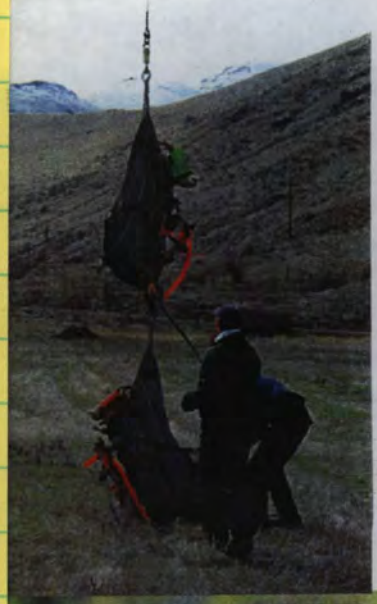
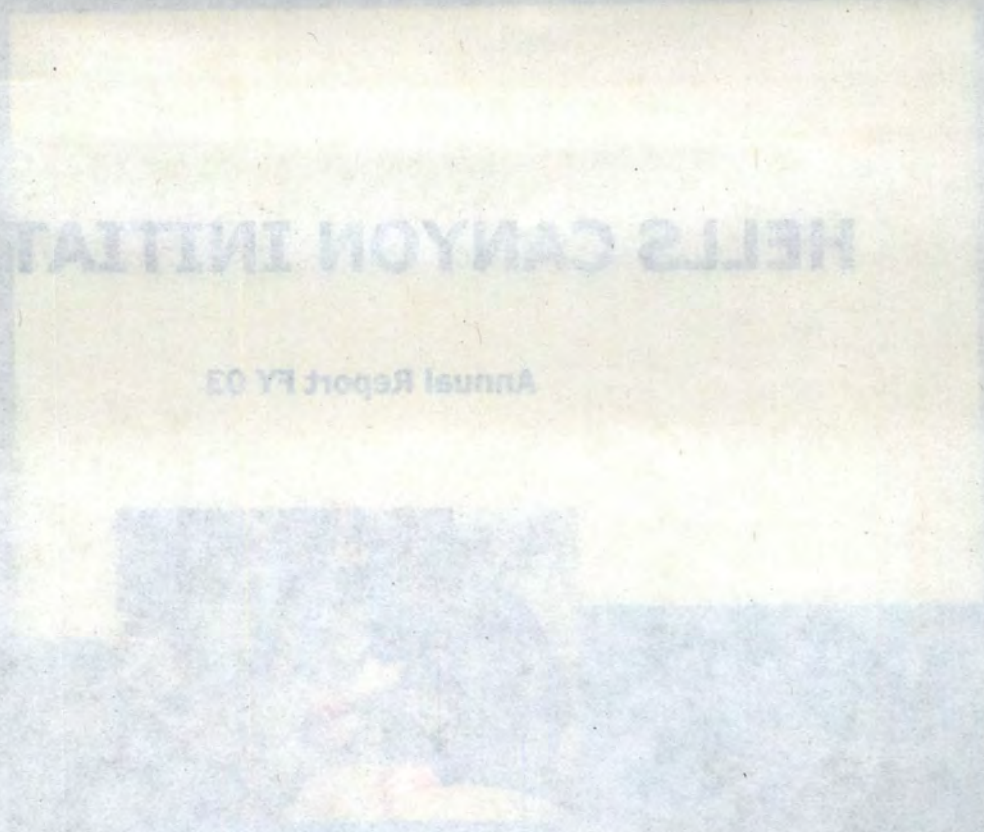
Jim and Holly,

Hope this finds you both OK. Saw OutDoor Idaho on OPB and you were the "stars". Also Crystal. She is now working in Enterprise on the Lostine, L. Imnaha, Upper Hells Canyon & Wenaha herds. We've been able to keep funding together so far, but you know well how things go. Attached is annual report for you. Ram on cover picture was one of the Spences bridge BC transplants, 46" left horn. Unfortunately he died from pneumonia last Dec. Holly, the Wenaha herd finally seems to be back to normal lamb survival after 7 years of heavy losses. We saw 74 sheep in late July with 39 ewes 23 lambs 13 rams. Hope this continues. How's Big Cr. doing? I've heard good reports from Idaho FNAWS. Keep in touch.

