

WHY IS MONTANA THE LAND OF GIANT RAMS?

DUNCAN GILCHRIST, Outdoor Expeditions and Books,
Box 696, Corvallis, MT 59828.

Abstract: Montana has been producing Boone and Crockett (B&C) record book bighorn (*Ovis canadensis canadensis*) rams in ever increasing numbers. Each year seems better than the last, and 1991 was no exception. These high scoring rams are coming mostly from introduced populations with the same genetic source (Sun River). There is much variation in horn growth among the introduced populations: the phenomenon of superior horn growth is explored and several hypotheses are brought forth that are intended to stimulate thinking among bighorn sheep managers.

As the 20th century draws to a close, a hunter would hardly expect to find large numbers of outstanding big game trophies being harvested. Such a phenomenon is occurring with Montana bighorn sheep. In 1990, a new official state record ram was taken by Lester Kish. It is the largest recorded ram killed by a hunter in the United States, with a B&C score of 200 $\frac{7}{8}$, and a left horn length of 49 $\frac{2}{8}$ inches.

In 1974, Jack Atcheson spoke before the Northern Wild Sheep and Goat Council. He explained that during the previous few years about 500 North American rams had been mounted in his shop. Of those 500 rams, he stated that less than 1% had horn lengths of 39 inches or more (Atcheson 1974). During mid-December of 1991 I visited Atcheson's Taxidermy. Record book bighorn rams were everywhere. They had just finished mounting a ram with a score of 196 $\frac{4}{8}$. Another had a score of 191 $\frac{6}{8}$. Others safely made the B&C minimum of 180. A couple of weeks later I returned to visit once again. There was a new set of horns on the floor with a reported score of 185 and horn lengths of nearly 44 inches. Have times changed!

Forty-eight bighorn rams from Montana have been officially scored 190 B&C points or more (Table 1). Others will score above 190 but have not been officially scored or have been disqualified for various reasons. Of these 48 rams, 38 (79%) have been taken since 1980. It is likely that at least 11 more rams were taken during the 1992 hunting season that will officially score over 190 points.

For the past decade and a half, Montana has produced up to 20 or more record book rams each year. In some management units half the kill, or more, is comprised of "Book" sheep (pers. records). Growth rates are phenomenal with many high-scoring sheep only being 4 $\frac{1}{2}$ years old. One ram measured from the East Fork of the Bitterroot, that had perished from pneumonia, was only 3 $\frac{1}{2}$ years old and had a 38 inch horn length and 17 inch bases.

In the 1990 Montana state record book, 34 of 139 registered rams are from Sun River. Most were taken many years ago. Gail Joslyn (Mont. Dep. Fish Wildl. and Parks, pers. commun.) feels that the Sun River herd produced its highest scoring rams following fires a generation ago. Fires no doubt stimulated forage growth with a possible reduction of lungworm larva (L.S. Nielsen, Mont. Dep. Fish Wildl. and Parks, pers. commun.).

Most "Record Book" sheep are coming from introduced herds that are genetically from Sun River stock. On new range, trophies tend to reach their maximum size until the population reaches the capacity for the range (Geist 1971, Shackleton 1973, Heimer and Smith 1975). Geist (1971) has theorized that quality rams are most likely to occur on new ranges where there is a low population density. Most of Montana's introduced bighorn populations are still expanding, so carrying capacities have not been reached (L.S. Nielsen, Mont. Dept. Fish Wildl. and Parks, pers. commun.). The Thompson Falls area is apparently an exception to this criterion (B. Sterling, Mont. Dep. Fish Wildl. and Parks, pers. commun.). Sterling told me in an interview that the population had probably reached a maximum level and that horn growth rates had drastically declined.

Stewart and Butts (1982) studied mean cumulative horn volume for the first 4 growth periods. It was found that all introduced herds demonstrated greater average horn volumes than native herds. They postulated that inbreeding has contributed to the small horns common in native herds. They feel that inbreeding will occur in a population of 50 animals or less, with a corresponding reduction in horn size. Additionally they feel inbreeding may also contribute to the eventual demise of the herd.

Stewart and Butts (1982:77) state, "It appears that when sheep are put into a new and relatively unexploited habitat, the rate of horn growth is exceptional--far surpassing that of the parent stock. As a population expands, the rate of horn growth declines. Eventually, carrying capacity is reached and horn growth is reduced to a level similar to that of the parent stock with minor differences, due to differences in productivity between the ranges." This same phenomenon has been demonstrated in New Zealand with red deer (*Cervus elaphus*) where antlers grew larger after transplanting than found in parent stock coming from England and Scotland. When red deer numbers grew to beyond the carrying capacity of the range, trophy antlers were not found within the population (Banwell 1986).

This paper explores some of the possible reasons why Montana is growing so many high scoring rams. It is hoped that it will stimulate some thinking among game managers on the production of "Super Rams."

