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## POPULATION STATUS AND TRANSPLANTING HISTORY OF CALIFORNIA BIGHORN SHEEP IN OREGON

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**Abstract:** California bighorn sheep (*Ovis canadensis californiana*) were native to southeastern Oregon. The last original sheep was reported about 1915. In 1954, California bighorn sheep were reintroduced from British Columbia to Hart Mountain. Trapping of that herd for release in other native habitat has led to over 20 newly established herds with over 1,800 animals currently in Oregon. From 1960 to 1990, 444 sheep have been captured and transplanted to new locations. Hunting permits have been offered for 570 rams since 1965, with 411 being taken. Funds received from one bighorn sheep tag auctioned each year have helped finance transplant operations since 1987.

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The California bighorn sheep are one of Oregon's premier big game species along with Rocky Mountain bighorns (*Ovis canadensis canadensis*). They are generally considered to be morphologically intermediate between the Rocky Mountain bighorn and the desert bighorn (*Ovis canadensis nelsoni*). Habitat occupied by the California subspecies is also intermediate to the Rocky Mountains and the Sonoran Desert.

The High Desert of southeast Oregon is prime habitat for the California bighorn sheep because of the prevalence of fault-block mountains and high lava plains. High elevation rimrock areas interspersed with shrub/bunchgrass benches provide both escape cover and forage.

This paper describes the history of the California bighorn sheep populations in Oregon and provides a record of transplanting during 1960-90 aimed at filling as many of the native habitats as possible.

### ORIGINAL DISTRIBUTION

Most historic reports place the California bighorn's range throughout central and southeast Oregon from the Deschutes River Canyon near The Dalles, southward along the east side of the Cascade Mountains within the high desert land types to the California and Nevada borders (Fig. 1). The range extended east to the Idaho border and north to the Burnt River drainage south of Baker City. Some early accounts suggest that Burnt River and the Strawberry Mountains near John Day were inhabited by the Rocky Mountain bighorn. The Oregon Department of Fish and Wildlife has agreed with reports favoring California bighorns as the most likely subspecies for these 2 areas (Mace 1969).

