Liberal Regulation: Limited ewe licenses valid in the entire hunting district during the general season for bighorn sheep in this district. The number of ewe licenses issued would be up to 20% of the number of ewes going into the fall season. The number of ewes going into the fall season would be based on the number of ewes observed during the biennial survey, assuming 5% mortality of adults, and adding recruitment of one-half the previous year's lambs,

OR if the number of ewes and rams is at least 25 sheep (minimum transplant number) above objective, the surplus could be used for transplanting.

The Liberal Regulation will be recommended if: The total number of bighorns counted on the survey area is greater than 10% above the population objective and lamb recruitment is greater than 40 lambs: 100 ewes.

Rams:

Standard Regulation: Limited-entry either-sex licenses with the number of either-sex licenses issued being up to 20% of the ¾-curl rams in the population.

The Standard Regulation will be recommended if: The population is within objective (+ 10% of 100), there are more than 30 rams: 100 ewes, and 30% of the rams are at least ¾-curl (Table 4).

Restrictive Regulation: Limited-entry either-sex licenses with the number issued being up to 10% of the ¾-curl rams in the population.

The Restrictive Regulation will be recommended if: The population is more than 10% below the population objective of 100, there are less than 30 rams: 100 ewes and less than 40 lambs: 100 ewes, and less than 30% of the rams are at least ¾-curl.

Liberal Regulation: Limited-entry either-sex licenses with the number of either-sex licenses issued being more than 20% of the ¾-curl rams in the population.

The Liberal Regulation will be recommended if: The population is more than 10% above the objective of 100, there are more than 100 rams: 100 ewes, and more than 30% of the rams are at least ¾-curl.

GALLATIN – YELLOWSTONE, SOUTH ABSAROKA, HYALITE, SOUTH YELLOWSTONE

(Upper Yellowstone Complex) (Hunting Districts 300, 303, 304, 305 and Mill Creek Non-Hunted Population)

Description: The Upper Yellowstone sheep management complex (Hunting Districts 300, 303, 304, and 305 and the Mill Creek non-hunted sheep population) is located in the Southern Mountains ecological region and contains approximately 1,350mi^2 in the Upper Yellowstone and Upper Gallatin River drainages north of Yellowstone National Park (YNP). This sheep population is comprised of several small, interconnected subpopulations, some of which occupy additional habitat inside YNP. Sheep movements across national park and state boundaries impact sheep management decisions, hunting regulations, and survey strategies (see below).

Bighorn sheep currently occupy less than 10% of this large area. Sheep habitat in the Upper Yellowstone drainage is a mosaic of foothills grassland, forest, alpine ridges and basins, and rugged rocky canyons and cliffs at elevations of 5,500 to 10,500 feet. Because most sheep in this complex occur in small, scattered

Table 4. Summary of potential ram harvest under different population parameters and criteria.

MOUNTAIN-FOOTHILLS	Number of Either-Sex or Legal Ram Licenses Is	When the Herd Has		
		Population Size	Ram: 100 Ewe ratio	% of Rams with ≥ ¾-curl
Standard Regulation	Up to 20% of the ¾-curl rams	± 10% of 100	>30	≥ 30
Restrictive Regulation	Up to 10% of the ¾-curl rams	More than 10% below 100	< 30	< 30
Liberal Regulation	Up to 20 % of the ¾-curl rams	Greater than 10% above 100	> 100	≥ 30

subpopulations and migrate considerable distances between seasonal habitats, their exact home range boundaries are not completely known. However, with the exception of a few small winter range areas in private ownership, the majority of occupied bighorn sheep habitat in this area is in public ownership, managed by the U.S. Forest Service (USFS) – Gallatin National Forest (NF) and the National Park Service (NPS) – Yellowstone National Park (YNP).

Public Access: In general there is good public access to all hunted and non-hunted sheep populations in this complex. Public access to bighorn sheep north of YNP is largely provided by the Gallatin NF and varies between subpopulations. In some cases, sheep hunting occurs a short distance from open Forest Service or county roads (Hunting Districts 303 and 305) or via a system of backcountry trails (Hunting Districts 300 and 304). Trail distances to hunt sheep in Hunting Districts 300 and 304 may range from 6 to 12 miles. The non-hunted Mill Creek bighorn sheep subpopulation can be viewed during the winter and spring from public roads at the mouth of the Mill Creek canyon and sporadically during the rest of the year from Forest Service roads and backcountry trails in the Mill Creek and Emigrant Creek drainages. During the winter and spring, sheep in Hunting Districts 300 and 303 are often visible from U.S. Highway 89 and adjacent county roads from the Point of Rocks south to Gardiner. Sheep on the east side of the Yellowstone River (Hunting District 303 and Mill Creek) move seasonally in and out of the Absaroka-Beartooth Wilderness Area. Inside YNP, sheep can be viewed seasonally from roads in several areas (e.g., Mount Everts/Gardiner River, Mount Washburn, Tower Falls/Junction Butte, Druid Peak) and from backcountry trails.

Bighorn Sheep Populations: There are nine distinct bighorn sheep subpopulations in the Upper Yellowstone Bighorn Sheep Complex. Population data for these bighorns has been collected and analyzed over time based on these population units (Figures 1-5 and Tables 1-9).

All bighorns in the Upper Yellowstone, with the exception of a 1985 transplant in Mill Creek, are "native" bighorn sheep. Between January 15 and March 27, 1985, 20 bighorn sheep were released on winter range at the mouth of Mill Creek canyon. Thirteen sheep (three rams, eight ewes, two lambs) came from a nearby native Upper Yellowstone subpopulation (Cinnabar Mountain near Corwin Springs) while seven ewes were "nonnative" sheep transplanted from Thompson Falls, in northwest Montana.

Hunted bighorn sheep subpopulations are monitored annually by spring helicopter surveys, and the non-hunted Mill Creek sheep population is monitored by annual ground counts throughout the winter and early spring. From 1995 to 2008, the total number of sheep counted during helicopter surveys on small, scattered winter ranges in Hunting Districts 300, 303, 304, 305, and adjacent YNP has ranged from 134 to 353 (mean=204). The Mill Creek sheep subpopulation is surveyed several times from the ground between January and April on its winter range, and in the last six years, 13 to 27 sheep have been observed (mean=21 sheep).

From 1995 to 2008, recruitment for the hunted and YNP subpopulations has been relatively low, ranging from 7 to 34 lambs: 100 ewes (mean=24) with an observed ram

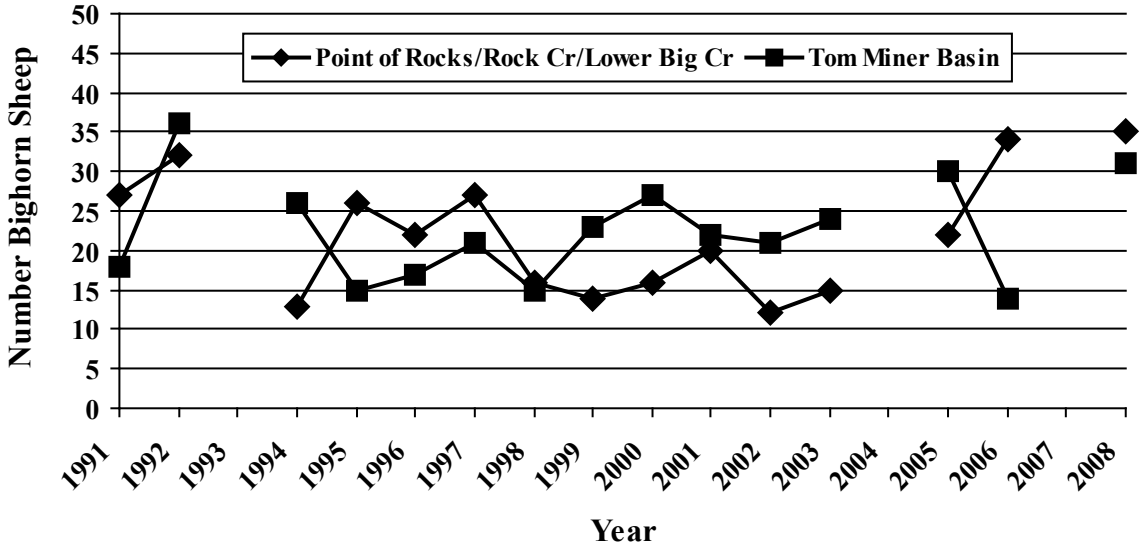


Figure 1. Total number of bighorn sheep observed during aerial trend surveys in Hunting Districts 300 and 304, 1997-2008.

Table 1. Classification data from aerial surveys in the Tom Miner Basin population segment, Hunting District 300, 1991-2008.

Year	Total	Rams	Ewes	Lambs
1991	18	2	14	2
1992	36	13	18	5
1994	26	6	16	4
1995	15	3	10	2
1996	17	1	13	3
1997	21	2	9	0
1998	15	1	12	2
1999	23	2	14	7
2000	27	7	15	5
2001	22	7	12	4
2002	21	3	14	4
2003	24	9	12	3
2005	30	6	15	9
2006	14	1	9	4
2008	31	8	18	5

to ewe ratio of 44 to 86 rams: 100 ewes (mean=63). Recruitment in the small non-hunted subpopulation in Mill Creek, from 2002 to 2007, has ranged from 1 to 5 lambs per year (mean=2.7) produced by 5 to 8 ewes per year (mean=7.2). The number of rams observed in the Mill Creek subpopulation has ranged from 6 to 14 rams per year (mean=11).

Observations and harvest of marked Mill Creek sheep following the transplant indicates connectivity between Mill Creek sheep and bighorns in Hunting District 303, 15 to 20 miles to the south.

The movement of sheep across YNP boundaries complicates monitoring and setting harvest prescriptions. While it is clear that portions of some YNP subpopulations move into Hunting Districts 300, 303, and 305 during the hunting season and contribute to rams that are available to hunters, other YNP subpopulations may or may not be part of the "huntable" sheep population, or their movements may vary from year to year. Many of the scattered subpopulations are biologically/genetically connected, but their exposure to potential harvest is not clearly understood. It must be remembered that not all sheep surveyed between Point of Rocks and Soda Butte Creek are subject to hunting, and we do not know for sure which ones are. Because the "huntable" bighorn subpopulations are quite small (probably less than 50 sheep in each hunting district), management flexibility and harvest prescription options are limited. In general, sheep management has been and will probably continue to be conservative, with an allowable harvest of only a few adult rams each year. Unless population size and recruitment increase significantly, increasing harvest quotas and/or harvesting females in the Upper Yellowstone complex is unlikely.

Regarding the small non-hunted Mill Creek population, large fires of 2006 and 2007 converted 30,000+ acres of forest into much more open habitats, including high-elevation ridges and drainage divides. This natural habitat conversion may benefit bighorns and potentially support larger numbers in the future.

Wildlife diseases can have profound impacts on bighorn sheep populations, and in some places the occurrence of disease can periodically remove large numbers of sheep and influence population management decisions. In 1981-82, an epizootic event of chlamydial-caused infectious keratoconjunctivitis, or "pink-eye," killed hundreds of bighorn sheep (approximately 60% of an estimated 500 bighorns) in the Upper Yellowstone complex inside and along the northern border of YNP. Based on aerial surveys, bighorn sheep populations between Cinnabar Mountain (outside YNP) and Soda Butte Creek (inside YNP) have never recovered to population levels observed prior to the "pink-eye" die-off. In spring 2008, 287 sheep were observed in roughly the same area where 487 sheep were observed in spring 1981. The most recent count is 200, or 41% fewer sheep than the pre-die-off sheep count of 1981; however, it should be noted that bighorn numbers were at record high levels just prior to the die-off.

In recent history, there has been no evidence of an all-age pneumonia/lungworm complex bighorn sheep die-off in the Upper Yellowstone area. All-age pneumonia-related die-offs have occurred in several southwest Montana sheep populations in the last 20 years. There has, however, been some evidence of chronic "lamb pneumonia" mortality in bighorn sheep in the Gardiner Basin in the mid-to late 1990s to include finding dead lambs in late summer and

Year	Total	Rams	Ewes	Lambs
1991	27	12	11	4
1992	32	17	12	3
1994	13	9	4	0
1995	26	5	18	3
1996	22	7	12	3
1997	27	14	13	0
1998	16	8	7	1
1999	14	9	4	1
2000	16	10	4	2
2001	20	14	5	1
2002	12	12	0	0
2003	15	8	4	3
2005	22	14	6	2
2006	34	11	22	1
2008	35	12	17	6

Table 2. Classification data from aerial surveys in the Point of Rocks, Rock Creek, and Lower Big Creek population segments, Hunting Districts 300 and 304, 1991-2008.

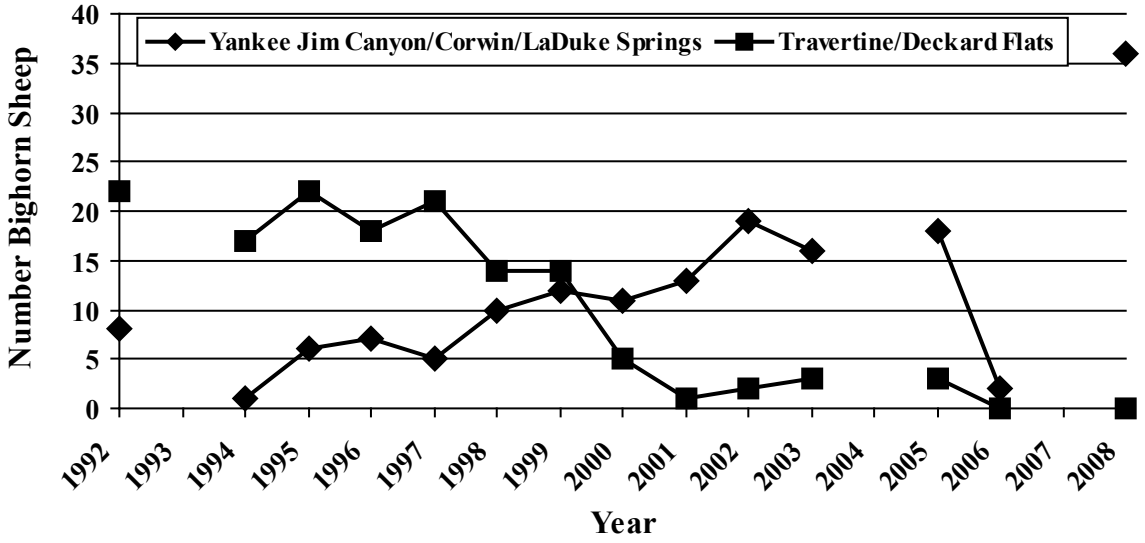


Figure 2. Total number of bighorn sheep observed during aerial trend surveys in Hunting District 303, 1992-2008.

Year	Total	Rams	Ewes	Lambs
1992	8	1	5	2
1994	1	0	1	0
1995	6	6	0	0
1996	7	4	2	1
1997	5	1	4	0
1998	10	0	8	2
1999	12	0	9	3
2000	11	0	11	0
2001	13	1	12	0
2002	19	0	14	5
2003	16	3	11	2
2005	18	3	11	4
2006	2	0	1	1
2008	36	8	23	5

Table 3. Classification data from aerial surveys in the Yankee Jim Canyon, Corwin, and LaDuke Springs population segments, Hunting District 303, 1992-2008.

Table 4. Classification data from aerial surveys in the Travertine and Deckard Flats population segments, Hunting District 303, 1992-2008.

Year	Total	Rams	Ewes	Lambs
1992	22	6	13	3
1994	17	1	15	1
1995	22	2	17	3
1996	18	1	13	4
1997	21	7	12	2
1998	14	7	7	0
1999	14	6	8	0
2000	5	4	1	0
2001	1	1	0	0
2002	2	0	2	0
2003	3	2	1	0
2005	3	3	0	0
2006	0	0	0	0
2008	0	0	0	0

Figure 3. Total number of bighorn sheep observed during aerial trend surveys in Hunting District 305, 1992-2008.

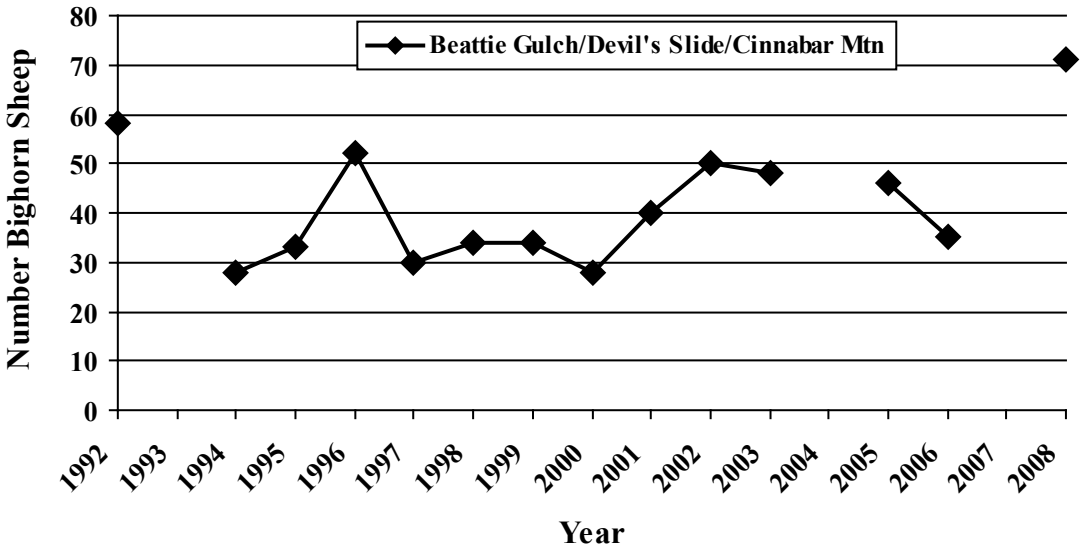


Table 5. Classification data from aerial surveys in the Beattie Gulch, Devil's Slide, and Cinnabar Mountain population segments, Hunting District 305, 1992-2008.

Year	Total	Rams	Ewes	Lambs
1992	58	25	24	9
1994	28	4	21	3
1995	33	11	19	3
1996	52	26	20	6
1997	30	12	16	2
1998	34	13	18	3
1999	34	12	16	6
2000	28	5	16	7
2001	40	12	22	6
2002	50	17	23	9
2003	48	17	25	6
2005	46	11	27	11
2006	35	11	19	5
2008	71	21	37	13

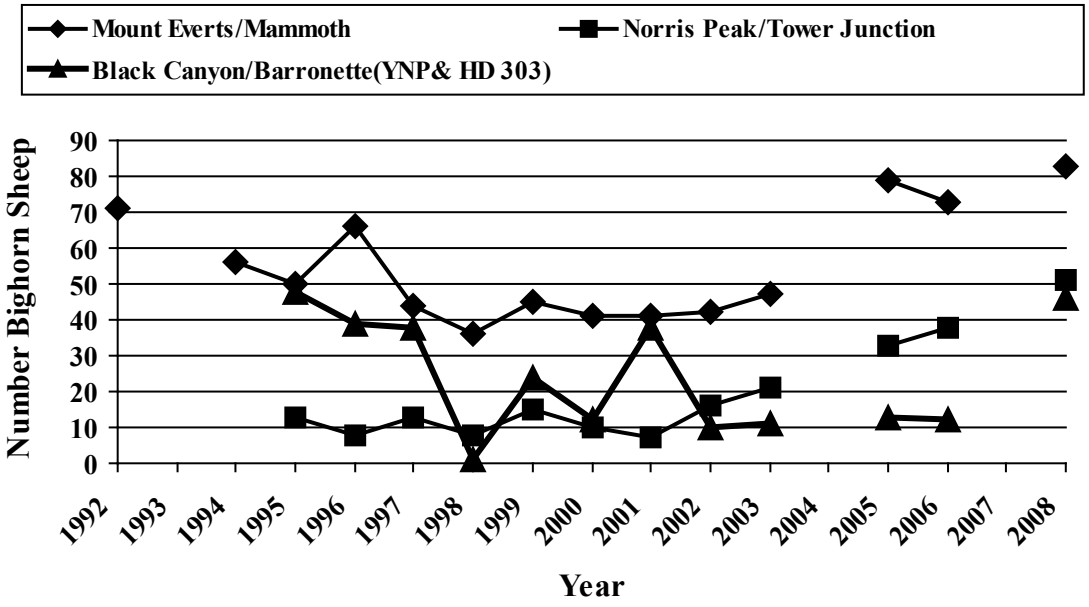


Figure 4. Total number of bighorn sheep observed during aerial trend surveys in Yellowstone National Park and portion of Hunting District 303, 1992-2008.

Year	Total	Rams	Ewes	Lambs
1992	71	30	34	7
1994	56	17	32	5
1995	50	23	21	6
1996	66	26	35	5
1997	44	26	17	1
1998	36	19	17	0
1999	45	16	23	6
2000	41	17	20	4
2001	41	16	25	0
2002	42	13	25	4
2003	47	13	25	9
2005	79	25	44	10
2006	73	24	43	6
2008	83	39	35	9

Table 6. Classification data from aerial surveys in the Mount Everts and Mammoth population segments, Yellowstone National Park, 1992-2008.

Year	Total	Rams	Ewes	Lambs
1995	48	18	24	6
1996	39	8	29	2
1997	38	22	14	2
1998	1	1	0	0
1999	24	10	11	3
2000	12	8	4	0
2001	38	2	26	9
2002	10	2	6	2
2003	11	2	7	2
2005	13	1	9	3
2006	12	6	5	1
2008	46	10	27	9

Table 7. Classification data from aerial surveys in the Black Canyon and Barronette population segments, Yellowstone National Park and Hunting District 303, 1995-2008.

Table 8. Classification data from aerial surveys in the Norris Peak and Tower Junction population segments, Yellowstone National Park, 1995-2008.

Year	Total	Rams	Ewes	Lambs
1995	13	8	3	2
1996	8	6	2	0
1997	13	5	8	0
1998	8	1	7	0
1999	15	6	6	3
2000	10	2	4	4
2001	7	4	1	2
2002	16	5	8	3
2003	21	12	5	4
2005	33	2	22	9
2006	38	1	25	12
2008	51	15	28	8

Figure 5. Total number of bighorn sheep observed during ground surveys in the non-hunted Mill Creek population, 2002-2007.