FACTORS AFFECTING HORN GROWTH

Forage

Areas that are producing high numbers of large horned rams from introduced herds have an abundance of good forage, such as rough fescue

(*Festuca scabrella*). Rough fescue has a high protein content as dry winter food, far exceeding most other plants that are natural foods of bighorn sheep (Wishart 1969, Johnson et al. 1968). Rough fescue is abundant only on range not overgrazed by domestic livestock or wildlife (L.S. Nielsen, Mont. Dep. Fish Wildl. and Parks, pers. commun.).

It seems appropriate to compare forage quality among herds in Montana, as all sheep with fast growing horns come from the same genetic source, the Sun River. It appears that all the best Montana rams are coming from areas that are producing a large volume of rough fescue or other super food (L.S. Nielsen and D. Hook, Mont. Dep. Fish Wildl., and Parks, pers. commun.). Nielsen has observed large amounts of rough fescue in areas noted for large horned sheep like Rock Creek and the South Flint Creek range. I have observed rough fescue in the bighorn ram summer range of the Highlands, which is another area noted for its large horned rams. Wishart (1969) noted that in Alberta large horned rams appear to be the result of an optimum combination of climate, soil, and vegetation. Rough fescue is the dominant grass in those portions of Alberta producing large horned rams.

Hunting Seasons

In western Montana, introduced sheep herds have relatively small home ranges. Rams use dense timber for security except during the rut. Sheep seasons often run until the Sunday after Thanksgiving, which includes some of the rut period. A few units such as Upper Rock Creek and the Anaconda area close at the end of October before the rut. The original intention of this regulation was to protect some rams, allowing them to reach old age (L.S. Nielsen, Mont. Dep. Fish Wildl. and Parks, pers. commun.). This hunting season seems to work as intended since these units produce a high percentage of trophy rams. Over the past 2 seasons, nearly half the rams harvested in Upper Rock Creek have scored in excess of 190 B&C points. Anaconda produced the U.S. record in 1990 and has produced numerous other record book rams under this type of season.

THE ROCK CREEK HERD

The area of Upper Rock Creek between Philipsburg and Missoula was the home of a native bighorn herd that reached low levels several times during this century (L.S. Nielsen, Mont. Dep. Fish Wildl. and Parks, pers. commun.). In 1975 wild sheep from the Sun River were released in the area. It has been stated that only 3 native sheep remained when the release was made (L. Clark, local guide, pers. commun.). Horns from mature rams before the release were small, seldom exceeding 30 inches in length (pers. observation). Since the season was reopened in 1983, record book rams have been taken with regularity, including the Larry Smith ram taken in 1984 scoring 199 0/8 (Table 1). Since 1990, rams with high scores have appeared in larger numbers in the harvested segment. In 1990, 4 of 10 rams had scores exceeding 190 points and in 1991, 2 exceeded 190 points (Table 1).

It has also been noted that ram body sizes in the area are exceptional. Boone (letter to R. Dimarchi, B.C. Fish and Wildl.

Branch, Cranbrook, 1985) wrote concerning the Gingras ram harvested in 1984, "What impresses me most is the size of the ram's body. The ram was brought out in pieces and weighed the next day, minus the lower legs, much of the back cape and some trimmed meat and bone, and of course the entrails. The weight was 255 pounds. The live weight is estimated at 350 plus pounds."

Butts (1980:69) had this to say about the Rock Creek herd: "Berwick reported that horn size of original Rock Creek rams was exceptionally small and tight. He attributed that to a lack of phosphorus (P), calcium (Ca) and other minerals, though he pointed out that horn size was larger shortly before the population crash. The availability of minerals on the Rock Creek range has probably not changed since the mid-1960's. The forage quality and the genetics of the population have changed."

In the mid to late 1960's, the range was considered in poor condition. As a result, cattle numbers were reduced and rest rotation grazing systems initiated on public lands. By the mid-1970's, the range was improving and ranked good to excellent according to the Bureau of Land Management (Butts 1980). Rams from the herd established after the 1975 release leave traditional wintering areas, allowing better utilization of forage including abundant rough fescue (Butts 1980). In a February 1992 telephone conversation, Rock Creek rancher and bighorn guide Larry Clark said that sheep were continuing to establish new splinter herds. The herd, which the state estimates at 300 individuals, appears to still be expanding and continuing to produce large horned rams.

MANAGEMENT SUGGESTIONS

The upper Rock Creek habitat should be studied to determine whether the area possesses unique properties that contribute to the growth of large horned rams. A comparison of forage types and quality among various bighorn sheep ranges may shed light on the role quality forage, such as rough fescue, plays in the growth of large horns.

