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Progress Report



BIGHORN SHEEP

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July 1, 2003 to June 30, 2004

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**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE:	<u>Idaho</u>	JOB TITLE:	<u>Bighorn Sheep Surveys and</u>
PROJECT:	<u>W-170-R-28</u>		<u>Inventories</u>
SUBPROJECT:	<u>2-7</u>	STUDY NAME:	<u>Big Game Population Status,</u>
STUDY:	<u>1</u>		<u>Trends, Use, and Associated</u>
JOB:	<u>4</u>		<u>Habitat Studies</u>
PERIOD COVERED:	<u>July 1, 2003 to June 30, 2004</u>		

STATEWIDE

Abstract

Idaho has huntable populations of both Rocky Mountain bighorn sheep and California bighorn sheep within its borders. Hunters may harvest only two bighorn sheep (one of each subspecies) in their lifetime under current regulations.

The Idaho Department of Fish and Game authorized 18 controlled hunts and a total of 57 permits for Rocky Mountain bighorn sheep in 2003 (Appendix A), plus two special permits (one each by lottery and auction). The 59 hunters harvested 28 Rocky Mountain bighorn sheep in 2003, for a harvest success rate of 47% statewide. By comparison, 64 hunters harvested 37 Rocky Mountain bighorn sheep in 2002 (hunter success rate of 58%) and 76 hunters harvested 38 Rocky Mountain bighorn sheep in 2001 (success rate of 50%). In 2000, 48 hunters harvested 28 Rocky Mountain bighorn sheep (success rate of 58%) and 62 hunters harvested 27 Rocky Mountain bighorn sheep in 1999 for a harvest rate of 44%.

The number of hunts and permits offered for California bighorn sheep was increased from three to four in 2003, and permits were increased from 13 to 15 (Appendix A). The Bruneau/Jarbridge and Little Jack Creek areas were reopened in the 2003 season. In 2003, the 15 permit holders harvested eight California bighorns for a success rate of 53%. Previously, 13 hunters harvested four rams in 2002 and nine rams in 2001 (hunter success rate of 31% and 75%, respectively). In 2000, 43 hunters harvested 24 California bighorn sheep (success rate of 56%); and 43 hunters harvested 23 California bighorn sheep in 1999 for a harvest rate of 53%.

Bighorn sheep permits are among the most desirable permits offered in Idaho. Each year a single permit, valid for any open bighorn sheep controlled hunt in Idaho, is offered at public auction. In 2003, this permit sold for \$90,000 at the annual convention of the Foundation for North American Wild Sheep (sales price in 2004 was \$46,000).

In 2003, 1,188 first-choice applications were received for 57 available permits for Rocky Mountain bighorn sheep (nearly 21 applications per permit offered). In 2002, 1,057 applications were received for 64 permits, similar to 2001 when 1,040 applications were received for 62 permits. This number reflects a significant increase in the number of first-choice applications

above the number received in 2000 when 749 applications were received for 62 permits (12 applications per permit). By comparison, 870 first-choice applications were received for 62 permits in 1999 (14 applications per permit). The majority (55%) of all applications in 2003 (802) were received from non-residents.

The number of first-choice applications received for California bighorn sheep permits in 2003 (277) increased by 15% over the number received in 2002 (233) and 2001 (232). In 2003, there was an average of 21 applications per permit, up from an average of 17 applications per permit in 2002 and 2001. Unlike Rocky Mountain bighorn sheep, most of the first-choice applicants (64%) were resident hunters. In 2002, 233 first-choice applications were received for 13 permits, nearly identical to 2001 when 232 applications were received for 13 permits. In 2000, there were 559 first-choice applicants for 43 available permits (13 applications per permit), 797 applicants for 43 permits in 1999 (18.5 applicants per permit), and 726 applicants for 45 permits in 1998 (16 applications per permit).

Research efforts on Rocky Mountain bighorn sheep populations were focused on the tri-state (Idaho, Oregon, Washington) Hells Canyon Initiative. Research on California bighorn sheep on Jim Sage Mountain near Burley, Idaho, was completed. Graduate student Gretchen Fowles published her thesis at Idaho State University, titled "Habitat Use and Population Characteristics of Newly Reintroduced California Bighorn Sheep (*Ovis canadensis californiana*) in South Central Idaho." Gretchen developed a habitat use model used to select a release site for additional California bighorn sheep on Cache Peak near Burley, Idaho. Research on lamb recruitment among California bighorn sheep herds in Big and Little Jack Creeks in southwestern Idaho, initiated in 2001, continued through June 2004.

**PROGRESS REPORT
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PERIOD COVERED:	<u>July 1, 2003 to June 30, 2004</u>		

CLEARWATER REGION

Units 11, 13, 18

Controlled Hunt Area 11

Abstract

Interest and support by The North American Foundation for Wild Sheep (FNAWS) and other state and federal agencies has raised the level of involvement with bighorn sheep along the Snake River in Units 11, 13, and 18. These units will continue to be a top priority for future transplants in the Clearwater Region. Recent survey results suggest growth in the population in Unit 11 and recovery from the 1995-1996 epidemic; however, disease concerns still exist in the Snake River canyon. Hunt Area 11 was closed in 1997 after surveys indicated few legal rams remained in the population; however, the unit was reopened in 1999 for limited harvest opportunity. Sixteen bighorn sheep were released in Unit 13 in 1997 and were supplemented with six additional bighorn sheep in 1999. A small population persists in Unit 18. Monitoring efforts continue and include continuation of work on developing a sightability model for bighorn sheep in this area.

Management Direction

The Department plans to conduct helicopter surveys for bighorn sheep at least every five years to monitor population trends. Interest and support by FNAWS and other state and federal agencies has raised the level of involvement with bighorn sheep along the Snake River in Units 11, 13, and 18. As a result, Hells Canyon of the Snake River will be the top priority for future transplants in the Clearwater Region. In Units 11 and 13, an additional objective is to pursue cooperative land acquisitions with federal agencies to secure significant blocks of bighorn sheep habitat. The domestic sheep/bighorn sheep conflict in Unit 18 (Hells Canyon National Recreation Area) was reduced in 1996 with the removal of the last remaining Wallowa-Whitman National Forest grazing permit.

Background

Bighorn sheep occurred naturally in the Hells Canyon area of Units 11, 13, and 18, but were extirpated in the early part of the century. Transplants have been conducted in all three units to reestablish populations.

The Unit 11 bighorn sheep population was reestablished onto the Craig Mountain Wildlife Management Area (WMA) in 1984, when 17 bighorn sheep (eight ewes and nine rams) from Torrey Rim, Wyoming, were transplanted into the area. Additionally, marked transplant stock from both Washington and Oregon has been observed mixing with bighorn sheep from the Wyoming transplant and vice versa.

Reports of dead and dying bighorn sheep on the Washington side of the Snake River opposite Unit 11 in December 1995 prompted the removal of 72 bighorn sheep from this area in an attempt to prevent the spread of pneumonia to other bighorn sheep in the population in the Snake River canyon. These bighorn sheep were transported to the IDFG Wildlife Health Laboratory in Caldwell after a joint capture effort by Idaho, Oregon, and Washington personnel. All but eight of these bighorn sheep died by June 1996 despite intensive treatment in captivity. Periodic aerial surveys were conducted through spring 1996 by Idaho, Oregon, and Washington personnel to monitor bighorn sheep status. The disease spread along the Snake River from north of the Grande Ronde River, Washington, to the Imnaha River, Oregon, and up the Grande Ronde River to the Wenaha River in Oregon. Some Idaho bighorn sheep appeared to exhibit symptoms, but no deaths were attributed to the Washington-Oregon outbreak. Unit 11 lamb survival was very low in 1996, high in 1997, dropped again in 1998 and 1999, rebounded in 2000 and 2001, but fell again in 2002.

The last-known native bighorn sheep in Unit 18 was observed in 1932. Speculation at that time attributed the loss of bighorn sheep to over-hunting by miners and disease outbreaks associated with domestic sheep contact. Bighorn sheep were reintroduced into Hells Canyon with transplants of Salmon River stock in 1975-1976 (11 ewes and ten rams) and 1979 (seven ewes). The population was augmented in 1990 with 30 bighorn sheep (20 ewes and ten rams) from Whiskey Mountain, Wyoming.

A disease outbreak that occurred in 1983 resulted in a substantial decline in the Unit 18 bighorn sheep population. The outbreak was initially detected through the observation of a number of dead and sick bighorn sheep along the Snake River. Domestic sheep, bighorn sheep, elk, mule deer, mountain goats, and white-tailed deer were tested for a variety of diseases at that time. The testing detected the presence of *Pasteurella* spp., Parainfluenza III (PI-3), epizootic hemorrhagic disease, and *Chlamydia* in the bighorn sheep and PI-3 and *Chlamydia* in the domestic sheep.

Another disease outbreak was detected in April 1991. Several sick bighorn sheep and two dead ewes were reported in the vicinity of Granite Creek in Hells Canyon. A subsequent helicopter survey did not detect any bighorn sheep, but a fixed-wing radio location flight (26 April 1991) after the survey found ten bighorn sheep and one active radio. Subsequent helicopter surveys in 1992, 1993, and 1996 indicated that few animals remained in the Unit 18 herd (Table 1). It is likely that domestic sheep have introduced one or more diseases to the bighorn sheep in Unit 18

and that the disease(s) have either caused or contributed to the decline of the population. The removal of the last remaining domestic sheep grazing permit offered by the Wallowa-Whitman National Forest should allow progress to be made on this issue.

Bighorn sheep were established in Big Canyon Creek in Unit 13 in December 1997 with a transplant of 12 ewes and four rams from Spences Bridge, British Columbia. The population was supplemented with six bighorn sheep (three ewes and three rams) from the Cadomin coal mine in Hinton, Alberta, Canada on 13 February 1999. In summer 2000, the population was estimated at 45 bighorn sheep (21 ewes, 16 lambs, six sub-legal rams, and two legal rams; Table 1). During fall 2000, nearly all lambs died. Nine yearlings and adults were also found dead in 2000 and 2001, primarily due to scabies infection and pneumonia. In March 2002, the population was estimated at 32. All lambs born in spring 2002 died that summer and the population was estimated at 32 in March 2003. Additional losses now put the estimate for Unit 13 at 21 sheep in March 2004.

Population Surveys

Since the 1984 transplant, the Unit 11 herd has grown at a moderate rate (Table 2). Frequency of bighorn sheep surveys in Unit 11 increased in 1996 to monitor mortality and survival of lambs and to develop a sightability model as part of a research effort focusing on the Snake River Hells Canyon complex. Lamb survival in 1996 was extremely low (seven lambs:100 ewes). This was presumably a residual effect of the 1995-1996 *Pasteurella* outbreak in Oregon and Washington. Most recently, fluctuating lamb production has resulted in a slow increase in total bighorn sheep numbers. The total number of sheep in the unit was 130 in March 2004. Three rams exhibiting exploratory movements were removed from the population in May 2000. One radio-collared two-year-old ram was hit by a car on Highway 12 near Hatwai Creek, and two yearling rams were darted near Clarkston, Washington, but subsequently died. These may have come from Idaho or Washington. Necropsy revealed that the two-year-old ram hit by the car had recovered from a previous pneumonia infection.

Sightability model development has been ongoing since March 1998. Sightability has been assessed during six trials, three in March and three in December, in seven herds in Idaho, Oregon, and Washington. Over the six trials, 359 of 397 radio-collared bighorn sheep (90%), 167 of 192 groups (87%), and 1,008 of 1,120 bighorn sheep (90%) have been observed during the helicopter surveys. Both the sightability model development and the vaccine test were conducted cooperatively under the "Hells Canyon Initiative."

Aerial surveys indicated a sharp decline in the number of bighorn sheep in Unit 18 since the occurrence of disease outbreaks in 1983 and 1991 (Table 1); however, bighorn sheep continue to be regularly observed at Bernard Creek. On 25 May 1999, four adult ewes, one yearling ewe, two lambs, and one yearling ram were observed. A similar group (six adult bighorn sheep and two lambs) was observed from the air on 16 June 1999. On 12 June 2000, four adult ewes, one yearling ewe, three lambs, and one yearling ram were observed at Bernard Creek. On 10 January 2001, two adult ewes, one yearling ewe, two lambs, and one yearling ram were observed. The yearling ewe was coughing. In March 2001, four ewes, two lambs, and one class II ram were

observed, all at Bernard Creek. In June 2002, six ewes, two lambs, one class I ram, one class II ram, and two class III rams were observed. The total sheep observed in 2003 was 14.

Harvest Characteristics

Hunting was initiated in Unit 11 in 1993. Fourteen rams have been harvested to date. The unit has consistently produced some of the largest rams taken statewide. A limited hunt with two permits was offered in 1993 and 1994. The likelihood of participation by the state auction or lottery tag holder in the Unit 11 hunt, as occurred from 1993-1996, led to a reduction in the number of permits offered in the unit from two to one in 1995 (Table 3). Odds of drawing a tag declined significantly in 1995, probably in large part due to the harvest of a record book ram in 1994.

In 1997, the hunt was closed after surveys indicated few legal rams remained in the population. The Idaho State record bighorn ram that probably died in 1996 was picked up in Unit 11 in 1997. In 1999, the statewide lottery tag holder was allowed to hunt in Unit 11 and harvested a record book ram. In 2001, the season was opened for one general draw tag and the statewide auction tag buyer. Two record book rams were taken. They received the bronze and first honorable mention awards for the 3rd and 4th largest Rocky Mountain bighorn rams taken by FNAWS members in 2001. In 2003, a record book ram was taken in Unit 11 with a muzzleloader.

No bighorn sheep hunt is offered at this time in Unit 13.

Hunting was initiated in Unit 18 in 1984. Permit and harvest levels were reduced in subsequent years and the odds of drawing a controlled hunt permit varied considerably (Table 4). Hunter success appeared to decline in the late 1980s and early 1990s concurrent with the population decline. Hunter success averaged 70% from 1984 through 1987, and 40% from 1988 through 1992. The hunt was closed in 1993.

Habitat and Climatic Conditions

Bighorn sheep habitat in Units 11, 13, and 18 consists of dry bunchgrass habitat types along the Salmon and Snake River breaks. Ownership in Unit 11 is primarily public along the Snake River including the Department's Craig Mountain WMA. Land along the Salmon River is primarily privately owned, although the Bureau of Land Management (BLM) manages much of the river corridor. The river breaks in Unit 13 are also primarily under private ownership with isolated tracts of BLM lands and state lands. The Snake River corridor in Unit 18 is entirely under U.S. Forest Service (USFS) ownership. Approximately 110 acres of the Snake River corridor in Unit 13 (Ragtown Bar) was acquired by a conservation group for transfer to the USFS in 1998. Additionally a conservation easement was acquired by the BLM on several thousand acres in Unit 13 in the Salmon River drainage.

The acquisition of habitat in Unit 11 by the Department, subsequent reduction of cattle grazing, and an intensive weed control program will lead to improved habitat conditions in that area. Restoration of fire to the Hells Canyon ecosystem should also benefit bighorn sheep. In Unit 11, a wildfire burned approximately 400 acres along the Snake River between Captain John Creek

and Billy Creek in 1996 and approximately 1,000 acres in the Tenmile Creek drainage in 1997. A prescribed fire burned additional acreage in Tenmile Creek in spring 1998 and the BLM and Idaho Department of State Lands cooperated with the Department on a mosaic burn between Captain John Creek and Dough Creek in March 1998. In 2000, the Maloney Creek wildfire burned approximately 70,000 acres along the Snake and Salmon Rivers between Maloney Creek on the Salmon River side and China Garden Creek on the Snake River. In Unit 18, wildfire burned approximately 16,100 acres of land managed by the USFS near Sheep Creek and 425 acres near Hells Canyon Dam in 1996.

The Clearwater Region experienced weather conditions in 2003-2004 that were considered below normal. Snowpack in the Clearwater Basin was 89% of average (October-March) while the Salmon River Basin averaged 78% for the same time period. Snowfall was earlier than usual in the Region but most accumulation at the lower elevations did not persist. This allowed big game populations to forage and move easily and probably had a positive effect on big game over-winter survival.

Trapping and Transplants

Twenty sheep (16 ewes and four rams) from the Missouri Breaks outside Havre, Montana were released along the Snake River upriver of Kirkwood Creek in Unit 18 on 13 February 2002. All sheep were radio-collared. One ewe died in Hiltley Creek after apparently getting tangled in a barbed wire fence. The remainder have split up into small groups between Sheep Creek, Idaho and Copper Creek, Oregon.

In December 2001, Oregon Department of Fish and Wildlife released 15 sheep (14 radio-collared) at Quartz Creek, Oregon. These sheep have moved between Hells Canyon Reservoir and Copper Creek on both the Idaho and Oregon sides of the Snake River.

Units 14, 17, 19, 20

Controlled Hunt Areas 19, 20-1, 20-2

Abstract

Bighorn sheep were hunted on a general-hunt basis in these units until 1971. Hunting pressure in the Clearwater Region under a general season framework allowed more accessible populations to be overexploited. In 1971, all bighorn sheep hunts were placed on a controlled-hunt basis. Recent surveys in Units 17, 19, and 20 have suggested a decline in total bighorn sheep numbers and lamb recruitment that may be related to similar declines in adjacent units caused by diseases, primarily *Pasteurella* spp. The late hunts were dropped and permit levels were reduced substantially for the 1993-1994 hunts. Six rams were harvested by 10 permittees on hunts 19, 20-1, and 20-2 during the 2003 hunting season. Aerial survey results from Unit 17 have suggested a stable population.

Management Direction

The Department plans to conduct bighorn sheep surveys at least every five years to monitor population trend and recruitment. Conservative permit levels will be continued until lamb recruitment and population trends suggest that increases are appropriate. In terms of hunting recreation, the emphasis will be to provide a high-quality backcountry hunting experience. Because of the difficulty that hunters experience in locating legal rams in some units, a somewhat lower success rate will be expected.

Background

Rocky Mountain bighorn sheep populations are found in Units 14, 17, 19, and 20. The Unit 14 herd is limited to a few, scattered animals that likely disperse from adjacent herds to the east in Unit 19. At present, hunting is permitted only in the western portion of Unit 14, the southern portion of Units 17, and in Units 19, and 20. These units are further divided into 3 controlled hunt areas (Table 5).

Units 14, 19, and 20 bighorn sheep populations reside within the Salmon River breaks. Bighorn sheep in Unit 17 commonly move between Idaho and Montana. Bighorn sheep were transplanted into two sites in Unit 17 in the Selway-Bitterroot Wilderness in 1988. Fifteen bighorn sheep (10 ewes and 5 rams) were released near Tango Bar and 14 bighorn sheep (13 ewes and 1 ram) were released at Elevator Mountain. Recent surveys have suggested that neither transplant was successful. Bighorn sheep have not been observed in the Tango Bar area since the transplant. Similarly, few animals have been observed in the Elevator Mountain area. The 1994 spring survey revealed the presence of one ewe on Elevator Mountain.