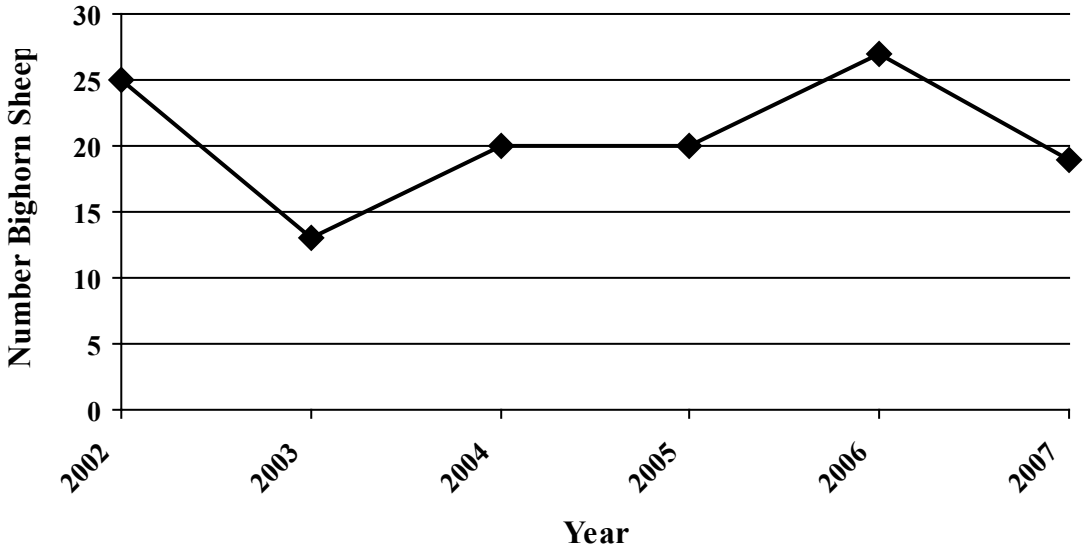


Table 9. Classification data from ground surveys in the non-hunted Mill Creek population segment, 2002-2007.

Year	Total	Rams	Ewes	Lambs
2002	25	14	7-8	3-4
2003	13	6	5	2
2004	20	12	6	2
2005	20	10	8	2
2006	27	14	8	5
2007	19	10	8	1

early fall and diagnosing pneumonia as a cause of death. Lamb recruitment from Soda Butte Creek to Point of Rocks between 1995 and 1998 was chronically low, ranging from 7 to 22 lambs: 100 ewes (mean=15 lambs: 100 ewes). Lamb recruitment in the last five years has been higher, ranging from 24 to 34 lambs: 100 ewes (mean=30 lambs: 100 ewes).

Recreation Provided: Bighorn sheep hunting occurs under two season types in the Upper Yellowstone bighorn sheep complex. Since 1978, sheep hunting in Hunting Districts 300 and 303 has occurred under some form of an unlimited access season. Over time the boundaries, harvest quotas, season dates, and season length have been adjusted, but the number of hunters has not been regulated. Since the late 1980s, season adjustments in Hunting District 300 creating an earlier, shorter season (September 1 to 10) and setting a quota of two adult rams were made to reduce the chance of over-harvesting rams. For a few years in the 1980s, a limited-draw sheep season offering two to five legal ram licenses occurred in both Hunting Districts 300 and 303 after the unlimited season (Tables 10 and 11). The unique unlimited access season type, which provides a sheep license to all hunters who apply, is currently offered in only five hunting districts in Montana (Hunting Districts 300, 303, 500, 501, and 502). Montana is the only state in the country to offer unlimited access sheep hunting. The odds of being selected to hunt in Hunting Districts 300 and 303 are 100%. Since 1978, 3,572 unlimited access sheep hunting licenses have been issued in Hunting Districts 300 and 303, contributing significantly to the statewide sheep hunting opportunity in Montana.

Hunting districts that have successfully maintained long-term unlimited sheep hunting seasons often share common characteristics: 1) populations are relatively small (often less than 75 to 100 sheep) with small numbers of legal rams, 2) the probability of finding and harvesting a legal ram is very low due to low numbers, reduced availability during the hunting season due to proximity to national park boundaries, short early season structure, conservative harvest quotas, small numbers of sheep dispersed over large, rugged areas, or a combination of factors, 3) the areas do not produce high-scoring trophy rams regardless of age, and 4) over time, hunter expectations have grown to match reality, i.e., hunters through research or personal experience know that the chances of harvesting or even seeing a legal ram are very small indeed (probably less than 5%). As a result of the challenges involved in the unlimited areas, the number of hunters is typically low; in 2007, 35 and 23 hunters applied for Hunting Districts 300 and 303, respectively.

Both Hunting Districts 304 and 305 have the traditional limited access sheep season, which in this case limits hunting opportunity to one hunter per year per hunting district and provides the opportunity to harvest one legal ram/year in each hunting district. Limited access sheep hunting began in Hunting District 304 in 1992 and in Hunting District 305 in 2001. Prior to 2001, Hunting District 305 was included within the boundaries of the unlimited access Hunting District 300 (see below). Hunting District 305 was created as the result of a public land purchase that made bighorn sheep easily accessible to hunters during the rut. The increased vulnerability of sheep to human harvest rendered the unlimited season regulation inappropriate for this area.

Hunters in Hunting Districts 304 and 305 are randomly selected from a pool of hunters who apply for a specific hunting district. Beginning in 2001, bighorn hunters may pay an additional $2.00 fee to accumulate bonus points that increase their chances of being selected. Each bonus point equates to one more chance of being drawn. Since limited sheep seasons began in Hunting District 304, 52 to 104 hunters per year (mean=72) have applied for one available license; in Hunting District 305, 63 to 94 hunters per year (mean=76) have applied for a single license (Tables 12 and 13). The odds of being selected to hunt have averaged 1.4% for Hunting District 304 and 1.3% for Hunting District 305. Since 1992, only 24 hunters have hunted sheep in Hunting District 304 and 305.

The objective of the 1985 Mill Creek sheep transplant was to reestablish a bighorn population in Mill Creek with hopes of providing public sheep viewing opportunities and possibly new hunting opportunities, if sheep numbers increased sufficiently. While the project has achieved its objective of reestablishing bighorns and providing public viewing opportunities, it has not met the original criteria for a sustainable sheep hunting season, which is an observable population of 100 sheep. Recent surveys are counting only a few more sheep now than were released into the area in 1985.

Current Annual Bighorn Sheep Harvest: Legally harvested sheep in Hunting Districts 300, 303, and 305 must meet Montana's "legal ram" ¾-curl definition. In Hunting District 304, hunters may legally harvest either-sex bighorn sheep. In reality, sheep hunters in Hunting District 304 harvest adult rams meeting the legal ram ¾-curl definition. In the last 30 years under the unlimited sheep seasons, 73 rams have been

Table 10. Number of licenses issued and legal ram quota and harvest, Hunting District 300, 1978-2007.

Year	Number Licenses	Legal Ram Quota	Legal Ram Harvest
1978	146	5	4
1979	154	5	2
1980[1]	126	6(5)	2(4)
1981[1]	206	5(3)	6(3)
1982	183	5	3
1983[1]	181	5(3)	6(2)
1984[1]	193	5(2)	3(2)
1985[1]	84	3(2)	3(2)
1986[1]	102	3(2)	3(2)
1987	83	3	3
1988	45	3	4
1989	78	3	5
1990	52	2	6
1991	48	0	2
1992	53	0	2
1993	71	0	4
1994	63	0	6
1995	41	0	0
1996	52	0	1
1997	61	0	0
1998	31	1	3
1999	43	2	0
2000	21	2	0
2001	24	2	0
2002	26	2	0
2003	40	2	1
2004	37	2	2
2005	30	2	1
2006	27	2	1
2007	35	2	0
Totals	2336		73(15)

[1] Indicates years in which there was a limited drawing sheep season following the unlimited access season in Hunting Districts 300 and 303; 2-5 limited drawing sheep licenses were issued each of these years. The additional limited licenses and harvest appears in ( ).

Year	Number Licenses	Legal Ram Quota	Legal Ram Harvest
1978	123	5	0
1979	131	5	2
1980[1]	65	5(5)	5(5)
1981[1]	120	3(2)	3(1)
1982	51	3	1
1983	34	2	1
1984	57	2	1
1985	41	2	2
1986[1]	34	2(2)	2(2)
1987	34	2	3
1988	19	2	1
1989	30	2	1
1990	23	2	0
1991	22	2	2
1992	36	2	2
1993	43	2	2
1994	25	2	1
1995	22	2	3
1996	27	2	2
1997	30	2	3
1998	33	2	1
1999	25	2	2
2000	35	2	1
2001	33	2	4
2002	39	2	1
2003	22	2	0
2004	23	2	0
2005	14	2	3
2006	22	2	3
2007	23	2	3
Totals	1236		55(8)

Table 11. Number of licenses issued and legal ram quota and harvest, Hunting District 303, 1978-2007.

[1] Indicates years in which there was a limited drawing sheep season following the unlimited access season in Hunting Districts 300 and 303; 2-5 limited drawing sheep licenses were issued each of these years. The additional limited licenses and harvest appears in ( ).

harvested in Hunting District 300 and 55 have been harvested in Hunting District 303 (Table 10 and 11). An additional 15 rams in Hunting District 300 and eight rams in Hunting District 303 were harvested under a limited access season in the 1980s. An average of 2.4 rams per year were harvested in Hunting District 300 and 1.8 rams per year were harvested in Hunting District 303 under unlimited seasons. With regard to harvest quotas, Hunting District 300 had designated harvest quotas of one to six rams for 23 out of 30 years and Hunting District 303 had quotas of two to five rams every year (Table/Figure 2). Harvest quotas in Hunting District 300 were exceeded six out of 23 years (26%) and seven out of 30 years (23%) in Hunting District 303. Since 1992, when limited access sheep hunting began in Hunting District 304, five rams have been harvested (mean=0.31 ram per year) (Table 12). Since 2000, seven rams have been harvested in Hunting District 305 (0.88 ram per year) (Table 13). One measure of long-term hunter success is the ratio (or percentage) of the number of sheep harvested verses the number of licenses issued over time. Hunter success in the unlimited sheep areas has been 3.1% in Hunting District 300 and 4.4% in Hunting District 303, while success rates in the limited draw areas has been 31.3% in Hunting District 304 and 87.5% in Hunting District 305.

Accomplishments: The following bighorn sheep–related projects have been accomplished in the Upper Yellowstone in recent years: 1) Removal of bighorn sheep from Corwin Springs Bison Quarantine Facility: In 2006 and 2007, FWP removed and released nearby approximately 10 bighorn sheep from inside the fenced Bison Quarantine Facility at Corwin Springs. For years sheep would move into and out of this fenced commercial elk farm owned by Welch Brogan. Sheep had access to the upper pasture where fencing intersected rocky cliffs. During the transition to a bison quarantine facility, the upper pasture has been re-fenced to eliminate bighorn sheep from entering the facility. 2) Domestic sheep allotment buyout/retirement: In 2005, the National Wildlife Federation, with support from FWP and other interest groups, was successful in negotiating a buyout and subsequent retirement of the 74,000-acre Ash Mountain and Iron Mountain Forest Service domestic sheep grazing allotment in the Absaroka-Beartooth Wilderness Area north of YNP. Retiring this grazing allotment has eliminated the potentially negative effects of domestic sheep on wildlife habitat and disease transmission to bighorn sheep. 3) Habitat management plan for privately owned sheep winter range: In 2005, FWP wrote a management plan to protect and enhance bighorn sheep winter range on a portion of the 360 Ranch at the mouth of Mill Creek. Recommendations to the owner included a deferred grazing system for 400 acres of lower pasture, eliminating all livestock grazing from high elevation slopes, and replacing old fencing with new "take down/fall down" fencing in areas of wildlife movement. 4) Lungworm medication project: In the winters of 2003 and 2004, FWP in cooperation with the GNF conducted a bighorn sheep lungworm medication project at 12 bait stations in the Gardiner Basin to help reduce lungworm levels in sheep, particularly lambs, to improve recruitment. Salt blocks and alfalfa-based pellets containing Fenbenazole (a medication used to kill lungworms) were provided to bighorn sheep for a period of several weeks. At least 30 to 40 sheep used the bait stations. During the first year, fecal analysis indicated the lungworm levels (shedding) were reduced in sheep at the bait stations. 5) Graduate student sheep studies; During the mid-to late 1990s, the Northern Yellowstone Cooperative Wildlife Working Group (NYCWWG) supported and funded two MSU masters thesis projects in the Upper Yellowstone that marked bighorn sheep with radio-telemetry collars. Graduate students studied sheep in the Mount Everts and Tom Miner/Point of Rocks area. Both studies contributed significantly to understanding local sheep movements and ecology.

Management Challenges: 1) Value and importance of maintaining a genetically "native" sheep population: To our knowledge, the Upper Yellowstone bighorn complex has not experienced all-age pneumonia/lungworm-related die-offs, which have occurred in other southwest Montana populations. Whether this is related to being a genetically "native" sheep population is unknown, but may be worthy of future consideration. Augmenting existing sheep populations through transplanting is a common management technique; however, there may be some risk of introducing sheep that are more susceptible to disease die-offs. In the Upper Yellowstone, a single transplant of seven ewes in 1985 from Thompson Falls is the only documented source of "nonnative" sheep into the area. Whether or not to introduce additional nonnative sheep is a management issue. 2) Difficulty in accurately surveying small populations on certain winter ranges. Some bighorn subpopulations are so small that they are difficult to consistently find and survey (e.g., Yankee Jim Canyon – LaDuke Hotsprings, Travertine – Deckard Flats, Black

Year	Number Licenses	Number of Applicants	Ram Harvest
1992	1	52	0
1993	1	56	0
1994	1	54	0
1995	1	63	0
1996	1	49	0
1997	1	65	0
1998	1	76	0
1999	1	69	1
2000	1	74	0
2001	1	79	0
2002	1	76	0
2003	1	74	1
2004	1	104	0
2005	1	97	1
2006	1	84	1
2007	1	83	1
Totals	16/1155		5

Table 12. Number of either-sex licenses issued and ram harvest, Hunting District 304, 1992-2007.

Year	Number Licenses Issued for Legal Ram	Number of Applicants	Ram Harvest
2000	1	67	1
2001	1	63	1
2002	1	72	0
2003	1	76	1
2004	1	85	1
2005	1	73	1
2006	1	79	1
2007	1	94	1
Totals	8/609		7

Table 13. Number of legal ram licenses issued and ram harvest, Hunting District 305, 2000-2007.

Canyon – Barronette Peak). Not finding even a small number of sheep can have a significant effect on survey results. The observability factor becomes a greater issue when sheep numbers are low. 3) Interpreting trends and changes in sheep numbers in certain subpopulations; It is challenging to accurately interpret survey results and it has been difficult to explain trends in some small subpopulations that have declined (e.g., Travertine – Deckard Flats; Hellroaring Slopes). FWP is concerned about declining numbers in these areas but are unsure if the sheep have experienced actual population declines or if they have dispersed to other areas. In some cases increased predator activity in an area (wolf dens) has been implicated, but with little real data. We have also noted that the timing of spring green-up, which triggers when we survey, is changing. Green-up conditions are occurring sooner, and we may need to adjust our survey accordingly to make sure we count sheep before they leave winter ranges (the 2007 survey was cancelled due to early green-up). 4) Maintaining the presence of all individual subpopulations. Biologically and genetically, it is important to maintain as many small subpopulations as possible, each having established its own unique seasonal home ranges and migration routes. If a subpopulation vanishes it may be extremely difficult to reestablish a group of sheep with similar migratory habits.

Population Monitoring: Currently, the hunted bighorn sheep subpopulations in Hunting Districts 300, 303, 304, and 305 and adjacent

YNP subpopulations are monitored by spring helicopter surveys, and the non-hunted Mill Creek sheep population is monitored by ground counts on its winter range. Systematic spring helicopter surveys began on a trial basis in a portion of Hunting District 300 in 1991. By 1995, the survey area was expanded to include all major sheep winter ranges in the Gardiner Basin and into YNP, from Mammoth Hot Springs to the Upper Lamar Valley. Monitoring bighorn sheep from Point of Rocks through the Gardiner Basin and into YNP is funded by the interagency NYCWWG. Cooperators include NPS, NF, FWP, and the USGS-Biological Resource Division. The Mill Creek sheep subpopulation is surveyed from the ground on its winter range several times between January and April. Fixed-wing surveys have been tried on the Mill Creek winter range, but due to the small number of sheep involved and the timbered habitat, aerial surveys were largely unsuccessful. Helicopter surveys would likely be more effective; however, the high cost of sampling a small number of sheep that are not hunted is a factor to consider.

Summary of Public Comment

Public comments related to the bighorn sheep population and its management in the Upper Yellowstone complex indicate strong continuing support for maintaining the unlimited access sheep hunting opportunity in Hunting Districts 300 and 303 and maintaining a limited access hunting opportunity in Hunting Districts 304 and 305. Both hunters and non-hunters enjoy seeing bighorn sheep in the Upper Yellowstone and support having healthy bighorn populations wherever they occur.

Management Goal

Manage for a healthy, sustainable, interconnected native bighorn sheep population composed of several small subpopulations in the Upper Yellowstone complex. Strive to preserve the unique unlimited access sheep hunting opportunity in Hunting Districts 300 and 303 and the conservative limited access hunting opportunity in Hunting Districts 304 and 305. Recognize and maintain the opportunity to readily view bighorn sheep in the Upper Yellowstone drainage both outside and inside YNP.

Habitat Objectives

1) Encourage maintenance and improvement of habitat conditions on publicly owned (USFS, YNP) bighorn sheep summer and winter ranges so that these habitats provide adequate forage for bighorns and other wildlife.

2) As opportunities arise, develop cooperative programs or provide technical advice that encourages private land managers to protect or enhance bighorn sheep habitats found within their ownership.

3) When and where appropriate (road development, rural subdivision planning), emphasize the negative effects of habitat fragmentation on bighorn sheep and other wildlife and provide guidance on important areas that should be maintained intact if possible.

Habitat Management Strategies

1) Comment on USFS, BLM, DNRC and NPS projects that could potentially affect wildlife habitats that include bighorn sheep. Through this process we can positively influence a wide variety of activities (grazing, burning, logging, road building) in terms of maintaining or enhancing habitat for wildlife including bighorn sheep.

2) Acquire or protect bighorn sheep habitat through involvement with other agencies and nongovernment organizations in public and private land exchanges, acquisitions and conservation easements.

3) Continue to participate in and support long-term noxious weed control on public and private lands, particularly as they apply to bighorn sheep winter range areas.

Game Damage Strategies

Bighorn sheep–related game damage problems and conflicts with livestock have not occurred in the Upper Yellowstone and are not currently anticipated to occur. Sheep numbers on private land are small enough not to create concerns from livestock producers at this time.

Access Strategies

FWP identified the area between Big Creek and West Pine Creek in the Gallatin Range as an area where improved access to the Gallatin NF is desirable for improving hunter access and increasing wildlife harvest, to include improved foot and horseback access to bighorn sheep in Hunting District 304. This access need has been discussed for several years with the Gallatin NF and public land access groups, and appears in

the Statewide Elk Plan and other documents. The Gallatin NF succeeded in securing a new access point in north Dry Creek as the result of a 1999 land trade/purchase.

Population Objectives

Population objectives in the Upper Yellowstone complex are strongly influenced by the small size and dispersed nature of several individual interconnected bighorn sheep subpopulations. The current population size and distribution are likely due to limited habitat availability, rigorous environmental factors, a predator-rich environment, and regional isolation from other sheep populations. Most subpopulations exist within a small population range of less than 15 to 40 sheep and appear to be regulated by natural factors other than human harvest. Given that sheep hunting seasons have been conservative for the past 30 years and populations remain relatively small and stable, FWP population objectives are:

1) Maintain a total observed Upper Yellowstone bighorn sheep population at or above recent survey counts of 200 to 230 sheep.
2) Maintain the presence of all individual bighorn subpopulations that currently exist in the Upper Yellowstone complex.

3) Support enough sheep (at current or higher levels) in the hunted subpopulations to maintain unlimited access hunting seasons in Hunting Districts 300 and 303 and the conservative limited access hunting seasons in Hunting Districts 304 and 305.

4) Reevaluate the status of the small non-hunted Mill Creek sheep population in light of major fire-induced habitat changes in Mill Creek. Explore the potential for expanding the size of this subpopulation.

Population Management Strategies

Currently, Upper Yellowstone sheep are managed conservatively through the use of specialized unlimited access and limited access hunting seasons. The harvest of sheep during unlimited seasons is regulated by a shorter season length, an early season that ends prior to the rut, and a mandatory 48-hour harvest reporting requirement combined with a low harvest quota of two legal rams. The harvest in the Upper Yellowstone limited access hunting district is as conservative as it can be with only one license for one legal ram per year. The key to accurately monitoring population size, composition, and trend of individual subpopulations is to continue with consistent annual aerial and ground surveys and improve and expand surveys when possible.

Prescriptive Harvest Management

When possible, FWP management direction for many big game species, including bighorn sheep, is shifting toward a modified Adaptive Harvest Management (AHM) approach. In general this approach provides suggested changes in regulation types, or "prescriptions," based on specific numeric "triggers" related to an observed range in total survey counts, sex ratios, recruitment rates or a combination of these factors. In some cases, time-related criteria are also added; e.g., a certain population range must be observed for two or more years, etc. The various prescription types are often referred to as "restrictive, standard, or liberal" regulation types or packages.

There are several advantages to the AHM approach including increased consistency in management decisions and regulation types, greater accountability and predictability in hunting season changes, increased efforts to systematically collect accurate survey data, and new opportunities to test the effectiveness of different regulations and to make corrective changes. The feasibility of the AHM approach as it applies to bighorn sheep, however, may depend on the size of individual populations and the ability to accurately collect survey data on them. When individual subpopulation counts are less than 50 animals (Hunting Districts 300, 303, 304, and 305) and recruitment may be less than five to ten lambs per year in each area, the range of management options and hunting prescriptions become limited; i.e., there are few opportunities for more liberal prescriptions (increasing the adult ram harvest, harvesting ewes, harvesting yearling rams) for such small populations. Based on the history of these populations, it appears unrealistic to significantly increase their numbers through changes in adult ram-only hunting seasons that are already conservative. In the Upper Yellowstone complex, the general management direction may of necessity be conservative, allowing a harvesting of one to two adult legal rams out of each hunting district, and recognizing that in some years no rams will be harvested in some areas. Until huntable subpopulations increase, there appears little opportunity for more liberal management.