Vic





Cover photos by Frances Cassirer, Vic Coggins, and Katherine Jones *Idaho Statesman*

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Redbird April 2003

Hells Canyon Bighorn Sheep Restoration Committee 2002-2003

Frances Cassirer, Idaho Department of Fish and Game, Wildlife Research Biologist, Project Coordinator

Dale Toweill, Idaho Department of Fish and Game, Wildlife Game Manager

Vic Coggins, Oregon Department of Fish and Wildlife, District Wildlife Biologist

Don Whittaker, Oregon Department of Fish and Wildlife, Program Coordinator

Pat Fowler, Washington Department of Fish and Wildlife, District Wildlife Biologist

Donny Martorello, Washington Department of Fish and Wildlife, Big Game Program Manager

Tim Schommer, U.S. Forest Service, Forest Biologist, Wallowa-Whitman National Forest

Craig Johnson, Bureau of Land Management, Wildlife Biologist

John Augsburger, Bureau of Land Management, Idaho State Biologist

Wayne Heimer, Foundation for North American Wild Sheep

Duncan Gilchrist, Foundation for North American Wild Sheep

Lloyd Oldenburg, Foundation for North American Wild Sheep

We would like to express our sorrow at the loss of Hells Canyon Bighorn Sheep Restoration Committee member and supporter Duncan Gilchrist. We will miss his good nature, passion for bighorn sheep and other wildlife, and his consistent enthusiasm for bighorn sheep restoration in Hells Canyon.

Lloyd Oldenburg congratulating Duncan Gilchrist in the Hells Canyon Initiative display booth at the 2002 FNAWS convention after Duncan received the FNAWS Distinguished Service Award.

ACKNOWLEDGMENTS

The Foundation for North American Wild Sheep National, Oregon and Washington chapters provided major funding and support for the Hells Canyon Initiative. Thanks also to the Oregon Hunters Association Rogue Valley Chapter and statewide organization for continued financial support.

Mike Hansen, Jamie Nelson, Crystal Strobl, and Robert Adair provided assistance in the field. We thank the Schlee family for providing access to private property in Washington. Dr. Mark Drew, Idaho Wildlife Health Lab (IWHL); Dr. Sushan Han, Washington State University; Dr. Kristin Mansfield, Washington Dept. of Fish and Wildlife; and Dr. Jeannie Ross assisted with sample collection and analysis. The University of Idaho Caine Veterinary Center, IWHL, and Washington State University Animal Disease and Diagnostic Lab also assisted with sample analysis and diagnosis. Dr. Bill Foreyt at Washington State University helped obtain ivermectin feed and accepted sheep removed from the wild. Vicky Osborn and Renai Brogden at Idaho Fish and Game assisted with the Hells Canyon display and other outreach projects.

Many other individuals continue to support the Hells Canyon Initiative in numerous ways. Their support is greatly appreciated.

INTRODUCTION

The Hells Canyon Initiative was started in 1995 as a program to accelerate restoration of bighorn sheep in Hells Canyon and the surrounding areas of Idaho, Oregon, and Washington and to focus research applicable to bighorn sheep restoration and management throughout the western United States and Canada. The concept was formalized in 1997 with the completion of an interagency memorandum of agreement and restoration plan (Hells Canyon Committee 1997). This is the sixth summary report, and covers the period from July 1, 2002 to June 30, 2003.

Major activities during this period included transplanted and resident sheep monitoring and management, habitat management, and disease research.

CAPTURE AND SAMPLING

Fifty-three sheep in 7 Hells Canyon study herds were radio-collared January – March 2003, and 59 in 6 herds were sampled for parasites, bacteria, trace elements, and disease exposure. Body condition was also estimated by palpation. Sheep were captured in a corral trap (11), ground darting (2), and helicopter netgunning (49). One sheep died during helicopter netgunning, no other sheep died during or subsequent to capture.

Table 1. Bighorn sheep capture and health testing results January – March 2003.

