

## Snake Smart

In the past, people have indiscriminately killed snakes out of fear or for safety concerns. Government and the public have recognized that snakes are an important part of the natural environment and require protection. The BC Wildlife Act now makes it illegal to capture, harass or kill snakes.



*M. Bezener*

The **Northern Pacific Rattlesnake** (Western) is a timid and reclusive animal that avoids conflict whenever possible.

**In BC, only the Northern Pacific Rattlesnake poses any threat to humans; however, this can be avoided with due care...**

### *Who are the Snakes in Your Neighbourhood?*

Ten kinds of snakes occur in BC. Seven of these live in the southern interior (see table listing snake species on page 3). The other three are coastal species: the Northwestern Garter Snake, the Pacific Gopher Snake, and the Sharp-tailed Snake.

Whether you are hiking in the hills, working outside, or playing in the dry Southern Interior of BC, snake encounters can be common. It is important to be able to distinguish between different kinds of snakes and to react appropriately. Knowledge of snake biology and behaviour will help you to comfortably co-exist with these misunderstood reptiles.



*M. Bezener*

Although the **Gopher Snake** is not venomous, it can be a convincing mimic of the rattlesnake. Note that it has a more narrow head and different colouration compared to the rattlesnake.

### *Why are Snakes Important?*

Snakes have played a key role in the environment for millions of years. Snakes are important players in the continuous cycling of nutrients and help to maintain the interdependence between species. They are significant predators of rodents such as mice, voles and pocket gophers. Snakes themselves are important prey for other predators, such as birds of prey, badgers and bears. If their populations continue to be threatened, they could face extinction and be gone from this area forever. People who take the opportunity to better understand snakes find them fascinating animals.

*The following sections are devoted to descriptions, habits and behaviours of the different snakes in the southern interior. An additional section is devoted to the Northern Pacific Rattlesnake, as this species suffers the most from conflicts with humans.*

## *Harmless Species of Snakes*

**Garter Snakes:** There are two species of Garter Snakes in the interior of the province. These species are also the most northerly occurring snakes in the province. The Common Garter Snake has a distinct, smooth-edged, yellow strip down the middle of its back. The Western Terrestrial Garter Snake is variable in colour and pattern but the yellow stripe always has irregular margins. Both species are often found near water where frogs and small fish are numerous. Neither species is venomous, but they may bite if handled roughly. Also when handled they often secrete a musk-smelling substance that is meant to deter predators. This odour may remain on your hands for a day even with washing.



*J. Dulisse*

The **Common Garter Snake** is often found near or in water. Note the very smooth edge to the central stripe down its back.



*J. Hobbs*

The **Western Terrestrial Garter Snake** is quite common in some areas. Note the jagged edge to the central stripe down its back.

**Rubber Boa:** The Rubber Boa occurs across the southern portion of the province, usually in forested habitats. It is rarely seen as it is nocturnal (active at night) and spends much of its time under debris and cover objects. Unlike larger boas from the tropics, it seldom exceeds 70cm; however, like its large cousins, it uses constriction to kill its prey. It feeds primarily on small mammals, especially shrews and young mice. Due to its nocturnal nature, the eyes are very small. The skin texture appears rubbery, as its name suggests. The tail is blunt like the head and is often presented to predators and parent mice as a diversion while under attack. The back, which has no pattern, ranges in colour from brown to green and the belly is always yellow. Rubber Boas are seldom found in large aggregations at dens. This snake species is completely harmless to humans and will not bite. However, it does poorly in captivity, and it is illegal to capture snakes under the BC Wildlife Act.



*M. Sarell*

A **Rubber Boa's** appearance makes it easy to distinguish from other kinds of snakes.

**Racer:** The Racer occurs in the southern interior of the province, inhabiting virtually the same areas as the Northern Pacific Rattlesnake. The Racer gets its name from its amazing speed, which is used to escape from predators and to travel through grassland and rocky habitats in search for food. Racers have a grey or turquoise back and a yellow belly. Because they are diurnal (active in the daytime), they have very large eyes. Although they resemble Gopher Snakes in their first year, older snakes have uniformly coloured skin on their backs. Racers are very slender and can reach lengths of more than one metre. Like garter snakes, they can only capture prey that they can overcome by mouth alone. Racers are one of the few snakes in the world that eat insects. Because of their ability to tolerate very high temperatures, they are uncommonly active during the hottest times of the day. These snakes are high-strung and may bite when handled, but are not venomous.