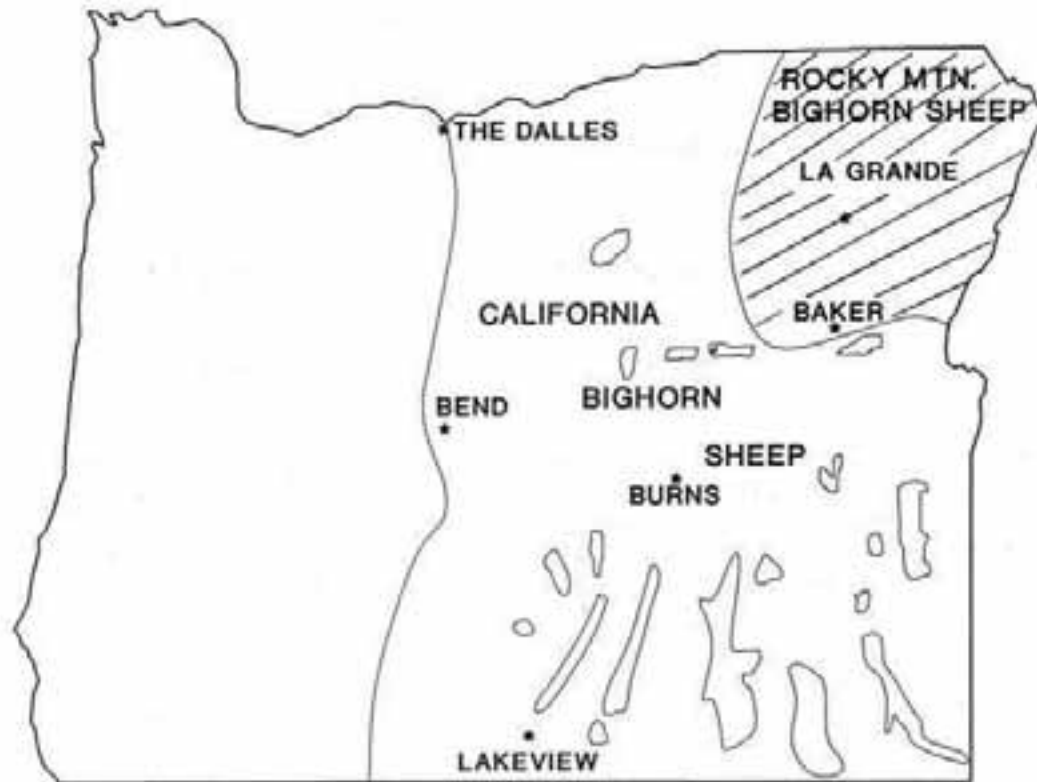


Fig. 1. Distribution of California bighorn sheep in Oregon

The Blue Mountains of Northeast Oregon are believed to have historically contained Rocky Mountain bighorns, so that subspecies has been reintroduced to native habitats in that region.

#### POPULATION HISTORY

The most reliable records of native bighorn sheep in Oregon indicate the last sheep disappeared about 1915 from the Steens Mountain. The last record for Hart Mountain was about 1912 (Mace 1969).

Several theories have been advanced to account for the extirpation of this subspecies from Oregon. Diseases from the huge flocks of domestic sheep that grazed the high desert at that time have been given credit for most of the decline. Winter loss due to livestock overgrazing of winter range and severe weather hastened the decline. Scabies mites supposedly caused loss of hair and increased mortality due to exposure during severe winters in the late 1800's. Certainly the unrestricted taking of bighorn sheep for meat and hides during this period aided the population decline that eventually led to complete loss of the subspecies from Oregon.

#### REINTRODUCTION

The idea of reintroducing bighorns to Oregon was originally presented to the U.S. Bureau of Biological Survey in 1936 by a supervisor of the Fremont National Forest, W. O. Harriman. With the aid of Stanley Jewett

and Ira Gabrielson, 23 Rocky Mountain bighorns from the National Bison Range in Montana were released on Hart Mountain in 1939. Records show the introduction failed due to poor condition of the animals and habitat suspected unsuitable for the subspecies (Mace 1969).

Restoration of bighorn sheep to Oregon was still on the minds of some people, and in 1950 the Oregon State Game Commission negotiated with the British Columbia Game Department to obtain California bighorns. Release sites in Oregon were selected and the agreement finalized by 1954. The U.S. Fish and Wildlife Service offered Hart Mountain National Antelope Refuge as a release site where an enclosure could be built for protection of the herd.

On 4 November 1954 a successful trapping effort resulted in capture of 20 sheep near Williams Lake, B.C. The herd consisted of 1 ram, 12 ewes, and 7 lambs. They were released from a double-decked truck on 6 November 1954 within a 35-acre portion of the planned enclosure on Hart Mountain. The fence around the 600-acre enclosure was completed in July 1955 and the herd flourished within. In June 1957, 18 sheep from the enclosure were released on the west face of Hart Mountain as the first attempt to establish a free-ranging population in Oregon.

The Hart Mountain enclosure herd of California bighorn sheep was used as the source of animals for release to other native habitats in southeast Oregon through the 1960's. The fence was eventually removed during the early 1970's and further capture efforts for transplanting utilized free-ranging sheep.

#### TRANSPLANT HISTORY

During December 1960 through January 1990 444 California bighorn sheep have been captured in Oregon and released into other sites in Nevada, Washington, and Oregon. The largest number (375) was reintroduced to selected sites in Oregon. These sites were prioritized on the basis of native range characteristics believed to be most important to California bighorns. All sites are within the original range of the subspecies. Four California bighorn herds have served as capture sources for all sheep transplanted from Oregon (Table 1). Most sheep (364) have been trapped on Hart Mountain. Thirty-nine came from Leslie Gulch, 27 from Steens Mountain, and 14 from Aldrich Mountain.

Releases into 22 locations in Oregon have led to establishment of what is hoped will become 12-15 populations. Convergence of herds from individual transplant sites is beginning to form contiguous herd ranges covering larger areas of suitable habitat.

