

Western Rattlesnake

Crotalus Oreganus

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Disclaimer: The following document was compiled based on a review of information currently available for this species as of November 25, 2005. This document can be used to assist with the identification of this species and to support the development of management recommendations as they relate to forestry activities. For more information on this species, please refer to the reference section or consult with a Species at Risk specialist.

Description

The Western Rattlesnake is one of British Columbia's largest snakes; adults are from 60 to 150 centimetres in total length. Sometimes confused with the Gopher Snake because of a similar colour pattern, the rattlesnake is readily distinguished by its broad head, which is triangle shaped and much wider than the neck, and the rattle on the end of its tail. Rattlesnakes also have a deep pit on each side of the face, between the eye and the snout¹.

The background colour of the Western Rattlesnake can be highly variable but is generally brown, tan, olive or grey, overlaid by large dark-brown markings along the back. In older animals, the dark markings may be surrounded by a white- or cream-colored ring. Towards the tail, the dark markings appear more like bands around the body. There is a broad, dark stripe on each side of the face, from below the eye to the corner of the jaw. The underparts are normally yellowish-white, but sometimes brownish. Males and females have a similar appearance. Juvenile rattlesnakes are usually lighter in colour than adults, and show greater contrast between the dark markings and background colouring¹.



Photos courtesy of Gary Nafis

Distribution

The distribution of the Western Rattlesnake in British Columbia is currently limited to those areas that represent northward extensions of the Great Basin desert. These areas occur within the Thompson-Okanagan Plateau ecoregion, in the hot, dry subzones of the Ponderosa Pine and Bunchgrass biogeoclimatic zones. The distributions of these biogeoclimatic zones occur primarily within the Okanagan and Thompson valley basins, and the Nicola valley in south-central British Columbia, with a small portion occurring along the Fraser River².



Distribution of the Western Rattlesnake in British Columbia (from www.bcreptiles.ca)

Forest Districts³

- Arrow Boundary Forest District (DAB)
- **Cascades Forest District (DCS)**
- **Kamloops Forest District (DKA)**
- Okanagan Shuswap Forest District (DOS)

Ecoprovinces and ecosections⁴

- SIM: SFH
- SOI: GUU, NIB, NOB, NOH, NTU (?), OKR, PAR,
- SOB, SOH, STU(?), THB, TRU

Biogeoclimatic Units^{3,4}

- BG - Bunchgrass - xh, xw(?)
- ESSF - Engelmann Spruce-Subalpine Fir - xc (one location?), xcp (one location)
- ICH – Interior Coastal-Hemlock - dw(?), mk (infrequently), xw(?)
- IDF - Interior Douglas-fir - dk (several locations), dm (infrequently), mw(?), ww(?), xh, xw
- MS - Montane Spruce – dm (one location), xh

- PP - Ponderosa Pine

Broad ecosystem units⁴

- **Hibernacula:**
 - AB, BS, CL, DF, DP, PP, RO, SS, TA
- **Foraging:**
 - AB, AC, BS, CF, CR, DF, DP, IN, LL, LS, ME, MR, MS, OV, OW, PP, RO, SP, SS, TA, WL

Elevation

In British Columbia, rattlesnakes typically occur along valley bottoms and adjacent slopes, typically at elevations below 800 m, although there are anecdotal sightings (unconfirmed) of rattlesnakes as high as 1400 m⁴. Rattlesnake hibernacula (dens) can be found at elevations of 500 to 625m².

Map of Known Locations

Western Rattlesnake occurrence data is considered sensitive by the Conservation Data Centre (CDC). Therefore, known locations for this species is not available to the public. Please contact the CDC to request this data at:

Phone: (250) 356-0928

Fax: (250) 387-2733

Biology

Western Rattlesnakes move seasonally between overwintering hibernacula and summer ranges. The snakes emerge from hibernacula in spring; most appear at the surface in April but timing depends on the weather and can be as early as March. All of the rattlesnakes return to the hibernacula by October. They stay at the surface or emerge for several hours on warm days until mid-October or in isolated cases until November⁵.

Reproduction

Male Rattlesnakes in British Columbia mature at 3 to 5 years. Females mature later, at 5 to 7 years, and usually have their first litter at 7 to 9 years².

