

Thinhorn Sheep

IN BRITISH COLUMBIA



Ecology, Conservation and Management



BRITISH
COLUMBIA

Ministry of Environment, Lands and Parks

The Thinhorn Sheep is of great conservation interest because of the small number of Dall's Sheep within our borders, and because the province is home to most of the world population of Stone's Sheep.



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INTRODUCTION

The mountainous terrain in the northern third of the province is home to British Columbia's 12,500 Thinhorn Sheep (*Ovis dalli*). About the size of domestic sheep, those hardy animals are called "thin horns" because the horns of the males, or rams, are more

slender and sharply pointed than those of the more familiar Bighorn Sheep of southern British Columbia and the western United States. There are two subspecies or races of thin horns with strongly contrasting colouration – the pure white Dall's Sheep (*Ovis dalli dalli*) and the almost black Stone's Sheep (*Ovis dalli stonei*). Conserving Thinhorn Sheep is a great concern because there are so few Dall's Sheep in British Columbia and because most of the world's population of Stone's Sheep live here.

thin horns emerged, the Snow Sheep (*Ovis nivicola*) of eastern Siberia and the closely related thinhorn sheep of Alaska. During this period, Thinhorn Sheep gradually spread eastward across the Yukon to the MacKenzie Mountains in the Northwest Territories and southward into British Columbia. The dark-coated Stone's Sheep then evolved from the white Dall's Sheep, but how is not clear.

The two races differ markedly only in the colour of their coat, but the rams' horns also differ slightly. Dall's Sheep have golden-yellow horns that often flare more widely than the horns of Stone's Sheep.

Thinhorn rams are larger than the ewes and have much larger horns. Rams stand about 90 cm high at the shoulder, weigh up to 110 kg, and have horns as long as 122 cm from base to tip. The rams' amber-coloured horns are roughly triangular in cross-section and grow throughout life, although they grow most during the first six to eight years. The horns grow rapidly in summer and slowly in winter, and the difference produces

Horn growth is rapid in summer and slow in winter, resulting in prominent rings or "annuli" which can be counted to determine age.

prominent rings or "annuli" that show the animal's age. The slender horns of ewes grow slowly and never get more than about 25 cm long. The rings on a ewe's horn are a less accurate reflection of age than the rings of a ram's horns because they are so close together.

Dall's Sheep have

TAXONOMY

Order

Artiodactyla
(Even-toed ungulates)

Family

Bovidae
(Bison, Mountain Goat, Bighorn Sheep, Thinhorn Sheep)

Genus

Ovis

Species

dalli

Subspecies

dalli (Dall's Sheep)
stonei (Stone's Sheep)

EVOLUTION AND APPEARANCE

At the height of the last glaciation, Thinhorn Sheep lived only in the Bering refugium, or "Beringia," in western Alaska and eastern Siberia. Sea levels were much lower then, and the exposed floor of the Bering Sea connected Asia and North America (the Bering land bridge). As the huge ice sheets melted 18,000 to 10,000 years ago, sea levels rose, and two forms of



DALL'S SHEEP ARE RESTRICTED TO THE EXTREME NORTHWESTERN CORNER OF BRITISH COLUMBIA. Syd Cannings

Like the Mountain Goat and Polar Bear, the white color of Dall's Sheep probably has survival advantage in a snowy environment.

pure white coats in all seasons, except for a few black hairs at the tip of the tail. In summer the coat may look yellow or brownish because of dirt stains. The coat or pelage of Stone's Sheep is usually dark grey to black, but the colour may include silver grey, yellowish brown, or almost white. The most striking wild sheep are the darkest ones, with their contrasting white rump patch, white trim down the back of the rear and front legs, and white belly. The head and neck usually have a lighter, grizzled

appearance. In southern Yukon, where the Dall's and Stone's ranges meet, many sheep have whitish bodies with dark saddles and lower legs. These "saddle-backed" sheep are Stone's Sheep, although they are also often called Fannin's Sheep.