Herd	Ewes	Rams	Total	Body condition score[1]	Selenium ppm	PI3[2] titer prevalence (range)	Fecal lungworm (*Protostrongylous*) prevalence (capsules)
Asotin	8	5	13	3.4	0.09	38.46% (8-32)	0
Imnaha	3	3	6	3.3	0.10	100.00% (8-16)	ND[3]
Wenaha	4	4	8	3.0	0.07	37.50% (16)	ND
Lostine	7	3	10	2.8	0.37	90.00% (4)	0
Redbird	9	3	12	3.6	0.20	100.00% (4 – 128)	100%(9.3)
Black Butte	7	3	10	3.4	0.16	90.00% (8 – 64)	80% (5.9)

[1] Body condition score 1 = poor, 5 = excellent

[2] *Parainfluenza – 3* virus

[3] No data

Black Butte March 2003

Table 2. *Pasteurella* bacteria isolated from bighorn sheep pharyngeal swabs January – March 2003.

Herd	No. sampled	Prevalance[1]	Biogroups (n)	Haemolysis
Asotin	13	92%	2 (6), 2B(4), 2S(3), 2C (1), 9abB (1)	0
Imnaha	6	83%	2 (2), 2B, 2BS, 2C, 3aeG, Uab, 8 P. multocida multocida b	50%
Wenaha	8	63%	2 (2), 2B, 2D (2), 2S, 16aE	43%
Lostine	10	70%	2 (1), 2B (7)	0
Redbird	12	25%	2 (3), 2D (1)	0
Black Butte	10	20%	2 (1), 2B (1)	0

[1] Percent samples with successful isolation of *Pasteurella* bacteria.

Bighorns were all in relatively good body condition, with low levels of lungworms. Serology indicated 1 or 2 individuals positive for exposure to bluetongue in the Wenaha, Redbird, and Asotin herds and 1 or 2 positive for exposure to epizootic haemorrhagic disease (EHD) in the Black Butte, Asotin, and Imnaha herds, and widespread positive, although generally low, titers to PI-3. Average levels of blood selenium were lowest in the Wenaha, Imnaha, and Asotin herds and highest in the Lostine herd where the sheep have access to and use supplemental mineral blocks (Table 1).

Several variants of biogroup 2 were the most common strains of *Pasteurella* isolated (Table 2). Haemolytic strains were isolated only from the Wenaha and Imnaha herds, these strains may be more virulent than nonhaemolytic strains. *P. multocida* was isolated only from the Imnaha herd. The samples from Redbird and Black Butte had low levels of isolation of Pasteurella, probably due to a delay between sampling and culturing. The results of health testing will be combined with ecological data in analysis of factors contributing to survival, productivity, and population trend.

TRANSPLANTS

Summary 1997 – 2003: Six transplants totaling 145 sheep have been conducted 1997 – 2002 under the Hells Canyon Initiative. Sheep were transplanted from outside the project area in four transplants, and two transplants moved sheep within the project area (Table 3). No transplants were conducted FY 2002 - 2003.

All transplanted sheep were radio-collared except 4 lambs. Average annual survival of transplants monitored longer than one year ranged from 26% for sheep transplanted within the project area from Lostine, OR in 1999 to 80% for sheep transplanted from Spences Bridge, BC in 1997. First year survival of the most recent sheep transplanted (winter of 2001 – 2002) was 85 – 90% (Table 4). Average annual survival rate of transplanted sheep was 70%. In comparison, annual survival of resident (Black Butte, Imnaha, Lostine, Redbird, and Wenaha herds) ewes averaged 93% and rams averaged 84% 1997 - 2003.

Table 3. Bighorn Sheep transplants conducted under the Hells Canyon Initiative July 1, 1997 – June 30, 2003

Source	Date	Ewes	Rams	Total	Release site(s)
Spences Bridge, BC	December 1997	29	9	38	Big Canyon Muir Asotin
Cadomin, AB	February 1999	14	6	20	Big Canyon Muir
Lostine, OR	December 1999	9	6	15	McGraw
Cadomin, AB	February 2000	27	10	37	Minam Sheep Divide
Lostine, OR	December 2001	11	4	15	Quartz Creek
Missouri Breaks, MT	February 2002	16	4	20	Myers Creek
Total		106	39	145	

Table 4. Average survival rates of bighorn sheep transplanted under the Hells Canyon Initiative, December 1997 – March 2003.

