

ROADWATCH BC: A PROGRAM FOR COLLECTING, CENTRALIZING, AND SYNTHESIZING INFORMATION FROM VEHICLE-INDUCED WILDLIFE MORTALITIES IN BRITISH COLUMBIA

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Road mortality of wildlife has attracted growing public attention throughout the world since Stoner (1925) published his classic paper *The Toll of the Automobile* in the journal *Science*. Today, an expanding network of roads and highways to transport people and goods, increased speed limits, habitat fragmentation, urbanization, and a rapidly growing human population poses a major threat to wild animals (Sherwood et al. 2002).

Regularly documenting collisions between motorized vehicles and wild animals in British Columbia was started in 1964 by the senior author and formally introduced in 1973 as part of a provincial “Wildlife and Roads” program that also included roadside surveys of raptors (Campbell et al. 1988). The initial autumn survey, covering about 2,250 km across southern British Columbia from 10 to 15 September 1973, tallied 87 road fatalities for 26 species of amphibians, reptiles, birds, and mammals (Campbell 1973). Eleven years later a summer

survey, in July, for the same general route produced 146 dead animals representing 42 species of higher vertebrates (Campbell 1984). Individual records add up quickly over the years and during the 43 years that Campbell maintained field notebooks, close to 12,000 incidental records of road-killed wildlife have been documented.

By the mid-1970s, a few other individuals became interested in recording roadside carcasses and their records were added to a centralized dataset. Each record became a permanent data point that, when incorporated into a centralized database, adds information on the distribution, occurrence, ecology, and natural history of vertebrates (and invertebrates) in the province. In addition, the summarized records have contributed to our knowledge of the seasonal and annual impact of vehicle collisions to wildlife and aided in developing mitigation plans to protect species when they are most vulnerable.

While reporting every roadkill with full details is useful, we have highlighted a few of the more noteworthy records in the following four broad categories: 1) Distribution, 2) Occurrence, 3) Natural History, and 4) Conservation. Table 1 provides examples of road-killed animals in each of these categories.

Distribution

Roadkills have provided significant records of range expansions and filled in gaps in the known distribution of wildlife in the province (Table 1).

In many cases, records of highway mortalities of wildlife provide very useful information that otherwise would be difficult to collect. Some of these include occurrences of nocturnal migrants such as the Northern Saw-whet Owl (*Aegolius acadicus*), nocturnal mammals including the North American Opossum (*Didelphis virginiana*) and Northern Flying Squirrel (*Glaucomys sabrinus*), rare wildlife such as the Spotted Owl (*Strix occidentalis*) and American Badger (*Taxidea taxus*), seasonal movements of the Western Toad (*Bufo boreas*) and Painted Turtle (*Chrysemys picta*), and documenting range expansions for introduced species like the Eastern Cottontail (*Sylvilagus floridanus*) and Eastern Gray Squirrel (*Sciurus carolinensis*) especially on Vancouver Island.

Within urban and residential environments the

specific location and general distribution of nocturnal mammals can be determined from noting carcasses during daily activities such as travelling to and from work. In Victoria, most of the information available on the Norway Rat (*Rattus norvegicus*) has been derived from animals hit while crossing roads.

Occurrence

Road casualties contribute important information on the period when animals occur in the province as well as seasonal dates on their activity. Records may

contribute to early arrival and late departure dates for migrants, first emergence and late activity dates for hibernating animals, seasonal movements, daily activity periods, aggregating times, and unusual dates for rare wildlife (Table 1).

Hatler et al. (1978) emphasized adding highway mortality records of Western Screech-Owl to a common database in Pacific Rim National Park. From the 1890s to 1975 the authors documented 27 records of this rare owl, of which 10 (37%) were from the winter period. Of these, 50% were roadkills.

Table 1. Examples of noteworthy records from animals found dead along roads in British Columbia, 1969 - 2006. Species names follow Matsuda et al. (2006), Nagorsen (1996, 2005), and Preston et al. (2005). VI = Vancouver Island.

