

REDBAND TROUT
(Oncorhynchus mykiss gairdneri)
POPULATION AND HABITAT SURVEYS
IN JUMP, REYNOLDS, AND SHEEP CREEKS,
AND SECTIONS OF THE
OWYHEE COUNTY, IDAHO

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INTRODUCTION

This report presents redband trout (*Oncorhynchus mykiss gairdneri*) population and stream habitat data collected on the Owyhee and Bruneau Resource Areas of the Bureau of Land Management (BLM) lands in Owyhee County, Idaho. Data was collected by Idaho Department of Fish and Game (IDFG) Southwest Region Fisheries Management staff in a cooperative project with the Boise District BLM. This report documents the second field season of stream and habitat surveys conducted by Southwest Region IDFG.

Redband trout historically occupied perennial drainages in Owyhee County, Idaho (Behnke, 1992). Sampling of these redband trout populations by BLM staff from 1976-1991 documented fragmented populations composed of small numbers of redband trout. Drought conditions experienced from 1987-1994 likely negatively impacted these redband trout populations. The main objectives of this second year of investigation remain constant:

- (1) To determine redband trout density estimates for previously sampled stream segments.
- (2) To establish trout density estimates for unsurveyed stream segments.
- (3) To measure stream substrate, bank stability, instream fish cover, solar input, composition of greenline plant communities, and water quality.

STUDY AREA

Stream surveys were conducted on Jum^P and Reynolds Creeks in the Owyhee Resource Area. Surveys were also conducted on Battle and Sheep Creeks and a section of the Owyhee River in the Bruneau Resource Area. Locations and descriptions of the survey sites are presented in Table 1, Figures 1-4, and Appendix A.

METHODS

FISH POPULATIONS

On streams with previously established sample sites, the sites were located using historic information (BLM data, unpublished). New sample segments were established with identifiable boundaries when necessary. Descriptions of all stream sample segments are presented in Appendix A.

Table 1. Location of stream segments sampled in Owyhee County during 1994.

SITE	LOCATION	LATITUDE/ LONGITUDE	DESCRIPTION
JUMP005.6	T2N R5W S27	N 43 28.75/ W 116 55.38	JUST BELOW PARKING AREA
JUMP005.9	T2N R5W S27	N 43 28.58/ W 116 55.50	JUST ABOVE FALLS
REYNOLDS002.8	T1S R3W S22	N 43 19.38/ W 116 41.20	LOWER MOUTH OF CANYON
REYNOLDS006.6	T2S R4W S12	N 43 15.83/ W 116 45.06	400 M BELOW LOWER WEIR
OWYHEE218.0	T14S R2W S1	N 42 13.73/ W 116 30.92	1ST BEND ABOVE OLD HOMESITE
OWYHEE218.7	T14S R1W S6	N 42 13.72/ W 116 30.56	RIFFLE ABOVE LARGE BEND
OWYHEE218.9	T14S R1W S6	N 42 13.66/ W 116 30.15	JUST BELOW YATAHONEY CR
BATTLE000.3	T13S R2W S1	N 42 14.43 W 116 31.37	500 M ABOVE MOUTH
BATTLE003.7	T13S R1W S20	N 42 16.84/ W 116 28.72	BELOW KELLY PARK
SHEEP027.5	T15S R5E S33	N 42 05.16/ W115 52.30	ABOVE FOOT- BRIDGE XING
SHEEP029.0	T16S R5E S7	N 42 03.21/ W 115 54.52	ROUGH MNT.

Figure 1. Sample sites in 1994 on Jump Creek drainage, Owyhee County, Idaho.

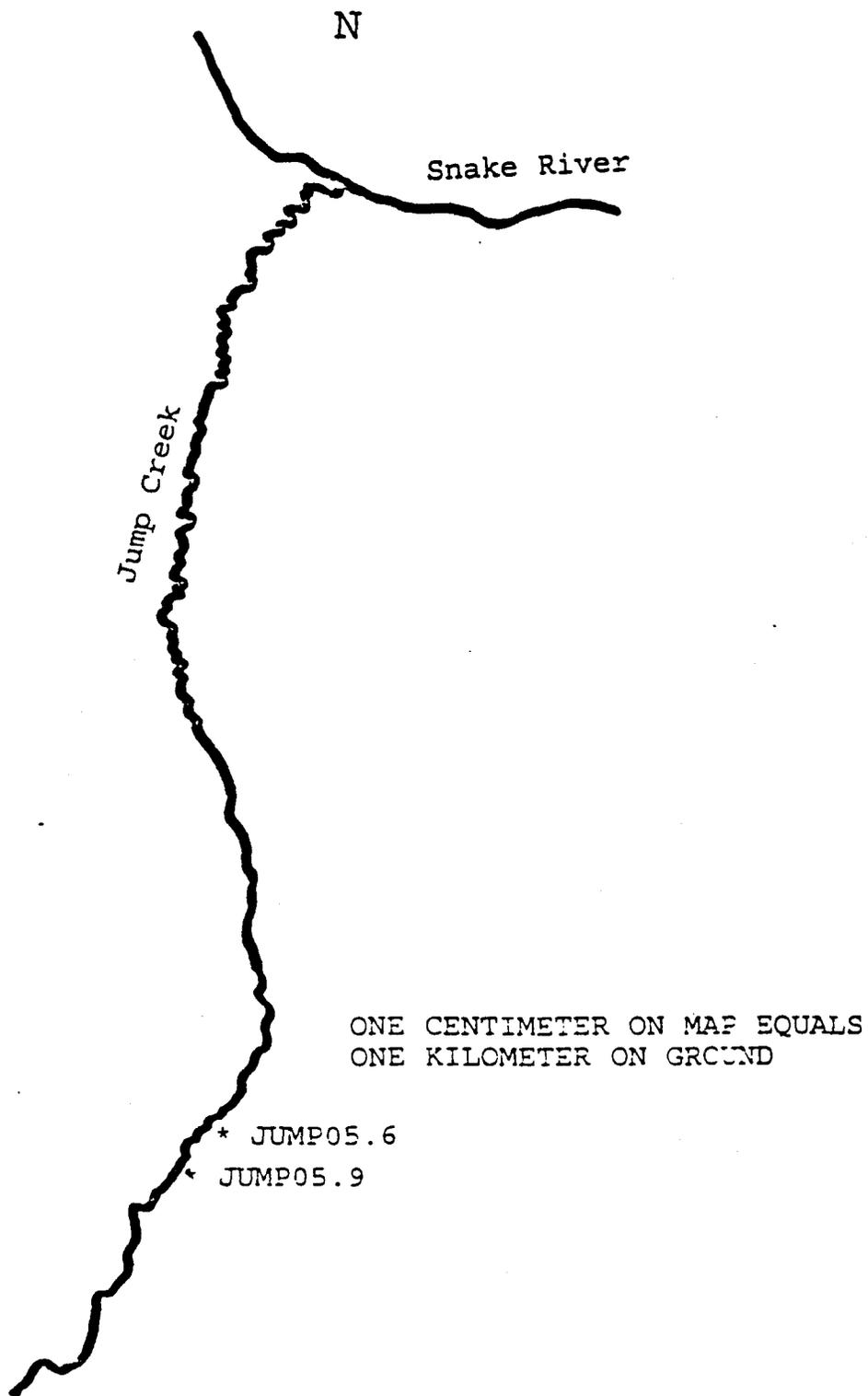
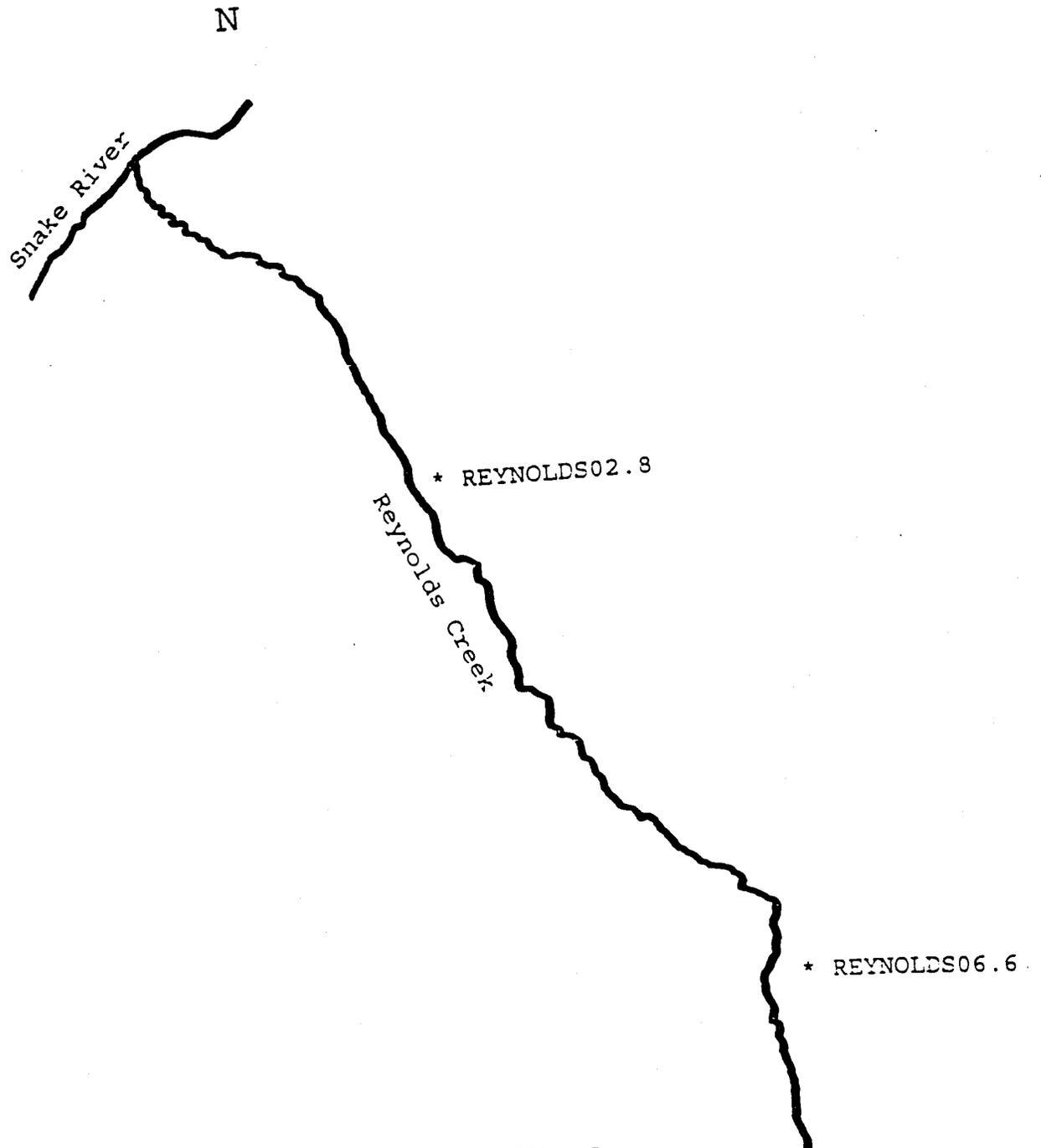