Population Surveys

Bighorn sheep have usually been surveyed by helicopter coincidentally with elk sightability surveys in January and February (Tables 6 and 7). From 5-14 February 2001, 15 hours were added to the elk survey flight time in Units 19 and 20 to allow total coverage of search units where bighorn sheep have been observed in the past. In Unit 17, eight bighorn sheep were observed on 8-9 February 2001 during a bighorn sheep capture effort in the upper Selway River east of Magruder Crossing. Spring surveys were most recently conducted in Units 19 and 20 during 1-3 May 1993 and in Unit 17 from 28-30 April 1994.

Total numbers of bighorn sheep observed during surveys have declined in Units 17, 19, and 20 since the early 1980s. From 99 to 121 bighorn sheep were observed in Unit 17 from 1982-1984, whereas only 37 to 52 bighorn sheep were observed on the last three surveys prior to 1995 (Table 6). The number of sheep observed in the unit in 2003 (32) and in 2004 (34) indicate a further decline in total numbers.

One hundred twenty-two to 136 bighorn sheep were observed during 1983 and 1984 in Unit 19, but only 52-60 were observed in 1992, 1993, and 1996 (Table 7). Although conducted with low sampling intensity, abundance of bighorn sheep observed in the 2001 survey in Unit 19 was within the expected range given recent levels. In Unit 20, 207-230 bighorn sheep were observed

during 1986 and 1987; however, this number declined in surveys in 1993, 1994, and 1996 to a range of 66-87 (Table 7). Observed abundance in the Unit 20 survey in 2001 was alarmingly low. This may be related to the occurrence of large-scale fires that burned bighorn sheep habitat on both the north and south sides of the Salmon River during the summer of 2000. Of interest is the fact that the Three Bears Fire occurred throughout Hunt Area 20-2 and the Flossie Fire was south of the Salmon River, adjacent to Hunt Area 20-2. However, bighorn sheep numbers were “normal” in 20-2, and deficient in 20-1. Lamb recruitment remained high in Unit 19 in 2001 (47 lambs per 100 ewes) after rebounding in 1996 from lows in 1992 and 1993 of 5.3 and 0.0, respectively. In Unit 20, observed recruitment in 2001 continued to be variable at 27 lambs, up from the 1992-2000 average of 17. Results from the 1994 and 1995 surveys in Unit 17 suggested favorable levels of lamb recruitment.

Low recruitment rates and overall decline in bighorn sheep numbers over the long term in these units may be caused by disease and habitat conditions. Diseases have apparently caused reduced lamb survival in adjacent herds along the Salmon River. The most significant pathogen appears to be *Pasteurella* spp., which causes pneumonia. *Pasteurella* spp. has a significant effect on population dynamics through increased adult and lamb mortality. Lambs generally develop clinical infections once they are weaned and passive immunity through colostrum is lost. Additionally, the effects of recent wildfires on bighorn sheep populations in these areas is as yet unknown, but may affect adult survival and recruitment of young, and alter habitat use patterns and distribution.

Harvest Characteristics

Beginning in 1952 and lasting until 1970, bighorn sheep hunting in the Clearwater Region was offered on a general-hunt basis. From 1971 to 1981, permit levels and hunt boundaries remained the same with variations only in season length. In 1982, the four controlled hunts were expanded and the September-October season was split, creating two hunts within the same hunt boundary. In 1985, one permit each was added to the September portion of the four hunts along the Salmon River (19-1, 20-1, 20-3, and 20-5).

The hunting season format was changed again beginning in 1991 to reduce the probability of hunters shooting bighorn sheep in the wrong hunt area, while continuing to provide the same amount of hunter opportunity on a statewide basis. As a result, Hunt 19-2 and portions of Units 19A and 20A were combined into 19-L, and Hunts 20-3 and 20-5 were changed to Hunts 20-2 and 20-3. Hunts 20-2, 20-4, 20-6, and portions of Units 21 and 20A were incorporated into Hunt 20-L. Additionally, Hunt 20-1 was expanded to include a portion of Units 17 and 21 beginning in 1991.

The hunting season structure was modified for the 1993-1994 hunting regulations to respond to the decline in total numbers and lamb recruitment. The late hunts, which had higher success rates, were discontinued. The number of permits offered for early hunts was reduced from 25 to 15. In 1995, further changes were made to the Units 19 and 20 hunts to address population status concerns. Hunt Area 20-3 was added to Hunt Area 19 to become Hunt Area 19. Permit numbers were reduced to two each in Hunt Areas 20-1 (minus four permits) and 20-2 (minus one permit).

In 2003, ten permittees killed six rams for an average success rate of 60% (Table 3). The current level of harvest is questionable given bighorn sheep plan guidelines which call for a minimum population of 100 bighorn sheep and a maximum harvest of 20% of the legal rams observed on the previous survey. The three hunt areas contain three discreet bighorn sheep populations that are each below the 100 bighorn sheep minimum (Hunt Area 19: 62; Hunt Area 20-1: 17; Hunt Area 20-2: 25). Combined, there are only 104 bighorn sheep (Table 7). In addition, with a total of 17 legal rams, maximum harvest would be three rams. The five-year mean harvest in the three hunt areas was 4.8 rams. These data suggest that the current ten permits should be reduced to seven: four in Hunt Area 19 and three in Hunt Area 20 (20-1 and 20-2 combined).

Habitat and Climatic Conditions

Bighorn sheep habitat in Units 14, 17, 19, and 20 consists of dry bunchgrass habitat types along the Salmon River breaks and in the upper Selway River drainage. Ownership throughout the area is primarily USFS with small inholdings of private land.

Prior to 1995, drought conditions predominated leading to dry, hot summers and mild winters. These conditions may have led to increased winter survival but may also have limited lamb production and lamb survival during summer and fall. In the fall of 1992, numerous lightning-caused fires occurred along the Salmon River breaks in Units 14 and 19. Extensive burns resulted from wildfires during the summer and fall of 2000. In Unit 19, the Lone Sheep Fire burned about 300 acres in the Gospel Hump Wilderness. The Three Bears and Flossie fires burned a total of about 120,000 acres in the Frank Church River-of-No-Return Wilderness in Unit 20. Fire activity may have diminished short-term habitat potential but can be expected to improve habitat conditions in the long term.

The Clearwater Region experienced weather conditions in 2003-2004 that were considered below normal. Snowpack in the Clearwater Basin was 89% of average (October-March) while the Salmon River Basin averaged 78% for the same time period. Snowfall was earlier than usual in the Region but most accumulation at the lower elevations did not persist. This allowed big game populations to forage and move easily and probably had a positive effect on big game over-winter survival.

Trapping and Transplants

As part of a statewide effort to monitor health in bighorn sheep populations, bighorn sheep were captured after immobilization with Carfentanil-filled darts to obtain throat and ear swabs and blood and fecal samples. During two trips up the Salmon River by jet boat into Unit 19 in November and December 2000, a total of 15 bighorn sheep (three rams and 12 ewes) were sampled and ear-tagged. Additionally in Unit 17, three bighorn sheep (one ram and two ewes) were processed during a trip by snowmachine into the upper Selway River area near Magruder Crossing at Sheep Creek 8-9 February 2001. Samples were taken from the ram, a 2½ year old, after it was observed from a helicopter being attacked and killed by a mountain lion.

Table 1. Summary of bighorn sheep population data for Units 13 and 18 in the Clearwater Region, 1983-present.

Unit/Year	Ewes	Lambs	Rams				Total legal rams	Total sheep	Lambs: 100 ewes	Rams: 100 ewes
			I	II	III	IV				
13										
1997 ^{a,b}										
Dec.	12	0	4	0	0	0	0	16	0.0	33.0
1998										
10/20	12	8	0	2	0	0	0	22	66.7	16.7
1999 ^c										
3/22 ^b	14	7	3	2	0	0	0	26	50.0	35.7
12/17 ^b	17	12	4	2	2	0	2	37	70.6	47.1
2000										
6/13	21	16	4	2	2	0	2	45	76.2	38.1
12/4 ^b	18	2	3	2	2	1	3	28	11.1	44.4
2001										
3/24	16	1	2	3	2	1	3	25	6.3	50.0
12/19 ^b	15	7	2	3	5	0	5	32	50.8	66.6
2002										
3/23 ^b	16	7	0	3	6	0	6	32	43.8	56.3
2003 ^d										
3/15,16 ^b	20	0	1	5	6	0	6	32	0.0	60.0
2004										
3/19 ^b	7	2	2	2	8	0	8	21	28.6	171.4
18 ^e										
1983 ^b	28	15	4	10	3	2	5	62	53.6	67.9
1987 ^b	23	4	0	4	5	1	6	37	17.4	43.5
1990 ^b	16	0	3	2	1	0	1	22	0.0	37.5
1992 ^b	1	0	0	0	1	0	1	2	0.0	100.0
1993 ^b	5	0	0	0	0	0	0	5	0.0	0.0
1996	0	0	0	0	0	0	0	0	0.0	0.0
1998 ^b	3	3	1	0	1	0	1	8	100.0	67.0
1999 ^b	5	2	1	0	0	0	0	8	50.0	20.0
2000 ^b	5	3	1	0	0	0	0	9	60.0	20.0
2001 ^b	4	2	0	1	0	0	0	7	50.0	25.0
2002 ^b	6	2	1	1	2	0	3	12	33.3	67.7
2003 ^b	6	3	3	2	0	0	0	14	50.0	83.3

^a Transplant from British Columbia, Canada.

^b Survey data used for population trend analysis.

^c Transplant from Alberta, Canada, of six bighorn sheep.

^d Two class II rams dispersed into herd from 2002 transplant from Montana.

^e Surveys during 1983, 1990, and 1992 were conducted during winter (December-January) incidental to mule deer and elk surveys. The 1987, 1993, and 1996 surveys were conducted during spring (March-April). The 1998, 1999, 2000, 2002, and 2003 data were collected incidentally from the Snake River in May and June. The 2001 data were collected incidentally from the Snake River in March.

Table 2. Summary of bighorn sheep population data for Unit 11 in the Clearwater Region, 1992-present. Counts are not additive.

Year ^a	Ewes	Lambs	Rams		Uncl.	Total sheep	Lambs: 100 ewes	Rams: 100 ewes
			Sub-legal	Legal				
1992	30	8	6	13	0	57	26.7	63.3
1993	25	4	6	10	0	45	16.0	64.0
1994	45	15	7	10	0	77	33.3	37.8
1995								
12/1 ^b	40	13	7	12	0	72	32.5	47.5
12/18	18	8	4	9	0	39	44.4	72.2
12/23	16	4	5	9	0	36	25.0	87.5
1996								
1/5	26	11	1	6	0	44	42.3	26.9
1/30	24	10	5	1	0	40	41.7	25.0
2/15	31	10	7	2	0	50	32.3	29.0
2/28	29	8	8	2	0	47	27.6	34.5
3/20 ^b	36	14	11	6	0	67	38.9	47.2
6/20	19	11	10	5	0	45	57.9	78.9
11/21	30	2	14	7	0	53	6.7	70.0
1997								
6/27	28	23	4	8	0	63	82.1	42.9
12/6 ^b	34	17	8	12	0	71	50.0	58.8
1998								
3/18	35	15	12	11	0	73	42.8	65.7
12/9 ^b	41	9	16	18	0	84	30.0	82.9
1999								
3/22 ^b	44	8	11	17	0	80	18.1	63.6
12/16	46	11	10	19	0	86	23.9	63.0
2000								
12/11 ^b	56	28	8	16	24	130	50.0	42.0
2001								
3/22 ^b	55	30	8	28	0	121	54.6	50.9
2002								
3/20	61	10	16	34	0	121	16.0	62.5
12/5-13 ^b	66	39	17	25	0	148	59.1	63.6
2004								
3/12-14 ^b	77	11	12	30	0	130	14.3	54.5

^a Surveys prior to 1995 were conducted during December and January incidental to elk and mule deer surveys.

^b Survey data used for population trend analysis.

Table 3. Summary of bighorn sheep harvest and drawing odds by hunt area in the Clearwater Region, 1994-present.

Hunt area	Year	No. of permits	Harvest	% Success	Days/hunter ^a	First-choice applicants	Drawing odds
11	1994 ^b	2	3	100	1.0	61	1:30.5
	1995	1	2	100	8.0	68	1:68.0
	1996 ^b	2	2	100	2.0	105	1:52.0
	1997	Closed					
	1998	Closed					
	1999 ^b	0	1	100	5.0	0	-
	2000	Closed					
	2001 ^b	1	2	100	2.0	222	1:222.0
	2002 ^b	1	2	100	3.0	263	1:263.0
	2003 ^b	1	2	100	1.0	248	1:248.0
19 ^c	1994	3	2	67	8.0	16	1:5.3
	1995	6	4	67	12.2	51	1:8.5
	1996	6	2	33	-	47	1:7.8
	1997	6	4	67	8.7	62	1:10.3
	1998	6	4	67	2.5	71	1:11.8
	1999	6	4	67	7.3	59	1:9.8
	2000	6	4	67	8.0	76	1:12.7
	2001	6	3	50	5.0	68	1:11.3
	2002	6	4	67	5.0	82	1:13.7
	2003	6	5	83	9.2	126	1:21.0
20-1	1994	6	2	33	7.0	28	1:4.7
	1995	2	1	50	9.5	15	1:7.5
	1996	2	2	100	3.0	30	1:15.0
	1997	2	1	50	9.0	23	1:11.5
	1998	2	2	100	8.0	22	1:11.0
	1999	2	0	0	-	45	1:22.5
	2000	2	2	100	11.0	10	1:5.0
	2001	2	1	50	20.0	33	1:16.5
	2002	2	1	50	17.0	24	1:12.0
	2003	2	0	0	-	17	1:8.5
20-2	1994	3	1	33	5.5	8	1:2.7
	1995	2	0	0	-	12	1:6.0
	1996	2	0	0	-	5	1:2.5
	1997	2	1	50	8.0	12	1:6.0
	1998	2	2	100	-	16	1:8.0
	1999	2	1	50	30.0	14	1:7.0
	2000	2	0	0	-	10	1:5.0
	2001	2	1	50	14.0	19	1:9.5
	2002	2	1	50	15.0	7	1:3.5
	2003	2	1	50	9.0	20	1:10.0

Table 3. Continued.

Hunt area	Year	No. of permits	Harvest	% Success	Days/hunter ^a	First-choice applicants	Drawing odds
20-3 ^c	1994	3	2	67	10.0	23	1:7.7

^a Prior to 1996, data are from a telephone survey of all hunters. Beginning in 1996, data are from mandatory check of successful hunters only.

^b The state auction or lottery tag holder hunted for bighorn sheep in Unit 11, raising participation by one permit.

^c Hunt 19 was expanded in 1995 to include 20-3.

Table 4. Summary of bighorn sheep harvest and drawing odds in the Clearwater Region, 1982-present.

Year	No. of permits	Harvest	% Success	First-choice applicants	Drawing odds
1982	13	3	23	79	1:6.1
1983	13	3	23	64	1:4.9
1984	17	9	53	124	1:7.3
1985	19	5	26	73	1:3.8
1986	19	6	32	139	1:7.3
1987	19	9	47	107	1:5.6
1988	19	11	58	83	1:4.4
1989	19	8	42	108	1:5.7
1990	19	8	42	64	1:3.4
1991	31	11	35	202	1:6.5
1992	31	13	42	151	1:4.9
1993 ^a	18	6	33	173	1:10.2
1994 ^a	18	10	56	136	1:8.0
1995	11	5	45	146	1:13.3
1996 ^a	12	6	50	187	1:17.0
1997	10	6	60	97	1:9.7
1998	10	8	80	109	1:10.9
1999 ^a	11	6	55	118	1:11.8
2000	10	6	60	96	1:9.6
2001 ^a	11	7	64	342	1:31.1
2002 ^a	11	8	73	376	1:34.2
2003 ^a	11	8	73	411	1:37.4

^a The state auction or lottery tag holder hunted for bighorn sheep in Unit 11, raising participation by one permit.

Table 5. 2003 season structure for bighorn sheep hunts in the Clearwater Region.

Season		Length	Hunt area	Number of permits
Dates				
30 August - 13 October		45 days	11	1
			19	6
			20-1	2
			20-2	2

Table 6. Summary of bighorn sheep population data for Unit 17 in the Clearwater Region, 1981-present.

Year ^a	Ewes	Lambs	Rams		Uncl.	Total sheep	Lambs: 100 ewes	Rams: 100 ewes
			Sub-legal	Legal				
1981	16	7	1	0	31	55	43.8	6.3
1982	84	29	8	0	0	121	34.5	9.5
1983	38	8	10	1	42	99	21.1	28.9
1984	56	26	18	9	0	109	46.4	48.2
1988	22	8	12	1	0	43	36.4	59.1
1991	37	7	6	2	0	52	21.2	24.2
1994	20	4	6	6	0	37	20.0	60.0
1995 ^b	22	11	5	5	0	43	50.0	45.5
2001 ^c	2	0	1	0	0	3	-	-
2003	10	6	2	0	14	32	60.0	-
2004	13	9	4	8	0	34	71.0	92.3

^a The 1994 survey was conducted during spring (28-30 April). Previous surveys and the 1995 survey were conducted during January and February coincident with elk surveys.

^b The 1995 data were analyzed using the current bighorn sheep sightability model.

^c The 2001 data were collected during a bighorn sheep capture effort in the upper Selway River east of Magruder Crossing.

Table 7. Summary of bighorn sheep population data for Units 19 and 20 in the Clearwater Region, 1981-present.

Unit/ Year ^a	Ewes	Lambs	Rams				Uncl.	Total legal rams	Total sheep	Lambs: 100 ewes	Rams: 100 ewes
			I	II	III	IV					
19											
1981	44	9	3	0	0	0	0	56	20.5	6.8	
1982	76	14	4	3	2	1	0	100	18.4	13.2	
1983	95	31	6	4	0	0	0	136	32.6	10.5	
1984	92	25	1	2	2	0	0	122	27.2	5.4	
1986	69	9	3	4	3	1	0	89	13.0	15.9	
1987	68	20	2	0	0	0	0	90	29.4	2.9	
1989	63	20	4	3	1	0	0	91	31.7	12.7	
1992	38	2	1	4	7	0	0	52	5.3	31.6	
1993	40	0	7	2	11	0	0	60	0.0	5.3	
1996	32	14	5	0	2	3	0	56	44.8	31.3	
2001	28	13	0	5	0	7	0	53	46.4	42.9	
20											
1981	12	3	6	3	1	1	0	26	25.0	91.7	
1982	78	19	3	8	15	6	0	129	24.4	41.0	
1983	83	13	13	11	10	3	0	133	15.7	44.6	
1984	107	29	6	15	14	6	0	177	27.1	38.3	
1986	132	31	14	15	19	19	0	230	23.5	50.8	
1987	113	25	16	12	30	11	0	207	22.1	61.1	
1989	94	26	10	9	10	3	0	152	27.7	34.0	
1992	68	13	3	8	10	4	0	106	19.1	36.8	
1993	53	7	1	2	3	0	0	66	13.2	11.3	
1994	49	11	10	3	12	2	0	87	22.4	55.1	
1996	51	7	4	5	7	3	1	78	13.8	39.2	
2001	22	6	10	0	13	0	0	51	27.3	104.6	

^a The 1993 survey was conducted during spring (May). All other surveys were conducted during January and February coincident with elk surveys. The 2001 data include sightability estimates with 90% bounds.