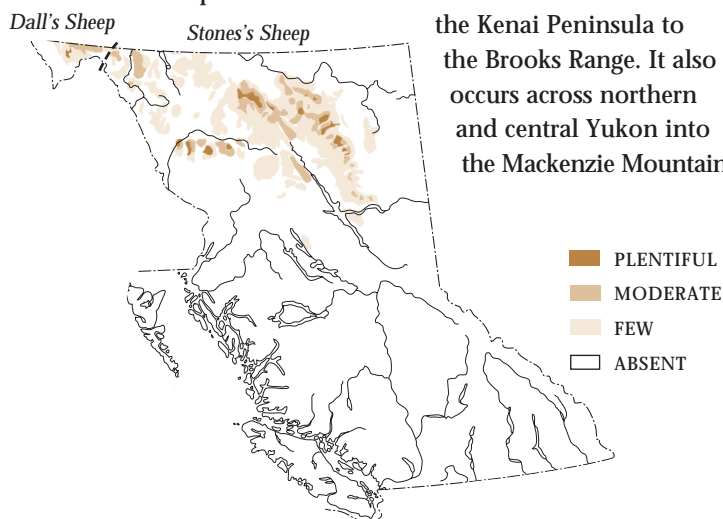
The white colour of the Mountain Goat, Polar Bear, and Dall's Sheep probably helps them to survive in a snowy environment. The Stone's Sheep's dark colour is more of a puzzle. Stone's Sheep may have evolved in a less snow-covered region than Dall's Sheep.



DISTRIBUTION AND ABUNDANCE

There are about 115,000 Thinhorn Sheep in the world, and they live only in northwestern North America. Approximately 100,000 or more of them belong to the white subspecies, which is fairly widespread in Alaska's mountainous terrain from

the Kenai Peninsula to the Brooks Range. It also occurs across northern and central Yukon into the Mackenzie Mountains



of the Northwest Territories and in the Kluane and Saint Elias ranges of southwest Yukon. Here the Dall's Sheep's range extends into the Tatsenshini River region in the extreme northwestern corner of British Columbia. Only 200 to 300 Dall's Sheep winter in this area, but a few Yukon animals may also summer there. Bennett Lake, about 80 km west of Atlin, is the approximate boundary between Dall's and Stone's Sheep in northwestern British Columbia.

Stone's Sheep occur only in south-central Yukon (about 3000 animals) and British Columbia (about 12,000). Here, they are distributed along the interior side of the Coast Range from the Yukon border to the vicinity of Mount Edziza and Spatsizi parks in the Stikine drainage and eastward into the Cassiar, Omineca, Muskwa, and northern Rocky Mountain ranges. The Pine River valley is the approximate dividing line between Thinhorn and Bighorn Sheep in British Columbia.

Landform and climate affect the distribution of Thinhorn Sheep. They are adapted to precipitous terrain and tend to occur in herds separated by landforms such as plateaus or forested valleys. Thinhorn Sheep tend to be most abundant on the drier, eastern mountain slopes where snowfall is lightest.

Thinhorn Sheep inhabit the most remote and untouched wilderness areas in the province. For this reason, the general distribution of Thinhorn Sheep has changed little in the past century, and natural factors such as weather and predation have controlled the size of individual herds. A few herds may have declined due to over-hunting and poaching in past decades when there were few regulations and enforcement was poor, for example in the Omineca and Atlin mining areas and near the Alaska Highway. But most herds have recovered and are relatively stable today.

LIFE HISTORY

The life history of Thinhorn Sheep begins with the mating season, or rut, from mid-November to early-December. The lambs are born in late May or early June after a gestation period of 170 days. This ensures that the lambs are born when the mothers are eating the nutritious new spring vegetation that makes rich milk and the lambs have time to grow strong before they face their first northern winter. One lamb is the rule, and twins are rare. In the wild, ewes usually

The haunts of Thinhorn Sheep comprise the most remote and untouched wilderness in the province.