#### CAPTURE METHODOLOGY

Throughout the 30 years of bighorn transplanting, 4 capture methods have been used. Original attempts within the Hart Mountain enclosure utilized a corral trap into which sheep were herded by people on foot. The method was somewhat successful, so early attempts to capture free-ranging bighorns on Hart Mountain centered around the use of permanent corral traps. Subsequent efforts utilized a helicopter to haze the sheep

into trap wings made of woven wire fencing. Some of these wings were several hundred yards long. Many attempts captured so few sheep that complete releases were not possible. However, periodic successes such as occurred in 1971 and 1983 (Table 1) kept this procedure high on the list of capture techniques.

Two events changed the direction and the success of bighorn sheep trapping in Oregon. These were: (1) cooperative capture projects with Nevada and California wildlife agencies; and (2) designation of a Governor's sheep tag to be auctioned annually to raise bighorn sheep management funds.

The direct effects of the cooperative projects were the introduction of Oregon personnel to 2 new techniques, and the realization that if funds were available, success was nearly always achieved. In January 1984, crews from Nevada, California, and Oregon first utilized the linear drive netting technique on bighorn sheep at Hart Mountain. A total of 21 sheep was captured and released at new locations in Nevada and Oregon. Close relationships were developed among personnel of each state and led to more extensive cooperative projects in 1987. In February 1987, 2 cooperative projects (Leslie Gulch and Hart Mountain) between Nevada and Oregon resulted in the successful release of 73 bighorns in the 2 states (Table 1). Linear drive netting was the original method of choice, but it was augmented by use of a Coda Netgun. Most equipment and funding was provided by Nevada in exchange for half the captured sheep. Oregon lacked the necessary equipment as well as funds, but had herds to use as sources of transplant stock.

The Oregon Legislature solved the monetary problems for the bighorn sheep program in 1987 when they approved a "Governor's Sheep Tag" to be auctioned annually. Proceeds of this auction went directly to the Oregon Department of Fish and Wildlife to be used for bighorn sheep management. Funds were used to purchase linear drive nets, netguns and accessories, and helicopter time for capture operations.

Oregon's trapping and transplanting success took a major leap forward. First, every sheep could go to a new site in Oregon, resulting in a 100% increase in bighorn sheep released in Oregon compared to prior cooperative ventures. Second, methods were available that virtually guaranteed success whenever a capture operation was attempted.

Linear drive netting and netgunning have emerged as the 2 dominant methods utilized by the Department for California bighorn sheep capture. Since first utilizing drive nets in 1984, 296 sheep have been transplanted using these 2 methods (Table 2). One hundred thirty-eight have been captured using drive nets and 153 with the netgun. During these capture efforts, 5 sheep were caught by hand as opportunities occurred.

In 1989 and 1990, the emphasis shifted to netgun capture. Some factors causing this shift were: (1) less manpower required; (2) long set-up time for drive nets; (3) netguns select specific individuals; and (4) more experience with the netgun made it more efficient.

Table 1. Summary of trapping and transplanting California bighorn sheep in Oregon.

| Date   | Capture Site | Release Site         | Sheep No. |
|--------|--------------|----------------------|-----------|
| 12/60  | Hart Mtn.    | Steens Mtn.          | 4         |
| 1/61   | " "          | " "                  | 7         |
| 11/65  | " "          | Leslie Gulch         | 17        |
| 8/68   | " "          | Sheldon NWR (NV)     | 8         |
| 7&8/71 | " "          | Canyon Mtn.          | 21        |
| 11/75  | " "          | Abert Rim            | 3         |
| 12/76  | " "          | " "                  | 2         |
| 12/76  | " "          | Pueblo Mtn.          | 16        |
| 1/77   | " "          | Abert Rim            | 5         |
| 2&3/78 | " "          | Aldrich Mtn.         | 14        |
| 11/80  | " "          | Pueblo Mtn.          | 7         |
| 11/80  | " "          | Fish Cr. Rim         | 2         |
| 12/81  | " "          | Aldrich Mtn.         | 4         |
| 10/83  | " "          | Pueblo Mtn.          | 17        |
| 10/83  | " "          | Iron Point           | 21        |
| 10/83  | " "          | Deary Pasture        | 14        |
| 1/84   | " "          | Hadley Cr.           | 8         |
| 1/84   | " "          | Jackson Mtn. (NV)    | 13        |
| 2/87   | Leslie Gulch | Burnt River          | 15        |
| 2/87   | " "          | Jackson Mtn. (NV)    | 15        |
| 2/87   | Hart Mtn.    | Painted Canyon       | 15        |
| 2/87   | " "          | Riverside WMA        | 8         |
| 2/87   | " "          | Nevada (2 sites)     | 20        |
| 10/87  | " "          | Oregon Canyon        | 27        |
| 10/87  | " "          | Red Butte            | 16        |
| 1/88   | Steens Mtn.  | McClellan Mtn.       | 15        |
| 1/88   | " "          | Fish Cr. Rim         | 12        |
| 2/88   | Leslie Gulch | Riverside WMA        | 9         |
| 2/89   | Hart Mtn.    | Thirty-Mile Cr.      | 14        |
| 2/89   | " "          | Coglin Buttes        | 16        |
| 2/89   | " "          | Home Cr.             | 17        |
| 1/90   | Aldrich Mtn. | Washington (4 sites) | 13        |
| 1/90   | " "          | Sheepshead Mtn.      | 1         |
| 1/90   | Hart Mtn.    | " "                  | 15        |
| 1/90   | " "          | Cottonwood Cr.       | 14        |
| 1/90   | " "          | Whitehorse Cr.       | 19        |

