



Western Rattlesnake

*Needless killing and
habitat loss to
expanding towns and
intensive agriculture
have put this species
at risk.*





Why are Western Rattlesnakes at risk?

In Canada, Western Rattlesnakes are found only in southern British Columbia, southeastern Alberta, and southwestern Saskatchewan. Their distribution range in British Columbia is confined to dry valleys of the southern interior. Because of this restricted range, the Western Rattlesnake has a small population in B.C.

Many people dislike snakes in general and poisonous ones like the rattlesnake in particular. Their reputation for danger, though not deserved, has resulted in needless killing of rattlesnakes since the first European settlers arrived in the Interior. This drastically reduced rattlesnake populations in some areas. In addition, many of the warm southern valleys that are home to these snakes have become heavily settled. Farms, subdivisions, highways, and other developments have destroyed some rattlesnake dens and foraging areas, and many snakes are killed by highway traffic. These threats will become more serious as land development and human populations increase.

Most rattlesnakes live out their lives near a winter den (hibernaculum), and return faithfully to it each autumn. At these sites, where large numbers congregate, the snakes are vulnerable to human-caused disturbance and killing. This fidelity to traditional dens also means that areas where rattlesnakes or their dens have been eliminated will not be readily reoccupied.

Rattlesnake populations suffer some natural losses due to predation by skunks, hawks, and other predators. Some die of natural causes in their dens in winter, particularly the newborn. Studies near Vernon, British Columbia showed that only about 25

percent survived their first year of life.

This low annual survivorship together with a low rate of reproduction means that populations can increase only slowly in size. This makes rattlesnake populations particularly slow to recover and vulnerable to local extirpation if populations are reduced through human actions.

What is their status?

The distribution of Western Rattlesnakes in British Columbia is fairly well known, but little is known about the actual number of dens and total number of snakes in the province. Without this information we can't say whether they are increasing or decreasing in abundance.

Many rattlesnake populations in the Vernon area were hunted to near-extinction in the 1930s and 1940s. The local population now seems to have recovered from that destruction, but this took several decades. University of Victoria researchers have estimated

rattlesnake abundance of 1.5 to 2.5 snakes per hectare in good habitat near Vernon on study areas where several dens occur in close proximity. These numbers cannot be applied to other areas because Western Rattlesnakes have such a patchy distribution within their range.

Rattlesnakes are legally protected under the British Columbia Wildlife Act. This Act prohibits the capture or killing of wildlife, except for the protection of life or property. Unfortunately, some people feel that any rattlesnake they encounter is a threat and should be killed.

Rattlesnakes are rather shy, retiring creatures which normally depart or seek cover when approached by people.

In reality, rattlesnakes are rather timid and easily avoided.

Because the Western Rattlesnake has a limited distribution in British Columbia and is vulnerable to direct killing and habitat loss, the Wildlife Branch of BC Environment has placed it on its Blue List. Blue-listed species are considered to be vulnerable or sensitive. This listing does not provide any additional legal protection, but indicates that the species deserves more attention in order to maintain its population in the province.

What do they look like?

The Western Rattlesnake (*Crotalus viridis*) is one of British Columbia's largest snakes; adults are from 60 to 150 centimetres in total length. Two other species, the Western Yellow-bellied Racer and the Gopher Snake, can equal or exceed this 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 snout (most safely seen with binoculars).

The background colour is brown, tan, olive or grey, overlaid by large dark-brown blotches along the back and smaller blotches along the sides. In older animals, the blotches may be surrounded by a white- or cream-coloured ring. Towards the tail, the blotches 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 blotches and background colouring.

The common name “rattlesnake” refers to the rattle-like structure at the end of the tail. Rattles consist of several horny segments which produce a buzzing sound when the tail is vibrated rapidly, and are used to warn intruders of the presence of the snake. A new rattle segment is produced each time the snake sheds its skin. Because shedding may occur more than once a year, and segments at the end of the rattle often wear away, the number of rattle segments is not a reliable way to tell the age of a rattlesnake. Rattlesnakes grow throughout their life and the largest ones are usually the oldest.