*Thinhorn Sheep
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conceive their first lamb when they are one year old, but a few may not breed until two years old. Most ewes produce a lamb each year during their lifetime, which may last up to 16 years. Although yearling rams are able to breed, almost all of the

breeding falls to older, dominant rams with horns of full-curl size or larger. Within each herd, the rams have a well-developed dominance hierarchy based on horn size. Small-horned rams recognize the superiority of larger-horned ones and don't challenge them, but rams with horns of similar size often butt heads to decide who is dominant. These clashes occur at any time of the year but are most common during the rut. Head-to-head encounters seem to be less common in Thinhorn Sheep than among bighorns. This may be why thinhorns have more sharply pointed horns than their southern cousins, whose horns are frequently worn or "broomed".

Thinhorn Sheep are social animals that usually live in groups or herds. During most of the year rams and ewes live in separate groups and mix only during the rutting period. The bands of ewes are extended families that contain yearlings of both sexes. At about two years old, the young males leave the ewe groups and band together with other rams.

As lambing time approaches, each pregnant ewe leaves its previous offspring and finds the most rugged terrain available to give birth to a 3 to 4 kg lamb. The lamb and its mother stay in these lambing cliffs for several days before rejoining their social group. During their first summer, the lambs suckle frequently and grow quickly. By fall, they weigh about 30 kg. By about October, they are weaned and are eating green vegetation. Many lambs die during their first year, mostly due to predation or starvation. The annual mortality rate is much lower for sheep two years old and older,

but it increases again as they reach old age. Thinhorn Sheep live 19 to 20 years at most.

Predation by wolves and other species is a major cause of death for Thinhorn Sheep. Although predation can occur at any time of the

year, it is most significant in winter, and particularly during severe winters. A severe winter is one with either exceptionally deep snow that may have developed a crust from thawing and freezing, winter weather that persists into spring and delays green-up, or a combination of these factors. Winter conditions weaken the sheep and hinder their movements, making them easy prey for wolves. Exceptionally severe winters may cause drastic "crashes" in sheep numbers.

ECOLOGICAL RELATIONSHIPS

Thinhorn Sheep react predictably to seasonal changes in their environment, particularly the weather and the effects of weather on vegetation. Sheep respond to these changes by moving between traditional seasonal ranges in the way they learn from their elders.

Despite being at home in their snowy northern environment, Thinhorn Sheep are poorly equipped to cope with snow. They do not have long legs to wade through snow, like Moose, or broad hooves to walk on top of it, like Caribou, and for food, they rely on low-growing grasses and sedges that are readily covered by snow. They usually seek out

treeless ranges with little or no snow cover. These are invariably located close to cliffs where the sheep can escape from wolves. Ideal winter ranges are few and far between, and sheep often graze them heavily. In northern British Columbia, most of the winter range is located on windswept ridge crests in the alpine zone from 1500 m to 2200 m in elevation. In early winter or in years with little snow, sheep may use grassy mountain slopes in the subalpine zone that forest fires have created, but in years with deep snow, few subalpine sites are available. Key winter ranges make up a small proportion of the regional landscape. In a study of an area in northern British Columbia larger than 1000 km², researchers found that Stone's Sheep wintered on ranges of less than 3 km².

In late April, Stone's Sheep typically descend to low-elevation ranges where the first green vegetation is appearing. Those sites, at elevations of about 1200 to 1500 m, are mostly natural subalpine openings like stream sides, rock slides, small grasslands, avalanche tracks, and burns. Then in May and June, most sheep gradually drift up to higher elevations as nutritious

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G. Jones

spring growth develops there. By July, they reach their extensive alpine summer pastures. In the fall, they move around to different areas, including high alpine peaks and subalpine burns. Stone's Sheep return to their traditional winter ranges from late October to late November, depending on the weather.

