

REVIEW OF THE HISTORICAL LITERATURE REGARDING THE DISTRIBUTION OF THE ROCKY MOUNTAIN GOAT (*Oreamnos americanus*)

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Abstract: The presently accepted southernmost range of non-introduced Rocky Mountain goats is the Sawtooth Range of Idaho (43° N, near 114° W). A significant number of credible historical accounts written during the 1800s places the Rocky Mountain goat south of 40° N Latitude in the Colorado Rocky Mountains. The outline of faunal investigations of the U.S. Department of Interior provided the method used to conduct the literature review. Criteria used to screen fictitious and unhelpful materials from credible sources is discussed. This paper reviews historical documents and explains how important information regarding the Rocky Mountain goat has been lost. Brief side notes on Western American history provide a useful background.

A lack of careful and scientific study of the Rocky Mountain goat prior to 1900 opens a question regarding its original range. Much of the confusion surrounding the issue of distribution may be attributed to terminology errors used when referring to mountain goats, bighorn sheep (*Ovis canadensis*), and pronghorns (*Antilocapra americana*). Lewis and Clark, and members of their expedition party, called the Rocky Mountain goat a "mountain sheep" and used the same term when referring to bighorn sheep (DeVoto 1953). They originally called pronghorns 'goats' or 'buck goats' prior to discovering the bighorn and the mountain goat.

The terminology error became a reproduction error in many Natural History books. In Stewart (1833), *Oreamnos americanus* is called a mountain sheep. While the accompanying illustration depicts a mountain goat, the text is almost exactly the same as the text printed on the next page for *Ovis canadensis*. Meanwhile, the name for *Ovis canadensis* is given as American argali (and is accompanied by an illustration of a bighorn sheep). The book does not describe the distribution of these animals. Such errors contributed to public and scientific confusion regarding the distinction between these two species.

Mountain men apparently saw "white goats" in what are now called the Colorado Rocky Mountains in the 1820s and 1830s. Many of them probably travelled above the tree line on occasion and may have seen mountain goats, but their general lack of literacy and familiarity with descriptive zoological

methods prevented them from conveying this information in a form useful to modern research.

Reports of Rocky Mountain goats show up in the literature printed prior to and during the era of the Colorado gold rush which began in 1858. Mining camps were hastily erected in the mountains before roads were built. The few toll roads that had been built in the 1860s were so expensive and poor that the price of food was extremely high and there were frequent shortages. Many of the prospectors turned to market hunting, killing as much game as fast as they could to earn a fortune from hungry miners (Ubbelonde et al. 1988). Like the prairie (*Bison bison bison*) and mountain bison (*Bison bison athabascaae*), all traces of Rocky Mountain goats in Colorado could well have been eliminated by market hunting.

Angora goats (*Capra* spp.) had been imported to Colorado as of 1872 (Baille-Grohman 1900). These animals were covered with long white hair and had horns extending horizontally from the head in a T-shaped pattern. Some modern scholars insist that these domestic goats are the cause of all "white goat" sightings in nineteenth century Colorado. However, Angora goats and Rocky Mountain goats are distinguishable not only by their appearance, but by their behavioral characteristics. This literature review cites only documents that clearly-illustrate, and/or describe the features, natural history, or behaviors of *O. americanus*.

The habitat of the Rocky Mountain goat is an environment that makes the chance finding of century old specimens highly unlikely. The alpine

zone is blanketed with snow in winter and repeatedly blasted with dry winds year round. A carcass left exposed to the elements quickly disintegrates leaving no trace of the animal that died. The geographic features of the land are constantly in motion, grinding up any subsurface remains with ground movement resulting from freeze and thaw cycles. Glaciers grind up any trapped animal and plant remains into tiny bits of debris. Only carcasses left in immobile pockets of glacier ice or caves might remain intact and none of these have been found to date in Colorado. However, Pleistocene fossil evidence of Rocky Mountain goats has been located within a few miles of the Colorado state line in Wyoming.