Source	% alive (n) Mar 2003	# yrs since release	Avg. annual adult survival
Spences Bridge, BC 1997	33% (12)	5	0.80
Cadomin, AB 1999	25% (5)	4	0.70
Lostine, OR 1999	6% (1)	3	0.26
Cadomin, AB 2000	30% (11)	3	0.67
Lostine, OR 2001	90% (14)	1	0.90
Missouri Breaks, MT 2002	85% (17)	1	0.85
All sources	41% (59)		0.70

All transplants were successful in starting new herds or supplementing existing ones except for the 1999 transplant from Lostine to McGraw. The 2000 transplant from Alberta was intended to start new herds in the Wallowa Mountains, but the sheep dispersed and supplemented existing herds in the project area.

At least two new herds, Muir Creek and Big Canyon, were established with bighorns from British Columbia, Alberta, and Montana, (Figure 1) and the distribution of existing herds has also expanded since 1997.

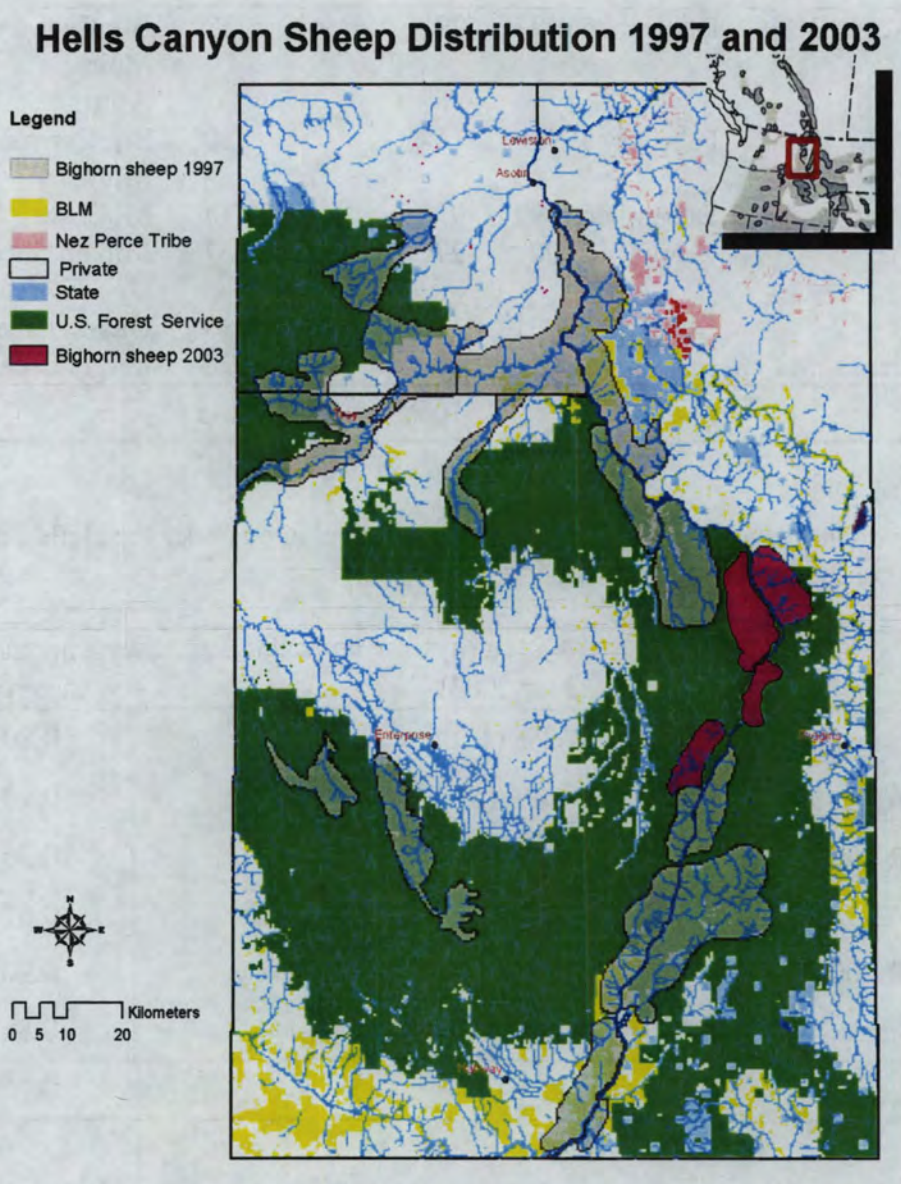


Figure 1. Current distribution of bighorns in Hells Canyon. Bighorns were present in gray polygons in 1997. New and expanded bighorn herds were established in dark pink polygons 1997 – 2002 under the Hells Canyon Initiative.