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE:	<u>Idaho</u>	JOB TITLE:	<u>Bighorn Sheep Surveys and</u>
PROJECT:	<u>W-170-R-28</u>		<u>Inventories</u>
SUBPROJECT:	<u>3, Nampa</u>	STUDY NAME:	<u>Big Game Population Status,</u>
STUDY:	<u>1</u>		<u>Trends, Use, and Associated</u>
JOB:	<u>4</u>		<u>Habitat Studies</u>
PERIOD COVERED:	<u>July 1, 2003 to June 30, 2004</u>		

SOUTHWEST (NAMPA) REGION

Units 41, 42

Controlled Hunt Areas 41, 42-1, 42-2

Abstract

Aerial surveys of California bighorn sheep herds were last conducted in early July 2002. The number of sheep observed (126) in the Little Jacks Creek and Big Jacks Creek herd decreased 44% from the count in 2000, but ground and aerial observations during the survey suggest sheep avoidance reaction to the helicopter may have been a more significant factor during this survey than in prior years. The survey crew detected only 50% of the radio-marked animals in this herd. Two hundred forty-nine bighorn sheep were observed during the survey in the Owyhee River area in 2002, a 19% reduction compared to the 2000 count. Disturbance and displacement of sheep by another helicopter during a portion of this survey may have contributed to the low count.

Department wildlife staff collected samples in March 2002 from three bighorn sheep populations to determine if these herds have been exposed to any disease agents that may be affecting population viability. An additional 31 samples were collected in March 2003. The Department and University of Idaho also initiated a graduate research project to assess bighorn sheep productivity and survival in the Little and Big Jacks Creek population. The project is in its third (final) year and is expected to be completed in spring 2005.

Fourteen bighorn sheep were captured from the East Fork Owyhee herd and Bruneau/Jarbidge herds in March 2003 and transplanted to start a new population in the Independence Peaks area in Unit 51.

Thirteen hunters harvested six California bighorn sheep during the 2003 hunting season.

Management Direction

Reintroduce bighorn sheep into as many suitable habitats as possible while keeping the Rocky Mountain and California bighorn sheep subspecies geographically separated; maintain controlled hunt strategy and offer more hunter opportunity where consistent with management goals; encourage bighorn sheep habitat improvement projects by land management agencies; harvest rams under the present $\frac{3}{4}$ curl 4+ years regulation, but consider a ewe hunt on a trial basis; harvest and/or remove for transplant no more than 15-20% of the observed legal rams in a hunt unit; and promote the non-consumptive value of bighorn sheep and consider such values in our management decisions.

The Department will continue to cooperate and coordinate management with Nevada and Oregon to ensure that adjacent bighorn sheep habitat is stocked with only the California subspecies; conduct a research study of California bighorn sheep population status, habitat needs, and livestock interactions; and increase permit levels as population status allows.

The goals for California bighorn sheep are to increase populations, establish new populations, increase harvest, and provide more recreation.

Background

Units 41 and 42 are reserved for the California bighorn sheep subspecies; all other units north of Interstate Highway 84 are designated as Rocky Mountain bighorn sheep habitat. Interstate 84 was selected as the boundary because it is readily definable and there are few places where suitable bighorn sheep habitat abuts this boundary from either the north or the south. Likelihood of bighorn sheep movement across this boundary is essentially nonexistent.

Four releases of California bighorn sheep from British Columbia into Owyhee County in the 1960s provided the nucleus for the original herds along portions of the Owyhee River and in Little Jacks Creek. As those herds grew, hunting seasons were initiated. Beginning in 1980, 50 bighorn sheep were transplanted into other parts of the Owyhee, Bruneau, and Jarbidge River drainage. An additional 12 bighorn sheep from British Columbia were released into Idaho's Jarbidge River Canyon in 1984 when deep snows prevented Nevada Department of Wildlife personnel from reaching their proposed release site in Nevada. Much suitable habitat remains unoccupied; there are significant opportunities to enhance population growth and geographic expansion of these bighorn sheep through a continuing transplant program. During this planning period, California bighorn sheep may be released into several areas of unoccupied habitat.

Population Surveys

Aerial surveys of all established California bighorn sheep herds in Owyhee County were flown in August 1987 and again in June 1990. The Little Jacks Creek and Owyhee River have been regularly surveyed since 1983 (Table 1). No bighorn sheep were observed in the South Fork Owyhee or Little Owyhee River drainages in 1987; but in 1990, 32 bighorn sheep were seen in these two drainages. The number of bighorn sheep observed in the Owyhee River drainage decreased from 669 in 1993 to 347 in 1994 (Table 1). Prior to 1987, all known bighorn sheep

areas on the East Fork Owyhee River drainage downstream to Red Canyon were surveyed. In 1987, a stratified random sample of the drainage was surveyed, as well as additional areas from Red Canyon downstream to the Oregon border. Since 1990, the survey area has included the whole drainage from the Oregon border upstream to approximately five miles above the point where the pipeline crosses the East Fork Owyhee River.

The drainage of the Little Jacks Creek/Shoofly Creek complex has been surveyed since 1983 (Table 1). A research project to develop a sightability survey technique to correct for missed bighorn sheep was conducted in the Little Jacks Creek area 1987-1991. June appears to offer the best “time window” during which to conduct bighorn sheep census flights, but a stratified random survey methodology does not appear to work due to extensive movements of bighorn sheep between sampling units as a response to helicopter disturbance. The number of bighorn sheep counted in 1993 was an all-time high.

Population surveys were conducted in July 2002. The weather conditions and plant phenology were favorable for the survey. The survey area was well covered and there were no problems with the survey operation. However, the number of sheep observed in the Jacks Creek drainages (126) declined 44% from the number observed in 2000 (225). The decline in total observed sheep is cause for concern, but ground and aerial observations of the reaction of sheep to the survey helicopter suggests that their dramatic escape response to the sound of the helicopter contributed to the low counts during this survey. Most sheep counted from the helicopter were already running for cover when first detected, and ground observers confirmed that sheep began running and/or sought cover in caves, slot canyons, or under overhanging rocks in response to the sound of the helicopter long before the aircraft was visible from the ground. The escape response was most dramatic in the Jacks Creek drainages where 38 bighorn sheep were captured by helicopter in March 2002 and radio-collared for a research project. In fact, aerial observers detected only 50% of the 34 radio-collared sheep known to be in the study area during the survey.

The reduced count during this survey may have been a result of an extreme escape response caused by the recent disturbance of sheep during the March capture operation. Although the dramatic decrease in number of observed sheep is reason for concern, these survey data should be evaluated with caution and the population reassessed within the next two years.

Big and Little Jacks Creek were both surveyed in 1998, 2000, and again in 2002 (Table 1). In the past, these areas have been treated as separate herds. After the increase in the Big Jacks Creek area population over time, there appears to be at least some interchange between the Big Jacks and Little Jacks Creek herds. With this interchange between the two areas, it is most appropriate that the population data be combined and examined as one larger herd (Table 1).

There are scattered pockets of bighorn sheep habitat in Unit 40, but none of these areas were surveyed in 2000 or 2002.

The East Fork Owyhee River herd showed little change between the 1998 (334 bighorn sheep observed) and 2000 surveys (309 observed), but 19% fewer sheep were observed in 2002

(249 observed) compared to 2000 (Table 1). Escape behavior of sheep observed in the Owyhee River area was much less dramatic in response to the helicopter than in the Big and Little Jacks Creek drainages and many sheep were observed standing still or walking rather than running for cover. Conditions were good and the search area and effort were comparable to the 1998 and 2000 survey. However, during the 2002 survey of the Deep Creek drainage, the survey crew encountered another helicopter flying along the bottom of the canyon. Origin of the other helicopter is unknown, but it is plausible that a sheep tag holder contracted a private helicopter to scout for sheep prior to his fall hunt. Regardless of the origin of this aircraft, it is probable that sheep were displaced from this search area during or prior to our survey effort. Six separate groups of sheep were observed in the Deep Creek Canyon area during the 2000 survey, but no sheep were observed there during our 2002 survey. If sheep were, in fact, displaced from the Deep Creek Canyon prior to our flight, the loss of these sheep from the 2002 survey count may explain a substantial portion of the difference in counts between the 2000 and 2002 survey totals.

A population survey of the Unit 41 and 42 sheep populations is planned for early July 2004.

Research

In response to concerns over sheep population status in the southwest region, the Department initiated two research projects in March 2002. Blood samples, fecal samples, ear swabs, and pharyngeal swabs were taken from ten sheep captured from the Owyhee River population, ten from the Bruneau-Jarbidge population, and approximately 40 from the Jacks Creek population to determine if these populations are affected by any diseases that could potentially be affecting population viability. Samples were collected from another 31 bighorn sheep in March 2003. Serology of 57 bighorn sheep sampled in the Jacks Creek, Owyhee, and Bruneau/Jarbidge herds in 2002 and 31 sampled in 2003 indicated minimal exposure to common viral and bacterial pathogens. Parasite loads of sampled sheep were considered normal. Pharyngeal swabs indicated a high prevalence of typical *Pasteurella* spp., but most were of low pathogenicity.

Blood samples collected from 39 ewes in the Jacks Creek population in 2002 and 13 ewes in 2003 indicated a pregnancy rate of 92% both years. Five of seven (71%) ewes sampled in the Owyhee herd in 2002 were pregnant and 100% of seven ewes sampled in that herd in 2003 were pregnant.

In addition to disease testing, the Department and University of Idaho are cooperating on a mortality and productivity study in the Big and Little Jacks Creek Canyons. Thirty-six ewes and one young ram were captured by helicopter and radio-collared in March 2002. An additional 14 ewes were radio-marked in March 2003. A university graduate student is monitoring the marked sheep to document ewe mortality, birth rates, lamb survival, and movements of marked sheep within and around the canyon complex.

Harvest Characteristics

The permit levels in most California bighorn sheep hunts were reduced in 1995, but a ram hunt was opened in Big Jacks Creek that year. The decrease in permit levels resulted in some changes to the season dates. The ram hunts were changed from three 12-day hunts to two 16-day hunts in

the Little Jacks Creek and Owyhee River areas. There was a six-day no hunting period between each hunt. The two hunts spread out the hunting pressure and reduced the potential for conflict from hunter crowding. However, even with the two hunts, some hunters interfered with other hunters by their presence or the inappropriate use of off-road vehicles.

There were two changes in the season structure for 1999 and 2000. The Big Jacks Creek hunt (41-4) was split into an early (30 Aug-14 Sep, 41-4) and a late (22 Sep-8 Oct, 41-5) hunt, similar to the Little Jacks Creek area. Unit 40, which contains several pockets of occupied bighorn sheep habitat, was added to Little Jacks Creek hunt areas 41-1 and 41-2. However, hunters did not harvest any rams from Unit 40 in 1999 or 2000.

In the 2001 and 2002 hunting seasons, Unit 40 was eliminated and the hunts in the Little Jacks and Shoofly drainages were closed because of concerns over declining numbers of sheep (Hunt Areas 41-1 and 41-2). Hunts 41-4 and 41-5 (the Big Jacks Creek drainage) were combined and renamed Hunt Area 41, and the permit level was changed to three. For the 2003 and 2004 hunting seasons, the Little Jacks and Shoofly drainages and Unit 40 were reopened and added to Hunt Area 41. Total permits for this larger hunt area remained unchanged (three permits) from the 2001 and 2002 hunt that included only the Big Jacks Creek drainage (Table 2).

The decreased number of permits did reduce the chances of drawing a California bighorn sheep permit (Tables 3 and 4). Based upon the mandatory check requirement, 13 hunters harvested six California bighorn rams in 2003 for a 46% success rate.

Habitat Conditions

These units are characterized by large expanses of flat terrain dominated by sagebrush/grass vegetative types. The major drainage systems (the Bruneau, Jarbidge, and Owyhee Rivers) have formed steep canyons that provide the habitats preferred by California bighorn sheep. Grass-covered benches along these canyons provide foraging sites. Steepness of these canyons and isolation of some forage areas by rimrock reduces competition between bighorn sheep and cattle. Thus, bighorn sheep seldom compete with cattle for forage on those sites. However, the potential for bighorn sheep/livestock conflicts may exist adjacent to the canyons, or in portions of the canyons accessible to livestock as the numbers of bighorn sheep or cattle increase, or as availability of forage decreases in the canyons due to drought, grazing pressure, wildfire, or invasion of unpalatable exotic weed or grass species.

The BLM administers most of the habitats suitable for bighorn sheep within these units. Some parcels of USFS, state, and private lands also contain suitable habitat. Most currently-occupied habitat has been under study by the BLM for possible wilderness designation and is incorporated in the current Owyhee Canyonlands Wilderness proposal.

Trapping and Transplants

Five ewes and one young ram were captured in the East Fork Owyhee River drainage and transplanted to start a new population in the Independence Peaks area in Unit 51 in March 2003. A history of trapping and translocation activity in Units 40, 41, and 42 appears in Table 5.

Management Implications

California bighorn sheep were reintroduced into Little Jacks Creek in 1967. The first controlled hunt was held in 1975. Prior to 1993, permit levels were held at a conservative level. This was in accordance with the plan that called for no more than 20% removal of legal rams. Additionally, the Owyhee River bighorn sheep population has been used to supply California bighorn sheep for reintroduction into other areas.

Hunting seasons since 1995-1996 have been modified in response to the 1994 and subsequent population survey results. These bighorn sheep populations should continue to be monitored very closely. Aerial surveys should be conducted every other year to monitor population trends, ram:ewe ratios, and lamb survival while these populations are being harvested for transplant and sport. If the herd continues to show a declining trend for several years, the rate of bighorn sheep removal should be closely evaluated and adjusted so that the herd will continue to be a viable source of transplant stock.

Table 1. Summary of bighorn sheep population data for Units 41 and 42 in the Southwest (Nampa) Region, 1983-present.

Unit/ Year	Ewes	Lambs	Rams		Uncl.	Total sheep	Lambs: 100 ewes	Rams: 100 ewes
			Sub-legal	Legal				
41-Little Jacks Creek								
1983	-	-	17	25	-	115	53.0	74.0
1985 ^a	30	16	26	13	0	85	53.3	130.0
1985 ^b	40	18	22	16	0	96	45.0	95.0
1987 ^c	84	49	26	25	0	184	58.3	60.7
1987 ^a	102	35	19	8	0	164	34.3	26.5
1988	73	29	56	26	0	184	39.7	112.3
1989	105	43	33	22	0	203	41.0	52.4
1990	78	32	54	33	5	202	41.0	111.5
1991	99	55	43	37	7	241	55.6	80.8
1992	81	42	35	36	0	194	51.9	87.7
1993	142	36	51	41	0	270	25.4	64.8
1994	107	40	41	16	0	204	37.4	53.3
1996	95	33	39	14	0	181	34.7	55.8
41-Big Jacks Creek								
1990	14	10	-	-	-	38	71.4	-
1993	46	19	17	8	0	90	41.3	54.3
1997	73	38	12	18	0	141	52.1	41.1
41-Big and Little Jacks Creek								
1998	116	48	60	31	0	258	41.4	78.4
2000	141	51	17	16	0	225	36.2	23.4
2002	63	18	21	19	5	126	28.6	63.5
42								
1983	135	76	76	46	1	334	56.3	90.4
1985	124	71	57	21	0	273	57.3	62.9
1987	140	70	-	-	0	329	50.0	85.0
1990	339	183	71	46	0	639	54.0	34.5
1991	400	175	60	114	4	753	43.8	43.5
1992	323	142	101	54	0	620	44.0	48.0
1993	406	81	125	57	0	669	20.0	44.8
1994 ^c	179	73	51	42	2	347	40.8	52.0
1994 ^d	177	63	61	35	0	336	35.6	54.3
1996	202	96	52	51	0	401	47.5	51.0
1998	204	76	24	26	4	334	37.3	24.5
2000	198	60	29	22	0	309	30.3	25.8
2002	164	50	25	9	1	249	30.5	20.7

^a August survey.

^b November survey.

^c June survey.

^d July survey.

Table 2. 2003 season structure for bighorn sheep hunts in the Southwest (Nampa) Region.

Season		Length	Hunt area	Number of permits
Dates				
30 August – 8 October		40 days	41	3
30 August-14 September		16 days	42-1	5
22 September-8 October		17 days	42-2	5

Table 3. Summary of bighorn sheep harvest and drawing odds in the Southwest (Nampa) Region, 1983-present.

Year	No. of permits	Harvest	% Success	First-choice applicants	Drawing odds
1983	11	6	55	197	1:17.9
1984	18	14	78	205	1:11.4
1985	20	16	80	245	1:12.3
1986	22	13	59	363	1:16.5
1987	22	14	64	360	1:16.4
1988	22	14	64	331	1:15.0
1989	22	14	64	275	1:12.5
1990	22	19	86	300	1:13.6
1991	30	25	83	373	1:12.4
1992	30	26	87	457	1:15.2
1993	62	39	63	467	1:7.5
1994	62	40	65	685	1:11.0
1995	39	25	64	584	1:15.0
1996	39	23	59	558	1:14.3
1997	39	27	69	557	1:14.3
1998	39	29	74	636	1:16.3
1999	37	22	59	607	1:16.4
2000	37	21	57	483	1:13.1
2001	13	9	69	232	1:17.8
2002	13	4	31	233	1:17.9
2003	13	6	46	200	1:15.4

Table 4. Summary of bighorn sheep harvest and drawing odds by hunt area in the Southwest (Nampa) Region, 1994-present.

Hunt area	Year	No. of permits	Harvest	% Success	Days/hunter ^a	First-choice applicants	Drawing odds
41-1 ^b	1994	5	4	80	7.0	110	1:22.0
	1995	5	5	100	8.5	84	1:16.8
	1996	5	3	60	10.0	103	1:20.6
	1997	5	3	60	6.7	86	1:17.2
	1998	5	4	80	6.5	95	1:19.0
	1999	4	3	75	4.7	115	1:28.7
	2000	4	2	50	3.5	83	1:20.8
41-2 ^b	1994	5	2	40	6.3	83	1:16.6
	1995	5	5	100	3.8	86	1:17.2
	1996	5	3	60	8.0	80	1:16.0
	1997	5	3	60	1.3	57	1:11.4
	1998	5	2	40	12.5	72	1:14.4
	1999	4	3	75	4.7	82	1:20.5
	2000	4	4	100	4.0	53	1:13.3
41 ^b	2001	3	3	100	-	67	1:22.3
	2002	3	1	33	14.0	83	1:27.7
	2003	3	3	100	5.0	74	1:24.7
41-3 ^c	1994	5	5	100	5.3	42	1:8.4
41-4 ^b	1994	5	3	60	4.8	6	1:1.2
	1995	3	3	100	7.5	94	1:31.3
	1996	3	3	100	4.3	71	1:23.7
	1997	5	3	60	3.0	108	1:21.6
	1998	5	5	100	3.6	110	1:22.0
	1999	3	2	67	2.0	43	1:14.3
	2000	3	3	100	6.3	38	1:12.7
41-5 ^b	1999	2	2	100	5.5	34	1:17.0
	2000	2	2	100	3.0	44	1:22.0
42-1	1994	12	5	42	7.4	135	1:11.3
	1995	10	6	60	7.4	110	1:11.1
	1996	10	4	40	6.0	139	1:13.9
	1997	10	6	60	5.3	93	1:9.3
	1998	10	7	70	6.6	144	1:14.4
	1999	10	3	30	2.3	149	1:14.9
	2000	10	2	20	7.0	77	1:7.7
	2001	5	3	60	6.3	76	1:13.3
	2002	5	3	60	6.0	72	1:14.4
2003	5	1	20	1.0	76	1:15.2	
42-2	1994	12	8	67	5.4	127	1:10.6
	1995	10	3	30	7.3	136	1:13.6
	1996	10	6	60	3.7	90	1:9.0
	1997	10	8	80	4.8	111	1:11.1
	1998	10	7	70	4.7	124	1:12.4

Table 4. Continued.