Figure 2. Sample sites in 1994 on Reynolds Creek drainage, Owyhee County, Idaho.



ONE CENTIMETER ON MAP EQUALS
ONE KILOMETER ON GROUND

Figure 3. Sample sites in 1994 on Battle Creek and the Owyhee River, Owyhee County, Idaho.

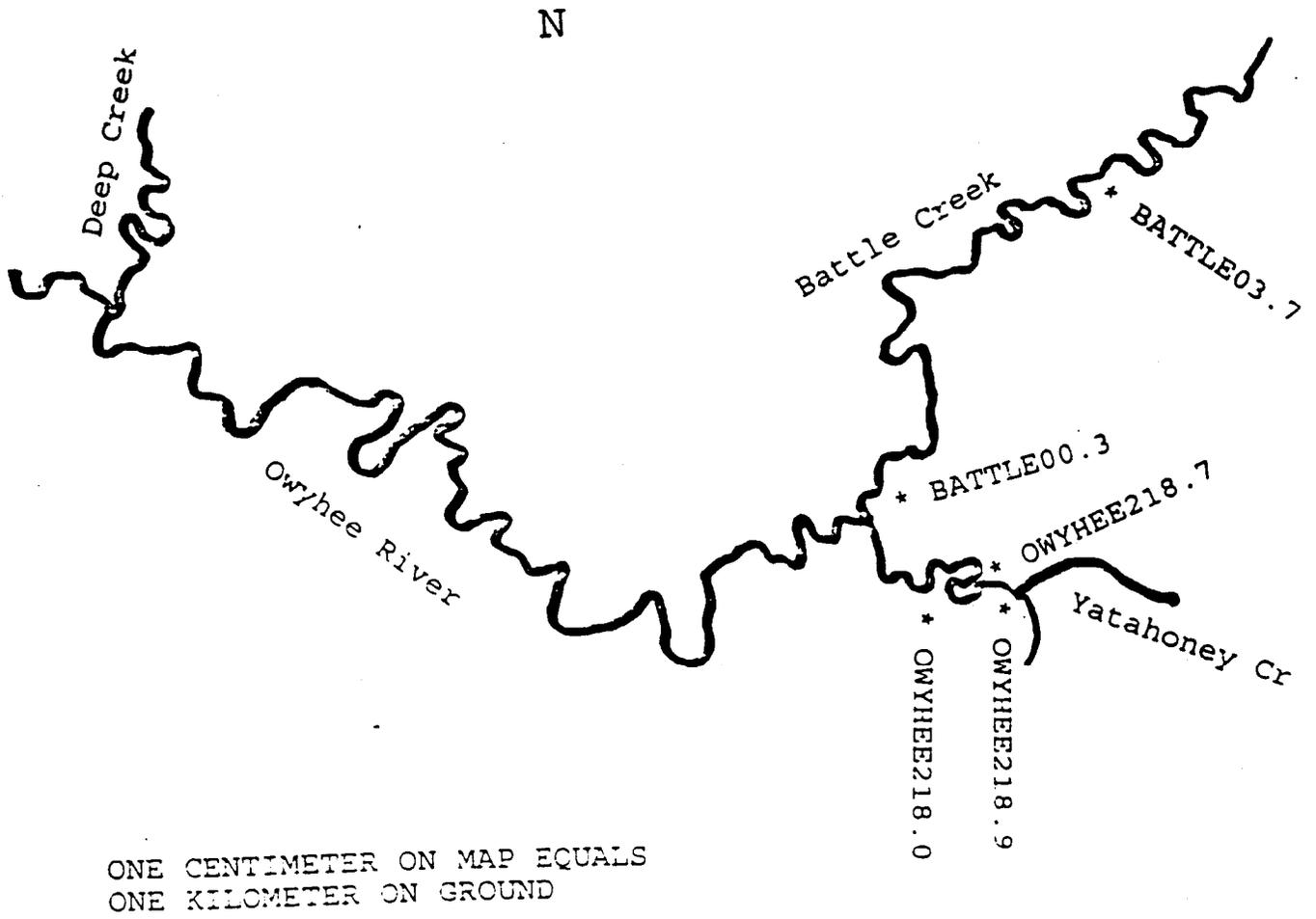
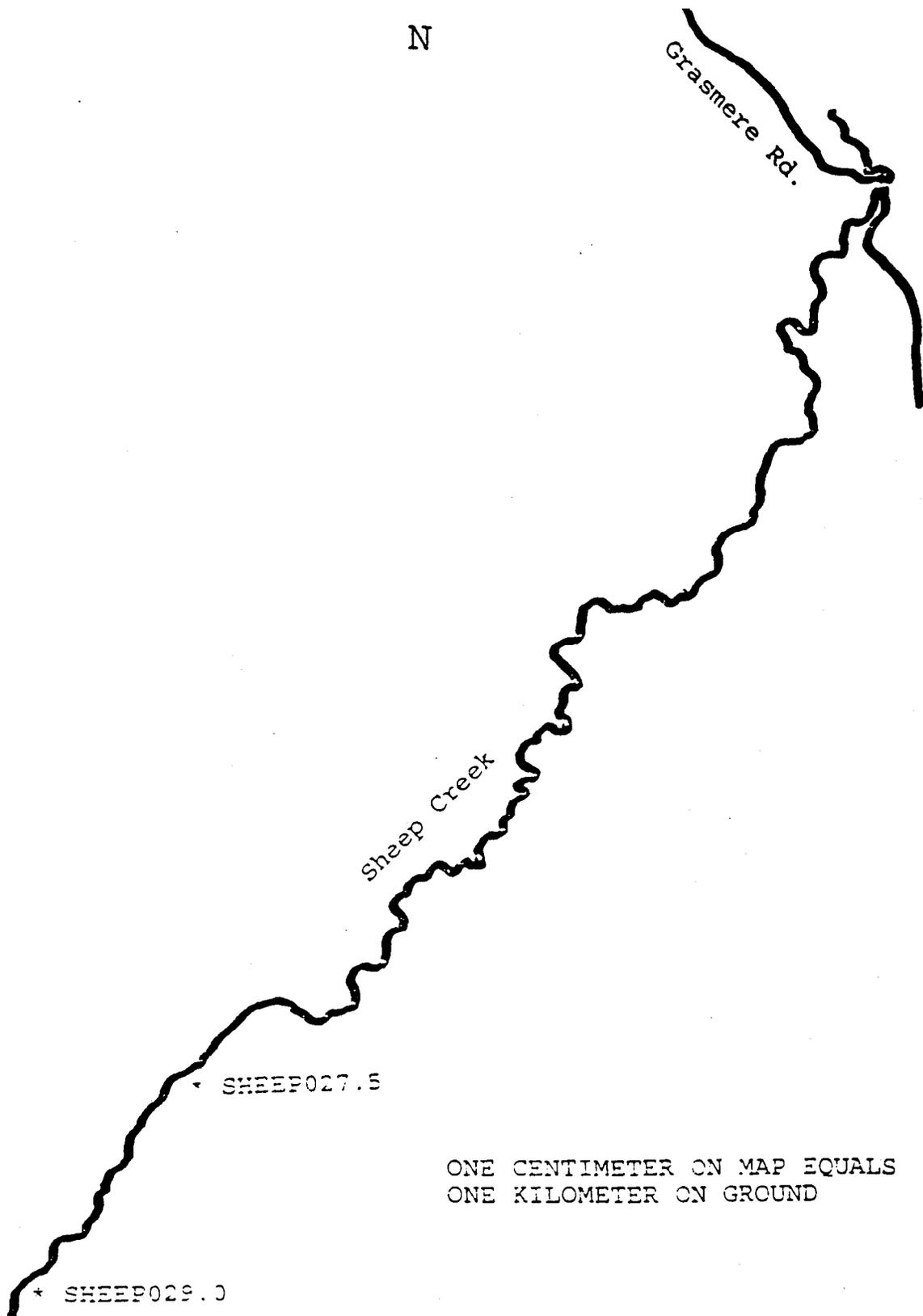


