

PRESENT STATUS OF ROCKY MOUNTAIN BIGHORN SHEEP IN NORTHEAST OREGON

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ABSTRACT: In 1971, after an absence of nearly 25 years, 2 groups of 20 Rocky Mountain bighorn sheep (Ovis canadensis canadensis) were re-introduced into northeast Oregon from Jasper Park, Alberta. The Snake River transplant failed and the sheep had disappeared by 1973. The Lostine River transplant succeeded and numbered over 100 animals in June 1979. These bighorns established a migratory tradition within the Wallowa Mountains, wintering on the lower Lostine River drainage and summering in alpine habitat on Hurricane Divide. The winter range is limited in size and currently supports about 1 sheep per 18 acres. Fourteen mature rams were harvested from this herd in 1978 and 1979 and 34 sheep have been trapped and relocated to upper Hells Canyon of the Snake River. A transplant to the Bear Creek drainage, 7 air-miles west of the Lostine River, failed because the animals returned to their original range. Fifteen bighorns from the Salmon River, Idaho, were released in January 1979 on the lower Imnaha River drainage. Future transplant plans are discussed. The Oregon population of Rocky Mountain bighorns is estimated at 125 animals.

The Rocky Mountain Bighorn sheep was native to much of northeastern Oregon. As late as 1933, Bailey (1936) reported that the U.S. Forest Service estimated 50 sheep on the Wallowa National Forest. By the mid-1940's, bighorns had disappeared from the Wallowa Mountains. Historic reports indicate the species was found in most of the canyon country of the Blue Mountains and was particularly abundant in the Wallowa Mountains and along

the Snake River divide. The reasons for the decline and eventual extinction of the native Oregon sheep have been the subject of much speculation. While no one will ever know for certain, the most probable explanations were uncontrolled grazing by domestic livestock (especially overgrazing of winter ranges), diseases brought in by domestic sheep, and indiscriminate shooting. All these factors probably contributed at least partially to the disappearance of the native sheep. After an absence of nearly 25 years, Rocky Mountain bighorn sheep were reintroduced at 2 locations in northeastern Oregon in 1971. This paper covers results of the 2 original transplants and subsequent trapping and transplanting activities.

STUDY AREAS

Hells Canyon

Hells Canyon of the Snake River is the deepest gorge in North America. Elevations vary from about 1,600 feet at river level below Hells Canyon dam to over 6,800 feet on Summit Ridge. The canyon walls are very steep and consist of alternating cliffs, terraces, and talus slopes. There are large open benches about mid-slope with precipitous slopes above and below. The top of Summit Ridge has some large flats with occasional dense stands of conifers. The north end from Lookout Mountain to Saddle Creek was burned in the 1973 Freezeout fire. Shrubs and grasses are the natural communities that occur at the lowest altitudes. Above 4,000 feet, scattered stands of conifers occur.

Warm, dry lower slopes most often have bluebunch wheatgrass (*Trisetum spicatum*)- sandberg bluegrass (*Poa sandbergii*) on them while the north aspects have bluebunch wheatgrass-Idaho fescue (*Festuca idahoensis*). Severely disturbed areas generally support cheatgrass brone (*Bromus tectorum*).

Periodic fires extend the grass and shrub types to the highest elevations, especially on the steepest slopes.

Lower Imnaha

Vegetation types in the lower Imnaha River area are similar to those at lower elevations in upper Hells Canyon. Ridgetops have numerous grass-covered basins with scattered conifers on north slopes. The terrain below these basins is very precipitous, with alternating cliffs, terraces, and talus slopes. Elevations vary from about 950 feet at the mouth of the Imnaha River to over 5,000 feet on Summit Ridge. The climate is mild, with little snow in the winter. Summers are characteristically dry and hot. Cattle graze the less precipitous terrain during the winter and spring, and cheatgrass brome is common on the "flats". The rugged canyon walls receive little livestock grazing and much of the area is covered with bunchgrass communities in good condition.

Lostine River

The Lostine River drainage is characterized by glaciated valleys, rugged precipitous terrain, and sharp ridgetops. The major summering area for this herd of sheep is on Hurricane Divide which has many alpine basins above 7,500 feet and peaks up to 9,673 feet in elevation. The winter range is a southwest-facing slope with rugged limestone outcroppings below a steep grassland. Part of the area was burned in August 1966, and north slopes presently are shrub or grass-covered with little evidence of conifer regeneration. Elevations range from 4,400 to nearly 7,500 feet on lower Sheep Ridge. Periodic warm fronts and strong winds generally keep the south exposures snow-free.

