Bureau of Fisheries Stream Habitat Surveys

Clearwater, Salmon, Weiser, and Payette River Basins

Summary Report 1934 - 1942

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**Summary Report for
Bureau of Fisheries Stream Habitat Surveys:
Clearwater, Salmon, Weiser, and Payette River Basins
1934-1942**

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NP = not present

INTRODUCTION

This document contains summary reports of stream habitat surveys, conducted in Idaho, by the Bureau of Fisheries (BOF, now National Marine Fisheries Service) from 1938-1942.. These surveys were part of a larger project to survey streams in the Columbia River basin that provided, or had provided, spawning and rearing habitat for salmon and steelhead (Rich, 1948). The purpose of the survey was, as described by Rich, "to determine the present condition of the various tributaries with respect to their availability and usefulness for the migration, breeding, and rearing of migratory fishes". The Idaho portion of the survey consisted of extensive surveys of the Clearwater, Salmon, Weiser, and Payette River Subbasins.

Current estimates of the loss of anadromous fish habitat in the Columbia River Basin are based on a series of reports published from 1949-1952 by the U.S. Fish and Wildlife Service. The reports were brief, qualitative accounts of over 5000 miles of stream surveys conducted by the BOF from 1934-1946 (Bryant, 1949; Bryant and Parkhurst, 1950; Parkhurst, 1950a-c; Parkhurst et al., 1950). Despite their brevity, these BOF reports have formed the basis for estimating fish habitat losses and conditions in the Columbia River Basin (Fulton, 1968, 1970; Thompson, 1976; NPPC, 1986).

Recently, the field notebooks from the BOF surveys were discovered. The data is now archived and stored in the Forest Science DataBank at Oregon State University (Stafford et al., 1984; 1988). These records are the earliest and most comprehensive documentation available of the condition and extent of anadromous fish habitat before hydropower development in the Columbia River Basin. They provide the baseline data for quantifying changes and setting a benchmark for future restoration of anadromous fish habitat throughout the Basin. The summaries contained in this book are exact replicates of the originals. Due to discrepancies between the field data and the summaries, the database should be used to assess pool and substrate conditions. This data is available from the Bonneville Power Administration.

The Bureau of Fisheries survey is unique because it is the only long-term data set that quantifies fish habitat in a manner that is replicable over time; no other similar work is known to exist. Other surveys, such as Thompson and Haas (1960), inventoried extensive areas in a manner that was mostly qualitative, subjectively estimating physical characteristics like bank cover and stream shading. Spawning, rearing, and resting habitat were not systematically quantified to allow comparisons over time.

Knowledge of the past and present quantity and quality of anadromous fish habitat in the Columbia River Basin is essential to any effort to enhance fish populations. Habitat condition is a key element in monitoring and evaluating progress towards the doubling goal. Integration of this information into the Columbia River Fish and Wildlife Plan can provide the baseline information to greatly enhance understanding of past, present, and future habitat conditions in the basin to provide for improved management decisions.

METHODS

This description of the survey is taken from Rich (1948). In cases where his meaning was unclear, we have clarified his descriptions where possible.

Most of the field work for the survey was accomplished by teams of two men. Each stream was examined on foot if warranted by its existing or potential value in a program of fishery maintenance. At times, horses and boats were used to conduct the surveys. It was customary to start at the mouth and work up to a point at which the stream ceased to be important. The survey was commonly terminated if the stream became too small to be of value, at total barriers, such as waterfalls, or wherever other conditions were such that the stream was of no present value and there was no reasonable hope of improvement. Beyond such points a more cursory inspection was frequently made although not always.

As the stream was traversed on foot, field observations were recorded on forms provided for the purpose--the "Observation Blank". Records were made at approximately 100-yard intervals. Distances were estimated by counting steps when conditions were favorable for pacing and, otherwise, by estimating short distances by eye. When possible, the sums of such estimated distances have been checked against maps, particularly when surveys were made by boat, and any substantial discrepancy has been noted on the survey record. At the upper end of each 100-yard section a record was made on the Observation Blank of such things as stream size, pools, character of the bottom, fish observed, etc. The location of barriers to upstream migration of fish, such as log jams, falls or dams was also recorded and an estimate made of the degree of obstruction.

Stations were designated, usually at intervals of several miles, at important landmarks or where stream conditions exhibited a marked change. At these stations special data were obtained and recorded on a "station Blank" that included measurements of width, depth, flow and temperature. Record was also made of general conditions observed between stations that were not recorded on the observation blank. These included such items as the nature of the marginal vegetation (riparian), evidences of erosion and of fluctuations in water level, gradient, character of the valley, type and amount of cultivation and of forest utilization, source and extent of pollution, number and species of fish observed and other pertinent data.

Width was measured by a tape. Average depth was determined from a series of 10 or more actual measurements by a rule (for small streams) or a sounding line. Temperatures were determined by calibrated thermometers shaded from the direct rays of the sun and, immersed at least one inch. Flow, in cubic feet per second, was estimated by the usual method: average width times average depth

times average speed of water in feet per second times a constant correction for drag. The speed was determined by floats traversing a measured distance. The product of the first three factors was corrected for drag by multiplying by 0.8 if the bottom was rough and irregular, and by 0.9 if the bottom was fairly smooth. When available, stream flow records were taken from the Water Supply Papers of the U.S. Geological Survey.

A special blank for obstructions was provided on which to record data relative to obstructions, both natural and artificial. When dams were encountered, measurements were taken or obtained from the operators of the height, length of crest, spill, etc. In the case of power dams the type and speed of the power units was recorded, because these are important factors in the safe passage of downstream migrants. Especial attention was paid to the condition and adequacy of fish ladders and other fish protective devices installed at dams.

On a Diversions blank, data were recorded that included the type of each diversion, its location, description of the headworks, amount of water diverted, character of screens and other fish protective devices if present, etc.

For each stream surveyed, the following data was collected:

1. General

- a. name of river system
- b. name of stream
- c. date of survey and names of surveyors
- d. stream source
- e. general direction of flow
- f. total length
- g. length surveyed

2. Station Data

- a. station designation
- b. landmarks
- c. map locations
- d. distance above previous station
- e. distance above mouth of stream
- f. width
- g. average depth

3. Character of Watershed

- a. the general character of the watershed (mountainous, flat, etc.)
- b. character of the banks (slope, composition, etc)
- c. nature and composition of marginal vegetation

- d. extent of erosion (if any) of banks or watershed

4. Gradient

- a. station elevations
- b. distance between stations
- c. difference in elevation
- d. average slope in feet per mile
- e. source of data (when available, topographic or plan and profile maps were used to determine the gradients. In other cases-the observers estimated the gradient.)