SPANISH PEAKS
(Hunting District 301)

Description: Hunting District 301 lies about 20 miles southwest of Bozeman. The core of the occupied bighorn habitat lies within an established wilderness area managed by the U.S. Forest Service (USFS). Other communities that serve this area include Ennis and Big Sky.

The Spanish Peaks hunting district includes about 676mi^2. About 65% is public land administered by the Gallatin and Beaverhead-Deerlodge National Forests. Additional public lands include the 9,000-acre Bear Trap Canyon Unit managed by the Bureau of Land Management (BLM), about 9,000 acres of state lands managed by the Department of Natural Resources and Conservation (DNRC), and about 3,200 acres managed by FWP. The remaining 30% of landownership in this hunting district is private. The majority of the USFS lands in this hunting district are within the Lee Metcalf Wilderness Area.

The core summer range for these sheep occurs within the 76,000-acre Spanish Peaks Unit of the Lee Metcalf Wilderness Area. The primary winter range occurs adjacent to the Gallatin River between the Big Sky Spur Road and Burnt Creek in the Gallatin Canyon. The primary forage on this winter range includes native bunchgrasses like bluebunch wheatgrass and Idaho fescue.

There are valid reports of bighorns along the Madison River within the Bear Trap Canyon Unit of the Lee Metcalf Wilderness. These reports occur during the spring and summer months. The reports verify bighorn occurrence in groups of two to six sheep.

Habitat within this hunting district ranges from above-timberline, cushion plant communities occurring above 11,000 feet, to mahogany and bitterbrush communities occurring along the Madison within the Bear Trap Canyon Unit below 4,800 feet.

Of the 676mi^2 within the hunting district, about 20% is actually occupied by bighorns. About 85% of the occupied bighorn habitat is public land. Small portions of the winter range, especially along the Gallatin Canyon, are privately owned. Most of these private lands have residential development. Other notable developments within this hunting district include Big Sky and Moonlight Basin Resorts. These resorts not only offer residential development, but also attract thousands of summer tourists and winter skiers. These developments have a direct impact on bighorn winter range along the Gallatin and West Gallatin Rivers and increase traffic along U.S. MT Highway 191. Vehicle collisions are a significant source of mortality for this sheep herd with an average of 8 to 12 sheep annually being hit along this stretch of U.S. MT Highway 191.

Public Access: The Spanish Peaks area provides an excellent diversity of hunting opportunities. Hunters are required to access most of the area primarily by foot or horseback. Access to the public lands is reasonable and limited only by mode of travel, with numerous trailheads located around the periphery of the hunting district. There is also some access to public lands available from public roadways. Access to the private lands is very restricted, although most of the sheep hunting opportunity occurs on public lands. The forest travel plan emphasizes nonmotorized travel through most of this hunting district. The same is true for the BLM-managed lands in the Bear Trap Canyon Unit.

Bighorn Sheep Populations: The number of bighorn sheep observed in this hunting district has been increasing over the past eight years (Figure 1 and Table 1). Successive years of poor lamb survival caused FWP to close this area to sheep hunting in 2001. At that time about 50 sheep survived in this hunting district. As of spring 2008, FWP observed 158 sheep on the winter range during the annual spring aerial survey.

This population is a native sheep herd. The only augmentation attempts on record occurred in 1944, 1947 and 1963. Two rams from the Kootenai Falls herd (Ural Tweed) were released in 1944, two rams from the Sun River herd were transported and released in 1947 and 6 rams from the National Bison Range were released in 1963. Interestingly, this herd has not experienced an all-age die-off common to other sheep herds in Montana.

Observing rams during the spring aerial surveys have always been a challenge. The rams often dispersed off of the winter ranges before the flight took place and were difficult to find. As a result, FWP began flying a rut survey in December 2006 (Table 2). Rams in this area are far more visible during this time of year compared to the spring flight window.

The 2008 spring aerial survey observed the highest total of bighorns since 1980. This count

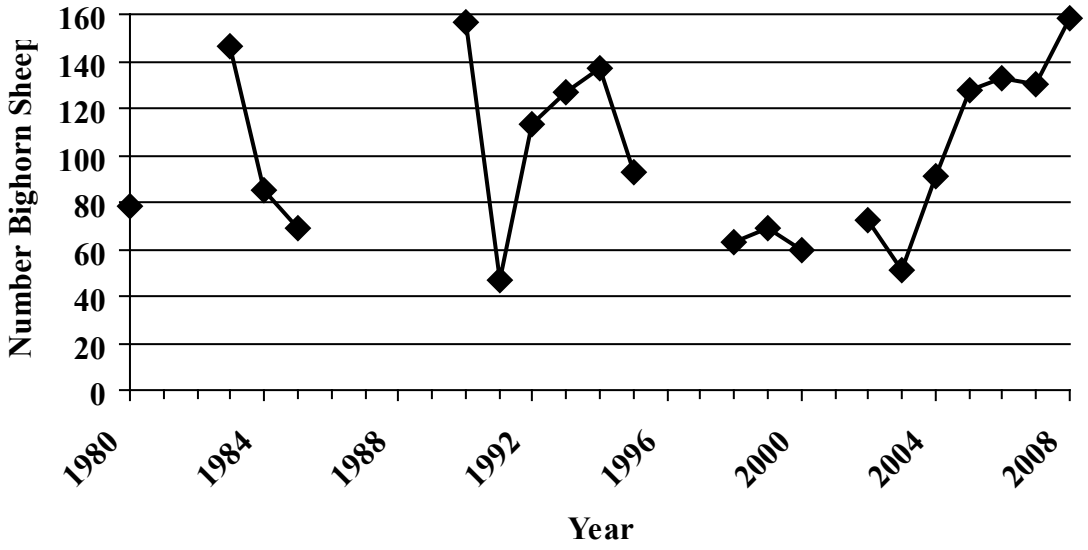


Figure 1. Total number of bighorn sheep observed during aerial trend surveys in the Spanish Peaks population, Hunting District 301, 1980-2008.

Year	Total	Rams	Ewes	Lambs	Lambs/100 Ewes	Rams/100 Ewes
1980	78					
1983	146	20	73	43	58	27
1984	85	9	60	16	27	15
1985	69					
1990	157					
1991	47					
1992	113					
1993	127 (103 class.)	20	57	26	46	35
1994	137	21	106	10	9	20
1995	93 (51 class.)	18	20	13	65	90
1998	63	9	53	1	17	2
1999	69					
2000	60	13	32	15	47	41
2002	72			13		
2003	51	3	37	11	29	8
2004	91	14	65	12	18	22
2005	128	17	77	34	44	22
2006	133	12	93	28	30	13
2007	130	0	97	33	34	0
2008	158					

Table 1. Classification data from spring aerial surveys for the Spanish Peaks population, Hunting District 301, 1980-2008.

Year	Total	Ewes	Lambs	Rams	¼	½	¾	¾-full	Lambs /100 Ewes	Rams/100 Ewes
2006	145	80	33	32	5	10	3	14	41	41
2007	155	66	46	40	7	9	8	14	70	60

Table 2. Classification data from aerial surveys conducted during the rut for the Spanish Peaks population, Hunting District 301, 2006-2007.

occurred following severe winter conditions throughout the upper Gallatin winter ranges. Presently, rams make up about 25% of the sheep population in the Spanish Peaks.

The Spanish Peaks herd has not been used as a source for capturing and relocating sheep. Typically, this herd has not grown to a level that would support such an effort. However, with it's low parasite loading and relative resistance to disease-induced die-offs, the Spanish Peaks herd would be a healthy candidate for consideration in future capture operations. The fact that many of the sheep winter within the wilderness boundary may prove problematic for helicopter darting or net-gun operations.

Recreation Provided: Since 1977, FWP managed the sheep hunting in this area as an unlimited district for bighorn sheep. This season type meant any applicant who applied for this hunting district was granted a permit to hunt for a "legal" ram. Although the hunting district boundaries changed in 1977 and 1978, Hunting District 301 became the most popular unlimited area to hunt bighorn sheep. The average number of licenses issued between 1978 and 1990 was 144; from 1991 to 1997, hunter numbers averaged 136. The range of hunters applying for licenses over that period of time was 94 to 235. The unlimited sheep season went through a series of season structure changes during this time. Originally, this season type opened in early September and remained open until a quota was reached. The quota fluctuated over the years from four to six legal rams. There was a 48-hour notice on the season closure. In 1991, the season changed to a six-day season with no quota. In 1999, there was an attempt to limit the number of sheep licenses available for Hunting District 301 to 90 licenses. The FWP Commission chose not to approve this proposal. The average harvest from 1978 to 1997 was seven legal rams. The average success rate over that same time period was about 8%. As mentioned previously, the unlimited hunting season for bighorns in Hunting District 301 was closed in 2001. The hunting season for Hunting District 301 reopened in the fall of 2008 with a limited-entry structure and five any-ram licenses were issued.

Current Annual Bighorn Sheep Harvest: The legal hunting season for bighorn sheep closed in this area in 2001. The sheep hunting season reopened in the fall of 2008 with five any-ram licenses. This area is not known for producing rams that score over 180 Boone and Crockett points.

Accomplishments: This sheep herd has fully recovered from a population low of about 50 sheep in 2000. The herd is a well established, native population that occupies most of its suitable habitat within the hunting district.

Management Challenges:

1) Attempting to minimize mortality from vehicle collisions along U.S. Highway 191 and the Big Sky Spur Road is an ongoing challenge. The traffic pattern will only intensify as the large resort areas near the Gallatin Canyon continue to build out. Sheep are attracted to the salt used in sanding the highways during the winter months.

2) Continued loss of habitat due to residential and resort development.

3) Maintaining this sheep herd within the habitat's ability to support it. The winter range portions of this hunting district are confined to the Gallatin Canyon. This area experiences severe winter weather. There is the potential for this sheep population to increase beyond the winter range's ability to support it under severe winter conditions. Long-term survey records indicate this population has no history of ewe hunting, nor any capture and relocation efforts. Both of these elements might be helpful in managing this population in the future.

4) Some of the highest quality sheep habitat is essentially unoccupied. The Bear Trap Canyon Unit of the Lee Metcalf Wilderness Area provides excellent sheep habitat although it is considered disconnected from the currently occupied sheep habitat within the hunting district. However, the Montana State University's "Red Bluff Ranch" is located within four miles of this wilderness area unit. Red Bluff has domestic sheep on its pastures during the spring, summer, and fall months. Unless some agreement could be worked out with the Red Bluff Ranch managers, having wild sheep in the Bear Trap area is not advisable.

5) Minimizing stress and disturbance to sheep from users of public lands during the summer and winter months. The increasing population of residents and visitors to Gallatin County has increased the number of people using the public land backcountry and winter ranges in and around the Gallatin Canyon.

Population Monitoring: This population is monitored annually through helicopter surveys during spring green-up and a late rut survey flown immediately after the general big game season ends. Sheep are classified on both surveys according to sex and horn class in the case of rams. Lambs are classified during these surveys as well.

Summary of Public Comment

Public comments reflect the desire to have a healthy, vibrant bighorn sheep herd in the Spanish Peaks. Public support for hunting these sheep is significant. There is divided support for bringing back the unlimited style hunting season compared to the basic limited permit season structure. Region 3 would like to pursue discussions regarding a third season type that would meet the desires of the unlimited-style hunting season yet protect: 1) the sheep from overharvest of rams, 2) the sensitive nature of the high-elevation plant communities where hunters camp during the hunting season within the Spanish Peaks Wilderness Area, and 3) the quality of hunt and hunting experience.

Management Goal

Continue to manage this sheep herd as a healthy, productive population that exhibits reasonable lamb survival and age diversity in rams. There is very little opportunity to increase sheep numbers in this district. The Bear Trap Canyon Unit offers significant opportunity for additional bighorn sheep in this area; however, there are numerous domestic sheep that occupy adjacent ranch lands. Continue to manage for a high-quality sheep hunting opportunity for hunters.

Habitat Objectives

1) Create partnership opportunities with public and private land managers to protect and preserve habitat presently occupied by bighorn sheep and other wildlife species in this area.

2) Encourage creative and progressive habitat improvement projects, particularly fire management on publicly owned winter ranges.

3) Encourage preservation and improvement of publicly owned bighorn sheep habitat to minimize the dependence on privately owned winter ranges in this area.

4) Encourage and cost-share wildlife-friendly fencing projects in this area.

Habitat Management Strategies

1) The majority of the occupied sheep range in this area is protected under a wilderness designation. Therefore, it is critical to work with the USFS to help manage and protect this area in its wilderness state.

2) Pursue conservation easements and other protective ventures with private landowners along the Gallatin Canyon to protect critical winter ranges for bighorn sheep and other wildlife in this area.

3) Work closely with Montana Department of Transportation regarding any highway improvements and construction along U.S. Highway 191 and occupied bighorn sheep range.

4) Continue to work with and consult with the USFS on fire management proposals for improving and increasing the amount of effective winter range in the Gallatin Canyon. The USFS has had a fairly active fire management plan in place within this sheep herd's winter and spring ranges. The primary goal of these prescribed burns is to lessen the fuel loading and assist in developing buffer zones that would help protect private residences in the area. These burns have been fairly effective at removing some of the conifer encroachment.

Game Damage Strategies

Game damage issues are nonexistent in this area. If they do arise, FWP will follow game damage policies now in place. In addition, FWP can use the legal hunting season to assist in population control by issuing ewe permits or scheduling a trapping and transplanting operation.

Access Strategies

Access is not a limiting factor regarding hunter opportunity in this area. FWP will remain vigilant in supporting current access opportunities for hunting and wildlife viewing.

Population Objectives

1) Maintain the number of bighorn sheep observed during late rut and green-up aerial surveys within 20% of 150 (120 to 180) sheep observed on the winter range.

2) Maintain a ram: 100 ewe ratio observed during late rut surveys of at least 50 rams: 100 ewes with a minimum of 40% of these rams being ¾-curl or larger.

Population Management Strategies

Bighorn numbers are currently being managed through hunter harvests of ewes and rams and through capture and removal projects. The population objective of 150 (± 20%) observed bighorn sheep was derived by considering: 1) the ability of public and private lands to provide forage for the wintering bighorn population, 2) conflicts with residential developments, 3) vehicular/bighorn collisions, and 4) the understanding that catastrophic disease-caused die-offs, exhibited in many other sheep populations, are often density dependent occurrences.

Ewes have not been harvested in this district in the past. In the advent that it may be desirable to harvest ewes in the future either for population management or recreational opportunity, the process has been developed to provide for ewe harvest. Additionally, if the population was sufficient and a potential transplant site existed, translocation of bighorns from this population is also an option.

The hunting season for Hunting District 301 reopened in the fall of 2008 with a limited-entry structure and five-any ram licenses issued. The season structure for the 2009 season will be the same. For the 2010 season, the potential for a new season type that will provide for additional hunter opportunity will be explored during FWP's biennial season setting process, which will begin in December of 2009. The current season structure for rams is depicted below.

Prescriptive Harvest Management

Ewes: Bighorn sheep populations are managed in many hunting districts through limited-entry harvest of the female segment. In Hunting District 301, licenses could be issued under the following prescriptions (Table 3):

Standard Regulation: A limited number of adult ewe licenses issued would be up to 20% of the number of ewes going into the fall season. The number of ewes going into the fall season would be based on the number of ewes observed during the annual survey, assuming 5% mortality of adults, and adding recruitment of one-half the previous year's lambs.

The Standard Regulation will be recommended if: The total number of bighorns counted on the survey area is within 20% of the population objective and lamb recruitment is above 35 lambs: 100 ewes.

Restrictive Regulation: Fewer than five ewe licenses would be prescribed.

The Restrictive Regulation will be recommended if: The total number of bighorns counted on the survey area is more than 20% below the population objective and lamb recruitment is less than 35 lambs: 100 ewes.

Liberal Regulation: Limited ewe licenses valid in the entire hunting district during the general season for bighorn sheep in this district. The number of ewe licenses issued would be up to 20% of the number of ewes going into the fall season. The number of ewes going into the fall season would be based on the number of ewes observed during the annual survey, assuming 5% mortality of adults, and adding recruitment of one-half the previous year's lambs,

Table 3. Summary of regulation types under different population criteria for ewe harvest and population management.

SOUTHERN MOUNTAINS	No. Bighorns Counted on Survey Area	Recruitment Lambs: 100 Ewes	Regulation Types	Harvest Rates
Standard Regulation_	± 20% of 150	Above 35	Limited Entry Adult Ewes	Up to 20% of Ewes
Restrictive Regulation	More than 20% below 150	Less than 35	Fewer than 5 ewe licenses	Less than 10% of ewes
Liberal Regulation	Greater than 20% above 150	Greater than 40	Limited Entry Ewes **OR** translocate if > 25 sheep including rams are available	More than 20% of Ewes

OR if the number of ewes and rams is at least 25 sheep (minimum transplant number) above objective, the surplus could be used for transplanting.

The Liberal Regulation will be recommended if: The total number of bighorns counted on the survey area is greater than 20% above the population objective and lamb recruitment is greater than 40 lambs: 100 ewes.

Rams:

Standard Regulation: Limited-entry any-ram licenses with the number of licenses issued being up to 35% of the ¾-curl rams in the population.

The Standard Regulation will be recommended if: The population is within objective (+ 20% of 150), there are more than 50 rams: 100 ewes, and 35% of the rams are at least ¾-curl (Table 4).

SOUTHERN MOUNTAINS	Number of Either-Sex or Legal Ram Licenses Is	When the Herd Has		
		Population Size	Ram: 100 Ewe ratio	% of Rams with ≥ ¾-curl
Standard Regulation	Up to 35% of the ¾-curl rams	± 20% of 150	>50	≥ 35
Restrictive Regulation	Up to 20% of the ¾-curl rams	More than 20% below 150	< 50	< 35

Table 4. Summary of potential ram harvest under different population parameters and criteria.

Restrictive Regulation: Limited-entry any-ram licenses with the number issued being up to 20% of the ¾-curl rams in the population.

The Restrictive Regulation will be recommended if: The population is more than 20% below the population objective of 150, there are less than 50 rams: 100 ewes, and less than 35% of the rams are at least ¾-curl.

HILGARDS
(Hunting District 302)

Description: The Hilgard bighorn sheep hunting district is located about 40 miles south of Bozeman. The hunting district is approximately 557mi² and is bordered by U.S. Highways 191 and 287 on the east and west respectively. The Montana-Idaho border is on the south end of the district, and the Taylor Fork and Indian Creek drainages are to the north. Out of the 557mi², 88mi² involve private lands, 3mi² are managed by the Bureau of Land Management (BLM), 4.5mi² are state lands (of which 1.5mi² are managed by FWP as a portion of the Gallatin Wildlife Management Area [WMA]) and the remaining 461mi² are U.S. Forest Service (USFS) lands.

A significant portion of this district is part of the Taylor Hilgard and Monument Mountain Units of the Lee Metcalf Wilderness Area. Additionally, the Cabin Creek WMA makes up a portion of the public lands within the hunting district. The Beaverhead-Deerlodge and Gallatin National Forests manage these USFS lands.

The primary summer range for these sheep occurs along the higher elevations of the Madison Range and the Cabin Creek WMA. Portions of the upper reaches of tributaries to Taylor Fork also summer small numbers of sheep. The core winter range occurs along the Madison River and the foothills of the Madison Range between Quake Lake and Wolf Creek.

Much of the winter activity is centered along the windswept slopes near Moose and Squaw Creeks and the private/public land complex above U.S. Highway 287 between the Madison Slide and Deadman Creek. Most of the winter range is comprised of native sagebrush and bunchgrass vegetation types interspersed with mesic aspen sites and Douglas fir and lodgepole pine overstory. This winter range is an uncommonly severe site for bighorn sheep. Except for the higher windswept slopes along Moose and Squaw Creeks, much of this area is a deep-snow environment. The windswept areas are relatively small and only have forage capacity to winter small (less than 30 sheep) groups of bighorns. The winter range along U.S. Highway 287 winters about 70 to 100 sheep. However, these sheep become highly vulnerable to severe winters when much of the forage in this area becomes buried in two to four feet of snow into the spring months. In the Henry's Mountains portion of this hunting district, there are few sheep. Attempts to survey them during other flights resulted in no observations. However, snowmobilers using the high-elevation plateaus during the winter months in the

Lionhead Mountain vicinity have observed bighorns wintering in the area.

Approximately 50% of this hunting district is actually occupied by bighorns. Roughly 80% of the occupied habitat occurs on public lands. Key portions of the winter range are privately owned. The winter range that occurs in the Moose/Squaw Creek area is split between the USFS and the Sun Ranch. The Sun Ranch property is under a conservation easement. The private lands near the Madison Slide have minimal residential development. A portion of this winter range occurs on the Oliffe Ranch. This property is also protected under the terms of a conservation easement. Presently, there are no conservation easements on the remaining private lands that include bighorn winter range.

Increasing traffic along U.S. Highway 287 is directly related to the increasing populations of Big Sky, Ennis, and West Yellowstone. Also, increasing numbers of residents and visitors are using U.S. Highway 287, especially during winter and spring months, as an avenue for wildlife viewing. Much of the most critical winter range in this hunting district occurs adjacent to this highway. Sheep/vehicle collisions are common during the winter and spring and have a direct impact on the herd's overall population.

Public Access: Much of the core summer and early fall sheep range is accessible from public lands in the Taylor Fork and Cabin Creek areas. Also, there are public trailheads at Papoose Creek and Indian Creek on the west side of the hunting district, although these access points are indirect ways of accessing the key summer range areas. Most of the habitat sheep occupy during the fall and winter months is bordered at lower elevations by private land. Presently, the Oliffe Ranch is enrolled in FWP's Block Management Program, which provides hunter access to this area. The other private lands are more difficult to find access to the adjoining public lands.