*J. Hobbs*

The **Racer** is not only a speedster on the ground but is also an excellent climber.

**Desert Night Snake:** The Desert Night Snake was not known to occur in the province until the early 1980's. Since then, less than 50 have been found, all in the semi-arid habitats of the south Okanagan and lower Similkameen. They have a distinct blotch or "saddle" marking on the back of their neck. Their eyes are copper coloured with elliptical pupils. They are very small, rarely exceeding half a metre. They are known to feed primarily on lizards but likely eat snakes and amphibians as well. Despite being mildly venomous, these snakes are very timid and have never been known to bite when handled. Any sightings should be reported with some documentation, such as photographs and details of the observation, to the BC Ministry of Environment.



A. Valedka

The rare **Desert Night Snake** is small and inoffensive.

Report all sightings to the BC Ministry of Environment.

**Gopher Snakes and Rubber Boas use constriction to kill their prey. Constricted prey is not crushed but dies from lack of oxygen (asphyxiation). The tightening coils do not allow inhalation and the constriction tightens with every exhale.**

**Gopher Snake:** Like the Racer, the Gopher Snake's distribution is very similar to that of the Northern Pacific Rattlesnake. The Gopher Snake is sometimes called a Bull Snake, which is actually the name of its eastern cousin. It is also mistaken for the rattlesnake and has undergone needless persecution. This is the largest snake species to occur in the southern interior. When fully grown, it sometimes exceeds two metres in length. Gopher Snakes are constrictors, like the boas, and are very strong. They spend a great portion of their time underground in rodent burrows and have also been found climbing trees. Some Gopher Snakes can be very calm when handled while others may be quite defensive; therefore, holding these snakes is not recommended. Bites from large Gopher Snakes will draw blood and are quite painful, but otherwise harmless.



Gopher Snake

M. Bezyener



Northern Pacific Rattlesnake

C. Tarr

The **Gopher Snake** has finer scales which give it a smooth appearance. As well as a more triangular head, the **Northern Pacific Rattlesnake** has eyes with a vertical pupil, whereas the **Gopher Snake** has circular pupils and a head that is in-line with its body.

The following table shows a list of the snake species that occur in the southern interior and their status

<i>Proper Common Names</i>	<i>Improper Names</i>	<i>Provincial<sup>1</sup></i>	<i>Federal<sup>2</sup></i>
Desert Night Snake	None	Red	Endangered
Great Basin Gopher Snake	Bull Snake	Blue	Threatened
Northern Pacific Rattlesnake (Western)	Timber Rattler	Blue	Threatened
Racer (Western or Yellow-bellied)	Blue Racer	Blue	Special Concern
Rubber Boa	Slow Worm or Two-headed Snake	Yellow	Special Concern
Common Garter Snake	Water or Gardener Snake	Yellow	Not Assessed
Western Terrestrial Garter Snake	Water or Gardener Snake	Yellow	Not Assessed

<sup>1</sup> Provincial Status is ranked by the Conservation Data Centre to indicate the degree of threat that the species has of becoming provincially extinct. Red indicates that the populations are very low and at risk of becoming extinct within the province; Blue indicates that populations are suspected of declining or considered vulnerable; and Yellow indicates that there is no immediate risk.

<sup>2</sup> Federal status is designated by the Committee on the Endangered Wildlife in Canada (COSEWIC). Endangered indicates a species facing imminent extirpation or extinction. Threatened indicates a species likely to become endangered if limiting factors are not reversed. Special concern (formerly Vulnerable) indicates that a species is particularly sensitive to human activities or natural events, but is not an endangered or threatened species.