Figure 4. Sample sites in 1994 on Sheep Creek drainage, Owyhee County, Idaho.



Sample sites were approximately 61 m in length. Upper and downstream sample segment boundaries were located at stream constrictions to minimize fish migration during electrofishing.

A Smith-Root Model 15-B backpack electrofishing unit was utilized by two people electrofishing from the lower to the upper sample segment boundaries. All fish species encountered were netted and placed in small net pens placed in the stream. We made three electrofishing passes, removing and segregating the fish from each pass. If no redband trout were encountered on the first pass and collection conditions were considered good, no further electrofishing passes were completed. All trout collected were measured to the nearest mm; weighted to the nearest gram; and a scale sample was collected from at least five fish per centimeter group, if possible; and then released.

Collected trout scales were mounted on acetate sheets and pressed with a Carver Heat Press to create a readable impression in the acetate. The acetate impressions were then used in a microfiche reader where the focus, annuli, and margin were identified and marked on a slip of paper. The annuli marks were entered on a digitizing pad and the DisBCal 89 V1.0 Program in the Fishery Analysis Tools software of the Missouri Department of Conservation. This program produced average back-calculated lengths for each age class of trout.

Redband trout population estimates and confidence intervals were calculated by utilizing the MicroFish 3.0 program developed by Van Deventer and Platts (1987). Population estimates were calculated for all trout captured and for all trout greater than 100 mm in length, creating two estimates for sections where trout were collected. Trout densities were calculated by dividing the population estimate by sampled area and reported as trout/100m²

STREAM HABITAT

Within each stream segment a 61.0 m habitat transect was established. Ten stream widths were measured at 6.1 m intervals beginning 6.1 m (20 feet) from the bottom of transect. At each cross section, depth measurements were taken at 1/4, 1/2, and 3/4 widths across the channel. Substrate composition was determined with standard IDFG methods utilizing a view box and categorizing the substrate by size class (Petrosky and Holubetz, 1988).

Instream fish cover was a subjective visual assessment of several parameters and was recorded for each cross-section as the percentage of the stream width defined as cover. For this study cover was defined as areas where redband trout were likely to be found: (1) pools >0.5 m (>1.5 feet) in depth, (2) overhanging bank vegetation, (3) instream vegetation, (4) near large instream rocks, (5) velocity breaks ie. broken water surface (6) pocket water behind or beside large rocks, (7) near Large woody debris.

Stream gradient was measured using an ocular hand level and a stadia rod. Gradient is the vertical drop between the upstream and downstream boundaries divided by the stream segment length and reported as a percentage.

Streambank stability measurements were a visual assessment to determine the vulnerability of the bank slopes to erosion (Platts, et. al., 1983). Four classes were used to rate the stability of the streambanks. Covered and Stable: over 50 percent of banks in healthy vegetation and/or anchoring rocks. The banks did not show signs of erosion. Covered and Unstable: more than 50 percent of streambank covered by vegetation but signs of erosion were present. Uncovered and Stable: less than 50 percent of stream bank covered by vegetation or anchoring rock. Does not show signs of erosion, ie. banks were bare but not vertical or slumped. Uncovered and Unstable: less than 50 percent covered with vegetation. Banks show some erosion, ie. slumped or vertical bare banks.

Thermal input to the stream waters was measured using a Solar Pathfinder™ following Platts, et. al. (1987). Percent stream shading was reported as the average percent of shading on the stream surface during June through September at 10 points along the stream sample segment.

The "greenline" is the first continuous cover of perennial vegetation above the stable low water level (USDA, 1992). We determined the composition of plant communities along the greenline on both banks for each stream transect. Streambank distances were summed for each community type and the percentage of the total greenline made up by each community type was calculated for each stream segment.

WATER QUALITY

Several water quality parameters were measured at each stream segment. Conductivity and pH measurements were taken with a hand held pen. Alkalinity and Hardness measurements were taken with Hach Company field titration kits. Water temperature was recorded with a pocket thermometer at each site. Recording thermographs were placed in several stream sites, but improper programming resulted in loss of data.

RESULTS AND DISCUSSION

TROUT POPULATIONS

Four of eleven stream segments sampled in 1994 contained redband trout. Three of these sites had been previously sampled and one was new. Population estimates and densities are presented in Table 2. Densities in stream segments containing redband trout ranged from 26.1/100m² in Jump Creek to 0.3/100m² in Sheep Creek for trout greater than 100 mm.

Jump Creek

Both sample sites contained populations of redband trout. Site JUMP005.9 contained only redband trout, no nongame fish were captured. This site lies above the large falls and redband trout were probably man-introduced some time in the past. Redband densities from these two sites were comparable to the range of densities documented in fall 1993 sampling (Allen et al, 1993). 1977 unpublished BLM data documents 12 redband trout captured by electrofishing directly below the falls, this old site lies between the two 1994 sites. IDFG and Department of Environmental Quality personnel were unable to collect any redbands downstream of section 27 in 1992, and the stream was considered much degraded by Cowley and Zaroban (1992).

Reynolds Creek

No redband trout were collected from two Reynolds Creek sampling segments in 1994. However, one redband and two non-redband type trout (non-redband type were differentiated by lack of parr marks, large red lateral -line marks and different spotting patterns) were captured in plunge pools above REYNOLDS006.6, the upper 1994 site. Redband trout have been documented in areas upstream of the town site of Reynolds (BLM unpublished data 1976 and 1977), but the upper drainage was dry in the fall of 1994. The only flows in Reynolds Creek in the fall of 1994 originated from springs in about R4W T2S S13 and entered the lower canyon and flowed to the Snake River.

Owyhee River

No redband trout were collected in three sample sites located above the Battle Creek confluence. These sites were all new in 1994. However, BLM fish distribution maps show redbands were present in the Owyhee River up to the Duck Valley Indian Reservation.

Table 2. Population estimates and redband trout density (trout/100m²) collected in 1994 in select Owyhee County, Idaho streams.

SITE	DATE	POPULATION ESTIMATE (95%CI)	DENSITY TROUT/100M²	DENSITY SIZE>100mm /100M²
JUMP005.6	9/28/94	91(8.4)	58.0	26.1
JUMP005.9	9/28/94	28(2.1)	17.3	11.7
REYNOLDS-002.8	9/29/94	0		
REYNOLDS-006.6	9/27/94	0		
OWYHEE-218.0	10/4/94	0		
OWYHEE-218.7	10/4/94	0		
OWYHEE-218.9	10/4/94	0		
BATTLE-000.3	10/2/94	0		
BATTLE-003.7	10/3/94	0		
SHEEP027.5	10/5/94	6(0.4)	2.1	0.3
SHEEP029.0	10/4/94	9(1.1)	3.4	3.4

Battle Creek

No redband trout were captured in the two stream segments sampled. Several more sample sites were planned in the upper drainage but were dry in late 1994.

