

CALIFORNIA BIGHORN SHEEP HABITAT EVALUATION

Jarbidge and Bruneau Rivers Owyhee County, Idaho



by
Elroy Taylor
Wildlife Research Biologist
Bureau of Land Management
Boise, Idaho

Jim Klott
Wildlife Management Biologist
Bureau of Land Management
Twin Falls, Idaho

Randall B. Smith
Regional Wildlife Manager
Idaho Department of Fish and Game
Jerome, Idaho



CALIFORNIA BIGHORN SHEEP HABITAT EVALUATION

JARBIDGE AND BRUNEAU RIVERS OWYHEE COUNTY, IDAHO

by

ElRoy Taylor, Wildlife Research Biologist, Bureau of Land Management. Boise, Idaho.

Jim Klott, Wildlife Management Biologist, Bureau of Land Management, Twin Falls, Idaho.

Randall B. Smith, Regional Wildlife Manager, Idaho Department of Fish and Game, Jerome, Idaho

**TECHNICAL BULLETIN NO. 98-6
IDAHO BUREAU OF LAND MANAGEMENT
CHALLENGE COST SHARE PROJECT D010-P4-0179
April 1998**

INTRODUCTION

The objective of this study was to evaluate habitat suitability for California bighorn sheep (*Ovis canadensis californiana*) along the Bruneau and Jarbidge Rivers in Owyhee County, Idaho. We investigated the potential for augmenting the existing bighorn population or releasing bighorns into suitable unoccupied habitat. This bulletin discusses the suitability of available habitats, describes the current bighorn sheep distribution and provides recommended management practices.

This habitat evaluation is the result of a Challenge Cost Share project by BLM, Idaho State Office and Idaho Department of Fish and Game, Magic Valley Region.

STUDY AREA

The study area begins about 10 miles southeast of Bruneau and extends south upriver to the Nevada State Line. Elevations range from approximately 900 m at the mouth of Bruneau River Canyon to about 1800 m at the Nevada state line. The study area consists of steep-walled canyons and adjacent plateaus out to 300 m from the canyon rim. Canyons are typically about 200 m deep. Principal canyons are oriented in a north-south direction. Canyon slopes consist of alternating cliffs and terraces formed into a step-like profile. Cliff material is either rhyolite or basalt. There are numerous side canyons that branch from the major canyons. Cliff faces vary from straight to convoluted. The upper plateaus are bordered by a basalt rimrock averaging about 3 m in height.

Plant communities include willow (*Salix* sp.) in the canyon bottoms and extensive sagebrush (*Artemisia tridentata tridentata*, *A.t. wyomingensis*, and *A.t. vaseyana*) stands on the plateaus. The few trees present are cottonwoods (*Populus* spp.), western juniper (*Juniperus occidentalis*) and quaking aspen (*Populus tremuloides*). Grasses include bluebunch wheatgrass (*Pseudoroegneria spicata*), Sandberg bluegrass (*Poa secunda*), and wildrye (*Elymus cinereus*).

The principal land use is livestock grazing in spring and summer. Recreation uses include hunting, whitewater rafting, hiking and fishing. Hunted species are bighorn sheep, mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), sage grouse (*Centrocercus urophasianus*) and chukars (*Alectoris chukar*). Bobcat (*Lynx rufus*) trapping and predator hunting occur during winter.

METHODS

A Bell 206B Jet Ranger helicopter was used to count bighorn sheep and evaluate bighorn sheep habitats. Flights were made on June 8, 9, 10, and 11, 1993 and August 26 and 27, 1994. The helicopter doors were removed to increase visibility. Two or three observers were used

depending on flying conditions. Only two observers were used when high temperatures and canyon winds made flying difficult. Flights were conducted when the weather was clear and visibility good.

Habitat evaluation and population data were recorded during the same flight when possible but population data was the priority during first flights. Additional passes were flown as necessary to collect habitat evaluation data. Population survey flights were limited to areas where bighorn sheep were known to be present. Habitat evaluations covered the entire drainage. Observers who participated both years were Rusty Anderson, Randy Smith, Don Stucker, and ElRoy Taylor. Additional observers in 1993 were Tim Carrigan, Jim Clark, Jim Klott, Craig Kvale, Louis Nelson, and Lloyd Oldenburg.

The census and habitat evaluations were conducted along the Bruneau and Jarbidge Rivers in Owyhee County, Idaho. We searched areas near canyons from the mouth of the Bruneau River upstream along the Bruneau and Jarbidge Rivers to the Nevada state line. There is a rough division between occupied and unoccupied habitats at about the confluence of the Bruneau and Jarbidge Rivers. Unoccupied habitat was generally from the confluence of the two rivers downstream to the mouth of Bruneau Canyon. Occupied habitat extended upstream along both rivers from their confluence to the state line.

Population survey:

Survey followed sightability protocol developed by Bodie et al. (1992). This technique consists of selecting blocks of habitat and flying routes along canyon walls at about 200 foot elevation intervals within each block. Flights begin along the canyon bottom and end with a sweep out over the plateau to find any sheep that might be out of the canyon. Typically, we made three or four transects on each side of the canyon followed by a top sweep. Sightability conditions are recorded for each bighorn sheep observation. Data are recorded for: (1) terrain where animal was seen including cliff type, (2) activity, standing or moving, and (3) light conditions, sun or shade.

We classified each observed bighorn sheep by sex and age class (Giest, 1971). We classified ewes and lambs with no attempt to separate yearling ewes. We classified rams into class I (yearling), class II ($\geq 1/2$ curl), class III ($\geq 3/4$ curl), and class IV (\geq full curl). Population estimates were obtained by computer model manipulation of field data to adjust for sightability conditions. Estimates of the number of sheep in each age class were made. Population estimates are followed by the 90% confidence interval in parentheses.