Category and Species	Location	Date	Comments and References
Distribution			
Baltimore Oriole	Watson Slough	25 May 2006	Western range expansion (Campbell et al. 2001); BC Photo 3328 ¹ .
Barn Owl	6 km S of Parson	18 Oct 1999	First record for Columbia valley (Campbell et al. 1990); BC Photo 3215 (Preston 2005).
Blue Jay	Green Lake	14 May 1975	First record for Whistler area (Gotz 1996).
Common Nighthawk	Contact Creek	18 Jul 2003	Locality record; BC Photo 3330.
Ermine	Atlin	19 Jul 2003	Locality record.
Lazuli Bunting	Pitt Meadows	20 Jun 1970	First record for area; BC Photo 69.
Long-eared Owl	9 km N of Muncho Lake	2 Jul 2005	Most northern occurrence (Campbell et al. 1990); BC Photo 3291 (Figure 1).
North American Opossum	Burnaby Lake	20 Mar 1969	Range extension; BC Photo 8.
North American Opossum	Sunshine Valley	18 Aug 2002	Eastern range expansion (Nagorsen 1996).
Northern Alligator Lizard	Pike Lake	28 Jul 2006	Locality record; BC Photo 3329.
Porcupine	Delta	10 Sep 1973	First record for Lower Mainland (Campbell 1973, Nagorsen 2005)
Red-tailed Chipmunk	6.1 km W of Rossland	9 Jul 1984	Locality record (Nagorsen 2005).
Short-eared Owl	Gold River (VI)	11 Nov 1997	Locality record; BC Photo 1647.
Striped Skunk	Nanaimo	19 Jun 1971	First records for Vancouver Island; BC Photo 3263 (Figure 2).

Category and Species	Location	Date	Comments and References
Western Screech-Owl	Dove (VI)	22 Mar 1989	Locality record; BC Photo 1940.
Woodchuck	18.3 km S of Peejay	27 May 2006	Northeastern range expansion (Nagorsen 2005); BC Photo 3323.
Yellow-bellied Marmot	5.7 km E of Jaffray	10 May 2005	Eastern range expansion (Nagorsen 2005).
Occurrence			
Black-headed Grosbeak	4.5 km N of Gibsons	1 May 2001	Earliest spring date for Sunshine Coast (Greenfield 1998); BC Photo 1946 (Figure 3).
Common Garter Snake	Helmcken Falls	30 Sep 2004	Late activity date; BC Photo 3295.
Common Garter Snake	Hasler Creek	6 Oct 2002	Late activity date.
Sora	Prince George	10 Oct 1989	Latest autumn date.
Sora	Vancouver	8 Jul 1970	Summer date for downtown core; BC Photo 10 (Figure 4).
Virginia Rail	Robson	28 Nov 1997	Latest autumn date.
Yellow Warbler	Tlell	9 May 1988	Earliest spring date for Queen Charlotte Islands (Hamel and Hearne 2002); BC Photo 3269.
Natural History			
Great Horned Owl	Hudson's Hope	7 Jul 2003	Fledgling; BC Photo 3267.
Northern Flicker	Eve River (VI)	15 Jun 2004	Hybrid; BC Photo 3300.
Red-breasted Sapsucker	Prince George	23 Jun 1987	Hybrid with Red-naped Sapsucker.
Ruffed Grouse	Goodlow	3 Jul 2005	Sixteen days old; BC Photo 3272.
Tree Swallow	100 Mile House	24 May 2006	Melanistic; BC Photo 3292.
Conservation			
Bald Eagle	Nicomens Slough	28 Dec 1974	Flying to fish spawning site.
Common Nighthawk	Okanagan Falls	12 Jul 1982	Foraging low over road.
Common Poorwill	Osoyoos	31 May 1966	Roosting on road.
Pileated Woodpecker	near Houston	4 July 2006	Flying between foraging sites (Figure 3).
Painted Turtle	Creston (Channel Rd)	18 Jun 2006	Moving to nesting site.
Semipalmated Plover	Three Guardsmen Lake	23 Jul 2003	Breeding adult.
Turkey Vulture	Chilliwack	28 May 2000	Feeding on roadkill.

¹ Some animals killed by collisions with vehicles in the province have been photographed and copies added to the British Columbia Photo File for Wildlife Records (see Campbell and Stirling 1971).

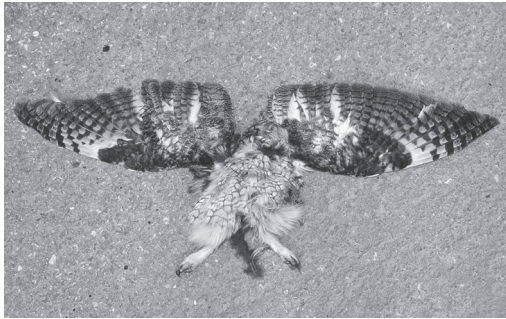


Figure 1. Adult Long-eared Owl killed by a truck 9 km north of Muncho Lake, BC on 25 May 2004, the most northerly occurrence for the province (R. Wayne Campbell). BC Photo 3291.

Natural History

A weakness in most wildlife databases is the lack of basic natural history information. Examining wildlife roadkills is an excellent opportunity to document this kind of information. Often the age and sex can be determined, the reproductive condition can be ascertained, the size of the animal can be measured (*e.g.*, snakes), the immediate habitat can be described, aberrant plumages, subspecies and hybrids can be identified and photographed, and young animals, especially fledglings, can be aged.

