

ROCKY MOUNTAIN BIGHORN SHEEP IN OREGON, HISTORY AND PRESENT STATUS

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Abstract: Rocky Mountain bighorn sheep (*Ovis canadensis canadensis*) were indigenous to northeast Oregon and extirpated from the state by 1945. Restoration efforts on historic range started in 1971 and has successfully restored Rocky Mountain bighorn populations to 10 northeast region herds numbering an estimated 500 animals. Limited ram hunting started in 1978 and a total of 114 rams have been harvested through 1995. Bighorns from 6 different sources of stock have been utilized for 22 translocations from 1971-95. The status of established herds, review of transplants and future management direction is summarized.

INTRODUCTION

Rocky Mountain bighorn sheep were native to Northeast Oregon and were numerous in the Wallowa Mountains, Snake River and Grande Ronde River Canyons (Bailey 1936). Archeological studies indicate bighorns were abundant and a major food item for native Americans living in Hells Canyon (USDA Forest Service Report 1991). Bailey (1936) reported a population estimate of 50 sheep on the Wallowa National Forest in 1933 where a mountain sheep refuge had been established. Bighorns were gone from Oregon by the mid-1940s (Coggins, 1980). Diseases contracted from domestic sheep were believed to be responsible for the elimination of native bighorns.

Rocky Mountain bighorn sheep restoration began in 1971 when 40 animals from Jasper National Park, Canada were released in Hells Canyon and the Lostine Drainage of the Wallowa Mountains. The 1996 population was estimated at 500 animals. Currently Rocky Mountain bighorns inhabit the northeast corner of the state from Fox Creek on Brownlee Reservoir, north along the Snake River to the Oregon-Washington state line and west to the Wenaha/Grande Ronde River drainages. Pasteurella pneumonia die-offs, excessive dispersal of transplants, and domestic sheep/bighorn conflicts have been major obstacles to restoration efforts.

TRANSPLANT HISTORY

Restoration of Rocky Mountain bighorns started in April 1971 and 328 sheep have been released at 15 different sites in 22 translocations through March, 1995 (Table 1). In addition, from January 1980

through January 1986, 66 bighorns from the Lostine herd were translocated to one site in Washington and 3 in Idaho (Table 2). Success of the Oregon releases varied with 10 transplants considered a success and 7 failures (Table 3). For our purposes we defined a successful transplant as a self sustaining bighorn population established within 10 air miles of the release site, and unsuccessful if transplants dispersed, disappeared and did not occupy the release site. Migratory was defined as the majority of the population moving from low elevation range to a high elevation mountain summer range. Non-migratory was defined as the majority of the population remaining at low elevations year long but they may move short distances along canyon walls.

Unsuccessful Transplants

Upper Hells Canyon No. 1

The upper Hells Canyon transplant of 20 bighorns disappeared within 2 years of being released. The release was made near a domestic sheep allotment and contact between the two probably resulted in the loss of the bighorn herd.

Hass/Wenaha/Cottonwood/Jim Creek

Hass Ridge No. 1, Wenaha No. 1, Cottonwood Creek and Jim Creek transplants dispersed from their original release sites. Both Hass and Wenaha had a few animals return to the original Lostine capture site from distances of up to 64 kilometers. Most of the rest of the animals continued to move around until they disappeared. Most of the Cottonwood Creek sheep moved to other occupied bighorn ranges and many recently died in a Pasteurella outbreak. Most Jim Creek sheep also moved away from the release site to

Table 1. Northeast Oregon Rocky Mountain bighorn sheep transplant history, 1971-1995.