Habitat Evaluations:

A bighorn sheep habitat suitability model was developed based on the "Habitat Suitability Rating System for Desert Bighorn Sheep in the Basin and Range Province" (Armentrout and Brigham, 1988). Categories were modified to fit California bighorn sheep in southern Idaho based on the

nearby Little Jacks Creek study (E. Taylor, unpublished data). Basically, their system was modified by making the categories more generic and arbitrary so they could be quickly evaluated from a helicopter. Two examples will illustrate the differences between our methods and those of Armentrout and Brigham. We rated forage on a continuous scale from 0 points for exotic annuals without shrubs up to 10 points for native range with good shrub and bunchgrass components. Their rating system considered forage areas, seral stage or condition, distance to escape cover, and visual obstruction. We rated water from 0 for no water in an evaluation block to 10 for numerous perennial sources and gave bonus points if the source was high on a canyon wall. They rated water on amount and permanence, distance from escape cover, competition, visual obstruction, and distribution. We broke topography into slope and lambing habitat based on the Little Jacks Creek data. Each habitat variable was rated on a scale from 0 for unsuitable to 10 for excellent habitats. A habitat evaluation field form was developed for use in the helicopter (Appendix).

The study area was divided into blocks of similar habitats. Landmarks were selected at the end of each block and latitude and longitude coordinates taken to ensure mapping accuracy. The same blocks were used for the population survey and habitat evaluation purposes. All habitat variables were scored in each block. Scores for each habitat category were discussed by observers until agreement was reached. Total scores for each habitat block were calculated by adding the scores of all habitat variables. Habitats were then ranked by total scores. Habitats with the highest scores were judged to be the best habitat for bighorn sheep.

The characteristics of adjacent habitat blocks were also considered during the evaluations. Blocks with complimentary scores elevated the rank of individual blocks. For example, a block with abundant lambing shelves located next to a block with good forage would be ranked ahead of a similar lambing block but without available foraging area. Low category scores within an analysis block were used to identify potential limiting factors. The potential for management to improve a habitat was used to break ties in habitat rankings.

The number of sheep that could be supported in suitable habitats was estimated to be five bighorns per square mile. This estimate is based on work in Oregon (Van Dyke et al., 1986) and is similar to the five to six sheep per square mile present on the nearby Little Jacks Creek area. The number of acres used in calculations included canyons and plateau within 300 meters of canyons. At Little Jacks Creek about 95% of all ewe observations were within 300 meters of a canyon. The capacities of adjacent habitats were considered to identify the potential for the combined habitat to support a minimum viable population of bighorn sheep.

The following is a brief description of the categories evaluated and the rating criteria used for each category.

Slopes were judged excellent if they were >50% and included cliffs and ledges suitable for security/thermal cover. Slopes became less suitable as they approached either flat or vertical. Slopes intermediate between excellent and unsuitable were scored according to

their perceived usefulness to bighorns.

Lambing habitat was judged on presence and abundance of lambing shelves. Lambing shelves were identified as isolated terraces with difficult access. Habitat ratings were low if few or marginal terraces existed and high if an abundance of suitable terraces was present.

Accessibility was based on availability of travel lanes suitable for bighorn sheep to cross slopes from top to bottom. A high rating was given if cliffs were broken into segments by travel lanes. Low ratings were given to long continuous cliffs which lacked crossing routes.

Livestock use was a measure of grazing pressure. Excellent scores were given if no sign of livestock was present. Low scores were awarded for the presence of numerous distinct trails and abundant signs of cattle grazing. If parts of a habitat block had obviously different grazing pressure, they were evaluated separately. Typically, grazing pressure was most evident in riparian areas and on plateaus adjacent to the canyon.

The vegetation category rated plant community composition. Native range with a good mix of shrubs and bunchgrass scored high. Annual grasses, weeds, and monocultures of crested wheatgrass scored low. As was the case with livestock use, in some cases the plateau, slopes and riparian areas were rated separately.

The water category scored high if water was abundant and convenient, especially if located high on a canyon wall. Lack of water or water largely inaccessible scored low. Ephemeral water also scored low. When information was available, notes were made regarding the presence of water during drought years. Good water available at the bottom of a canyon was scored as an eight. If this source was augmented with springs on the canyon wall, the score could be as high as 10. Water was considered available if it was within 2 miles of a habitat.

RESULTS

Population survey:

Survey and distribution patterns for the two years were similar (Table 1). In 1993, we saw 114 bighorns; 51 ewes, 55 rams, and 8 lambs. There were 16 legal rams (rams that can be legally taken by hunters must have horns $\geq 3/4$ curl or exceed 4 years of age) and 39 sublegal rams. The population estimate based on the computer adjustment for sightability was 165 (± 37) bighorns consisting of 79 (± 27) ewes, 73 rams (± 18), and 13 (± 6) lambs. In 1994, we observed 132 bighorns; 76 ewes, 32 rams, and 24 lambs. We saw 17 legal and 15 sublegal rams.

Observations adjusted by the sightability model gave a population estimate of 174 (± 31) bighorn sheep consisting of 101 (± 22) ewes, 42 (± 13) rams, and 31 (± 8) lambs. We estimated that there were 19 (± 6) sublegal rams and 23 (± 8) legal rams in the population.

Bighorns were distributed along the Jarbidge and Bruneau Rivers above their confluence near Indian Hot Springs (Figs. 1 & 2). Sheep were seen on the Jarbidge River from two miles above Dorsey Creek downstream to the confluence. Sheep were seen on the Bruneau River from Black Rock Crossing to the confluence with the Jarbidge River.

Table 1. Census Data. Counts are raw data while estimates are the counts adjusted for the sightability of each observation.