Hunt area	Year	No. of permits	Harvest	% Success	Days/hunter ^a	First-choice applicants	Drawing odds
42-3 ^d	1999	10	7	70	6.6	125	1:12.5
	2000	10	5	50	3.4	100	1:10.0
	2001	5	3	60	-	89	1:17.9
	2002	5	0	0	-	78	1:15.6
	2003	5	2	40	7.0	50	1:10.0
	1994	12	11	90	6.0	91	1:7.6
	1997	2	2	100	1.0	46	1:23.0
	1998	2	2	100	5.0	58	1:29.0
	1999	2	1	50	2.0	32	1:16.0
	2000	2	1	50	2.0	45	1:22.5
42-4 ^d	1997	2	2	100	2.0	56	1:28.0
	1998	2	2	100	9.0	33	1:16.5
	1999	2	1	50	2.0	27	1:13.5
	2000	2	2	100	4.0	43	1:21.5

^a Prior to 1996, data are from a telephone survey of all hunters. Beginning in 1996, data are from mandatory check of successful hunters only.

^b Hunts 41-1 and 41-2 were closed in 2001, and Hunts 41-4 and 41-5 were renamed Hunt 41.

^c Hunt 41-3 was eliminated in 1995.

^d Hunts 42-3 and 42-4 were eliminated in 2001.

Table 5. Summary of bighorn sheep translocation in the Southwest (Nampa) Region, 1963-present.

Date	Capture site	Release site	Adult ^a		Lambs		Total
			Male	Female	Male	Female	
Oct 1963	Chilcotin, B.C.	E.F. Owyhee R	5	14	-	-	19
Nov 1965	Chilcotin, B.C.	E.F. Owyhee R	2	7	-	-	9
Nov 1966	Chilcotin, B.C.	E.F. Owyhee R	2	8	-	-	10
Oct 1967	Chilcotin, B.C.	Little Jacks Cr	4	8	-	-	12
Mar 1980	Little Jacks	Granite Mt, NV	1	4	-	-	5
Feb 1981	Little Jacks	Jarbidge R, NV	3	9	-	-	12
Dec 1982	E.F. Owyhee	Bruneau/Jarbidge	2	10	-	-	12
Mar 1984	Chilcotin, B.C.	Bruneau/Jarbidge	2	10	-	-	12
Dec 1984	E.F. Owyhee	Bruneau/Jarbidge	2	9	-	-	11
Jan 1985	Little Jacks	Bruneau/Jarbidge	1	0	-	-	1
Jan 1985	Little Jacks	S.F. Owyhee	2	7	-	-	9
Dec 1986	E.F. Owyhee	Snowcloud Mt, NV	-	-	-	-	7
Dec 1986	E.F. Owyhee	Cottonwood Cr	4	11	-	-	15
Dec 1987	Little Jacks	Cottonwood Cr	3	11	-	-	14
Feb 1988	Chilcotin, B.C.	Big Jacks Cr	3	11	-	-	14
Mar 1988	E.F. Owyhee	Big Jacks Cr	2	0	-	-	2
Nov 1988	Shoofly Cr	Cottonwood Cr	5	9	-	-	14
Nov 1988	Shoofly Cr	Nevada	2	11	-	-	13
Nov 1988	Battle Cr	Duncan Cr	9	15	-	-	24
Dec 1989	Little Jacks	W.F. Bruneau	3	9	-	-	12
Nov 1990	E.F. Owyhee	W.F. Bruneau	5	11	0	0	16
Nov 1990	E.F. Owyhee	North Dakota	6	17	0	0	23
Nov 1991	E.F. Owyhee	E.F. Dry Cr	3	10	2	1	16
Nov 1991	E.F. Owyhee	North Dakota	5	28	3	2	38
Nov 1991	E.F. Owyhee	Nevada	4	31	1	2	38
Dec 1993	E.F. Owyhee	Battle Mt, NV	3	20	1	1	25
Dec 1993	E.F. Owyhee	Deschutes, OR	6	25	2	2	35
Dec 1993	E.F. Owyhee	Bruneau/Jarbidge R & Big Cottonwood Cr	-	-	-	-	45
Mar 2003	E.F. Owyhee	Independence Pks, Id.	1	5	-	-	6

^a When the age of transplanted bighorn sheep is not available, all are listed as adult.

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE:	<u>Idaho</u>	JOB TITLE:	<u>Bighorn Sheep Surveys and</u>
PROJECT:	<u>W-170-R-28</u>		<u>Inventories</u>
SUBPROJECT:	<u>3, McCall</u>	STUDY NAME:	<u>Big Game Population Status,</u>
STUDY:	<u>1</u>		<u>Trends, Use, and Associated</u>
JOB:	<u>4</u>		<u>Habitat Studies</u>
PERIOD COVERED:	<u>July 1, 2003 to June 30, 2004</u>		

SOUTHWEST (MCCALL) REGION

UNITS 19A, 20A, 26

Controlled Hunt Areas 20A, 26, 26-L

Abstract

The bighorn sheep hunt areas in Units 20A and 26 were restructured during implementation of the 1991-1995 Bighorn Sheep Management Plan and again in 1997. Population surveys were conducted in Hunt Areas 20A, 26, and 26-L on 29 and 30 March, 2004. A total of 180 sheep was observed. The ram:100 ewes:lamb ratio was 34:100:28. A total of six harvest permits were issued in 2003 among three separate hunt areas. A total of two rams were harvested for a 33% hunter success rate.

Management Direction

Allow and/or encourage population increases. Increase recreational opportunity. Develop and/or continue with reintroduction programs. Monitor populations via helicopter surveys every other year.

Background

Hunting seasons for bighorn sheep in Units 20A and 26 were restructured with the implementation of the 1991-1995 Bighorn Sheep Management Plan. Prior to this plan, there were five hunt areas (20A-1, 20A-2, 20A-3, 26-1, and 26-2) in these units. Hunt Area 20A-1 remained unchanged. Hunt Area 20A-3 was incorporated into Hunt Area 20A-2. Hunt Areas 26-1 and 26-2 included all of Unit 26 and were stratified by season dates, but in 1992, a portion of Hunt Area 20A-2 was incorporated into Hunt Area 26-1 and a portion of 27-1 was incorporated into Hunt Area 26-2. The season dates for Hunt Areas 26-1 and 26-2 were made concurrent in 1991. Hunt Area 26-L was created in 1992 and incorporated portions of both Hunt Areas 26-1 and 26-2. This hunt was designed to provide a low permit level, high quality hunt close to the rut period. Hunt areas were restructured again in 1997 in response to declining bighorn sheep survey numbers. Hunt Area 20A-1 was eliminated and Hunt Area 20A-2 became

Hunt Area 20A. Hunt Areas 26-1 and 26-2 were combined and renamed Hunt Area 26; permit levels were reduced from a combined total of 11 to a new total of six. Permit levels were further reduced to two in Hunt Areas 20A and 26 in 2003. Population data in Table 1 reflect the new hunt area boundaries.

Population Surveys

Population surveys were conducted in Hunt Areas 20A, 26, and 26-L on 29 and 30 March, 2004 (Table 1). A total of 180 sheep were observed. The ram:100 ewes:lamb ratio was 34:100:28.

Harvest Characteristics

Harvest data are generated from a mandatory hunter report regulation for all permit holders for bighorn sheep hunts. Successful permit holders must present their bighorn sheep horns to a Department office and complete a harvest report within ten days of the date of kill. Unsuccessful permit holders must present and/or mail their unused bighorn sheep tag/permit to a Department office within ten days of the close of the hunt for which the tag was valid.

A combined total of six permits were authorized for bighorn sheep Hunt Areas 20A, 26, and 26-L in 2003 (Tables 2 and 3). Two rams were harvested which represents a 33% (two out of six) hunter success rate. The 2003 season structures are displayed in Table 4.

Management Implications

The permit level in Hunt Areas 26-1 and 26-2 was reduced by two and nine, respectively, in 1993. This reduction was in response to continued recruitment problems in the Big Creek and Middle Fork Salmon River drainages. The low number of legal rams observed in Hunt Area 26-2, and the fact that no hunters were able to harvest a legal ram during the 1995 and 1996 seasons indicated that management restrictions were necessary. In 1997, the permits for Hunt Area 26-2 were dropped, and Hunt Area 26-2 was combined with Hunt Area 26-1 to form new Hunt Area 26. The bighorn sheep population in Hunt Area 20A showed a similar trend, but permit levels remained constant. The 1999, 2002, and 2004 bighorn sheep aerial surveys indicated bighorn sheep recruitment may be improving, although the overall population still appears static, and ram numbers appear to be declining.

A research study conducted in April 2000 indicated that a highly virulent strain of *Pasteurella* spp. is present in the Big Creek bighorn sheep population. This evidence does not suggest that this population is stable. In response to the disease status and less than desirable population performance, permit levels were reduced from six to two in both Hunt Areas 20A and 26 for the 2003-2004 hunting seasons. This bighorn sheep population will be monitored every other year as funding permits.

UNITS 22, 23, 31

Abstract

No hunting or population surveys for bighorn sheep occurred in this area during the 2003-2004 reporting period.

Management Direction

Follow statewide management direction. Continue to work with the USFS and livestock producers in the Hells Canyon National Recreation Area to minimize the potential for any disease transfer between domestic sheep and bighorn sheep. Coordinate with the Oregon and Washington departments to release Rocky Mountain bighorn sheep in Hells Canyon. Open additional hunts as transplanted populations become established and meet minimum population estimate criterion of 100. Complete inventories of potential release sites, assess status of recently established herds, and increase bighorn sheep numbers through transplants.

Background

Units 22, 23, and 31 represent the southern and western distribution of Rocky Mountain bighorn sheep habitat in Idaho. Until recently, the Granite Creek drainage and the area from Granite Creek south to Hells Canyon Dam represented the occupied bighorn sheep habitat in Unit 22. Sheep translocations on the Oregon side of Hells Canyon in the mid 1990s have supplied the source for animals now colonizing Unit 22 in the Dukes Creek and Limepoint Creek areas.

The opportunity for establishing huntable bighorn sheep populations in these units is limited by the abundance and distribution of domestic sheep. There has never been bighorn sheep hunting authorized in these units.

Population Surveys

No population surveys were conducted in these units during the reporting period.

Harvest Characteristics

No bighorn sheep hunting was authorized during this reporting period.

Management Implications

Available habitat exists for the bighorn sheep population to expand into in Unit 22. However, the bighorns in Unit 22 are precariously close to domestic sheep allotments and pose a disease vector risk to other bighorn sheep in Hells Canyon. Management recommendations for this area are dependent upon the status of domestic sheep grazing. Coordination with the Payette National Forest and livestock producers is necessary to minimize the potential for any disease transfer between domestic sheep and bighorn sheep.

Table 1. Summary of bighorn sheep population data for the Southwest (McCall) Region, 1987-present.

Year	Ewes	Lambs	Rams				Uncl.	Total legal rams	Total sheep	Lambs: 100 ewes	Rams: 100 ewes
			I	II	III	IV					
20A											
1989	76	13	5	8	6	8	0	14	116	17.1	35.5
1991	72	3	4	2	20	4	0	24	105	4.2	41.7
1992	80	7	4	7	11	7	0	18	116	8.8	36.3
1993	62	10	1	5	11	4	1	15	94	16.1	33.9
1994	63	11	4	1	7	7	0	14	93	17.5	30.2
1995	53	11	3	3	6	7	0	13	83	20.8	35.8
1996	38	6	1	4	1	8	0	9	58	15.8	36.8
1999	35	11	0	2	2	1	0	3	51	31.4	14.3
2002	35	14	1	2	3	3	0	6	58	40.0	25.7
2004	21	8	3	2	2	0	0	2	36	38.1	33.3
26 ^a											
1989	180	28	11	17	18	26	0	44	270	15.6	40.0
1991	93	4	5	8	20	6	0	26	136	4.3	41.9
1992	91	26	0	10	11	19	8	30	165	28.6	44.0
1993	108	22	3	3	11	18	0	29	165	20.4	32.4
1994 ^b	33	2	1	2	9	10	0	19	57	6.1	66.7
1995	95	10	3	3	7	9	0	16	131	10.5	23.2
1996	99	11	2	9	7	10	0	17	138	11.1	28.3
1999	88	23	5	12	10	8	0	18	146	26.1	39.8
2002	86	26	6	7	8	2	0	10	135	30.2	26.7
2004	90	23	10	9	9	3	0	12	144	25.6	34.4
26-L											
1987	114	19	5	9	11	10	0	21	177	16.7	30.7
1988	116	18	3	7	8	12	0	20	172	15.5	25.9
1989	122	19	7	13	15	24	0	39	200	15.6	48.4
1991	64	4	2	8	13	2	0	15	93	6.3	39.1
1992	62	20	0	5	6	14	0	20	107	32.3	40.3
1993	82	13	2	3	8	10	0	18	118	15.9	28.0
1994	22	1	1	2	7	5	0	12	38	4.5	68.2
1995	85	7	4	6	6	7	0	13	115	8.2	27.1
1996	73	9	1	7	4	7	0	11	101	12.3	26.0
1999	62	14	4	9	6	5	0	11	100	22.6	38.7
2002	50	16	3	6	5	1	0	6	81	32.0	30.0
2004	62	12	9	9	6	3	0	9	101	19.4	43.5

^a Unit 27 data not included.

^b Incomplete survey.

Table 2. Summary of bighorn sheep harvest and drawing odds by hunt area in the Southwest (McCall) Region, 1993-present.

Hunt area	Year	No. of permits	Harvest	% Success	Days/hunter ^a	First-choice applicants	Drawing odds
20A	1994 ^b	6	3	33	8.0	43	1:7.2
	1995	6	4	67	6.6	33	1:5.5
	1996	6	0	0	-	72	1:12.0
	1997	6	5	83	3.6	41	1:6.8
	1998 ^b	6	5	67	-	75	1:12.5
	1999	6	3	50	-	46	1:7.6
	2000	6	4	67	-	77	1:12.8
	2001	6	1	17	-	57	1:9.5
	2002	6	1	17	-	33	1:18.2
	2003	2	1	50	-	13	1:6.5
26	1994 ^c	6	2	17	7.0	58	1:9.7
	1995	6	2	33	5.2	55	1:9.2
	1996	6	3	50	-	39	1:6.5
	1997 ^d	6	3	50	4.6	59	1:9.8
	1998	6	5	83	13.2	67	1:11.2
	1999	6	3	50	-	84	1:14.0
	2000 ^e	6	4	80	-	100	1:16.7
	2001 ^f	7	2	29	-	69	1:11.5
	2002	6	2	33	-	25	1:24
	2003	2	0	0	-	27	1:13.5
26-L	1994	2	2	100	3.5	7	1:3.5
	1995	2	2	100	2.5	48	1:24.0
	1996	2	1	50	-	24	1:12.0
	1997	2	2	100	6.0	28	1:14.0
	1998	2	2	100	5.0	53	1:26.5
	1999	2	1	50	10.0	82	1:41.0
	2000	2	2	100	11.5	80	1:40.0
	2001	2	1	50	-	21	1:10.5
	2002	2	1	50	-	48	1:24
	2003	2	1	50	-	15	1:7.5

^a Prior to 1996, data are from a telephone survey of all hunters. Beginning in 1996, data are from mandatory check of successful hunters only.

^b The auction tag permit holder harvested a bighorn sheep in Hunt Area 20A.

^c Wildfires resulted in public access closures for this hunt area during the 1994 hunting season. The Commission allowed the two permit holders to relocate in other hunt areas. One of the permit holders harvested a bighorn sheep in Hunt Area 26-1. The other permit holder did not harvest a bighorn sheep.

^d Hunt area restructured in 1997 to include former Hunt Area 26-2.

^e One permit holder opted for a rain-check tag in 2001 due to forest fire area closures during part of the 2000 season.

^f Includes one rain-check recipient from the 2000 hunting season.

Table 3. Summary of bighorn sheep harvest and drawing odds in the Southwest (McCall) Region, 1975-present.

Year	No. of permits	Harvest	% Success	First-choice applicants	Drawing odds
1975	22	7	32	-	-
1976	27	10	37	-	-
1977	28	8	29	-	-
1978	23	9	39	-	-
1979	23	7	30	-	-
1980	25	7	28	-	-
1981	25	13	52	-	-
1982	30	16	53	-	-
1983	28	16	57	-	-
1984	28	12	43	-	-
1985	26	13	50	-	-
1986	26	18	69	-	-
1987	26	12	46	-	-
1988	26	13	50	-	-
1989	26	11	42	-	-
1990	26	13	50	-	-
1991	34	15	44	-	-
1992	32	10	31	149	1:4.7
1993	21	10	49	135	1:6.4
1994 ^a	14	7	50	108	1:7.7
1995	14	8	57	136	1:9.7
1996	14	4	29	135	1:9.6
1997	14	10	71	128	1:9.1
1998 ^a	14	12	86	195	1:13.9
1999	14	7	50	212	1:15.1
2000	14	10	71	257	1:18.4
2001	15	4	27	147	1:9.8
2002	14	4	29	106	1:7.6
2003	6	2	33	55	1:9.2

^a The auction tag permit holder harvested a bighorn sheep in Hunt Area 20A.

Table 4. 2003 season structure for bighorn sheep hunts in the Southwest (McCall) Region.

Season			
Dates	Length	Hunt area	Number of permits
30 August - 13 October	45 days	20A	2
		26	2
13-31 October	19 days	26-L	2

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE:	<u>Idaho</u>	JOB TITLE:	<u>Bighorn Sheep Surveys and</u>
PROJECT:	<u>W-170-R-28</u>		<u>Inventories</u>
SUBPROJECT:	<u>4</u>	STUDY NAME:	<u>Big Game Population Status,</u>
STUDY:	<u>I</u>		<u>Trends, Use, and Associated</u>
JOB:	<u>4</u>		<u>Habitat Studies</u>
PERIOD COVERED:	<u>July 1, 2003 to June 30, 2004</u>		

MAGIC VALLEY REGION

Units 46, 47, 54, 55, 57

Controlled Hunt Area 46

Abstract

Bi-monthly radio-monitoring of the newly reintroduced California bighorn sheep population on Jim Sage Mountain in Unit 55 continued. Only one of 16 bighorns monitored died during the reporting period. There have been no movements away from Jim Sage Mountain by radio-collared sheep; however, there were several unconfirmed reports in June 2004 of bighorns that had moved off the mountain. An aerial survey is scheduled for the upcoming reporting period to provide estimates of population size, reproductive performance, and distribution. In March 2003, 13 California bighorn sheep were reintroduced into suitable habitat on the Albion Mountains to augment the Unit 55 bighorn population. None of the 12 sheep radio-monitored from this release remains near the release site. Three of the sheep have dispersed to Jim Sage Mountain, three sheep have moved west where contact with domestic sheep is a concern, one ewe has moved west into Birch Creek, and the remaining five have died. It is uncertain whether additional release efforts will be made on the Albion Range.