Time spent in pursuit was higher with drivenetting than with netgunning. Stress levels and body temperatures were higher with the increased pursuit time inherent in drivenetting. Average sheep mortality has been 4.4% since 1984 when a majority of Oregon's bighorns have been captured (Table 3). Mortality by each method is within acceptable limits, but is under close scrutiny on all operations. Over the last 3 capture operations, close attention to monitoring stress, and better procedures for reducing it, have reduced losses to capture myopathy. Oregon's goal is to reduce capture-related mortalities to only those few "unavoidable accidents" that occur anytime big game animals are being restrained and handled by man.

Table 2. Number of California bighorn sheep captured by various methods in Oregon, 1984-1990.

| Year  | Capture technique |        |       | Total |
|-------|-------------------|--------|-------|-------|
|       | Drivenet          | Netgun | Other |       |
| 1984  | 19                | -      | 2     | 21    |
| 1987  | 88                | 32     | -     | 120   |
| 1988  | 21                | 18     | 1     | 40    |
| 1989  | 10                | 37     | 2     | 49    |
| 1990  | -                 | 66     | -     | 66    |
| Total | 138               | 153    | 5     | 296   |

Table 3. Comparison of capture-related mortalities occurring from 1984-1990.

| Method    | No. Captured | Mortality |     |
|-----------|--------------|-----------|-----|
|           |              | No.       | %   |
| Drivenets | 138          | 8         | 5.8 |
| Netguns   | 153          | 6         | 3.9 |
| Other     | 5            | 0         | 0.0 |
| Total     | 296          | 14        | 4.4 |

#### CURRENT POPULATION STATUS

Field biologists estimate that the California bighorn herds in Oregon total 1,805 animals at the end of March 1990 (Table 4). The largest contiguous herd (425) is found on Hart Mountain. There are also 425 bighorns in the Owyhee River Canyon, but these 5 transplants have not yet merged into 1 population. The Steens Mountain herd of 250 sheep has been stable for almost 10 years. Some range expansion is being noted, but the core habitat maintains a stable population.

Of the more recently established herds, Aldrich Mountain and the Pueblo Mountain/Alvord Peaks populations have shown the greatest increases. The Pueblo/Alvord herd has established a migration pattern to a major winter range, and uses several widely separated summer ranges. The Abert/Alkali Rims herd appears to be more stable after a large initial increase. Dispersion to other locations may be occurring, however.

Considering the rate of increase of established herds, Oregon could easily have 3,000 California bighorn sheep by the year 2000. When all the native range is occupied a much higher population is expected.