METHODS AND MATERIALS

Efforts to obtain and re-introduce Rocky Mountain bighorn sheep to Wallowa County were successful in 1971 when 40 animals were obtained from Jasper National Park, Alberta. Eight rams and 12 ewes of mixed ages were released in early April near Hells Canyon dam on the Snake River. In mid-November, 15 ewes and 5 rams were released on the lower Lostine River drainage of the Wallowa Mountains.

Surveys were flown in a Piper supercup (P.A. 150) annually during the winter and after lambing in June or July. The Lostine River herd offered numerous additional opportunities for observation because of its accessibility and its being used as a source of transplant stock. Re-introductions made since 1976 have been monitored at least bi-monthly as time and weather permitted. Collars equipped with radio transmitters have been placed on 1-4 individuals in each release. Sightings from the public and agency personnel have been solicited.

A trapping and transplanting program was initiated in December 1976, using Lostine River sheep. Ten ewes and 7 rams of mixed ages were transplanted to the Bear Creek drainage, 7 air miles west of the Lostine range in December 1976 and January 1977. Four 8-month old rams and 4 ewes (two 8 months of age and 2 long yearlings) were released in the same location in December 1977. Thirty-four bighorns were trapped from the Lostine herd between December 1977 and February 1980 and released in upper Hells Canyon of the Snake River, a short distance below Hells Canyon dam. Nine ewes and 6 rams from the Panther Creek drainage, Salmon River, Idaho, were released in the lower Innaha River canyon in early January 1979.

RESULTS AND DISCUSSION

Hells Canyon Transplant

The 20 bighorns released near Hells Canyon dam on the Middle Snake River arrived in good condition with the exception of 1 ewe (she was unsteady from the effects of the capture drug). The animals came off range (Jasper Park) where winter was still very much in control and were released on range that was very green and quite advanced (serviceberry Amelanchier alnifolia in bloom). This group of sheep was very tame and had little fear of humans. Soon after the release, at least some sheep began to disperse. Stray sheep were reported as far north as Salt Creek, 23 airmiles from the release site. In September 1971, the scattered remains of a carcass were found about 2 airmiles west of the release site. About the same time, a dead ewe was found, shot, about 16 airmiles northwest of the release site.

Lamb production was observed in 1971 and 1972. In June 1971, 10 bighorns, including 3 new lambs, were seen on Summit Ridge near Saulsbury Saddle (the highest ground above the release site on the Oregon side) about 3 miles west of the release site. In August 1972, 13 sheep, including 1 medium-sized ram and 3 lambs, were seen a short distance north of Saulsbury Saddle.

The last observation of bighorns from this release was made by Department of Fish and Wildlife personnel in mid-June 1973 when an adult ewe and 2 yearlings were observed on the "bench lands" above Hells Canyon dam. Scattered reports of small numbers of sheep were received for several years. Aerial elk surveys were conducted annually in the upper Hells Canyon and several fixed-wing and 1 helicopter flights were made specifically to look for bighorns. No sheep were located and the transplant was considered a failure by 1974.

The most probable reasons for this failure were extreme habitat differences between the release and the capture sites, extensive dispersal of original stock, and lack of "wildness" of the animals. The possibility exists that predation could have been a factor, as cougars (Felis concolor) are abundant in this area. Habitat differences between the sheep's original range and the release area were great. While winter food supplies in the Snake River Canyon were excellent, the ridgetop area used for summering were about 50% timbered and openings were heavily grazed by domestic sheep and cattle. Lack of familiar alpine range for summering could have contributed to the transplant's failure and caused some of the observed wandering. Dispersal soon after the release was probably a significant factor in reducing the original number of bighorns. This was possibly due to making the transplant in the spring at a time when migratory sheep would be moving to summer range and lambing areas. We speculated the animals were not in the release area long enough to develop fidelity to it and at least some animals failed to return to the transplant area to winter and thus were lost from the nucleus herd. These bighorns were very tame and were vulnerable to indiscriminate shooting. While only 1 known mortality from this cause was found, sheep were frequently reported by the public at Hells Canyon dam and by hunters and stockmen on the Summit Ridge summer range.

Lostine River Transplant

In mid-November 1971, 15 ewes and 5 rams were released in Silver Creek burn in the Lostine River drainage. The sheep were transported from Jasper National Park and arrived at the release site in excellent condition. Heavy snows fell in early December and may have restricted animal movements to some degree. One adult ewe did move 17 air miles northwest of the release area and was frequently seen along Highway 82, west of Wallowa. This animal was accid-

entally killed in mid-July in a re-capture attempt.