Category	1993 Count	1993 Estimate	1994 Count	1994 Estimate
Total	114	165 (± 37)	132	174 (± 31)
Ewes	51	79 (± 27)	76	101 (± 22)
Rams	55	73 (± 18)	32	42 (± 13)
Lambs	8	13 (± 6)	24	31 (± 8)
Sublegal Rams	39	53 (± 14)	15	19 (± 6)
Legal Rams	16	20 (± 6)	17	23 (± 8)

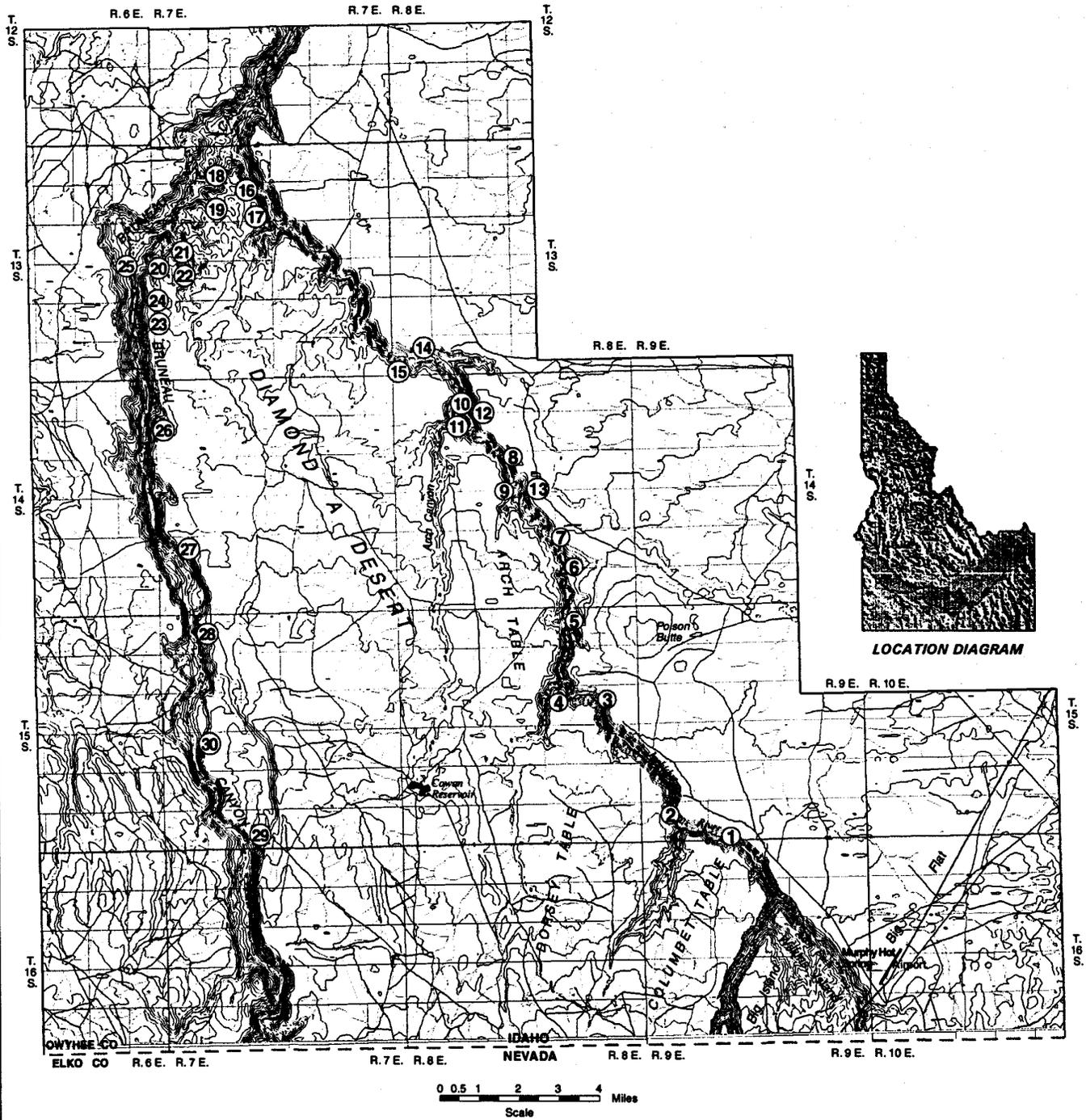


Fig. 1. Location of California bighorn sheep seen during the June 1993 census. Observation numbers are keyed to counts and classification in Table 3.

