THE BIGHORN SHEEP IN COLORADO

by

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The Rocky Mountain bighorn sheep is of both historic and current interest in Colorado. Indian petroglyphs depicting the bighorn attest to early day attention. More recently, on May 1, 1961, the General Assembly enacted legislation establishing this species as the state animal of Colorado; and on July 7 of that year the then Game and Fish Commission officially adopted the bighorn as the Department (now Division) insignia. As a result, the bighorn symbol was placed on Division uniforms, vehicle seals, badges of Wildlife Conservation Officers and other law enforcement personnel, and on appropriate materials used by the Division organization.

Interest in the status and welfare of the Rocky Mountain bighorn remains intense, not only on the part of those responsible for its management, or who pursue it as a trophy big game animal, but also by Colorado citizens as well as visitors to the state. This paper summarizes a part of the past and the present Colorado bighorn sheep management program, and briefly describes plans designed to enhance the future welfare of the species.

DISEASE AND THE INITIAL HUNT

Although the bighorn is a magnificent and symbolically sturdy animal, it is not immune to disease and other factors which control animal populations. According to Moser (1962), the bighorn sheep in the Tarryall Mountains of Colorado comprised probably the largest and best known sheep herd in the United States until the winter of 1952-53 when a die-off caused by lungworm disease severely decimated the herd. Prior to this event, the Tarryall herd was twice depleted in numbers: in 1885, supposedly from losses caused by the psoroptic mite; and in 1923-24, from losses attributed to hemorrhagic septicemia (Spencer 1943).

A report by George W. Jones (in Moser and Pillmore 1954) provides insight into the severity of the bighorn sheep die-off in the Tarryall and Kenosha ranges during 1953: "The sheep started dying in the Tarryall from lungworms (pneumonia) starting January 26, 1953. It hit each individual herd working seventeen miles northwest along Tarryall Creek taking 37 days to reach the last herd on the west end of the sheep range.

"To date, we have found 157 rams (including 21 yearlings), 126 ewes and 62 yearling ewes, making a total of 345 animals. The death included all age classes from yearlings to those 14 years of age.

"The first death noticed on the Kenosha Mountains was on July 23. This included 32 ewes, 16 rams and 18 lambs making a total of 66 sheep found dead in this area."

A summary of statistics on dead bighorn sheep found in three areas during the winter of 1952-53 (Moser and Pillmore 1954) is shown in Table No. 1.

Table 1 - Statistics on dead bighorn sheep found during the winter of 1952-53, prior to the initial 1953 hunting season

	Number of Dead Sheep				
Area	Rams	Ewes	Yearlings	Lambs	Total
Pikes Peak	24	24	9	0	57
Tarryall-Kenosha	173	158	93	18	442
All areas	197	182	102	18	499

The bighorn epizootic received considerable attention by biologists and management staff of the then Colorado Game and Fish Department. State Game Manager, Gilbert N. Hunter, and others firmly believed that the loss could be reduced or eliminated by preventing over-concentration of animals, using hunting seasons as a management manipulation. A proposal was made for an 11-day hunting season on rams with one-half or greater curl during September 3-13, 1953.

The contention that hunting was a necessary management tool to "break up" bighorn sheep concentrations and thus help the animals was not universally accepted. Considerable opposition against the season on the part of newspapers, officials, and other interests resulted. However, the need for a hunt was "sold" and the season was established through Commission action. This was the first of 18 consecutive hunting seasons in Colorado that have followed (1953-1970).

Through this 18-year period the advisability of selective bighorn harvest has become accepted. At the same time hundreds of hunters have been able to obtain a trophy ram while enjoying thousands of hours of exhilarating outdoor recreation and returns of the hunts.

REGULATION AND LEGISLATIVE HISTORY HIGHLIGHTS

Several significant dates and features relative to bighorn sheep have been reflected in Commission regulations and Legislative action, a portion of which are recorded in Table No. 2.

Details of regulations for sheep hunting, Table 3, show a trend toward restrictions as seasons have progressed, 1953 to 1970. The horn-size restriction remained at 1/2-curl for legal rams during all years, 1953-1965, except in 1958 and 1959. From 1965 through 1969, 3/4-curl or greater has been required for legal bighorns in most areas. In 1970 the full-curl requirement was imposed in all except three open areas.

