

KINGS OF THE MOUNTAIN



Bighorn Sheep
Ovis canadensis

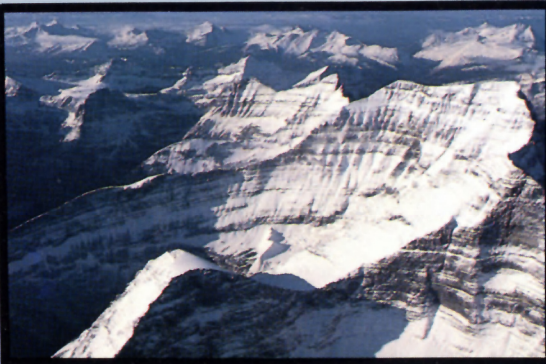
Mountain Goat
Oreamnos americanus

The Alpine Kingdom

Glacier is sky-high country. Over one-third of the Park lies above tree-line. The bands of towering rocks are layers of sediment that once lay on the bottom of ancient seas. Pressures deep within the earth thrust them upward to great heights, creating mountains that now divide the waters of the continent. Over hundreds of thousands of years, vast Ice Age glaciers cut and ground away at the uplifted rock, shaping jagged summits and plunging valleys.

And it is wintry country. Although the last great continental ice sheet retreated about 10,000 years ago, a walk or drive across the Continental Divide almost anywhere in the park will take you past small but active alpine glaciers. Snow and ice cover the high country from late October until well into June; sometimes longer. Winter temperatures reach minus 40 degrees, while powerful winds shape drifts and snow cornices up to 30 meters (98 feet) deep.

During the short, cool summer, plants rush to complete their cycles of growth and flowering while animals graze the nutritious new green forage on highland meadows and rock ledges. With the first snows of fall, most of Glacier's wildlife begins to migrate to warmer climates, hibernate in underground dens and burrows, or retreat to much lower altitudes.



Two Stay to Face the Winter

One is the Mountain Goat

In any month, this shaggy mountaineer may be found living in higher and steeper terrain than any of Glacier's other large inhabitants. Mountain goats are abundant, with a population of about 1,400 to 2,000 animals spread throughout the upper elevations of the Park.

Male mountain goats are known as billies; females as nannies. Both have short, sharp, dark horns made of fingernail-like protein called keratin, that grows over a bony core. A mountain goat keeps its horns throughout life. Though sexually mature at two-and-a-half, mountain goats do not reach full adult size until they are four years old. At the age of three, however, nannies can produce their first young, called kids. After a six-month pregnancy, one, or occasionally two kids are born in late May or early June. Mountain goats may live 13 years or more, but the average lifespan is closer to nine.



The Other Is the Bighorn Sheep

Between 300 and 500 of these majestic animals inhabit the eastern half of the park. Glacier's bighorns are brownish—sometimes a light grey-brown that may appear cream colored in late winter—but never solid white like some other wild and domestic sheep or mountain goats. Males are called rams, and females ewes. The species' name comes from the huge, curving horns of the ram. Both sexes carry horns which, like those of the goat, are made of keratin and never shed.

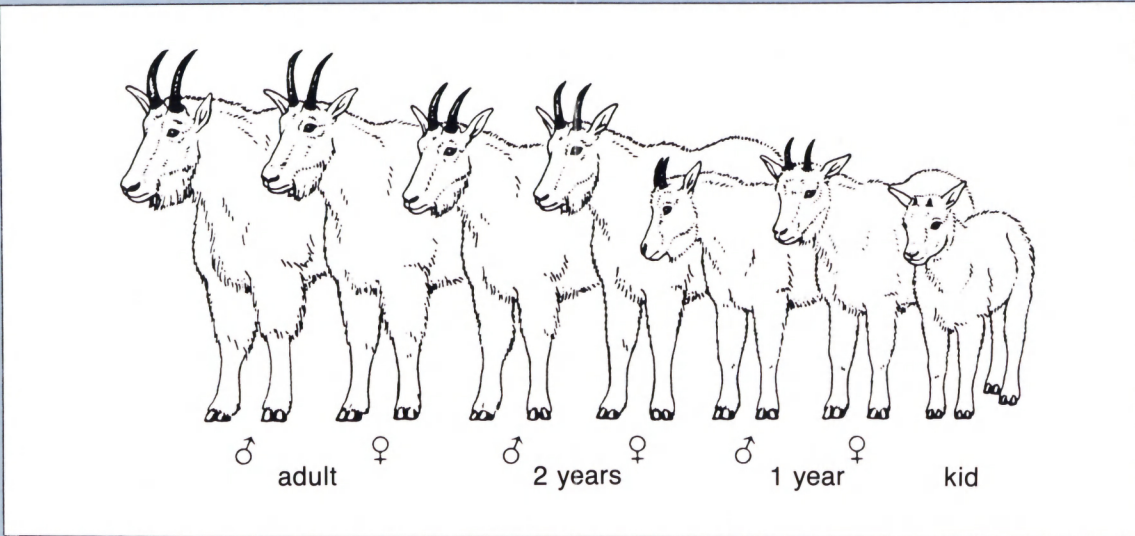
Bighorns can breed at one-and-one-half years of age, but males do not usually mate until they reach four or five because of competition from older rams. Females generally do not breed until age two-and-a-half, dropping their first lamb when they are three years old. Ewes give birth in May or early June to a single lamb, able to trot after its mother before it is a day old. By the end of their fourth summer, females have reached full adult size; males, by the end of their sixth year. Bighorn lifespan is usually between eight and twelve years in Glacier, although some individuals may live much longer.