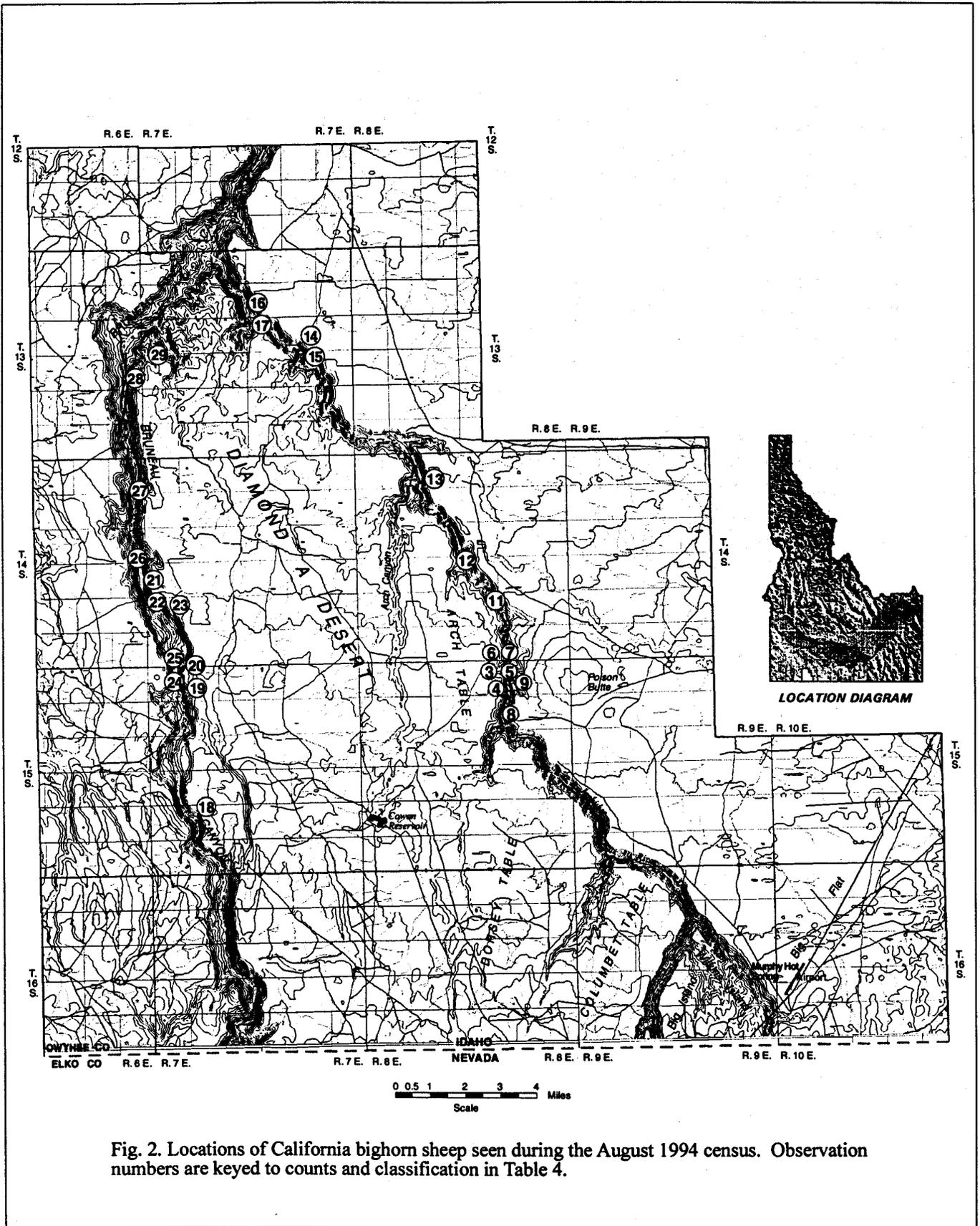


Fig. 2. Locations of California bighorn sheep seen during the August 1994 census. Observation numbers are keyed to counts and classification in Table 4.

Habitat evaluation:

We evaluated more than 110,000 acres of potential bighorn sheep habitat along the Bruneau River, Jarbidge River, Dorsey Creek, Sheep Creek and Clover Creek. The evaluated area was divided into 22 blocks each containing uniform habitat features (Fig. 3). The rank of each habitat block along with the total score, the number of acres in the block, and the limiting factors is shown in Table 2. The count and classification of each group of bighorn sheep seen during 1993 and 1994 is shown in Tables 3 and 4, respectively.

Physical factors (slope, access and lambing habitat) were found to be limiting the bighorn population in 17 habitat segments. Biological factors (vegetation and livestock use) were limiting in 15 segments. Nine segments were limited by both physical and biological factors. Other potential limiting factors included military activities (1 segment) and water availability (2 segments).

Limiting factors were livestock use, lambing habitat, accessibility, water and slope. Livestock use was the most common limiting factor (8 of 11 blocks) and typically consisted of heavy cattle grazing either on the plateau next to the canyon or in the riparian area along the river. The second most limiting habitat factor was lambing habitat which was limited in 6 of 11 habitat blocks. Accessibility and water were each limiting in two of 11 cases. Slope (size not steepness) was limiting in one block.