The objectives of our project are: to question the historical distribution of the Rocky Mountain goat and to report all available documentation listing *O. americanus* occurring in Colorado.

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METHOD OF SCREENING LITERATURE

This research recognizes the misidentification errors and cites credible historical sightings contingent upon the original author's demonstrated ability to distinguish between the bighorn sheep, pronghorn, and the mountain goat. These distinctions were made based on the narration of the behavior and habits of the animal and by the physical description of live or killed specimens. Many fanciful and fictitious accounts were discovered during the course of the review. Such accounts were excluded because of incorrect descriptions of geography, habitat, fauna, history, or climate. No part of any account which could reasonably be judged fictitious was used in the review, even if by coincidence some part of it would agree with known truths. The precedent for this survey can be found in the outline of faunal investigations of the U.S. Department of Interior (Wright et al. 1932).

CHRONOLOGY OF FINDINGS

Fossil Remains

If Rocky Mountain goats lived in Colorado during the 1800s, they may have resulted from relict populations from the last ice age. Fossil evidence has been located in the Bell and Horned Owl Caves located in Albany County, 32 km NE of Laramie, Wyoming (41°34'N, 105°31'W) [the Colorado-Wyoming state line is at 41°00' N] and in Little Box Elder Cave in Converse County, 30 km west of Douglas (42°40'N, 105°52'W) (Guilday et al. 1967, Anderson 1974). These specimens date to the late Wisconsinian period 30,000 years ago. The remains of *O. americanus* have been found along with other animals of alpine affinity (Kurtén & Anderson 1980).

Early Explorations

The expeditions of Pike in 1806-7 and Long in 1820 failed to document any sightings of Rocky Mountain goats in Colorado (Coeus 1895, James 1966). Long did not travel as extensively as Pike and confined his explorations to the Front Range between present day Denver and Colorado Springs.

Mountain men of the 1820s and 1830s later claimed to have seen animals fitting the description of the Rocky mountain goat; however, these accounts were later discredited in the literature by aristocratic sporthunters who were disappointed in their quests to kill the animal in Colorado. Burrington visited local Native Americans in the Cañon City area between 1838-1842 and noticed that they possessed samples of "a shiny long black horn" (Messiter 1878). After negotiating, he got them to agree to take him on a hunt for the animal which provided the horns. Burrington hunted bighorns, prong-horns, and bison and knew that the horns did not come from these species (Messiter 1878).

A report, compiled from the notes of Johnson and Abert of the U.S. Army Hunting Party in the Southern Teton (Cooke 1847-1848) describes the killing of a mountain goat in Wyoming. The location of the kill was south of our presently accepted historical distribution.

The first mountain goat specimens given to the Museum of the Royal College of Surgeons of England was inventoried as the head and skin of a female and her kid that had been "shot south of the 40th parallel" in 1849 (Garson 1871).

U.S. Army Hunting parties continued to explore the Colorado Rocky Mountain region in the 1850s. Their purpose was to survey game availability as food along proposed railroad routes and for provisioning troops on future expeditions. A party scouting the region around the Gunnison River in

1853 killed several mountain goats (Old Army Section document #21311).

The Topographical Corps (1857), a 13 volume quarto set, contains the correspondence and field journals of various railroad exploring parties of 1853-55. Volumes 7, 9, & 10 are devoted exclusively to scientific reports on botany and zoology. These volumes are considered to be among the most important American scientific productions of the nineteenth century. Volume 5 reports: "42 white goats killed for meat." This occurred north of Meade and Wasatch canyon of southern Idaho.

Market Hunting During the Gold Rush Starting in 1858

The Colorado Rocky Mountain ecosystem could sustain a permanent native population estimated at around 4,000 to 10,000 Native Americans (Ubbelohde et al. 1988). The Gold Rush brought over twice that many newcomers each year after 1858. As of 1859, as many as 50,000 gold miners had arrived in and along the front range and as many as 25,000 may have stayed on after the first grueling weeks and months of prospecting (Ubbelohde et al. 1988). This influx continued through the 1860s despite the Civil War starting in 1861. In the beginning, roads were non-existent, leading to chronic food shortages and prices that were ten times higher than in Denver. Many of the prospectors abandoned their claims to hunt and provide meat for the mining camps and towns, an occupation that often proved more lucrative than digging for gold.