Rattlesnakes mate in August or early September, usually near a den. Mated females enter their winter dens soon after this with sperm stored in the uterus, but ovulation and fertilization don't occur until after they emerge the next spring¹. Pregnant females stay near den entrances through the summer, carefully regulating their body temperatures by basking in the sun or by seeking shade when it is too hot. This ensures a proper temperature for the developing embryos¹.

In British Columbia, two to eight (average of five) young develop internally during the summer and are born live in September or early October. Young rattlesnakes are approximately 30 cm long when born in September and shed their skin about three weeks after birth¹. After giving birth the females almost immediately resume hibernation without mating or feeding. This means that Western Rattlesnakes in British Columbia can produce young, at most, every second year; every third year is more common¹. The total period from mating to birth is approximately 13 to 14 months.

Foraging

The diet of juveniles is almost exclusively small mammals especially shrews, deer mice and voles. Other food items included pocket gophers, chipmunks and birds. The diet of adult Western Rattlesnakes is more diverse than those of juveniles. Food items include deer mice and voles, and the larger items, pocket gophers and wood rats. Adults also consumed shrews, pocket mice, marmots and squirrels⁶.

Habitat

Within British Columbia, Western Rattlesnakes are restricted to habitats characterized by blue bunchgrass, wheatgrass grasslands, and open Douglas-fir and ponderosa pine parklands. These habitats occur primarily in the Okanagan and Thompson River basins. Because these areas are located in the rain shadow of the Coast Mountains they are the warmest and driest areas of the province in summer. Precipitation is low, and the skies are generally clear, particularly in summer. In winter and early spring, inversions in the valleys resulting from outbreaks of cold dense arctic air from the north may result in prolonged periods of cold weather at the middle and low altitudes. Snakes generally occupy talus slopes or ridges within these habitats. They require hibernacula suitable for overwintering, and summer range that provides adequate food, shelter, and basking sites^{2,4}.

Western Rattlesnakes exhibit strong fidelity to hibernacula and seasonal foraging areas. It appears that when areas are developed near hibernacula, most perish in these areas but individuals that have territories away from the development persist. If hibernacula are destroyed when snakes are not present, it is generally believed that most individuals will be unable to find suitable hibernacula elsewhere and perish as winter approaches⁴.

In British Columbia females are known to typically have smaller home ranges than males. Females typically remain within 500–1000 m of the den. Males have slightly larger home ranges and will move 1000–1500 m from the den⁴.

Important Habitats and Habitat Features

Hibernacula are the most critical habitat features for Western Rattlesnakes. In British Columbia hibernacula include rocky ridges with crevices or deep talus slopes. The crevices must be deep enough for the snakes to escape freezing temperatures in winter. Most located hibernacula are inside discrete rock outcrops or in localized areas of large continuous rock faces on south, southeast, or southwest facing slopes at elevations of 500 to 625m. Generally, hibernacula on the south-facing slopes are located in the upper third of the slope, while 25% are located in the middle or lower regions. As snakes emerge from hibernation in the spring, areas of coarse talus adjacent to dens appear to be important basking sites^{4,5}. Rock outcrops, which provide shelter and shedding sites, are an important component of the summer range².

Foraging

Grassland, parkland forest, wetland, and riparian areas provide foraging habitat for Western Rattlesnakes. Foraging habitats must also provide suitable cover, in the form of vegetation and coarse woody debris, to provide protection from predation and to enable the snakes to forage successfully by using cover for concealment⁴.

One study has suggested that snakes preferably dispersed along ridge tops and north-facing slopes following emergence from hibernacula. Vegetation in these areas was

more dense and homogeneous than on south facing slopes, and characterized by open Ponderosa Pine and Douglas Fir forest. Prey availability in these areas may also have been higher. Insulative properties of this vegetation cover may also allow snakes longer periods of time to forage above ground on hot summer days, and to remain active after dusk⁵.

Movements and Dispersal

Western Rattlesnakes spend a considerable amount of time basking at den entrances prior to dispersal after the winter. The remainder of spring is spent on warm aspect slopes, due to thermoregulatory requirements. As the weather warms, rattlesnakes will move to more densely vegetated areas such as riparian habitats, to avoid excessive heat. Travel corridors are often followed when moving between dens and adjacent foraging areas. These usually consist of vegetated gullies, ravines, and similar terrain features that are suspected to provide enhanced cover opportunities for dispersing snakes. Individuals seek cover objects throughout the active season⁴.