Sheen Creek

Redband trout were captured at both sample sites in 1994. SHEEP027.5 was a resample of a 1980 BLM survey. A population of 2 trout per 200 feet of stream was documented in 1980 versus a population estimate of 6 (± 0.4) in 200 feet of stream in 1994. The upper site SHEEP029.0 was a new site in 1994 and yielded a population estimate of 9 redband trout (Table 2). Sheep Creek was dry at the Grasmere road crossing approximately 8 km downstream of the SHEEP027.5 site, by fall.

NONGAME FISH SPECIES

Several nongame species were collected at all sites except JUMP2 which contained only redband trout. Species observed were: Speckled Dace, *Rhinichthys osculus*; Longnose Dace, *Rhinichthys cataractae*; Redside Shiner, *Richardsonius balteatus*; Chiselmouth, *Acrocheilus alutaceus*; Northern Squawfish, *Ptychocheilus oregonensis*; Smallmouth Bass, *Micropterus dolomieu*; Bridgeline Sucker, *Catostomus columbianus*; Mountain Whitefish, *Prosopium williamsoni*; and Mottled Sculpin, *Cottus bairdi*. A matrix table of species occurrence and location is presented in Table 3.

REDBAND TROUT AGE AND GROWTH

Most scales collected from redband trout were regenerated as was noted in Allen et al. 1993. Segments JUMP005.6 and JUMP005.9 scale samples show similar patterns of yearly growth. Length frequencies of these two segments were similar (Figures 5 and 6). The length frequencies from SHEEP027.5 and SHEEP029.0 document missing age classes of redband trout in that stream reach (Figures 7 and 8).

HABITAT

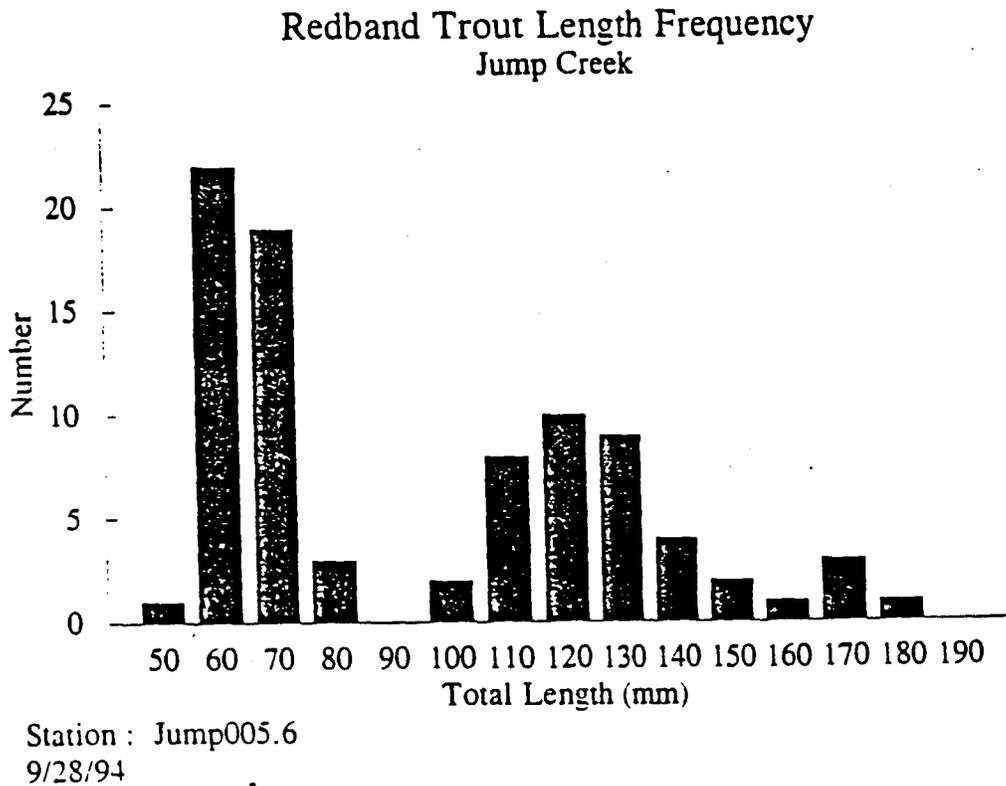
Habitat variables were collected consistent with the 1993 surveys Allen, et al., 1993. The data were collected to provide baseline riparian habitat conditions. Habitat variables of mean stream width, depth, substrate composition, and gradient are presented in Table 4. Assessment of instream fish habitat is provided by sample site in Table 5. Percent of streambank cover and streambank stability is presented in Table 6. Percent of stream shading derived from the Solar Pathfinder™ is summarized in Table 7. The percent of vegetative community types, "greenline" for each stream segment are presented in Appendix A.

Table 3. Fish species occurrence by sample location in 1994 *in* sampled stream segments in Owyhee County, Idaho.

SITE	WF	RBT	SMB	RSS	SPD	BLS	LND	MTS	CSM	
JUMP-005.6		X			X	X				
JUMP-005.9		X								
REYN-002.8				X	X	X				
REYN-006.6					X					
OWYH - 218.0			X		X	X	X	X	X	X
OWYH-218.7			X	X	X	X	X	X		X
OWYH - 218.9	X		X	X	X	X	X	X	X	
BATT-000.3				X	X	X	X	X	X	
BATT-003.7			X	X	X	X		X	X	X
SHEEP 027.5		X		X	X	X				X
SHEEP 029.0		X			X	X				

WF = MOUNTAIN WHITEFISH
RBT = REDBAND RAINBOW TROUT
SMB = SMALLMOUTH BASS
RSS = REDSIDE SHINNER
SPD = SPECKLED DACE
BLS = BRIDGELIP SUCKER
LND = LONGNOSE DACE
MTS = MOTTLED SCULPIN
CSM = CHISELMOUTH
SQF = SQUAWFISH

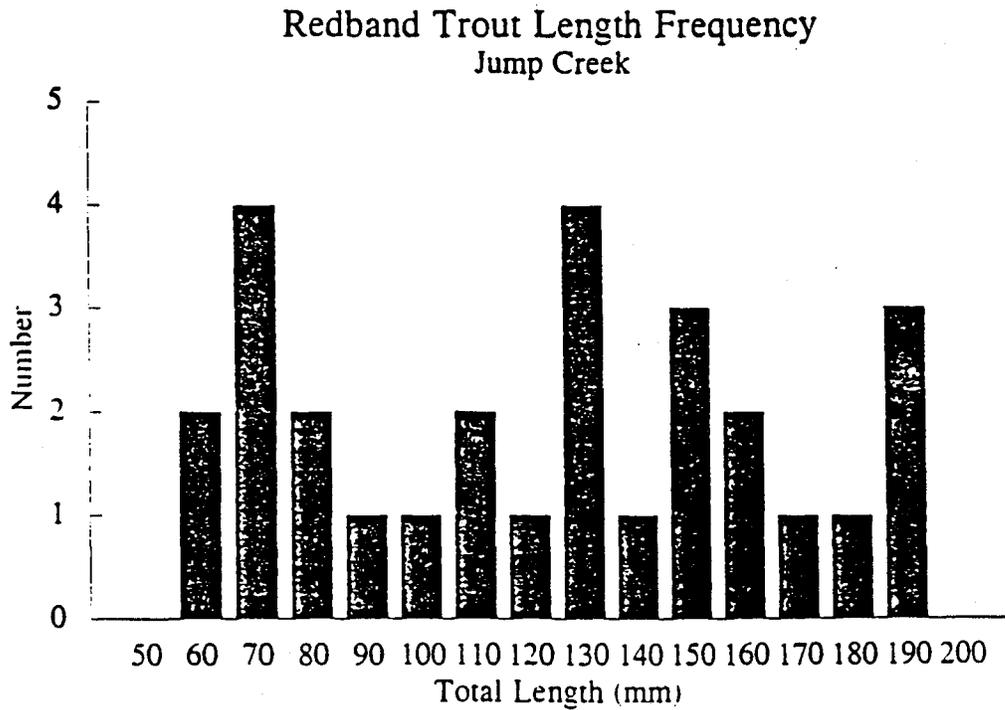
Figure 5. Length frequency and average back-calculated length at age for redband trout on stream segment JUMP005.6 in 1994 in Owyhee County, Idaho.