What makes them unique?

One of the most noteworthy habits of rattlesnakes, particularly where winters are cold, is their use of communal dens for hibernation. Twenty-four dens which were studied

near Vernon contained from 8 to 266 rattlesnakes per den. All had one, two or three entrances; most were in south-facing rock outcrops. Small numbers of other snakes (Western Yellow-bellied Racers; Common Garter Snakes; Gopher Snakes) also used many of those dens.

Dens are the focal point of rattlesnake activity, and all seasonal movements start and end there. In summer, most snakes follow regular travel routes to favourite foraging and basking areas up to a kilometre or more from the den. Pregnant females however, remain near their dens. The snakes almost invariably return to the same den each fall, although a few juveniles sometimes switch dens.

Little is known about rattlesnake dens. They are deep enough so that the snakes can avoid freezing temperatures. When hibernating, the body temperatures of rattlesnakes near Vernon were found to be in the 2 to 7°C range, and within one degree

of the den temperature.

Rattlesnakes grow throughout life (except while hibernating) and must regularly shed their skin, which becomes worn and too small. The old skin, shed from the nose backward, is turned inside-out as the snake crawls forward out of it. In the North Okanagan area most adults shed once per summer; a few shed twice. Most juveniles shed twice. Rattlesnakes are more vulnerable than usual during this shedding process, which takes about 15 to 20 days, and seek secluded places while it is going on.

Western Rattlesnakes are unique in being the only venomous (poisonous) snakes in British Columbia (apart from the mildly venomous Night Snake, which is not believed to be harmful to humans). In recent years, however, the average number of people bitten has been only three or four per year, and only one of 63 bites was fatal. Many bites are a result of foolish behaviour around rattlesnakes and could be avoided.

How do they reproduce?

In the Okanagan Valley of British Columbia, 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 spring. From two to eight (average of five) young then develop internally during the summer and are born live in September or early October. The total period from mating to birth is lengthy – about 13 to 14 months. After giving birth the females almost immediately resume hibernation without mating or feeding. This means that rattlesnakes in this area can produce young, at most, every second year; every third year is more common and some may breed even less often than that!

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 embryos. They generally do not feed during this period or while hibernating during the following winter, resulting in a fasting period of 19 months or more. Females have to double their weight before they can breed again, often taking two summers to do this.

Young rattlesnakes, about 30 cm long when born

Rattlesnakes in this area can produce young, at most, every second year.

in September, shed their skin about three weeks after birth. A “button” develops at the end of the tail when the skin is shed. A few days later they den for the winter, without having eaten.

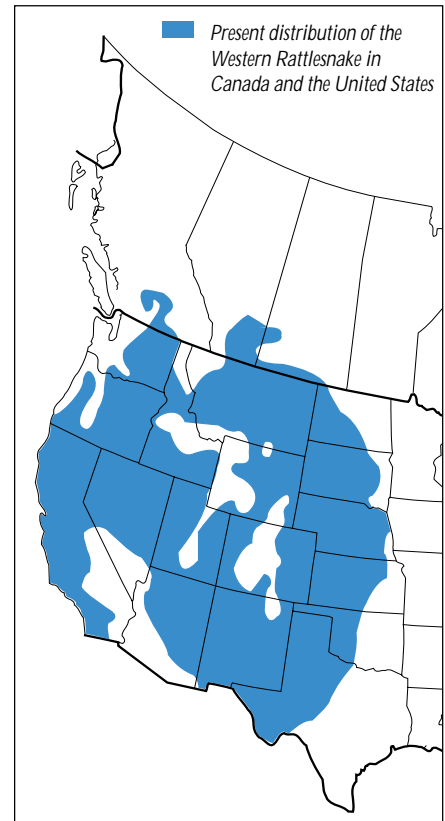
Male rattlesnakes are sexually mature at three or four years of age but may

not actually breed until older than this. Studies have shown that female rattlesnakes in British Columbia don't produce their first litters until they are six to eight years old. Maximum lifespan is about 25 years.