Who's Who?

It is not always easy to guess the age or sex of these animals, but here are some clues to watch for:

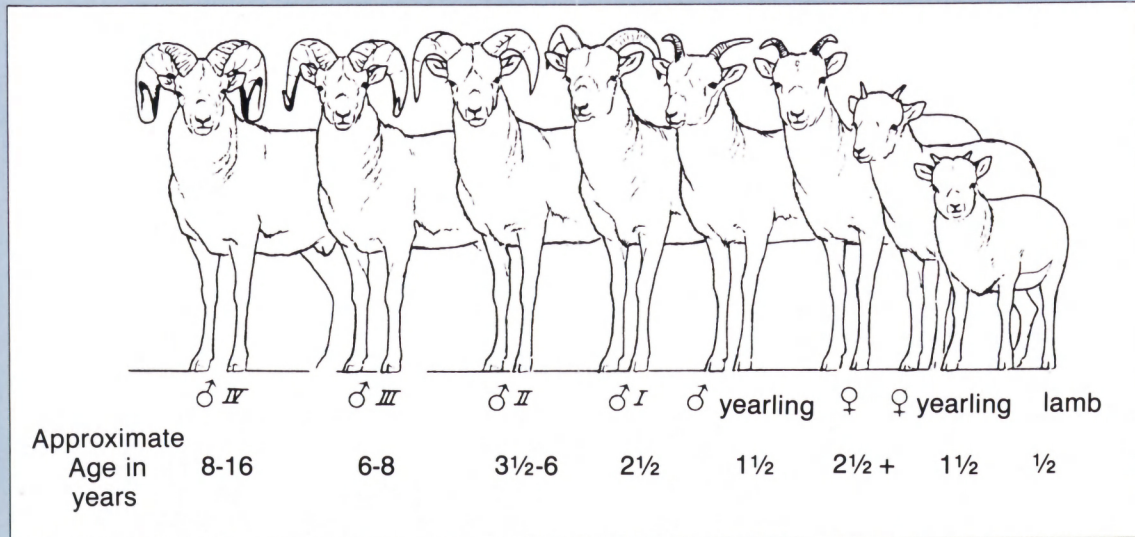
How to Identify Goats

During the summer, kids are about one-fourth adult size and yearlings about one-half. Experienced observers at close range may be able to distinguish the two-year olds which range from two-thirds to three-fourths adult size. Keen observers with binoculars may be able to distinguish adult billies from nannies when they are side by side, but few people can do so when the sexes are separated. The billies are only slightly larger than nannies, with somewhat more exaggerated neck and shoulder development. The horns of billies are slightly thicker at the base and have a less-pronounced backward curve than the nannies'. Billies are more often solitary, and they shed their coats earlier in the summer. Urination posture is perhaps the surest clue to mountain goat sex. Nannies squat while billies stretch.



And Bighorns

Mountain sheep are somewhat larger and heavier than goats. Rams have massive, curling horns, but ewes' horns are thinner and shorter. As with goats, the sexes may be distinguished from each other by their urination postures. By the time they are yearlings, young rams are nearly the size of adult ewes. They have thicker horns, however, which may have up to one-half curl by their third summer. Lambs have smaller horns. They grow quite rapidly and rarely stray far from ewes.