Either-sex hunting of bighorn sheep was permitted in one area during 1954, 1957 and 1958, but has not been permitted since, and has never been permitted in any other area.

HARVEST

A total of 3,439 bighorn sheep hunting licenses were issued during the 18-year period, 1953-1970, resulting in the harvest of 817 animals (Table 4). As shown, high and increasing interest in bighorn sheep hunting is indicated. Hunter success has averaged 23.8 percent, the highest, 34.9 percent, in 1954, the second open season; and the lowest (15.3) was in 1970 when only 98 licenses were allowed and full-curl restrictions were imposed in all except three areas.

BIGHORN SHEEP POPULATIONS

Estimates of the bighorn sheep population in Colorado before the lambing period in 1971 ranged from 1,500 to 1,800. These figures are based on estimates from Division personnel, combined with information from the U. S. Forest Service, hunters, and other sources.

Efforts to obtain population estimates have perhaps been more intensive in recent years than for a period immediately preceding this time. It is impossible for this reason to determine trends in bighorn sheep numbers with full accuracy as of this writing.

Moser (1962) stated that there are at least 52 known major sheep herds in Colorado. In 1949, on the basis of trend counts, it was estimated that 70 percent of the sheep were on the eastern slope (east of the Continental Divide). Here, in 1949, the trend count was 1,694 animals whereas, after the die-off in the Pikes Peak, Tarryall and Kenosha herds, the count was 1,283 in 1954.

There is some belief, speculation and evidence that bighorn sheep are declining in Colorado for various reasons, although sizable and healthy herds are still present. It is estimated that the two largest and healthiest herds (Pikes Peak and Saguache) alone account for nearly a third of the total number of bighorns in Colorado. That statewide

Table 2 — Regulation and legislation history highlights

Year	Highlights
1953	First season, September 3-13 (11 days), 18 areas, 1/2 curl, 169 licenses sold.
1958	First year 3/4-curl regulation, 21 areas, rams only, 1 area either sex. Last year either-sex harvest permitted. First year post-season (Nov.) in Poudre, South Platte, Georgetown-Empire, Empire-James Peak Areas. 212 licenses sold. Last year post-season (Nov.) Georgetown-Empire and Empire-James Peak Areas.
1961	Rocky Mountain bighorn sheep designated as State animal, State of Colorado, May 1.
1963	First year successful applicant was restricted to every other year in drawing.
1965	Last year 1/2-curl in all areas but Sheep Creek-Trickle Mountain, Glenwood Canyon, Sheep Mountain, Cimarron Peak, Cow Creek, San Luis Peak, Battlement Mesa, Vallecito Creek, Blanco River.
1969	Last year 1/2-curl allowed.
1970	First year, full-curl regulation in 13 of 16 areas open. 3/4-curl other three areas; 98 licenses, fewest on record.

Table 3 — Summary of bighorn sheep regulations in Colorado, 1953-70

Year	Days in Regular Season	No. of Areas					No. of Areas	
		Curl			Sex		Regular Season	Post-Season
		1/2	3/4	Full	Rams	E.S.		
1953	11	18	0	0	18	0	18	0
1954	9	21	0	0	21	1	22	0
1955	9	20	0	0	20	0	20	0
1956	9	19	0	0	19	0	19	0
1957	16	17	0	0	17	1	18	0
1958	16	0	20	0	20	1	17	4
1959	16	0	18	0	18	0	16	2
1960	16	21	0	0	21	0	19	2
1961	16	24	0	0	24	0	22	2
1962	17	23	0	0	23	0	23	0
1963	16	23	0	0	23	0	23	0
1964	37	22	0	0	22	0	20	2
1965	23	20	1	0	21	0	19	2
1966	22	1	21	0	22	0	20	2
1967	18	0	18	0	18	0	17	1
1968	23	9	10	0	19	0	18	1
1969	23	1	21	0	22	0	21	1
1970	24	0	3	13	16		16	0

Table 4 — Bighorn sheep hunting applications, licenses and harvest in Colorado, 1953-1970