Thinhorn Sheep eat mostly grasses and grasslike plants, including bluegrasses, fescues, ryegrass, and sedges, plus herbs such as locoweed, lupines, yarrow, and pasture sage. In spring and early summer, they eat a lot of newly sprouted willow and poplar leaves. Thinhorn Sheep are fond of mineral licks, particularly in spring and early summer, and they often travel several kilometres to reach them. At the licks they may become obsessed with licking and show little fear of people. Research suggests that sodium is the main element they are seeking at licks.

Wolves are the most common predators of Thinhorn Sheep, but wolves mostly kill sheep that are weak from starvation or injury. When wolves are abundant, they may kill enough sheep to reduce the herd below the number that the food supply can support. Coyotes, Wolverines, Lynx, Black Bears, and Golden Eagles sometimes kill lambs or vulnerable adult sheep. Thinhorns harbour parasites such as ticks, lungworms, and stomach worms, but they don't usually cause diseases unless the sheep are undernourished. Epidemic die-offs such as those caused by the pneumonia-lungworm complex in Bighorn Sheep, have not been reported among thinhorns.

VALUES AND USES

The majestic Dall's and Stone's sheep symbolize the very essence of wilderness. At home in the most spectacular, untouched alpine habitats in British Columbia, they prove that the province still has pristine environments and contribute immeasurably

The remote and rugged habitats preferred by Thinhorn Sheep have largely escaped human impacts.

to our tourism image. To see and perhaps photograph these striking animals in their mountain solitude is the ultimate wilderness experience. It is possible to see Stone's Sheep at Muncho Lake Provincial Park about km 760 (mile 474) of the Alaska Highway, where they come down to mineral licks in spring and summer. Alpine hiking trails in nearby Stone Mountain Park also provide



WHILE WINDSWEEPED RIDGE CRESTS IN THE ALPINE ZONE PROVIDE WINTER RANGE, STONE'S SHEEP TYPICALLY USE SMALL GRASSLANDS, AVALANCHE TRACKS AND BURNS AT LOWER ELEVATIONS DURING SPRING AND FALL. *BC Parks*

day hike access to Stone's Sheep habitat. Those willing to take more strenuous overnight hikes may view Stone's Sheep in spectacular settings in Mount Edziza and Spatsizi parks off Highway 37. It is harder to see Dall's Sheep, but there are opportunities at Mount Mansfield beside the Haines Highway, or in the nearby Tatsenshini-Alsek Provincial Park.

Thinhorn Sheep rams are prized big game trophies. Although sheep hunting is closely regulated and hunters take few animals, guiding and related activities are economically important to First Nations and other people in remote communities like Dease Lake, Telegraph Creek, and Atlin.

First Nations people in northern British Columbia have relied mostly on Moose and Caribou for meat. However, their oral history and archeological sites indicate that they once harvested Thinhorn Sheep as well and that they used horns, hides, and other parts for a variety of purposes.

CONSERVATION CONCERNS

British Columbia has a small Dall's Sheep population that is not widely distributed. Dall's Sheep is on the provincial Blue List, which means the species or subspecies is vulnerable to human activities or natural events. Stone's Sheep are not considered at risk in British Columbia because they are relatively common and their main habitats are secure.