In March, 1972, 19 sheep were seen on the steep grass slopes above the release-site. In April, most of the sheep were observed at lower elevations along the Lostine River, apparently seeking new green forage. In late May, the first new lamb was located in limestone cliffs above the release site. In early June, numerous sightings of from 1 to 5 sheep were reported from the prairie north of Enterprise. One herd of 5 animals was seen on several occasions, 21 airmiles north of the release area (the observers reported the ear tag colors, leaving no doubt of the origin of the sheep). On July 4, Department personnel located 15 adult bighorns with 3 lambs above timberline on the Hurricane Divide. During a late August aerial mountain goat (Oreamnos americanus) survey, 20 sheep were observed above the 9,000 foot level, 8 airmiles southeast of the wintering area. Since 17 adult sheep were in the herd, it was apparent that most of the "wanderers" had returned. We speculated the bighorns were from a herd with migratory traditions and were seeking familiar country. Not finding what they were looking for, they returned to the only area familiar to them (the release site) and moved up Sheep Ridge to alpine country.

In late December, 1973, 19 bighorns were located in lower Hurricane creek Canyon, 8 airmiles east of the release site. By January 22, 1974, they had moved back to the release site. Since that time, this sheep herd has been very predictable. The bighorns have wintered in Silver Creek burn and summered in the high alpine basins of the Hurricane Divide, 8 to 10 airmiles southeast.

The winter range for this sheep herd is small and appears to be in the factor that will ultimately limit the population's growth. The primary

winter range encompasses about 1,300 acres, of which approximately 600 acres is south slope grassland and 700 acres is burned over north slope forest land resulting from a fire in 1966. The burned northslope is used by bighorns in late fall and spring. The most critical range is southwest facing and winds normally keep the upper third of the ridge blow free of snow. Periodic warm fronts melt the snow-off lower elevation south slopes.

The Lostine sheep generally began moving off the winter range in early May. Adult ewes moved first to lambing areas on Sheep Ridge (just above winter range) or to high peaks on the Hurricane Divide (if snow depths or a heavy crust permit it). Adult rams generally remained on the winter range until early or mid-June before moving to summer range areas.

These bighorns summered primarily on the Hurricane Divide from Iraverse Ridge south to Echo Lake. They utilized the alpine basins from 8,000 to 9,500 feet in elevation. The past several years, ram groups of up to 9 animals have been observed on the Hurwal Divide, east of the main summer range area. Ram groups have been reported on peaks in the Wallowa Mountains as far as 20 airmiles from the Lostine River winter range.

Lamb production and survival has been good since the release with the exception of 1972 (3 lambs observed). A minimum of 115 lambs have been produced in the 8 lambing seasons since the re-introduction. Table 1 below presents composition data for the Lostine herd with the following assumptions:

- 1) Numbers of lambs were from actual count.
- 2) Sheep 15 years and older were considered dead.
- 3) Known mortalities, rams harvested, and transplants were deducted from totals.
- 4) Lamb sex ratios favored males and when an uneven number of

lambs were produced, the extra was assigned to the male segment of the herd.

Table 1. Composition of Lostine River Bighorn Sheep Herd, 1971-1980.

<u>Year</u>	<u>Ewes</u>	<u>Lambs</u>	<u>Kams</u>	<u>Total (1) ossible</u>	<u>Total (2) ossible</u>	<u>Lambs per 100 ewes</u>	<u>Kams per 100 ewes</u>
1971	10	5	4	19	19	50	40
1972	14	3	5	22	19	21	36
1973	15	11	7	33	30	73	47
1974	20	11	13	44	40	55	65
1975	25	12	19	56	53	48	76
1976	31	19	25	75	63	61	81
1977	38	19	34	94	73	50	89
1978	44	19	42	103	76	43	95
1979	50	21	38	109	84	42	76
1980	47	--	32	79	75	--	--

1) June (post lambing estimate, except 1980)

2) Highest winter count

Rocky Mountain goats, mule deer and elk share the Lostine herds summer range. Competition is believed to be minimal with most deer and elk utilizing the basins adjacent to tree cover. Mountain goats and a few large bucks share portions of the alpine range with the sheep. The size of the alpine area appears to preclude serious interspecific competition for food at present population levels.