Photo courtesy of Morgan Brown



Photo courtesy of Cherilyn Drew

Conservation and Management

Status³

Provincial Rank: S3 (Special concern)

BC List: Blue (Special concern)

COSEWIC Status: T (May 2004) (Threatened)

SARA Schedule: 1 (Threatened)

Threats

There are three inter-related limitations to the continued survival of viable populations of the Western Rattlesnake: habitat loss and the unknown size and distribution of home ranges; mortality due to cars and people; and viability of existing dens^{4,6}. Habitat loss and fragmentation, resulting from high rates of development and land use in the Okanagan, is most likely the leading cause of population decline. Roads and housing developments have decimated hibernacula and available summer habitat. Road mortality is more likely to occur on paved roads, rather than gravel roads as rattlesnakes either move across roads or lie on them in evenings because the dark asphalt retains heat⁶.

The low reproductive rate of the Western Rattlesnake is also major concern as it means that the species has a slow recovery rate after disturbance. Small populations are especially vulnerable to disturbance because of this; with a low reproductive rate, the population may not be able to recover⁷.

Management Recommendations

Consult with a Registered Professional Biologist prior to implementing the following management recommendations because certain situations may require custom solutions based on specific site characteristics.

- Budget permitting, develop a habitat model to help identify high value habitat found within your areas of interest. The complexity of the model, and therefore its accuracy, will be dependent on budgetary constraints.
- Identify hibernacula and critical habitat sites: if available, obtain occurrence data from the Conservation Data Centre (<http://srmwww.gov.bc.ca/cdc/>) and if necessary conduct surveys to confirm presence or absence of this species.

In areas where this species has been identified:

- Maintain a 1 km buffer zone around known hibernacula sites and critical habitats to conceal snakes and maintain foraging opportunities. Do not construct roads within this buffer zone unless no other option exists. In this case place roads as far as practicable from hibernacula and known snake travel corridors and deactivate after use. Avoid construction between April 1 and October 15 when snakes are active^{4,7}.
- Only conduct harvesting and silviculture activities within the buffer zone between October 15 and April 1.
- Where necessary, use snake drift fences and drainage culverts at intersections of roads and known travel corridors. Drift fences should be ≥75 cm high. Length will vary by site depending on area used by snakes. Consult Ministry of Environment for more information⁴.
- Within the buffer zone, maintain critical structural elements such as rock outcrops, talus slopes, friable soils, coarse woody debris, concentrations of boulders, or other unconsolidated materials and vegetative cover^{4,7}.
- Maintain and maximize connectivity between hibernacula and foraging habitats.
- Do not use pesticides⁴.

References

- ¹ Blood, D.A. 1993. Western Rattlesnake. B.C. Minist. Environ., Lands and Parks, Wildl. Branch. 6pp.
- ² Charland, M.B., K.J. Nelson, and P.T. Gregory. 1993. Status of the Northern Pacific Rattlesnake in British Columbia. B.C. Minist. Environ., Lands and Parks, Wildl. Branch. Working Rep. WR-54. 23pp.
- ³ BC Conservation Data Center. Website: <http://srmapps.gov.bc.ca/apps/eswp/>.
- ⁴ Sarell, M. 2004. Western Rattlesnake. Accounts and Measures for Managing Identified Wildlife, Accounts V. 2004. Website: <http://wlapwww.gov.bc.ca/wld/documents/identified/iwARADE02140.pdf>.
- ⁵ Macartney, J.M. 1985. The Ecology of the Northern Pacific Rattlesnake, *Crotalus viridis oreganus*, in British Columbia. M.Sc. Thesis, University of Victoria, Victoria, British Columbia.
- ⁶ COSEWIC. 2004. COSEWIC assessment and status report on the western rattlesnake *Crotalus oreganus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 26 pp.
- ⁷ Habitat Atlas for wildlife at Risk: South Okanagan and Lower Similkameen. Website: http://wlapwww.gov.bc.ca/sir/fwh/wld/atlas/species/species_index.html.