AVERAGE BACK-CALCULATED LENGTHS (mm) FOR EACH AGE CLASS

<u>YEAR CLASS</u>	<u>AGE</u>	<u>n</u>	<u>BACK-CALCULATION AGE</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
1993	1	0			
1992	2	15	86.83	124.0	
1991	3	3	95.22	137.3	161.67
<u>ALL CLASSES</u>			88.23	126.22	161.67
<u>n</u>		18	18	18	3

Figure 6. Length frequency and average back-calculated length at age class for redband trout on stream segment JUMP005.9 in 1994 in Owyhee County, Idaho.

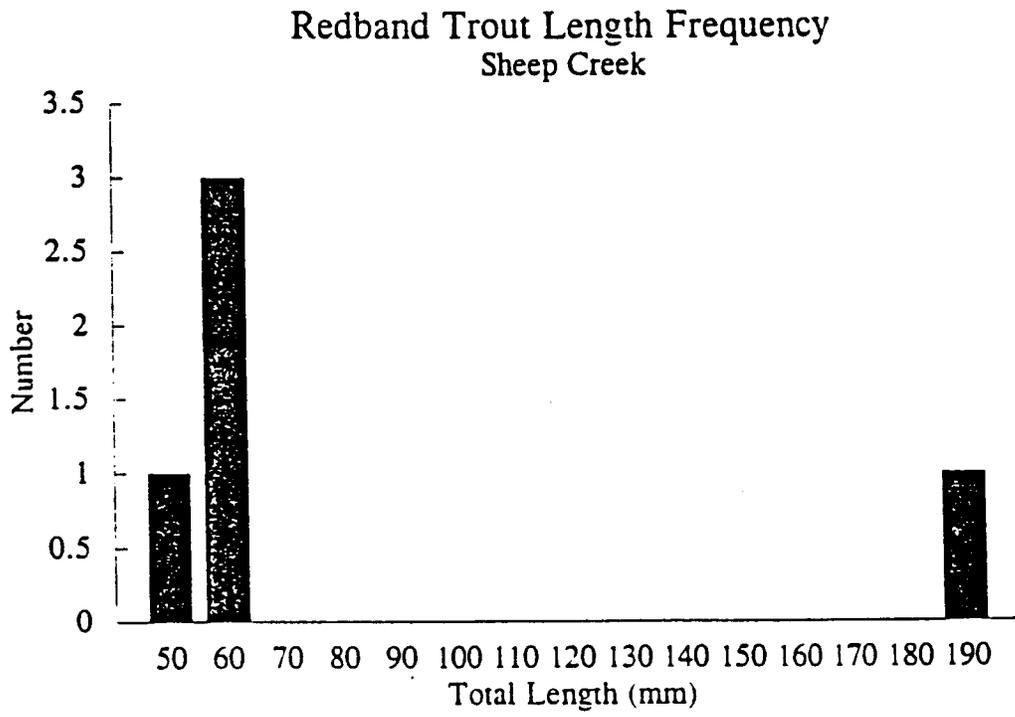


Station: Jump005.9
9/28/94

AVERAGE BACK-CALCULATED LENGTHS (mm) FOR EACH AGE CLASS

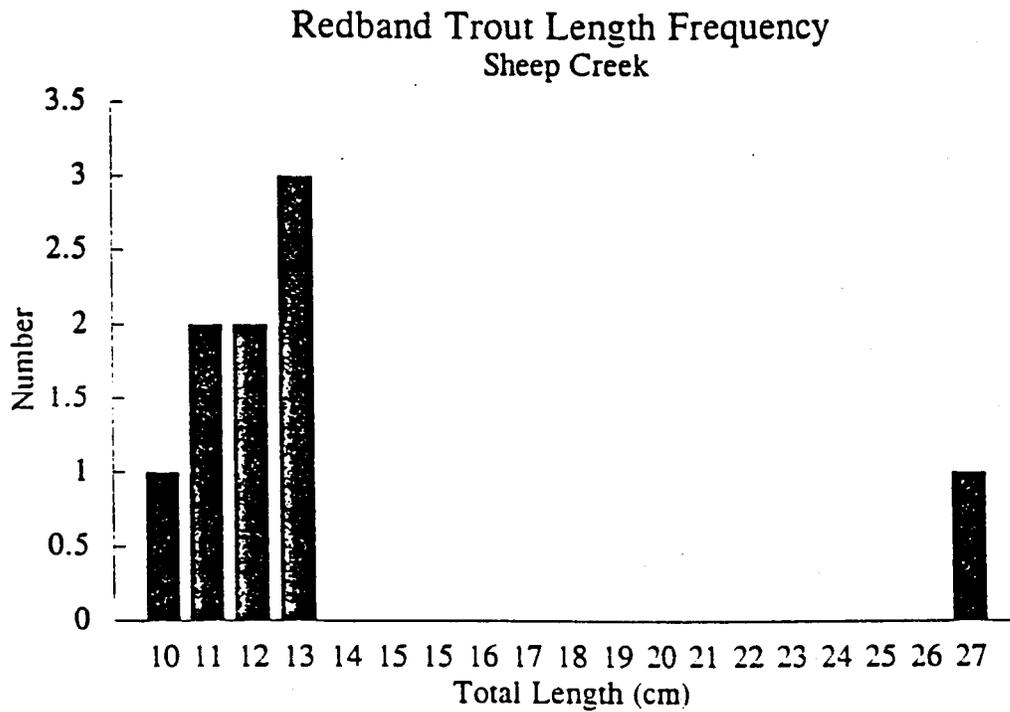
<u>YEAR CLASS</u>	<u>AGE</u>	<u>n:</u>	<u>BACK-CALCULATION AGE</u>			
			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
1993	1	0				
1992	2	12	89.16	123.75		
1991	3	5	87.37	135.33	172.00	
1990	4	1	85.47	121.56	163.54	190.0
<hr/>						
ALL CLASSES			85.46	126.34	170.59	190
18		18	18	18	6	1

Figure 7. Length frequency of redband trout on stream segment SHEEP027.5 in 1994 in Owyhee County, Idaho.



Station: Sheep0027.5
10/6/94

Figure 8. Length frequency and average back-calculated length at age class for redband trout on stream segment SHEEP029.0 in 1994 in Owyhee County, Idaho.



Station: Sheep029.0
10/5/94

AVERAGE BACK-CALCULATED LENGTHS (mm) FOR EACH AGE CLASS

<u>YEAR CLASS</u>	<u>AGE</u>	<u>n</u>	<u>BACK-CALCULATION AGE</u>			
			<u>2</u>	<u>3</u>	<u>4</u>	
1993	1	0				
1992	2	6	74.21	116.67		
1991	3	0				
1990	4	1	109.38	144.03	222.60	270.0
<hr/>			<hr/>			
ALL CLASSES			79.23	120.58	222.60	270.0
n		7	7	7	1	1

Table 4. Habitat variables of stream length, average width, average depth, percent composition of stream substrate, and percent gradient in 1994 on sampled stream segments in Owyhee County, Idaho.

SITE	LENGTH (m)	WIDTH (m)	DEPTH (m)	% OR- GANIC	% SAND	% GRAV EL	% RUB- BLE	% BOUL - DER	% BED- ROCK	% GRAD- IENT
JUMP-005.6	62.5	2.5	0.13	1.0	39.7	19.0	18.8	21.5	0.0	N/A
JUMP-005.9	53.7	3.0	0.14	1.3	16.0	10.4	14.8	46.0	11.5	4.5
REN02.8	61.0	3.5	0.18	17.3	20.3	15.3	19.3	27.8	0.0	1.2
REN06.6	61.0	2.9	0.23	29.0	26.0	15.7	13.7	15.6	0.0	N/A
OWYHEE-218.0	61.0	12.7	0.37	11.3	44.3	2.0	36.7	5.7	0.0	N/A
OWYHEE-218.7	61.0	5.6	0.21	4.3	7.0	8.3	77.7	2.7	0.0	0.7
OWYHEE-218.9	61.0	7.4	0.25	2.0	7.5	2.0	70.8	17.7	0.0	0.41
BATTLE-000.3	61.0	5.3	0.28	7.3	0.3	17.7	71.7	3.0	0.0	0.29
BATTLE-003.7	61.0	5.5	0.19	0.0	1.0	12.3	64.7	22.0	0.0	0.76
SHEEP-027.5	61.0	4.7	0.16	2.6	17.2	12.5	37.5	29.8	0.0	0.82
SHEEP-029.0	61.0	4.4	0.29	0.0	35.0	6.7	19.7	30.3	8.3	0.80

Table 5. Percent of instream cross-section classified as fish habitat available in sampled stream segments in 1994 in Owyhee County, Idaho.