In addition more detailed analysis of the effects of supplemental transplants of desirable genetic stock on sheep herd productivity, survival, and horn growth should be undertaken. A better understanding of these factors may help managers duplicate the current Montana phenomenon of extraordinary ram horn growth in other sheep herds.

Table 1. Montana bighorn sheep with an official Boone and Crockett score of 190 or greater.

Score	Locality	Year	Hunter
200 7/8	Unit 213	1990	Lester Kish
200 3/8	Unit 680	1991	Eugene Knight
199 0/8	Unit 216	1984	Larry Smith

Table 1. Continued.

Score	Locality	Year	Hunter
197 5/8	Unit 213	1987	Art Dubs
197 1/8	Unit 121	1979	Armand Johnson
197 1/8	Unit 216	1990	Lee Hart
197 0/8	Unit 340	1989	Gene Riordan
196 7/8	Unit 216	1990	Keith Koprivica
196 5/8	Sun River	1961	Don Anderson
196 4/8	Unit 340	1991	Vern Barnett
196 2/8	Unit 340	1989	Guy Miller Jr.
196 0/8	Unit 203	1984	Claude Burlingame
195 7/8	Unknown	1890	Dole and Bailey, Inc.
195 5/8	Park Co.	pick up	Rodney Lawrence
195 4/8	Unit 213	1988	Tom Matosich
195 3/8	Unit 203	1990	Leonard Thompson
195 0/8	Sun River	1911	Gold White
194 5/8	Unit 213	1987	Mitch Thomson
194 4/8	Unit 216	1990	Bill Pelc
194 3/8	Unit 213	1987	Norman Lesh
193 4/8	Unit 216	1986	Michael Girard
193 4/8	Unit 340	1990	Thomas Webster
193 2/8	Unit 121	1989	Jerry Landa
193 1/8	Unit 203	1982	Bonnie Ford
192 6/8	Unit 216	1991	John Steel
192 7/8	Unit 216	1989	Ray Dvorak
192 5/8	Sun River	pick up	Robert Gabbert
192 3/8	Unit 216	1991	John Sandman
192 2/8	Sanders Co.	1968	Richard Browne
192 2/8	Sanders Co.	1978	Michael Jorgenson
191 7/8	Unit 216	1984	Steve Gingras
191 7/8	Unit 203	1989	Carl Schmidt
191 7/8	Wildhorse Is.	1961	U of M (stolen)
191 6/8	Unit 340	1991	Jim Dennehy
191 5/8	Unit 121	1982	Bryan Nelson
191 4/8	Lincoln Co.	1961	Ed Boyes
191 1/8	Unknown	1985	Mike Gesuale
190 7/8	Sanders Co.	1988	Terri Stoneman
190 6/8	Unit 122	1991	Gene Warren

Table 1. Continued.

Score	Locality	Year	Hunter
190 6/8	Unit 216	1990	Scott Campbell
190 6/8	Unit 203	1986	Art Dubs
190 5/8	Unit 203	1985	John Ottman
190 5/8	Unit 203	1986	Chris Mostad
190 4/8	Unit 340	1988	Quinn Ness
190 4/8	Unit 121	1991	Bob Blenker
190 3/8	Sun River	1957	F. P. Murray
190 1/8	Unit 203	1987	Joe Turner
190 0/8	Unit 210	1991	Rick Williams

LITERATURE CITED

- Atcheson, J. 1974. Wild sheep from an economic and consumer viewpoint. Pages 2-6 in K. Constan and W. Mitchell, eds. Proc. Symp. North. Wild Sheep Counc., Mont. Dep. Fish and Game, Great Falls.
- Banwell, D. 1986. Great New Zealand deer heads, Halcyon Press. Auckland, New Zealand. 176pp.
- Butts, T. 1980. Population characteristics, movements, and distribution patterns of the upper Rock Creek bighorn sheep. M.S. Thesis, Univ. of Montana, Missoula. 190pp.
- Geist, V. 1971. Mountain sheep a study in behavior and evolution. Univ. Chicago Press., Chicago, Ill. 383pp.
- Heimer, W., and A. Smith III. 1975. Ram horn growth and population quality, their significance to Dall sheep management in Alaska. Alas. Dep. of Fish and Game, Juneau, AK. 41pp.
- Johnson, A., L. Bezeau, and S. Smoliak. 1968. Chemical composition and in vitro digestibility of alpine tundra plants. J. Wildl. Manage. 32:774
- Shackleton, D. 1973. Population quality and bighorn sheep. Ph.D. Thesis. Univ. of Calgary. Alta. 266pp.
- Stewart, S., and T. Butts. 1982. Horn growth as an index to levels of inbreeding in bighorn sheep. Bienn. Symp. North. Wild Sheep and Goat Counc. 3:68-82.
- Wishart, B. 1969. Bighorns and little horns. Alberta-Lands-Forests-Parks-Wildlife. 12:4-10.