Bighorn Sheep Populations: The number of bighorns observed in this area has been increasing over the past eight years (Figure 1 and Table 1). In 1996-97, a die-off attributed to an outbreak of lungworm/pneumonia caused FWP to close the hunting season in this district.

This hunting district was originally part of Hunting District 301. In 1978, the Taylor Hilgards portion was divided into a separate district (Hunting District 302) and managed as an unlimited hunting district. This hunting district was closed to hunting in 1987 following an all-age die-off. It was reopened in 1991 as a limited-entry area, and then closed again in 1997 following another all-age die-off. Originally a native population, supplemental transplants into this area began in 1988 with 19 sheep from Thompson Falls, in 1989 with 5 sheep from Thompson Falls, in 1989 with 19 sheep from Lost Creek and in 1993 with 26 sheep from Wildhorse Island. Over that time, a total of 69 sheep were captured in FWP Regions 1 and 2 and relocated to the Taylor Hilgards and Henry's Mountains. The Henry's Mountains sheep suffered from a similar all-age die-off in 1996-97. This population is at very low numbers and probably will not recover to any viable numbers without assistance from FWP.

Presently, there are about 105 sheep in this hunting district. Twenty-seven sheep were observed in the Squaw/Moose Creek areas during a 2008 elk survey of Hunting Districts 360 and 362. An additional 79 sheep were observed through ground surveys in the Slide Inn vicinity during the winter of 2008. It is highly doubtful that sheep from these two population segments have much interchange while on winter ranges. These two wintering areas are fairly distinct and isolated by severe winter conditions and snow depths. Population figures and survey data for this area are incomplete and will require additional efforts in the future.

Recreation Provided: Hunting for bighorns in Hunting District 302 is presently closed, but the population has reached the 100 sheep population goal to trigger FWP to propose limited hunting as early as 2010.

Previous to 1978, FWP managed this area as part of Hunting District 301, which had an unlimited hunting regulation at that time. From 1978 to 1986, this area was removed from Hunting District 301 and given a new hunting district designation as Hunting District 302. The area remained an unlimited hunting district until 1987. FWP closed the hunting district from 1987 to 1990 following an all-age die-off, then reopened the hunting district to limited-entry sheep hunting in 1991. FWP closed the hunting district again in 1997 after a second all-age die-off. It has been closed since that time. The last year of legal hunting occurred in 1996 when four either-sex licenses were valid for this hunting district. Hunters harvested four rams with an average days per harvest of 13.

Region 3 would like to propose the reopening of a hunting season for bighorn sheep in Hunting District 302. The proposal might follow very similar protocol as compared with Hunting District 301: calling for an initial limited-entry style season with some energy spent on looking toward creating a new season

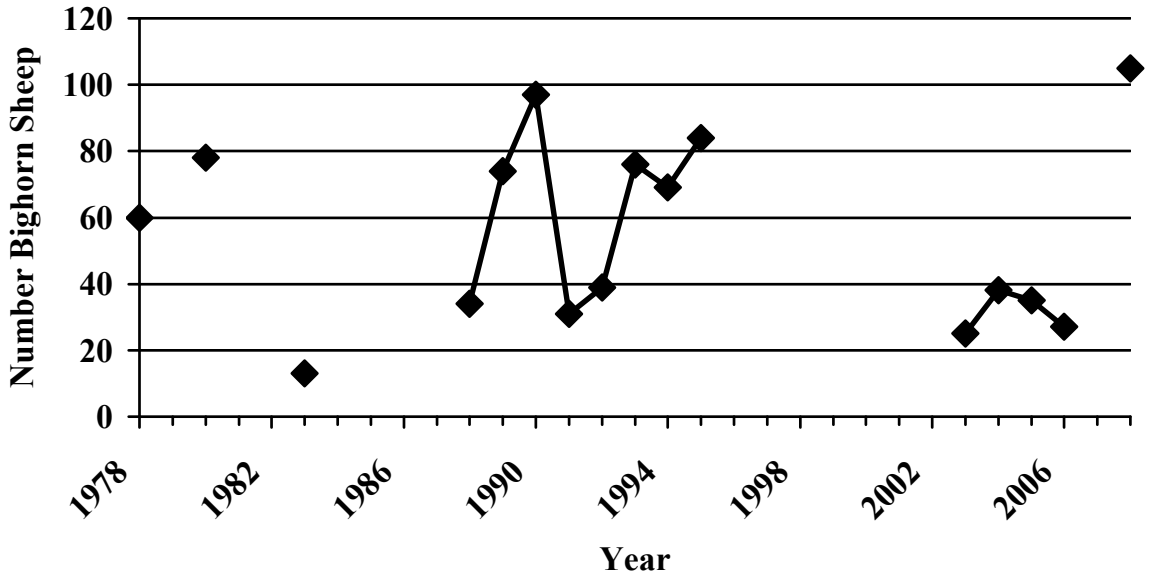


Figure 1. Total number of bighorn sheep observed during aerial trend surveys in the Hilgards population, Hunting District 302, 1978-2008.

Year	Total	Total Classified	Rams	Ewes	Lambs	Lambs/100 Ewes	Rams/100 Ewes
1978	>60						
1980	78						
1983	13						
1988	34	34	5	13	8	61	38
1989	74	74	16	44	13	29	36
1990	97	97	27	47	23	49	55
1991	31	31	5	18	8	44	28
1992	39	39	12	19	9	47	63
1993	76						
1994	69		12				
1995	84	66	26	25	15	60	104
2003	25	25	12	12	1	8	100
2004	38	38	6	25	7	28	24
2005	35	35	1	34	0	0	3
2006	27	27	13	8	6	75	162
2008	105	105	34	49	22	45	69

Table 1. Classification data from aerial surveys for the Hilgards population, Hunting District 302, 1978-2008.

type that meets the desires of the unlimited-style hunting community.

In addition to hunting, the sheep in this area are highly visible to the general public during the winter and spring months. Wildlife viewing is a very popular pastime for area residents and tourists. This winter range is located along popular commercial wildlife viewing and birding routes.

Current Annual Bighorn Sheep Harvest: This hunting district is presently closed to legal hunting for bighorn sheep.

Accomplishments: This herd has slowly recovered from successive die-offs in the late 1980s and 1990s. It has most recently recovered from a population low of less than 30 sheep to its current population of 105 sheep observed on the winter ranges in 2008. This sheep herd was the subject of two master's degree projects during the mid-1990s.

Management Challenges:

1) Coordinating the management of associated big game species, particularly elk and mountain goats. This sheep herd winters in direct competition with an unusually large number of elk, in addition to mountain goats and mule deer. With winter conditions being fairly severe on bighorn winter range, managing the number of sheep in regard

to the immediate competition from other ungulates is a major challenge.

2) Minimizing mortality from vehicle collisions along U.S. Highway 287.

3) Protecting and conserving private portions of winter range along U.S. Highway 287.

4) Maintaining this sheep herd within the habitat's ability to support it. These sheep winter on a fairly confined winter range. Two major population die-offs occurred when the population approached 100 sheep. The high population combined with severe winter conditions, high numbers of other ungulates and domestic livestock, place a priority to avoid allowing this herd to increase beyond the 100 sheep objective.

5) Avoiding artificial feeding by local residents.

6) Protecting sheep from contact with domestic sheep and goats. There are several weed control programs in the Madison Valley promoting the use of domestic sheep as a weed control tool. It is imperative that FWP continue to keep watch over this program and any actions by private landowners choosing to bring domestic sheep or goats into proximity of this bighorn sheep herd.

7) Monitoring predation on these bighorn sheep from large carnivores, including wolves and mountain lions.

Population Monitoring: This population has not received the monitoring attention afforded other sheep herds in Montana. This herd should be monitored every spring during early green-up. In the past, the herd was monitored at the end of the spring mule deer or late winter elk survey. Those surveys alone were six- to seven-hour surveys, even before the biologist reached the primary sheep winter range. Logistically and physically, that situation was not conducive to surveying under the best conditions. Secondly, much of the winter and early spring range is timbered. Surveying rams in this area might best be accomplished by conducting late rut or early winter ground surveys. Most of the adult rams are highly visible during this time.

In the past five years, sheep were classified according to gender, with rams being classified according to horn growth. Lambs were classified during these surveys as well.

Summary of Public Comment

Beyond the local residents and tourists, this sheep herd is not well known to wildlife enthusiasts in Montana. However, those familiar with this herd desire a healthy, vibrant sheep herd that is managed to minimize further die-off events. Many would appreciate the chance to hunt this area for bighorns. It is not known for, nor probably capable of, producing Boone and Crockett–defined trophy rams. However, the early season hunting opportunities require hunters to access very demanding and wild country. It presents a quality hunting opportunity from a terrain and access aspect.

Management Goal

Continue to manage this sheep herd for optimum health and productivity. Manage for a population that promotes reasonable lamb survival and diversity in age structure in rams. There is very little opportunity to increase sheep numbers in this district. Attempting to manage for a population that exceeds 100 to 120 is probably not in the best interests of this sheep herd.

Habitat Objectives

1. Create partnership opportunities with public and private land managers to protect and preserve habitat presently occupied by bighorn sheep and other wildlife species in this area.

2. Encourage creative and progressive habitat improvement projects, particularly weed and fire management on publicly owned winter ranges.

3. Encourage preservation and improvement of publicly owned bighorn sheep habitat to minimize the dependence on privately owned winter ranges in this area.

4. Encourage and cost-share wildlife-friendly fencing projects in this area.

Habitat Management Strategies

1) The majority of the occupied sheep range in this area is protected under a wilderness designation. Therefore, it is critical to work with the USFS to help manage and protect this area in its wilderness state.

2) Pursue conservation easements and other protective ventures with private landowners along the Slide Inn area to protect critical winter ranges for bighorn sheep and other wildlife in this area.

3) Work closely with Montana Department of Transportation regarding any highway improvements and construction along U.S. Highway 287 and occupied bighorn sheep range.

4) Continue to work with and consult with the USFS on fire management proposals for improving and increasing the amount of effective winter range in the upper Madison Valley.

Game Damage Strategies

Game damage issues may arise in this area. There are incidences of private landowners artificially feeding sheep during the winter. This practice artificially concentrates these sheep into small areas on private lands. FWP will follow game damage policies now in place. In addition, FWP can use the legal hunting season to assist in population control by issuing ewe licenses or scheduling a trapping and transplanting operation.

Access Strategies

Access may be a limiting factor regarding hunter opportunity in this area. FWP will remain vigilant in supporting current access opportunities for hunting and wildlife viewing and work with private landowners to create new opportunities in the immediate future.

Population Objectives

1) Maintain the number of bighorn sheep observed during late rut and green-up aerial surveys within 20% of 100 (80 to 120) sheep observed on the winter range.

2) Maintain a ram: 100 ewe ratio observed during late rut surveys of at least 50 rams: 100 ewes with a minimum of 40% of these rams being ¾-curl or larger.

Population Management Strategies

Bighorn numbers have been traditionally managed through hunter harvest. The population objective of 100 (± 20%) observed bighorn sheep was derived by considering 1) the ability of public and private lands to provide forage for the wintering bighorn population, 2) conflicts with residential developments, 3) vehicular/bighorn collisions, and 4) the understanding that catastrophic disease-caused die-offs, exhibited in many other sheep populations, are often density dependent occurrences.

Bighorn sheep in the district have recovered sufficiently to provide some limited hunting. Reopening this district for the 2010 season will probably be proposed during FWP's biennial season setting process.

Ewes have not been harvested in this district in the past. In the advent that it may be desirable to harvest ewes in the future either for population management or recreational opportunity, the process has been developed to provide for ewe harvest.

Assuming hunting of bighorns in this district will be reopened in 2010, the season structure could follow the format depicted below.

Prescriptive Harvest Management

Ewes: Bighorn sheep populations are managed in many hunting districts through limited-entry harvest of the female segment. In Hunting District 302, licenses could be issued under the following prescriptions (Table 2):

Standard Regulation: A limited number of adult ewe licenses issued would be up to 20% of the number of ewes going into the fall season. The number of ewes going into the fall season would be based on the number of ewes observed during the annual survey, assuming 5% mortality of adults, and adding recruitment of one-half the previous year's lambs.

The Standard Regulation will be recommended if: The total number of bighorns counted on the survey area is within 20% of the population objective and lamb recruitment is above 35 lambs: 100 ewes.

Restrictive Regulation: Fewer than five ewe licenses would be prescribed.

The Restrictive Regulation will be recommended if: The total number of bighorns counted on the survey area is more than 20% below the population objective and lamb recruitment is less than 35 lambs: 100 ewes.

Liberal Regulation: Limited ewe licenses valid in the entire hunting district during the general season for bighorn sheep in this district. The number of ewe licenses issued would be up to 20% of the number of ewes going into the fall season. The number of ewes going into the fall season would be based on the number of ewes observed during the annual survey, assuming 5% mortality of adults, and adding recruitment of one-half the previous year's lambs,

The Liberal Regulation will be recommended if: The total number of bighorns counted on the survey area is greater than 20% above the population objective and lamb recruitment is greater than 40 lambs: 100 ewes.

Table 2. Summary of regulation types under different population criteria for ewe harvest and population management.

SOUTHERN MOUNTAINS	No. Bighorns Counted on Survey Area	Recruitment Lambs: 100 Ewes	Regulation Types	Harvest Rates
Standard Regulation_	± 20% of 150	Above 35	Limited Entry Adult Ewes	Up to 20% of Ewes
Restrictive Regulation	More than 20% below 150	Less than 35	Fewer than 5 ewe licenses	Less than 10% of ewes
Liberal Regulation	Greater than 20% above 150	Greater than 40	Limited Entry Ewes **OR** translocate if > 25 sheep including rams are available	More than 20% of Ewes

Rams:

Standard Regulation: Limited-entry any-ram licenses with the number of licenses issued being up to 20% of the ¾-curl rams in the population.

The Standard Regulation will be recommended if: The population is within objective (+ 20% of 100), there are more than 50 rams: 100 ewes, and 35% of the rams are at least ¾-curl (Table 3).

Table 3. Summary of potential ram harvest under different population parameters and criteria.

SOUTHERN MOUNTAINS	Number of Either-Sex or Legal Ram Licenses Is	When the Herd Has		
		Population Size	Ram: 100 Ewe ratio	% of Rams with ≥ ¾-curl
Standard Regulation	Up to 35% of the ¾-curl rams	± 20% of 100	>50	≥ 35
Restrictive Regulation	Up to 20% of the ¾-curl rams	More than 20% below 100	< 50	< 35

Restrictive Regulation: Limited-entry any-ram licenses with the number issued being up to 10% of the ¾-curl rams in the population.

The Restrictive Regulation will be recommended if: The population is more than 20% below the population objective of 100, there are less than 50 rams: 100 ewes, and less than 35% of the rams are at least ¾-curl.

TENDOY

(Hunting District 315)

Description: Hunting District 315 contains approximately 720mi² with 22% privately owned and 78% managed by the Montana Department of Natural Resources and Conservation (DNRC), Bureau of Land Management (BLM), and the U.S. Forest Service (USFS). Bighorn sheep currently occupy about 20% of the district, or 140mi² , in the Tendoy Mountains, Whitepine Ridge, and the south end of the Beaverhead Mountains. The Beaverhead Mountains population is an interstate population that straddles the Continental Divide, typically summering in Montana and wintering in Idaho Hunting Units 30 and 30A. Occasionally, bighorns are observed in the Lima Peaks. No bighorns have been observed in recent history in either the Italian Peaks or Red Conglomerate Mountains.

Currently occupied bighorn range is comprised of 95% public land and 5% private, with the majority of land administered by the USFS (64%) and BLM (29%). The land is managed for multiple-use with livestock grazing and recreation the dominant land uses. There is some interest in oil and gas exploration and development within the current occupied range. Winter range is scattered over 50mi² of predominantly BLM (53%) and USFS (30%) lands with the balance either DNRC or private lands. The BLM withdrew primary winter range in the Hidden Pasture drainage in the Tendoy Mountains from grazing for the benefit of bighorns and other wildlife.

Public Access: The Tendoys, Beaverheads, and Lima Peaks provide a diversity of hunting experiences. Within the current occupied range, bighorns are generally accessible from county or public roads, or by foot or horseback trails maintained by either the BLM or USFS. The BLM recently implemented a new travel plan while the USFS will undertake travel planning in the near future. User-created trails in the Tendoy Mountains are a major concern as they compromise wildlife security, promote soil erosion, and spread noxious weeds.

Bighorn Sheep Populations: Bighorn sheep in the Tendoy and Beaverhead Mountains are introduced populations on historical bighorn range. Transplant records vary, but the Tendoy herd was started with an initial transplant of about 39 in 1985 and another 14 in 1986 (Table 1). Additional transplants of 19 in 1997 and 30 in 2002 were made following two lungworm-pneumonia die-offs in 1993 and 1999. Idaho Fish and Game transplanted 22 bighorns in 1985 and another 17 in 1988 to start the population in Unit 30A. About 100 bighorns occupy Hunting District 315, with about 70 in the Tendoys and about 30 in the Montana portion of the Beaverhead Mountains (Figure 1 and Tables 2 and 3).

Recreation Provided: Hunting of bighorn sheep was reauthorized in 2005 with the issuance of two either-sex licenses. Bighorn sheep, most notably rams, have been somewhat hard for hunters to find in either the Beaverhead or the Tendoy Mountains early in the season, forcing most hunters to wait until sheep migrate to traditional winter range in the vicinity of Big Sheep Creek in the south end of the Tendoys. This migration occurs in mid-to late October. Since the bighorn season was reauthorized, all sheep hunters were successful and hunted an average of 14 days (range 5 to 20) each before harvesting a sheep. All sheep during this period were harvested out of the resident (Tendoy) population. Hunters have pursued sheep in the Beaverhead Mountains but have not been successful in harvesting from this subpopulation, which generally returns to rut and winter in Idaho.

The mountains of southwest Montana are well known for sport hunting and recreation on a variety of public and private lands. Hunters and recreationists from across Montana and the nation recreate in Beaverhead County. Bighorn sheep in the Tendoy and Beaverhead Mountains are migratory but occupy public lands that make them available for viewing during most months of the year. Popular viewing areas include Big Sheep Creek, Muddy Creek, Morrison Lake, and White Pine Ridge.

Location	Year	No. Released	Composition	Origin
Tendoys	1985	39	13 Rams, 26 Ewes	Lost Creek
	1986	14	13 Rams, 1 Ewe	Thompson Falls
	1997	19		Rock Creek
	2002	30	3 Rams, 27 Ewe	Sun River
Idaho Unit 30 A	1985	22		Lostine Mountains, OR
	1988	17		Morgan Creek (Unit 36B)

Table 1. Bighorn sheep transplant history, composition, and origin, Hunting District 315 1985-2002.

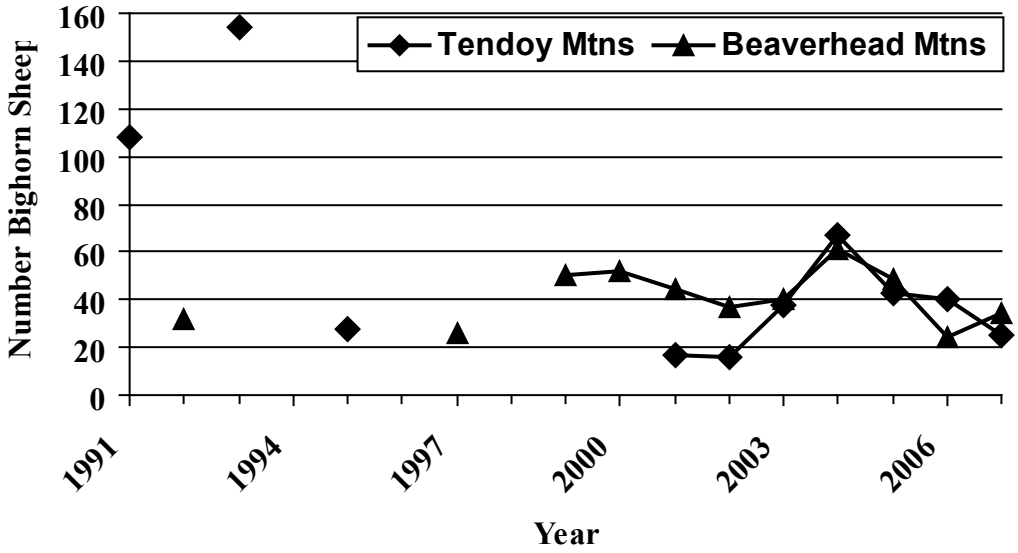


Figure 1. Total number of bighorn sheep observed during aerial trend surveys in Hunting District 315, 1991-2007.

Table 2. Bighorn sheep population parameters in Tendoy Mountains, Hunting District 315 1990-2007.

Year	Total	Lambs	Rams	¾+ Rams
1991	108 (19 Unclassified)	26	32	
1993	154	27	71	44
1995	28	0	12	7
2001	17	3	5	
2002	16	5	2	
2003	38	9	9	
2004	67	13	12	
2005	43 (15 unclassified)	6	2	2
2006	40	6	13	12
2007	25	5	7	6

Table 3. Bighorn sheep population parameters in Beaverhead Mountains, Hunting District 315 1996-2007. Data provided by Idaho Fish and Game from Units 30 and 30A, excepting the 2006 Montana observation. Observations were all made incidental to surveys for other species or reflect incomplete coverage of the bighorn habitat.

Year	Total	Lambs	Rams	¾+ Rams
1992	32	2	11	2
1997	26	5	18	12
1999	50	9	12	4
2000	52	2	24	16
2001	44	9	17	10
2002	37	4	18	10
2002	37	10	9	3
2003	40	8	10	7
2004	61	9	15	11
2005	49	6	18	13
2006	28	1	10	1
2006	24 (Montana)	2	9	9
2007	34	0	8	7

Current Annual Bighorn Sheep Harvest: Bighorn sheep hunting was reauthorized in Hunting District 315 in 2005. The hunt followed five years where no hunting was authorized due to the die-off event in the late 1990s. Two either-sex licenses have been issued annually since 2005 (Table 4). The district was also expanded in 2005 to include the Beaverhead Mountains south of Pass Creek. No harvest has been directed toward the ewe segment of the population since 1993. License levels will likely remain at low levels until the population shows significant growth toward the population objective of 200 bighorns.