POPULATION MONITORING

Hells Canyon bighorns were surveyed by the states of Oregon, Idaho, and Washington from a helicopter, fixed-wing aircraft, and on the ground in 2002 - 2003. Approximately 895 bighorns are estimated to occur in 16 herds or subpopulations within the project area (Table 5) a 6% increase from 845 sheep in 2002 – 2003. Since 1997 – 98 the population has increased by 170 bighorns (Figure 2). Individual subpopulations have increased up to 125% and decreased as much as 50%. Population dynamics of adjacent herds differ considerably (Figure 3). One of the goals of this project has been to determine why.

Table 5. Hells Canyon Bighorn Sheep Herd Counts, May 1, 2002 – April 30, 2003.

Herd	Survey date(s)	Total bighorns	Ewes	Lambs	Rams	Estimated population
Black Butte, WA[1]	3/23-25/03	53	24	13	16	**60**
Asotin, WA[1]	4/16 – 4/29/03	42	23	11	8	**45**
Wenaha, OR/WA[1]	03/18-20/03	59	29	12	18	**65**
Mountain View, WA	3/20/03	18	11	0	7	**20**
Muir Creek, OR[1]	3/24/03	24 (17)[2]	16	2	6	**25**
Lower Hells Canyon, OR	3/5/03	26	15	7	4	**35**
Upper Joseph Creek, OR	3/18/03	37	19	11	7	**40**
Lower Imnaha, OR[1]	3/17/03	152	77	46	29	**165**
Bear Creek, OR	7/29-30/02	26	10	4	12	**35**
Lostine, OR[1]	3/19/03	73	39	14	20	**80**
Sheep Mountain, OR	3/9/03	24	0	0	10	**35**
Upper Hells Canyon, OR[1]	3/10/03	29	15	2	12	**45**
Big Canyon, ID[1]	3/15-16/03	32 (30)[3]	20	0	12	**32**
Redbird, ID[1]	12/6 – 13/03	148	66	39	42	**150**
Upper Hells Canyon, ID	6/24/02 10/16/02	18	6	3	9	**25**
Saddle Creek, OR	3/18/03	8	7	0	1	**10**
Lonepine, OR (2001- 02 releases)	4/2/03	12	7	4	1	**12**
Myers Creek, ID (2002 release)	3/12/03	16	9	6	1	**16**
Total						**895**
Average						50

[1] **Intensive survival and movements monitoring is being conducted on these nine herds.**
[2] **Four ewes, 2 lambs, and 1 ram included in count dispersed to population from 2001-02 releases.**
[3] **Two rams included in count dispersed to population from 2002 release.**

