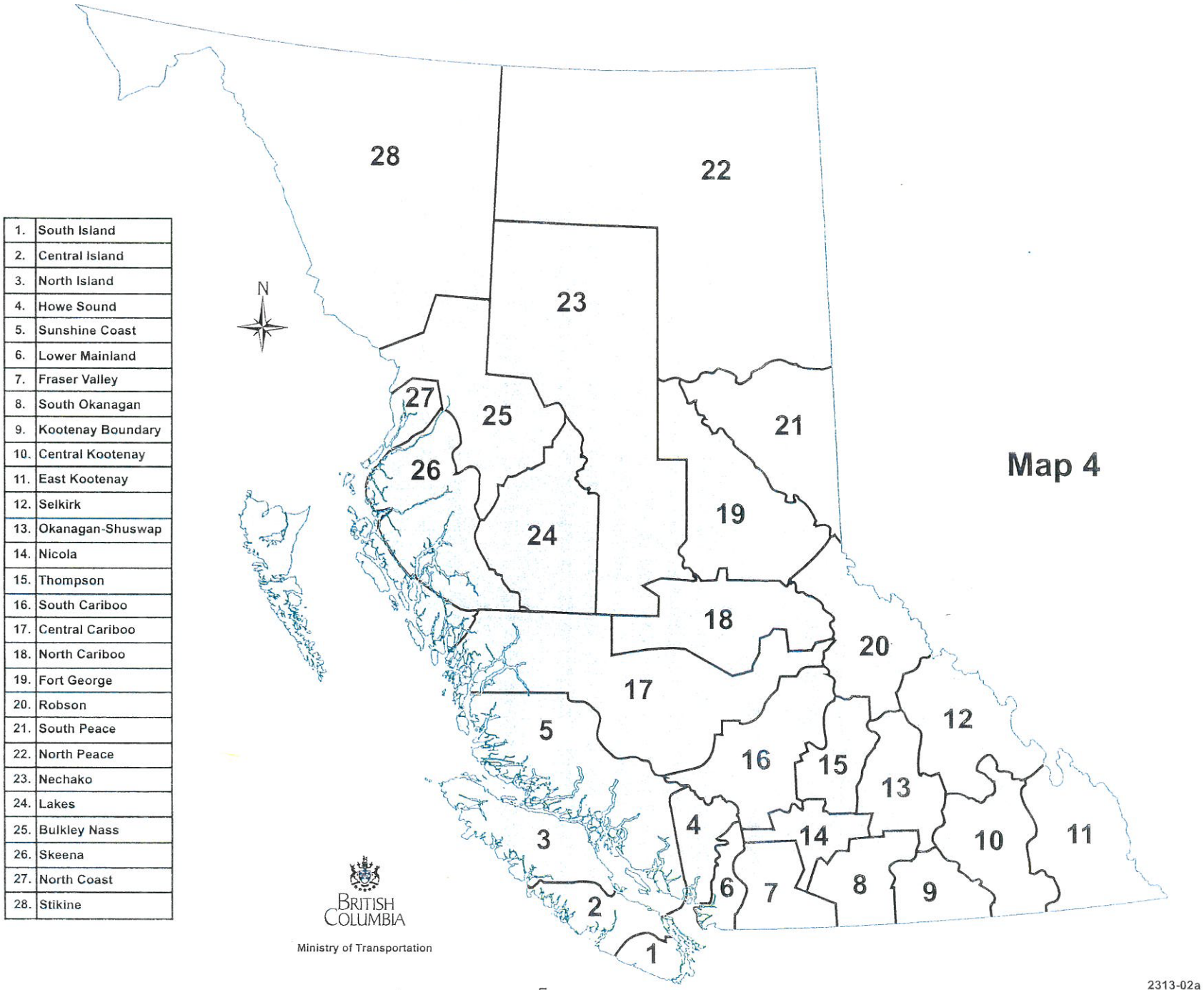
Road and Bridge Maintenance Service Areas