Accomplishments: Initial introductions of bighorns into the Tendoy Mountains flourished for almost a decade. However, since 1993 the population has suffered two major pneumonia-lungworm die-off events and a transplant that was largely a failure in 1997. These events led to accusations over the cause of the die-offs and hard feelings over the loss of a cherished wildlife resource and associated hunting and viewing opportunity. The 1990s were a hard decade for sheep management across southwest Montana, and several populations were affected. Fortunately, other areas of the state were not affected, and FWP has been able to readily provide transplant stock to reestablish populations.

The 2002 transplant, comprised of mostly females, has survived and produced sufficient lambs to slowly grow the population despite unusually high lungworm loads in the population. (Lungworm is a native, respiratory tract parasite that may act as a stressor that can lead to pneumonia). Given these factors, the department has decided to not add additional bighorns to this population. The management theory is that additional bighorns may introduce new organisms that promote immunological stress in the existing population. In this regard, the Tendoy hunting district is acting as an experiment in sheep management.

FWP is supporting research through Montana State University to understand the differences between stable and unstable populations across western Montana, including the Tendoy population. This habitat study is focused on the vegetation, environment, and geographic character of sheep habitat.

Year	Either-Sex or Legal Ram Licenses	Ram Harvest	Ewe Licenses	Ewe Harvest
1992	3	3	10	9
1993	5	5	10	7
1994-1995	CLOSED			
1996	2	2	-	-
1997	2	2	-	-
1998	1	1	-	-
1999	1	1	-	-
2000-2004	CLOSED			
2005	2	2	-	-
2006	2	2	-	-
2007	2	2	-	-

Table 4. License and harvest history, Hunting District 315 1992-2007. Legal ram licenses were issued for the period 1992-1999 and either-sex licenses since 2005.

Management Challenges: There are a number of management challenges related to bighorn sheep management in the Tendoys. Overall herd health is the most pressing concern at this time following two independent die-off events in the 1990s. The population is currently declining and is far below historical growth rates in the Tendoys or those observed in other Montana populations. The Tendoy herd currently has high lungworm loads, including the highest load ever documented in Montana. FWP has attempted some treatment for lungworm at bait stations as recently as 2006, but has subsequently decided there is more risk from artificially concentrating sheep than reward from reducing lungworm loads.

Maintaining separation of wild sheep and domestic sheep is a significant issue in the Tendoy district. There are four domestic sheep producers within the district, mostly well removed from occupied bighorn sheep habitat. There is one USFS domestic sheep allotment that poses some risk to wild sheep in one pasture in the Beaverhead Mountains and another allotment in Idaho that will preclude bighorn sheep expansion into the Red Conglomerate Mountains. FWP and the Montana Wild Sheep Foundation have met with one producer to seek amicable solutions to this issue and to discuss the need to remove individual bighorns that come in contact with domestic sheep. To date there has been no management removals of bighorns.

Population Monitoring: Primary winter range in the Tendoys, Deadwood Gulch, and the north side of Garr Canyon is surveyed annually with a helicopter in early January in conjunction with a post-season mule deer flight. This flight covers the majority of the winter range but is not particularly effective at detecting population trends. Bighorns are also observed during annual elk census flights conducted with a fixed-wing aircraft. Bighorns in the Beaverhead Mountains are surveyed incidental to other surveys. Idaho Fish and Game surveys bighorns in the Beaverhead Mountains, either incidental to other surveys or with incomplete coverage. There is a need for a periodic, dedicated helicopter survey in this district, conducted in March or early April. All observed bighorns are classified by age and sex; rams are classified by horn class.

Summary of Public Comment

Public comments are highly supportive of the current season structure in the Tendoys. A few individuals have expressed concern over the lack of Boone and Crockett, or trophy, rams in the district. A few individuals have brought alternatives forward such as a 7/8-curl regulation and distribution of supplemental minerals to promote horn growth. There is general concern regarding the health of the Tendoy herd following the die-off events during the last decade.

Management Goal

Manage for a three-fold increase in the Tendoy (resident) bighorn population with diverse age classes of rams. Cooperate with public land management agencies, the State of Idaho, interested organizations, and private individuals in the management of bighorn habitat. Provide opportunities for bighorn sheep hunting and wildlife viewing.

Habitat Objectives

1) Encourage the maintenance and improvement of habitat conditions on public lands (USFS, BLM, and DNRC) for the benefit of bighorns, other wildlife, and other agency-mandated uses.

Habitat Management Strategies

1) The USFS and BLM are the principal land management agencies for the public land in Hunting District 315. DNRC manages a few key winter range parcels. FWP provides support, distribution of information, and technical assistance to agency habitat management efforts from the planning level to project implementation. Both the USFS and BLM have installed a total of three wildlife guzzlers for the benefit of bighorns. Fences have been modified, or in a few cases removed, wherever possible to accommodate wildlife movement. New fences are being built to allow wildlife passage. FWP maintains a Memorandum of Understanding (MOU) with the USFS on the manipulation of habitat. The MOU is intended to ensure coordination and cooperation between the agencies during the planning, implementation, and evaluation phases of projects that occur in sagebrush, Douglas fir, aspen/willow and mountain mahogany/bitterbrush communities.

2) Interest in oil and gas leasing and exploration has recently occurred within occupied bighorn range on Whitepine Ridge, the Tendoy Mountains, and the Lima Peaks. FWP submitted distribution information and comments in support of either seasonal or year-round no surface occupy stipulations for leases that occur in habitat that is critical to bighorn sheep and other wildlife.

3) Two 500KV powerlines are planned to bisect southwest Montana in the near future. FWP is actively involved in trying to mitigate impacts from these lines on wildlife resources and is cooperating with private landowners, industry, and other agencies to ensure critical habitats are not degraded or fragmented.

Game Damage Strategies

Game damage problems have not occurred to date and are not anticipated at current population levels. There is limited opportunity for bighorns to depredate haystacks or standing crops on or near their primary winter range. Should such problems develop, FWP will respond with fencing, herding, or hazing to mitigate the damage. Should the population approach the objective of 200 individuals and game damage occur, those individuals responsible for the damage could be offered as transplant stock for other herds.

Access Strategies

FWP maintains three Block Management Areas (BMAs) within Hunting District 315, totaling approximately 17,000 acres. Most of the access to bighorns is from public lands administered by the BL and USFS, and these BMAs. FWP continually works with other public land management agencies on travel plans that emphasize access while trying to eliminate user-created, unauthorized trails.

Population Objectives

1) Maintain the number of bighorn sheep observed during post-season aerial surveys within 10% of 200 sheep (180 to 220) within the current winter ranges in Muddy Creek, Big Sheep Creek, Garr Canyon, and Deadwood Gulches.

2) Maintain a ram: 100 ewe ratio observed during post-season aerial surveys of at least 40 rams: 100 ewes with at least 30% of the rams having a ¾-curl.

3) Coordinate survey and harvest management strategies with Idaho on the interstate bighorns in the Beaverhead Mountains.

Population Management Strategies

Hunting District 315 is located in the Mountain Foothills ecological region. The bighorn population has been introduced on historical bighorn sheep range. The initial transplants flourished and were characterized by high lamb production and recruitment and, as a result, rapid population expansion. Two die-off events in the 1990s reduced the bighorn population to as few as 16 observed individuals. Additional transplants in 1997 and 2002 have not resulted in rapid population expansion due to lagging lamb recruitment. Bighorns are currently being managed for population growth with extremely low harvest directed solely at the ram segment. Should the population begin to expand toward the objective of 200, ewe licenses would be issued and/or the population surplus could be offered as transplant stock.

The population objective of 200 (± 10%) observed bighorn sheep was derived by considering the history of the 1984 and 1986 transplants, which may have exceeded 200 for a brief period, and other uses of the land base within the hunting district. Population management strategies will focus on maintaining bighorn numbers consistent with allotment and other land use plans on private, BLM, and USFS administered lands.

Prescriptive Harvest Management

Ewes: Bighorn sheep populations are managed where necessary through limited-entry harvest of the female segment. In Hunting District 315, licenses will be issued under the following prescriptions (Table 5):

Standard Regulation: Limited ewe licenses valid in the Tendoy (resident) portion of the hunting district during the general season for bighorn sheep. The number of ewe licenses issued would be up to 15% of the number of ewes going into the fall season. The number of ewes going into the fall season would be based on the number of ewes observed during the annual survey, assuming 5% mortality of adults, and adding recruitment of one-half the previous year's lambs. Ewe licenses could include the Beaverhead Mountains (interstate population) if the population is within the prescription.

The Standard Regulation will be recommended if: The total number of bighorns counted on the survey area is within 10% of the population objective and lamb recruitment is between 30 and 40 lambs: 100 ewes.

Restrictive Regulation: Fewer than five ewe licenses would be prescribed.

The Restrictive Regulation will be recommended if: The total number of bighorns counted on the survey area is more than 10% below the population objective and lamb recruitment is below 30 lambs: 100 ewes.

Liberal Regulation: Limited ewe licenses valid in the Tendoy (resident) portion of the hunting district during the general season for bighorn sheep. The number of ewe licenses issued would be up to 20% of the number of ewes going into the fall season. The number of ewes going into the fall season would be based on the number of ewes observed during the annual survey, assuming 5% mortality of adults, and adding recruitment of one-half the previous year's lambs. Ewe licenses could include the Beaverhead Mountains (interstate population) if the population is within the prescription.

OR if the number of ewes and rams is at least 25 sheep (minimum transplant number) above objective, the surplus could be used for transplanting.

The Liberal Regulation will be recommended if: The total number of bighorns counted on the survey area is greater than 10% above the population objective and lamb recruitment is greater than 40 lambs: 100 ewes.

Rams:

Standard Regulation: Limited-entry either-sex licenses with the number of licenses issued up to 15% of the ¾-curl rams in the population.

The Standard Regulation will be recommended if: The population is within objective (+ 10% of 200), the annual survey showed at least 40 to 60 rams: 100 ewes, and 30% of the rams are at least ¾-curl (Table 6).

Restrictive Regulation: Limited-entry either-sex licenses with the number of licenses issued up to 10% of the ¾-curl rams in the population.

The Restrictive Regulation will be recommended if: The population is more than 10% below the objective of 200, the annual survey showed less than 40 rams: 100 ewes, and less than 30% of the rams are at least ¾-curl.

Liberal Regulation: Limited-entry either-sex licenses with the number of licenses issued up to 20% of the ¾-curl rams in the population.

MOUNTAIN-FOOTHILLS	No. Bighorns Counted on Survey Area	Recruitment Lambs: 100 Ewes	Regulation Types	Harvest Rates
Standard Regulation	±10% of 200	Between 30-40	Limited Entry Ewes	Up to 15% of Ewes
Restrictive Regulation	More than 10% below 200	Less than 30	Fewer than 5 ewe licenses	Less than 10% of ewes
Liberal Regulation_	Greater than 10% above 200	Greater than 40	Limited Entry Ewes or translocate if > 25 sheep including rams are available	Up to 20% of Ewes

Table 5. Summary of regulation types under different population criteria for ewe harvest and population management.

Table 6. Summary of potential ram harvest under different population parameters and criteria.

MOUNTAIN-FOOTHILLS	Number of Either-Sex or Legal Ram Licenses Is	When the Herd Has		
		Population Size	Ram: 100 Ewe ratio	% of Rams with ≥ ¾ curl
Standard Regulation	Up to 15% of the ¾-curl rams	±10% of 200	40-60:100	≥ 30
Restrictive Regulation	Up to 10% of the ¾-curl rams	More than 10% below 200	< 40:100	< 30
Liberal Regulation_	Up to 20 % of the ¾-curl rams	Greater than 10% above 200	> 60:100	≥ 30

The Liberal Regulation will be recommended if: The population was more than 10% above the objective of 200, the annual survey showed more than 60 rams: 100 ewes, and more than 30% of the rams are at least ¾-curl.

HIGHLAND
(Hunting District 340)

Description: The Highland area (Hunting District 340) located just south of Butte, contains approximately 1,141mi² and includes the Highland Mountains and the northern portion of the East Pioneer Mountains near the town of Melrose. Interstate 15 and the Big Hole River separate the two mountain chains. The district is comprised of shrub grasslands (sagebrush, mountain mahogany, bluebunch wheatgrass, Idaho fescue), coniferous forests, and agricultural lands. Forty-two percent of the district is in private ownership, located primarily at the lower elevations of the district. The majority of private land is in agricultural production, primarily cattle although there are several hobby sheep farms as well. Due to the mineral-rich geology of this area, there are also a significant number of mining claims, active or otherwise, located throughout this district. The other 58% of land in this hunting district is managed by various public land management agencies. The Bureau of Land Management (BLM) administers 231mi² (20%), managed under the Butte Resource Management Plan. Included in the BLM portion of publicly administerrd land is the Humbug Spires Wilderness Study Area, which is managed as a roadless area with no resource extraction. The U.S. Forest Service (USFS) - Beaverhead-Deerlodge National Forest administers 363mi² (32%), while the State of Montana, through the Department of Natural Resources and Conservation (DNRC), administers 62mi² (6%).

Approximately 233mi² of the district (20%) is currently occupied by bighorn sheep during some portion of the year. Sixteen percent of the occupied area is private land and 84% is public land. Bighorn sheep winter range comprises approximately 188mi² of this district (16%); 23% is private land and 77% public, with the majority of public land being administered by the BLM. Based on past and current telemetry data and recent observations, the majority of the bighorn sheep population winters on public lands.

The vegetation within the occupied bighorn sheep range is predominantly rocky terrain interspersed with sagebrush grassland, mountain mahogany, and lodgepole pine and Douglas fir forest.

Public Access: The Highland hunting district provides a diversity of hunting experiences, including motorized hunting along main drainages and walk-in hunting in between drainages. There is ample road access throughout the unit in general, including access to public land specifically. Travel Plan revisions on USFS and BLM lands were implemented in 1995 with the primary objectives being the protection of the soil, water, and vegetation and enhancement of elk security where it was low. Existing, and some new, winter range closures were incorporated into this revision. The Upper Big Hole Travel Plan was again revisited in 2006 during the revision of the Butte Resource Management Plan. Although this plan will not be finalized until 2009, it is expected that additional closures and seasonal restrictions will be implemented on BLM lands within bighorn sheep habitat.

Bighorn Sheep Populations: The original Highland bighorn sheep herd, located in the Highland and East Pioneer mountain ranges, died out in the early 1900s, mainly due to

overharvesting and disease transmission from domestic livestock. In the late 1960s, an effort was made to reestablish this herd through two transplants of bighorn sheep from the Sun River herd (Table 1). Since this original transplant of 53 bighorn sheep, the number of animals counted in the Highlands herd grew steadily until reaching its peak of over 300 observable animals in the early 1990s. During the winter of 1994-95, a die-off occurred, causing as much as 90% mortality and reducing the Highlands bighorn sheep population to less than 100 animals. The die-off was attributed to a pneumonia-lungworm complex.

Month/Year	Source Herd	Number Tranplanted	Release Site
1967	Sun River	22	Camp Creek
1969	Sun River	31	Camp Creek
Dec 2000	Sun River	15	Camp Creek
Feb 2001	Sun River	17	Camp Creek
April 2001	Bonner	3	Soap Gulch
Feb 2002	Sula	14	Camp Creek
Feb 2007	Ruby Mtns	17	Soap Gulch
Jan 2008	Sun River	65	Soap Gulch/Camp Creek

Table 1. History of bighorn sheep transplants to the Highlands population, Hunting District 340, 1967-2008.

Following the die-off, several transplants ensued in an attempt to rebuild this population. During the winter of 2000-01, 32 bighorn sheep were transplanted from the Sun River herd. In the spring of 2001, three sheep were transplanted from the Bonner herd. During winter 2002, 14 sheep were transplanted from the Sula herd, and in 2007, 17 sheep were transplanted from the Ruby Mountains. In January 2008, 65 sheep were transplanted from the Sun River herd. Since 1967, a total of 184 sheep have been released in Hunting District 340.

From 1994 to 1996, two Montana State University graduate research studies plus an additional study were done on the Highlands herd, in cooperation with FWP, BLM, and the Montana Foundation for North American Wild Sheep:

Hoar, K.L., D.E. Worley, and K.E. Aune. 1996. Parasite loads and their relationship to herd health in the Highlands bighorn sheep herd in southwestern Montana. Proceedings of the Bienn. Symp. of the North. Wild Sheep and Goat Council.10: 57-65.

Weigand, J.P. 1994. Range use and interspecific competition of Rocky Mountain bighorn sheep in the Highland Mountains, Montana. MS Thesis. Montana State University, Bozeman. 86pp.

Semmens, W.J. 1996. Seasonal movements and habitat use of the Highland/Pioneer Mountains bighorn sheep herd of southwest Montana. MS Thesis. Montana State University, Bozeman. 103pp.

The results from Hoar's work show that the Highlands bighorn sheep suffered a light lungworm infection in the early 1990s, prior to the die-off. This finding is not uncommon among bighorn sheep herds.

Intensive telemetry work done by Weigand and Semmens in 1994-95 identified three subpopulations of the Highlands herd and described seasonal range distribution and interaction between these subpopulations. As defined by associated ewe-lamb groups and the location of their seasonal home ranges, the subpopulations were described as the East Pioneer, Moose Creek, and Camp Creek population units. Sheep established traditional seasonal ranges in these locations, generally wintering at the lower elevations then moving to higher, south-facing slopes during the spring through fall.

Radio-telemetry data from Weigand's and Semmens's studies showed very little mixing occurred among subgroups during the summer and winter, while some mixing occurred during the spring lambing period. The majority of documented interactions occurred in the fall during the rut. It is worth noting that on numerous occasions, bighorn sheep rams have been observed crossing Interstate 15 between the Highland and East Pioneer mountain ranges.

Since bighorn ram movements have never been monitored via instrumented animals, the extent of ram range is best known from observations made by FWP and the public. Summering rams have been located as far west as Sheriff and Lion Mountains in the East Pioneers and as easterly as Brazil Ridge in the Highlands. Rams have been spotted north of the Big Hole River on the Fleecer Wildlife Management Area and as far south as the Birch Creek drainage, although these sightings have been rare and probably do not indicate commonly used areas but rather random wanderings of a few individuals.

Despite the die-off and transplants, bighorn sheep in the present-day Highlands herd appear to continue to use traditional seasonal ranges, although it is unknown at this time whether three distinct subpopulations still exist.

Prior to the die-off, the Highlands bighorn sheep herd was at an all-time high of over 300 observable animals (Figure 1 and Table 2), and some avid sheep watchers claim there were as many as 400 or more sheep by the late 1980s. It was not uncommon for groups of 50 or more rams to be observed. Since the die-off, total counts of observed bighorn sheep have remained below 50 animals, despite transplant efforts. From 1999 to 2004, no aerial surveys specifically for bighorn sheep were flown and only opportunistic observations were gathered during other big game surveys. Lamb production and recruitment has remained low, contributing to the bottleneck in population growth that the Highlands herd is currently experiencing.

In the late summer following the 2008 transplant, another small die-off event occurred in the Highlands sheep population. This event appeared to be limited primarily to adult ewes from the 2008 transplant that did not migrate off the winter range. Field necropsies suggested that all the sheep were in poor body condition prior to mortality. Lab results showed that pneumonia was the likely cause of death. In all, 11 adult ewes and one adult ram were known to perish in this die-off event. It is inconclusive whether the ram had been from the 2008 transplant.

Concurrent with this die-off event attacking adult sheep, lamb pneumonia continued to claim more than 90% of the lamb crop for 2008. By fall, only a few lambs were observed in the herd. Interestingly, the one group of sheep that have consistently produced and retained lambs for the past two years is a group of ewes from the 2007 transplant that migrated away from the main body of the herd and took up residence approximately 10 miles to the south.

Recreation Provided: Bighorn sheep in the Highlands herd have been one of Montana's best-known and premier wild sheep herds, both for hunting and wildlife watching. Because much of the annual range is within easy access and sight of Interstate 15 and several secondary roads, going out to "watch sheep" has been and continues to be a popular pastime of many local residents and wild sheep fans. Popular areas to view bighorn sheep are the lower extents of Moose Creek, Soap Gulch, and Camp Creek in the Highlands and the Maiden Rock and Canyon Creek areas in the East Pioneer Mountains.

Second only to the Missouri Breaks herd in Montana for trophy status, the Highlands herd at one time was known as one of the best places to harvest a trophy ram. At the height of the population in the mid-1990s just prior to the die-off, as many as 35 either-sex licenses and 35 ewe licenses were being issued. A skull found in the East Pioneers from a Highlands ram that presumably died from natural causes scored 203 5/8 Boone and Crockett points.

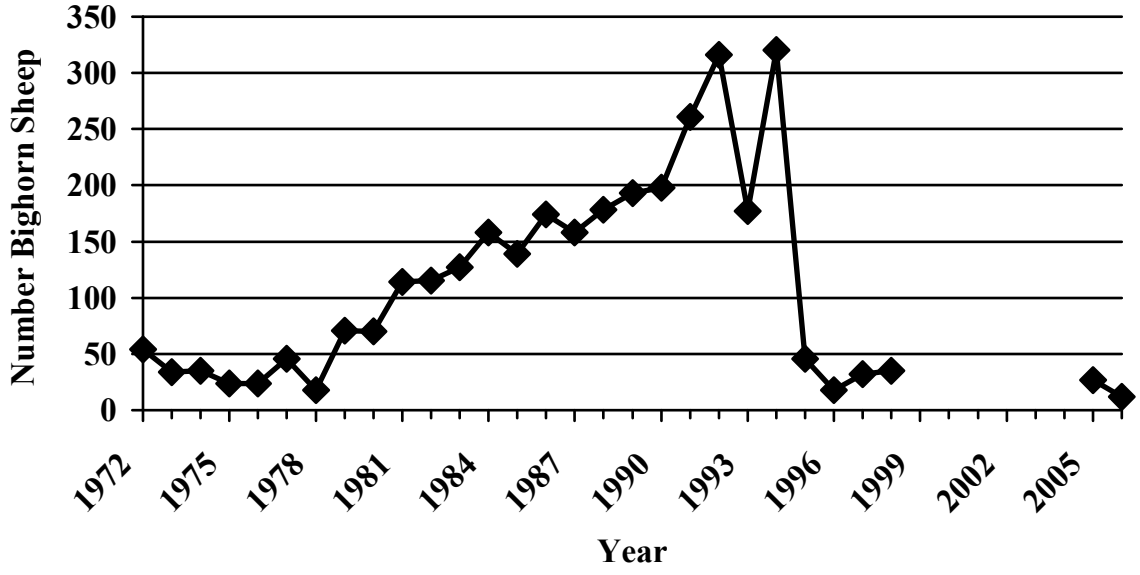


Figure 1. Total number of bighorn sheep observed during aerial trend surveys in Hunting District 340, 1972-2006.