Western Rattlesnakes in British Columbia are at the northern extreme of the species range. At this latitude they must hibernate for up to seven months if they are to survive. The short above-ground period places limits on feeding and replenishment of energy stores. As a result, Western Rattlesnakes grow more slowly, reach sexual maturity later, and breed less often in British Columbia than further south.

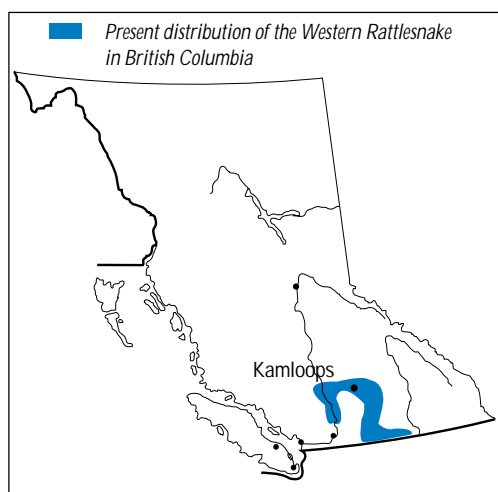
What do they eat?

Western Rattlesnakes prey almost entirely on small mammals which they catch alive and swallow whole, usually head-first. In the North Okanagan area, Meadow Voles, Montane Voles and Deer Mice are the major food items, but a total of 10 kinds of mammals and a few small birds have been recorded in the diet. Juvenile snakes prey mostly on mice and shrews, while adults capture and swallow some surprisingly large animals like Red Squirrels, Northern Pocket Gophers,



and young Yellow-bellied Marmots, as well as mice. The halves of the lower jaw are not sutured at the chin. This flexibility, plus expandable ribs and skin, means the snake can swallow prey of greater diameter than its own body.

Because their most important prey animals are active from dusk to dawn, this is when most rattlesnake foraging also occurs. Rattlesnakes are superbly adapted for locating warm-blooded animals in dim light by means of infrared heat-sensing organs (loreal pits) located on each side of their face. They usually strike the prey with a forward stabbing motion, inject venom through their hollow fangs, and then withdraw. The hapless prey is immobilized in a matter of seconds. The fangs of rattlesnakes are hinged so that they can be erected when capturing prey and folded back neatly out of the way at other times. If removed, they grow back in a short time. The venom of rattlesnakes acts in two main ways – it causes muscular paralysis by blocking nerve conduction, and contains enzymes which digest tissues.



Where do they live?

The Western Rattlesnake is one of the most widely distributed snakes in North America. It occurs from northern Mexico to southern British Columbia, Alberta, and Saskatchewan, and from the coast of California inland to Kansas and Nebraska. Summer temperatures are mostly warm to hot throughout their range, but it is remarkable that this snake has been able to adapt to locations with winter climates as different as Alberta and southern California.

In British Columbia, rattlesnakes occur only in the dry southern valleys, in the Bunchgrass, Ponderosa Pine, and lower fringes of the Interior Douglas-fir zones. They have been recorded in the Okanagan, Kettle, Similkameen, Nicola, and Thompson River valleys, and along the Fraser in the Lytton-Lillooet area. Throughout this area they prefer dry, usually rocky and rugged landscapes with sparse or scattered tree cover.

Terrain having suitable hibernating sites is important for rattlesnakes. In British Columbia this usually involves rocky ridges with crevices or deep talus slopes. The crevices must be deep enough for the snakes to escape freezing temperatures in winter. Rattlesnakes also need suitable hunting and basking areas within a

They prefer dry, usually rocky and rugged landscapes with sparse or scattered tree cover.

reasonable distance of their dens. Foraging sites are usually open grassy areas. Riparian zones (near water) are important foraging areas for rattlesnakes, since small mammals are usually more abundant there. For basking in the sun, exposed rocky ledges are preferred.