Climbing Beasts, Real and Imaginary

Blackfeet and Flathead Indians hunted and made spiritual vision quests among Glacier's lofty peaks. Mountain goats and bighorns provided them with meat, fur, hides, and horns, which they carved into ceremonial spoons.

Widespread in the early West, bighorns soon became known to white explorers. But the mountain goat, in its remote, cloud-and-snow-shrouded crags, was confused with the polar bear, white buffalo, white antelope, and bighorn ewe. Many experts continued to consider it a mythical beast through much of the nineteenth century.

Mountain goats and bighorns shared a common primitive ancestor millions of years ago in Asia but thereafter evolved along separate paths. Ancestors of both species crossed the Bering Land Bridge to North America over 100,000 years ago. Besides the bighorn, North America has one other wild sheep species that includes both the white Alaskan Dall sheep race and the dark brown Stone's sheep of northern Canada. The mountain goat, however, is the only one of its kind. Despite its common name, it is not a true goat but more closely related to European chamois and Asian goral and serow. These animals are called rupicaprids.

Native range and numbers of bighorns were severely reduced during the settlement of the West. More recently, mountain goat populations have also declined. The National Parks of the United States and Canada are now important strongholds for remaining populations of both mountaineers. With its one million acres of undisturbed wildlands, Glacier Park provides habitat for a healthy bighorn population and one of the highest natural densities of mountain goats in North America.

One of the current concerns of wildlife biologists involves the wintering range of bighorns, which tend to migrate into unprotected lower elevation rangelands. There they are often vulnerable to hunting pressures and habitat degradation. When natural bighorn populations are reduced by such pressures, the remaining groups of animals may be subject to potentially catastrophic losses from disease or other causes. Loss of habitat may result from past fire suppression policies, as well. Mountain goats are less vulnerable to such stresses, since they prefer the higher elevations within the park where their natural ecosystem remains largely intact.



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High Society

Like people, Glacier’s hooved animals live in communities with customs and rules. Needs and wants are communicated through a language of postures, movements, and sounds.

Goat and sheep populations are usually segregated into two kinds of bands: adult males, and females with young. Though weaned early, kids and lambs follow their mothers closely for nearly a year. They then become more independent but continue to tag along after older females not necessarily their mothers. Maturing females remain on their mother’s home range, but males depart to travel on their own or with other males on separate ranges. Billies are subordinate to nannies with kids and do not usually compete with females and young for food resources. Adult males and females come together mainly during the mating season, called the rut, in November and early December.

The average size of mountain goat bands is small on most of their range, between two and five; but in Glacier, larger groups are seen occasionally. Bighorns are more sociable, and you may find 40 or more together on a hillside.

Groups are organized into dominance hierarchies through aggressive behavior that may include threats, chases, or actual combat. Goats of all ages and sexes joust for social position, but pitched battles are rare, because their dagger-like horns can cause deadly wounds. Among sheep and goat bands, the familiarity of group association may help solve clashes over social status through displays rather than bodily contact. When goats do fight, they whirl head-to-tail while each animal tries to prod the other’s thick-skinned flanks. Bighorn ewes seldom fight; rams often do, with spectacular head-crashing results. But their horns and thickened skulls are specialized for this form of combat, so they seldom injure themselves.

The largest, healthiest, and most aggressive animals usually end up with the highest social rank. More dominant nannies, for example, occupy the best portions of the winter range and their kids share in their better position. Lowest on the mountain goat social scale are the yearlings; although they share the same winter ranges, they are often pushed away from food. Their mortality may be high in severe winters.



Goat Rocks

You may find mountain goats feeding on gently sloping meadows, but the white climbers prefer slopes of 45 degrees and steeper. They will tackle slopes of up to 80 degrees, just short of vertical. The rocks they climb in the park are mostly Precambrian limestones and shale-like argillites. When these sediments erode, step-like ledges result that make good habitat for the goats. But the many-layered rocks also tend to be loose and crumbly, so the goats have to take care with their footing, as people must when they climb these mountains.

Mountain goats have home ranges in which they use the same trails, dust-bathing pits, feeding areas, and bedsites year after year. Adult billies are usually found in somewhat less desirable habitats that are steeper, higher, and more rugged than those of nanny-young groups whose food supply must fill the needs of growth and lactation. The males, however, are more likely to move between ranges, especially during the rut. Their breeding activity in the fall can leave them exhausted for the winter, and result in a shorter lifespan than nannies have. Consequently, there tend to be fewer males than females in the adult herd.