Year	Total	Ewes	Lambs	Rams	Unk	¾+ Rams
2006	12	6	0	6		3
2005	27	6	2	19		5
1999-2004	NA	----	----	----		-----
1998	35	25	6	4		1
1997	32	27	4	1		1
1996	18	18	0	0		0
1995	46	23	6	14	3	2
1994	320	161	41	118		91
1993	177	91	49	37		7
1992	316	182	58	76		47
1991	261	154	61	46		25
1990	198	74	27	97		67
1989	193	98	37	58		30
1988	178	116	29	33		13
1987	158	75	35	48		22
1986	174	98	26	50		37
1985	139	59	39	41		18
1984	158	101	15	42		16
1983	127	62	31	34		15
1982	115	42	19	22		7
1981	114	71	29	14		5
1980	70	41	17	12		1
1979	71	35	28	8		3
1978	18	11	4	3		3
1977	46	25	13	8		2
1976	24	12	7	5		0
1975	24	14	7	3		1
1974	35	-	-	-		-
1973	34	20	10	4		-
1972	54	-	-	4		-

Table 2. Bighorn sheep population parameters before die-off (1972-1994) and after die-off (1995–2006) for Highlands population, Hunting District 340.

Despite the die-off, the Highlands bighorn sheep herd continues to be one of Montana's most important herds and a source of local pride for the residents of the Butte, Anaconda, Whitehall, and Dillon areas.

Current Annual Bighorn Sheep Harvest: In 1994, prior to the die-off, 35 either-sex licenses and 35 ewe licenses were issued for Hunting District 340 (Table 3). As a result of the significant decrease in population size following the die-off, Hunting District 340 was closed to all bighorn sheep hunting in 1995. The district did not reopen until 2002 when one either-sex permit was issued. As a result of a perceived increase in the number of bighorn sheep in the Highlands herd based on opportunistic observations and response to augmentation efforts, the number of either-sex licenses was increased to three in 2005. Annual bighorn sheep aerial surveys resumed in December 2005. Data gathered from the 2005 and 2006 surveys, combined with observations made during concurrent ground surveys, substantiated re-closing Hunting District 340 to all bighorn sheep harvest in 2007 based on the low number of observable sheep (Table 2). Currently, Hunting District 340 remains closed.

Accomplishments: Since the original transplant efforts in the late 1960s, the Highlands bighorn sheep herd has been one of

Table 3. History of license types and number issued in the Highlands Hunting District 340, 1994-2007.

Year	License Type/# Issued	# Harvested/# rams
2007	CLOSED	------
2005-2006	Either-Sex/3	3/3
2002-2004	Either-Sex/1	1/1
1995-2001	CLOSED	------
1994	Either-Sex/35 Ewe/35	35/35 32/0

Montana's most popular herds for both wildlife viewing and harvest opportunity. This herd once held the reputation as being the source of trophy rams, and prior to the die-off a majority of the rams in the population exceeded 180 points (by Boone and Crockett scoring methods) by six years of age.

In order to better understand the seasonal movements and ranges, habitat conditions and requirements, and herd dynamics within the Highlands bighorn population, a Highlands bighorn sheep study was initiated in 1992. A cooperative effort between FWP, BLM, Foundation for North American Wild Sheep, and the Butte Skyline Sportsmen Association, this initiative led to the completion of two masters of science theses from Montana State University, plus one internal report, (see Bighorn Sheep Populations section). These bodies of work have led to a greater understanding of the ecology and population dynamics of this herd.

In 2007, signs were erected on all the main access roads in the Highlands sheep range requesting voluntary reporting of bighorn sheep sightings. In addition, observation cards were made available to the public at local sporting good stores and at the BLM Butte Field Office. To date, this voluntary reporting system has been moderately used and has provided valuable information on the Highlands herd while at the same time generating ownership in the welfare of the herd.

In February 2007, 17 bighorn sheep were transplanted from the Ruby Mountains to the Highlands hunting district. Eight adult ewes were fitted with radio collars prior to release. In January 2008, 65 bighorn sheep were transplanted from the Sun River herd, consisting of 57 adult ewes, three lambs, and five adult rams. Radio collars were placed on 17 ewes while 27 other ewes received individual neckbands. Instrumented sheep are monitored regularly from the ground by FWP biologists and citizen volunteers, including students and teachers from Butte High School.

Management Challenges: There are a number of issues related to bighorn sheep management in this district including increasing the current size of the herd and maintaining an upward trend in population so that the district can be reopened to hunting opportunity; maintaining separation with domestic sheep and goats to prevent disease transmission to bighorn sheep; and the mortality associated with crossing Interstate 15.

Despite efforts to increase the Highlands bighorn sheep herd through several transplants since the mid-1990s die-off, this herd currently is experiencing a bottleneck in population growth. Lamb: ewe ratios generally need to be greater than 50 lambs: 100 ewes in order for the population size to increase. In recent years, lamb recruitment has been negligible, with very few lambs surviving through their first year to offset adult mortality.

Historically, the Highlands bighorn sheep range has overlapped with two small bands of domestic sheep located on private land near Maiden Rock in the East Pioneer Mountains. Semmens (1996) observed bighorn sheep using agricultural areas that supported these domestic sheep bands throughout the year, with the majority of use occurring in the fall. Bighorn sheep have used this overlapping area with domestic sheep for more than 20 years prior to the die-off in the mid-1990s and no problems with diseases had arisen in the past, although die-offs of wild sheep have been linked to domestic sheep and goat interactions in other areas. Presently, several domestic sheep hobby farms operate within proximity of the Highlands wild sheep range. There are no BLM or Forest Service sheep allotments, active or retired, in the Highlands or East Pioneer Mountains. The need to monitor the Highlands herd on a regular basis for domestic sheep interactions and herd health continues to be a management concern.

Interstate 15 cuts through the middle of the Highlands bighorn sheep range, separating the Highlands from the East Pioneer Mountains. Movement of bighorn sheep from one side of

the interstate to the other has been documented. The majority of crossover occurs by rams during the rut, although there has been documentation of ewes crossing the interstate as well. Bighorn sheep have been involved in vehicular collisions in the past while crossing Interstate 15. Any crossings of well-traveled roads carry the risk of mortality to bighorn sheep.

Population Monitoring: To monitor the bighorn population, aerial surveys are conducted annually, generally using a helicopter, in early spring during green-up when sheep are most concentrated. The entire area historically occupied by bighorn sheep during winter is flown, including public and private lands. Bighorns are counted and classified by age and sex and rams are classified by horn class.

Summary of Public Comment

Public comments related to this bighorn sheep population and its management in this hunting district have indicated a high level of support for having bighorn sheep here. Both hunters and non-hunters enjoy seeing bighorn sheep in this area.

Management Goal

Manage for a healthy and productive bighorn sheep herd in balance with available habitat. Cooperate with public land management agencies and private individuals in the management of bighorn sheep habitats. Manage for hunter harvest opportunity of surplus males in a manner that allows for the opportunity to harvest trophy rams.

Habitat Objectives

1) Develop cooperative programs that encourage public and private land managers to maintain approximately 100,000 acres of occupied bighorn sheep habitat (based on telemetry data) for the benefit of bighorns, other wildlife species, and other agency mandated uses.

2) Encourage maintenance and improvement of habitat conditions on publicly owned winter ranges (primarily BLM) so that vegetation conditions on these winter ranges provide adequate forage for bighorns and other wildlife during the winter.

3) Encourage maintenance and improvement of habitat conditions on public lands (USFS and BLM) so that bighorns continue to utilize these lands during summer and fall rather than moving onto private lands.

Habitat Management Strategies

1) The BLM in both the Butte and Dillon Field Offices are implementing forest and grassland/shrubland restoration projects, noxious weed control, and better grazing management to maintain and/or improve wildlife habitats in the Soap Gulch and Camp Creek drainages. To date, approximately 1,000 acres of conifer encroachment in grassland and shrubland habitat has been slashed and burned. Roughly 3,700 acres of additional restoration treatments will occur in the Soap Gulch and Camp Creek drainages and approximately 3,000 acres will be treated in the McCartney Mountain area. No new roads have been or will be built with these treatments.

2) Grazing allotments in the southwest Highlands, including Camp Creek, have been modified to lessen the impacts of grazing on grassland and shrubland communities. These changes include reducing animal unit months, changing seasons of use, and changing the grazing system and/or the allowable use levels.

3) A complete inventory of leafy spurge will be completed by the BLM Butte Field Office. This inventory will be used to develop a strategy to reduce and control the population of spurge. Spraying of noxious weeds will continue in the southwest Highlands.

4) The Upper Big Hole Travel Plan was revisited in 2006 during the revision of the Butte Resource Management Plan. Although this plan will not be finalized until 2009, it is expected that additional closures and seasonal restrictions will be implemented on BLM lands within bighorn sheep habitat.

Game Damage Strategies

Specific game damage problems with the Highlands bighorn sheep have not occurred to date and are not anticipated. In the event that game damage occurs, bighorn sheep numbers can be managed through trapping and transplanting sheep from this area as the population approaches or is at objective.

Access Strategies

The majority of bighorn sheep annual range is located on public land (USFS and BLM). Based on the current distribution of bighorns during the hunting season, lack of hunter access to these sheep is not an issue. FWP will continue to work actively with public land management agencies to maintain sufficient access to the

Highlands bighorn sheep herd. If bighorn sheep shift their range to private land during the hunting season, FWP will work with landowners to allow hunter access.

Population Objectives

As a result of the mid-1990s die-off and chronic lamb pneumonia that has persisted in the herd and is causing extremely low annual recruitment, the reasonable management objective for the Highlands herd is that of a minimum viable population of 125 sheep, sufficient enough to be self-sustaining (Geist 1971).

Reopening the Hunting District

Hunting of bighorn sheep in the Highlands population (Hunting District 340) will be recommended when at least three of the following four criteria have been met for a minimum of three successive years:

1) The population is at least 75 observable sheep.

2) There are at least 30 rams: 100 ewes.

3) More than 30% of the rams are at least ¾-curl.

4) There are at least 30 lambs: 100 ewes.

Monitoring of these sheep will continue at a level sufficient to determine if these criteria are being met. If so, license levels will be based on the number of ¾-curl rams observed during surveys.

Population Management Strategies

Strategies to manage bighorn sheep populations are being based, in part, on how bighorn populations respond demographically within five ecological regions across Montana. Bighorn populations and therefore objectives for the various populations and subsequent monitoring programs vary across Montana and depend largely on the environment or ecological region where they occur. Hunting District 340 is located in the Mountain Foothills ecological region (see discussion of ecological regions in Chapter 1), which includes much of southwest Montana. This bighorn population suffered an all-age die-off event in the mid-1990s; as a result, several transplants into this area have occurred in an effort to rebuild and stabilize this herd. Hunting has been closed since 2007. Hunting may occur again if the conditions listed above are met. If the population exceeds population objective, appropriate Adaptive Harvest Prescriptions will be developed to adequately manage these sheep.

Prescriptive Harvest Management

Ewes: Not applicable at this time.

Rams: Not applicable at this time.

ELKHORN
(Hunting District 380)

Description: The Elkhorn Mountains area (Hunting District 380) contains approximately 1,241mi^2 with 59% privately owned and 41% managed by various public land management agencies. The Elkhorn Mountains are a relatively small and isolated mountain range of about 391mi^2 located about 16 miles southeast of Helena. Approximately 116mi^2 of the district (10%) is currently occupied by bighorn sheep during some portion of the year. Twenty percent of the area occupied by bighorn sheep is private land and 80% is public land. There are approximately 40mi^2 of bighorn sheep winter/year-round range in this unit; 30% is private land and 70% public. Based on past telemetry data and recent observations, approximately 70% of the total bighorn sheep population spend winter on public lands. About 250mi^2 of this productive mosaic of mountain grasslands, forests, and alpine vistas are managed by the U.S. Forest Service (USFS) – Helena and Beaverhead-Deerlodge National Forests. The portion of the range in Forest Service management, by virtue of special Forest Plan direction, is managed as the only Wildlife Management Unit in the National Forest System. According to the 1986 Forest Plan for the Helena National Forest, management goals for big game winter range on forest lands include "Optimize big game winter range" and "Provide for other resources as long as their uses are compatible with maintaining elk winter range".

Additionally, 145mi^2 of foothills, predominated by grassland/shrubland vegetation, are managed by the Bureau of

Land Management (BLM). These adjacent BLM lands are managed under the Headwaters Resource Management Plan (RMP), which provides for multiple use management. Some of the major uses on BLM lands include a utility corridor occupied by the Colstrip 500-KV line, a National Guard training range, and the Graymont lime mine near Townsend. In 2006 and 2007, the BLM acquired two major properties in this unit, the McMaster's and Iron Mask properties. The Iron Mask property is occupied by bighorn sheep and is winter year-round range for approximately 50 bighorns.

Public Access: The Elkhorn Mountains district provides a good diversity of hunting experiences, including motorized hunting on the periphery and walk-in hunting in the interior. There is ample road access to the majority of the unit. Access to public land is relatively good, and in addition, there were a total of 18 Block Management areas involving 25 different landowners in the Elkhorn Mountains in 2008. Travel Plan revisions on USFS and BLM lands were implemented in 1995 with the primary objectives being the protection of the soil, water, and vegetation and enhancement of elk security where it was low. Existing, and some new, winter range closures and game retrieval areas were incorporated into this revision. In the Limestone Hills, which are located on the eastern side of the unit near Townsend, the Montana National Guard has an artillery range. This range is currently on BLM lands, which the National Guard is in the process of trying to withdraw for their use. Approximately 7,000 acres of this area is closed to the public for safety reasons. Approximately 20 bighorn sheep have used this closed area, primarily during the winter period.

Bighorn Sheep Populations: The number of bighorn sheep counted in Hunting District 380 had been steadily increasing since the initial transplant of 25 sheep in 1996 (Figure 1 and Table 1). On January 10, 2008, the Townsend FWP office received a report of a dead bighorn sheep in the Elkhorn Mountains. Field observations confirmed bighorn sheep were dying and a helicopter survey was flown on January 16, 2008, to determine the extent of the die-off. Based on the results of the 2007 bighorn survey and the recruitment of an average lamb crop, there should have been approximately 220 to 230 bighorn sheep on winter ranges. We flew the entire winter range and observed a total of 35 sheep (Table 2). Some sheep could be seen coughing from the helicopter.

FWP normally conducts bighorn surveys in late winter or early spring prior to them moving off of winter range. This survey was flown in conjunction with a mule deer trend survey, which covers a similar area, on April 2, 2008. It appeared from on the ground observations that the die-off was slowing down or perhaps we were running out of sheep left to die. We saw a total of 19 bighorn sheep on this survey (Table 3). The coverage on this survey was good as we refueled in order to fly the extra time and area to get full coverage. The loss of sheep due to this die-off represents approximately 90% of the population and essentially all of the lambs and older rams. On this survey we documented approximately 75 domestic goats running loose on BLM and private lands in Keating Gulch.

The Elkhorn bighorn sheep are from transplants, which began in the winter of 1995-96 (N=25 from upper Rock Creek), supplemented in 1996-97 (N=30 from Milltown) and in 2000 (N=20 from Missouri

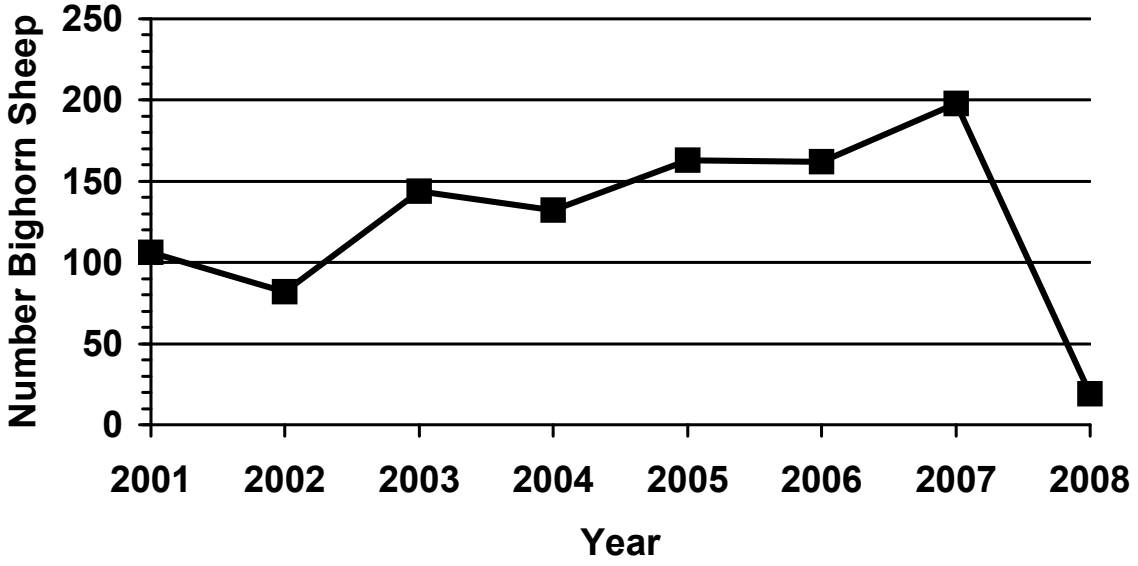


Figure 1. Total number of bighorn sheep observed during aerial trend surveys in the Elkhorn population, Hunting District 380, 2001-2007.

Table 1. Bighorn sheep population parameters for the Elkhorn population, Hunting District 380, 2001-2007.

Year	Total	Lambs	Rams	¾+ Rams
2001	106	19	25	
2002	82	31	6	
2003	144	32	35	13
2004	132	29	25	7
2005	163	28	48	15
2006	162	24	54	19
2007	198	27	75	18
2008	19	0	4	0

Table 2. Summary of bighorn sheep observations for Elkhorn population, Hunting District 380, January 16, 2008.

Location	Total	Ewes	Lambs	Rams			
				0-1/4	1/4-1/2	1/2-3/4	3/4+
Shep's Ridge	2	2					
"	2	2					
Cold Springs	1			1			
Crow Creek	1				1		
Sagebrush Gul	3	3					
Crow Creek	2						2
Power Gul	1					1	
Big Mountain	3	3					
"	3	2	1				
Keating Gul	1				1		
"	6	5		1			
Limestone Hills	1	1					
"	3	1	1	1			
"	5	3	1	1			
"	1	1					
Total	35	23	3	4	2	1	2

Table 3. Summary of bighorn sheep observations, Hunting District 380, April 2, 2008.

Location	Total	Ewes	Lambs	Rams			
				0-1/4	1/4-1/2	1/2-3/4	3/4+
Shep's Ridge	5	4		1			
"	2	2					
"	1					1	
Cold Springs	5	5					
Big Mountain	1				1		
South Fk Crow	1					1	
"	2	2					
Rattlesnake Gul	2	2					
Total	19	15		1	1	2	

River Breaks). A total of 75 sheep have been released at two different release sites. Radio collars and individually marked neckbands were placed on a total of 35 and 23 sheep, respectively. Intensive telemetry work has provided seasonal range distribution information for this growing sheep herd.

Sheep have established traditional seasonal ranges, primarily in the Crow and Indian Creek drainages. Approximately one-quarter of the sheep are migratory just prior to lambing and use the heads of the Beaver Creek and McClellan Creek drainages. The distribution information collected from the telemetry work

proved valuable during this survey, as all sheep observed were within traditional wintering areas.

The total count of 198 sheep in 2007 was the highest total count since surveys were initiated. Lamb production was relatively good with a total of 27 lambs observed for a 28.4 lambs: 100 ewes ratio. A total of 75 rams were observed with approximately 76% of these being younger rams or having less than a ¾-curl. Approximately 18 rams were legal rams with a few of these probably scoring greater than 180 (by Boone and Crockett scoring methods). Rams made up 37.9% of the sheep population.

For the 2006 hunting season, the fifth year of hunting these sheep, there were three either-sex licenses issued. The population objective for sheep in the Elkhorn Mountains (Hunting District 380) is for a total of 250 sheep. The production and recruitment of lambs has started picking up the past couple of years, and at the current rate this population objective could be reached in a few years. For the first time, there were three ewe licenses issued for the 2006 season with the objective of implementing a season structure to help manage sheep numbers as the population nears objective. For the 2007 season, there were four either-sex licenses and eight adult ewe licenses issued.

Recreation Provided: Hunting of bighorn sheep in the Elkhorn Mountains was initiated in the fall of 2002 with the issuance of two either-sex licenses. As the population increased, the number of licenses was increased to three either-sex licenses in 2005. As bighorn sheep numbers continued to increase toward the population objective of 250 total sheep, a series of ewe licenses was initiated in 2006 with three licenses being issued. In 2007, the number of either-sex licenses was increased to four and there were eight licenses issued for ewes.

The proximity of the Elkhorn Mountains to population centers, combined with good access by virtue of public ownership of much of the mountain range, has made the area popular for hunting of big game in general and wildlife viewing during all seasons of the year. Most of the bighorn sheep in the Elkhorns are nonmigratory and use habitats near their release site in the southeast portion of the range. A majority of these areas are located on public lands with good access. Popular areas for viewing bighorn sheep include lower portions of the Crow Creek and Indian Creek drainages. The migratory population of these sheep can be observed in the heads of Beaver and McClellan creeks and Casey Peak, and have been observed on Elkhorn and Crow Peaks.

Current Annual Bighorn Sheep Harvest: The bighorn sheep population, in Hunting District 380 is a newly established population and a hunting season was first initiated in 2002 (Table 4). As the population continued to grow, the number and types of licenses issued increased. The population objective for bighorn sheep in this unit is a total of 250 sheep. As the population started approaching this objective, ewe licenses were issued beginning in 2006 in an effort to start managing the total number of sheep. Due to the 2007-08 die-off, the hunting season was closed for the 2008 season.