# Northern Pacific Rattlesnake

## What Does a Rattlesnake Look Like?

Everyone in rattlesnake habitat should learn to distinguish a rattlesnake from the other species of snakes. This is especially true for children who may try to pick up or play with a snake.

### Rattlesnake Identification

- 🐍 **Broad, triangular-shaped head**
- 🐍 **Stout, greyish body with dark blotches surrounded by light 'halos'**
- 🐍 **Rattle or 'button' (for newborn snakes) at the end of the tail**

The Gopher Snake is similar in appearance to a rattlesnake. The two are often confused. Both of these snakes have similar markings, but the dark blotches on the Gopher Snake are not surrounded by halos and it has a narrower head and pointed tail. As well, the Gopher Snake has a creamy background colour, as opposed to the greyish background of a Northern Pacific Rattlesnake. The Gopher Snake is often mistaken for a rattlesnake because of its defensive behaviour of coiling, hissing, broadening its head and vibrating its tail.

Individual Northern Pacific Rattlesnakes are variable in colouration and pattern but all belong to the same species. There are no other species of rattlesnakes in the province, such as Timber Rattlers, Sidewinders or Diamondbacks. These names refer to different species of rattlesnakes that live in the United States.

## Where Do Rattlesnakes Live?

The Northern Pacific Rattlesnake occurs in the Okanagan, Kettle, Similkameen, Nicola, Thompson and Fraser River Watersheds. They are most common on dry hillsides, rarely occurring higher than 1000 metres above sea level. In the valley bottoms, human settlement has resulted in reduced rattlesnake numbers.

## Lives of Rattlesnakes

**Reproduction:** Rattlesnakes give live birth to 4 to 8 young during late summer or early fall, usually near the den. Mature females may only reproduce once every three years in BC. With our short growing season, it takes this long to accumulate enough body weight to nurture the embryos. Young snakes are limited by the small size of prey that can be caught and swallowed. Consequently, many do not survive their first winter. Rattlesnakes may live up to 25 years.

**Hibernation:** All snakes in temperate climates must find some protective shelter to avoid freezing in winter and to conserve the energy and water resources stored in their body tissues until spring. Rattlesnakes have been found in underground sites with high humidity and constant temperature near, but not below, freezing to maintain this dormant condition. An underground site like this is called a hibernaculum (plural hibernacula) or den. Rattlesnakes congregate in variable numbers (10 to 250) in hibernacula, and usually den with other species of snakes. Most dens have been used by countless generations of snakes. Because rattlesnakes rarely use other dens, these sites are critically important to their survival.



S. Klein

A Northern Pacific Rattlesnake (Western)  
in a defensive position - notice the distinct  
triangular head, stout body and rattle.

**Growing and Shedding:** Growth depends on the amount of food obtained. The outer skin layer covers the scales of a snake. That skin layer does not grow and must be shed to accommodate body growth. As the old skin prepares to separate from the underlying skin, the scales over the eyes become cloudy, as do the scales covering the rest of the body. This cloudiness reduces the snake's vision, which may increase the likelihood that it will strike if it feels threatened. The old skin layer peels off, starting at the nose. It is thin and translucent. The shedding process is like removing a sock by the cuff; it can end up being inside out or bunched up.

## *Rattlesnakes and People*

**The Rattle:** The rattle starts as a 'button' on newborn rattlesnakes. Each shedding event contributes one more segment to the rattle, forming loosely interlocking sections of brittle skin. The number of rattle segments is not a reliable guide to the age of a rattlesnake, as the frequency of shedding is related to the amount of food the snake ingests and rattle segments often break off. When the rattle is vibrated quickly, it produces the 'buzzing' sound that has gained the rattlesnake its notoriety. It is believed that the rattle evolved to warn hooved animals that might otherwise trample the snake. Rattlesnakes do not always rattle when they sense humans. Often, they stay hidden, preferring to avoid confrontation. Newborn rattlesnakes cannot rattle as they have only one segment on their rattle.