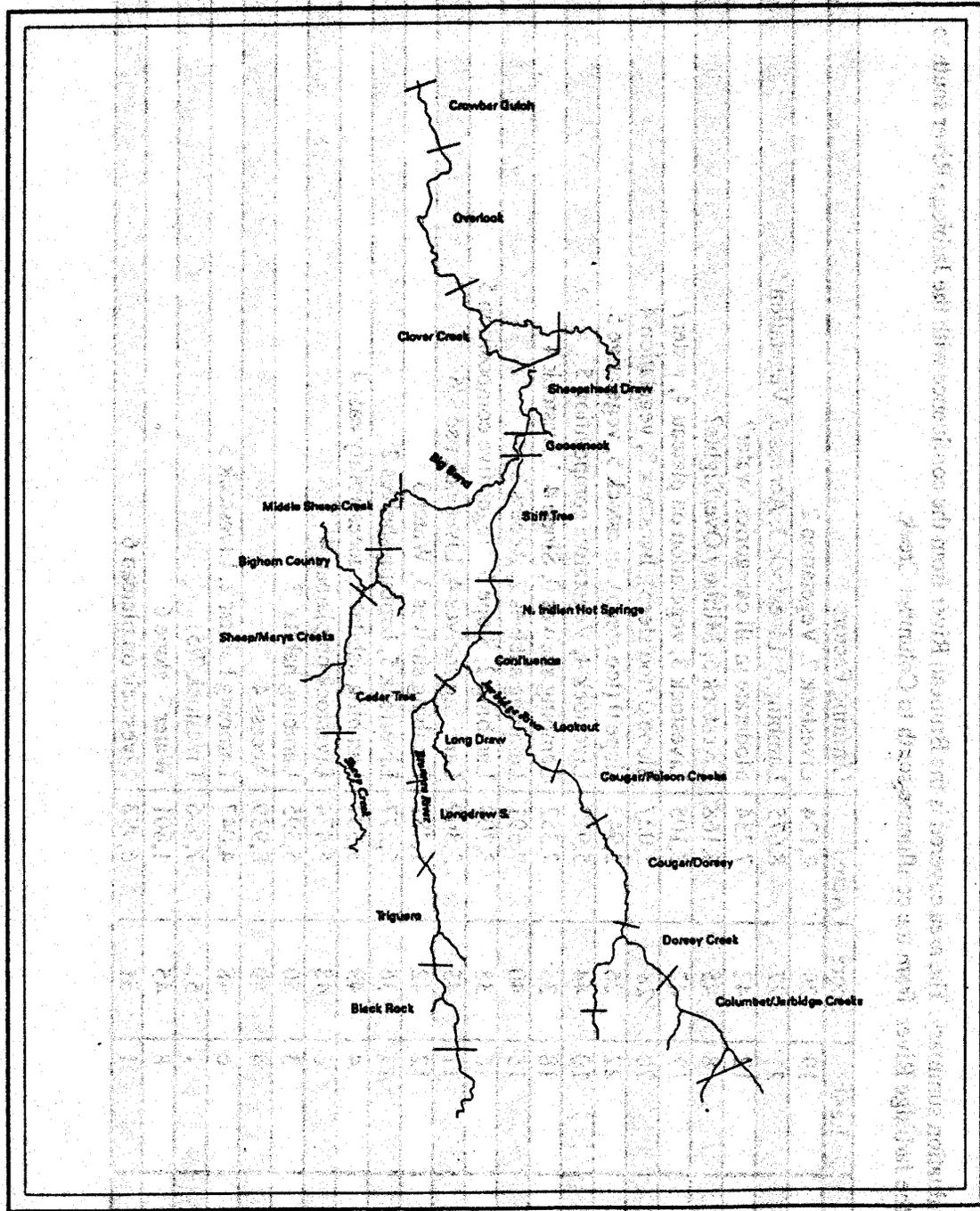


Fig 3. Habitat blocks evaluated for suitability for bighorn sheep in Owyhee County, Idaho.

Table 2. Habitat evaluation summary. The area covered is the Bruneau River from the confluence with the Jarbidge River south to Cougar Creek and the Jarbidge River from the confluence south to Columbet Creek.

Habitat Block	Rank	Score	Acres	Limiting Factors
Crowbar Gulch	19	29	2,124	Livestock 2, Vegetation 2
Overlook	21	27	8,675	Lambing 3, Livestock 3, Access 5, Vegetation 5
Clover Creek	12	42	7,234	Moderate in all categories, water?
Sheepshead Draw	8	45	4,168	Livestock 5, Military Overflights?
Gooseneck	12	42	2,105	Livestock 3, vegetation on plateau 4, water?
Big Bend	20	28	5,027	Slope 0 (too steep), livestock 3, vegetation 4
Middle Sheep Creek	22	26	2,943	slope 0 (too steep), livestock 5, vegetative 5
Bighorn Country	10	44	5,912	Livestock 4, Vegetative composition 5
Sheep/Marys Creeks	18	35	7,352	Lambing shelves 0, Slope 4, Livestock 4
Stiff Tree	15	40	7,591	Lambing shelves 2, Access 3
N Indian Hot Springs	16	38	3,709	Lambing 2, Slope 5, Vegetative composition 5
Confluence	11	43	3,869	Lambing shelves 4, Livestock use 9/6
Long Draw	12	42	1,481	Lambing shelves 3, Water 3
Cedar Tree	17	36	5,277	Livestock 5, lambing shelves 2
Long Draw South	4	49	3,307	Lambing habitat 5, accessibility east 4
Triguero Homestead	6	48	4,474	Livestock on plateau 4
Black Rock	3	50	5,395	Lambing habitat 7
Lookout	4	49	8,939	Access 4
Cougar/Puison Creeks	6	48	4,047	Lambing habitat 2, Livestock 5
Cougar/Dorsey	1	51	7,656	Livestock 7/5
Dorsey Creek	8	45	1,801	Water 3, slope 6
Columbet/Jarbidge Creeks	1	51	6,993	Livestock on plateau 6

Table 3. Count and classification of each group of bighorn sheep observed, June 1993, Jarbidge and Bruneau rivers, Idaho.

Observation #	Ewes	Lambs	Sublegal Rams	Legal Rams
1	1	1		
2			1	
3			2	2
4			3	3
5	4			
6			3	3
7	2			
8	5		1	
9	2			
10	1		1	
11			1	
12			1	
13			3	2
14	2	1		
15	2	1		
16	2			
17	1			
18			2	3
19			7	1
20			1	
21	8	1		
22			2	
23			3	1
24			3	
25			2	1
26	3	1		
27	12	1		
28	6	2		
29			3	1
Total	51	8	39	17

Table 4. Count and classification of each group of bighorn sheep observed, August 1994, Jarbidge and Bruneau rivers, Idaho.

Observation #	Ewes	Lambs	Sublegal Rams	Legal Rams
1	2	1		
2	7			
3	2	1		
4			2	
5	4	1		
6	1	1		
7	1	1		
8	5	1		
9	1			
10	2	1		
11	1			
12	3	1		
13			1	2
14	5	1		
15	5	1		
16			1	
17	13	6	3	
18	2		1	
19			1	2
20				2
21				1
22			1	2
23	2	1		
24	1	1		
25	5	4		
26	8	1		
27	2	1	1	
28	4			
29			3	4
30			1	4
Total	76	24	15	17

DISCUSSION

The best habitats for bighorn sheep are in the southern part of the evaluation area. In fact, the eight best habitats are grouped in this part of the study area and are already inhabited by bighorn sheep.