#### HUNTING OPPORTUNITY

One original objective of reintroducing California bighorn sheep to Oregon was the potential for a few of the state's sportsmen to harvest a ram. The sportsmen were paying the bill through license fees for other species, so they should be allowed to benefit if sheep numbers reached the point where surplus rams were available. This dream became reality

Table 4. Estimated numbers of California bighorn sheep in Oregon, March 1990.

| <u>Herd</u>        | <u>Pop. size</u> |
|--------------------|------------------|
| Hart Mtn.          | 425              |
| Steens Mtn.        | 250              |
| Owyhee             | 425              |
| Strawberry Mtns.   | 15               |
| Abert/Alkali Rims  | 135              |
| Pueblos/Alvord     | 175              |
| Aldrich Mtn.       | 150              |
| Fish Cr. Rim       | 30               |
| Hadley Cr.         | 30               |
| Burnt River        | 30               |
| Coglin Butte       | 20               |
| Riverside          | 20               |
| Lower John Day R.  | 20               |
| E. Trout Cr. Mtns. | 60               |
| Sheepshead Mtns.   | 20               |
| <u>Total</u>       | <u>1,805</u>     |

in a relatively short time. In 1965, 11 years after the return of these sheep to Oregon, a hunt was authorized on Hart Mountain. There have been permits allocated for Hart Mountain in 23 of 25 years since 1965. In 1968, the first hunt was authorized for Steens Mountain. Hunts have occurred for 22 years in that area. The Leslie Gulch herd on the Owyhee River has had 17 hunts since 1973.

Five hundred seventy permits have been authorized in Oregon for California bighorn sheep and 411 rams have been harvested (Table 5). The herds on Hart Mountain, Steens Mountain, and Leslie Gulch have provided the bulk of the recreational opportunity, but newly established herds with great growth potential are currently entering the hunting picture as older rams become available. Hunting opportunity for 45 rams was offered on a permit basis in 1989.

Table 5. Harvest of California bighorn sheep in Oregon, 1965-1989.

| <u>Herd range</u> | <u>Ram harvest</u> |
|-------------------|--------------------|
| Hart Mtn.         | 180                |
| Steens Mtn.       | 125                |
| Lower Owyhee      | 70                 |
| Warner            | 13                 |
| Aldrich Mtn       | 10                 |
| Pueblo/Alvord     | 5                  |
| Juniper           | 4                  |
| Upper Owyhee      | 2                  |
| Middle Owyhee     | 1                  |
| Strawberry        | 1                  |
| <u>Total</u>      | <u>411</u>         |

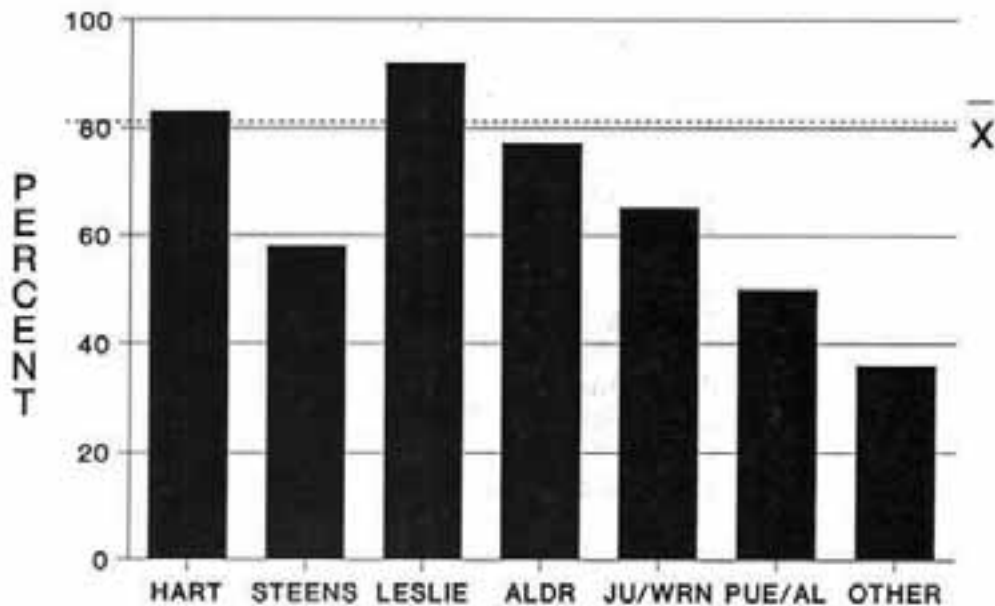


Fig. 2. Hunter success in Oregon for major California bighorn sheep herds, 1965-89.