Accomplishments: This population of bighorn sheep had increased relatively rapidly since the first transplant in 1996. The fall of 2007 was the sixth year that sheep were hunted in this district. At the time of the die-off, FWP was in the second year of beginning to manage the population through the use of ewe licenses, to be within the objective of a total of 250 sheep.

The BLM in 2007 finalized a major land acquisition. The 5,548-acre Iron Mask property on the east slope of the Elkhorn Mountains provides year-round habitat for up to 50 bighorn sheep and winter habitat for approximately 300 elk. This property will likely be managed as a "grass bank," where livestock from other allotments can be moved temporarily to facilitate management actions on those allotments.

In 1992, a Memorandum of Understanding (MOU) (since updated) was developed between the three primary managing agencies in the Elkhorns, the USFS, BLM, and FWP. Shortly thereafter, the agencies completed the Elkhorns

Year	Number Either-Sex Licenses	Ram Harvest	Number Ewe Licenses	Ewe Harvest
2002	2	2	-	-
2003	2	2	-	-
2004	2	2	-	-
2005	3	3	-	-
2006	3	3	3	3
2007	4	4	8	8

Table 4. Number and types of licenses issued and subsequent harvest in the Elkhorns, Hunting District 380, 2002-2007.

Landscape Analysis. This analysis established the historical and existing conditions of the soil, water, vegetation, and wildlife resources in the Elkhorn Mountains. The desired conditions for all the resources were then integrated and compared with existing conditions to establish general, mountain range–wide management direction. Projects completed include a comprehensive Elkhorn Travel Plan, reintroduction of bighorn sheep, the revision of allotment management plans, vegetation treatments that reflect the landscape analysis in much of the mountain range, rehabilitation of historic mine sites, a mountain range–wide "fire plan," bighorn sheep habitat enhancements, westslope cutthroat trout restoration, a comprehensive recreation and travel map, and signing and interpretive projects.

In 1998, FWP acquired a conservation easement on the 1,600-acre Hahn Ranch in Kimber Gulch along the east slope of the Elkhorns. This important property is adjacent to USFS and BLM-managed lands and is important seasonal range for a variety of animals including bighorn sheep.

Management of the Elkhorns historically has been and continues to be controversial. Primary issues are the relationship between wildlife and management activities such as vegetation treatments, travel management, mining, grazing, timber harvest, and recreational uses. The number of elk and their management also is an ongoing controversial issue. In early 2002, to address some of these issues, the agencies, along with other sponsoring partners, formed a working group comprised of individuals from a variety of interests. This diverse group attended several facilitated meetings that primarily addressed conflicts with elk and livestock management. The product of these meetings was a list of recommendations from the working group to the sponsoring agencies on how to address this issue, including information needs, habitat management strategies, and educational efforts. Beginning in 2004, the working group facilitated a contracted vegetation study focusing on the relationship between livestock grazing and elk use of the mountain range. Results from this study and recommendations based on the results were presented to the three managing agencies in the summer of 2007. The working group has been very supportive of protecting wildlife habitat and played a key role in the BLM acquiring the Iron Mask property.

Management Challenges: The primary challenge to reestablishing this bighorn population to former levels will be resolving the potential for contact between domestic sheep and goats and bighorn sheep. When bighorn sheep were first transplanted into the Elkhorns during the winter of 1995-96, BLM guidelines formulated in 1992 were used, which identified a buffer of six miles between habitat that bighorn sheep would potentially use and domestic sheep distribution. These guidelines were the only ones available at that time, and the buffer distance was thought to be adequate. For several years the distance was adequate, but as the bighorn sheep population grew, their distribution increased and contact with domestic animals occurred.

Loss of wildlife habitat continues to occur in this unit. Primarily through human development on winter range areas. Mining, specifically mining occurring in the Limestone Hills on BLM lands is resulting in substantial loss of year-round and winter habitat for bighorn sheep as well as mule deer. While the mine has implemented reclamation efforts, these have been inadequate to offset the loss of wildlife habitat from their operation.

Also in the Limestone Hills adjacent to the mining operation, is a National Guard training area. While this area is currently on public land (BLM) the Guard is pursuing withdrawal of the property to ultimately gain ownership and management responsibility. While the Guard has shown sensitivity to wildlife and wildlife issues on their training area, the cumulative impacts to wildlife of having an active mine and a military training area will likely have a long-term negative effect on wildlife that use this area.

Management of bighorn sheep habitat on public lands has been an issue at times in this district. Lack of coordination on specific projects has resulted in management actions that have questionable value to bighorn sheep based on the scientific literature and documented seasonal distribution and habitat use of bighorns. Some projects were probably detrimental to other big game and wildlife species in general. Closer coordination on projects needs to occur between managing agencies, and specific objectives for managing wildlife habitats on public lands need to be developed.

Bighorn sheep use of private land is at times an issue. While the major landowners in this unit who have bighorns on their property periodically signed off on this transplant, it is imperative that we continue to work with them and make every effort to ensure we keep this population of sheep within the stated objective that was promised to the landowners and public when the analysis was done for these introduced bighorns.

Population Monitoring: To monitor the bighorn population, aerial surveys are conducted annually, generally using a helicopter,

in late winter to early spring. About one-third of these sheep are migratory and start moving off of winter range areas around the middle of April. To get a total count for population trends, the survey has to be conducted prior to then. The entire area occupied by bighorns during winter is flown, including public and private lands. Bighorns are counted and classified by age and sex and rams are classified by horn class.

Summary of Public Comment

Public comments related to this bighorn sheep population and its management in this hunting district have indicated a high level of support for having bighorn sheep here. Both hunters and non-hunters enjoy seeing bighorn sheep in this area.

Management Goal

The primary goal is to ultimately reestablish this population to its former abundance. This will require making sure there is effective separation between bighorn sheep and domestic sheep and goats in this area.

Habitat Objectives

1) Develop cooperative programs that encourage public and private land managers to maintain approximately 80,000 acres of occupied bighorn sheep habitat (based on telemetry data) for the benefit of bighorns, other wildlife species, and other agency mandated uses.

2) Encourage maintenance and improvement of habitat conditions on publicly owned winter ranges (primarily USFS) so that vegetation conditions on these winter ranges provide adequate forage for bighorns and other wildlife during the winter.

3) Encourage maintenance and improvement of habitat conditions on public lands (USFS and BLM) so that bighorns continue to utilize these lands during summer and fall rather than moving onto private lands.

Habitat Management Strategies

1) FWP has worked in cooperation with the USFS and BLM in developing a Landscape Analysis for all public land in this mountain range. This analysis determined the existing condition of soil, water, and vegetation and developed specific projects to improve, maintain, or enhance these resources. Additionally, the agencies, along with the Rocky Mountain Elk Foundation as a partner, are pursuing land exchanges, acquisitions, and conservation easements to acquire or protect important wildlife habitat. Allotment management plans have been revised where needed to enhance vegetation on these sites for wintering wildlife. Some vegetation manipulation through prescribed burning has also been implemented to make these winter ranges more attractive to wintering wildlife.

2) A major effort by the agencies has been underway the past couple of years to control noxious weeds. This will continue and has recently expanded to include adjacent private lands. Much of this effort has been directed at areas of bighorn winter range.

3) A number of recommendations related to habitat made by the Elkhorn Working Group are being evaluated by the agencies and may be implemented in the near future. Some of these involve vegetation monitoring, which would help direct future management direction and decisions.

Game Damage Strategies

Specific game damage problems have not occurred to date and are not anticipated. Bighorn sheep do have the potential for causing conflict with the mining operation in the Limestone Hills. When sheep were being introduced in this mountain range, one of the release sites was a few miles from the mining operation. An MOA was written in conjunction with the mine, stating that if sheep became a conflict with the mining operation, FWP would haze or herd the sheep off of the area. Additionally, bighorn numbers can be managed through trapping and moving sheep from this area as they approach or are at objective.

Access Strategies

FWP has actively pursued new Block Management Areas (BMAs) on private land. In 2007, there were 18 BMAs totaling over 100,000 acres in Hunting District 380. Based on the current distribution of bighorns during the hunting season, lack of hunter access to these sheep has not been an issue. Where sheep use private land during the hunting season, the landowners either allow hunter access on their own or are enrolled in FWP's Block Management Program.

Population Objectives

The population objective for these sheep prior to the die-off was for a total of 250 bighorns, which was being approached at that time. As a result of the die-off and anticipated poor lamb production and recruitment, the objective is being revised. A reasonable objective is that of a minimum viable population of 125 sheep, sufficient enough to be self-sustaining (Geist 1971).

Reopening the Hunting District

Hunting of bighorn sheep in the Elkhorn Mountains (Hunting District 380) will be recommended when at least three of the following four criteria have been met for a minimum of three successive years:

1) The population is at least 75 observable sheep.

2) There are at least 30 rams: 100 ewes.

3) More than 30% of the rams are at least ¾-curl.

4) There are at least 30 lambs: 100 ewes.

Monitoring of these sheep will continue at a level sufficient to determine if these criteria are being met. If so, license levels will be based on the number of ¾-curl rams observed during surveys.

Population Management Strategies

Strategies to manage bighorn sheep populations are being based, in part, on how bighorn populations respond demographically within five ecological regions across Montana. Bighorn populations and therefore objectives for the various populations and subsequent monitoring programs vary across Montana and depend largely on the environment or ecological region where they occur. Hunting District 380 is located in the Mountain Foothills ecological region (see discussion of ecological regions in Chapter 1), which includes much of southwest Montana. This bighorn population is a relatively recently established population that went through a major die-off (90+%), and hunting was closed. Hunting may occur again if the conditions listed above are met. If the population exceeds population objective, appropriate Adaptive Harvest Prescriptions will be developed to adequately manage these sheep.

Currently, the most important strategy for this population is to work with domestic sheep producers and other interested parties in this district to ensure that there is effective separation between domestic animals and bighorn sheep to prevent potential disease transmission, which will help this population recover.

Prescriptive Harvest Management

Ewes: Not applicable at this time.

Rams: Not applicable at this time

SLEEPING GIANT

(Hunting District 381)

Description: Hunting District 381 (Sleeping Giant) begins about eight miles north of Helena and is 533mi² in area. The Sleeping Giant is at the southeastern end of the Lewis and Clark Range of the Rocky Mountains and is adjacent to the Big Belt Mountains. The majority of the district is privately owned (77%) and the remaining land is managed by various public land management agencies. There are three large ranches with FWP conservation easements, six properties enrolled in Block Management within Hunting District 381. The district encompasses approximately 41mi² of Bureau of Land Management (BLM) land. Nearly 19mi² of these BLM lands are designated as an Area of Critical Environmental Concern with management objectives to preserve resource values, provide primitive recreational opportunities, and promote wildlife and habitat values.

Based on telemetry data collected from 1992 to 2003, bighorn sheep occupy a minimum of 75mi² of the Sleeping Giant area(14%) year-round, and during winter, sheep occupy about 40mi². Sixty-seven percent of the total area occupied by bighorn sheep is private land and 33% is public land. Ownership of bighorn sheep winter range within Sleeping Giant is 56% private land and 44% public. These core use areas include BLM lands but do not include private lands with FWP conservation easements or Block Mangement Areas within the district at large.

Seasonal use areas overlap and are not distinct. Sheep do not appear to migrate to specific seasonal use areas except during late summer when sheep do spend some time at higher elevations. Movements of marked animals indicate that sheep readily cross the Missouri River at two areas, one known as

Ming Bar and the other as Oxbow Bend. Sheep move bidirectionally between Hunting District 381 on the west side of the river and Hunting District 455 on the east side (Beartooth Wildlife Management Area, Beartooth bighorn herd; FWP Region 4). Some sheep permanently dispersed to the Birdtail Hills west of Cascade in Region 4. As recently as 2008, bighorns were observed on the Roberts Mountain ridge, which is between the Sleeping Giant and the Continental Divide. According to long time ranchers in that area, Roberts Mountain was historically occupied by bighorns. It is likely that sheep move between the Sleeping Giant herd and the Continental Divide, but movements are probably infrequent as the connecting habitat between these areas does not appear to be suitable for bighorn sheep.

The area occupied by sheep is a mosaic of forests and grasslands. Forests are predominantly Douglas fir, but ponderosa, limber, and lodgepole pines are also present (Rau 1991). Past fire and logging activities provide additional diversity to conifer stands within the core use area. Native bunch grasses are the dominant herbaceous cover throughout the area. Grasslands are characterized by bluebunch wheatgrass, rough and Idaho fescue, and needle and thread grass, and common shrubs include mountain maple, skunkbush sumac, chokecherry, and mountain big sagebrush (Rau 1991). Natural mineral licks are present. Cliff and rock outcrop terrain are common and encompass several thousand acres in five major drainages. Most suitable habitat is between 5,000 to 6,000 feet in elevation.

Public Access: A substantial amount of both public and private lands within Hunting District 381 is accessible to the public. There are 60mi^2 of Montana State Trust lands. There are several large ranches with FWP conservation easements and six properties enrolled in Block Management within this district. Together, these provide about 140 square miles of hunting opportunity on private land within the district. However, the core use areas for sheep do not overlap with these easements or Block Management areas. Core use areas do overlap with approximately 41 square miles of BLM lands and border about 30 miles of the Missouri River. Further, other private landowners have also allowed access for bighorn sheep hunting.

Road access is extensive throughout the district. Interstate 15 bisects the southern portion of the district, and U.S. Highway 287 is the eastern boundary of the district to the north. The Recreation Road along Prickly Pear Creek parallels Interstate 15. MT Highways 279 and 200 form the majority of the western boundary. The Woodsiding Gulch Road provides access to the Sheep Creek-Spring Gulch ridge. The best access to core use areas on BLM lands is from the Missouri River. Walk-in access to core use areas on BLM lands includes the river, Interstate 15, and the Woodsiding Gulch road and Recreation Road.

Bighorn Sheep Population: Bighorn sheep may have been endemic to the Sleeping Giant area, and evidence in support of this includes photographs of a bighorn ram killed on the nearby Carey Hilger Ranch in the 1930s (G. Joslin, personal communication). However, the herd was decimated in the late 1800s as Helena's human population expanded. In 1968, 32 sheep from the Sun River herd were reintroduced. Additionally, sheep emigrated to and immigrated from the Beartooth herd on the east side of the Missouri River (Hunting District 455). Sheep numbers declined in the mid 1980s, which was coincident with an outbreak of viral pneumonia that spread throughout all bighorn herds along the Continental Divide from Alberta south to the Beartooth Wildlife Management Area. By 1988, no bighorns were observed in the Sleeping Giant area. In 1989, the BLM requested that FWP consider reintroducing sheep to the area again. In 1990, as part of the sheep-reintroduction agreement, 14 feral horses were removed. In 1992 and 1993 respectively, 35 sheep from Melrose (Hunting District 340) and 32 sheep from Wildhorse Island (Hunting District 340) were reintroduced.

Of the 67 animals released in 1992 and 1993, 45 were uniquely marked (including 28 neckbands, eight radio collars, and seven colored ear tags; 59 females: eight males). Three uniquely marked ewes were never relocated. Two radio-marked ewes immediately and permanently dispersed to the Birdtail Hills west of Cascade in Region 4, and by fall 2001 approximately 23 sheep were observed in that area (B. Knudson, personal communication).

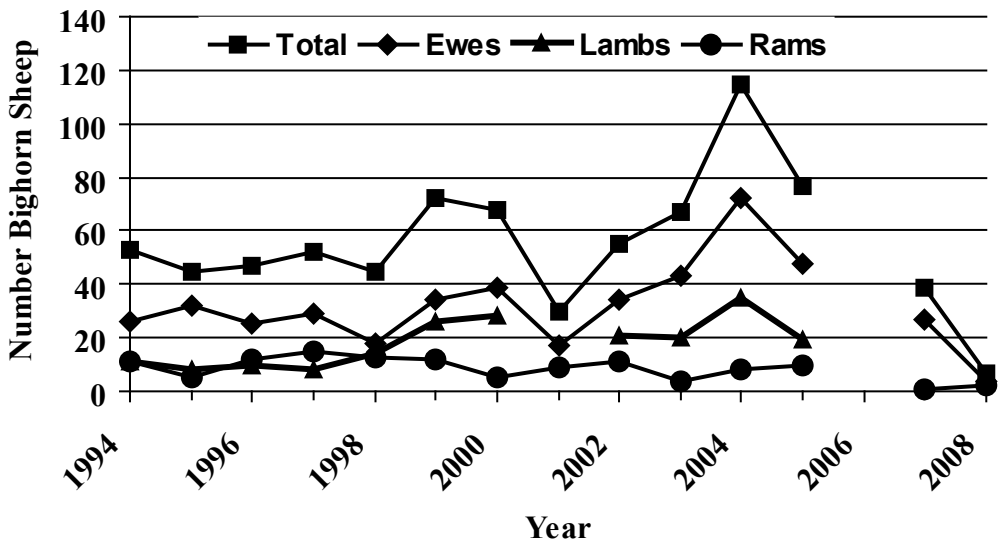
It is important to note that aerial surveys of bighorn sheep in the Sleeping Giant area were conducted at different times of year to document seasonal distribution of this reestablished herd (Table 1). Some spring surveys were conducted pre- and some post-production, and some surveys were conducted in fall and winter, which would be expected to result in more variability in the numbers observed between years due to lamb presence or absence and sheep distribution and visibility. In the interpretation of the survey results that follow, it is not assumed that observations made at different times of year were comparable for trend analysis. While it is likely that stress and disease contributed to the number of deaths and the subsequent decline

Table 1. Summary of aerial survey data for bighorn sheep including number observed and ratio of lambs and rams per 100 ewes in the Sleeping Giant population, Hunting District 381 1994–2008.

Date	Number Observed										Ratios (per 100 ewes)	
	Total	Ewe	Lamb <6 mo	Lamb >6 mo	Ram					Total unclassified	Lamb	Ram
					1/4	1/2	3/4	Full	Unclassified			
Jul-94	53	26	11	-	-	2	3	1	5	5	42	42
Jun-95	45	32	8	-	-	-	-	-	5	-	25	16
Jun-96	47	25	10	-	2	5	2	-	3	-	40	48
Jun-97	52[1]	29	8	-	1	-	12	2	-	-	28	52
Jun-98	45	18	14	-	1	2	6	4	-	-	78	72
Jun-99	72	34	26	-	4	3	4	1	-	-	76	35
Jun-00	68	39	21	-	1	-	5	2	-	-	54	21
Jul-00	70	37	28	-	1	-	2	2	-	-	76	14
Dec-01	30	17	-	4	-	3	2	-	4	-	24	53
Jan-02	55[2]	25	-	19	2	5	3	1	-	-	76	44
Sep-02	56[3]	34	21	-	-	1	-	-	-	-	62	3
Jun-03	67	43	20	-	2	1	1	-	-	-	47	9
Jun-04	115	72	35	-	4	2	2	-	-	-	49	11
Sep-05	77	48	19	-	9	1	-	-	-	1	40	21
Apr-07	39	27	-	11	1	-	-	-	-	-	41	4
Apr-08	7	4	-	-	2	-	-	-	-	1	0	50

1 Includes five ewes and two lambs north of the old Hunting District 381 boundary.
2 Includes four ewes, three lambs, and two rams north of the old Hunting District 381 boundary.
3 Includes six sheep north of the old Hunting District 381 boundary.

Figure 1. Number of ewes, lambs, rams, and total bighorn sheep observed during aerial trend surveys in the Sleeping Giant area, Hunting District 381 1994–2008.



in the number of sheep observed in some years, variability in survey date likely contributed to the fluctuations observed as well. Further, when comparing lamb: ewe ratios between years, whether the survey was conducted pre- or post-production and how many months past production the survey was conducted must also be considered. Some lamb: ewe ratios presented in Table 1 approximate yearling: ewe ratios. Finally, emigration and immigration are known to occur, but the degree to which they affect this herd's population dynamics, and subsequent growth, is uncertain.

Within the Sleeping Giant area, the number of sheep observed was relatively stable with low to moderate lamb production from 1994 until 1998 (Figure 1). In 1998, the number of lambs observed in June and September and the lamb: ewe ratio increased, indicating that production had increased (Table 1). Production remained high through 2002. The increase in total number of sheep observed in this case is not indicative of an increase in the recruitment rate, because lamb production was already higher than previous years and would contribute to growth of the herd. Given the high lamb: ewe ratio (more than 50:100 ewes), an increasing trend in the number of ewes and rams would be expected but was not observed from 2000 to 2002 (Figure 1). In December 2001, anglers reported dead sheep. The number of sheep observed during that winter was lower than other years, which could have been a result of survey date or may have represented a decline in the herd. The die-off was likely minor in 2001, because the number of ewes observed between 2000 and 2002 was similar.

In 2003 and 2004 however, lamb: ewe ratios dropped below 50:100. During the same time period, the number of ewes observed increased and more ¼-curl rams were observed, suggesting good recruitment of yearlings in 2004 and 2005.

The number of sheep observed peaked in this area at 115 in 2004. In 2005, the number of ewes observed and the lamb: ewe ratio declined, but the number of ¼-curl rams (yearling rams) increased.

In 2006, 30 bighorn sheep and 102 domestic sheep were sampled to assess disease prevalence (Joslin 2007). Bighorns were captured by helicopter net gunning. After the sampling work, additional domestic sheep and goats were introduced to this area, and contact between domestic and wild sheep did occur on the north end of the district. In the 18 months following the sampling work, 11 bighorns were reported dead, and one of these tested positive for the bacterial pneumonia *Pasteurella multocida*. Another die-off may have been the cause of further decline in the number of sheep observed between 2005 and 2007, but lamb: ewe ratios were the same during that time. No survey was conducted in 2006.

In 2007, more than 65 square miles burned on the east side of the Missouri River, adjacent to the Sleeping Giant herd's core use area. In 2008, only seven bighorn sheep were observed during a spring pre-production survey. (Sheep may have been in heavier cover, and therefore less observable, due to the strong wind that came up during the survey.)

This herd is not stable, and since 2005 it has been declining. There have been biologically significant fluctuations in lamb production, with some years of low to moderate production and some years of high production. Why years of high production have not resulted in an increase in herd size could be related to a number of factors, including emigration, low recruitment, or adult survival. Known causes of adult mortality include road kill, removal, disease, and predation.