In addition, there are several adjacent habitat blocks located near the Bruneau/Jarbidge confluence which, while they do not score well separately, complement each other to provide a good balance of habitat components. The Confluence, Long Draw, Cedar Tree, Lookout and Cougar/Poison habitat blocks make up about 24,000 acres with good all-around habitat qualities. These blocks deserve an increase in ranking that exceeds the sum of their individual rankings because adjacent habitats provide needed lambing, grazing and ram habitat in a useable pattern. What one habitat block lacks, a neighboring block supplies. For example, several of these habitat blocks lack lambing habitat while the Lookout block has lambing habitat but ranks low on access. The whole connected series of habitats from the confluence up to Black Rock Crossing on the Bruneau River and Columbet Creek on the Jarbidge River should be able to support about 400 bighorn sheep. The existing population is less than half that number but does exceed the minimum viable population number of 125. It appears likely that these populations will expand to fill the available habitat.

Many of these habitats could be improved to make them more suitable as bighorn sheep habitat. Suitability of several habitat segments could be improved by controlling grazing, improving the vegetation community or developing water. In some places (e.g., Bighorn Country) fire has resulted in a community of mostly exotic annuals such as cheatgrass (*Bromus tectorum*), tumble mustard (*Sisymbrium altissimum*), tansy mustard (*Descurainia* spp.) and Russian thistle (*Salsola kali*). Replacement of this community of invaders either through natural succession or seeding combined with low levels of grazing would increase the suitability of these habitat blocks. Other blocks were rated low because livestock grazing appeared heavy. Grazing pressure in these areas needs to be more thoroughly evaluated. There are also parcels with no practical potential as bighorn sheep habitat because they lack basic features such as lambing shelves or suitable slopes.

We recognize some limitations of our habitat suitability model. The current model focuses on ewe habitat and may not identify even superior ram habitat. Rams have more general habitat requirements than ewes and may be able to find suitable range adjacent to any habitat that is suitable for ewes. For example, we found several habitat segments without lambing shelves. These habitats may be well suited for rams. One shortcoming of our preliminary method was the lack of detail in the grazing evaluation. We recommend a more detailed inventory of forage availability in the case of a proposed transplant. These are general procedures that should be followed up with a specific on ground inventories of habitat components before bighorn sheep transplant decisions are made.

A complicating factor was frequent low-level overflights by military jets near Sheepshead Draw. The effect of overflights is unknown but needs to be addressed in the habitat evaluation process.

RECOMMENDATIONS

1. Manage suitable areas as bighorn sheep habitat.

We recommend that areas suitable for bighorn sheep be managed as bighorn sheep habitat. This management should begin with the following conservative approach and be changed as indicated by monitoring or research.

a. Avoid activities and structures which concentrate cattle near canyons. Among such activities and structures are salting, corrals, fences, water pipelines and other water developments.

b. Restore vegetation in disturbed areas by establishing a mixture of native grasses and shrubs consistent with wilderness study area guidelines.

c. Strictly avoid overuse of forage within a quarter mile of canyons.

d. Develop water sources for bighorn sheep in side drainages off the Bruneau and Jarbidge Rivers such as Long Draw, Stiff Tree Draw, and Sheepshead Draw. Water source development was identified as a need in the Jarbidge Resource Area Resource Management Plan.

e. Discourage fence building between canyons. Bighorn sheep often travel between canyons to avoid disturbances. Fences along these escape routes could pose a serious hazard.

2. Monitor the bighorn sheep population.

We recommend that a long-term program be established to closely monitor bighorn sheep numbers, distribution and health. This monitoring would be useful to identify management needs and potential problems. Monitoring could supply information about the natural range expansion process in bighorn sheep and the need for transplants in the management strategy.

Emphasize further delineation of important seasonal use areas and identification of critical areas, such as lambing habitat.

Monitoring of the forage resource in bighorn sheep habitat is highly recommended. Radio telemetry could be an important part of an effective monitoring package.

3. Prepare and implement a Habitat Management Plan (HMP).

We recommend that plans for bighorn sheep habitat management be formally developed and coordinated through an HMP. This plan should address habitat improvements and management. Potential habitat improvements include developing water sources and restoring disturbed rangeland to a natural condition. A standard fire rehabilitation plan should be developed which includes reestablishment of native shrubs, perennial grasses and a forb component in Wilderness Study Areas. Management alternatives should include limiting grazing on the forage resource to reserve adequate forage for bighorn sheep, designing fire rehabilitation efforts to consider the needs of bighorns, and avoiding building structures near bighorn sheep habitat. The effectiveness of a HMP should be evaluated by monitoring.

4. Prepare a conservation strategy for this bighorn sheep population.

We recommend that existing state and national strategic plans be applied to manage bighorn sheep in this particular area. Existing plans include the Idaho Department of Fish and Game's 1991-1995 bighorn sheep management plan, and BLM's Mountain Sheep Ecosystem Management Strategy in the 11 Western States and Alaska. The conservation strategy we recommend would develop a specific local plan of action from the general goals contained in the two agency plans. Coordination and permitting should be initiated to address anticipated transplant priorities and population goals.

5. Increase small populations in good habitat before establishing new herds in marginal habitat.

The bighorn sheep population appears healthy but small. Data from this study indicate the population could be larger. There are still unoccupied habitats that will support bighorn sheep. We recommend allowing the existing population to grow and expand its distribution naturally for 3-5 years before considering transplanting bighorns into more marginal habitat areas. We suggest the habitat improvements we recommended begin in the south part of this range near the confluence of the two rivers and proceed northward as the bighorn sheep population expands.

Several projects could be accomplished in anticipation of expanding the bighorn sheep population northward. Principle among these potential projects is reclaiming native shrub/grass communities in the burned over part of Sheep Creek. We recognize that potential habitat improvements are limited due to the designation of much of this area as a wilderness study area. Coordination and permitting should be initiated to address anticipated transplant priorities and population goals.