After panning out gold laden streams, mining operations turned to more ecologically destructive methods such as placer mining which polluted numerous streams with mercury, and smelting which denuded entire mountain valleys of trees. These environmental changes would have helped deplete game animals in the lower valleys and driven market hunters to higher elevations.

Sportsman's Literature in the Gold and Silver Years

The earliest published sporthunting book to claim that Rocky Mountain goats reside in Colorado is the *Encyclopaedia of Sport* (Pike 1872). In Cartwright (1875, Chapter 5: The Rocky Mountain Goat), the distributional range of the Rocky mountain goat is given as 40 to 60 degrees north latitude. This agrees with Hallock (1879), who wrote "the White Goat is confined to the loftiest peaks of the Rocky Mountains; it is not known south of

Colorado, and is probably rare south of Washington Territory, but is found to the northward as far as Alaska."

Theodore Roosevelt (1888) wrote that Rocky Mountain goats were found "on the highest most inaccessible mountain peaks down even to Arizona and New Mexico; but being fitted for cold climates, they are extremely scarce everywhere south of Montana and northern Idaho and the great majority even of the most experienced hunters have hardly so much as heard of their existence." Cooper (1980), is less specific regarding the range of the mountain goat stating that "the Rocky Mountain Goat has been reported as far south as 36 degrees north latitude". Grinnell (1897) likewise asserted that the mountain goat could be found "on a peak or two in Colorado".

The United States Cartridge Company of Lowell, Massachusetts sent out letters to governors of the various states and territories requesting information on game availability in their region. According to this information published in their book (1898), the governors "referred the matter to the game commissioners." Cited in the chapter for Colorado, are references from Jordan Land, the Colorado State Fish Commissioner. In regard to mountain goats, the book states: "there are some Rocky Mountain goats in the state, but they are not abundant."

Huntington (1904), is not as assertive in his claim of mountain goats living in Colorado. He approaches the subject of mountain goat distribution by stating that: "other writers" claim the mountain goat can be found in Colorado.

By contrast, 68 years later, Armstrong (1972) cited from Coues and Yarrow (1875): "in an account of the mountain goat, reported 'one individual seen in Colorado by Lt. Marshall's party.' Trippe (1874) noted the mountain goat (as *Aplocerus montanus*) among the mammals of Clear Creek and Gilpin counties." Armstrong goes on to assert that "there is no evidence to indicate that the mountain goat has occurred in Colorado in recent times prior to its introduction by man. Perhaps early reports represent sightings of bighorn ewes."

The Session Laws of 1887 and 1889

Recognizing a steady reduction in the availability of game, the Colorado state legislature passed two sets of session laws that established hunting seasons and banned the killing of bison for 10 years, bighorn sheep for 8 years, and Rocky

mountain goats for 10 years (General Assembly Session Laws 1887 and 1889). The 1889 law made it easier to prosecute poachers in the district in which they were caught, and added possession and transportation of protected animals' remains to the list of offenses.

William T. Hornaday

Hornaday (1914), remembered purchasing 150 mountain goat hides in Denver, Colorado for fifty cents each around 1887. He was pleased to note that the seller probably lost money in the transaction. It is not clear where Hornaday believes the southern-most distribution of Rocky Mountain goat lays. His map "Distribution Of The White Mountain Goat" subtitle: "the black dots represent actual occurrences", shows several dots locating goat populations along the Rocky and Canadian Pacific coast mountain chains. A single population dot has been placed in the Teton Mountains near Jackson Hole, Wyoming. The map ends at the southern boundary of Wyoming.