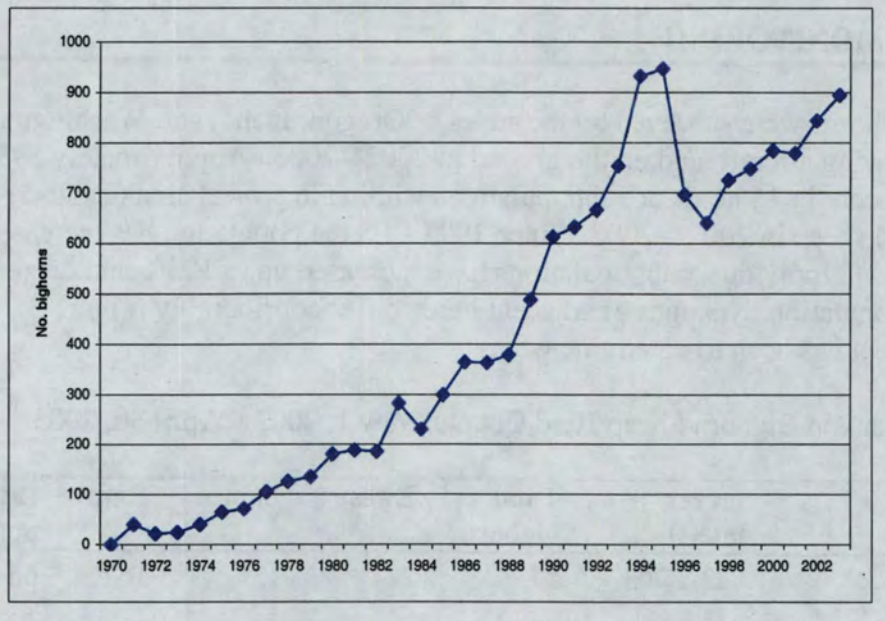


Figure 2. Hells Canyon Initiative bighorn population, 1970 – 2003.

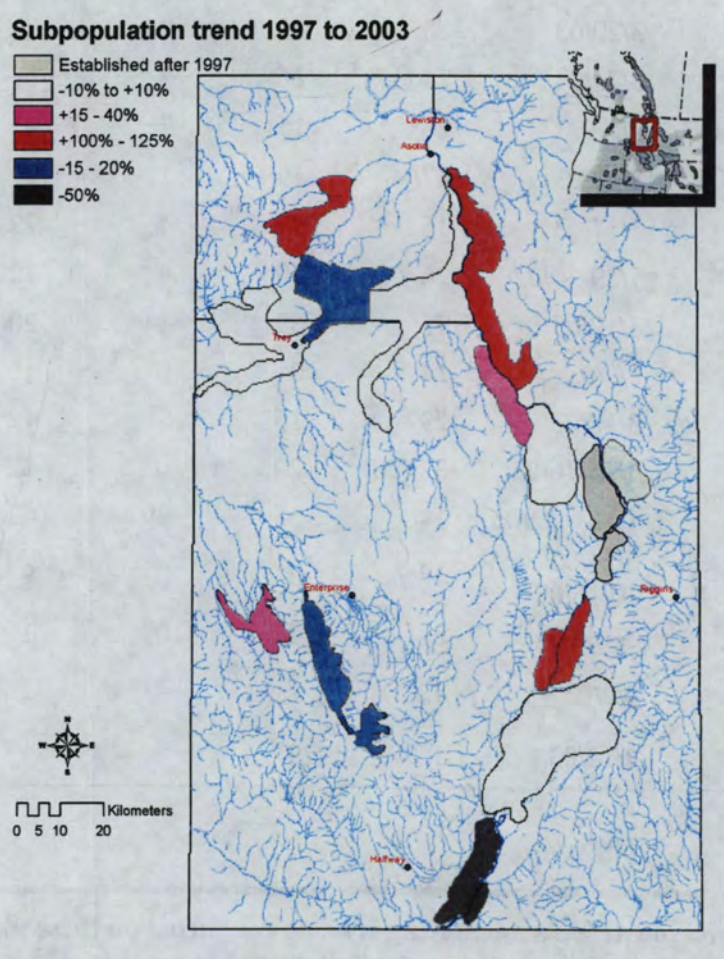


Figure 3. Trend of subpopulations (herds) within the Hells Canyon bighorn population 1997 – 2003.

Productivity and lamb survival: Intensive monitoring of summer lamb survival continued in 2002. Productivity (% radio-collared ewes seen with lambs) ranged from 63% in the Wenaha herd to 100% in the Black Butte and Muir Creek herds. Summer survival (birth through October 1) ranged from 0 (no lambs from radio-collared ewes survived) in Big Canyon, Muir Creek, and Upper Hells Canyon to 100% in Black Butte (Table 6). Five lambs were found dead and submitted to the Washington State University Diagnostic Laboratory (WADDL) (Table 7). Four had pneumonia, this included lambs from 2 of the 3 herds where all lambs of radio-collared ewes died during the summer (Table 6). The 5th lamb found dead (Imnaha herd) had skin lesions consistent with contagious ecthyma (sore mouth), although no causative pathogen could be isolated. Contagious ecthyma has previously been confirmed in the Imnaha bighorns.

