

Mountain Goat Horns Of The Kootenay Region Of British Columbia

DUNCAN GILCHRIST, POB 696, Corvallis, MT. 59828, 406 961-4314.

Abstract: The Wildlife Branch of the province of British Columbia was kind enough to supply me with a computerized list of horn measurements for all mountain goats taken in the Kootenay Region for the years 1976 through 1985. By entering part of the data (1984 and 1985) in my computer I was able to verify information that would be of interest to the hunter. At a later time, I added 1989 and 1990, so as to see if there were any great changes in the age or horn size of harvested mountain goats due to management or weather.

Questions that were examined include: Percent Of Mountain Goat Horns Over Listed Age, Percentage of Horns Over Given Length, Average Horn Length By Age And Sex, Average Age and Length of Longest Horn By Year and Sex, and The Question of Broken Horns.

My son Stuart, who was a high school student at the time, designed the computer program so that these questions could be examined.

As an outdoor communicator, a past Alaska outfitter and a serious mountain goat hunter, I had several theories on mountain goat horns and their growth. These ideas were based on some 14 years of extensive mountain goat hunting on both the Kenai Peninsula and along the Lynn Canal between Juneau and Haines, Alaska. In addition, commonly I would spend 100 hours a year, or more, observing mountain goats from my Super Cub (PA-18). This was at a time when the Alaska Department of Fish and Game virtually ignored the species. I could not find any biologist in any state or province who could answer any of my questions. My questions included:

1- By aging many horns it appeared that mountain goats live longer than Dall sheep.

2- For any given age, there was little difference in horn length for billies or nannies. I also thought that horn lengths over 10 inches were more common with nannies.

3- After examining many mountain goat horns I concluded that most billies mature with 9 3/8 inches of horn length and lengths over that are uncommon.

4- There appeared to be little horn

growth after age four. I felt that no matter how old that a goat lives he or she would not likely grow more than a half inch of additional horn length.

5- I pondered the percentage of mountain goat horns that are broken significantly.

Ray Demarchi from the British Columbia Wildlife Branch in Cranbrook said they did not have the answers but that they could supply me with raw data if I wanted to analyze it. I worked with Bill Warkentin, a technician from the branch, who supplied the data.

Table 1. Sample Size - Kootenay Region - British Columbia

	<i>1984- 85</i>	<i>1989- 90</i>
Males	255	500
Females	249	295
	504	795

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be of interest to the hunter. At a later time, I added 1989 and 1990 so as to see if there were any changes due to management or weather.

To answer question 1 from Table 2 it can be readily seen that mountain goats do not appear to live longer than Dall sheep, In the period 1989- 90, there were definitely more older age class (7 1/2 years

or older) mountain goats of both sexes than there was in 1984- 85. I suspect that this increase in older mountain goats may have been the result of conservative management (harvest) practices. Bill Warkentin (personal communication) said that management goals at the time were to harvest no more than 5% of the known population.

Table 2. Percent Of Mountain Goats Over Listed Age

Age*	% Males		%Females	
	1984- 85	1989- 90	1984- 85	1989- 90
1.5	100.00	100.00	100.00	100.00
2.5	97.25	95.60	94.38	93.90
3.5	88.63	87.00	88.76	83.05
4.5	74.12	73.80	68.67	66.10
5.5	55.29	61.20	49.00	49.49
6.5	38.82	47.80	30.92	33.90
7.5	23.14	37.20	17.67	22.37
8.5	15.69	25.60	9.64	16.27
9.5	9.02	15.04	4.82	10.85
10.5	5.49	8.40	3.21	5.76
11.5	3.53	4.00	1.61	4.07
12.5	0.78	3.06	1.61	3.39
13.5	0.39	1.02	0.40	1.69
14.5	0.39	0.20	0.40	1.02
15.5	0.00	0.20	0.00	0.34

* Age was determined from horn annuli

To answer questions 2 and 3 one can find from Table 3 that my ideas might have been valid along the coasts of Alaska but not in the Kootenay Region of British Columbia. By examining Table 3 one can quickly see that the horns from nannies are definitely shorter than those from billies. The author has frequently stated that the

magic length for billy horns is 9 3/8 inches with lengths over that being fairly rare. This conclusion is based on goats observed living as a guide and serious mountain goat hunter for 14 years along the coast of Alaska. At least in Southeast British Columbia it would appear that approximately a third have lengths greater