1.	South Island
2.	Central Island
3.	North Island
4.	Howe Sound
5.	Sunshine Coast
6.	Lower Mainland
7.	Fraser Valley
8.	South Okanagan
9.	Kootenay Boundary
10.	Central Kootenay
11.	East Kootenay
12.	Selkirk
13.	Okanagan-Shuswap
14.	Nicola
15.	Thompson
16.	South Cariboo
17.	Central Cariboo
18.	North Cariboo
19.	Fort George
20.	Robson
21.	South Peace
22.	North Peace
23.	Nechako
24.	Lakes
25.	Bulkley Nass
26.	Skeena
27.	North Coast
28.	Stikine

Reporting

WARS is a flexible system which attempts to meet a broad range of requirements, from producing site specific reports over a few kilometres to creating detailed reports of various aspects of wildlife-vehicle accidents for the entire province. WARS data are used to produce annual reports for each calendar year and a wide range of adhoc reports. Annual reports provide detailed information and analyses of wildlife-vehicle accidents for a given year. Ten-year reports provide considerable information of wildlife-vehicle accidents over a decade and examine trends such as frequency, location and magnitude of accidents. Adhoc reports are created for people in need of specific information for particular species on selected highways. Approximately 30% of these inquiries are from MoT personnel. The remaining inquiries are made by other government agencies, consultants, researchers, news media, wildlife associations, and members of the general public.

Assumptions and Constraints

The Ministry estimates the number of wild animals recorded by the WARS system represents only about 25% to 35% of the actual number of wild animals killed. The low number of reports can be attributed to a number of factors. In high traffic areas, the remains of small species of wildlife, like badgers and raccoons, often become unrecognizable after being run over by a number of vehicles. Some animals, primarily deer, are removed from the roadside by passing motorists before they are recorded by MoT Maintenance Contractors.

Data is also lost due to the following:

- animals die outside the highway right-of-way,
- animal remains are removed by natural predators or scavengers,
- animal remains are obscured by snow, ice, vegetation, or roadside debris,
- errors and omissions in reporting accident locations and/or species type, and
- random and systematic errors and omissions in reporting and data processing.

WARS contains data on wildlife-vehicle accidents dating back to 1978. The data used in this report represents all the data for the 2000 reporting year received from District offices and Maintenance Contractors up until March 31, 2001.

Data Quality

The quality of the data contained in the WARS system is very dependent on the reporting diligence of the Ministry's Maintenance Contractors. Since wildlife accidents often occur at very untimely hours, under less than ideal weather conditions, comprehensive reporting at the accident scene is difficult at times.

In 2000, of the 4,768 reports received, 20% lacked valid segment numbers, and 31% lacked valid kilometre references. These reports did not contain enough information for Environmental Management Section staff to determine the valid segment numbers and km references. This was a significant improvement over 1995, when 28% lacked valid segment numbers and 44% lacked valid km references. The quality of reporting

continues to improve. When Wildlife Accident Report Forms are filled out correctly and consistently with the necessary LKI and km information, the value of the WARS data to the Ministry, Maintenance Contractors, and others increases.

The Maintenance Contractors' positive response to the new WARS forms H-107 (1999/01) appears to be addressing the issue of data completeness and accuracy. To date, the data provided on the new H-107 forms for 2000 is more complete and accurate, and thus more valuable for analysis and outcomes.

WARS data helps the Ministry direct its limited financial resources for wildlife accident mitigation to locations where it is most needed. The Insurance Corporation of British Columbia (ICBC) also uses WARS data to evaluate Ministry cost-sharing proposals for highway safety projects. Since each wildlife-related accident clean-up can cost hundreds of dollars in Maintenance Contractor staff and equipment time, the WARS system can direct Ministry attention to high wildlife accident locations to reduce the operating costs for Maintenance Contractors.