Table 6. Productivity and summer lamb survival in 9 herds in Hells Canyon, 2002.

Herd	No. radioed ewes	Productivity (% radiocollared ewes observed w/lambs)	Summer survival[1]
Black Butte, WA	3	100%	100%
Asotin Creek, WA	5	80%	75%
Redbird, ID	11	91%	60%
Big Canyon, ID	9	88%	0
Wenaha, OR	8	63%	60%
Imnaha, OR	12	83%	60%
Muir Creek, OR	8	100%	0
Upper Hells Canyon, OR	7	86%	0
Lostine, OR	17	82%	71%

[1] Survival from birth to October 1.

Table 7. Summary of lamb necropsies at WADDL – Hells Canyon, summer 2002.

Animal ID #	Herd	Mortality date	Diagnosis	Comments
02WA01	Mountain View	5/30	bronchopneumonia	
02OR05	Imnaha	6/12	histologic lesions	Possible contagious ecthyma
02OR02	Muir Creek	6/25	bronchopneumonia	*P. trehalosi* isolated from lungs
02OR03	Muir Creek	6/26	bronchopneumonia	
02ID01	Big Canyon	8/4	bronchopneumonia	

HABITAT MANAGEMENT

Habitat improvement: Ongoing agency weed control programs treated over 2,500 acres throughout the canyon at a cost of over $100,000. Yellow starthistle, Scotch thistle, and white top were the primary weeds targeted.

Two seedings totaling about 80 acres were completed on Oregon Department of Fish and Wildlife property in the Wenaha herd range.

DISEASE

Treatment: Until this winter, the Lostine was the only herd in Hells Canyon that did not have endemic scabies (*Psoroptes ovis*) infection. Mites were observed in 10% (7) of 74 Lostine bighorns for the first time this winter. Most of the herd was fed medicated alfalfa pellets with ivermectin powder prepared at Washington State University. Bighorns were given pellets at a customary feeding site over an 8 day period during February and by May some rams appeared to be recovering. No mortality has been associated with this infection. This herd will be closely monitored this summer and the treatment repeated this winter if needed.

Disease prevention: In July 2002, a bighorn ram was hazed away from 2 domestic sheep bucks near Imnaha. In September 2002, two yearling female bighorns and two domestic goats ranging together were captured and removed from the town of Asotin, WA. The goats were sent to the Lewiston livestock yard and the bighorns were moved to captivity at the Idaho Wildlife Health Lab. In February 2003, a ram in a Clarkston, WA subdivision was darted and moved to captivity at Washington State University because of concerns about potential contact with domestic sheep or goats and resident complaints.

In September 2002, contact was made with Oregon pack goat owner Jim Byars about potential disease transfer from goats to bighorns. A feature article about the issue appeared in the *La Grande Observer* and *Oregon Goat Packers* newsletter resulted thanks to Mr. Byars. In February 2003, Idaho property owner Bob Stoll was contacted by phone about his use of goats for weed control adjacent to a bighorn sheep herd and a subsequent pneumonia epizootic in the bighorns. The goats were used again this spring.

Muir Creek June 2002

Disease research: Work continued on molecular analysis of *Pasteurella* and *Mannheimia* isolates from bighorn, Dall's, and domestic sheep at the University of Idaho Caine Veterinary Research and Teaching Center and San Diego State University. Analysis of DNA sequencing of the 16s rRNA and RNAse P structural genes in 49 isolates from bighorns, Dall's, and domestic sheep and domestic goats indicated significant differences among hosts and biogroups. This suggests that it is possible to distinguish domestic sheep and goat bacteria from those native to wild sheep and that different strains can be distinguished genetically. Initial results of leukotoxin sequencing revealed that this gene evolves more rapidly than the structural genes through recombination and possible transfer among isolates. This could be significant because this gene is involved in the disease process. Manuscript preparation is in progress and proposals are being submitted for funding to continue this research.

PUBLIC INFORMATION AND OUTREACH

Nez Perce tribe: Two complete hides, 2 ram heads and the horns of 6 ewes were given to the Nez Perce tribe for cultural uses.