5. Stream Flow and Fluctuations

- a. location
- b. date
- c. observed flow
- d. fluctuation in water level as given by Water Supply Papers, the records of operators of dams, reports of local residents or as indicated by debris, erosion, marginal vegetation, etc.
- e. time and variation in seasonal runoff
- f. causes of variation
- g. effects of fluctuations on migratory fish (if published papers are used the reference is given).

6. Temperature

- a. station
- b. location
- c. date and hour
- d. air temperature
- e. water temperature
- f. weather conditions
- g. any observed influence of temperature on fish

7. Pools and Riffles

- a. pools were classified six different ways based on area and depth, the classes were:
 - S1: > 50-yd² and > 6 feet deep
 - S2: 25- to 50-yd² and 3-6 feet deep
 - s3: < 25-yd² and < 3 feet deep
 - S4: 25- to 50-yd² and > 6 feet deep
 - S5: 25- to 50-yd² and < 3 feet deep
 - S6: small pools in cascades (pocket pools)
- b. riffles were classified as "Good", "Fair", and "Poor" on the basis of the observer's judgement as to the

relative value for natural spawning purposes. Characteristics on which this classification was based were size, gradient, size of substrate, etc. To date, we have found this data to be of no use, as it is not replicable and highly qualitative.

8. Character of Bottom

In tables, station totals are given for:

- a. distance between stations
- b. total area of bottom
- c. area and percentage of bottom for substrate classes
- d. substrate classes were:

Large Rubble (LR) = > 6 inches
Medium Rubble (MR) = 3 to 6 inches
Small Rubble (SR) = 1/4 to 3 inches
Mud and Sand (MS) = < 1/4 inches

9. Suitable Spawning Area Available

This is defined as that part of the medium and small rubble that possesses the water conditions and other characteristics that are necessary if the area is to be used for spawning purposes. The station totals are given for:

- a. distance between stations
- b. total area of bottom
- c. area and percentage of suitable spawning substrate available
- d. estimate of the total of suitable spawning area available at low water
- e. estimate of total available at high water only

10. Suitable spawning area not available

Station totals were given for:

- a. distance between stations
- b. total area of bottom
- c. area and percentage of suitable spawning substrate not available
- d. stages of water when the area is inaccessible
- e. reason for unavailability

11. Obstructions

The data recorded on the "obstructions" field form were recorded.

12. Diversions

The data recorded on the "diversions" field form were recorded.

13. Pollution

- a. portion of the stream. polluted
- b. type of pollution
- c. source of pollution
- d. effect on fish
- e. recommendations

14. Salmon and Steelhead

The station totals were given for:

- a. distance between stations
- b. date of each observation
- c. visibility at time of observation
- d. number of fish counted alive and dead
- e. number of redds counted that were occupied and unoccupied
- f. estimate of total number of fish present
- g. data on runs secured from local residents
- h. summary estimate of present populations and stream capacity for each species of fish (stream capacities are based on the observation that approximately 20 square yards of suitable spawning substrate is required for the average chinook salmon redd, allowing for the necessary spacing between redds).
- i. time of appearance for runs and approximate spawning periods
- j. information on juvenile fish

15. Fish Other Than Salmon and Steelhead

- a. species
- b. estimates of abundance
- c. observations based on the ecological relations of these fish to the salmon and steelhead
- d. extent of sport fishing

16. Tributaries

All direct tributaries are listed in upstream order by name. The location and size of each is given and any available information on its value as a fish stream.

17. General Remarks

Summaries and miscellaneous field observations not appearing in the other sections are given and the opinions of the surveyors as to the potential development of the fishery resources in the stream in question.

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Clearwater River

River System: Snake River
Name of Stream: Clearwater River

Date of Survey: September 1938, by Hanavan and Wilding

source: The main river is formed by the confluence of the Middle and South forks at the town of Kooskia. Other large tributaries enter the main stream below this location. The headwaters of all these tributaries lie in the Bitterroot Mountains on the divide between Idaho and Montana. The drainage area is roughly bounded by parallels **45° 30'** and **47°N** and meridians **114° 30'** and **117°W**.

Approximate Length: 75 miles, all surveyed.

Station Location:

Sta	Location	Distance above prev. Station vds miles		Distance above Mouth vds miles		Map Location	Width	Depth
A	Bridge at Lewiston	0	0	0	0	T36N R5W	900'	2.4'
B	Clearwater Lumber Co. Dam					T36N R5W		
C	Bridge @ junction Hyw. 95 and 9					T36N R4W	384'	5.8'
D	County Road Bridge					T36N R3W	270'	>16'
E	Kendrick-Juliaetta Co. Road Bridge					T37N R2W	270'	5.2'
F	Lenore Bridge					T37N R2W		3.8'
G	County Road Bridge Grain Warehouse					T36N R1W	291'	6.0'
H	Orofino Bridge					sec 7, T36N R2E	414'	3.7'
I	Greer Bridge					sec 14, T35N R2E	174'	2.1'
J	Cable Car Crossing to grain elevator					T34N R3E		
K	Bridge @ Kamiah					sec 1 T33N R3E		
L	Confluence Middle & South Forks					sec 5, T32N R4E		

EPA River Reach Codes:

Station	HUC	SEG	Rmi
A	17060306	0082	0.00
C	17060306	0002	3.42
D	17060306	0017	2.18
E	17060306	0019	1.32
F	17060306	0021	2.20
G*	17060306	0025	1.01
H	17060306	0026	0.00
I	17060306	0028	19.94
J*	17060306	0029	19.94
K	17060306	0029	19.94
L	17060306	0033	19.94

* Station location is not definite and has been estimated

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
mouth to A	434,900	106,940	24.6	126,810	29.2	141,820	32.6	59,330	13.6
A-B	454,600	180,060	39.6	180,880	39.8	63,340	13.9	30,320	6.7
B-C	701,300	135,630	19.3	150,060	21.4	193,520	27.6	222,090	31.7
C-D	1,717,600	649,420	37.8	564,390	32.9	228,090	13.3	275,700	16.1
D-E	419,000	194,330	46.4	116,830	27.9	60,410	14.4	47,430	11.3
E-F	1,062,500	502,960	47.3	351,190	33.1	115,460	10.9	92,890	8.7
F-G	1,176,700	565,800	48.1	317,160	26.9	144,330	12.3	149,410	12.7
G-H	1,495,600	827,300	55.3	387,870	25.9	134,580	9.0	145,850	9.8
H-I	1,176,600	770,790	65.5	186,820	15.9	52,090	4.4	166,900	14.2
I-J	1,021,600	561,110	54.9	143,840	14.1	41,660	4.1	274,990	26.9
J-K	835,200	528,470	63.3	186,240	22.3	58,530	7.0	61,960	7.4
K-L									
Total	10,495,600	5,022,810		2,712,090		1,233,830		1,526,870	
%		47.9		25.8		11.8		14.5	

Totals do not include section of river from Kamiah to Kooskia (sta. K-L) for which the survey notes could not be found, nor the 4 miles above the Lewiston Dam, which was a continuous pool and surveyed only by auto.