Sheep Meadows

Bighorns like moderately sloping (between 25 and 50 degrees) grassy meadows and talus, the fallen rock debris beneath cliffs. But the lushest of meadows is a poor home for bighorns unless there are cliffs close by that they can scramble up to escape from predators. Both goats and bighorns hesitate to cross timbered areas where predators can hide, but they will feed in shrubfields grown up in the wake of forest fires.

If you could recognize a certain sheep, say, due to a broken horn, you would probably find it in about the same place at the same time each year. A ram may have up to six separate ranges which he visits in the course of a year; and a ewe, four different ranges, for such activities as mating, giving birth, and finding food. Like goats, bighorns disperse through the high country in warm weather and concentrate lower on the mountainside in winter. At any time of year, the sheep tend to inhabit somewhat lower elevations than do the mountain goats.

Why Don’t They Fall?

Sometimes they do. Accidents are bound to happen in a lifetime of climbing. Because they spend so much time on precipitous stone walls with loose rocks and icy chutes, goats are especially likely to fall to their death. Others survive, but with broken horns or limping walks.

The feet of the mountain goats are not like suction cups, as many people believe. But the hooves are unusually flexible, with rough traction pads on the bottom and hard, gripping edges. Short legs provide a low center of gravity. Since their legs are quite close together, goats may perch on thin ledges and pinnacles. The powerful shoulder muscles that give mountain goats their humped appearance enable them to pull themselves up nearly sheer walls or pivot their rear ends around while balancing entirely on their front legs. And it helps to be born with a certain enthusiasm—hours-old kids begin trying to climb up rocks before they have even learned to walk without falling.

Like human mountaineers, the goat’s method is to move slowly and deliberately, keeping three of its four limbs in contact with the rock whenever possible. Sheep, on the other hand, are leapers and bounders, capable of great speed and grace across broken, rocky terrain. They too have an excellent sense of balance and will traverse extremely steep spots from time to time. And they too make the occasional misstep and tumble toward injury or death.

Getting through the Long Winter

Winter forage is easiest to find on south-facing exposures where the sun’s warmth melts some of the snow, and on windy slopes and ridge-tops swept clean of snow. But heavy, wet snows and icy crusts can make even the forage in these places hard to get at for days or weeks at a time, and the animals must rely on their fat reserves. Over a long, hard winter, up to half the kids or lambs in a herd may die, along with weak older animals.

Mountain goats and bighorns must also contend with avalanches all through the winter and into late spring. Snowslides are perhaps the major cause of death among adult goats—a fact worth remembering when you are winter camping or skiing in goat country.

The mountain goat’s climbing abilities allow it to forage on cliffs too steep and ledges too narrow for snow to accumulate. It’s well-developed pawing abilities help it to uncover snow-buried food elsewhere. The white mountaineers make use of whatever vegetation is available, from mosses and lichens growing in cracks, to grasses and sedges, shrubs, and the needles of subalpine fir and pine trees. Bighorns paw too, but less efficiently than goats. Most of their feeding is done on open, windblown slopes where grasses are a dietary staple. Sheep also eat shrubs, forbs, and lichens, as available. Both animals are ruminants, like cattle, whose complex-chambered stomachs convert dried fodder into

essential vitamins and fats with the aid of bacteria.

Both goats and sheep wear double coats to protect them against subzero cold and wind. The goat’s shaggy outer coat has coarse guard hairs up to 19 centimeters (7.5 inches) long. Beneath that is a thick layer of interwoven cashmere-quality wool. In the spring, the billies shed their coats first, followed by the nannies, and later in the summer, by nannies with suckling kids.

Bighorns also have a fine, wooly inner coat. Their outer coat consists of short, thick hairs that are hollow (which makes them highly effective insulators) and waxy (which makes them waterproof). Both species shed their coats beginning in the spring. Shedding goats and sheep trailing ragged tangles of fur may not look beautiful, but they are not diseased, as some people suspect.

Who Shares the High Country

Mountain goats and bighorns co-exist peacefully and occasionally feed and bed side by side. However, there is not much overlap in ranges of the two species, and relatively little interaction between them.

When near goats or sheep, keep your eyes open for hoary marmots, golden-mantled ground squirrels, pikas, blue grouse, white-tailed ptarmigan, mountain bluebirds, rosy finches, and other wild neighbors. Many native birds and small mammals gather goat and sheep fur to make warm linings for nests.