Presentations and field trips:
July 2002 -- Oregon Foundation for North American Wild Sheep summer directors meeting
September 2002 -- Asotin High School Agriculture Issues Class
April 2003 -- La Grande Chapter Oregon Hunters Association
April 2003 -- Idaho FNAWS Wild Sheep Summit
May 2003 -- Lewiston/Clarkston Kiwanis Club luncheon
June 2003 -- Burns Chapter Oregon Hunters Association,
June 2003 -- Hells Canyon Committee meeting and tour
June 2003 -- USFS – Hells Canyon NRA
June 2003 -- Tristate FNAWS chapters summer meeting hosted in Hells Canyon.

A poster display was staffed at the National FNAWS convention, Idaho FNAWS banquet, Oregon FNAWS banquet, and the Idaho Sheep Summit,

Media: An article on the Hells Canyon project appeared in the Summer issue of the National FNAWS magazine "*Wild Sheep*", and articles or updates appeared in nearly every issue of the Oregon, Idaho, and Washington FNAWS newsletters published during this period. An article on the project appeared in the *Idaho Statesman* Outdoor magazine in Boise and was picked up in the Seattle, LaGrande, Medford, and Corvallis, OR papers. Three articles also appeared in the Lewiston and Moscow ID papers.
Boise Public Radio also featured the project in the series "*Off the trail*".

Other: A bandanna featuring a map of Hells Canyon and a bighorn sheep theme is being developed to be sold by river outfitters and other organizations in Hells Canyon. A portion of the proceeds will be donated to the Hells Canyon bighorn sheep restoration project.

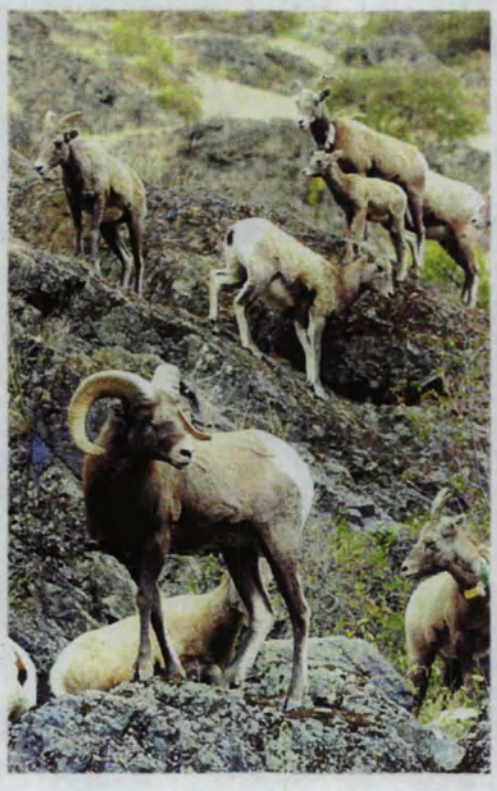
EXPENDITURES FOR THE HELLS CANYON INITIATIVE

In addition to funds spent directly on the Hells Canyon Initiative (summarized below), each organization has contributed substantial amounts of time and materials for activities such as weed control, seeding, bighorn surveys, management, and health testing, public outreach, and fundraising that will directly benefit the project.

Table 8. Hells Canyon Initiative funding FY 03 (1 July 2002 - 30 June 2003).

Organization	*Personnel*	*Operating*	*Equipment*	*Total*
FNAWS	-	$40,000.00	-	$40,000.00
ORFNAWS	-	$6,509.00	-	$6,509.00
WAFNAWS	-	$6,600.00	-	$6,600.00
OHA	-	$2,830.00	-	$2,830.00
ODFW[1, 2]	$28,000.00	$25,467.00	-	$53,467.00
WDFW[1, 2]	$15,116.03	$7,531.66	-	$22,647.69
IDFG[1]	$64,000.00	$29,000	-	$93,000.00
BLM	$10,000.00	-	-	$10,000.00
TOTAL	$117,116.03	$117,937.66	0	**$235,053.69**

[1] State funding primarily from proceeds of bighorn sheep auction and/or lottery tags
[2] Estimate



Big Canyon October 2002