Spawning Area Usable and Available:

Station	Distance yds miles	Area (yd ²)	Available Spawning Area(yd ²) (MR&SR)	% Avail	Usable Spawning Area(yd ²)	% Usable
mouth-A	3000		268,630	61.8	38,650	8.9
A - B *	4400(+4mi)		244,220	53.7	28,800	6.3
B-C	5800		343,580	49.0	38,200	5.4
C-D	15,500		792,480	46.1	79,120	4.6

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
D-E	4500		177,240	42.3	13,060	3.1
E-F	8200		466,650	43.9	36,050	3.4
F-G	12,300		461,490	39.2	31,060	2.6
G-H	16,200		522,450	34.9	41,100	2.7
H-I	14,900		238,910	20.3	18,460	1.6
I-J	15,200		185,500	18.2	15,160	1.5
J-K	10,303		244,770	29.3	21,700	2.6
K-L	<2>					
Total 110,300(+4mi)			3,945,920	37.6	361,360	3.4

* Does not include a 4 mile pool above the dam, which was surveyed only by car.

<2> Stream survey notes for that portion of the river between stations K and L (is .8 miles) could not be found.

NOTE; before the fish ladder was installed over the power dam in 1940 only 413,650 yds of M.R. and S.R. were available in the entire river system at low water.

Spawning Area Unavailable and Unusable: none

Character of Watershed:

Much of the clearwater flows through high plateau lands surmounted by extensive wheat fields. This is true of the entire area lying south and west of the river from the mouth to a point several miles up the South Fork. On the north bank the grain fields parallel the river from the mouth to the confluence of the North Fork where sparse wood lands merge into the heavy white pine forests of Eastern Idaho. Forests also cover the watershed lying east of the river above the confluence of the North Fork.

The slopes from the river to the plateau lands are steep throughout rising 1,500 - 2,000 feet. Below the North Fork these slopes are barren with occasional sparsely wooded ravines. Farther up the wooded areas become progressively more extensive.

Diversions:

D-1: The only diversion on the main river is that to the Washington Water Power Co. power plant a short distance above Lewiston. The intakes to the two turbines, each of 2,100 cfs capacity, are protected only by vertical 3 inch grizzlies.

Artificial Obstructions:

Location	Character	Height	Protective Device	
			Type	Efficiency
1. 5,500 yds above mouth	power dam of Wash. Water power co. Two turbines of 2,100 cfs capacity. Dam is 200' wide (see special report)	37'	None at time of survey (1938). Since then a fish ladder has been installed, and operated for the first time in 1940.	
2. 7,400 yds	diversion dam to power plant. 1,100' long. Dike shunts water to power dam. Dam has drumgates, radial gates, and stop logs.	35-40'	2 fish ladders. Cannot function in low water because fish cannot swim up the almost dry river channel. In high water there is scarcely enough attraction for the fish. The ladder is poor for chinooks, as it is located at the extreme left side of the dam	
3. 4,500 - 7,400 yds	Between the confluence of the power plant tail race and the diversions dam there is not enough water in the main channel for fish at low water (5 cfs. in a 1,000' channel).			

Natural Obstructions: None

Fluctuation in Watershed:

Causes: Mainly caused by rapid run off from the Bitterroot Mountains when the snows melt in spring. The numerous large tributaries emptying into the main Clearwater contribute to the potentially great annual fluctuation in water level.

Feet Variation: Estimated at the time of stream survey; stations A-G 8 - 10 feet, station G-I 10 - 15 feet.

Stream Volume: The volume at station I on September 20, 1938, was calculated to be 1170 cfs. Each of the turbines at the Power plant has a capacity of 2,100 cfs. In addition the diversion dam has a capacity of 220,000 cfs. with provisions for blasting out a portion of the dike if the flow ever becomes greater than this. Hence, the potential variation in stream flow below all large tributaries is 50 fold approximately 4,000 to 200,000 cfs.

Pollution:

Location of Source: Large placer gold dredging operations on the South Fork of Clearwater River.

Type of Pollution: Mainly silt from the washing process, and

possibly some chemicals from the extraction process. In several places the water was stated to be olive green in color.

General Remarks: Because of the great dilution of this polluted water, there are probably few deleterious effects on the fish of the river system, except possibly the fish within South Fork itself.

Fish (Salmon):

No chinook or steelhead trout were observed during the survey in September, 1938, however, both these species occur in the river. In 1928, 8,689 steelhead and 335 chinook were counted over the fish ladder in the Power Plant diversion dam, and in 1929, 4,830 steelhead and 103 chinook. Even these are only partial counts. In 1938 fish were again counted over the ladder, 2,220 steelhead, 7 chinook, 1 blueback and 1 silver were counted. The total for the steelhead is 'not accurate because the fish had been ascending the ladder in significant number; before the count was begun on April 21.

Fish (other than Salmon):

Sta.	Species	Date	Very Abundant	Abundant	Fair Numbers	Scarce
A-C	"Cyprinids"	9/15/38		X		
	suckers	9/15/38		X		
C-E	"rough fish"	9/17/38		X		
E-G	"minnows"	9/17/38		X		
	suckers	9/17/38		X		
	squaw fish	9/17/38		X		
G-I	"rough fish"	9/19/38		X		

General Remarks:

Before the fish ladder was installed over the power dam above Lewiston in 1940, fish could not get above this point at low water because of a the inaccessibility of the fish ladder. The 2 dams were more of a barrier to chinook than steelhead, as the fish ladder was located at the far side of the diversion dam where chinook could not find it readily. Each year during low water period many chinook and steelhead would mill around below the power dam, unable to ascend the stream any further.

