

Bighorn Sheep

(*Ovis Canadensis*)



Photo credit: Kim Keatin, USGS

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Introduction

This wild sheep from the Bovidae family, called the bighorn sheep or *Ovis canadensis*, has a long and rich history in North America. Bighorns have been hunted for thousands of years and were an important resource for many First Nations groups. Today bighorn sheep remain an admired and valuable animal. There are several subspecies of bighorn sheep, of which the Rocky Mountain and California bighorns are found in the northwestern parts of the continent, in British Columbia, Alberta, Washington, Idaho, and Oregon.

Characteristics

Rocky Mountain bighorns are the most well-known and familiar subspecies of *O. canadensis*. These muscular animals have a dark to a grey-brown coat that becomes scruffy and less attractive during shedding season in early summer. The bighorn's muzzle, rump, belly, back of legs, and eye patch are white. It has a short, black tail and black cloven hooves. Its tracks are shaped like elongated pears, skinny at the top, broadening at the bottom.

The male bighorn (rams) can grow to a length of 150 to 180 cm (5 to 6 feet) from head to tail, and weigh up to 136 kg (300 lbs). The females (ewes) are about 15% smaller than the rams. A difference in environmental conditions in their range produces the California bighorn, smaller than the Rocky Mountain bighorn, but of the same subspecies. Baby bighorns (called lambs if one year old or under) can weigh from 2.8 to 5.5 kg (6 to 12 pounds) at birth. Lambs have stubby horns that may or may not be visible, and gray or mousy coloured fur.

The ram's distinctive, spiral horns are made of keratin that is deposited annually along the bone core, which means a male bighorn's age can be roughly determined by counting the number of rings along its horn. The female's horns are too short (about 20 cm) and narrow for its age to be determined this way. The ram's horns can measure up to 115 cm (45 inches) and weigh up to 15 kg (33 pounds). Rams are known to "broom" or rub the edges off their horns to improve their peripheral vision.

Life Cycle & Behaviour

The bighorn reaches puberty as early as 18 months. Rams continue to grow after puberty while ewes stop growing. Ewes on average do not mate until they are 2.5 years old. Rams may begin breeding between two and six years. Where older rams are present the younger rams, though sexually mature, do not breed until they are approximately six. The mating period is called the "rut" and takes place in late fall and early winter.

For most of the year bighorns live in sexually segregated groups, but come together for the rut. One or two months before the rut begins the rams congregate on fall or winter ranges. Status is established and dominance reinforced through ritualized and sometimes aggressive behaviours. Horns are rubbed against the body and face of more dominant males as a kind of tribute. "Low stretch" and "chin up" positions show off the horns. When these gestures are not enough to establish dominance a "horn clash" may take place, usually initiated by the inferior individual. Tillet describes this sequence in his book *OVIS: North American Wild Sheep* (1997, 19):

"The standoff space is established and powerful hindquarters pile drive the horns, skull and massive neck and shoulders into the equivalent parts of the suitably matched opponent. In many instances both rams raise their bodies and charge on rear legs and at the last second they drop toward each other adding the energy of the fall into the blow. "

The sound these fights produce is a loud crack. The result of these combats, which can last several hours, may include horns split or broken, concussions, and blood flowing from the ears and nose. The loser of the fight will be the one to stumble, fall, or get knocked off all fours. The “champion” establishes his dominance and receives breeding rights as his reward.

Males can inseminate several females in a matter of minutes. Ewes are selective in mating and may evade the attentions of unsuitable males.

Lambing takes place during the spring from May to June when vegetation becomes more available and the weather improves. Ewes will leave their group and go to ledges, cliffs, or steep areas in order to ensure seclusion and safety from predators and the elements. Ewes produce only one lamb; twinning is not common. A lamb is usually active and playing within a few minutes of birth. Lambs start to eat solid food by the time they are one week old; by two weeks they are eating the same food as the adults. After the lamb is born it follows its mother, staying close for the first few weeks of life, establishing a mother-young bond that is essential for its survival.

Ewes raise the young. The ewes work on a nursery system where one or two ewes may watch over several lambs while the other ewes seek food. Ewes also allow lambs that are not their own to nurse from them.

Young males become socially independent of their mothers by one or two years old, but they remain in the female group until they are socially and physically more dominant than the ewes, at which point they join the male group. Female offspring stay with the ewes.

Life expectancy correlates to the state of the population. Where populations are stable or declining, resources are not strained and the sheep may live to 20 years or more. In stressed environments – overpopulated for the available resources – life expectancy of adults drops, as does the survival rate of lambs. Lambs are particularly vulnerable in their first year through disease, predators, and malnutrition. As well, lambs born later in the lambing season miss the peak of forage nutrition, which leaves them vulnerable to the cold and food shortages of winter.