**Senses:** Rattlesnakes have several ways to detect prey (and predators). Like all snakes, they catch molecules in the air and on the ground on their tongues and then 'taste' the scent with specialized organs on the roof of their mouth. Rattlesnakes can also sense the heat that radiates from endothermic (warm-blooded) animals, by using facial pits, sensory organs unique to all pit vipers and some boas and constrictors. Although rattlesnakes cannot hear airborne sounds, they can detect ground vibrations with their internal ears. Unlike with bears and other animals, talking loudly or shouting while in rattlesnake habitat will not warn the snakes of your presence; however, they may be alerted by the vibrations created from footsteps. Like most snakes, they cannot clearly see distant objects, but can detect movement from many metres away.

**Venom and Feeding:** Rattlesnakes avoid prolonged contact with prey. A quick bite allows venom to be injected through a pair of hollow, curved fangs. These enlarged teeth are located on a hinged bone so that the fangs can lie against the roof of the snake's mouth when not in use. Rattlesnakes have complex venom that damages both the circulatory and nervous systems. The venom also causes substantial damage to tissue. Once injected into prey, the venom begins the digestive process, making the ingestion of the meal more efficient while the jaws and smaller teeth work alternatively to hook and drag the prey down the throat. These jaws can 'unhinge' to accommodate prey that may be much larger than the diameter of the snake's own head and body.

Every year there are numerous encounters between rattlesnakes and people. In many cases, people are not even aware that they have been near a rattlesnake, as the snake did not announce its presence. Despite the notoriety of rattlesnake bites, the number of bites for the last fifty years has averaged about three per year in the province. Most of these bites resulted from people harassing or handling the rattlesnake. In all that time, only two human fatalities from bites have been recorded in BC.

Rattlesnakes are timid creatures and usually retreat from humans rather than enter conflict. When they are frightened, they may strike to protect themselves as a last resort.



*A rattlesnake button prior to its first shed. Other snake tails, except the Rubber Boa, are tapered to a point.*

*M. Sarell*

### *Avoiding Surprises*

- 👉 Wear protective footwear, such as rubber or high leather boots, when walking in tall grass or areas where you cannot clearly see the ground.
- 👉 Move slowly and be observant if you are in an area where rattlesnakes are likely to be present (rocky talus, open grasslands and wetlands).
- 👉 Never put your hands or feet where you cannot see if a rattlesnake is present.
- 👉 Avoid picking up objects under which a snake might hide, but if you must, use a pole to carefully overturn the object.

### *Stop. Hey. What's that Sound?*

When you hear the buzzing of a rattlesnake, stop and determine where it is located. Slowly retreat from the snake. Remember, the rattle is a sign that the snake is aware of you and wishes to avoid confrontation. **Do not attempt to move the snake unless it is absolutely necessary.** Even though they can sense heat, if you remain motionless, you will not appear threatening. If you suddenly find yourself in strike range (length of snake), remain motionless and have someone else use a stick to distract the snake away from you.

**Many landowners now leave snakes alone or have rattlesnakes moved by trained personnel to areas where they will not be in conflict with people.**

### *To Move or Not Move a Rattlesnake*

Not all rattlesnakes need to be removed. Often, if left alone, they will never be encountered again. Other snakes will also leave an area in a short time and should not be approached or handled. However if it is deemed that the snake may cause bodily harm and/or must be removed, **call the Conservation Officers Hotline for assistance in capturing and relocating the snake at: 1-800-663-WILD (9453).**

*The Bite:* It is very unlikely that you will be bitten by a rattlesnake unless you have harassed or injured it. Biting is its last resort in self defence. The production of venom consumes large amounts of energy for the snake and therefore the animal does not behave in a way that would be wasteful. It is not uncommon for rattlesnake bites to be 'dry' (no venom is injected). However, if bitten, always seek medical attention as soon as possible even if no symptoms occur. Call the hospital immediately to allow them time to prepare. Do not apply a tourniquet. Do not cut the wound. Do not attempt to suck out the venom with your mouth. Sucking out the venom will allow it to enter the highly vascularized tissues of your mouth. First Aid suction pumps may remove some of the venom if used immediately after the bite.