	Date	Source	Origin of Stock	Release Site	County	No. of Animals
1	1939	Montana	Not Known	Hart Mountain	Lake	23
2	4/71	Alberta, Canada	Jasper Park	Upr Hells Canyon	Wallowa	20
3	11/71	Alberta, Canada	Jasper Park	Lostine River	Wallowa	20
4	1/76	Lostine River	Jasper Park	Bear Cr.	Wallowa	17
5	1/77	Lostine River	Jasper Park	Bear Cr.	Wallowa	8
6	1/78	Lostine River	Jasper Park	Upr Hells Canyon	Wallowa	5
				Battle Creek		
7	1/79	Lostine River	Jasper Park	Upr Hells Canyon	Wallowa	29
				Battle Creek		
8	1/79	Salmon R., ID	Panther Cr. Salmon River	Lwr. Imnaha	Wallowa	15
9	1/81	Lostine River	Jasper Park	Hass Ridge	Wallowa	10
10	1/83	Lostine River	Jasper Park	Wenaha Canyon	Wallowa	15
11	1/84	Sullivan L., WA	Waterton Park/ Thompson Falls	Bear Creek	Wallowa	11
12	1/84	Salmon R., ID	Panther Creek	Hass Ridge	Wallowa	11
13	12/84	Salmon R., ID	Cove Creek/ Salmon River	Wenaha WA	Wallowa	28
14	12/85	Salmon R., ID	Ebenezer/Salmon F	Minam River	Wallowa	12
15	1/90	Tarryall CO	Tarryall, CO	Sheep Mtn.	Baker	21
16	2/90	Cottonwood Cr., CO	Cottonwood Cr.	Sheep Mtn.	Baker	9
17	12/93	Wildhorse Is., MT	Sun River MT	Lower Hells Canyon	Wallowa	9
				Cherry Creek		
18	12/93	Wildhorse Is., MT	Sun River MT	Fox Creek	Baker	12
19	2/94	Wildhorse Is., MT	Sun River MT	Downey Creek	Wallowa	14
20	2/94	Wildhorse Is., MT	Sun River Mtn.	Fox Creek	Baker	12
21	2/95	Alberta, Canada	Cadomin	Joseph Cr. Drainage	Wallowa	16
				Cottonwood Cr.		
22	2/95	Alberta, Canada	Cadomin	L. Hells Cnym, Jim Cr.	Wallowa	22
23	2/95	Alberta, Canada	Cadomin	Sheep Mtn.	Baker	11
			(Waterton/Salmon f	Sheep Mtn.	Baker	2
Total						352

Citation: ODFW Wallowa District Office Files, Enterprise, Oregon.

Table 2. Northeast Oregon Rocky Mountain bighorn sheep transplanted outside of Oregon.

	Date	Source	Origin of Stock	Release Site	No. of Animals
1	1/80	Lostine River (a)	Jasper Park	Chief Joseph WA, WA	10
2	1/84	Lostine River (b)	Jasper Park	Salmon River, ID	16
3	12/84	Lostine River (b)	Jasper Park/Watert	Beaverhead Mtns, ID	22
4	1/86	Lostine River (b)	Jasper Park/Watert	Pahsimeroi Mtns, ID	16
Total					66

join other bighorn groups nearby. A group of 6 animals from this release moved southeast 32 kilometers to unoccupied bighorn habitat where they reside at this time. Three ewes in this group are radio collared and will be monitored to determine subsequent movements.

Bear Creek No. 1 and 2

Bear Creek No. 1 was a transplant from Lostine stock and the animals were released on a winter range 11 kilometers from their original range. Most of these animals returned to the Lostine, although a group of 8

Table 3. Success of transplants, migratory vs. non-migratory stock.

Successful	Migratory		Non-Migratory			
	n	Unsuccessful	n	Successful	n	Unsuccessful
Lostine River	20	Upper Hells Canyon No. 1	20	Lower Imnaha	15	None
Upper Hells Canyon No. 2	34	Hass Ridge No. 1	10	Hass Ridge	11	
Sheep Mtn.	42	Wenaha No. 1	15	Wenaha No. 2	28	
		Bear Creek No. 1	25	Bear/Minam	12	
		Bear Creek No. 2	11	Fox Creek	24	
		Cottonwood Creek	16	Downey Creek	14	
		Jim Creek	22	Cherry Creek	9	

Number of animals transplanted

sheep did remain on the Bear Creek range through the winter prior to returning. Bear Creek No. 2 was a group of 11 bighorns from Hall Mountain, Washington released at the Bear Creek site. These animals moved through deep snow 11 kilometers and joined the Lostine herd. This group of bighorns had no knowledge of the location of other sheep in the area having been trapped about 350 kilometers north of the release area. They became part of the Lostine herd including a summer migration to alpine summer range. The movements reported above demonstrate the ability of bighorns to find other bighorns.