The operation of these 2 dams for 13 years without adequate fish ladders contributed probably more than any other factor to the reduction in size of the annual chinook run to this river system. Whereas in 1928, 335 chinooks and 1929, 103 chinook were counted over the diversion dam ladder (incomplete figures) in 1938 only 7 chinook were counted through the ladder during the entire period April 21 to November 6.

Some pollution in the form of silt and chemicals comes from placer gold dredging operations on the South Fork. Because of dilution there

are believed to be no deleterious effects to the fish except possibly those in South Fork itself. Some of the silt from South Fork is precipitated in the main Clearwater forming a layer of silt over the rubble during low water period.

All the spawning area in the main stream is now available at all times, but prior to the construction of an additional fish ladder over the power dam in 1940, 3,532,270 sq. yds. or 89.5% of the spawning area in the main river was unavailable at low water, as well as all the spawning area in the tributaries.

The steelhead ascend the main river during spring high water, and consequently most of the steelhead were always able to pass over the dam and utilize the spawning area in the headwaters.

Temperature Data:

Sta.	Date	Hour	Air	Water	Skv
A	9/18/38	11:00 AM	a 1°F	74°F	clear
C	9/18/38	12:00 PM	90°F	72°F	clear
D	9/18/38	12:30 PM	97°F	71°F	clear
E	9/18/38	12:45 PM	97°F	70°F	clear
F	9/18/38	1:00 PM	92°F	69.5°F	clear
G	9/18/38	1:30 PM	90°F	73°F	clear
H	9/18/38	2:00 PM	87°F	70°F	clear
Above H	9/20/38	9:30 AM	87°F	64°F	clear
I	9/20/38	-----	82°F	66°F	clear

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6
Mouth-A	20	12.0	12.0				
) miles)			100.0				
A-B	33	13.0	14.0	18.0		1.0	
			42.4	54.5		3.1	
B-C	23	7.0	20.0	3.0			
			87.0	13.0			
C-D	69	8.0	66.0	3.0			
			95.7	4.3			
D-E	26	10.0	26.0				
			100.0				
E-F	32	5.0	32.0				
			100.0				
F-G	75	11.0	75.0				
			100.0				
G-H	74	a.0	74.0				
			100.0				
H-I	63	7.0	63.0				
			100.0				

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
I-J	71	a.0	71.0				
			100.0				
J-K	75	13.0	73.0	1.0		1.0	
			97.3	1.3		1.3	

NOTE : These are only approximations of the number of pools in the river, because of the difficulty of counting them in a stream as large as the Clearwater. In most instances in the survey notes pools were represented only by plus signs, in every case these were tabulated as SlT1 pools.

Gradient:

No data immediately available, although the gradient can be accurately determined from plan and profile maps of the river system by the U.S.G.S.

Tributaries:

- 1) Sweetwater Creek, 200 yds below station C, right bank, >2 cfs.
- 2) Potlatch River, 4,800 yds above station C, left bank, surveyed in 1938 by Parkhurst and Morton.
- 3) Cottonwood Creek, 3,800 yds below station D, right bank, 1 cfs.
- 4) Jacks Creek, 100 yds above station F, right bank, 1 cfs, volume increases 40x in spring.
- 5) Canyon Creek, 500 yds. below station G, right bank, 4 cfs.
- 6) North Fork Clearwater, 8,800 yds above station G, left bank, surveyed.
- 7) Orofino Creek, 600 yds above station H, left bank, 8-10 cfs.
- 8) Jim Ford Creek, 7,000 yds above station H, left bank, 2 cfs.
- 9) Lolo Creek, 2,500 yds above station I, left bank, 10 cfs.
- 10) No name, 4,600 yds above station I, right bank, 1/4 cfs.
- 11) No name, 3,100 yds below station J, right bank, 1 cfs.
- 12) Lawyer Creek, at station K, right bank.
- 13) South and Middle Forks of Clearwater, confluence at station L.

Potlatch Creek

River System: Snake River
 Stream Surveyed: Potlatch Creek

Date of Survey: September 15-17, 1938 by Parkhurst and Morton

Source: Potlatch Creek rises from two small creeks one of which rise in Sec 21 T42N R1E and the other in Sec 9 T42N R1W [??? small creeks joining on the Boise Meridian in T41N about Sec 12 about 3 miles above Bovill, Idaho]. From here the river flows south southwest to the left bank of the Clearwater about 15 miles above its mouth.

Total Length: 50 miles of which 22.5 miles were surveyed

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		yds	miles	yds	miles			
A	Highway Bridge above mouth	0	0	800	0	sec 7, T36N R3W	51'	13.5"
B	Julietta Bridge						90'	5.3"
C	Bridge below Kendricks						69'	15.0"
D	Upper Silver Bridge (2nd above Kendricks)						30'	19.0"

EPA River Reach Codes:

Station	HUC	SEG	Rmi
A	17060306	0048	0.00
B	17060306	0050	2.13
C	17060306	0051	2.64
D	17060306	0053	1.78

Character of Bottom Between Stations:

Station	Area (yd2)		%	M.R.		%	S.R.		%	M&S		%
	L.R.											
A-B	231,500	75,030	32.0	73,050	31.5		47,460	20.5		25,960	16.0	
B-C	80,900	36,470	45.0	23,270	29.0		8,090	10.0		13,070	16.0	
C-D	166,700	77,510	46.0	41,170	24.0		29,560	17.0		18,460	13.0	
Total	479,100	189,010	40.0	137,490	28.0		85,110	18.0		67,490	14.0	

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
A-B		231,500	120,510	52.0	20,090	9.0
B-C		80,900	31,360	39.0	7,490	9.0
C-D		166,700	70,730	41.0	12,780	7.0
Total		479,100	222,600	46.0	40,360	8.0

Spawning area unavailable and unusable: none

Character of Watershed:

- 2- hilly, high steep barren hills
- 7- open - hills mostly grass covered
- 6 - wooded - scattered pines up to Sta D, moderately covered above this
- 8 - cultivated 5% of watershed, valley only

Diversions: none

Artificial Obstructions: a loose rock or rubble dam two feet high at Kendricks, Idaho. Sta C is the only artificial obstruction found and it is passable to migrating fish at any time.

Natural Obstructions: two or three beaver dams across creek in 6th mile above mouth that evidently wash out each spring and are rebuilt in the early summer, not over a foot high and passable at all times (also at 17 miles).