Habitat

The Rocky Mountain and California bighorns are found in the mountainous regions of western North America, including Alberta and British Columbia in Canada, and Montana, Idaho, Utah, Wyoming, Colorado, and New Mexico in the United States. The slightly smaller California bighorns have gone extinct in much of their historical habitat, which includes the eastern Coast Mountains in central B.C. through Washington, Oregon, Idaho and the Sierra Nevada in California.

Between 1954 and 1999, bighorns, mostly from British Columbia, were successfully introduced to areas in the western American states.

Bighorns live in rugged terrain. They like large open spaces, with nearby canyons, talus cliffs, steep slopes, mountaintops, and river benches available for escape from predators. Their preferred climate is warm and arid with cold, dry winters. During the summer they live on steep mountain slopes, and move to lower foothills during the winter to optimize their diet.

In order to reduce competition and disturbance of ewes and lambs by males, bighorns live in sexually segregated groups. Bighorn groups, male and female, travel among seasonal ranges throughout the year. Each animal has a bedding spot in every range that it returns to every night, sometimes over several years.

Behaviour

Bighorns are vegetarians, consuming grass, forbs, herbs, sedges, and shrubs, and eating most frequently during dawn and dusk. They are opportunistic feeders adapting their diets as they range across habitats and seasons. They fatten up during the summer by eating more grass and herbs in order to survive the harsh winter when they browse dormant plants with lower nutritional quality such as willows, shrubs, sage, bearberry, and rose. They may also eat snow for water. Their diet is supplemented with minerals from salt licks; they will eat crumbling rock or soil for its minerals.

Bighorn behaviour is learned from their elders—what they eat, and where they migrate. Everything they learn is fixed and cyclic. The cycle is only broken when natural or unnatural pressure changes it, so the animals may be forced to move to unfamiliar and possibly less suitable terrain.

Overall the bighorns' activities are controlled by the seasons. During the summer they may spend most of the day eating and resting with brief periods of social interaction and running. During the shorter days of winter, feeding makes up most of the activity to compensate for the poor nutritional value of the plants. If the weather is very cold the sheep may rest most of the day to conserve their energy.

Bighorns live in groups of from two to forty animals. This gives the assurance of a combined defence against predators and an increase in predator detection, so the individual bighorn is able to spend more time grazing and foraging. They are able to be less vigilant and nervous and can concentrate on eating.

In general bighorn sheep, especially rams, remain silent but when so inclined are able to communicate with one another over long distances. Up until they are weaned the lambs are the most vocal members of the bighorn herds. Bleating between lamb and mother is used to establish a bond. If a bighorn is nervous or threatened it will stamp its foot, blow sharply through its nostrils and make a low, growling bleat.

Scent is important to bighorns. Ewes use it to establish a bond with their lambs enabling each ewe to recognize her own lamb in a nursery group. Ewes use scent from their urine to communicate to rams that they are in estrous. Rams rub their eye glands on trees or rocks and spray their urine to mark territory.

Sight is critical to bighorns. They use it to detect danger and it is their first defence against predators. Their hearing is also good, but eyesight is their most valuable sense.

Bighorns are able to live in the rough and hazardous terrain that they do because of their climbing and hiding ability. They are agile athletes, able to scale steep slopes with grace and confidence. Bighorns are not especially fast runners so they must rely for survival on their ability to detect predators and escape them by using and enduring virtually uninhabitable terrain.

Threats

The status of the bighorn species varies; some populations are stable and healthy while others are not. Responsibility for determining survival status resides with individual provinces and states, rather than nationally with Canada or the U.S. In British Columbia, bighorn sheep are on the blue list of species at risk since they are considered to have characteristics that leave them vulnerable to human activity or natural events. Bighorn sheep in Canada are not specifically protected by federal legislation, although the *Wildlife Act* gives the federal government general responsibility for preservation of wildlife and habitats.

Natural threats to bighorns include grizzly bears, black bears, cougars, bobcats, lynx, grey wolves, coyotes, and golden eagles. Coyotes, golden eagles, bobcats and lynx are a bigger threat to lambs than to adults.

European settlers in North America hunted bighorns to near extinction, so hunting has been controlled since the early 1900s. Bighorns are still regarded as valuable trophy animals. Hunting them in B.C., Alberta, and the northwestern American states is heavily regulated and expensive, with the proceeds of licence sales going to support management of the herds. Illegal poaching of bighorns is a concern because it removes mature males from the breeding pool.

Bighorns are very sensitive creatures. They need a lot of space to be comfortable. The presence of large mammals or people can cause nervous tension so that the bighorns will become physically run down. People cannot interact with bighorns by advancing on them; bighorns must come to people on their own terms. Accessible food and water, though possibly abundant, are of no use to bighorns if they are uncomfortable in that space.