Successful Transplants

Ten transplants were considered successful with 7 from stock not considered migratory and 3 from migratory sheep stock (Table 3). The habitat type and behavior of the bighorn source stock appears to be important in determining transplant success. Bighorns from migratory herds moving seasonally some distance to and from high elevation mountain habitat seem to disperse when released in low elevation canyon wall type habitat.

Lostine

The Lostine herd originated from migratory stock and was transplanted to winter range adjacent to high elevation mountain habitat. They moved from the winter range to summer ranges 12 to 30 Kilometers in distance. This migration pattern started in 1972, the summer following the transplant, and has continued to date.

Sheep Mountain

Sheep Mountain was established from migratory sheep in a 1990 transplant. It was supplemented with migratory bighorns in 1995. This herd occupies low

elevation canyon wall habitat adjacent to Oxbow reservoir.

Upper Hells Canyon

This herd was established with migratory Lostine stock and experienced a decline probably from a *Pasteurella* die-off. It appears to be slowly recovering and a few rams from this herd move to alpine habitat in the Wallowa Mountains. Ewe-lamb groups utilize low elevation canyon wall habitat.

Other Herds

Of the 7 transplants considered successful from non-migratory stock all but one utilizes low elevation canyon wall habitat. The Bear/Minam herd moved from the original release site to higher elevation canyon wall habitat but it is essentially a resident herd even though an abundance of alpine habitat is available nearby.

There are obviously overlaps in success of migratory versus non-migratory stock and other reasons for transplant failures. However, we believe the habitat and behavior of bighorn stock used for transplants is also an important factor in their success. Utilizing nonmigratory bighorns from canyon wall habitat at release sites with similar habitat characteristics appears to have resulted in more successful herds being established. We believe habitat characteristics and behavior of transplant source stock should be matched as closely as possible to the areas where releases are planned.

HUNTING OPPORTUNITY

Providing bighorn hunting opportunity was one of the primary purposes of re-establishing bighorn sheep. The first season for Rocky Mountain bighorns was established in 1978 when 8 tags were authorized for

3/4 curl or larger rams. The Lostine herd was the only Rocky Mountain bighorn population in Oregon at the time and 7 of the 8 hunters were successful (Coggins 1980). Since then, 129 ram tags (including auction and raffle tags) have been issued and 114 rams from 6 herd ranges (Table 4) have been taken by tagholders. Sixteen of the harvested rams have equalled or exceeded the Boone and Crockett Rocky Mountain bighorn record book minimum score of 180 points. Six herds were hunted in 1995 with 12 tagholders all taking rams.

In 1991, the ram bag limit was changed from one 3/4 curl to one ram. Oregon law currently allows an individual to receive only one bighorn sheep tag in a lifetime. In 1985, the Oregon Legislature passed a law that allowed the Fish and Wildlife Commission to auction one bighorn tag per year. The auctioning of one tag per year was employed. In 1991, the legisla-

a subsequent disagreement over the compatibility of domestic sheep allotments and bighorns, all transplants on the Wallowa-Whitman Forest were postponed. This action resulted in only one transplant (Sheep Mountain) on BLM land being completed between 1986 and November 1993. Since that time, the Wallowa-Whitman National Forest, Oregon Department of Fish and Wildlife, BLM, and with the help of many private individuals, 8 transplants to 6 different sites in Hells Canyon have been made. The last domestic sheep allotment (permit) in Hells Canyon (Temperance Creek) on the Oregon side expires in October, 1996 and an environmental assessment decision was made not to renew it because of incompatibility with bighorns. This action was very much opposed by livestock groups and some of the public in the area. A United States District Court ruling (April 1996) reaffirmed the U. S. Forest Service decision to remove domestic sheep from the

Oregon portion of the Hells Canyon National Recreation Area. This action makes Hells Canyon in Oregon and much of the Idaho side of the Snake River Canyon available for a major effort to restore bighorns to historic range. In addition, the Foundation for North American Wild Sheep has backed the restoration effort both politically and financially with a long term commitment to restoring Hells Canyon bighorn populations through the Hells Canyon project.

Table 4. Harvest of Rocky Mountain bighorn sheep in Oregon, 1978-1995.