Hunter success on the various hunt areas since 1965 has averaged 72% (Fig. 2). Leslie Gulch leads the list with 92%, Hart Mountain is second with 83%, and Aldrich Mountain is third at 77% hunter success. The ruggedness of terrain on Steens Mountain affects the ability of hunters to harvest rams on that escarpment. Only 58% success has been achieved for the 217 permits authorized to date. Success on the remaining hunts has generally been lower, evidently influenced by lower numbers of legal rams available in those hunt areas.

The size of California bighorn rams harvested in Oregon has been good for the subspecies. The largest Boone and Crocket score recorded to date (green horns) has been 175 5/8. All hunt areas have shown similar patterns of age classes and scores. The 125 rams taken on Steens Mountain averaged 150 3/8 points in size with ages ranging from 2 to 12 years (Fig. 3). Two of the smaller rams were taken as 1/2 curls during 1974 and 1975 when the minimum regulation was lowered to 1/2 curl or larger.

The best average Boone and Crocket scores were achieved on Steens Mountain when rams reached 10 years of age, an age class with little representation in harvest and in census. Only 9 rams have been taken over 9 years of age (Table 6). Under the current 3/4 curl harvest regulation, few 2-3 year old rams are taken, with the majority of the harvest comprised of 4-7 year old animals. It may be ill-advised for management to expect or attempt to produce large numbers of rams over 8 years of age.



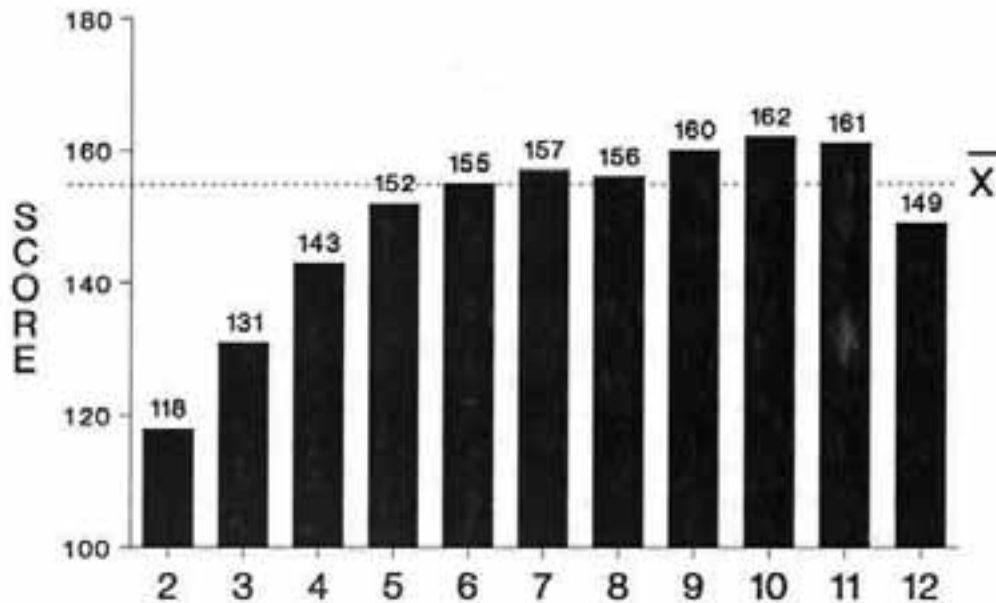


Fig. 3. Boone and Crocket scores in relation to age of 125 California bighorn rams from Steens Mountain, Oregon.

Table 6. Estimated age and Boone and Crocket scores for 125 California bighorn rams harvested on Steens Mountain, 1968-1989.

| Estimated age | No. harvested | Average B. & C. score |
|---------------|---------------|-----------------------|
| 2             | 3             | 118.0                 |
| 3             | 12            | 130.5                 |
| 4             | 21            | 143.1                 |
| 5             | 18            | 152.0                 |
| 6             | 22            | 155.3                 |
| 7             | 20            | 157.0                 |
| 8             | 13            | 155.8                 |
| 9             | 8             | 160.4                 |
| 10            | 5             | 162.3                 |
| 11            | 2             | 160.6                 |
| 12            | 2             | 149.2                 |
| Total         | 125           | 150.4                 |

#### LITERATURE CITED

- Mace, R. U. 1969. Bighorns in Oregon. Oregon Game Comm. Bull. 24 (8):3-5.