The bighorn sheep population in Unit 54 has decreased during the past ten years to fewer than 15 bighorns. Disease is the suspected, but unverified, cause of the population decline. There are no future plans to augment the existing population because of the proximity of domestic sheep grazing allotments.

Aerial survey results from June 2002 and June 2003 suggest an upward trend in the Jarbidge/Bruneau bighorn sheep population. Based on these results, the hunting was reauthorized for the 2003 and 2004 seasons.

Management Direction

Increase existing populations; reintroduce bighorn sheep into suitable historical habitats; conduct research on habitat use and population dynamics; promote non-consumptive values.

Background

Bighorn sheep were extirpated from southern Idaho in the early 1900s. In 1963, the Department initiated a program to reestablish California bighorn sheep populations in the Owyhee River and Little Jacks Creek drainages in Owyhee County. These early releases were successful and bighorn sheep populations increased and expanded their range in southwest Idaho.

In Idaho, the area south and west of Interstate 84 within the Magic Valley and Southwest regions has been designated exclusively for the California bighorn sheep subspecies. In 1992, it was estimated there were more than 1,200 California bighorn sheep in Idaho. From 1980-1992, Idaho's healthy California bighorn populations provided a source for numerous reintroduction projects and 413 sheep were trapped and moved to other locations in Idaho, Nevada, Oregon, and North Dakota. Population surveys in 1994 indicated a substantial decline in California bighorn populations in the East Fork Owyhee and Jacks Creek drainages and annual trapping/translocation operations were discontinued. Surveys conducted from 1996-2002 indicate populations have not increased to pre-1994 levels.

Units 46, 47, and 41 (east) - From 1982-1993, the Idaho Department of Fish and Game (IDFG) and Nevada Department of Wildlife (NDOW) released 93 bighorn sheep into portions of the Jarbidge and Bruneau drainages (see Table 5 in the Southwest Region-Nampa section). The bighorn sheep released by NDOW in 1982 and 1984, with the objective of reestablishing a population in the Jarbidge Mountains, moved north and took up residence in the Jarbidge River Canyon in Idaho. Bighorn sheep have also been released by the Department near the confluence of the Jarbidge and West Fork Bruneau Rivers, at Dorsey Creek, and near Black Rock Pocket on the West Fork Bruneau Canyon. Bighorn sheep are distributed throughout the Jarbidge and West Fork Bruneau canyons upstream from their confluence. Bighorns have been observed as far north in the Bruneau Canyon as Cave Draw and are occasionally observed in the Sheep Creek and Marys Creek drainages.

Unit 54 – Suitable habitat for bighorn sheep occurs in the Rock Creek, Dry Creek, and Big Cottonwood Creek drainages. However, the proximity of domestic sheep grazing allotments has hindered reintroduction efforts. From 1986-1993, 50 California bighorn sheep were released into the Big Cottonwood drainage, and 24 bighorns were released into the East Fork of Dry Creek (Table 1). The released bighorn sheep did well in Unit 54 until 1989 when high mortality of ewes and poor lamb survival were documented, and the population began to decline. Disease from interaction with domestic sheep is believed to be the cause of the decline, although it has not been verified. Wild sheep were known to have contacted a farm flock of domestic sheep near Big Cottonwood WMA and were also observed intermingling with domestic sheep on the Sawtooth National Forest. Currently, fewer than 15 bighorn sheep persist in Unit 54.

Units 55 and 57 - During 1999, domestic sheep grazing on federal grazing allotments in Unit 55 was eliminated, clearing the way for bighorn sheep releases. In February 2000, February 2001, and March 2003, 58 California bighorn sheep were reintroduced into suitable habitat on the Jim Sage and Albion mountains. Studies are currently ongoing to monitor the success of the releases. Unit 57 is currently considered unsuitable habitat because of domestic sheep grazing.

Population Surveys

Units 46, 47, and 41 (east) – No population surveys were conducted during the reporting period. A survey has been scheduled for mid-July 2004. Surveys conducted in 2002 and 2003 suggest the population has increased since 2000 (Table 2).

Unit 54 - There were no aerial surveys conducted during the 2003-2004 reporting period. Data collected were limited to incidental sightings and observations made during mule deer flights.

Observations of bighorn sheep in Unit 54 have become more infrequent in recent years, reflecting the decline in bighorn sheep numbers. No sheep were observed using the meadows at Big Cottonwood WMA for the first time since they were reintroduced in 1986. Two ewes were observed in Dry Creek during March 2004 deer surveys. There were also several sightings of bighorn sheep in Rock Creek Canyon near Harrington Fork. The total bighorn sheep population in Unit 54 is estimated to be less than 15 head.

Unit 55 – No aerial surveys were conducted to estimate bighorn sheep numbers during the reporting period.

Harvest Characteristics

Units 46, 47, and 41 (east) - From 1991-2003, 55 hunters harvested 36 rams from the Jarbidge/Bruneau population (Hunt Area 46). Annual hunter success rates have ranged from 33% to 100% and averaged 68%. Ages of harvested rams range from 4.5 years to 12.5 years with a mean of 7.2 years (SD=1.76, N=34) and a median of 6.5 years (Table 3). The hunting season in the Jarbidge/Bruneau area was eliminated in 2001 and 2002 because of low bighorn sheep numbers. Based on the results from aerial surveys in 2002 and 2003, a two-permit hunt was authorized for the 2003 and 2004 seasons (Table 4).

Units 54 and 55 - There was no legal harvest of bighorn sheep in Units 54 and 55 during the reporting period.

Trapping and Transplants

Forty-five California bighorns, captured in Oregon, were released in the Jim Sage Mountains (Unit 55) in 2000 and 2001 (Table 1). Twenty-four radio-collared bighorns have died since the initial release in 2000. Fourteen of the 24 documented mortalities (58%) occurred within the first four months of the releases. Only ten mortalities have been documented since May 2001 suggesting good survival. During the 2003-2004 reporting period, only one of 16 radio-monitored sheep died. The cause of death was attributed to mountain lion predation. Causes of death for all mortalities on Jim Sage include mountain lion predation (63%), coyote predation (4%), and natural causes or accidents (17%). Observed lamb production in 2000, 2001, and 2002 was nine lambs, 14 lambs, and eight lambs, respectively. The estimated population size in early July 2002 was 48-59 sheep (Fowles 2002).

On 8 March 2003, 13 California bighorns (two rams, ten ewes, one lamb) were released near Thunder Mountain in the Albion Mountains to augment the Unit 55 bighorn population. The Thunder Mountain release site is approximately five miles west of Jim Sage Mountain. The release was preceded by an investigation of bighorn sheep habitat suitability that predicted adequate winter, lambing, and summer habitat in the area for bighorns (Fowles and Merrick 2003). All of the sheep, except the lamb, were radio-collared to allow monitoring of movements and survival. Following release, the sheep were radio-monitored three times a week for the first two weeks and have been monitored bi-monthly since then. Since the release, three sheep have moved to Jim Sage Mountain, two sheep moved to Middle Mountain southwest of the release site, one sheep traveled west and was last located at Salmon Falls Creek Reservoir 60 miles west of the release site, one ewe moved in west to Birch Creek, and the five remaining radio-collared sheep died. Three of the mortalities were attributed to lion predation and two sheep died in natural accidents. Presently none of the sheep released on the Albion Mountains is in the release area.

Management Studies

Units 46 and 47 - During March 2002, ten bighorn sheep (seven ewes and three rams) were captured and radio-collared in the Jarbidge and Bruneau canyons to provide information on seasonal movements and survival. Three of the bighorns are known to have died through February 2003. No monitoring was conducted during the 2003-2004 reporting period. Six of the possible seven remaining collared sheep were observed on the June 2003 aerial survey.

Unit 55 - See discussion above under "Trapping and Transplants".

Management Implications

Units 46 & 47 - Population surveys in 1998 and 2000 indicated poor recruitment and a downturn in the Jarbidge/Bruneau bighorn population. The substantial and rapid decline of this sheep population suggested a disease die-off, although no conclusive evidence was available. Possible sources of disease for the Jarbidge/Bruneau herd were identified in the Marys Creek and Contact, Nevada areas. The decline in bighorn sheep numbers prompted the closure of the hunting season in 2001 and 2002.

Results from aerial surveys in 2002 and 2003 indicated an upward population trend and an estimated population of approximately 150 sheep with 15 legal rams. The observed ratio of 55 lambs:100 ewes in 2003 was the highest ever observed in that population. Based on these data, a hunting season with two permits was authorized for 2003 and 2004.

Unit 54 – The future of the bighorn sheep population in Unit 54 is uncertain. It is believed there are currently fewer than 15 bighorn sheep remaining in the unit. Disease is believed to be the cause of the decline, although we have no conclusive evidence. Wild bighorns were known to have contacted a farm flock of domestic sheep near Big Cottonwood Canyon and a wild bighorn ram was observed intermingling with domestic sheep near Dry Creek. In addition, the rapid decline of the Dry Creek herd and the timing of summer lamb mortality strongly suggest that

disease played a role. Presently, there are no plans to attempt any further bighorn sheep releases in the unit.

Unit 55 – Only one of 16 adult bighorns on Jim Sage Mountain died during the 2003-2004 reporting period. In addition, no movements away from the area by radio-collared sheep have been documented since the releases in 2000 and 2001. During June 2003, three unconfirmed reports were received of bighorn sheep moving off Jim Sage Mountain to the east. These reports are currently being investigated. With an anticipated reproductive performance in 2003 and 2004 of 50 lambs:100 ewes, the population is estimated to be 70-80 bighorns. An aerial survey of the Jim Sage population is scheduled for the upcoming reporting period. Bi-monthly radio-monitoring will continue during the 2004-2005 reporting period to assess survival, movements, and project success.

The release of bighorn sheep on the Albion Mountains in 2003 was intended as a trial to provide information useful in deciding whether to proceed with additional future releases. Presently, none of the released sheep remain on the Albion Range. Three of the sheep have moved west where contact with domestic sheep is a concern. The unfamiliarity of the release area to the sheep was likely magnified by the release area's habitat differences to the Bruneau and East Fork Owyhee canyons where the sheep were trapped. The Bruneau and East Fork Owyhee canyons are treeless, rugged, and relatively sparsely vegetated. In contrast, the release area, while possessing very steep and rocky slopes, is an isolated mountain range with tall mountain shrub communities and patches of trees. Oregon and Nevada have committed to providing bighorns for another release in the upcoming reporting period. The source populations would come from habitat that is more closely matched with the habitat on the Albion Range. A final decision of whether to proceed with additional releases has not been made.

Literature Cited

- Fowles, G. I. 2002. Habitat use and population characteristics of newly reintroduced California bighorn sheep (*Ovis canadensis californiana*) in south-central Idaho. M.S. Thesis. Idaho State University, Pocatello. 103 pp.
- Fowles, G. I. and M. Merrick. 2003. Evaluation of bighorn sheep habitat on the Albion Mountains. Idaho Department of Fish and Game. Boise. 12 pp.

Table 1. Summary of bighorn sheep transplants in Units 54 and 55 in the Magic Valley Region.

Date	Capture site	Release site (Unit)	Adults		Lambs		Total
			Male	Female	Male	Female	
12/17-20/86	E Fork Owyhee R	Big Cottonwood (54)	2	10	1	2	15
12/16/87	Little Jacks Ck	Big Cottonwood (54)	3	6	0	1	10
11/15/88	Poison/Shoofly Ck	Big Cottonwood (54)	5	8	0	1	14
12/6/91	E Fork Owyhee R	E Fork Dry Ck (54)	2	9	1	2	14
12/19/93	E Fork Owyhee R	Big Cottonwood (54)	3	8	0	0	11
12/20/93	E Fork Owyhee R	E Fork Dry Ck (54)	1	7	1	1	10
2/6-8/00	John Day R, OR	Jim Sage Mtn (55)	7	15	2	6	30
2/1/01	Hart Mtn NWR, OR	Jim Sage Mtn (55)	0	14	0	1	15
3/9/03	E Fork Owyhee/ Bruneau Rivers	Albion Mtns (55)	2	10	0	1	13
Total			25	87	5	15	132

Table 2. Summary of bighorn sheep population data, Jarbidge/Bruneau area (Hunt Area 46) in the Magic Valley Region, 1990-present (Obs = observed, Est = estimated).

Year	Ewes		Lambs		Sub-legal rams		Legal rams		Un-classified		Total Est ±90%CI	Est. lambs: 100 ewes	Est. rams: 100 ewes	
	Obs	Est	Obs	Est	Obs	Est	Obs	Est	Obs	Est				
1990	51	-	12	-	8	-	13	-	0	-	84	-	23.5	41.2
1993	51	79	8	13	39	53	16	20	0	0	114	165±37	16.5	92.4
1994	76	101	24	31	15	19	17	23	0	0	132	171±31	30.7	41.6
1996	102	147	33	43	14	20	15	22	5 ^a	7	169	239±44	29.3	31.3
1997	62	83	25	34	21	33	10	14	3	4	121	168±40	41.0	56.6
1998	85	138	18	29	26	41	6	11	0	0	135	220±44	21.0	37.7
2000	33	45	7	10	6	8	2	3	0	0	48	66±18	22.2	24.4
2002 ^b	49	73	17	22	8	10	3	3	0	0	77	108±34	30.0	17.8
2003	46	64	26	35	18	29	10	15	0	0	100	144±27	54.7	68.7

^a Four were unclassified rams.

^b Only the Jarbidge Canyon, approximately half of the area, was surveyed.

Table 3. Summary of bighorn sheep harvest and drawing odds in the Magic Valley Region, 1991-present.

Hunt area	Year	No. of permits	Harvest	% Success	Days/hunter ^a	First-choice applicants	Drawing odds
46	1991	2	2	100	4.0	36	1:18.0
	1992	2	2	100	7.0	34	1:17.0
	1993	7 ^b	6	86	7.7	94	1:15.7
	1994	6	2	33	6.4	91	1:15.2
	1995	6	3	50	10.5	74	1:12.3
	1996	6	4	67	6.5	75	1:12.5
	1997	6	5	83	4.0	101	1:16.8
	1998	6	4	67	2.8	90	1:15.0
	1999	5 ^c	3	50	3.5	190	1:31.7
	2000	7 ^c	3	43	9.0	76	1:12.7
	2001	Closed					
	2002	Closed					
	2003	2	2	100	2.5	77	1:38.5

^a Prior to 1996, data are from a telephone survey of all hunters. Beginning in 1996, data are from mandatory check of successful hunters only.

^b The winner of the lottery permit hunted here in addition to the six authorized permits.

^c A hunter successfully drawn for the 1999 season was given a rain-check to hunt in 2000.

Table 4. 2003 season structure for bighorn sheep hunts in the Magic Valley Region.

Season		Length	Hunt area	Number of permits
Dates				
30 August – 8 October		40 days	46	2

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE:	<u>Idaho</u>	JOB TITLE:	<u>Bighorn Sheep Surveys and</u>
PROJECT:	<u>W-170-R-28</u>		<u>Inventories</u>
SUBPROJECT:	<u>6</u>	STUDY NAME:	<u>Big Game Population Status,</u>
STUDY:	<u>I</u>		<u>Trends, Use, and Associated</u>
JOB:	<u>4</u>		<u>Habitat Studies</u>
PERIOD COVERED:	<u>July 1, 2003 to June 30, 2004</u>		

UPPER SNAKE REGION

Units 51 (part), 58, 59A, 61, 64, 65, 67

Abstract

Bighorn sheep in the Lost River range are managed and reported by the Salmon Region. Bighorn sheep in the Lemhi and Beaverhead ranges are not hunted. The Lionhead bighorn sheep are hunted in Montana, but not Idaho. There is not an established bighorn sheep herd in the Bighole Mountains.

No population survey was conducted during this reporting period. One ewe with a lamb was observed incidental to a deer/elk survey in Rocky Canyon, Unit 50, in January 2004.

Management Direction

The above units in the Upper Snake Region supported Rocky Mountain bighorn sheep populations historically. By the early 1900s, bighorn sheep were eliminated from most of the area and severely reduced in the remaining habitats. Vegetative changes due to livestock use on winter ranges, loss to disease, and indiscriminate harvest by settlers and miners probably were the main causes of bighorn sheep declines.

Habitats are diverse, generally mountainous types, with bighorn sheep summering mostly at higher elevations on alpine and sub-alpine ranges. The winter ranges are mostly sagebrush-grass or curlleaf mountain mahogany types where precipitation is low. The USFS generally administers summer ranges, whereas the BLM primarily manages the winter ranges.

Subsistence and indiscriminate harvest of bighorn sheep by early settlers and pioneering travelers was greatly reduced after establishment of the Idaho Department of Fish and Game in 1937. Some general bighorn sheep hunts were authorized through 1970, but since then, all bighorn sheep hunts have been by permit only. These restrictions, along with improved habitat and reintroductions, have all contributed to increased bighorn sheep numbers in these units. Changes in land and livestock management practices have resulted in improved range conditions for bighorn sheep in much of these units. Improved grazing management, water developments,

controlled burns on bighorn sheep ranges, and closing or changing domestic sheep allotments to eliminate domestic-bighorn sheep contact could further improve conditions for bighorn sheep in this area.

Bighorn sheep obtained from the Whiskey Mountain, Wyoming, herd were released in Badger and Uncle Ike Creeks in Unit 51 in 1983 and 1984.

Bighorn sheep trapped from Panther Creek, Idaho, were released into Long, Skull, and Bloom Canyons of Unit 58 in four transplants between 1976 and 1982.

Management Goals

Increase population; increase recreational opportunity; maintain or increase harvest; revamp season framework; continue reintroduction program; attempt to manipulate one bighorn sheep population below carrying capacity to prevent periodic die-off; investigate whether domestic sheep have a role in disease transmission.

Background

Eighty-two Rocky Mountain bighorn sheep were released in Units 51 and 58 between 1976 and 1984. All of the bighorn sheep released in these units were transplants from either Panther Creek, Idaho or Whiskey Mountain, Wyoming.

A small population of bighorn sheep occurs on the Idaho-Montana border in the Lionhead area of Unit 61. During the summer and fall months, 12 to 15 bighorn sheep can frequently be seen in Idaho. Idaho has never authorized a hunt on this herd. The history of the Montana hunts on these bighorn sheep has been to issue a few permits a year until the herd declines, close the hunt and let the herd rebuild, and then open it again for a few years. This herd has high non-consumptive value.

Bighorn sheep are occasionally observed during summer in the Bighole Mountain area of Units 64, 65, and 67. We believe these are pioneering bighorn sheep from Grand Teton National Park. Since we have no reports or observations of these bighorn sheep during the winter and few summer observations in consecutive years, we assume there is no established herd in Idaho.

Population Characteristics

Aerial counts of these populations have generally been made in conjunction with aerial surveys for other big game animals (Table 1). Ground observations have been reported on several occasions. A ewe with lamb bighorn sheep was observed in Rocky Canyon, Unit 50 during a deer/elk survey in January 2004.