Unit	Herd Range	Tags Issued	Ram Harvest	Percent Success
Minam	Lostine	62	53	85
Snake River	Lower Imnaha	42	39	93
Wenaha	Wenaha	10	10	100
Sled Sprs./Ches.	Joseph Creek	9	7	78
Chesnimnus	Lower Hells Canyon	3	3	100
Minam	Bear Creek	3	2	67
Total		129	114	88

ture approved legislation allowing the raffle of one bighorn tag per year in addition to the auction tag. A total of 10 tags have been purchased (auction) and 4 tags issued by raffle. Twelve of the 14 tagholders chose to hunt Rocky Mountain bighorns and 10 of the hunters harvested rams.

DOMESTIC SHEEP AND POLITICAL CONSIDERATIONS

Domestic sheep allotments on the Wallowa-Whitman National Forest have prevented transplants of bighorns to a large area of high quality habitat. Diseases transmitted from domestic sheep to bighorns (Martin, K. D., Schommer, T. and Coggins, V. L., in press) have made these sites unavailable to bighorns. Following the Lostine die-off in 1986-87 and

Table 5. Estimated numbers of Rocky Mountain bighorn sheep in Oregon by herd range, April 1996.

Unit	Herd Range	Population Size	Transplant Year
Lookout Mtn.	Sheep Mtn.	40	1990, 1995
Lookout Mtn.	Fox Creek	30	1993, 1994
Chesnimnus	L. Hells Canyon	20	1993-1995
Ches./Sled Sprs.	U. Joseph Canyon	15	none
Sled Springs	Loet Prairie	30	none
Minam	Lostine	65	1971
Minam	Bear/Minam	35	1985
Snake River	L. Imnaha Canyon	130	1979
Snake River	U. Hells Canyon	25	1978-1980
Wenaha	Wenaha	90	1984
Total		500	

Pasteurella outbreak 1995-96 decimated the herd.

CURRENT POPULATION STATUS

Ten established Rocky Mountain bighorn herds are identified in Northeast Oregon. The April 1996 population estimate for these bighorn herds is 500 animals (Table 5). The largest contiguous herd (130) is located in the Lower Imnaha drainage. The Lower Hells Canyon and Upper Joseph Canyon herds contain the smallest number of animals 20 and 15, respectively. Both of these herds suffered losses due to a pneumonia outbreak in the winter of 1995-96. Prior to the pneumonia outbreak all herds were showing slow annual increases.

Ram to ewe and lamb to ewe ratios vary considerably between sheep herds. This variation is believed to be a result of diseases, parasites, predation, and less than desirable survey information from some herds. Currently, combined survey data indicates a 54 ram and 40 lamb per 100 ewe ratio for Oregon Rocky Mountain bighorns (Table 6).

Hells Canyon transplant was believed to have died from pneumonia in 1973. Other small groups of bighorns moved to domestic sheep ranges in the early 1980s and soon disappeared. A few dead bighorns were found in these areas and disease was suspected. A major die-off of Lostine bighorns occurred the winter of 1986-87 and the population dropped from 100 to 34. In 1996, a pneumonia die-off spread into Oregon from an outbreak in Southeast Washington, reducing the Lower Hells Canyon herd from an estimated 80 to 20. The disease was also found in the Upper Joseph Creek herd but no estimate of losses are available at this time.

Contagious ecthyma has been found in the Lower Imnaha herd but no mortalities were attributed to this disease. Protostrongylus are present in all herds but most are treated with medicated blocks keeping levels low. Psoroptes Scabies (*Psoroptes* sp.) are present in at least 3 herds and some losses were suspected from this parasite in the Wenaha herd in past years. These sheep are presently treated with medicated blocks at salt licks and this technique seems to have reduced the incidence of scabies in the herd.

Predation

Mountain lion (*Felis concolor*) kills have been documented in some radio collared transplants. Lion numbers are believed to be increasing following recent passage of an Oregon law prohibiting the use of dogs to take lions. Several small bighorn herds have failed to exhibit population increases, possibly because of predation. Several studies (Harrison and Hebert 1988, Cunningham et al. 1993) have indicated lions can be

significant predators of bighorn sheep and especially transplants. The Arizona study reported two transplants that had experienced severe predation. This may be an important factor in establishing new herds in Northeast Oregon given the apparent rapid growth of cougar populations.