LITERATURE CITED

- Armentrout, D.J. and W.R. Brigham. 1988. Habitat Suitability Rating System for Desert Bighorn Sheep in the Basin and Range Province. BLM Technical note 384. 18pp.
- Bodie, W., E. R. Taylor, and M. McCoy. 1992. California bighorn sheep ecology. Job Completion Report. Project W-160-R-19. Idaho Dept. of Fish and Game, Boise. 33pp.
- Giest, V. 1971. Mountain Sheep: A Study in Behavior and Evolution. Univ. Chicago Press, Chicago and London. 383 pp.
- Van Dyke, W.A., A. Sands, J. Yoakum, A. Polenz, and J. Blaisdell. 1986. Bighorn Sheep. Wildlife habitats in managed rangelands - the Great Basin of southeastern Oregon. U.S. For. Ser. Gen. Tech. Rep. PNW-159 (Special ed.). 37 pp.

COMPLETED HABITAT EVALUATION FORMS.

Date	Location	Habitat Evaluation	
		Score	Notes
1/15/01	Site 1	4	Good habitat with some nesting sites.
1/15/01	Site 2	3	Decent habitat, some nesting sites.
1/15/01	Site 3	2	Poor habitat, no nesting sites.
1/15/01	Site 4	1	Very poor habitat, no nesting sites.
1/15/01	Site 5	5	Excellent habitat, many nesting sites.
1/15/01	Site 6	4	Good habitat, some nesting sites.
1/15/01	Site 7	3	Decent habitat, some nesting sites.
1/15/01	Site 8	2	Poor habitat, no nesting sites.
1/15/01	Site 9	1	Very poor habitat, no nesting sites.
1/15/01	Site 10	5	Excellent habitat, many nesting sites.
1/15/01	Site 11	4	Good habitat, some nesting sites.
1/15/01	Site 12	3	Decent habitat, some nesting sites.
1/15/01	Site 13	2	Poor habitat, no nesting sites.
1/15/01	Site 14	1	Very poor habitat, no nesting sites.
1/15/01	Site 15	5	Excellent habitat, many nesting sites.