Weather Conditions

The summer of 2003 had higher than normal temperatures and below normal precipitation. Winter conditions during 2003-2004 had lower than normal snow accumulation in the areas where bighorn sheep occur.

Management Implications

Bighorn sheep populations in the Upper Snake Region do not occupy all available habitats. Domestic sheep allotments have been closed on some USFS lands. However, active domestic sheep allotments still occur on USFS- and BLM-administered bighorn sheep range in Units 51, 58, and 59A.

During this reporting period, the Idaho Chapter of FNAWS was successful in working with the USFS and livestock operator to convert the domestic sheep allotment in the Long Lost Dry Creek from sheep to cattle. The USFS initiated work toward an action plan with the Department, BLM, Idaho Chapter FNAWS and other interested parties to improve sheep numbers in the Lost River range during this reporting period. The team is in the initial stages of developing a plan and evaluating the current distribution of bighorn sheep and habitat conditions in the range.

The greatest concern for the future of bighorn sheep in the Region is interaction with domestic sheep. The Department continues to work with the USFS and BLM to identify all the domestic sheep allotments that overlap with bighorn sheep range in the Lemhi and Beaverhead ranges. Once this is done, contingency action plans will be discussed with the respective agency and domestic sheep permittee to minimize the potential of bighorn-domestic sheep interaction and to quickly remove bighorn sheep that have come into contact with domestic sheep.

In the Lemhi range, the Bernice BLM allotment on the Little Lost River side of the range and the Mahogany Butte BLM allotment on the Birch Creek side of the range overlap with bighorn sheep range. The Mahogany Butte domestic sheep allotment also includes USFS land. Five domestic sheep allotments (Mahogany Butte [BLM]; Reno Gulch [BLM]; and Snaky Canyon, Rocky Canyon, and Nicholia Canyon [USFS]) in the Beaverhead range overlap with bighorn sheep range. Domestic sheep on private land near the bighorn sheep habitat is also a concern.

Concern for domestic-bighorn sheep interaction and disease transmission has been discussed with both the BLM and the domestic sheep permittee of the Bernice allotment. The Department, BLM, and permittee are working together cooperatively to monitor for the presence of bighorn sheep before and during the time domestic sheep are on the allotment. If bighorn sheep are observed on or near the allotment, all entities will be informed and efforts made immediately to prevent bighorn sheep contact with domestic sheep.

The bighorn sheep population in the south Beaverhead range uses private land on the Waggoner and Simmonds Ranches at the mouth of Goddard Canyon and Skull Canyon during rut and early winter. Although these ranches no longer run domestic sheep, the bighorn sheep daily come down and feed with corralled cattle during the winter.

On two occasions, bighorn sheep were observed on domestic sheep range above Rattlesnake Point and Reno Gulch during the winter of 2000-2001 and again in March 2002. As a result of these observations, the Department met with the USFS and BLM to develop contingency plans similar to what was developed for the Bernice allotment. To date, draft plans from these two agencies have not been received.

Available free water is unevenly distributed along the Lemhi and Beaverhead ranges. This may be the reason bighorn sheep are observed at lower elevations during the fall prior to the rut. Currently, there are no plans to map the location of water sources or install additional water developments in the range.

There may be opportunity to coordinate management and hunter opportunity of the bighorn sheep in the Lionhead Area of Unit 61 with Montana Fish, Wildlife, and Parks. This herd is small and currently provides limited hunter opportunity for Montana hunters. The Idaho Fish and Game Commission has approved a cooperative agreement between the two state agencies allowing hunters to hunt in either state when a small herd of big game animals occurs on the state line. However, the Montana Commission has not approved a similar agreement.

The bighorn sheep that are occasionally observed during the summer months in the Bighole range (Units 64, 65, and 67) are probably transients from Grand Teton National Park. Although this range historically supported bighorn sheep, plant community succession makes it unsuitable to support bighorn sheep today. Domestic sheep also heavily graze the range. Therefore, management is directed to document bighorn sheep observations, protection of the bighorn sheep, and non-consumptive use.

There is interest in trying to reestablish migratory tradition of the bighorn sheep currently occurring in the Teton range. The present winter range is very limited and being impacted by winter recreation. The closure of domestic sheep allotments on the west slope of the Teton range provides an opportunity to reestablish migratory tradition to winter range in lower Bitch Creek and the Teton River Canyon.

Two bighorn sheep skulls were reported picked up in the Beaverhead range during this reporting period. One was of a five-year-old ram reported found in the Willow Creek area, Unit 58, and the other was of a nine-year-old ram that had died a couple days earlier in Goddard Canyon, Unit 58. The ram from Goddard Canyon was observed a couple days earlier in the same location in a very thin, poor physical condition. This is near where bighorn sheep winter in corrals with cattle.

Table 1. Summary of bighorn sheep population data for the Upper Snake Region, 1992-present.

Unit/ Year	Ewes	Lambs	Rams				Uncl.	Total legal rams	Total sheep	Lambs: 100 ewes	Rams: 100 ewes
			I	II	III	IV					
51											
1993 ^a	14	7	0	5 ^b	0	0	0	0	26	50.0	35.7
1995 ^a	11	7	0	4 ^b	0	4 ^b	0	4	26	63.6	72.7
2000 ^c	4	1	-	2	-	-	-	-	-	-	-
2000 ^d	5	2	1	5	3	0	0	3	16	40.0	180.0
2003 ^a	10	5	0	3 ^b	0	1 ^b	0	4	20	50.0	40.0
58											
1992	11	6	5 ^b	0	0	1 ^b	0	1	23	54.5	54.5
1993 ^e	14	8	0	0	0	0	12 ^f	0	34	57.1	85.7
1995 ^a	27	16	0	6 ^b	0	11 ^b	0	11	60	59.3	63.0
2000 ^a	8	0	0	0	0	0	6 ^f	0	14	0.0	75.0
2001 ^a	4	0	7	0	6	0	0	6	17	0.0	325.0
2002 ^a	7	0	0	5	1	0	13	1	26	0.0	85.7
2003 ^a	3	0	0	2	0	0	0	2	5	0.0	40.0

^a Incidental to aerial elk or mule deer surveys. The entire bighorn sheep winter range was not surveyed.

^b Rams classified to sub-legal and legal only.

^c Only the area from South Creek around to the first canyon east of East Creek was surveyed.

^d Incidental to helicopter mountain goat survey of the entire Lemhi range 1-5 August 2000.

^e Ground classification of bighorn sheep coming onto bait - Goddard Face, winter 1992-1993.

^f Rams not classified, but some were legal.

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE:	<u>Idaho</u>	JOB TITLE:	<u>Bighorn Sheep Surveys and</u>
PROJECT:	<u>W-170-R-28</u>		<u>Inventories</u>
SUBPROJECT:	<u>7</u>	STUDY NAME:	<u>Big Game Population Status,</u>
STUDY:	<u>I</u>		<u>Trends, Use, and Associated</u>
JOB:	<u>4</u>		<u>Habitat Studies</u>
PERIOD COVERED:	<u>July 1, 2003 to June 30, 2004</u>		

SALMON REGION

Units 21, 21A, 27, 28, 29, 30, 30A, 36, 36A, 36B, 37, 37A, 50, 51

Controlled Hunt Areas 21, 27-1, 27-2, 27-3, 27-4, 27-L, 28-1, 28-2, 30, 36B, 37

Abstract

From 1989-1991, bighorn sheep populations in the Salmon Region experienced major, rapid declines (30-50%), followed by several years of very low lamb recruitment. Recent aerial surveys suggest lamb production, although still low (31 lambs per 100 ewes), is beginning to improve in several units. Lamb production was still notably low in parts of Unit 27. In general, bighorn sheep populations may be stabilizing after several years of decline, with some populations showing signs of increase.

During 2003 hunting seasons, 40 controlled hunt permits for bighorn sheep rams ($\geq 3/4$ curl or >4 years old) were authorized in 11 hunt areas. Permit holders harvested 18 rams (45% success). Average age of harvested rams was 7.5 years. Chances of being drawn from among 722 applicants for bighorn sheep permits in 2003 (5.5%) decreased to an 11-year low and were almost 2% below the previous five-year average of 7.3%.

Management Direction

Follow statewide direction to increase bighorn sheep populations, harvest, and recreational opportunity. Continue to establish new herds via translocation where suitable habitat and conditions exist. Recognize non-consumptive values of bighorn sheep. Conduct bighorn sheep disease research. Conduct bighorn sheep survey flights on at least a five-year rotation. Establish ≥ 1 hunt for female bighorn sheep. Attempt to manipulate one bighorn sheep population below carrying capacity to prevent periodic die-offs. Maintain hunts only where bighorn sheep population size is estimated to be ≥ 100 animals. Annually harvest $\leq 20\%$ of legal rams observed during the most recent survey.

Background

The Salmon Region contains approximately two-thirds of Idaho's Rocky Mountain bighorn sheep and offers two-thirds of the hunting opportunity. Habitats, bighorn sheep population characteristics, land management activities, and human access all vary considerably across the Region, presenting a variety of bighorn sheep management situations.

Unit 27 contains bighorn sheep habitats of Middle Fork Salmon River drainages. Bighorn sheep populations in this area were protected from pressures of early settlement by the remote nature of the area and, thus, were better able to maintain viable population levels. Access into most occupied bighorn sheep habitats is limited. Herds are relatively stable, although annual fluctuations are commonly associated with varying winter losses and lamb survival rates.

Unit 27 is located in the Frank Church River-of-No-Return Wilderness Area, and managed by the USFS. Most bighorn sheep in the unit winter along the river breaks corridor and migrate to sub-alpine habitats during summer. However, some bighorn sheep remain along the Middle Fork Salmon River during summer, where they provide a valuable viewing resource for river float parties. Past grazing practices, especially on upper river winter ranges, changed some ranges from grassland to shrub-dominated habitats. However, recent range trends are back toward grass-dominated habitat types because of changes in livestock and fire management.

Hunt areas 27-1, 27-2, 27-7, and 27-8 were combined into one hunt (27-1) in 1987. In 1991, the north end of Hunt Area 27-1 (Brush Creek to Big Creek) was incorporated into Hunt Area 26. Hunt Area 27-4 (Camas Creek to Warm Springs Creek east of the Middle Fork Salmon River) was previously part of Hunt 36B, but was created as a separate hunt in 1989 to facilitate better distribution of hunters and harvest. Hunts 27-4, 27-5, and 27-6 were combined into one hunt in 1991 (27-3) to allow hunters a better likelihood of finding a ram. In 1997, Hunt Area 36B was formed by combining hunts 36B-1, 36B-2 and 36B-3, and hunts 28-1 and 28-2 were combined into one hunt and the area was enlarged in 1999. In 2003, Hunt 28 was split again and area 28-2 was enlarged.

Units 21 and 28 contain bighorn sheep habitats of the Panther Creek drainage and along the roaded portion of the Salmon River below the North Fork. Human access to major portions of bighorn sheep ranges and ongoing or planned development projects dictate special management considerations in this area. These units are well roaded, with potential for copper and cobalt mining, geothermal development, and timber harvest, which could lead to even more development and roads. Increased roading can lead to high levels of unregulated harvest. However, viewing and photographing bighorn sheep along the Salmon River and Panther Creek are popular recreational pastimes. We expect this type of non-consumptive use to increase in importance.

Bighorn sheep populations in Units 21 and 28 were considered high-quality herds, exhibiting high lamb production and herd growth through the 1970s. However, populations along Panther Creek experienced a decline in the early 1980s, probably due to weather-related mortality. The same herd suffered a major population decline (approximately 50%) during 1989-1990, possibly

caused by *Pasteurella haemolytica* pneumonia. Low lamb recruitment followed the decline and persisted for three years.

The Panther Creek bighorn sheep population was the primary source of Rocky Mountain bighorn sheep for translocation to other sites; 125 were captured and moved between 1974 and 1985. During the 1981-1985 planning period, new trapping sites were developed in Unit 21 along the Salmon River. However, capture and translocation have been curtailed since populations and productivity declined.

Much of the remainder of the Salmon Region (Units 21A, 30, 30A, 36, 36A, 37, 37A, 50, and 51) supported Rocky Mountain bighorn sheep in the past. By the early 1900s, bighorn sheep were eliminated from most of the area and populations were severely reduced in remaining habitat. Vegetative changes due to livestock use on winter ranges, disease losses, and indiscriminate harvest by settlers and miners probably were primary causes of bighorn sheep declines.

The bighorn sheep population in Units 37, 50, and 51 (Lost River Range) resulted from releases of seven bighorn sheep from Morgan Creek in 1969 and 24 bighorn sheep from Banff Park, Alberta, Canada in August 1970. The first hunt in Hunt Area 37 was authorized in 1981 and the area has become very popular with bighorn sheep hunters. By 1992, the Lost River Range population had suffered the same decline and persistent low recruitment as other bighorn sheep herds in the Region. Permit numbers were correspondingly reduced from a peak of 19 permits in 1992 to three in 1995 and two in 2001.

In 1982, eight Rocky Mountain bighorn sheep from Panther Creek were released near Birch Creek southwest of Challis in Unit 36B. This translocation was an attempt to stimulate growth of a small, stable population. In January 1985, 22 bighorn sheep obtained from Oregon were released in Unit 30A near Leadore. The first hunt for these animals in Hunt Area 30 was authorized in 2001 with two permits available. Since 1986, 54 bighorn sheep have been released in Unit 37A (two sites) and an additional 17 have been released in Unit 30A.

Population Surveys

Aerial surveys specifically for bighorn sheep were conducted in most of Unit 27 in spring 2004 (Table 1). Bighorn sheep were counted incidental to other big game in portions of Units 28, 30, 30A, 36A, and 36B. More than 500 individuals were observed across all survey efforts. Compared to previous surveys in these areas, total bighorn sheep numbers for comparable survey effort were stable to slightly higher. The region-wide lamb/100 ewes ratio in 2004 was 31.0, very similar to the regional value in 2004.

Salmon Region bighorn sheep populations experienced major young and adult mortality (apparently disease-related) beginning in 1990 and very low lamb production for several years afterward (generally ≤ 10 lambs per 100 ewes). Although ewe to lamb ratios were still somewhat low, recent surveys suggest that the trend of very low lamb production in recent years may be reversing. Lamb production during this year's surveys ranged from 21 to 71 lambs per 100 ewes in units with moderate sample sizes of ewes (Table 1).

Harvest Characteristics

Low lamb survival through the 1990s was expected to reduce recruitment of legal rams available to hunters in 1993 and afterward for several years. Therefore, 1993 permit levels were reduced 50% from 1992. Of 17 hunts in the Salmon Region, four hunts were eliminated, permit levels were reduced in ten hunts, and permit numbers in three hunts were unchanged. Because hunter success was very high (80%) during late hunts (21 October-5 November), most of these hunts were eliminated to allow more regular season hunter opportunity. One remaining late hunt, 27-L, was shifted to an earlier time frame (13-31 October).

Harvest and hunter information was compiled from Big Game Mortality Reports (BGMRs). Successful hunters must present bighorn sheep horns to an IDFG representative within ten days of harvest and complete a BGMR. At the time of check-in, an identification pin is set in the right horn. Eleven controlled hunts with 40 permits were authorized for 2003 in the Salmon Region. Hunters could harvest a male bighorn sheep with $\geq 3/4$ horn curl or >4 years old. Success among 40 permit holders was 45% in 2003. Bighorn sheep season structure has been essentially unchanged since 1991 (Table 2). Concurrent with splitting Hunt Area 28 into two separate hunts, one additional permit was available compared to 2002 (Tables 3-4). Of 366 permits issued since 1995, 154 hunters harvested rams (42% success).

Chances of drawing a Salmon Region bighorn sheep permit dropped sharply in the early 1990s, primarily because of severe reductions in permits. Chances have continued to decline steadily since the mid-1990s, from 10.4% in 1995 to 5.5% in 2003. Average chance of drawing a permit since 1995 was 7.2%.

Region-wide, non-hunting mortalities peaked during the suspected disease die-off period (1990-1992) and subsided afterward as mortality rates decreased and bighorn sheep numbers reached low ebb (Table 5). Under historic treaty rights, Shoshone-Bannock Indians from Fort Hall Indian Reservation are allowed to hunt bighorn sheep for subsistence uses. However, tribal bighorn sheep season dates, permit levels, and harvest data are generally not available to the Department. Tabulation of non-hunting mortality was not available for the reporting period.

Climatic Conditions

Rainfall during summer months in 2003 was below average, with warm, dry weather during early summer. Vegetative growth generally appeared well below average. Winter conditions were generally mild with temperatures above normal and snow accumulation at lower elevations below average. Animals, therefore, likely entered winter in average to below average body condition, then encountered a mild to average winter, which should have produced average over-winter survival. Snow pack (as measured at higher elevations) was approximately 70% of average by late winter. Onset of spring weather and associated plant phenology was apparently advanced by approximately 3-4 weeks. Water-year precipitation to date has been near average.

Habitat Conditions

Habitats are diverse, generally mountainous types, with bighorn sheep summering primarily at higher elevations in sub-alpine ranges. Winter ranges are dominated by sagebrush and grassland systems where precipitation is low. Summer ranges are generally administered by the USFS, whereas the BLM primarily manages winter ranges. Recent changes in land management practices resulted in improved range conditions for bighorn sheep. Improved grazing management and controlled burns on bighorn sheep ranges could further improve conditions in other units. There are several opportunities to increase existing bighorn sheep herds, and some possibilities for reintroductions.

Land management practices over the past 25 years have generally improved bighorn sheep habitat. Water developments and controlled burns have been directed toward improving bighorn sheep range. Grazing systems have been modified and range improvements for livestock have been beneficial to bighorn sheep. Although domestic sheep numbers are down dramatically from historic levels, there are continued occurrences of bighorn sheep coming in contact with domestic sheep.

Several major wildfires have occurred in the Frank Church River-of-No-Return Wilderness since 1979. Large fires on bighorn sheep ranges from Ship Island to Goat Creek, Tappan Gulch, Pole to Warm Springs Creek, Grouse Creek, Camas Creek, and Marble Creek have been beneficial to bighorn sheep and elk. Several wildfires occurred during summer 2000, burning parts of Pistol, Indian, Brush, Soldier, Sheep, Warm Springs, and Yellowjacket creeks in the Middle Fork Salmon River drainage, as well as several tributaries in the lower half of Panther Creek. Several habitat rehabilitation projects were undertaken within burned areas. Habitat changes associated with wildfires and subsequent habitat work are expected to improve range conditions for bighorn sheep.

In early 2004, the Department entered a Memorandum of Understanding (MOU) with the BLM and USFS to foster enhanced management of bighorn sheep in the Lost River Range (GMUs 37, 50, and 51). The MOU was spurred by removal of domestic sheep from grazing allotments within and adjacent to occupied bighorn sheep range. Enhanced monitoring and data collection will occur during summer 2004 and a management plan will be prepared during the upcoming reporting period.

Capture and Translocation

The Salmon Region had a very active capture and translocation program for a number of years (Table 6). Bighorn sheep were taken from Units 21, 28, 36A, and 36B for translocation to other parts of Idaho and to other states. Within the Region, Units 28, 30A, 37/50, and 37A have all received bighorn sheep in attempts to reestablish extirpated herds. However, stagnant to declining bighorn sheep populations characterized by low productivity suggest that translocation from Salmon Region herds would be unwise in the near future. Some release sites are available in the Salmon Region if an appropriate source population can be identified. No bighorn sheep were captured or translocated within the Region during the reporting period.