FUTURE MANAGEMENT DIRECTION

Restoration of Rocky Mountain bighorn sheep to native ranges in Northeast Oregon remains a priority for the Oregon Department of Fish and Wildlife. Potential source stock for future transplants will be evaluated to obtain sheep that more closely match the desired release site. Our experience indicates that distance between capture and release site, habitat type and behavior of the bighorn source stock, and habitat type of the future release sites are 4 important factors to be considered prior to obtaining transplant stock. Sheep from a predominantly migratory population transplanted to a canyon wall type habitat tend to disperse, generally resulting in a transplant failure. Likewise, bighorns from a nonmigratory population released at a site where seasonal migration is desired, will generally not adopt a migrational pattern unless movement patterns are already established by resident sheep.

Oregon, Washington, Idaho, Wallowa-Whitman National Forest, FNAWS and many private individuals are committed to a major restoration effort in Hells Canyon. The elimination of domestic sheep allotments in the Hells Canyon National Recreation Area has opened a large area in Oregon and Idaho for bighorns. FNAWS efforts through the Hells Canyon Project has the potential to provide the support, both politically and financially, to see this effort succeed.

Hunting for bighorn rams will continue under the current any ram bag limit. The number of ram tags available will vary depending on future population trends and individual herd status. Offering annual auction and raffle sheep tags has been a positive influence to bighorn management in Oregon, providing recreational opportunity and program funding.

Disease research and improving field treatment techniques need to continue especially with the *Pasteurella pneumoniae*'s and scabies. *Pasteurella* die-offs continue to periodically devastate Oregon bighorn populations.

Larger numbers of sheep may be needed for individual transplants given the increase in carnivores in Hells Canyon. Liberalizing hunting seasons and other methods to reduce the impact of predation on transplants needs to be developed.

Table 6. Oregon Rocky Mountain bighorn sheep population and herd composition.

Year	Ewes	Lambs	Rams	Total Classified	Lambs/ 100 Ewes	Rams/ 100 Ewes	Highest Count	Pop. Estimate
1972 - 73 /1	14	3	3	20	21	21	19	22
1973 - 74 /1	13	3	3	19	23	23	19	25
1974 - 75 /1	17	8	5	30	47	29	30	40
1975 - 76 /1	25	12	10	47	48	40	47	55
1976 - 77 /1	26	19	8	53	73	31	53	60
1977 - 78 /1	24	19	17	70	79	71	63	70
1978 - 79	no data							
1979 - 80 /1	41	28	28	97	68	68	104	125
1980 - 81 /2	45	26	39	110	58	87	134	155
1981 - 82 /2	77	21	44	142	27	57	142	175
1982 - 83 /2	55	34	53	142	62	96	153	185
1983 - 84 /2	67	39	44	150	58	66	172	210
1984 - 85 /2	83	41	56	180	49	67	182	210
1985 - 86 /3	108	53	34	195	49	31	216	270
1986 - 87 /3	104	43	50	217	41	48	217	250
1987 - 88 /3	100	34	47	182	34	47	169	225
1988 - 89 /3	114	58	49	221	51	43	229	285
1989 - 90 /3	114	54	59	227	47	52	278	350
1990 - 91 /4	121	66	70	257	55	58	310	425
1991 - 92 /4	137	58	79	274	42	58	280	450
1992 - 93 /4	147	80	89	316	54	61	330	475
1993 - 94 /5	177	75	102	354	42	58	393	800
1994 - 95 /5	196	90	90	376	46	46	413	625
1995 - 96 /7	248	99	133	480	40	54	491	500

/1-Lostine herd only.

/2-Lostine, Upper Hells Canyon, and Lower Innaha herds.

/3-Cherry Cr., Lostine, Bear-Minah, Upper Joseph Cr., Lower Innaha, Upper Hells Canyon, and Wenaha herds.

Highest counts from June-May time period.

/4-Sheep Mountain added.

/5-Lost Prairie and Fox Creek added for first time.

/6-Two transplants added.

/7-Pasteurella die-off in Lower Hells Canyon, Black Butte, and Joseph Creek herds, December 1995-March 1996.

Population estimate—post die-off, other data pre die-off.

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