Because Glacier preserves a large and relatively natural ecosystem, major populations of predators such as grizzly bears, cougars, lynx, wolverines, and coyotes roam within its boundaries. But the mountain goat is not easy prey for any of them. Its rapier-sharp horns make it a formidable foe as an adult.

And once within its steep, rocky fortress, it can outclimb any predator except one: Eagles may try to snatch away young kids or knock an older goat from a precarious foothold. Bighorns depend upon their agility and fleetness to outrun enemies over rough terrain, though carnivores do take a toll.

Predators like wolverines, bears, and cougars are skillful hunters, but they are not “bad guys,” nor are they harmful over the long run to the animal populations they hunt. Goats and sheep must be healthy and strong to survive the severe demands of the wintry alpine world. Predators selectively remove the weak and sick while the fittest usually escape to reproduce. The worst enemies of bighorns are parasites and bacterial diseases, to which dense populations are especially vulnerable if they are nutritionally stressed.

People Go There Too

Many of Glacier’s high country trails cross mountain goat and bighorn ranges. Because they are not shot or chased, the animals have little reason to be afraid of humans. If you are fortunate enough to come into close contact with them, do not try to get so close for a better look or photograph that you would disturb their activities. And never feed the animals. It’s tempting, but let’s look at what feeding really does to them.

Giving human food to wild animals substitutes artificial nutrients for balanced forage. It causes animals to stay on a seasonal range eating and trampling vegetation long after they should have migrated to new pastures, allowing the old ones to regrow. Predators find goats and sheep easy to hunt if they stay around one area. And diseases and parasites may spread more easily. Is this doing them a favor?

Besides harming wildlife, feeding animals leads to human injuries. Visitors have been butted by sheep and gored by aggressive goats. The position of a goat’s tail is an indication of how it feels. The further up its tail is raised, the more nervous a goat is, and the more likely to flee. If the tail is tucked down, the goat may threaten and possibly attack.

Goats love salt. They will travel long distances across their ranges to natural mineral licks each spring and summer. A large mineral lick, known as Walton Goat Lick, provides a natural source of salt and other minerals at the south end of the park. But some goats in Glacier have learned to associate salt with people. Why? Because human sweat and urine are rich in salty minerals. These goats look for places where people have urinated and are too often rewarded near heavily-used trails and campsites. As with feeding, this upsets natural patterns. So, when you are in goat country, try to use public rest rooms, or go some distance from your camp or trail to “answer nature’s call” if the goats are in the area.

Remember, by offering animals salt or food, you are causing them to lose something of their very wild, free way of life in a natural setting that you and others came to enjoy.

Where to Look

In summer, the best time to see goats and sheep is on cool, overcast days or during the chilly morning and evening hours of hot days. Between 10:00 a.m. and 4:00 p.m., you may find them bedded in the shade, often on north-facing slopes or near snow patches. If you are

driving, do not stop in the roadway to observe the animals, but park at the nearest overlook or parking lot. Or watch for them along the park’s many trails.

For Goats

- Above the Going-to-the-Sun Road between the Loop parking area and Logan Pass, and along the Highline Trail below the Garden Wall.
- Between Gunsight Pass and Sperry Glacier.
- At the Walton Goat Lick, three kilometers east of the Walton Ranger Station on U.S. Highway 2. The lick is a steep bank of blue-grey rock between the highway and the Middle Fork of the Flathead River. Drive slowly and be alert for animals on the road.
- All along the south side of Mt. Grinnell between Lake Josephine and Grinnell Glacier in the Many Glacier area.
- Around the headwalls of Iceberg Lake, also in the Many Glacier area.

And Bighorns

- On the side of Mt. Altyn above the Many Glacier hotels and campgrounds—best early and late in the summer season.
- Along the trail to Ptarmigan Tunnel in the Many Glacier area.
- A number of rams spend each summer around Haystack Butte and the Highline Trail.
- Smaller herds frequent hillsides in the Two Medicine and St. Mary Valleys in the spring.
- In the vicinity of Redgap Pass in summer.

These are only suggestions. Mountain goats are found almost everywhere there are high cliffs in Glacier, and bighorns might be observed from any trail in the eastern half of the park. A good pair of binoculars or a telescope can bring animals climbing along the very crown of the continent into view. The best advice is: If you are going through Glacier Park, look up!