Table 3. Percentage of Horns Over Given Length

Length (ins.)	% Males		% Females	
	1984- 85	1989- 90	1984- 85	1989- 90
5.00	100.00	99.60	99.19	97.63
6.00	98.65	97.60	96.79	95.93
7.00	96.77	94.80	93.98	90.85
8.00	88.14	83.60	72.79	66.44
8.50	74.66	69.00	49.80	44.07
9.00	53.10	47.20	26.91	21.02
9.25	41.78	34.80	16.87	11.86
9.50	25.07	20.80	9.64	5.08
9.75	15.90	12.00	4.82	2.71
10.00	7.82	6.60	2.41	1.36
10.25	3.50	3.00	1.61	0.34
10.50	1.62	1.00	0.80	0.34
10.75	0.81	0.00	0.00	0.34
11.00	0.27	0.00	0.00	0.00
12.00	0.27	0.00	0.00	0.00

than 9 3/8 inches. Note that about 7% have horn lengths exceeding 10.0 inches.

The longest horn noted was 12.0472 inches, with a 5.7 inch base, from a 6 1/2 year old billy, which was harvested in October 1984 from Unit 35B. I have heard that after being officially scored this trophy still had a length of 11 7/8 inches. The records also noted a 13/0 inch nanny from the East Kootenays that was only 4.5 years old. To answer question 4 a person needs to examine Table 4. It should be noted that billy goats on the average only grow 0.6 inches of horn after age 4 1/2. After age 8 1/2 there was no indicated growth. Horn growth after age 4 1/2 appears similar for both sexes. This corresponds with mountain goat horns that I have personally examined.

To answer question 5 breaking a horn has always been the bane of the alpine hunter. I have always been amazed at how

few mountain goats break their horns after being shot and plunging from their rocky homes. In all my years of hunting the species in Alaska, I only saw one break off a significant length of horn but others have had chunks torn away by hitting rocks, with the length remaining close to intact. I scored on a Montana goat and was surprised when finding one horn was missing nearly an inch from a fresh break. It had only rolled a short distance down a relatively gentle slope.

With the mountain goat horn data available to me from the Kootenays, I decided to try to answer question 5 on the frequency of horn breakage. By inspecting the measurements of 1,299 horns, I found that 10.4% had 1/2 inch or more of horn length difference.

MANAGEMENT IMPLICATIONS

From table 5, if we discount the years

Table 4 Average Horn Length By Age and Sex

Age In Years	Males		Females	
	Average Length Inches		Average Length Inches	
	1984- 85	1989- 90	1984- 85	1989- 90
1.5	6.46	6.53	6.27	5.97
2.5	7.80	8.05	7.91	7.52
3.5	8.79	8.46	8.10	8.29
4.5	8.94	8.76	8.58	8.33
5.5	9.07	8.98	8.74	8.41
6.5	9.32	9.04	8.75	8.63
7.5	9.40	9.18	8.93	8.68
8.5	9.55	9.15	8.86	8.84
9.5	9.61	9.34	9.48	8.84
10.5	9.66	8.97	9.26	8.87
11.5	9.54	8.91	7.28 *2	9.53
12.5	8.61*1	9.33	8.75	9.25
13.5	No Data	9.24	No Data	10.04
14.5	9.33	No Data	8.70	8.96
15.5	No Data	9.65	No Data	7.76*2

*1 This age class only represented by four individuals; two of which appeared to have broken horns.

*2 As was the case with males the sample size of older females was very small so an individual with a broken horn can greatly influence the data.

Table 5 Average Age and Length Of Longest Horn By Year and Sex

Year	Males		Females	
	Ave. Age	Ave. Length	Ave. Age	Average Length
1976*	6.6	9.2	3.5	8.3
1977*	6.6	8.9	6.3	8.7
1978	5.5	8.6	4.5	8.5
1979	5.5	8.5	4.3	8.1
1980	5.1	8.8	4.7	8.4
1981	5.1	8.3	4.2	8.3
1982	5.8	8.6	5.3	8.3
1983	5.6	8.8	5.1	8.3
1984	5.8	8.8	5.0	8.3
1985	5.7	8.9	5.2	8.4
1989	5.5	8.7	4.9	8.7
1990	5.8	8.8	4.9	8.3

* Sample size for 1976 and 1977 was very small and probably meaningless.

1976 and 1977, because of the small sample size, we can find that the mountain goat herds of the Kootenays were holding up well to the level of harvest at the time. The average size of horn and average age of harvested animal was nearly static.

ACKNOWLEDGMENTS

There was no outside funding for this project. The project was carried on to satisfy my own curiosity and to be able to pass on what was learned to others that are interested in mountain goats

LITERATURE CITED

None.