Year	No. of Applications	Licenses Issued (No. Hunters)	Animals Harvested	Percent Success
1953	Unknown	169	58	34.3
1954	Unknown	226	79	34.9
1955	Unknown	179	45	25.1
1956	Unknown	175	34	19.4
1957	Unknown	218	60	27.5
1958	Unknown	209	51	24.4
1959	234	144	25	17.4
1960	297	177	40	22.6
1961	361	210	46	21.9
1962	485	229	61	26.6
1963	529	226	66	29.2
1964	501	208	59	28.4
1965	596	205	40	19.5
1966	748	285	33	11.6
1967	579	205	36	17.6
1968	462	131	32	24.4
1969	552	145	37	25.5
1970	526	98	15	15.3
Total		3,439	817	23.8

numbers continue to hold at 1,500 plus must be attributed largely to the excellent status of these two herds, with strong evidence suggesting that most other herds are either static or declining. New and concerted efforts are underway to improve census and population trend data permitting the current and changing status of herds to be more accurately determined.

The approximate distribution of bighorn sheep in 1971 is shown in Figure 1. As indicated, 16 areas were hunted in 1970; 15 additional areas have been hunted in the past, and six areas have never been hunted. Areas never hunted include those primarily in National Parks and Monuments, as well as those containing low sheep numbers.

RESTORATION

In September of 1944, a project was established under the Federal Aid in Wildlife Restoration Act in Colorado to initiate trapping and transplanting of bighorn sheep. Cooperation was given by the U. S. Forest Service (Moser 1962). Through the entire Federal Aid trapping and transplanting program, projects W-32-D and W-41-R, 202 sheep were captured and moved into 12 new areas (Table 5). Data do not include animals trapped and moved because of nuisance damage or other reasons. George W. Jones, Clifford A. Moser and Claude E. White played a major part in restoration efforts throughout the trapping and transplanting operations.

PROPOSED MASTER PLAN FOR BIGHORN SHEEP MANAGEMENT

The preceding sections in this paper provide a summary of hunting, population status and restoration efforts undertaken to date in behalf of bighorn sheep in Colorado. It is indicated that much additional effort is needed.

Upon recommendation by the Division, the Legislature earmarked $50,000 during the 1970-71 session for an accelerated study of the bighorn. These and additional monies will be used to implement certain phases of a Master Plan designed to improve the status and management of the species. Basic provisions in the Master Plan are:

1. Identify occupied range and determine the status of each herd.
2. Identify areas where additional sheep are needed.
3. Trap and transplant sheep to all suitable areas.
4. Identify unproductive areas, determine limiting factors, and improve herd status.
5. Obtain data for these objectives through research and field investigations.
6. Utilize the resource through appropriate hunting regulations.