Competition, while apparently not significant on the summer range, could be serious on the winter range. Both mule deer and elk utilize the Silver Creek burn during the winter. Domestic horses have grazed the burn in past years during the spring and summers, greatly reducing available grass on critical winter range. Since most of the winter range is private land, domestic livestock grazing could be a problem. Neither elk or mule deer numbers are believed to be high enough at this time to seriously compete with the bighorns.

Winter range appears to be the limiting factor for the Lostine herd. Considering the size of the winter range (600 acres of south slope grassland), the area supported about 1 sheep per 8 acres (herd estimated at 75 animals). Even when the entire winter range (burned north slopes included) was considered, the area supported 1 sheep per 18 acres this past winter. This was in addition to an estimated 25 elk and 100 deer that used the area periodically. On Wildhorse Island in Montana, Woodgerd (1964) reported a sheep density of 1 per 12 acres of grassland. This was on year-long range on a 4 square mile island with an estimated 1 deer per 13 acres. Blood (1963) found California bighorns spaced in the winter time at 50-60 animals per square mile or about 1 per 12 acres. Because of the limited winter range, we would like to keep the Lostine sheep population at about 75 animals in winter and manage this herd primarily to provide stock for future transplants.

In 1978, 8 tags were issued for 3/4 curl or larger rams on Hurricane Divide. Seven of the 8 hunters were successful in taking rams. In 1979, 6 tags were issued for 3/4 curl or larger rams. All 6 hunters took rams. In addition, one 3½ year old ram was shot and lost, bringing the total number of rams taken to 14. A summary of rams taken by age class follows:

Table 2. Lostine River ram harvest, 1978-1979.

Year	Age in years					
	3 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$	8 $\frac{1}{2}$
1978	2	1	3			1
1979	2	2	2	1		
Total	4	3	5	1		1

In 1980, 6 tags were again authorized for the Hurricane Divide.

Trapping and Transplanting

Geist (1971) reported that social structure of sheep makes them incapable of dispersal and attributed their lack of expansion to the inheritance of social traditions. Oregon's experience with California big-horns has been similar and none of the herds have expanded far into new range. The Lostine herd followed a similar pattern, with the entire herd wintering on 1,300 acres. In an attempt to expand sheep distribution and keep the Lostine herd productive, a trapping and transplanting program was initiated in 1976.

The trap was a small (12 feet in diameter) corral constructed of 8' x 8' panels of 1" x 6" boards. It was self-tripping and constructed around a salt lick. Deer pellets were also used for bait and were readily accepted by the big-horns.

A total of 59 sheep has been trapped and transplanted to 2 release sites. The first site selected was the Bear Creek drainage, 7 air-miles west of the Lostine Range. The range was similar to the Lostine in slope and aspect but had not been recently burned. Considerable open grassland was available for wintering near rugged rimrock cliffs. Alpine summer

range was available to sheep adjacent to the winter range. The second release site selected was in Pattle Creek, 6 miles south of Hells Canyon dam. This area has extremely rugged grass-covered canyon walls from about 1,500 to 6,800 feet in elevation. Much of the area was burned in the 1973 Freezeout fire. Both release areas were within historic sheep range.

Bear Creek Transplant

In December 1976 and January 1977, 10 ewes and 7 rams of various ages were transported to Bear Creek by 4-wheel drive pickup. Sheep were generally very calm and no drugs were used to tranquilize or immobilize them. All animals were ear tagged and colored streamers were attached. Although 5 separate releases of 1-6 animals were made, most were able to regroup and 12 sheep were located on the Bear Creek range in 1 herd in early February. By early April 1977, 8 of the sheep from the transplant were located on the Lostine winter range near the original capture site. Since only about half the Lostine population was observed, it is possible that most of the animals had returned to their original range (a distance of 7 air miles).

In December 1977, 8 lambs and 2 yearling ewes were transplanted to Bear Creek. Young animals were used in this release because it was felt they would have less fidelity to the Lostine winter range and be more apt to remain in the Bear Creek drainage. The animals were ear tagged and had colored streamers attached, and 2 male lambs were equipped with radio transmitters. The bighorns remained on the winter range until early May, but most returned to the Lostine and the following winter.

The transplant was a failure and efforts to restock this range using Lostine river sheep have been abandoned. The open winter of '76-77 allowed the first transplants to return to their original range soon after the release. The 1977-78 transplants, while remaining on the Bear Creek range for the winter, moved back to the Lostine by the following winter. Since sheep from the Lostine were frequently seen on the Bear Creek summer range, we theorized the young transplants mixed with adults from their original range and followed them back to the Lostine river wintering area.