Fluctuation in Water Level: at time of survey water was at its lowest yearly level (almost dry), bank marks showed 6 to 10 feet higher this year and at flood stage in spring it is reported to be 20-30 ft higher than present low. Run off is rapid and of short duration, so this river shows a very great fluctuation in water level.

Pollution: sewage from Julietta is emptied into the river but the quantity is not so noticeable as at Kendricks where the shore is lined with garbage dumpings and the sewage of the entire village is dumped into the creek. However, the effects of this sewage is unknown at present.

Fish (Salmon): no salmon seen nor reported.

Fish (other than Salmon):

Chisel-mouth or Whitefish: abundant
Squawfish: abundant

Common minnows: very abundant
Black minnows: fair numbers
Darting minnows: fair numbers

General Remarks:

Topography: from station A to B Potlatch Creek flows through a flat valley 1/4 to 1/2 mile across with steep lava cliffs on each side covered with a grass that looks like wild oats--cheatgrass the natives call it--very few scattered pine in gulleys, no sagebrush. From B to C more pine trees are seen otherwise the topography is the same. Above Kendricks Sta C - D the hills and bluffs become extremely steep, 400 ft high in places and the valley narrows down from 1/4 mile to 100 yards in upper part. There is a fairly moderate covering of scrub pine in this upper portion.

Character of streambed: the most notable feature of Potlatch Creek at the time of the survey was the extreme low water stage and the resultant bottom rubble uncovered. As shown by the attached summary sheets this averaged over 50% of the area surveyed. In the lower area (i.e., Sta A-B) the rubble types are fairly evenly distributed but the water is warm and the rubble slimy and often algae covered - the banks at the time of the survey were indefinite - just a wide expanse of rubble with cockleburrs and Golden rod growing here and there. Marginal vegetation sparse of willows and poplar. Sta B-C the marginal vegetation becomes moderate with 6 to 12 ft banks of earth fairly common - rubble mostly large and medium and silt and slime covered probably from sewage disposal of Julietta and Kendricks. From Sta C to D the proportion of bedrock increases as we work upstream marginal vegetation becomes more dense and banks rise from 6 to 30 ft steep of rock mostly - sometimes earth or both. Much mud, silt, and algae and bedrock spoil the spawning gravel present in this area also.

Fish population: in the lower portions of the river all back channels and deep holes were full of "shiner" minnows of the common type and all sizes of squawfish. Many crayfish also observed and the shore of these wide shallow pools was lined with 5" long tadpoles. Beaver dams occurred also in this area. In the few deep (6-8 ft) holes above here (10 miles upstream on) several large schools of 8"-12" whitefish were observed. They showed no fear of sudden movements, bottom of pool was green with spiragya type of growth. Many beaver dams just above and more squawfish and whitefish in each large hole above here. Not a sign of any salmonids or "game" fish of any kind which could probably be accounted for by the low water and high temperatures in this lower portion of the Potlatch. Perhaps in the extreme upper portions trout may occur - no report of them however.

Temperature Data:

Station	Date	Hour	Air	Water	Sky
A	9-15-38	10:35 am	77.5°F	66°F	clear
L. Potlatch Cr	9-15-38	11:00 am	82°F	70°F	clear
B	9-15-38	3:30 pm	86°F	75°F	clear
B	9-16-38	12:30 pm	89°F	75°F	clear
C	9-16-38	1:00 pm	88°F	72°F	clear
D	9-18-38	2:15 pm	96°F	70oF	clear
C	9-18-38	1:30 pm	97°F	74°F	bright & fair
B	9-18-38	1:15 pm	96°F	76°F	bright fair and hot
A	9-18-38	12:30 pm	91°F	71°F	bright & fair (slight breeze)

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
A-B (10.0 miles)	77	7.7	7 9.1	14 18.2	10 13.0	46 59.7	25
B-C (4.0 miles)	14	3.5	0 0.0	0 0.0	12 85.7	2 14.3	5
C-D (8.5 miles)	58	6.8	7 12.1	18 31.0	13 22.4	20 34.5	72

Gradient:

A-B slight
 B to C slight to moderate
 C-D moderate to steeper.

Tributaries:

1. small unnamed trib, 1/2 mile above mouth L.B., 3 c.f.s., length (?) passable
2. small unnamed trib 3 mile above mouth L.B., <2 c.f.s., length (?) impassable
3. Little Potlatch Creek, 5 mile above mouth L.B., 5-8 c.f.s., length 12 miles passable
4. small unnamed trib above Julietta, 10 miles above mouth L.B., 3 C.f.S., length 15 miles passable
5. small unnamed trib, 18 miles above mouth L.B., <2 c.f.s., length (?) passable
6. Cedar or Boulder Creek, 22 miles above mouth R.B., 8-10 C.f.S., length (?), passable cold and cloudy water

Orofino Creek

River System: Snake River

Stream Surveyed: Orofino Creek, tributary to the Clearwater River

Date of Survey: 9/21/38, by Hanavan and Wilding

Source: In the hills of T37N R5E, T37N R6E and T36N R6E

Total Length: 30 miles of which 5.2 were surveyed

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		yds	miles	yds	miles			
A	at mouth	0	0	0	0	sec 7, T36N R2E	n/a	n/a
B	County Bridge above Whiskey Ck					sec 10, T36N R2E	39'	10"
C	Bridge 1900 yds above Sta B					sec 10, T36N R2E	42'	8"
D	series of impassable 6' & 12' Falls					sec 10, T36N R2E		

EPA River Reach Codes:

Station	HUC	SEG	Rmi
A	17060306	0081	0.00
B	17060306	0042	0.00
C	17060306	0042	0.93
D*	17060306	0042	0.93

* Station location is not definite and has been estimated

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.		M.R.		S.R.		M&S	
			%		%		%		%
A-B	54,100	25,430	47.0	19,770	36.5	8,710	16.1	190	0.4
B-C	13,200	7,950	60.2	3,220	24.4	1,230	9.3	800	6.1
C-D	6,000	4,120	68.7	1,040	17.3	520	8.7	320	5.3
Total	73,300	37,500	51.2	24,030	32.8	10,460	14.3	1310	1.8

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
A-B	6,000		28,480	52.6	2,730	5.0
B-C	1,900		4,450	33.7	190	1.4
C-D	1,200		1,560	26.0	230	3.8
Total	9,100		34,490	47.1	3,150	4.3

Spawning Area Unavailable and Unusable: everything above station D is unavailable because of a series of impassable 6' and 12' falls.