THE RATTLE WARNS INTRUDERS OF THE SNAKE'S PRESENCE.
Malcolm Macartney photo

What can we do?

The Western Rattlesnake is a fascinating result of thousands of years of evolution, wonderfully adapted to its dry, rugged environment. It deserves our attention and protection just as much as deer, ducks, songbirds and other fauna. Its needs are simple: just a place to live and freedom from persecution.


Rattlesnakes are rather shy, retiring creatures which normally depart or seek cover when approached by people. If cover is not readily available they usually give a warning rattle. The last thing they want to do is bite an animal that is too big to swallow! This usually only happens when they are stepped on, cornered, handled, or attacked. People who encounter rattlesnakes along

trails should detour around them and go on their way. Rattlesnakes will not chase after people and can not strike

beyond the length of their body. People frequenting known rattlesnake habitats should wear heavy trousers and high boots, avoid putting their hands or feet into crevices they can't see into, and generally be on the lookout for snakes. Frequent or lengthy visits to rattlesnake dens should be avoided so that interference with normal activities of the snakes is minimized.

Rattlesnakes occur where they do because of a combination of habitat factors which include hibernating dens, sunny basking places, scattered shrubs for shade, travel corridors, and foraging habitats. Alteration or destruction of any of these can be harm-

ful to the snakes. Unfortunately, the locations of many British Columbia hibernacula are not well known, much less the local distribution of important habitats in their vicinity. In general, attempts should be made to protect all den sites and natural habitats within a kilometre or so of them.

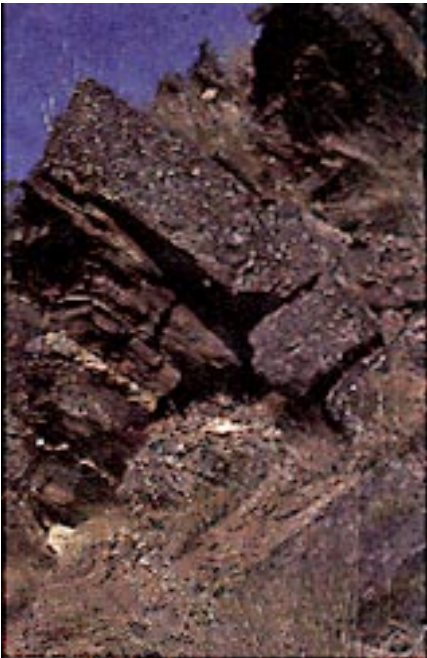
Agencies such as BC Environment and BC Parks have programs for habitat protection and den site monitoring, and to ensure that development of highways and other major projects do not harm known rattlesnake populations. Assignment of the Western Rattlesnake to the Blue List now ensures that it will get more attention with respect to inventory and protection. The public can be of assistance by advising the nearest BC Environment office about den locations and any possible threats to them, by supporting the establishment of protected areas for rattlesnakes, and by encouraging greater respect for these misunderstood and mistreated reptiles. 



DRY, ROCKY LANDSCAPES COMPRISE TYPICAL RATTLESNAKE HABITAT. *Malcolm Macartney photo*



RATTLESNAKES ARE PATTERNED WITH DARK BROWN BLOTCHES ON A PALER BACKGROUND. *Tom Hall photo*



DENS ARE OFTEN FOUND IN ROCK OUTCROPS. *Malcolm Macartney photo*



RATTLESNAKES HAVE A DISTINCTIVE BROAD TRIANGLE-SHAPED HEAD. *Malcolm Macartney photo*

FOR MORE INFORMATION ON THE WESTERN RATTLESNAKE, CONTACT:

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