Currently the biggest threat to bighorns is the human activity that affects their traditional habitats. Residential and rural developments, road construction, industrial developments, agricultural developments, the introduction of domestic sheep to bighorn habitat, and recreational developments encroach, so the bighorns move farther away. When they have less access to their habitat the remaining land gets overused and is unable to provide proper nutrition or roaming space for the animals. If the bighorns do not get enough food in the summer they die in the winter cold.

Forest encroachment is another serious threat. Bighorns are fire dependant in that they need forests that are at an early stage of growth. They depend on annual forest fires to continue this pattern. However, governments have increased their forest fire prevention policies, as well as their forest preservation policies. As a result forests have been able to develop. The density of the trees inhibits the bighorns' ability to see far distances, increasing predation risks. Consequently, bighorns abandon their traditional movement corridors, and are further isolated from their habitats

Some populations of bighorn have already gone extinct, such as the so-called Badlands bighorn (*Ovis canadensis auduboni*) in the Dakotas and Montana, but some such as the California bighorn have been successfully rehabilitated by importing animals from other areas.

What We Can Do To Help

- Bighorns are sensitive creatures, do not approach or advance on them.
- Preserve their habitats by discouraging development in their traditional ranges, or by making their habitats protected areas or national parks.
- Keep domestic sheep and other domestic animals in an enclosed area at least 16km (10 miles) away from the bighorns.
- Promote range improvement, such as controlled burning in some areas, or mechanical removal of undesirable vegetation.
- Transplant animals to depleted populations.

Other Interesting Facts

- For a long time, Rocky Mountain and California bighorns were thought to be different subspecies. The current view is that differences in the two groups are reflections of the environmental conditions that affect growth rather than genetic make-up.
- Bighorns can have as few as two and as many as six home ranges in one year. For rams these can include pre-rut, rutting, midwinter, later-winter/spring, salt lick, and summer ranges. Ewes may have winter, spring, lambing, and summer ranges.
- First Nations describe wild sheep in their oral histories and traditions. The belt of the Orion constellation contains three stars that were seen by some First Nations bands as wild sheep.
- Bighorn sheep are frequently depicted in the prehistoric rock art of the peoples of western North America.

Where and When to view the Bighorn Sheep

Bighorns need their space and the less interaction they have with people the better. This website offers a webcam view of the desert bighorn, a relative of the Rocky Mountain and California bighorns, located in the mountains of West Texas: <http://video-monitoring.com/wtek/>. This webcam is a way to view this subspecies of the bighorn sheep in a minimally invasive way.

If you are travelling in British Columbia, depending on the season you may see Rocky Mountain or California bighorn sheep in these locations:

- Junction Sheep Range Provincial Park and Farwell Canyon area, southwest of Williams Lake
- Kootenay National Park, at the south end near Radium Hot Springs, or sometimes at the north end near the boundary with Banff National Park
- Vaseux Lake Provincial Park near Oliver
- The town of Spences Bridge
- Along the East Shuswap Road following the South Thompson River from Kamloops to Chase
- Churn Creek Provincial Park and Protected Area, south of Williams Lake

Bibliography

Book Resources

Demarchi, R. A., C.L. Hartwig, and Donald A. Demarchi, 2000, Status of the California Bighorn Sheep in British Columbia, ISBN: 0-7726-4140-4. (Available at <http://wlapwww.gov.bc.ca/wld/documents/statusrpts/b99.pdf>.)

Shackleton, David, 1999, Hoofed Mammals of British Columbia, ISBN: 0-7748-0728-8

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Tillet, Guy, 1997, Ovis: North American Wild Sheep, ISBN:0-9528607-2-4.

Valdez, Raul and Paul R. Krausman editors, 1999, Mountain Sheep of North America, ISBN: 0-8165-1839-4.

Web References

Bighorn Sheep, Naturescapes.

This website has both in-depth information and easy summaries; it also has pictures.

<http://www.eduscapes.com/nature/bighorn/index1.htm>

British Columbia, Ministry of Environment: Endangered Species and Ecosystems.

This website is maintained by B.C.'s provincial government and includes an explanation of how animals and other wildlife are ranked according to the stability of their populations. It offers summary descriptions of many animals and their status, including the bighorn sheep.

<http://www.env.gov.bc.ca/atrisk/red-blue.htm>

BCadventure.com.

This is a travel website for B.C. that offers a brief explanation of the bighorn and also provides a picture of their tracks.

<http://www.bcadventure.com/adventure/wilderness/animals/bighorn.htm>

Texas Bighorn Society Webcam.

This site offers live webcam images of desert bighorn in their natural habitat in a minimally intrusive way.

<http://video-monitoring.com/wtek/>

The National Bighorn Sheep Interpretive Centre.

Go to this site's Photo Gallery to see some pictures of Rocky Mountain bighorn sheep, including an image of a horn clash.

<http://www.bighorn.org/index.html>