Character of Watershed:

Mountainous
 Hilly X
 Rolling
 Flat
 Swampy
 Wooded X
 Open
 Cultivated % less than 1% of total watershed
 Character of Valley
 Character of Banks
 Density of Marginal Vegetation
 Erosion
 a) of banks
 b) of watershed

The river flows through a hilly country covered almost everywhere with pines. Some land is cultivated in the lower part of the watershed, but this undoubtably represents less than 1% of the total watershed.

Irrigation Diversions: None

Artificial Obstructions:

1) log jam 2,900 yards above mouth, 2' high with 1" spill over top. Passable.

Natural Obstructions: Series of impassable 6' and 12' falls, 9,100 yards above the mouth of the creek. The survey was terminated here.

Fluctuation in Water Level: 3-5 feet, produced mainly by melting of snow in spring and early summer.

Pollution: None

Fish (Salmon): None observed

Fish (other than Salmon): Minnows and chub fry abundant. Adult chubs and squawfish numerous

General Remarks:

Even in the lowest 5 miles of stream, which are passable to fish, the amount of usable rubble is considerably less than the total of medium and small rubble because of the rapid current and predominance of large rubble.

About 5 miles above the mouth the stream narrows rapidly to a width of only 6 feet. Here there is a series of 6' and 12' falls considered impassable at all times. Hence, the stream cannot be considered potentially very important as a producer of salmon.

Temperature Data:

Station	Date	Hour	Air	Water	Skv
A	9/21/38	10:30	AM 80°F	63°F	clear
B	9/21/38	10:30	AM 76°F	64°F	clear
C	9/21/38	11:00	AM 81°F	62°F	clear

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6
A-B	14	4.1	0	0	0	14	33
(miles)			0.0	0.0	0.0	100.0	
B-C	8	7.4	0	0	0	8	60
(miles)			0.0	0.0	0.0	100.0	
C-D	14	20.5	0	0	14	0	33
(miles)			0.0	0.0	100.0	0	

Gradient: stated to be moderate to steep.

Tributaries:

Whiskey Creek, at 5,300 yards above the mouth, left bank, 1 cfs.

Middle Fork Clearwater River

River System: Snake River

Stream Surveyed: Middle Fork Clearwater River

Date of Survey: 10/6-7, 1938.

Source: confluence Selway and Locksa Rivers

Total Length: 24.2 miles, all surveyed

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		vds	miles	vds	miles			
A	at mouth	0	0	0	0	sec 8, T32N R4E	375'	n/a
B			5.0		5.0	sec 4, T32N R7E	330'	n/a
C			5.0		10.0		40'	n/a
D			5.0		15.0		150'	n/a
E			5.0		20.0		70'	n/a
F			4.2		24.2		105'	n/a

Stations b, c, d, and e are arbitrary divisions for convenience in calculations of data.

EPA River Reach Codes:

Station	HUC	SEG	Rmi
A	17060306	0001	0.00
F	17060306	0004	0.00

Character of Bottom Between Stations:

Station	Area (vd^2)	L.R.		M.R.		S.R.		M&S	
			%		%		%		%
A-B	825,500	335,200	40.06	147,900	17.9	129,800	15.7	212,600	25.7
B-C	845,600	364,620	43.1	254,290	30.0	89,300	10.5	137,390	16.2
C-D	671,400	336,110	50.0	129,730	19.3	83,310	12.4	122,250	18.2
D-E	527,300	291,960	55.3	95,140	18.0	44,150	8.3	96,050	18.2
E-F	418,400	210,630	50.3	88,340	21.1	37,060	8.8	82,370	19.6
Total	13,288,200	1,538,520	46.8	715,410	21.8	383,620	11.7	650,660	19.8

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
A-B	5.0	825,500	277,700	33.6	109,800	13.3
B-C	5.0	845,600	343,590	40.6	274,430	32.4
C-D	5.0	671,400	213,040	31.7	83,840	12.4
D-E	5.0	527,300	139,290	26.4	67,270	12.7
E-F	4.2	418,400	125,400	30.0	85,560	20.4
Total	24.2	3,288,200	1,099,020	33.4	620,900	18.9

Spawning Area Unavailable and Unusable: none

Character of Watershed:

Hilly - hill hills throughout
 Wooded - throughout
 Open - lower mile
 Cultivated - little, in lower mile

Irrigation Diversions: none

Artificial Obstructions: none

Natural Obstructions: none

Fluctuation in Water Level:

Causes: spring runoff and seasonal rains
 Feet variation: 8-12' in spring
 Stream volume: approximately 500-800 c.f.s.

Pollution: none

Fish (Salmon): none

Fish (other than Salmon):

<u>Species</u>		
Sucker	abundant	10-7-38
Rainbow	fair numbers	
Cutthroat		
Cottus		
Steelhead	reported abundant in spring	

General Remarks:

Topography: The country is uniform through the 24 miles. The valley varies from 1/2 to 1/8 mile wide and from U shaped in the

lower area to broad V above. The hills are about 1000 feet high and only sparsely covered with pine, spruce, hemlock, poplar, and brush. marginal vegetation is also sparse. There are a few farms at Kooskia, near the mouth of the river.

Character of stream: The stream is nearly uniform throughout. The width varied from 200-300 ft. Pools and riffles are abundant providing food and resting areas with the moderate gradient is in ideal fish habitat. Many of the large riffle areas are good spawning beds. The bottom rubble averaged approximately 50% large, 20% medium, 10% small and 20% sand and silt.

Fish Population: Due to the large size of the river it was difficult to get an idea of the fish population. A few suckers, rainbow and cutthroat were seen and steelhead were reported to run in the spring. The stream is capable of supporting a large population of trout and sea run fish.

Temperature Data:

Station	Date	Time	Air	Water	Skv
A	10-6-38	9:30 am	54°F	56°F	cloudy
B	10-6-38	1:30 pm	63°F	58°F	cloudy
F	10-7-38	4:00 pm	61°F	58°F	cloudy

Pool Grade:

Station	Resting Pools-	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
A-B (5.0 miles)	75	25.0	23	2	1	49	6
B-C (5.0 miles)	88	17.6	5	14	50	19	26
C-D (5.0 miles)	65	13.0	12	4	9	40	35
D-E (5.0 miles)	86	17.2	18	28	7	33	13
E-F (4.2 miles)	82	19.5	23	22	25	12	0
			28.0	26.8	30.5	14.6	

Gradient: no topographic maps are available. The gradient is moderate throughout.