Most importantly, try to remain calm. Rattlesnake venom evolved to kill and digest small mammals like mice and voles - nothing as large as a human. Therefore, although quite painful, rattlesnake bites are rarely fatal. Allowing the venom to slowly dilute throughout the body will lessen the effects on one area and minimize any long-term damage. Do not attempt to kill the snake.



*C. Tarr*  
Trained snake relocation response personnel are available to the public by calling the number below.



*C. Tarr*  
Snake tongs are a safe tool for relocating rattlesnakes.

Landowners can assist by monitoring the movements of the snake and ensuring that people and pets do not come near the snake until qualified help arrives.

Being too close to the snake can cause it to try and hide, and thereby hamper capture efforts. Conservation Officers and snake response personnel have been trained and permitted to safely capture and relocate snakes. They take caution when working with rattlesnakes. The snake is approached slowly to avoid exciting it, reducing the chance of a strike. It is then gently placed into a suitable, secure container with a proper snake-relocating tool (eg. snake tongs or hook). Once it is in the container, the snake is immediately relocated to a suitable area. Choosing a release location depends on the proximity to humans, permission of the landowner, and availability of a site not further than one kilometre from the point of capture. Releasing the snake much further away may result in death if the snake is not able to locate its den in the fall.

Remember, wildlife, including rattlesnakes and other indigenous snakes, are protected under the BC Wildlife Act. These snakes are a conservation concern throughout their range.

**For assistance in capturing and relocating a rattlesnake call the Conservation Officers Hotline... 1-800-663-WILD (9453) or your local BC Ministry of Environment.**

## Here Are Some Things You Can Do:

### How to Protect Snakes

All snakes have suffered substantial declines in the last 100 years. Urbanization, intensive agriculture, rock blasting, roadway mortalities and direct persecution have caused snake numbers to dwindle. Conserving the remaining snake populations is part of protecting our entire natural environment. Understanding and tolerance of snakes is the first step to helping these species.

- 🐍 Be careful to avoid driving over snakes when they are crossing or basking on roads.
- 🐍 Avoid disturbing rock and woody debris in potential snake habitat.
- 🐍 Encourage others to use harmless and effective ways to cope with snake encounters, such as snake barrier fencing around yards.
- 🐍 Confine pets that will harm snakes or try to train them to leave snakes alone.
- 🐍 Report any den locations to your local BC Ministry of Environment office.

### Further Readings:

Reptiles of British Columbia. Royal BC Museum Handbook, 1984.

Reptiles of Washington and Oregon. Seattle Audubon Society, The Trailside Series, 1995.

Wildlife in British Columbia at Risk: Western Rattlesnake (brochure). BC Environment, 1993.

British Columbia's Wildlife at Risk: Gopher Snake (brochure). BC Environment, 1997.

Habitat Atlas for Wildlife at Risk: South Okanagan and Lower Similkameen. BC Environment, 1998.



Gopher Snake

M. Bezener



Northern Pacific Rattlesnake

M. Bezener

Although the patterns of the **Gopher Snake** and the **Northern Pacific Rattlesnake** appear similar, there are a number of differences. The rattlesnake has more dark, circular blotches with a light halo, whereas the Gopher Snake has more rectangular blotches on a cream coloured body.

Text by Mike Sarell with review and comments by Sue Austen, Orville Dyer, Anthea Bryan, Allison Haney, Lisa Scott, Harry Parsons, Laura Friis, Karl Larsen, Bob Lincoln, Syd Cannings, Steve Shay, Bill Koenig, Dave Fraser, Liz Stanlake, Will Valley and Alyson Pulham. Mike Ovenell provided considerable guidance to the production of the original pamphlet.

The South Okanagan-Similkameen Stewardship Program (SOS Stewardship) was set up in 1994 to help private landowners protect and enhance natural areas on their lands.

Partnerships between landowners and SOS Stewardship, as well as other conservation organizations, have resulted in a variety of conservation projects that serve to demonstrate good stewardship.