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Overlook		Start # 165	End # 166
Category	Score	Excellent 10	Poor- 0
Slope	7	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	3	Isolated lambing shelves with difficult access	Few or none
Accessibility	5	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	3	None	Heavy trailing and surface structures, including fences etc.
Vegetation	4	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	5	Numerous perennial, esp. springs high on a canyon wall	None
Notes: Limited access to river.			
Cow trails in canyon.			
8,675 Acres			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Clover Creek		Start # 164	End # 165
Category	Score	Excellent 10	Poor- 0
Slope	8 Highly variable	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	6	Isolated lambing shelves with difficult access	Few or none
Accessibility	6	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	6	None	Heavy trailing and surface structures, including fences etc.
Vegetation	5 Plateau 6 Canyon	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	2-10	Numerous perennial, esp. springs high on canyon wall	None
Notes: Smooth short cliffs on E. Fork. Almost too steep. E. Fork dry during			
the Irrigation season in 1992 but water ran yearlong in 1993. Road along rim of E. Fork.			
Good stands of squirreltail in patches			
Mouth of E. Fork worth more investigation			
South half of the unit has the best lambing shelves			
Water ran all summer in 1993			
7,234 Acres			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Sheepshead Draw		Start # 158	End # 164
Category	Score	Excellent 10	Poor- 0
Slope	8	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	7	Isolated lambing shelves with difficult access	Few or none
Accessibility	8	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	5	None	Heavy trailing and surface structures, including fences etc.
Vegetation	8 plateau 6 canyon	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	9	Numerous perennial, esp. springs high on canyon wall	None
Notes: In approach route for military training at the Saylor Creek bombing			
range. Many overflights with turning and diving aircraft observed from the			
ground during an earlier field trip.			
4,168 Acres			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Gooseneck		Start # 157	End # 158 (confluence)
Category	Score	Excellent 10	Poor- 0
Slope	10	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	7	Isolated lambing shelves with difficult access	Few or none
Accessibility	8	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	3, heavy use on plateau	None	Heavy trailing and surface structures, including fences etc.
Vegetation	4 plateau 6 canyon	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	10*	Numerous perennial, esp. springs high on canyon wall	None
Notes: Tim Carrigan said that water was gone except for a few puddles in summer of 92, after 6 years of drought.			
2015 Acres			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Bighorn Country		Start # 160	End # 161
Category	Score	Excellent 10	Poor- 0
Slope	10	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	6	Isolated lambing shelves with difficult access	Few or none
Accessibility	8	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	4	None	Heavy trailing and surface structures, including fences etc.
Vegetation	5 Plateau 7 Canyon	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	10	Numerous perennial, esp. springs high on canyon wall	None
Notes: Mountain Lion seen in this block with a fresh deer kill.			
Burn on the plateau that has been seeded but not fully recovered.			
2 side draws that might be used by sheep; Louse Creek and Big Lake Draw.			
Lambing shelves available in adjacent middle Sheep Creek block.			
Water may be limited during drought -Tim Carrigan.			
5,912 Acres			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Confluence		Start #	End #
Category	Score	Excellent 10	Poor- 0
Slope	8	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	4	Isolated lambing shelves with difficult access	Few or none
Accessibility	10	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	6 bottom 9 top	None	Heavy trailing and surface structures, including fences etc.
Vegetation	7 bottom 8 top	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	8	Numerous perennial, esp. springs high on canyon wall	None
Notes: A water source is the river.			
Lots of side drainages.			
Good grass on point between drainages			
west side of the canyon more heavily grazed in the canyon and on plateau.			
Bruneau/Jarbidge upstream to Long draw			
8/26-27/1994			
3,869 Acres/ 30 sheep			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Long Draw		Start #	End #
Category	Score	Excellent 10	Poor- 0
Slope	8	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	3	Isolated lambing shelves with difficult access	Few or none
Accessibility	10	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	6 Plateau 8 Canyon	None	Heavy trailing and surface structures, including fences etc.
Vegetation	10	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	3	Numerous perennial, esp. springs high on canyon wall	None
Notes: Slope has only moderate rock outcroppings. The upper end of draw is dry. Long way to water. Could perhaps benefit from a guzzler in this location if we could keep the cattle out. Roads on plateau. Old burn on top of ridge.			
8/26-27/1994			
1,481 Acres/ 12 sheep			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Cedar Tree		Start #	End # 42 14 24 115 39 72
Category	Score	Excellent 10	Poor- 0
Slope	5	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	2	Isolated lambing shelves with difficult access	Few or none
Accessibility	10	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	4 plateau 5 canyon	None	Heavy trailing and surface structures, including fences etc.
Vegetation	6 top 8 slopes 6 bottom	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	8	Numerous perennial, esp springs high on canyon wall	None
Notes: Water source is river only. Narrow ribbon of habitat along river but open enough that is grazed by cows west plateau looks hard grazed. East side with rams.			
Long Draw upstream on Bruneau			
8/26-27/1994			
5,277 Acres/ 41 sheep			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Long Draw South		Start #	End #
Category	Score	Excellent 10	Poor- 0
Slope	10	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	5	Isolated lambing shelves with difficult access	Few or none
Accessibility	4 East 10 West	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	8 Slopes 6 top & bottom	None	Heavy trailing and surface structures, including fences etc.
Vegetation	10	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	8	Numerous perennial, esp springs high on canyon wall	None
Notes: Water sources are river only.			
8/26-27/1994			
3,307 Acres/ 26 sheep			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Triguero Homestead		Start #	End # Road out of canyon on west
Category	Score	Excellent 10	Poor- 0
Slope	10	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	8	Isolated lambing shelves with difficult access	Few or none
Accessibility	10	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	4 top 6 plateau	None	Heavy trailing and surface structures, including fences etc.
Vegetation	4 top 6 plateau	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	8	Numerous perennial, esp springs high on canyon wall	None
Notes: Water source is river. Slopes are layered cliffs.			
ewe with a yellow collar seen in this segment			
8/26-27/1994			
4,474 Acres/ 35 sheep			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Black Rock		Start #	End washed out bridge
Category	Score	Excellent 10	Poor- 0
Slope	10	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat		Isolated lambing shelves with difficult access	Few or none
Accessibility	10	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	7 Plateau	None	Heavy trailing and surface structures, including fences etc.
Vegetation	8	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	8	Numerous perennial, esp springs high on canyon wall	None
Notes: Old trails- no evidence of recent grazing.			
Lots of chukars			
8/26-27/1994			
5,395 Acres/ 42 sheep			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Lookout		Start # Loran	End # Confluence
Category	Score	Excellent 10	Poor- 0
Slope	10	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	7	Isolated lambing shelves with difficult access	Few or none
Accessibility	4	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	10	None	Heavy trailing and surface structures, including fences etc.
Vegetation	7 (low quantities) slopes 10 bot.	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	8 bottom only	Numerous perennial, esp springs high on canyon wall	None
Notes: Large cliffs			
Sheep trails in bottom			
No connection between stream bottoms and upper slope			
Lots of security crevices			
Better access across cliffs near confluence			
Fill out new form for lower about one mile			
8/26-27/1994			
8,939 Acres/ 70 sheep			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Cougar/Poison Creeks		Start # Cougar Creek	End # 42 15 02 115 32 19
Category	Score	Excellent 10	Poor- 0
Slope	10	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	2	Isolated lambing shelves with difficult access	Few or none
Accessibility	10	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	5	None	Heavy trailing and surface structures, including fences etc.
Vegetation	5 slopes 10 bottom	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	8 bottom	Numerous perennial, esp springs high on canyon wall	None
Notes:			
8/26-27/1994			
4,047 Acres/ 32 sheep			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Cougar/Dorsey		Start # Cougar Creek	End # Dorsey Creek
Category	Score	Excellent 10	Poor- 0
Slope	10	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	8	Isolated lambing shelves with difficult access	Few or none
Accessibility	10	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	8	None	Heavy trailing and surface structures, including fences etc.
Vegetation	7 sides 5 plateau	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	8	Numerous perennial, esp springs high on canyon wall	None
Notes: water source is river			
good security cover on side draws			
vegetation looks hard used to rimrock			
lots of sheep trails in this block			
part of apparent poor shape of grass is probably due to drought.			
8/26-27/1994			
7,656 Acres/ 60 sheep			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Dorsey Creek		Start #	End #
Category	Score	Excellent 10	Poor- 0
Slope	6 <small>(small)</small>	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	8	Isolated lambing shelves with difficult access	Few or none
Accessibility	10	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	7 plateau 10 bottom	None	Heavy trailing and surface structures, including fences etc.
Vegetation	8 junipers	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	3 stagnant pools	Numerous perennial, esp springs high on canyon wall	None
Notes: rough little canyon with nooks and crannies			
8/26-27/1994			
1,801 Acres/ 14 sheep			

BIGHORN SHEEP HABITAT EVALUATION FIELD FORM

Location: Columbet-Jarbidge		Start #	End #
Category	Score	Excellent 10	Poor- 0
Slope	10	Suitable, >50-100%, varied, rock outcrops	Unsuitable- flat or vertical
Lambing Habitat	8 Mostly on n end of block	Isolated lambing shelves with difficult access	Few or none
Accessibility	7	Travel lanes between benches and around cliffs	Solid cliffs with no visible travel possibilities
Livestock use	8 canyon 6 plateau	None	Heavy trailing and surface structures, including fences etc.
Vegetation	10 canyon 6 plateau	Native range with good shrub and bunch grass components	cheatgrass or seedings, no shrubs
Water sources	8	Numerous perennial, esp springs high on canyon wall	None
Notes: Some cow trails in the area but not a lot of fresh use. Some cow trails in bottom around Columbet creek. Grass on plateau is heavily used. Water is located in bottom of the canyon.			
Below Columbet to Dorsey			
8/26-27/1994			
6,993 Acres/ 55 sheep			