Tributaries:

Clear Creek	2 mi above mouth r.b., not seen
Big Horse Creek	r.b., not seen
Sutter Creek	l.b., 9 mi above mouth, 5 cfs, steep, impassable
Wilson Creek	l.b., 10.5 mi above mouth, 2 cfs, steep, impassable, not seen

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Tucker Creek	r.b., not seen
Tahos Creek	r.b., 10 cfs
Swan Creek	l.b., at Ranger Station, not seen
No One Creek	r.b., at Ranger Station, not seen
Smith Creek	l.b., 1 mi above Ranger Station, 5 cfs, passable
Syunga Creek	l.b., 2 mi above Ranger Station, 10 cfs, passable
Lodge Creek	r.b., 5 mi above Ranger Station, 5 cfs, falls
Bridge Creek,	l.b., 6 mi above Ranger Station, not seen
Three Devils Creek	l.b., 7 mi above Ranger Station, 3 cfs, falls
Locksa River	see survey report
Selway River	see survey report

Selway River

River System: Snake River

Stream Survey: Selway River, tributary to Middle Fork Clearwater

Date of Survey: October 8, 1938, by Hanavan and Wilding

Source: The river arises on the west side of the Bitterroot Mountains divide approximately between parallels 45° 30', and 46° 20' N.

Total Length: 100 miles of which 19 were surveyed

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		vds	miles	vds	miles			
AA	Confluence Lochsa River	0	0	0	0	sec 4, T32N R7E	170'	n/a
BB	5 mi intervals no landmarks		5.0		5.0	sec 17, T21N R11E	90'	n/a
CC			5.0		10.0		200'	
DD	II		5.0		15.0		80'	
EE	Confluence Meadow Creek		4.1		19.1	T31N R9E	51'	

EPA River Reach Codes:

Station	HUC	SEG	Rmi
AA	17060306	0001	0.00
EE	17060306	0010	0.66

Character of Bottom between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
AA-BB	439,300	231,050	52.6	100,290	22.8	52,020	11.9	55,940	12.7
BB-CC	431,600	262,650	60.9	81,610	18.9	38,850	9.0	48,490	11.2
CC-DD	545,900	310,960	57.0	109,050	20.0	42,680	7.8	83,210	15.2
DD-EE	233,500	122,310	52.4	35,510	15.2	9,780	4.2	65,900	28.2
Total	1,650,300	926,970	56.2	326,460	19.8	143,330	8.7	253,540	15.4

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
AA-BB	5.0	439,300	152,310	34.7	21,850	5.0
BB-CC	5.0	431,600	120,460	27.9	11,780	2.7
CC-DD	5.0	545,900	151,730	27.8	8,980	1.6
DD-EE	4.1	233,500	45,290	19.4	4,400	1.9
Total	19.1	11,650,300	469,790	28.5	47,010	2.8

Spawning Area Unavailable and Unusable: None

Character of Watershed:

Mountainous X
 Hilly
 Rolling
 Flat
 Swampy
 Wooded Moderately covered with conifers and partly
 burned off in some places
 Open
 Cultivated (%) 0
 Character of Valley Narrow and steep
 Character of Banks
 Density of Marginal
 Vegetation
 Erosion
 a) of banks
 b) of watershed

Irrigation Diversions: none

Artificial Obstructions: none

Natural Obstructions:

A 7' falls 3/4 mile below Meadow Creek Confluence is passable at all times.

Fluctuation in Water Level:

Estimated to be 4-6 feet. Caused mainly by rapid run off from the Bitterroot Mountains and foothills when the snows melt in spring and summer.

pollution: none

Fish (Salmon):

None observed. An old placer miner said that many steelhead could be observed at Selway Falls each year, and chinooks come up in the fall. These runs are much smaller at present than in former years because of the deleterious effects of the dam at Lewiston.

Fish (other than Salmon):

A few rainbow trout were observed.

General Remarks:

Because of a rather steep gradient and a preponderance of large rubble not much of the stream is good for salmon. The stream was surveyed to the end of the road at Meadow Creek confluence, 19 miles above the mouth of the river. Above here are at least 80 miles still to be surveyed. Only pack trails follow this upper portion of the stream.

Temperature Data:

Station	Date	Hour	Temperature		Sky
			Air	Water	
24,200 yds above mouth	10-08-38	n/a	62°F	53°F	n/a
33,000 yds above mouth	10-08-38	12:30 pm	59°F	55°F	cloudy

Pool Grade:

Station	Resting	Resting	SlT1	SlT2	S2T1	S2T2	S6
	Pools	Pools/Mile	%	79	%	%	
AA-BB (5.0 miles)	79	15.8	0	100.0	0	0	0
BB-CC (5.0 miles)	92	18.4	0	92	0	0	0
CC-DD (5.0 miles)	80	16.0	0	80	0	0	0
DD-EE (4.1 miles)	123	30.0	0	123	0	0	2
			0.0	100.0	0.0	0.0	

Gradient:

Estimated to be moderate to fairly steep. Plan and profile maps of the Selway River have been published by the U.S.G.S. but are unavailable at present.

Tributaries:

1) Swiftwater Creek, 6,500 yds above the mouth, right bank, <1 cfs

- 2)Goddard Creek, 7,200 yds above the mouth, right bank, 2 cfs
- 3)Johnson Creek, 7,300 yds above the mouth, left bank,1 cfs, steep
- 4)O'Hara Creek, 12,000 yds above the mouth, right bank, 15 cfs
- 5)Rockcliff Creek, 14,100 yds above the mouth, left bank, 3 cfs
- 6) 19 Mile Creek, 15,000 yds above the mouth, left bank, 2 cfs
- 7)Slide Creek, 18,500 yds above the mouth, left bank, 2-3 cfs, steep and fast, impassable to spawners
- 8)Boyd Creek, 19,200 yds above the mouth, left bank, 1 cfs, steep, no good for spawning, location of State Fish Hatchery
- 9)Island Creek, 20,900 yds above the mouth, right bank, 1 cfs, 15' falls near mouth
- 10)23 Mile Creek, 22,400 yds above the mouth, left bank; 1 cfs, steep, no good for salmon
- 11)Cache Creek, 24,100 yds above the mouth, left bank, <1 cfs, steep, no good for salmon
- 12)Glover Creek, 27,200 yds above the mouth, left bank, 5-7 cfs, steep, impassable
- 13)Falls Creek, 29,300 yds above the mouth, right bank (?), 2 cfs, too steep
- 14)Gedney Creek, 31,600 yds above the mouth, left bank, 12- 15 cfs, good stream, State trout rocks at mouth
- 15)Meadow Creek, 33,700 yds above the mouth, right bank, 25 cfs

Lochsa River

River System: Snake River

Stream Surveyed: Lochsa River, tributary to Middle Fork
Clearwater

Date of Survey: October, 1938 by Morton, Parkhurst, Wilding and
Hanavan

Source: Numerous small lakes and springs on the Idaho side of the
Bitterroot Mountains.