WARS Enhancements

In 1994, two notable enhancements were made to the system. The first of these was expanding on the Potential Hazard reporting function of the system. In addition to Potential Hazard Reports for specified highways, the system can now also produce Potential Hazard Reports by Province, Region and District. This function can identify where accidents are most likely to occur within the area of concern whether it is a particular highway or Region. The second enhancement involved the capability of the system to report on the location of wildlife mitigation measures throughout British Columbia. WARS now contains up-to-date information on the location of wildlife fencing, reflectors and wildlife warning signs throughout the Province. In 2000, additional functions were added to the WARS system to streamline database queries and make multi-year analysis of species-specific accidents easier.

Region and District Boundary Changes

Changes in the Region and District boundaries, which occurred between 1997 and 1999, are reflected in the information presented in this report.

- District 16 of Region 2 was amalgamated with District 17 of Region 4 to form District 17 in Region 2,
- In Region 4, District 19 was amalgamated with District 23 to form District 19, and
- In Region 5, District 24 was amalgamated with District 25 to form District 25.

In each amalgamated district, the Ministry Maintenance Contractors continue to collect WARS data separately for the Maintenance Contract Service Areas that remain in the former districts (Appendix B). The data is merged at Ministry Headquarters for reporting purposes.

WILDLIFE-RELATED MOTOR VEHICLE ACCIDENT FACTORS

The highway environment in British Columbia is a very complex and varied one, ranging from multi-lane freeways located in urban centres to two-lane highways transecting the undeveloped hinterland. British Columbia has a diverse number of wild animal species, ranging from seemingly ubiquitous deer to elusive wolves, each with their own highway interaction characteristics. Wildlife-related motor vehicle accidents have been recorded on highways throughout the Province. There are many related and unrelated, man-made and natural factors which may influence drivers and wildlife interactions, and affect highway conditions. Some of the factors identified, many difficult to measure and evaluate, are listed in Table 1.

Table 1. Wildlife-Related Motor Vehicle Accident Factors

1. Wildlife Characteristics	species, population, age, sex, stage of reproduction, nutritional needs, movement behavior, population cycles
2. Wildlife Activities	feeding, breeding, sleeping, migrating, evading predators, chasing prey
3. Natural Water Sources	intermittent and permanent streams, rivers, slews, lakes, ponds, springs, waterfalls
4. Man-made Water Sources	settling ponds, surface drainage systems, wells, dugouts
5. Natural Food Sources	natural vegetation, salt licks, fish-bearing waters, prey
6. Man-made Food Sources	orchards, gardens, fields, pets, livestock, garbage
7. Wildlife Shelter	caves, cliffs, forests, culverts, bridges
8. Habitat Conditions	seasonal vegetation changes, snow depth, drought, flooding, fire, overgrazing
9. Traffic	volume, speed, composition, time-of-day, time-of-year
10. Vehicles	size, design, operating condition, brakes, lights, horns
11. Drivers	wildlife hazard awareness, highway familiarity, general alertness, driving skill, response time, response actions
12. Highway Design	road width, number of lanes, curvilinearity of alignment, right-of-way width, shoulder width, ditch depth, pavement surface, lighting
13. Roadside Management and Maintenance	native and non-native right-of-way vegetation, weed control, mowing, brushing, ditching, snow removal, de-icing, sign and reflector repairs
14. Roadside Development	natural, urban, suburban, rural
15. Accident Mitigation Devices	wildlife signs, fencing, under/overpasses, reflectors
16. Topography	elevation, cliffs, slopes, plains, undulating terrain
17. Weather	rain, snow, sleet, fog, haze, smoke, wind, cloud cover
18. Time of Day	dawn, day, dusk, night, length of day/night
19. Lunar Cycle	phases of the Moon, intensity of Moonlight
20. Human Activities Outside Right-of-Way-	construction, forestry, farming, mining, hunting, off-road recreation