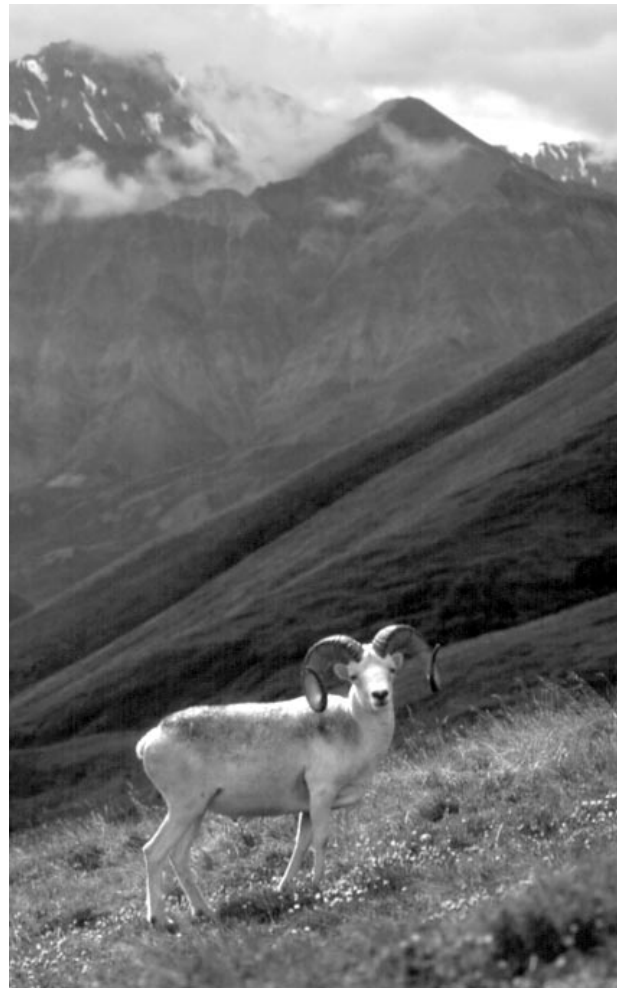


Regulated sport hunting is not a threat to Thinhorn Sheep now, but poaching and harassment will probably increase in future as access to sheep habitats gets easier as a result of new mining or other roads; expanded hiking, horse, and snowmobile trails; and seismic cut-lines. The preservation of thinhorn populations will depend on controlling the creation of new access routes and the kinds and levels of human use on existing roads and trails.

A few Stone's Sheep are hit by cars on the Alaska highway near Muncho Lake, but this is not a widespread problem. Harassment of sheep is potentially harmful where intensive helicopter activity occurs, for example during mineral exploration or heliskiing operations. This can be controlled with appropriate regulations. Human-caused mortality of Thinhorn Sheep doesn't appear to be a significant threat at present, but continued vigilance is required.

Thinhorn Sheep prefer the kind of remote and rugged habitats that have largely escaped the impact of human activities. Large-scale mining developments and access roads to communication towers located on mountain tops represent possible threats to these habitats, but a great deal of Thinhorn Sheep habitat is now protected in provincial parks and in wilderness and special management areas. Most of British Columbia's rare Dall's Sheep live inside the renowned Tatsenshini-Atlin Provincial Park. Thinhorns also occur in other parks, including Atlin, Edziza, Spatsizi, Muncho Lake, and Stone Mountain. The recently established Muskwa-Kechika Special Management Area, which is the size of Nova Scotia, supports over half of the province's Stone's Sheep. Those government initiatives, supported by resource industries and conservation groups, have immense importance for the long-term conservation of Thinhorn Sheep and many other wildlife species.

In the long term, ensuring good management and protection of Thinhorn Sheep and their habitats, both inside and outside of parks, will require a herd-by-herd inventory of critical sites such as mineral licks, lambing and wintering areas, and migration routes. Increased enforcement by conservation officers is also desirable. These programs will help cope with increasing human activity in northern British Columbia. If we give them the respect they deserve, these magnificent wild sheep have a bright future in our northern wildlands.



Jared Hobbs

BROCHURE FUNDING PROVIDED BY



This project was funded by the Habitat Conservation Trust Fund that was created by an act of the legislature to preserve, restore, enhance and acquire key areas of habitat for fish and wildlife throughout British Columbia. Hunters, anglers, trappers and guides contribute to the Trust Fund enhancement projects through license surcharges. Tax deductible donations to assist in the work of the Trust Fund are welcomed.

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MELP 851539.0300