SITE	PERCENT FISH HABITAT
JUMP005.6	27.5
JUMP005.9	38.8
REYNOLDS002.8	23.0
REYNOLDS006.6	34.5
OWYHEE218.0	37.5
OWYHEE218.7	16.5
OWYHEE218.9	39.0
BATTLE000.3	51.5
BATTLE003.7	30.5
SHEEP027.5	36.5
SHEEP029.0	55.0

Table 6. Streambank stability rating (%) on sampled stream segments in 1994 in Owyhee County, Idaho.

SITE	PERCENT COVERED/ STABLE	PERCENT COVERED/ UNSTABLE	PERCENT UNCOVERED/ STABLE	PERCENT UNCOVERED/ UNSTABLE
JUMP005.6	43.0	21.3	19.3	16.5
JUMP005.9	37.6	0.0	52.9	9.5
REYNOLDS-002.8	88.8	3.2	7.0	1.0
REYNOLDS-006.6	82.2	1.5	15.0	1.3
OWYHEE - 218.0	90.0	0.0	10.0	0.0
OWYHEE-218.7	68.5	0.0	31.5	0.0
OWYHEE-218.9	40.0	0.0	60.0	0.0
BATTLE-000.3	66.5	9.2	22.5	1.8
BATTLE-003.7	80.0	12.5	7.5	0.0
SHEEP027.5	50.5	0.0	32.5	17.0
SHEEP029.0	75.2	4.1	16.2	4.5

Table 7. Percent of stream shading on sampled stream segments *in* 1994 in Owyhee County, Idaho.

SITE	PERCENT SHADING
JUMP005.6	72.6
JUMP005.9	70.3
REYNOLDS002.8	49.5
REYNOLDS006.6	13.8
OWYHEE218.0	31.9
OWYHEE218.7	7.7
OWYHEE218.9	33.6
BATTLE000.3	25.7
BATTLE003.7	18.4
SHEEP027.5	20.4
SHEEP029.0	12.8

WATER QUALITY

Water quality variables measured during 1994 are presented in Table 8. The parameters measured are all acceptable to trout survival. Reynolds Creek has higher conductivity, alkalinity, and hardness than all other sites because this water all originated out of spring flows. Reynolds, Battle, and Sheep Creeks all had limited flows and were dry over much of their drainage by fall. The lack of water limited the amount of survey work completed.

CONCLUSION

Only four of eleven sites sampled contained redband trout in the fall of 1994. Reynolds, Battle, and Sheep Creeks had stream reaches that were dry and reduced the number of planned sample sites. Drought conditions and agricultural water diversion affects stream flows in many Owyhee County streams. Redband trout populations have been reduced from the 1970's in many drainages.

RECOMMENDATIONS

1. Complete survey of major Owyhee County stream drainages. Increase intensity of sampling to positively identify the presence/absence and develop population estimates of redband trout populations on a drainage basis county wide.
2. Collect and analyze trout tissue samples to determine the genetic purity of Owyhee County redband trout populations.
3. Monitor seasonal stream temperatures with recording thermograph placed into stream segments to be sampled.
4. Establish several 10-20 hectare stream and riparian exclosures and monitor the changes to the riparian area, stream channel, and fish populations over time.

Table 8. Water quality sampling results from sampled stream segments in 1994 in Owyhee County, Idaho.

SITE	DATE	WATER TEMP (C)	ph	CONDUCTIVITY Us/cm	HARDNESS mg/1	ALKALINITY mg/1
JUMP005.6	9/28	13.9	8.3	310	100	120
JUMP005.9	9/28	14.4	8.5	270	120	140
REYNOLDS-002.8	9/29	15.5	8.5	1270	320	300
REYNOLDS-006.6	9/27	14.4	8.5	1330	440	460
OWYHEE-218.0	10/4	7.8	9.2	290	80	120
OWYHEE-218.7	10/4	10.0	9.3	270	100	140
OWYHEE-218.9	10/4	11.7	9.7	270	80	140
BATTLE-000.3	10/3	8.3	8.0	180	60	100
BATTLE-003.7	10/2	16.7	9.2	200	60	80
SHEEP-027.5	10/5	6.1	8.6	190	80	100
SHEEP-029.0	10/4	7.8	8.8	170	80	100

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APPENDIX A.

**STREAM SAMPLING SYNOPSIS OF SECTIONS OF JUMP, REYNOLDS, BATTLE,
AND SHEEP CREEKS, AND SECTIONS OF THE OWYHEE RIVER COLLECTED IN
THE FALL OF 1994**

REDBAND TROUT STREAM SAMPLING SYNOPSIS

STREAM SEGMENT NAME: JUMP005.6

DATE: 9/28/94

LOCATION: T2N R5W S27 NW SE

LAT/LONG: N 43 28.75/ W 116 55.38

IRIS: 17050103-023

SITE DESCRIPTION: TOP OF SECTION IS APPROX. 10 M BELOW STEEL
STAIRCASE AT LOWER END OF PARKING LOT

TROUT POPULATION ESTIMATE: 91 (8.4)

DENSITY/100M²: 58.0

DENSITY TROUT >100mm/100M²: 26.1

WATER QUALITY MEASUREMENTS:

TEMP: 13.9

pH: 8.3

CONDUCTIVITY uS/cm: 310

HARDNESS mg/1:100

ALKALINITY mg/1:120

HABITAT VARIABLES:

SAMPLE LENGTH (m): 62.5

AVERAGE WIDTH (m): 2.5

AVERAGE DEPTH (m): 0.13

PERCENT GRADIENT: N/A

SUBSTRATE COMPOSITION:

% ORGANIC: 1.0 SAND: 39.7

% GRAVEL: 19.0

% RUBBLE: 18.8

% BOULDER: 21.5

% BEDROCK: 0

PERCENT STREAM SHADE: 72.6 PERCENT

STREAM FISH HABITAT: 27.5

GREENLINE--PERCENT VEGETATIVE COMMUNITY TYPES:

21.5 ALNUS

11.6 SCIRPUS SPP

00.3 RHUS RADICANS

06.5 BOULDER

49.3 ALNUS/SCIRPUS

10.8 MESIC FORB

REDBAND TROUT STREAM SAMPLING SYNOPSIS

STREAM SEGMENT NAME: JUMP005.9

DATE: 9/28/94

IRIS: 17050103-023

LOCATION: T2N R5W S27 SW SW

LAT/LONG: N 43 28.58/ W 116 55.50

SITE DESCRIPTION: SECTION STARTS AT FIRST POOL ABOVE MAIN JUMP CR FALLS AND GOES UPSTREAM. WE CLIMBED UP ON WEST SIDE OF FALLS.

TROUT POPULATION ESTIMATE: 28 (2.1)

DENSITY/100M²: 17.3

DENSITY TROUT >100mm/100M²: 11.7

WATER QUALITY MEASUREMENTS:

TEMP: 14.4

pH: 8.5

CONDUCTIVITY uS/cm: 270

HARDNESS mg/1:120

ALKALINITY mg/1:140

HABITAT VARIABLES:

SAMPLE LENGTH (m): 53.7

AVERAGE WIDTH (m): 3.0

AVERAGE DEPTH (m): 0.14

PERCENT GRADIENT: 4.5

SUBSTRATE COMPOSITION:

% ORGANIC: 1.3

% SAND: 16.0

% GRAVEL: 10.4

% RUBBLE: 14.8

% BOULDER: 46.0

% BEDROCK: 11.5

PERCENT STREAM SHADE: 70.3

PERCENT STREAM FISH HABITAT: 38.8

GREENLINE--PERCENT VEGETATIVE COMMUNITY TYPES:

10.8 ALNUS

04.0 SCIRPUS

04.3 RHUS RADICANS

45.2 BOULDER

25.6 ALNUS/RHUS RADICANS

10.2 SYRINGA

REDBAND TROUT STREAM SAMPLING SYNOPSIS

STREAM SEGMENT NAME: REYNOLDS002.8

DATE: 9/29/94

LOCATION: T1S R3W S22 NW NW
LAT/LONG: N 43 19.38/ W 116 41.20
IRIS: 17050103-033

SITE DESCRIPTION: SECTION ENDS AT FENCE CROSSING THE STREAM. YOU MUST DRIVE UP TO PARKING AREA THAT ENDS AT NE END OF PRIVATE GROUND AT MOUTH OF LOWER CANYON, CEMETERY LANE.