Edwin Carter and the Denver Museum of Natural History

In 1868, Edwin Carter and William Wilkinson set up a museum of Colorado fauna in Breckenridge. Carter bought out Wilkinson's share of the museum in 1896. The collection consisted of a large number of wild animals: "100 elk heads [*Cervus elaphus*] and 1 elk, 8 bison (of which 2 were the mountain subspecies), 55 deer heads [*Odocoileus* spp.], 161 ptarmigans [*Lagopus leucurus*], 3 wolverines [*Gulo gulo*], 4 grizzly bears [*Ursus arctos*], etc." (Fiester 1973). Prior to this project, it was believed that Edwin Carter had no mountain goats in his collection. Recently obtained information now challenges this belief. In the past few years the Summit County Historical Society has been restoring the Edwin Carter Museum and one of their projects was the restoration of a collection of glass plates photographed in the late 1800s. From this collection, a photograph was discovered showing a full body mount of a Rocky Mountain goat standing in the north room of the Museum. Another photograph contains the unfocused image of a Rocky Mountain goat head mounted to the wall behind Edwin Carter displaying a wolf (*Canis lupus*) in the foreground. While the wolf photograph merely suggests the presence of a mountain goat specimen in the background, the other photo confirms that at least one entire Rocky mountain goat was displayed in Edwin Carter's museum of "Colorado fauna".

Other references to Rocky Mountain goats include the Probate Record (Summit County Court House- No. 18) where several goat skulls and horns were listed and appraised. The values given to the items in the appraisal were greater than that given to the complete remains of bighorn sheep suggesting that the goat items were relatively rare and certainly not of domestic goats.

After Carter's death in February 1900, his collection was acquired for the museum in Denver, taken from Breckenridge, and stored in the state capitol. Many of the specimens were never displayed in the Colorado Museum of Natural History because they had deteriorated. This is because of Carter's primitive methods of taxidermy and the stuffing of larger mammals with straw. Meanwhile, the first employees of the Colorado Museum of Natural History, a father and son team of taxidermists named Rudolf and Victor Borchardt, quickly sought replacements for the mountain goat specimens. This is described in an article in the Denver Times (October 14, 1900) where several members of the Colorado Museum and Library Association put together a hunting expedition to search Idaho for mountain goats to complete the collection. The article states that: "in Colorado, they [mountain goats] had become quite extinct."

The mountain goats were displayed in the collection of mammals indigenous to Colorado until 1908. After that, a variety of exhibits were intermixed with the Colorado fauna collection and it was not until 1920 and after several turnovers in staff that the museum put together another exhibit hall dedicated solely to Colorado fauna (Colorado Museum of Natural History Annual Report to the Trustees 1912-1920). Meanwhile, the 1913-1914 Biological Surveys failed to find any Rocky Mountain goats in Colorado (Colorado Museum of Natural History Annual Report to the Trustees 1914). The museum staff had records indicating that the mountain goats in their collection were acquired in Idaho. As such they judged the mountain goats to be "obviously doubtful forms" and had them moved to the Standley Wing which was set up to display animals that were not indigenous to Colorado. Thus, the Rocky Mountain goat was informally and unknowingly declassified as a species indigenous to Colorado. None would be seen in the Colorado Rocky Mountains until their successful reintroduction in 1948 (Irby and Chappell).

DISCUSSION

This paper identifies numerous historical sources placing the Rocky Mountain goat in Colorado previous to and during the Gold Rush years. The destructive environmental changes of the late nineteenth century led to habitat loss and overhunting of many game species. The mountain bison is known to have suffered extinction in Colorado during this period. It is highly probable that the Rocky Mountain goat became extinct in Colorado as well. This paper is an attempt to make a comprehensive survey of historical documentation that focuses on the distribution of the mountain goat with emphasis on its presence in Colorado.

Although archeological evidence is felt to be a more decisive way of ascertaining the mountain goat's existence in Colorado prior to 1900, historical documentation cannot be ignored as a valid source of information in determining animal distributions. The historical materials reviewed here suggest that the Rocky Mountain goat may have lived south of the 40°N Latitude in the Colorado Rocky Mountains.

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