Conservation

Vehicle deaths, often found clustered, can provide clues to periods in animals' lives when they are most vulnerable to road traffic. Some of these include mass movements between wetlands for toadlets, searching for breeding sites by Painted Turtles, traditional local movements of snakes, migration of large mammals, access to foraging areas for colonial-breeding mammals, traditional migration routes, ground-roosting sites, and movements to and from hibernating habitats.

Identifying areas of concern locally and provincially requires a working database to give a broader perspective. Often erecting road signs (Figure 5) and warning motorists of seasonal animal activities, or reducing speed limits, have positive mitigating results and compels people to be more aware that wildlife also use roads in their daily

activities. Unfortunately, wildlife signs are popular targets for vandals who destroy or collect them. To alleviate signage damage or loss in the Creston valley, the Creston Valley Wildlife Management Area erects signs seasonally, and has removed all signage from the Duck Lake area.

RoadWatch BC – A New Program for Recording, Storing, and Synthesizing Information on Wildlife Road Mortalities in British Columbia

Through preparation of this manuscript, and in the compilation of the *Roads and Wildlife* supplement to *Wildlife Afield*, it was apparent that two major problems exist:

1) vehicle-induced wildlife mortality is a major problem for many species of wildlife in British Columbia, and virtually nothing is known from a quantitative perspective, except from where the species involved are major social and economic burdens (*e.g.*, large mammals); and

2) there is no province-wide program that promotes awareness of the road mortality problem for all wildlife, and there is no central data-gathering program in place for amassing and synthesizing road mortality data.



Figure 2. A Striped Skunk found dead on a roadside in Nanaimo, BC on 19 June 1971 was the first occurrence for Vancouver Island (British Columbia Fish and Wildlife Branch). BC Photo 3263.



Figure 3. The Pileated Woodpecker is a *blue-listed* species in British Columbia. Records of road mortality for “listed” species can provide insight into understanding the severity of the problem and deciding whether mitigation may be necessary. Highway 16 west of Houston, BC. 4 July 2006 (Roy V. Rea). BC Photo 3279.

In recognition of these deficiencies, the Biodiversity Centre for Wildlife Studies has introduced **RoadWatch BC** to:

- 1) raise awareness;
- 2) encourage data-recording and the centralization of a vehicle-induced wildlife mortality database;
- 3) understand the scope of the problem both in the kinds of species being killed and in what abundance; and
- 4) summarize and interpret wildlife mortality data to identify problem areas and species and provide suggestions for mitigation.

To participate in **RoadWatch BC**, simply visit our website at, www.wildlifebc.org, and download **RoadWatch BC** observation sheets. Basic information that can be recorded includes Species, Date, and Location. Useful additional information will include such things as Time of Day, Type of Road, and parameters regarding distance travelled and number of animals observed. An instruction sheet is also provided.

From time to time, observations resulting from

RoadWatch BC data will be summarized and published either in *Wildlife Afield*, on our website, or in our Report series.

Acknowledgements

We are grateful to those individuals who have submitted their observations of road mortalities, some with accompanying photographs, to our provincial wildlife databases. Robert S. Ferguson provided details for the mounted Barn Owl he found dead near Parson and Tony Greenfield quickly confirmed spring migration dates of the Black-headed Grosbeak for the Sunshine Coast.

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Figure 4. Summer occurrences of secretive marsh birds in urban environments, such as this Sora, are frequently obtained from roadkill observations. Chilco and Robson Street in Vancouver, BC. 8 July 1970 (R.Wayne Campbell) BC Photo 10.

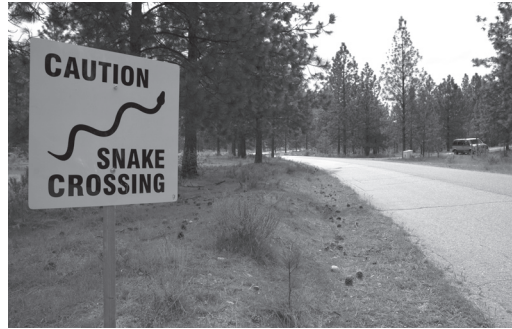


Figure 5. Road signs have been posted at key locations throughout British Columbia where animals are impacted by road traffic during vulnerable periods in their life history. **Left photo:** In the Creston valley, Painted Turtles are killed when travelling across roads to and from their nesting sites. West Creston, BC. 6 August 2006 (Linda M. Van Damme). **Right photo:** In the South Okanagan valley, snakes often use roads to absorb heat, subsequently putting them at risk of being hit by a vehicle. On Inkaneeep Road, snake crossing signs are used to inform motorists. Inkaneeep Road, South Okanagan valley, BC. 29 April 2006 (Michael I. Preston).

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About the Authors

Wayne Campbell is a Co-founder and Director of the Biodiversity Centre for Wildlife Studies.