Disease

During an apparent disease outbreak in winter 1988-1989, bighorn sheep in several areas of the Salmon Region and adjacent regions were sampled for disease pathogens. Bighorn sheep tested positive for *Pasteurella multocida* and *P. haemolytica* (biotypes/serotypes A₁, A₁₁, T₃, T₄, and T₁₀). Both haemolytic and nonhaemolytic types of *P. haemolytica* were found. Antibody titers to Respiratory Syncytial Virus (RSV), Parainfluenza (PI3), and Brucellosis (*Brucella ovis*) are common. However, there does not appear to be a correlation between RSV/PI3 titers and sick bighorn sheep or *Pasteurella* positive bighorn sheep. Lungworm (*Protostrongylus* spp.) loads tend to be very high in Salmon Region bighorn sheep. Scabies (*Psoroptes* spp.) is occasionally evident but rarely severe on any individual bighorn sheep. Poor population performance of Salmon Region bighorn sheep in recent years may well be an indication of residual disease problems.

During October 2003, a domestic ewe was observed in association with bighorn sheep on the south side of the Salmon River between Pine Creek and Panther Creek (Unit 28). The domestic sheep tested positive for several forms of *Pasteurella*. Wild sheep in the area were monitored for signs of illness for several months; however no problems have been detected to date. Additional health monitoring is planned for autumn 2004.

Management Implications

Harvest of $\geq 3/4$ curl bighorn rams has no effect on total bighorn sheep populations when annual harvest is restricted to $\leq 20\%$ of observed legal rams. Unregulated bighorn sheep populations appear to periodically build to high densities followed by herd die-offs, which are probably related to disease outbreaks. The 1991-1995 bighorn sheep plan calls for ewe removals via capture and translocation and/or hunting to maintain bighorn sheep populations at lower densities, which are less susceptible to die-offs.

Virtually all Salmon Region bighorn sheep populations have recently experienced poor population performance, particularly low lamb production. In some units (37, 50, 51) productivity has been low for several years while in others (36A), low productivity did not appear until 1991. However, in most of the Region, declines were first noted during winter 1989-1990. In all cases, low lamb:ewe ratios continued through at least 1992. Aerial surveys suggest lamb recruitment is improving somewhat in most units. However, overall lamb:ewe ratios are still low compared to historical levels and productivity is notably low in some areas (e.g., parts of 27). Salmon Region bighorn sheep herds probably will not produce surplus animals for translocation in the near future. Small lamb crops have resulted in fewer rams available to hunters. Four- to eight-year old rams comprise the bulk of hunter harvest. Permit levels in many hunts were reduced and will remain low as several years of reduced ram recruitment continue to impact absolute ram numbers.

Table 1. Summary of bighorn sheep population data for the Salmon Region, 1983-present.

Area/Year	Ewes	Lambs	Rams				Uncl.	Total legal rams	Total sheep	Lambs: 100 ewes	Rams: 100 ewes
			I	II	III	IV					
Unit 21											
1989	93	49	14	11	9	22	0	31	198	52.7	60.2
1990	41	4	6	4	7	10	0	17	72	9.8	65.9
1991	60	5	10	8	2	2	0	4	87	8.3	36.7
1992	72	8	1	13	14	5	0	19	113	11.1	45.8
1993	97	24	14	10	10	3	0	13	158	24.7	38.1
1996	62	20	10	12	8	9	1	17	122	32.3	62.9
2000 ^a	47	5	1	11	8	2	0	10	74	10.6	46.8
2001	40	16	5	11	9	4	0	13	85	40.0	72.5
2002 ^a	10	7	0	6	3	0	0	3	26	70.0	90.0
2003 ^a	13	6	8	0	0	0	0	0	27	46.2	61.5
Unit 21A											
1998 ^a	9	3	1	0	1	0	0	1	14	33.3	22.2
2000	5	4	0	1	0	0	0	0	10	80.0	20.0
2002 ^b	7	6	2	1	2	0	0	2	18	85.7	71.4
2003	5	3	2	1	0	0	0	0	11	60.0	60.0
Hunt Area 27-1											
1989	77	39	3	9	29	12	3	41	172	50.6	68.8
1991	108	3	5	12	19	6	0	25	153	2.8	38.9
1993	90	14	5	1	5	14	0	19	129	15.6	27.8
1995 ^{a,c}	58	13	6	12	6	3	0	9	98	22.4	46.6
1999	56	14	7	8	13	5	0	18	103	25.0	58.9
2001	80	13	5	2	10	6	0	16	116	16.3	28.8
2002 ^{a,c}	45	9	11	7	16	3	0	19	91	20.0	82.2
2003 ^{a,c}	64	21	8	6	2	1	0	3	102	32.8	26.6
2004	100	24	7	8	19	5	0	24	163	24.0	39.0
Hunt Area 27-2											
1989	57	19	3	10	4	2	38	6	133	33.3	33.3
1990	43	5	2	6	7	12	0	19	75	11.6	62.8
1991	60	2	3	2	4	2	0	6	73	3.3	18.3
1993	36	2	1	7	4	4	0	8	54	5.6	44.4
1995 ^{a,c}	16	4	0	3	1	0	0	1	24	25.0	25.0
1999	54	16	7	8	5	1	0	6	91	29.6	38.9
2002 ^{a,c}	28	8	0	3	9	1	0	10	49	28.6	46.4
2004	44	9	4	1	3	6	0	9	67	20.5	31.8
Hunt Area 27-3											
1989	80	35	7	9	11	11	1	22	154	43.8	47.5
1991	88	7	2	10	13	3	0	16	123	8.0	31.8
1993	62	17	7	4	8	11	0	19	109	27.4	48.4
1995 ^{a,c}	30	3	1	1	3	2	0	5	40	10.0	23.3
1999	67	12	3	8	9	3	0	12	102	17.9	34.3
2001 ^c	34	7	0	3	1	0	0	1	45	20.6	11.8
2002 ^{a,c}	31	4	6	3	7	4	0	11	55	12.9	64.5
2003 ^{a,c}	24	1	5	0	3	1	0	4	34	4.2	37.5
2004	57	13	4	6	11	3	4	14	98	22.8	42.1

Table 1. Continued.

Area/Year	Ewes	Lambs	Rams				Uncl.	Total legal rams	Total sheep	Lambs: 100 ewes	Rams: 100 ewes
			I	II	III	IV					
Hunt Area 27-4											
1989	28	11	1	9	0	2	0	2	51	39.3	42.9
1991	36	3	5	8	5	1	0	6	58	8.3	52.8
1993	29	12	2	4	2	0	1	2	50	41.4	27.6
1995 ^{a,c}	3	0	0	1	0	1	0	1	5	0.0	66.7
1999	2	0	1	1	6	8	0	14	18	0.0	800.0
2001 ^c	10	1	0	0	0	0	0	0	11	10.0	0.0
2002 ^{a,c}	26	5	2	2	4	0	1	4	40	19.2	30.8
2004	12	8	1	1	1	1	0	2	24	66.7	33.3
West Lower Panther Creek											
1989	62	24	7	6	5	7	2	12	113	38.7	40.3
1990	34	7	3	3	3	5	0	8	55	20.6	41.2
1991	31	7	2	9	7	5	0	12	61	22.6	74.2
1992	17	8	0	3	3	3	0	6	34	47.1	52.9
1996	29	6	5	1	1	1	0	2	43	20.7	27.6
1999 ^a	22	7	4	4	2	0	0	2	39	31.8	45.5
2001 ^a	15	2	0	0	7	2	0	9	26	13.3	60.0
2002 ^a	10	5	0	0	2	0	0	2	17	50.0	20.0
2004 ^{a,c}	13	7	4	2	1	0	0	1	27	53.9	53.9
East Lower Panther Creek											
1989	93	30	9	5	14	23	1	37	175	32.3	54.8
1990	36	4	1	8	7	12	0	19	68	11.1	77.8
1991	51	9	2	13	9	17	0	26	101	17.6	80.4
1992	66	2	2	3	12	3	0	15	88	3.0	30.3
1996	57	7	5	5	2	3	0	5	79	12.3	26.3
1999 ^a	71	23	10	3	8	5	0	13	120	32.4	36.6
2001	49	11	4	6	3	2	0	5	67	22.4	30.6
2002 ^a	50	11	6	2	12	1	0	13	82	22.0	42.0
2004 ^{a,c}	11	10	0	0	0	0	0	0	21	90.9	0.0
Williams Creek to Perreau Creek in Unit 28											
1991	8	4	2	7	2	0	0	2	23	50.0	137.5
1996	11	3	0	3	5	0	0	5	22	27.3	72.7
1999 ^a	9	2	2	5	3	1	0	4	22	22.2	122.2
2001 ^a	27	9	4	5	4	0	0	4	49	33.3	48.1
Units 30 & 30A											
1992	19	2	3	6	2	0	0	2	32	10.5	57.9
1997	3	5	1	5	5	7	0	12	26	166.7	600.0
1999	29	9	3	5	1	3	0	4	50	31.0	41.4
2000 ^a	23	2	0	8	12	4	3	16	52	8.7	104.3
2001 ^a	18	9	5	2	9	1	0	10	44	50.0	94.4
2002 ^a	15	4	1	7	9	1	0	10	37	26.7	120.0
2003 ^a	22	8	0	3	4	3	0	7	40	36.4	45.5
2004 ^a	37	9	3	1	7	4	0	11	61	24.3	40.5
Unit 37A											
1992	36	2	1	2	5	3	1	8	50	5.6	30.6
1998 ^{a,c}	11	4	6	4	3	2	0	5	30	36.4	136.4

Table 1. Continued.

Area/Year	Ewes	Lambs	Rams				Uncl.	Total legal rams	Total sheep	Lambs: 100 ewes	Rams: 100 ewes
			I	II	III	IV					
2003	35	15	3	3	3	0	0	3	59	42.9	25.7
Unit 36A											
1990	98	47	2	13	20	8	3	28	191	48.0	43.9
1991	84	7	5	11	12	9	0	21	128	8.3	44.0
1992	85	3	3	8	10	7	0	17	116	3.5	32.9
1993	63	5	4	6	10	7	0	17	95	7.9	42.9
1994	65	2	4	6	6	8	0	14	91	3.1	36.9
1996	61	7	1	1	3	5	0	8	78	11.5	16.4
1997	53	2	0	1	2	3	0	5	60	3.8	11.3
2000 ^a	34	5	7	5	1	1	0	2	53	14.7	41.2
2001	27	7	1	2	0	0	0	0	37	25.9	11.1
2004 ^a	20	11	4	0	3	0	0	3	38	55.0	35.0
Morgan Creek area, Unit 36B											
1990	66	10	11	18	12	13	0	25	130	15.2	81.8
1991	89	18	9	16	13	14	0	27	159	20.2	58.4
1992	75	10	10	11	16	6	1	22	129	13.3	57.3
1993 ^{c,d}	47	9	1	14	7	4	0	11	82	19.1	55.3
1994 ^{c,d}	54	3	1	6	14	4	0	18	82	5.6	46.3
1996	66	13	12	6	7	1	0	8	105	19.7	39.4
1997	61	19	2	5	7	3	0	10	97	31.1	27.9
2000 ^a	32	16	2	7	11	4	0	15	72	50.0	75.0
2001	77	10	6	8	21	5	3	26	130	13.0	51.9
2002 ^a	17	3	0	1	6	5	0	11	32	17.6	70.6
Birch Creek area, Unit 36B											
1991	23	4	0	1	2	4	0	6	34	17.4	30.4
1993 ^{c,d}	27	4	1	5	6	4	0	10	47	14.8	59.3
1994 ^{c,d}	7	3	0	0	2	0	0	2	12	42.9	28.6
1996	30	0	0	0	6	1	0	7	37	0.0	23.3
1997	29	3	2	2	1	1	0	2	38	10.3	20.7
2000 ^a	14	2	2	4	1	0	0	1	23	14.3	50.0
2001	21	2	2	3	4	0	0	4	32	9.5	42.9
2002 ^a	5	0	0	5	11	1	0	12	22	0.0	340.0
2003 ^a	22	6	0	2	4	0	0	4	34	27.3	27.3
Hunt Area 37											
1983	90	16	14	7	7	2	0	9	136	17.8	33.3
1987	100	22	7	8	17	6	4	23	164	22.0	38.0
1992	38	1	2	3	3	0	0	3	47	2.6	21.1
1994	54	4	5	8	7	6	0	13	84	7.4	48.1
2000	38	8	3	2	4	0	0	4	55	21.1	23.7

^a Incidental to deer and/or elk surveys.

^b Ground count.

^c Partial count.

^d Incidental to other surveys.

Table 2. 2003 season structure for bighorn sheep hunts in the Salmon Region.

Season		Hunt area	Number of permits		
Dates	Length				
30 August - 13 October	45 days	21	3		
		27-1	12		
		27-2	6		
		27-3	2		
		27-4	3		
		28-1	2		
		28-2	2		
		30	2		
		36B	4		
		37	2		
		13-31 October	19 days	27-L	2

Table 3. Summary of bighorn sheep harvest and drawing odds by hunt area in the Salmon Region, 1994-present.

Hunt area	Year	No. of permits	Harvest	% Success	Days/hunter ^a	First-choice applicants	Drawing odds
21	1994	3	0	0	9.7	50	1:16.7
	1995	3	1	33	22.3	36	1:12.0
	1996	3	3	100	5.7	53	1:17.7
	1997	3	3	100	-	34	1:11.3
	1998	3	2	67	10.7	43	1:14.3
	1999	3	3	100	8.7	51	1:17.0
	2000 ^b	3	1	50	1.0	44	1:14.7
	2001 ^b	4	4	100	5.7	60	1:20.0
	2002	3	2	67	8.5	105	1:35.0
	2003	3	0	0	-	60	1:20.0
27-1	1994	30	2	7	9.9	74	1:2.5
	1995	12	2	17	9.1	39	1:3.2
	1996	12	2	17	-	34	1:2.8
	1997	12	4	33	-	63	1:5.2
	1998	12	0	0	-	58	1:4.8
	1999	12	2	17	11.0	60	1:5.0
	2000 ^c	12	1	13	-	51	1:4.3
	2001 ^c	16	3	19	6.0	38	1:3.2
	2002	12	2	17	10.5	61	1:5.1
	2003	12	2	17	5.5	39	1:3.3
27-2	1994	6	1	17	10.0	41	1:6.8
	1995	6	4	67	3.8	45	1:7.5
	1996	6	3	50	-	44	1:7.3
	1997	6	1	17	-	83	1:13.8
	1998	6	3	50	5.0	42	1:7.0
	1999	6	1	17	10.0	99	1:17.0
	2000 ^b	6	3	60	4.5	64	1:10.7
	2001 ^b	7	5	71	10.8	43	1:7.2
	2002	6	0	0	-	58	1:9.7
	2003	6	2	33	7.0	43	1:7.2
27-3	1994	2	2	100	7.0	14	1:7.0
	1995	2	1	50	5.5	30	1:15.0
	1996	2	0	0	12.5	16	1:8.0
	1997	2	1	50	-	30	1:15.0
	1998 ^d	2	2	67	-	27	1:13.5
	1999	2	1	50	9.5	36	1:18.0
	2000 ^{b,d}	2	1	50	1.0	51	1:25.5
	2001 ^b	3	0	0	-	21	1:10.5
	2002	2	2	100	6.5	15	1:7.5
	2003	2	1	50	7.0	29	1:14.5
27-4	1994	3	1	33	7.0	11	1:3.7
	1995	3	1	33	8.3	28	1:9.3
	1996	3	1	33	-	27	1:9.0
	1997	3	1	33	-	22	1:7.3
	1998	3	2	67	-	36	1:12.0
	1999	3	2	67	2.0	36	1:12.0

Table 3. Continued.

Hunt area	Year	No. of permits	Harvest	% Success	Days/hunter ^a	First-choice applicants	Drawing odds
27-L	2000	3	1	33	1.0	22	1:7.3
	2001	3	1	33	4.0	56	1:18.7
	2002	3	2	67	5.0	53	1:17.7
	2003	3	3	100	6.3	67	1:22.3
	1994	2	1	50	6.0	30	1:15.0
	1995	2	2	100	8.0	22	1:11.0
	1996	2	1	50	-	69	1:34.5
	1997	2	1	50	-	63	1:31.5
	1998	2	1	50	-	106	1:53.0
	1999	2	1	50	-	98	1:49.0
	2000	2	2	100	5.0	88	1:44.0
	2001	2	2	100	6.0	80	1:40.0
28-1	2002	2	0	0	-	74	1:37.0
	2003	2	1	50	9.0	61	1:30.5
	1994	2	0	0	14.0	15	1:7.5
	1995	2	0	0	8.5	10	1:5.0
	1996	2	1	50	-	10	1:5.0
	1997	2	0	0	-	13	1:6.5
	1998	2	1	50	-	11	1:5.5
	2003	2	1	50	2.0	47	1:23.5
28-2	1994	3	1	33	10.3	29	1:9.7
	1995	3	0	0	10.5	32	1:10.7
	1996	3	0	0	-	33	1:11.0
	1997	3	2	67	-	33	1:11.0
	1998	3	2	67	-	37	1:12.3
28	2003	2	2	100	1.5	128	1:64.0
	1999	3	0	0	-	41	1:13.7
	2000 ^e	3	0	0	-	37	1:12.3
	2001 ^e	5	2	40	11.0	36	1:12.0
30	2002	3	2	67	17.5	10	1:3.3
	2001	2	2	100	7.0	96	1:48.0
	2002	2	1	50	2.0	43	1:21.5
36A	2003	2	2	100	14.5	78	1:39.0
	1994	6	2	33	9.5	50	1:8.3
	1995	3	1	33	16.3	33	1:11.0
36B-1	1996	3	2	67	-	39	1:13.0
	1994	2	1	50	5.0	18	1:9.0
	1995	2	1	50	13.0	19	1:9.5
36B-2	1996	2	1	50	-	27	1:13.5
	1994	2	2	100	9.5	23	1:11.5
	1995	2	2	100	21.5	29	1:14.5
36B-3	1996	2	0	0	-	26	1:13.0
	1994	2	1	50	8.5	25	1:12.5
	1995	2	1	50	9.5	24	1:12.0
36B	1996	2	1	50	-	9	1:4.5
	1997	4	2	50	-	65	1:16.2
	1998	4	2	50	-	57	1:14.2

Table 3. Continued.

Hunt area	Year	No. of permits	Harvest	% Success	Days/hunter ^a	First-choice applicants	Drawing odds
37	1999	4	4	100	14.0	50	1:12.5
	2000 ^e	4	1	50	7.0	57	1:14.3
	2001 ^e	6	5	83	9.6	61	1:15.3
	2002	4	4	100	9.3	74	1:18.5
	2003	4	3	75	5.7	85	1:21.3
	1994	6	6	100	7.5	95	1:15.8
	1995	3	1	33	15.0	83	1:27.7
	1996	3	1	33	9.0	74	1:24.7
	1997	3	1	33	-	55	1:18.3
	1998	3	2	67	-	61	1:20.3
	1999	3	1	33	4.0	69	1:23.0
	2000	3	3	100	6.0	85	1:28.3
	2001	2	2	100	5.5	60	1:30.0
	2002 ^d	2	3	100	4.3	82	1:41.0
	2003	2	1	50	2.0	85	1:42.5

^a Prior to 1996, data are from a telephone survey of all hunters. Beginning in 1996, data are from mandatory check of successful hunters only.