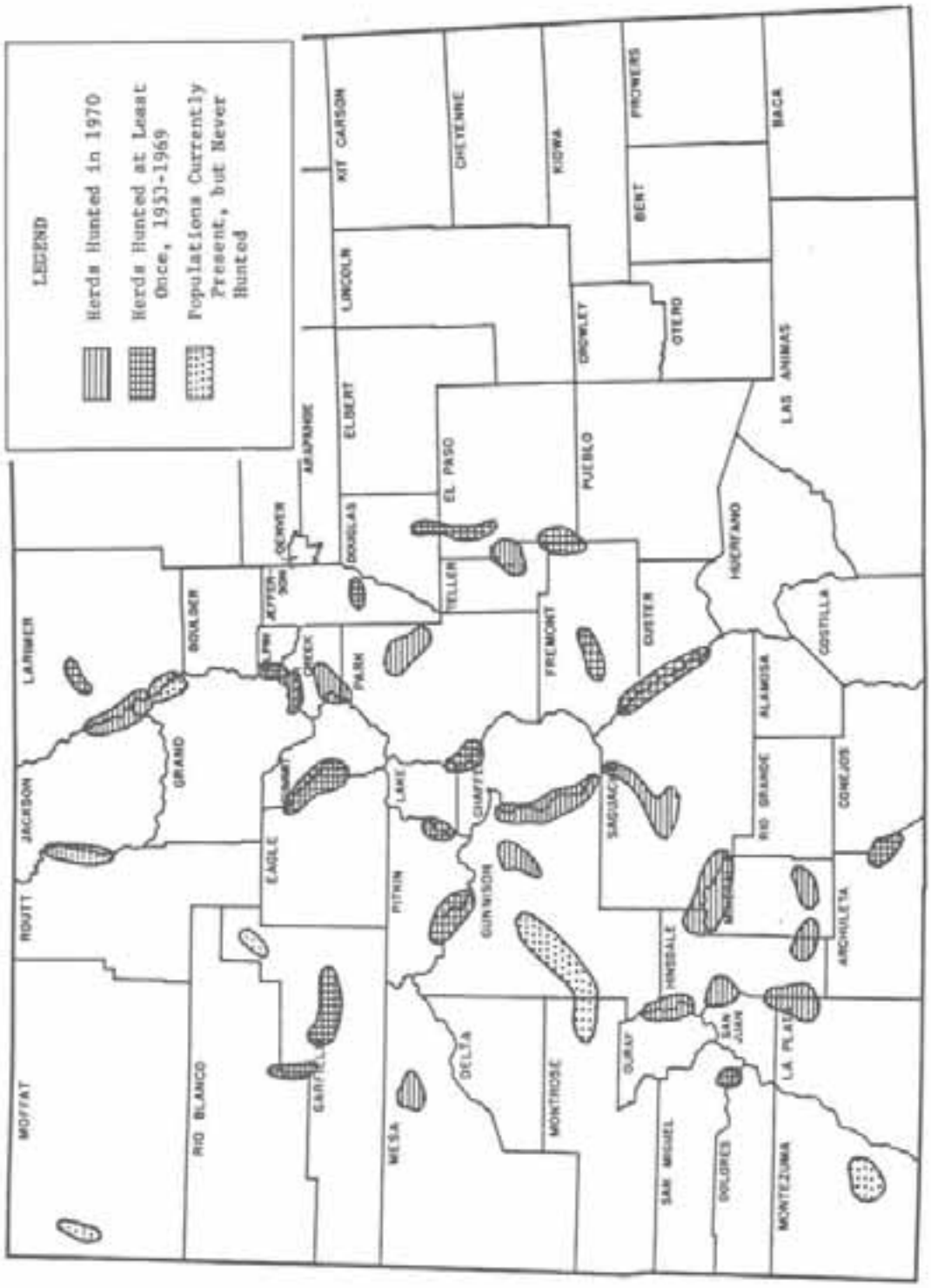

Figure 1-- Approximate Distribution of Bighorn Sheep in Colorado, 1971.

Table 5 -- Bighorn sheep trapping and transplanting in Colorado, 1944-1952

Year	Transplanted to	Number Released				
		Rams	Ewes	Lambs	Yearlings	Total
1944-46	Geneva Creek	3	3	5	0	11
	Sangre de Cristo Range	1	7	6	0	14
	Mesa Verde N.P.	3	7	4	0	14
1946-47	Georgetown	3	20	7	3	33
	Cache la Poudre	3	6	4	3	16
	Rampart Range	3	11	2	0	16
1947-48	Geneva Creek	0	5	0	0	5
	Glenwood Canyon	4	9	4	0	17
	Gore Range	1	6	0	0	7
	Rifle Hogback	4	8	5	0	17
1948-49	Georgetown	2	8	2	2	14
1949-50	Brush Creek	2	3	3	0	8
1950-51	Saguache Creek	3	8	4	0	15
1951-52	Ladore Canyon	3	12	0	0	15
1952-53	Tarryall die-off -- end of trapping and transplanting					
Totals		35	113	46	8	202

FUTURE CONSIDERATIONS

The Master Plan for bighorn sheep indicates the general procedures or approaches considered necessary in effecting improved management. Specific consideration in this plan and in on-going management activities relate to two basis purposes, production and utilization. Subsequent to research and field investigations, the Division hopes to improve sheep production through: (1) trapping and transplanting, (2) disease control or abatement, and (3) perhaps most importantly, range improvement.

For the utilization phase of management it is anticipated that: (1) harvest will be selective by area based on improved population information; (2) evaluation of the biological reasons for trophy ram harvest, curl limitation, and the potential need for bighorn harvest will be made; (3) studies on time of year for hunting and length of season will be conducted; (4) the bighorn sheep is a "privilege" species from the hunting standpoint and that the existing regulation limiting harvest to an animal in a lifetime is consistent with this philosophy; and (5) clearer identification of the role the bighorn plays in providing consumptive and non-consumptive recreational enjoyment is both necessary and desirable.

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