TROUT POPULATION ESTIMATE: 0

DENSITY/100M² : 0 DENSITY TROUT >100mm/100M² : 0

WATER QUALITY MEASUREMENTS:

TEMP: 15.5
pH: 8.5
CONDUCTIVITY uS/cm:1270
HARDNESS mg/1:320
ALKALINITY mg/1:300

HABITAT VARIABLES:

SAMPLE LENGTH (m) : 61.0
AVERAGE WIDTH (m) : 3.5
AVERAGE DEPTH (m) : 0.18
PERCENT GRADIENT: 1.2

SUBSTRATE COMPOSITION:

% ORGANIC: 17.3
% SAND: 20.3
% GRAVEL: 15.3
% RUBBLE: 19.3
% BOULDER: 27.8
% BEDROCK: 0.0

PERCENT STREAM SHADE: 49.5
PERCENT STREAM FISH HABITAT: 23.0

GREENLINE--PERCENT VEGETATIVE COMMUNITY TYPES:

1.75 ALNUS
09.5 SALIX EXIGUA
48.5 ELEOCHARIS
27.75 SALIX AMYGDALOIDUS
07.0 ACER GLABRUM
03.0 TAMARIX SPP

REDBAND TROUT STREAM SAMPLING SYNOPSIS

STREAM SEGMENT NAME: REYNOLDS006.6

DATE: 9/27/94

LOCATION: T2S R4W S12 SE SE
LAT/LONG: N 43 15.83/ W 116 45.06
IRIS: 17050103-035

SITE DESCRIPTION: SECTION ENDS ABOUT 400 M BELOW LARGE CONCRETE WEIR. THIS IS BELOW THE AREA OF LARGE BOULDERS. KIND OF THE FIRST AREA THAT HAS RIFFLES AND RUNS AND LESS GRADIENT. 2 REDBAND AND 2 CATCHABLE RBT WERE CAPTURED ABOVE SECTION IN PLUNGE POOLS IN 10 MINUTES OF SHOCKING.

TROUT POPULATION ESTIMATE: 0

DENSITY/100M²: 0 DENSITY TROUT >100mm/100M²: 0

WATER QUALITY MEASUREMENTS:

TEMP: 14.4
pH: 8.5
CONDUCTIVITY uS/cm:
1330 HARDNESS mg/1:440
ALKALINITY mg/1:460

HABITAT VARIABLES:

SAMPLE LENGTH (m): 61.0
AVERAGE WIDTH (m): 2.9
AVERAGE DEPTH (m): 0.23
PERCENT GRADIENT: N/A

SUBSTRATE COMPOSITION:

% ORGANIC: 29.0
% SAND: 26.0
% GRAVEL: 15.7
% RUBBLE: 13.7
% BOULDER: 15.6
% BEDROCK: 0.0

PERCENT STREAM SHADE: 13.8
PERCENT STREAM FISH HABITAT: 34.5

GREENLINE--PERCENT VEGETATIVE COMMUNITY TYPES:

25.0 SALIX EXIGUA
48.25 MESIC GRASS
07.25 ELEOCHARIS
01.75 SCIRPUS
15.5 BARREN
02.25 WATERCRESS

REDBAND TROUT STREAM SAMPLING SYNOPSIS

STREAM SEGMENT NAME: BATTLE000.3

DATE: 10/3/94

LOCATION: T13S R2W S1 NW NE

LAT/LONG: N 42 14.43/ W 116 31.37

IRIS: 17050104-077

SITE DESCRIPTION: SECTION LIES APPROX 500 M ABOVE MOUTH. THE SECTION IS ABOVE THE DEEP POOLS AND IS ON THE EAST SIDE OF THE CANYON WHERE THE CANYON STARTS TO OPEN UP ON THE EAST SIDE.

TROUT POPULATION ESTIMATE: 0

DENSITY/100M² : 0

DENSITY TROUT >100mm/100M² : 0

WATER QUALITY MEASUREMENTS:

TEMP: 8.3

pH: 8.0

CONDUCTIVITY uS/cm: 180

HARDNESS mg/1:60

ALKALINITY mg/1:100

HABITAT VARIABLES:

SAMPLE LENGTH (m): 61.0

AVERAGE WIDTH (m): 5.3

AVERAGE DEPTH (m): 0.28

PERCENT GRADIENT: 0.29

SUBSTRATE COMPOSITION:

% ORGANIC: 7.3

% SAND: 0.3

% GRAVEL: 17.7

% RUBBLE: 71.7

% BOULDER: 3.0

% BEDROCK: 0.0

PERCENT STREAM SHADE: 25.7 PERCENT

STREAM FISH HABITAT: 51.5

GREENLINE--PERCENT VEGETATIVE COMMUNITY TYPES:

04.5 SCIRPUS

51.5 SALIX EXIGUA

11.5 ELEOCHARIS

20.0 EQUISETUM/SAEX

03.0 EQUISETUM

01.25 CORNUS STOLONIFERA

08.25 BARREN

REDBAND TROUT STREAM SAMPLING SYNOPSIS

STREAM SEGMENT NAME: BATTLE003.7

DATE: 10/2/94

LOCATION: T13S R1W S20 SW SW

LAT/LONG: N 42 16.84/ W 116 28.72

IRIS: 1705014-079

SITE DESCRIPTION: DRIVE ON SMALL SIDE TRAIL TOWARDS SEC 20 THE TRAIL ENDS AT BATTLE CR CANYON RIM. YOU WALK DOWN RIDGE THAT HEADS WEST INTO CANYON, NO TRAIL. THE SECTION LIES IN THE CORNER AND RUNS NORTH TO SOUTH.

TROUT POPULATION ESTIMATE: 0

DENSITY/100M² : 0

DENSITY TROUT >100mm/100M² : 0

WATER QUALITY MEASUREMENTS:

TEMP: 16.7

pH: 9.2

CONDUCTIVITY uS/cm: 200

HARDNESS mg/1:60

ALKALINITY mg/1:80

HABITAT VARIABLES:

SAMPLE LENGTH (m): 61.0

AVERAGE WIDTH (m): 5.5

AVERAGE DEPTH (m): 0.19

PERCENT GRADIENT: 0.76

SUBSTRATE COMPOSITION:

% ORGANIC: 0.0

% SAND: 1.0

% GRAVEL: 12.3

% RUBBLE: 64.7

% BOULDER: 22.0

% BEDROCK: 0.0

PERCENT STREAM SHADE: 18.4

PERCENT STREAM FISH HABITAT: 30.5

GREENLINE--PERCENT VEGETATIVE COMMUNITY TYPES:

26.75 SCIRPUS

41.75 SALIX EXIGUA

17.75 ELEOCHARIS

01.0 EQUISETUM

06.75 MESIC GRASS

06.0 CORNUS STOLONIFERA

REDBAND TROUT STREAM SAMPLING SYNOPSIS

STREAM SEGMENT NAME: OWYHEE218.0

DATE: 10/4/94

LOCATION: T14S R2W S1 SE SW

LAT/LONG: N 42 13.73/ W 116 30.92

IRIS: 17050104-008

SITE DESCRIPTION: SECTION LIES IN STREAM BEND JUST ABOVE OLD STONE HOMESTEAD WHERE THE ROAD ENDS APPROXIMATELY 3/4 MILE ABOVE BATTLE CREEK MOUTH. TAKE 4X4 ROAD WEST OUT OF RIDDLE ALL THE WAY TO THE OWYHEE RIVER AND DOWN THE CUT IN RIM TO THE RIVER. THE BEND IS ABOUT 400 M FROM WHERE YOU PARK.