^b One permit deferred until 2001 season.

^c Four permits deferred until 2001 season.

^d The state auction or lottery tag holder hunted for bighorn sheep in the Salmon Region, raising participation by one permit.

^e Two permits deferred until 2001 season.

Table 4. Summary of bighorn sheep harvest and drawing odds in the Salmon Region, 1983-present.

Year	No. of permits	Harvest	% Success	First-choice applicants	Drawing odds
1983	79	30	38	591	1:7.5
1984	79	30	38	492	1:6.2
1985	92	37	40	495	1:5.4
1986	92	37	40	622	1:6.8
1987	117	36	31	680	1:5.8
1988 ^a	118	35	30	751	1:6.4
1989	130	61	47	658	1:5.1
1990 ^a	131	48	37	751	1:5.7
1991 ^a	136	47	35	830	1:6.1
1992 ^b	137	55	40	681	1:5.0
1993	68	26	38	433	1:6.4
1994	69	20	29	475	1:6.9
1995	45	17	38	430	1:9.6
1996	45	16	36	461	1:10.2
1997	40	16	40	461	1:11.5
1998 ^a	41	17	43	478	1:12.0
1999	38	15	39	540	1:14.2
2000 ^{a,c}	38	13	34	499	1:13.1
2001 ^c	50	26	52	551	1:14.1
2002 ^a	39	18	46	575	1:14.7
2003	40	18	45	722	1:18.1

^a The state auction or lottery tag holder hunted for bighorn sheep in the Salmon Region, raising participation by one permit.

^b Both the state auction and lottery tag holders hunted for bighorn sheep in the Salmon Region, raising participation by two permits.

^c Eleven of these permits were deferred until 2001 season because of wildfires.

Table 5. Summary of bighorn sheep mortality in the Salmon Region, 1993-present.

Year	Controlled harvest	Indian harvest ^a	Illegal kill	Other	Total
1993	26	0	0	30	56
1994	20	5	0	23	48
1995	17	3	0	38	58
1996	16	1	0	17	34
1997	16	2	0	28	46
1998	17	1	2	26	46
1999	15	1	1	24	41
2000	13	2	0	23	38
2001	26	0	1	26	53
2002	18	4	0	28	50
2003	18	-	-	-	-

^a Indian harvest information has not been consistently available and is incomplete.

Table 6. Summary of bighorn sheep translocation in the Salmon Region, 1968-present.

Year	Capture site		Release site		Adults		Lambs		Total
	Unit/State	Location	Unit/State	Location	M	F	M	F	
1968-69	36B	Morgan Cr.	37	Mahogany Cr.	1	4	1	1	7
1969-70	Canada	Banff Park	37	Mahogany Cr.	5	19	0	0	24
1974-75	28	Burnt Gulch	18	Granite Cr.	1	10	2	0	13
1975-76	28	Pretty Gulch	18	Granite Cr.	5	10	4	2	21
		Bacon Ranch	58	Blue Dome	1	3	1	1	6
1977-78	28	Burnt Gulch	58	Long Canyon	2	8	0	2	12
1978-79	28	Burnt Gulch	Oregon	Imnaha R.	5	9	1	0	15
		Burnt Gulch	18	Bernard Cr.	0	7	0	0	7
	Wyoming	Whiskey Mt.	50	Elbow Canyon	3	10	2	2	17
1979-80	Wyoming	Whiskey Mt.	50	Jaggles Canyon	2	5	2	2	11
1981-82	28	Clear Cr.	36B	Birch Cr.	2	3	0	3	8
		Clear Cr.	58	Goddard Canyon	1	3	2	0	6
		Pretty Gulch	58	Goddard Canyon	0	3	0	0	3
		Burnt Gulch	58	Bloom Canyon	2	8	0	4	14
1983-84	28	Pretty Gulch	Oregon	Imnaha R.	3	8	0	0	11
	Oregon	Lostine R.	21	Shoup Bridge	3	7	3	3	16
1984-85	28	Burnt Gulch	Oregon	Grande Ronde R.	5	5	0	1	11
	21	Cove Cr.	Oregon	Grande Ronde R.	1	10	3	2	16
	Oregon	Lostine R.	30A	Rocky Canyon	3	14	3	2	22
1985-86	21	Ebenezer Bar	Oregon	Minam R.	2	9	1	0	12
	Oregon	Lostine R.	37A	Falls Cr.	4	11	1	2	18
1987-88	36A	E. Fk. Salmon R.	37A	Morse Cr.	3	9	1	0	13
	36B	Morgan Cr.	30A	Cedar Gulch	4	11	2	0	17
	36B	Morgan Cr.	28	Williams Cr.	2	4	0	0	6
1988-89	36B	Morgan Cr.	37A	Falls Cr.	2	18	2	1	23
	36B	Morgan Cr.	17	Tango Bar	5	9	1	0	15
	36B	Morgan Cr.	17	Elevator Mt.	2	11	0	1	14
1991-92	36B	Morgan Cr.	Wyoming	Bighorn Mts.	2	16	2	2	22

APPENDIX A
IDAHO
2003 SEASON
BIGHORN SHEEP RULES

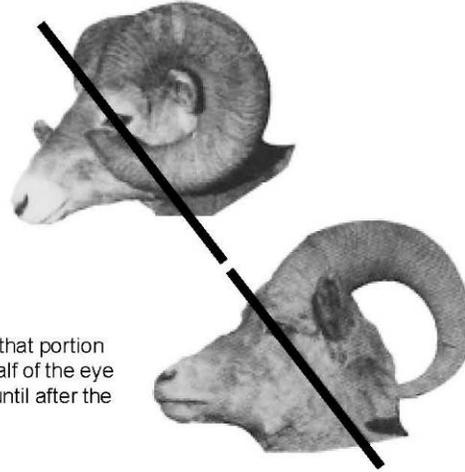


2003 & 2004 BIGHORN SHEEP HUNTING SEASONS

- Only bighorn sheep rams having 3/4-curl or greater horns or exceeding four years of age may be taken in any hunt open for rams only.

Determination of a 3/4 curl shall be made from a side view of the head. A ram shall be considered 3/4 curl if an imaginary straight line extending downward from the front of the base of the horn through the center of the eye socket intersects any portion of the horn.

Any hunter taking a bighorn ram must leave that portion of the skull plate containing the upper one-half of the eye socket naturally attached to both the horns until after the horns have been pinned by IDFG.



MANDATORY CHECK AND REPORT REQUIREMENTS

Any hunter killing a bighorn sheep ram must present the horns to an IDFG regional office within 10 days of the date of the kill. *The IDFG headquarters office is not equipped to check in "mandatory check" species. In the Boise area, these animals can be checked at IDFG's volunteer office at 109 W. 44th St. in Garden City, between 10 a.m. and 3 p.m. weekdays.*

Successful hunters must complete a big game mortality report, available at IDFG regional offices, within 10 days of the date of the kill.

A hunter may authorize another person to comply with the above report requirements if that person complies with those requirements and possesses the necessary information to accurately complete the form.

Unsuccessful permittees must present or mail their unused tags to an IDFG office within 10 days after the close of the season for which the tag was valid. Cancelled tags will be returned to the hunter upon request. Failure to report may result in future ineligibility in bighorn sheep drawings.

MANDATORY TRAINING

Anyone drawing a sheep permit must view a short bighorn sheep video at an IDFG office before hunting bighorn sheep. Attendees will be issued a certificate of completion that must be carried by the permittee during the hunt.

The video is available at IDFG offices between 8 a.m. and 4 p.m., Monday through Friday, except holidays.

Any hunter who will be with an Idaho licensed outfitter or guide at all times while hunting sheep may choose to have the outfitter or guide attend in the hunter's place. This option may be accomplished by notifying IDFG, in writing, the name, address, and phone number of the designated outfitter or guide. Notification must be sent to the Idaho Department of Fish and Game, c/o Sheep School, P.O. Box 25, Boise, Idaho 83707 and must be received by IDFG prior to attendance by the designated outfitter or guide.

2003 & 2004 BIGHORN SHEEP CONTROLLED HUNTS - RAMS ONLY
ALL 5000 SERIES HUNTS ARE FOR ROCKY MOUNTAIN BIGHORNS;
ALL 7000 SERIES HUNTS ARE FOR CALIFORNIA BIGHORNS.
74 TOTAL PERMITS INCLUDING SPECIAL LOTTERY AND AUCTION TAG

Rocky Mountain Bighorn Rams: North of Interstate Highway 84 - 57 Permits

Hunt No.	Season Dates	Controlled Hunt Area	Permits	Notes
5001	Aug 30 - Oct 13	11	1	Boundary change.
5002	Aug 30 - Oct 13	19*	6	
5003	Aug 30 - Oct 13	20-1*	2	
5004	Aug 30 - Oct 13	20-2	2	
5005	Aug 30 - Oct 13	20A	2	
5006	Aug 30 - Oct 13	21	3	
5007	Aug 30 - Oct 13	26*	2	
5008	Aug 30 - Oct 13	27-1	12	
5009	Aug 30 - Oct 13	27-2	6	
5010	Aug 30 - Oct 13	27-3*	2	
5011	Aug 30 - Oct 13	27-4*	3	
5012	Aug 30 - Oct 13	28-1	2	Boundary change.
5013	Aug 30 - Oct 13	28-2	2	Boundary change.
5014	Aug 30 - Oct 13	30*	2	
5015	Aug 30 - Oct 13	36B*	4	
5016	Aug 30 - Oct 13	37*	2	
5017	Oct 13 - Oct 31	26L	2	
5018	Oct 13 - Oct 31	27L*	2	

California Bighorn Rams: South of Interstate Highway 84 - 15 Permits

Hunt No.	Season Dates	Controlled Hunt Area	Permits	Notes
7001	Aug 30 - Oct 8	41*	3	Boundary change.
7002	Aug 30 - Sep 14	42-1*	5	
7003	Sep 22 - Oct 8	42-2*	5	
7004	Aug 30 - Oct 8	46*	2	

**See controlled hunt area descriptions. This unit includes other units or parts of other units.*

HUNT AREA DESCRIPTIONS

Hunt Area 11 — That portion of Unit 11 that drains into the Snake River downstream from the mouth of the Salmon River to, but excluding, the Tenmile Creek Canyon drainage.

Hunt Area 19—Those portions of Units 14, 19 and 20 from the Red River Ranger Station-White Water Ranch Road (Forest Service Road 421) downstream to and including the Wind River drainage.

Hunt Area 20-1—That portion of Unit 20 upstream from Sabe Creek, that portion of Unit 21 downstream from the Horse Creek Trail (Forest Service Trail 159) and Reynolds Creek Trail (Forest Service Trail 067) and that portion of Unit 17 upstream from the Witter Ridge Trail (Forest Service Trail 75) and the Thompson Flat-Wood Hump-Surprise Creek Trail (Forest Service Trail 031).

Hunt Area 20-2—That portion of Unit 20 downstream from the Nez Perce-Bitterroot Forest boundary along Sabe Creek to the Red River Ranger Station-White Water Ranch Road.

Hunt Area 20A—Those portions of Unit 20A upstream from and including the Butts Creek drainage to the Middle Fork of the Salmon River, and within the Middle Fork of the Salmon River drainage upstream to Papoose Creek-Papoose Lake-Coyote Springs.

Hunt Area 21—That portion of Unit 21 downstream from the Spring Creek Road (Forest Service Road 038) to the Horse Creek Trail (Forest Service Trail 159) and Reynolds Creek Trail (Forest Service Trail 067).

Hunt Area 26—All of Unit 26 and that portion of Unit 20A within the Middle Fork of the Salmon River drainage upstream from Papoose Creek-Papoose Lake-Coyote Springs and that portion of Unit 27 on the west side of the Middle Fork of the Salmon River from Big Creek upstream to and including the Brush Creek drainage.

Hunt Area 26-L—All of Unit 26.

Hunt Area 27-1—That portion of Unit 27 west of the Middle Fork of the Salmon River upstream from, but excluding, the Brush Creek drainage to and including the Indian Creek drainage.

Hunt Area 27-2—That portion of Unit 27 east of the Middle Fork of the Salmon River upstream from its mouth to the Waterfall Creek Trail (Forest Service Trail 045).

Hunt Area 27-3—That portion of Unit 27 east of the Middle Fork of the Salmon River upstream from the Waterfall Creek Trail (Forest Service Trail 045) to and including the Camas Creek drainage on the north side of Camas Creek, and that

portion of Unit 28 within the Camas Creek drainage north of Camas Creek and west of the Silver Creek-Meyers Cove Road (Forest Service Road 108).

Hunt Area 27-4—That portion of Unit 27 within the Loon Creek drainage; that portion of Unit 27 east of the Middle Fork of the Salmon River, south of Camas Creek, and northwest of Fly Creek Trail (Forest Service Trail 124); that portion of Unit 36 within the Yankee Fork drainage.

Hunt Area 27-L—That portion of Unit 20A within the Middle Fork of the Salmon River drainage, and that portion of Unit 27 on the west side of the Middle Fork of the Salmon River downstream from but excluding the Pistol Creek drainage and the east side of the Middle Fork of the Salmon River downstream from but excluding the Camas Creek drainage.

Hunt Area 28-1—That portion of Unit 28 west of Panther Creek downstream from and including Big Deer Creek drainage.

Hunt Area 28-2 — That portion of Unit 28 east of Panther Creek, and north of the Hat Creek drainage.

Hunt Area 30 — All of Units 30 and 30A.

Hunt Area 36B—All of Unit 36B; that portion of Unit 28 south of and including the Hat Creek drainage; that portion of Unit 28 west of the Panther Creek Road and south of the Silver Creek- Meyers Cove Road; and that portion of Unit 27 southeast of Fly Creek Trail (Forest Service Trail 124) and northeast of the Sleeping Deer Road (Forest Service Road 086).

Hunt Area 37—All of Unit 37 and that portion of Unit 50 east of U.S. Highway 93 and that portion of Unit 51 west of the Howe-Goldburg Road.

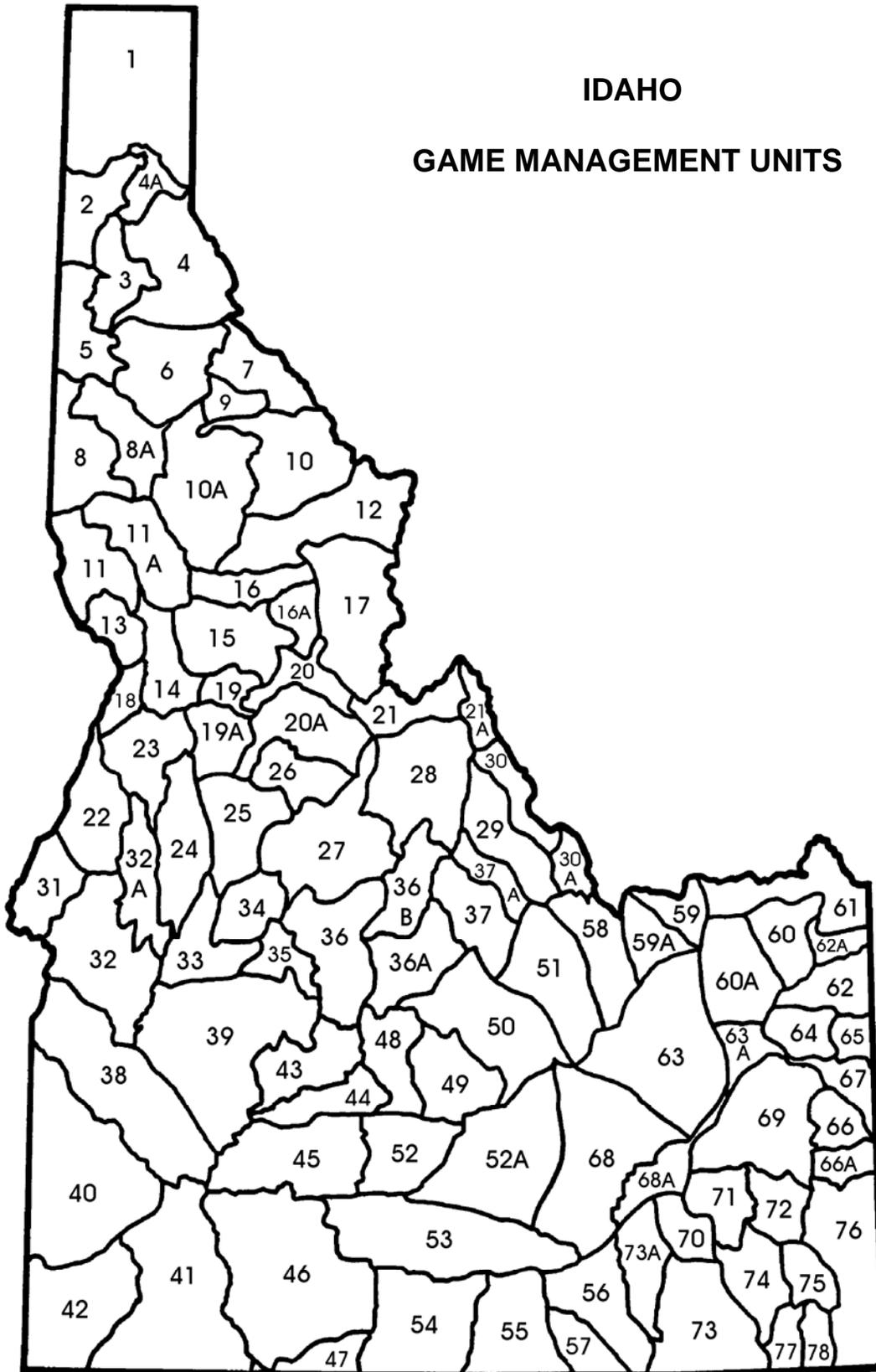
Hunt Area 41 — That portion of Unit 41 within the Big Jack Creek drainage, Little Jack and Shoofly drainages and all of Unit 40.

Hunt Areas 42-1 and 42-2— All of Unit 42 and that portion of Unit 41 within the East Fork and South Fork of the Owyhee River drainages outside the Duck Valley Indian Reservation boundary.

Hunt Area 46 — Those portions of Units 41, 46 and 47 within the Bruneau and Jarbidge River drainages upstream from and including Sheep Creek drainage.

IDAHO

GAME MANAGEMENT UNITS



FEDERAL AID IN WILDLIFE RESTORATION

The Federal Aid in Wildlife Restoration Program consists of funds from a 10% to 11% manufacturer's excise tax collected from the sale of handguns, sporting rifles, shotguns, ammunition, and archery equipment. The Federal Aid program then allots the funds back to states through a formula based on each state's geographic area and the number of paid hunting license holders in the state. The Idaho Department of Fish and Game uses the funds to help restore, conserve, manage, and enhance wild birds and mammals for the public benefit. These funds are also used to educate hunters to develop the skills, knowledge, and attitudes necessary to be responsible, ethical hunters. Seventy-five percent of the funds for this project are from Federal Aid. The other 25% comes from license-generated funds.