At the FWP Commission's recommendation, the first hunting season for bighorn sheep in Hunting District 381 was established in 2002, and this was a reactionary response to the die-off in 2001. One license for an either-sex bighorn sheep is issued annually and is valid from September 15 through November 30. The regulations remained the same through the 2008 hunting season, except that the boundary of Hunting District 381 was expanded in 2007 to accommodate the expansion of the range of the herd to the Rock Creek drainage to the west and the Dearborn River to the north. Hunting may be closed altogether in this district depending on the number of bighorn sheep observed during the pre-production survey in 2009.

Recreation Provided: Year-round recreational use of the Sleeping Giant includes hunting, fishing, photography, and wildlife viewing. There are many big game hunting opportunities in this area due to the availability of public lands and the substantial size of the Block Management areas. Fishing opportunities are good along the Missouri River. Wildlife viewing is featured by a popular boat tour along the Missouri River. Bighorn sheep may be observed from the river and along Interstate 15 near the town of Wolf Creek. Hunting of bighorn sheep in the Sleeping Giant area began in fall 2002. One either-sex license has been issued annually. However, hunting may be closed altogether in this district beginning with the 2009 (see above).

Current Annual Bighorn Sheep Harvest: The first hunting season for bighorn sheep in Hunting District 381 was established in 2002.

The regulations have remained the same to date, except that the boundary of Hunting District 381 was expanded in 2007. Annually, one license for an either-sex bighorn sheep has been issued and has been valid from 15 September through 30 November. Since the harvest season was initiated, one ram has been harvested in each year (2002 to 2008) except for 2007. Ages of harvested rams ranged from 4.5 to 8.5 years old. Successful harvest has taken 7 to 30 days.

Accomplishments: Six properties are enrolled in the Block Management Program in Hunting District 381, and FWP has conservation easements with the Sieben and O'Connell ranches. Combined, these properties total 140mi^2. The easements are designed to maintain and improve wildlife habitat, provide public hunting opportunity, and protect wildlife habitat from development, in perpetuity. Further, these easements provide continuity for wildlife movement across the landscape by connecting the Continental Divide and the Big Belt Mountains through the Sleeping Giant area.

To better understand disease dynamics between wild and domestic sheep, a respiratory study was conducted in 2006 across several areas of Montana with bighorn sheep herds, including the Sleeping Giant. From two ranches in the Sleeping Giant area, baseline blood, throat swab, and fecal samples were collected and screened from 30 wild sheep and 96 domestic sheep. To date, the report for this study is not completed.

Management Challenges: There are a number of challenges to bighorn sheep management in this district. There is a need to understand what factors may be limiting herd growth. The herd has yet to exceed 115 observable sheep during aerial surveys, despite high lamb: ewe ratios, and the number of sheep observed in this population during pre-production surveys was 39 in 2007 and 7 in 2008. Incidentally, 20 bighorns were observed during a survey of elk in the area in February 2009. Factors potentially limiting herd growth include low lamb survival, low recruitment rates, road kill, emigration, and disease transmission between wild sheep and domestic sheep and goats, resulting in lower survival rates.

Interaction between wild sheep and domestic sheep and goats occurs in this area, and is a management concern given the potential for disease transmission. There are at least two substantial domestic sheep ranching operations, one substantial domestic sheep and goat operation, and one smaller domestic sheep operation within the district. Feral goats have also been observed. There are no sheep grazing allotments in this district, but there is a cattle grazing allotment on BLM lands within the Sleeping Giant area. Pneumonia has been documented as the cause of death in some wild sheep in this area. Occasionally, wild and domestic sheep have interacted on the north end of the district, and as a management response, bighorns were killed.

To date, bighorn use of private lands has not been an issue, but maintaining tolerance for bighorns is also a management priority. When bighorns were reintroduced to the Sleeping Giant area in 1992-93, all but one of the landowners in the area consented to the reintroduction, and since that time, the one landowner that did not consent has sold the property. Landowners and sheep growers in the area are cooperative and supportive of the establishment of this bighorn herd. One sheep grower stated that they were willing to adjust domestic sheep operations for the benefit of the bighorns if necessary. To maintain tolerance for bighorn sheep in this area, it is imperative that FWP continue to work with landowners and manage this herd within stated objectives.

Occasionally, bighorn in this district are killed on Interstate 15 in the north end of the district (average two per year), by drowning in the Missouri River, or by poachers.

Classified noxious weeds and other exotic plants are spreading throughout the district, and, if invasion becomes widespread, forage for bighorns might become limited. There is currently no noxious weed control on the BLM lands in the Sleeping Giant area, and noxious weed control on public lands is recommended. Several private landowners do have strategies in place for managing noxious weeds.

Historically, habitat monitoring in the area occupied by bighorn sheep has not been conducted, but is recommended. If any habitat management is proposed by the BLM or the U.S. Forest Service (USFS), interagency coordination is recommended to develop reasonable and appropriate habitat management objectives for bighorns and other wildlife.

Although housing development is predominantly outside areas that sheep are known to use, loss of wildlife habitat continues in this district. Further, motorized use of public lands via USFS and BLM system roads and illegal off-road use are also a concern.

Population Monitoring: To monitor the Sleeping Giant bighorn population, surveys are conducted annually from a helicopter. Initially, some surveys were conducted at different times of year to document seasonal distribution. Bighorns are counted and classified by age and sex, rams are classified by horn class, and

locations are recorded. Previously, surveys were conducted in all seasons, including in the spring both before and after lambing. In the future, efforts will be made to conduct surveys in late winter or early spring prior to lambing to reduce variability in observations due to lambing and potential changes in distribution and observability throughout the year. The entire area known to be occupied by bighorns during winter will be surveyed, including public and private lands.

In addition to trend surveys, investigation of the population demographics of this herd is recommended to help explain what may be limiting herd growth.

Summary of Public Comment

Generally, public sentiment regarding bighorn sheep establishment in the Sleeping Giant area is positive. Landowners and sportspersons are both supportive.

Management Goal

The management goals for this herd are: 1) to manage for a healthy, productive, stable, and sustainable bighorn sheep herd with a diverse age structure of rams, 2) to better understand the population dynamics of this herd, 3) to cooperate with public land management agencies and private individuals in the management of bighorn habitats, and 4) to maintain good opportunity for hunter harvest.

Habitat Objectives

1) Develop and maintain cooperative programs that encourage public and private land managers to maintain a minimum of 75 square miles of occupied bighorn sheep habitat (based on location data) for the benefit of bighorns, other wildlife species, and other agency-mandated uses.

2) Encourage maintenance and improvement of habitat conditions on publicly owned winter ranges (primarily BLM) so that vegetation conditions on these winter ranges provide adequate forage for bighorns and other wildlife during the winter.

3) Encourage maintenance and improvement of habitat conditions on public lands (BLM and USFS) adjacent to the area currently occupied by sheep so that the use area might expand and more bighorn sheep might be sustained within the district.

Habitat Management Strategies

1) There is currently no noxious weed control on the BLM lands in the Sleeping Giant area, and noxious weed monitoring and control on public lands is recommended. Several private landowners do have strategies in place for managing noxious weeds.

2) Habitat monitoring is needed and recommended.

3) Specific habitat treatments have not been implemented, but it is recommended that options for improving or expanding bighorn habitat be considered with land management agencies such as the BLM and the USFS.

Game Damage Strategies

Specific game damage problems have not occurred to date and are not anticipated. Bighorns are occasionally killed on Interstate 15 (current average is two per year), and it may be necessary to address this if the incidence increases. If bighorn sheep exceed population objectives in this district, they could be trapped and relocated to other areas.

Access Strategies

Public access is good in this district because of the cooperation of landowners and the availability of public land. Landowners have granted bighorn sheep hunters permission to hunt and to traverse their lands to access BLM lands. Opportunities for enrolling private land into FWP's Block Management Program or for obtaining conservation easements on private lands will be pursued, if these lands benefit proposed management goals and/or habitat objectives for bighorn sheep or other wildlife.

Population Objectives

The overall objective is to establish a stable herd in the Sleeping Giant area of approximately 125 bighorn sheep, a herd size that should be self-sustaining (Geist 1971). This population objective of 125 (± 10%) observed bighorn sheep was established based on the ability of private and public lands to provide forage for the majority of the wintering bighorn herd and landowner tolerance for the remaining sheep that winter on private lands.

Population Management Strategies

Strategies to manage bighorn sheep populations are being based, in part, on how bighorn

populations respond demographically within five ecological regions across Montana. Bighorn populations and therefore objectives for the various populations and subsequent monitoring programs vary across Montana and depend largely on the environment or ecological zone where they occur. Hunting District 381 is located in the Mountain Foothills ecological zone (see discussion of ecological regions in Chapter 1), which includes much of southwest Montana.

The Sleeping Giant bighorn herd is below population objective, and the observed herd size tends to fluctuate. It is assumed that harvest of one legal ram (at least ¾-curl), or one ewe, annually is not detrimental to this herd, given that 25 sheep in the field is expected to produce one trophy ram annually (Wishart 1978). However, hunting may be closed altogether in this district beginning with the 2009 season depending on the number of bighorn sheep observed during the pre-production survey in 2009. Monitoring migration and standardizing the timing of surveys may better explain the dynamics of this herd. It is recommended that the population dynamics of this herd, and factors that might be influencing these dynamics, be investigated prior to additional transplant. Given the prevalence of domestic sheep and goat producers in this area and the likelihood of mixing between these domestics and wild sheep, sustainable success is dubious. This herd may also be limited by suitable habitat. There is much USFS land near the area occupied by sheep, but these lands are primarily dense forests, which do not provide adequate habitat for bighorn sheep. Habitat improvements may be necessary to meet management objectives.

Prescriptive Harvest Management

Ewes: Not applicable at this time due to small herd size.

Rams: Not applicable at this time due to small herd size.

Reopening the Hunting District:

If hunting of bighorn sheep in the Sleeping Giant area (Hunting District 381) is closed for the 2009 season, reopening will be recommended when at least three of the following four criteria have been met for a minimum of three successive years:

1) The population is at least 75 observable sheep.

2) There are at least 30 rams: 100 ewes.

3) More than 30% of the rams are at least ¾-curl.

4) There are at least 30 lambs: 100 ewes.

Monitoring of these sheep will continue at a level sufficient to determine if these criteria are being met. If so, license levels will be based on the number of ¾-curl rams observed during surveys.

GREENHORN

Description: The Greenhorn Mountains contain approximately 169mi^2 with private land on the west bench and public land in the vast majority of the mountain range. The Greenhorns are a relatively small mountain range located about 3 miles southeast of Alder, Montana. The mountain range is currently occupied by bighorn sheep during the entire year. This productive mosaic of mountain grasslands, forests, and alpine vistas are managed primarily by the U.S. Forest Service (USFS) – Beaverhead-Deerlodge National Forest, and the Bureau of Land Management (BLM). The BLM lands are managed under the Dillon Resource Management Plan.

Public Access: The Greenhorn Mountains provide a good diversity of hunting experiences, including motorized hunting on the periphery and walk-in hunting in the interior. Access to public land is relatively good north of Idaho Creek and south of Greenhorn Creek on the west slope and in the remainder of the area. However, only foot access exists between Idaho and Greenhorn Creeks. Access here is limited by the absence of any public roads and the closure of most of the private land to public access.

Bighorn Sheep Populations: The number of bighorn sheep in the Greenhorn population has been steadily decreasing since the initial transplant of 69 sheep that occurred in February 2003 (N=30 from the Missouri Breaks) and February 2004 (N=39 from the Sun River). Radio collars were placed on 36 sheep.

Telemetry work has provided movement data and range distribution for this sheep population.

A total count of 31 sheep in April 2007 is the latest high observed count available. Lamb production and ram counts have been difficult to determine as so many sheep have been removed from the population by dispatch to avoid contact with domestic sheep or trapping and transplanting, and the few remaining have been so widely dispersed.

The population objective for bighorn sheep in the Greenhorn Mountains is 125 sheep. A large number of sheep have been removed from this population prior to enough time passing to allow for population growth. From the original 69 sheep released, there have been known mortalities of 15 radioed sheep (13 were from unknown causes and 2 were dispatched). There have also been 14 other sheep dispatched for a total of 29 mortalities out of the original 69. In addition, 18 sheep were removed in February 2006, eight of which were from the original 69 and 10 others born since the last transplant in February 2004. Of the 69 sheep originally released, 34 have died or been removed from the population, leaving a maximum of 35 of the original sheep to grow the population. At the current rate of removal, this population is not likely to establish as viable. Even in the absence of further removals, it is not known whether the remaining number of sheep will be sufficient to establish a viable population. Time will tell whether the population becomes viable and will approach the population objective.

Recreation Provided: Hunting of bighorn sheep in the Greenhorn Mountains was one of the objectives of the transplant into the area. Should the population increase sufficiently, following all the recent removals, hunting may yet be achievable for this population. Bighorn sheep may sometimes be viewed near the Ruby Reservoir dam, in the Barton Gulch area, along the Ruby Road near some buffalo jumps near Jack Creek, and at the Ruby River Canyon near Powder Gulch.

Management Challenges: Issues in bighorn sheep management in this area all relate to wild sheep and domestic sheep conflicts. One issue is the potential for transmission of disease between the two species. Another is the potential for wild rams to breed domestic ewes. To date, and to the best of our knowledge, neither of these potentials has come to fruition. There has been sufficient spatial separation between the two species, even without the removal measures listed above, which further reduced potential conflicts.

An Environmental Analysis (EA) was done prior to transplanting sheep into this area. In that EA, provisions were developed to attempt to preclude wild and domestic sheep conflicts. These were outlined in a Memorandum of Understanding (MOU) between FWP, the USFS, BLM, and local sheep producers, and included trapping and dispatch, both of which have been carried out. In addition, local sheep producers were provided with kill permits to dispatch any bighorns with potential to come into proximity to their domestic sheep. To date, the sheep producers have not used these permits.

Another part of the EA completed prior to releasing bighorns in the area was a plan for dealing with sheep that move beyond the Greenhorn Mountains or attempt to establish beyond the Greenhorn Mountains. This included provisions to trap or dispatch, as indicated above, as well as allowing hunting or preparing an amendment to the EA to determine if the population should be allowed to expand. To date, neither of these latter two provisions has been used.

The final challenge would be getting the population to a level sufficient for hunting. Given the extent of removals, the low level of the population at this time, the propensity for management actions, and the population objective, it is not likely that hunting could be expected to occur prior to the population reaching an observed level of at least 125 animals.

Population Monitoring: To monitor the Greenhorn bighorn population, aerial surveys will be conducted annually. The entire area occupied by bighorns during winter will be surveyed, including public and private lands. Bighorns will be counted and classified by age and sex, and rams will be classified by horn class.

Management Goal

Manage for an increasing healthy and productive bighorn sheep population with a diverse age structure of rams. Cooperate with public land management agencies and private individuals in the management of bighorn habitats, and develop opportunity for bighorn sheep hunters to harvest sheep.

Habitat Objectives

1) Develop cooperative programs that encourage public and private land managers to maintain occupied bighorn sheep habitat for the benefit of bighorns, other wildlife species, and other agency-mandated uses.

2) Encourage maintenance and improvement of habitat conditions on publicly owned winter ranges so that vegetation conditions on these winter ranges provide adequate forage for bighorns and other wildlife during the winter.

3) Encourage maintenance and improvement of habitat conditions on public lands so that bighorns continue to utilize these lands during summer and fall rather than moving onto private lands.

Habitat Management Strategies

Prescribed burning or other habitat manipulations are not necessary to improve bighorn sheep habitat in this area. The results from such activities are anticipated to be minimal at best, and consequently, are not proposed at this time. In this area, habitat management strategies will be developed should the bighorn population appear that it may become viable.

Game Damage Strategies

Specific game damage problems have not occurred to date and are not anticipated. However, the EA prepared for reintroducing bighorns to the Greenhorns specified actions to be taken should conflicts on private lands occur. These actions consist of, where possible, hunting and/or translocating sheep back into the Greenhorn Mountains. Hazing, herding, scare guns or dispatch may also be employed as the situation merits.

Access Strategies

Access is only anticipated to be a potential problem in the area between Barton Gulch and Greenhorn Creek. In this area, access strategies will be pursued should the bighorn population appear it may become viable and hunting may become feasible.

Population Objectives

The population objective originally proposed for this population prior to release, which was identified in the EA done for this transplant, was for a total of 200 bighorn sheep. Since the initial transplants of 2003 and 2004, removal of bighorn sheep as a result of agreements made with adjacent domestic sheep producers have precluded these bighorns from expanding numerically. While there may be adequate habitat to support more bighorn sheep a more reasonable and perhaps attainable objective would be for a total of 125 bighorns, which is what is considered a minimum viable population (Geist 1971). The objective would be:

1) Maintain the number of bighorn sheep observed during winter aerial surveys within 20% of 125 sheep (100 to 150) with 30 to 40 lambs: 100 ewes.

2) Maintain a ram: 100 ewe ratio observed during winter aerial surveys of at least 40, with at least 30% of the rams having a ¾-curl.

3) Maintain the average age of 5½ years for rams harvested (should there be hunting) on either-sex licenses.

Population Management Strategies

Strategies to manage bighorn sheep populations are being based, in part, on how bighorn populations respond demographically within five ecological regions across Montana. Bighorn populations and objectives for the various populations as well as monitoring programs vary across Montana and depend largely on the environment or ecological region where they occur. The Greenhorn Mountains are located in the Mountain Foothills ecological region (see discussion of ecological regions in Chapter 1), which includes much of southwest Montana. This bighorn population is a very recently reintroduced population.

The population objective of 125 (± 20%) observed bighorn sheep was derived by considering both the ability of public lands to provide forage for the majority of the wintering bighorn population and landowner tolerance for the remaining sheep that winter on private lands. Population management strategies will be directed at maintaining bighorn numbers consistent with landowner tolerance as well as maintaining the number of sheep wintering on public lands within carrying capacity.

Prescriptive Harvest Management

Hunting of bighorn sheep in the Greenhorn Mountains will be recommended when at least three of the following four criteria have been met for a minimum of three successive years:

1) The population is at least 75 observable sheep.

2) There are at least 30 rams: 100 ewes.

3) More than 30% of the rams are at least ¾-curl.

4) There are at least 30 lambs: 100 ewes.

Monitoring of these sheep will continue at a level sufficient to determine if these criteria

are met. If so, license levels will be based on the number of ¾-curl rams observed during surveys.

Ewes: Not applicable at this time.

Rams: Harvest would initially be conservative with the number of either-sex licenses recommended equal to approximately 10% of the rams observed during aerial surveys.

DEEP CREEK, CASTLE REEF, GIBSON LAKE NORTH, FORD CREEK (SOUTHERN ROCKY MOUNTAIN FRONT ELK CREEK – TETON RIVER COMPLEX)

(Hunting Districts 421, 422, 423, 424)

Description: The Southern Rocky Mountain Front region, sheep Hunting Districts 421, 422, 423, and 424, represents 1,105mi² with 434mi² (42%) privately owned and the rest managed by several public land management agencies. In Montana, the Rocky Mountain Front extends from Glacier National Park approximatly 155 miles in a southeasterly direction. Roughly 330mi² (30%) of these hunting districts are currently occupied by bighorn sheep during at least some portion of the year. Less than 10% of existing occupied sheep habitat is private land. Just over 450 square miles of this productive mosaic of mountain foothills and grasslands, forests and alpine vistas are managed by the U.S. Forest Service (USFS) – Lewis and Clark National Forest (NF). There are an additional 22mi² of foothills, predominated by grassland/shrubland vegetation, managed by the Bureau of Land Management (BLM). The private land portion of the area is mostly cattle and hay operations with a smaller amount of dryland grain on the eastern perimeter. The Teton and Sun Rivers along with Deep, Willow, Smith, Ford, and Elk Creeks drain eastward through the area from the mountain front and the Continental Divide.

Public Access: Hunting as well as many other forms of outdoor recreation occurs on private and public lands throughout the Southern Rocky Mountain Front Complex. Bighorn sheep hunting access is mostly by foot or horseback on USFS trails. There is further access on BLM and private lands. Very little of the Lewis and Clark NF and adjacent BLM lands are authorized for motorized use. Access to private lands for bighorn hunting varies from limited to no access, with varying amounts of public use depending upon individual landowners. Currently, there are no Block Management areas in the area where bighorns reside. The majority of the bighorns in these hunting districts are available to the public during the hunting season. Most of the bighorn sheep on the Southern Front are migratory in nature, using mountain foothills for winter range habitat and backcountry subalpine and alpine territories for summer range. Popular areas for viewing bighorn sheep are along the Gibson Reservoir, Sun Canyon, Ear Mountain, Ford Creek along the Benchmark Road, and Willow Creek heading up to locales around Fairview Plateau.

Bighorn Sheep Populations: From a historical standpoint, the Southern Rocky Mountain Front sheep have for the most part been a healthy and numerous herd. The most recent large-scale disease die-off (due to a pneumonia/lungworm complex) occurred in 1983 to 1984. Other sheep die-off events were recorded between the 1920s and 1930s. Although some small herd segments stay within and between these hunting districts, bighorns frequently move to and from neighboring use areas. Bighorns occupy a variety of habitats within this region, including mountain foothills and meadows, steep, rocky ridges, avalanche chutes, and cliff faces. Historical survey and inventory records for these sheep date back to the middle part of the 20th century. Sheep habitats in these hunting districts are typically rugged and, in some areas, difficult to access for survey and inventory purposes. Traditional foot/horseback and some aerial surveys are conducted biannually (fall [rut] and spring) to monitor bighorn populations. Supplemental observations are recorded during other species survey efforts or summer survey efforts (mostly related to lamb recruitment). Animals are counted and classified by gender and number of lambs. Horn curl is used to classify ram age structure: ¾-curl +, ¾-curl, 2/3-curl, ½-curl and ¼-curl.

Bighorn census figures from late fall/early winter surveys from as early as 1955 for each hunting district are enumerated below (Figures 1-4 and Tables 1, 3, 5, and 7). All four hunting districts are annually surveyed during late fall/early winter (December) and spring (April). Yearly late fall/early winter rut survey counts