TROUT POPULATION ESTIMATE: 0

DENSITY/100M²: 0

DENSITY TROUT >100mm/100M²: 0

WATER QUALITY MEASUREMENTS:

TEMP: 7.8

pH: 9.2

CONDUCTIVITY uS/cm:290

HARDNESS mg/1:80

ALKALINITY mg/1:120

HABITAT VARIABLES:

SAMPLE LENGTH (m): 61.0

AVERAGE WIDTH (m): 12.7

AVERAGE DEPTH (m): 0.37

PERCENT GRADIENT: N/A

SUBSTRATE COMPOSITION:

% ORGANIC: 11.3

% SAND: 44.3

% GRAVEL: 2.0

% RUBBLE: 36.7

% BOULDER: 5.7

% BEDROCK: 0.0

PERCENT STREAM SHADE: 31.9

PERCENT STREAM FISH HABITAT: 37.5

GREENLINE--PERCENT VEGETATIVE COMMUNITY TYPES:

16.5 SCIRPUS AMER/ EQUISETUM

19.0 SCIRPUS AMER/ELEOCHARIS

33.5 ELEOCHARIS

01.25 EQUISETUM

14.5 PHALARIS ARUNINACEA

15.25 SCIRPUS ACUTUS/CAREX LANUGINOSA

REDBAND TROUT STREAM SAMPLING SYNOPSIS

STREAM SEGMENT NAME: OWYHEE218.7

DATE: 10/4/94

LOCATION: T14S R1W S6 SW SW
LAT/LONG: N 42 13.72/ W 116 30.56
IRIS: 17050104-008

SITE DESCRIPTION: SECTION LIES ABOVE HUGE BEND THAT HAS LARGE SAND BAR AREA. THE SECTION IS THE FIRST RIFFLE POOL ABOVE THE BIG BEND THAT IS NARROW ABOUT A HALF HOUR WALK ABOVE THE HOMESTEAD PLACE. THE RIVER RUNS INTO THE NORTH CLIFF AT THE LOWER END OF THE SECTION.

TROUT POPULATION ESTIMATE: 0

DENSITY/100M²: 0 DENSITY TROUT >100mm/100M²: 0

WATER QUALITY MEASUREMENTS:

TEMP: 10.0

pH: 9.3

CONDUCTIVITY uS/cm: 270

HARDNESS mg/1:100

ALKALINITY mg/1:140

HABITAT VARIABLES:

SAMPLE LENGTH (m): 61.0

AVERAGE WIDTH (m): 5.6

AVERAGE DEPTH (m): 0.21

PERCENT GRADIENT: 0.7

SUBSTRATE COMPOSITION:

% ORGANIC: 4.3

% SAND: 7.0

% GRAVEL: 8.3

% RUBBLE: 77.7

% BOULDER: 2.7

% BEDROCK: 0.0

PERCENT STREAM SHADE: 7.7

PERCENT STREAM FISH HABITAT: 16.5

GREENLINE--PERCENT VEGETATIVE COMMUNITY TYPES:

02.6 BARREN

00.75 SCIRPUS AMER

13.25 ELEOCHARIS

09.25 EQUISETUM

28.5 SALIX EXIGUA

42.3 ELOECHARIS/SCIRPUS/EQUIS

03.2 MESIC GRASS

REDBAND TROUT STREAM SAMPLING SYNOPSIS

STREAM SEGMENT NAME: OWYHEE218.9

DATE: 10/4/94

LOCATION: T14S R1W S6 SW SE

LAT/LONG: N 42 13.66/ W 116 30.15

IRIS: 17050104-008

SITE DESCRIPTION: SECTION LIES JUST BELOW YATAHONEY CREEK MOUTH. SECTION STARTS A LOWER END OF RIFFLE WITH SEVERAL BOULDERS IN IT AND RUNS UP TO RUN JUST BELOW CREEK MOUTH. SECTION IS ABOUT 45 MINUTE WALK FROM HOMESTEAD ON THE RIVER.

TROUT POPULATION ESTIMATE: 0

DENSITY/100M²

0

DENSITY TROUT >100mm/100M² : 0

WATER QUALITY MEASUREMENTS:

TEMP: 11.7

pH: 9.7

CONDUCTIVITY uS/cm: 270

HARDNESS mg/1:80

ALKALINITY mg/1:140

HABITAT VARIABLES:

SAMPLE LENGTH (m): 61.0

AVERAGE WIDTH (m): 7.4

AVERAGE DEPTH (m) : 0.25

PERCENT GRADIENT: 0.41

SUBSTRATE COMPOSITION:

% ORGANIC: 2.0

% SAND: 7.5

% GRAVEL: 2.0

% RUBBLE: 70.8

% BOULDER: 17.7

% BEDROCK: 0.0

PERCENT STREAM SHADE: 33.6

PERCENT STREAM FISH HABITAT: 39.0

GREENLINE--PERCENT VEGETATIVE COMMUNITY TYPES:

43.5 MESIC GRASS

07.5 SCIRPUS AMER

11.0 ELEOCHARIS

28.5 EQUISETUM/SOLIDAGO

03.0 EQUISETUM/APOCYNUM

06.5 SOLIDAGO

03.2 MESIC GRASS

REDBAND TROUT STREAM SAMPLING SYNOPSIS

STREAM SEGMENT NAME: SHEEP027.5

DATE: 10/5/94

LOCATION: T15S R5E S33 NE NW

LAT/LONG: N 42 05.16/ W 115 52.30

IRIS: 17050102-045

SITE DESCRIPTION: THE SECTION STARTS JUST ABOVE THE FOOTBRIDGE THAT IS ON THE OLD PACK TRAIL THAT IS MARKED ON MAP. YOU HAVE TO HIKE IN ABOUT 1.5 MILES DOWN THE PACK TRAIL, YOU CAN DRIVE TO THE PACK TRAIL THE ROAD EXTENDS FURTHER THAN SHOWN ON THE MAP.

TROUT POPULATION ESTIMATE: 6 (0.4)

DENSITY/100M²: 2.1

DENSITY TROUT >100mm/100M²: 0.3

WATER QUALITY MEASUREMENTS:

TEMP: 6.1

pH: 8.6

CONDUCTIVITY μ S/cm: 190

HARDNESS mg/1:80

ALKALINITY mg/1:100

HABITAT VARIABLES:

SAMPLE LENGTH (m): 61.0

AVERAGE WIDTH (m): 4.7

AVERAGE DEPTH (m): 0.16

PERCENT GRADIENT : 0.82

SUBSTRATE COMPOSITION:

% ORGANIC: 2.6

% SAND: 17.2

% GRAVEL: 12.5

% RUBBLE: 37.5

% BOULDER: 29.8

% BEDROCK: 0.0

PERCENT STREAM SHADE: 20.4

PERCENT STREAM FISH HABITAT: 36.5

GREENLINE--PERCENT VEGETATIVE COMMUNITY TYPES:

34.25 SALIX EXIGUA 00.5 ARTEMISIA

41.0 EQUISETUM 02.0 APOCYNUM

05.0 SALIX LUTEA

02.0 BROMUS INERMIS

02.75 SALIX LASIANDRA

01.5 ROSA WOODSII

11.0 ALNUS

REDBAND TROUT STREAM SAMPLING SYNOPSIS

STREAM SEGMENT NAME: SHEEP029.0

DATE: 10/4/94

LOCATION: T16S R5E S7 NW SW

LAT/LONG: N 42 03.21/ W 115 54.52

IRIS: 17050102-045

SITE DESCRIPTION: THE SECTION LIES AT THE NE CORNER OF ROUGH MOUNTAIN ABOVE BRUSH CREEK ABOUT 300 M. HIKE DOWN FROM WHERE THE ROAD QUITS ABOUT A MILE TO THE CANYON RIM. THE SECTION STARTS ABOUT WHERE YOU END UP AFTER COMING DOWN THE STEEP CANYON SLOPE

TROUT POPULATION ESTIMATE: 9 (1.1)

DENSITY/100M²: 3.4

DENSITY TROUT >100mm/100M²: 3.4

WATER QUALITY MEASUREMENTS:

TEMP: 7.8

pH: 8.8

CONDUCTIVITY uS/cm: 170

HARDNESS mg/1:80

ALKALINITY mg/1:100

HABITAT VARIABLES:

SAMPLE LENGTH (m): 61.0

AVERAGE WIDTH (m): 4.4

AVERAGE DEPTH (m): 0.29

PERCENT GRADIENT: 0.80

SUBSTRATE COMPOSITION:

% ORGANIC: 0.0

% SAND: 35.0

% GRAVEL: 6.7

% RUBBLE: 19.7

% BOULDER: 30.3

% BEDROCK: 8.3

PERCENT STREAM SHADE: 12.8

PERCENT STREAM FISH HABITAT: 55.0

GREENLINE--PERCENT VEGETATIVE COMMUNITY TYPES:

46.0 SALIX EXIGUA 03.75 CLEMATIS LIGUSTICIFOLIA

01.75 CORNUS STOLON. 02.0 MESIC GRASS

13.5 SALIX LUTEA 01.5 SALIX BOOTHII

03.75 BROMUS INERMIS 00.5 CAREX SPP

12.75 SALIX LASIANDRA

10.0 ROSA WOODSII

04.0 ALNUS