Battle Creek Transplant

Thirty-four bighorns were trapped off the Lostine range and transplanted to upper Hells Canyon between December 1977 and February 1980. Two ewes and 3 rams were transported by jet boat to Battle Creek, 6 miles below Hells Canyon dam in December 1977. In 1978-79, 2 ewe lambs and 6 young rams were released in this location. During December 1979, 5 males and 7 females (10 were lambs) were transplanted to Battle Creek. In February 1980, 3 males and 5 females were released in Hells Canyon Creek, a short distance below the dam. All animals had been ear tagged and had colored streamers attached. Four sheep were equipped with radio transmitters and 4 had individually numbered collars on them. A ewe and young ram from the first release are known to be dead. Twenty-four sheep were observed in the Hells Canyon Creek area in mid-March 1980 while conducting the annual aerial survey. We plan to monitor this release at least once every 2 months until radio transmitters go dead or fall off the sheep. We currently estimate there are about 30 sheep in this release area.

Lower Imnaha Transplant

In early January 1979, 9 ewes and 6 rams were transplanted from the Panther Creek drainage, a tributary of the Salmon River in Idaho, to the lower Imnaha River drainage. All animals were ear-tagged and marked with red ear streamers, and 3 ewes were equipped with radio collars. We attempted to monitor this transplant at least once every 2 months. On March 10, 1979, all 15 animals were located from the air. The bighorns were in 3 groups, all within 7 airmiles of the release site. At least 6 lambs were produced in 1979 and 16 animals (including the 6 lambs) were seen during the March 1980 aerial census. Ten animals were seen near the mouth of the Imnaha River (about 3 miles northwest of the release) and 6 animals on Windy Ridge (6 miles south of the release site). We were very encouraged by 1979 lamb production (4 of 9 ewes were yearlings when released) and estimated that 20 sheep are currently in this release area.

Future Releases

Three re-introductions are proposed for northeast Oregon over the next few years. Environmental assessment reports have been requested from the Forest Service for the Hinam River drainage in the Wallowa Mountains and the Wenaha River drainage in the Northern Blue Mountains and from the BLM for the McGraw Creek drainage in upper Hells Canyon. There appears to be a large area of potential bighorn sheep habitat in Wallowa and Baker counties.

CONCLUSIONS

In conclusion, Rocky Mountain bighorns appear well established in the Lostine River drainage of the Wallowa mountains. This herd is currently estimated at 75 animals. The Battle Creek and Lower Imnaha area sheep

herds are estimated at 30 and 20 animals, respectively, for a total of 125 Rocky Mountain bighorns in Oregon. Using the Lostine herd for nucleus stock, hopefully Rocky Mountain bighorn sheep can be re-established on other suitable historic range in northeastern Oregon.

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QUESTION - RESPONSES

Dwight Smith: Obviously one of the criteria you have for your release sites is that it is an area of historic range. What are some of the other criteria that you're looking for when you select one of these many release sites that you've used?

Vic Coggins: The Bear Creek side, it was so similar to where that Lostine herd had done well, that we just felt that it was good potential sheep habitat. The lower Imnaha herd we had Bill Hickey come over and take a look at. We went through kind of a review, let him use his expertise because we were going to get his sheep. That's kind of what we went by. The upper Snake River herd, is just looks like such excellent sheep habitat, that grass is virtually, well there are a few elk and a few mule deer, but it's in very good condition. That is the basis that we went by. The other ones are in the process of going through the environmental assessment procedure. We will be analyzing them over the next three years.

Dwight Smith: In one of the last slides you showed it looked like some heavy utilization; I think you made the comment that that was one of the problems you're anticipating there. Was that livestock use?

Vic Coggins: Yes. That was not on a sheep range. I was going to point out on that Lostine sheep herd, our one thriving herd, it is private land, most of it. We are kind of at the whim of the private landowner. It has had horses grazed on it in the past. The present owner is getting a band of domestic sheep and whether we're going to be able to negotiate with him or not, I don't know. He has indicated a willingness to sell to us, but I think he knows he has us between a rock and a hard place. I don't know how we're going to be able to work it out. It's also zoned, part of the lower country, for subdivision.

Anonymous: A question about homing of transplanted sheep back to the population from which they were trapped out of.

Vic Coggins: We've had some of those young rams that we released in that Bear Creek area: one of them moved at least 30 air miles south and showed up back on that winter range; we trapped him the next winter.

Anonymous: A point of interest on that, we have had 20 odd miles homing back to the original herd.