# For further reading about snakes, here are other South Okanagan-Similkameen Stewardship publications

**Living in Nature Series**  
South Okanagan-Similkameen Stewardship Program

## Snake Barrier Fencing

**Unwanted Snakes**  
Most snake species in British Columbia are harmless. Even the venomous Northern Pacific Rattlesnake is a timid creature seldom encountered. Nonetheless, many people feel uncomfortable about sharing their workplace or yards with snakes. Furthermore, snakes can be at risk from human activities, as they are often killed by traffic, agricultural activities, and domestic pets.

Snake barrier fencing is one management tool for improving public and worker safety, as well as reducing risks that snakes face in agricultural properties. This fact-sheet provides basic information about planning and installing snake barrier fencing, as well as associated safety and environmental concerns.

**Fence Layout**  
The layout of the fence needs to be carefully thought out to ensure that the fencing is effective and cost-efficient. Fences can either deflect snakes away from a property (snail fences) or enclose a property or workplace (exclusion fencing). Care should be taken not to block the main migration corridors for other small animals.

Trillium fencing can be effective if one knows the migration patterns of snakes as they move to and from the dens where they hibernates in the winter (hibernacula). A snake biologist can help identify likely movement patterns.

The best fence layout should be determined based on terrain, erosion potential, soil types, migration corridors, and the needs of the landowner. The prototype fencing at Tisham Creek Vineyards was designed to deflect snakes away from the vineyard and onto adjacent natural lands. It is also intended to prevent snakes from entering public roads and the irrigation canal.

The snake fence, depicted in red, deflects snakes to the vineyard as they travel downriver to the river and across them on the soil from causing other agricultural areas and roadways.



*The Northern Pacific Rattlesnake is the only venomous snake in the area. It is similar in appearance to the non-venomous Gopher (Ball) Snake.*



*Planted with adjacent snake habitat*



**Living in Nature Series**  
South Okanagan-Similkameen Stewardship Program

## How to Snake-proof Your House and Yard

It is not unusual for residents of the southern interior of BC to have the occasional encounter with a snake in their yard. For some, this is a thrilling experience; for others, it is a most unpleasant or dreaded encounter. People's reactions differ largely because of their level of understanding of snakes, early life experiences and/or what they were taught. Fear can be transferred to others, especially impressionable children. Learning about the habits and needs of snakes can help to alleviate fear.

In any event, snake encounters around your house and yard can be reduced with appropriate snake management techniques. These techniques, in combination with knowledge of the different species of snakes, their importance in the environment, and suitable behaviour in snake habitat, will help us co-exist with snakes.

**The Provincial Wildlife Act and the Federal Species at Risk Act prohibit the harassment, killing, or capturing of listed snakes.**



*A home with snake exclusion fencing*

**Living in Nature Series**  
South Okanagan-Similkameen Stewardship Program

## Working in Snake Country

A guide for agricultural workers

Snakes are generally unwanted in agricultural settings because they are disliked or feared, even though they do not damage crops and rarely impact livestock. This attitude has been a large factor in the significant declines in snake populations worldwide. Snakes play an important role in the environment, being major predators of rodents and toads, providing food for other predators higher up the food chain. Each species of snake fills its own specific niche.

There are seven species of snakes in the southern interior of British Columbia. Many of these snake species are encountered in agricultural areas, especially where there are rocky terrain. As in other places in the world, snakes are often perceived as threats, and in some cases their lives are not valued.

Although snakes can greatly reduce rodent populations that damage crops, they may affect agricultural productivity by disrupting work. This is especially true of the Northern Pacific Rattlesnake that is venomous and can be a safety concern. Because many people are unfamiliar with the different snake species, they may not be able to distinguish rattlesnakes from harmless snakes. Methods to deal with the situation often include killing the snake to provide a safer working environment. Non-lethal management of snakes is required to reduce continuing declines in their populations, yet provide a safe work place.

**The Wildlife Act prohibits the harassment, killing, or capturing of snakes, unless it is to protect human life, domestic animals, or property. The use of relocating a snake makes it unnecessary to take severe measures.**



*A harmless Gopher (Ball) Snake caught in bird netting in a garden.*



*A Northern Pacific Rattlesnake in a defensive posture.*

This publication is supported by...



For more information, please contact:  
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