Total Length: 75 miles, of which 14.6 miles from the mouth to
the Fine Creek confluence.

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		yds	miles	yds	miles			
AA	at mouth	0	0	0	0		75'	n/a
BB							90'	n/a
CC							144'	n/a
DD	Confluence with Fine Creek				14.6		95'	n/a

EPA River Reach Codes:

Station	HUC	SEG	Rmi
AA	17060306	0000	0.00
DD	17060306	0003	6.58

Character of Bottom between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
AA-BB	382,400	201,880	52.8	74,180	19.4	41,050	10.7	65,290	17.1
BB-CC	400,600	238,240	59.5	80,310	20.0	28,610	7.2	53,440	13.3
CC-DD	401,400	257,300	64.1	74,760	18.6	33,190	8.3	36,150	9.0
Total	1,184,400	697,420	58.9	229,250	19.4	102,850	8.7	154,880	13.1

Spawning Area Usable and Available:

Station	Distance vds miles	Area (vd2)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
AA-BB	5.0		115,230	30.1	24,230	6.3
BB-CC	5.0		108,920	27.2	61,090	15.2
CC-DD	4.6		107,950	26.9	3,410	0.8
Total	14.6		332,100	28.1	88,730	7.4

This area is available at all times.

Spawning Area Unavailable and Unusable: None

Character of Watershed:

Mountainous x to
 Hilly X
 Rolling
 Flat
 Swampy
 Wooded covered with conifers and maples
 Open
 Cultivated % 0%
 Character of Valley narrow and deep, about 1/4 mile wide
 Character of Banks
 Density of Marginal Vegetation
 Erosion
 a) of banks
 b) of watershed

Hilly to mountainous, valley narrow and deep, about 1/4 mile wide, covered with conifers and maples, no cultivation.

Irrigation Diversions: None

Artificial Obstructions: None

Natural Obstructions: None

Fluctuation in Water Level: Estimated to be 4 feet to 8 feet.

Pollution: None

Fish (Salmon): None

Fish (other than Salmon): A few trout.

General Remarks:

The river does not appear to be very good as a salmon stream, chiefly because of the preponderance of jagged large rubble constituting almost 60% of the 15 miles surveyed. The best spawning areas are located in the second 5 miles section of the river, but even here the medium and small rubble totals less than 30% of the bottom. As the river is approximately 75 miles long there are still 60 miles to be surveyed, nearly all of which will be of necessity packwork.

Temperature Data: No temperatures were taken

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
AA-BB (5.0 miles)	81	16.2	20	4	33	24	24
BB-CC (5.0 miles)	135	27.0	24.7	4.9	40.7	29.6	64
CC-DD (4.6 miles)	69	15.0	9	* 63	56	7	0
			6.7	46.7	41.5	5.2	
			0	* 69	0	0	
			0.0	100.0	0.0	0.0	

*= Pools listed by plus signs by Hanavan and Wilding

Gradient:

Listed as moderate on the observation between station blanks. Plan and profile maps of the entire river have been made by the U.S. Geological Survey, but are unavailable at present.

Tributaries:

- 1) Lottie Creek, 1,760 yards above station AA, right bank, 3 cfs
- 2) Lowell Creek, 3,620 yards above station AA, left bank, 5-8 cfs
- 3) Pete King Creek, 4,445 yards above station AA, left bank
- 4) Rye Patch Creek, 8,975 yards above station AA, left bank, 3 cfs, impassable, steep grade, large T rubble
- 5) Hellgate Creek, 12,220 yards above station AA, 3 cfs, precipitous, impassable, solid bedrock
- 6) Canyon Creek, 13,700 yards above station AA, left bank, 5 cfs
- 7) Apgar Creek, 14,300 yards above station AA, left bank, 1/2 cfs, steep
- 8) Glade Creek, 15,500 yards above station AA, left bank, 1 cfs
- 9) Deadman Creek, 18,500 yards above station AA, left bank, 5 cfs, steep, boulders
- 10) Coolwater Creek, 23,200 yards above station AA, right bank, 2-3 cfs steep, large rubble, impassable at low water
- 11) Bimerick Creek, 24,400 yards above station AA, left bank, 3-4 cfs, steep but passable
- 12) Rire Creek, 15,600 yards above station AA, right bank, 3-4

cfs, steep at lower end, 80% of bottom washed out and exposed.

End of 1938 survey

Salmon River

River System: Salmon River
 Name of Stream: Salmon River

Date of Survey: July 20, 21, 22, 23, 1941 By F.G. Bryant
 Tabulations and card write up by Bryant

Source: Rises in Sec 1. T. 5 N, R. 14 E. Its origin is at the northwest end of the Smoky Mtns, apart of the Sawtooth Range at the head of the Stanley Basin in Blaine County Idaho.

Direction of Flow: North approx. 35 miles to town of Stanley; east another 40 miles to below Clayton; N.N.E. and North for approx 100 miles until below Salmon City; west over 125 miles to Riggins; north 40 miles, then northwest approx 30 miles, then finally looking S.W. approx 25 miles to confluence with the left bank of the Snake River a bit over 50 miles upstream from Lewiston Idaho. (These distances are only approximate and should be corrected when more of the stream is surveyed).

Approx. total length: 400 miles of which the 19.2 mile stretch from the mouth of Valley Creek in the town of Stanley to the wooden bridge opposite the Sawtooth Valley Range Sta. was surveyed in July 20-23, 1941.

Station Location:

Sta	Location	Distance above prev. Station vds miles	Distance above Mouth vds miles	Map Location	Width	Depth
A.	At mouth of Valley Creek	? 365	-	sec 3, T10N,R14E	120'	2'
B.	At mouth of Redfish Lake outlet	9,900 370.6	9,900 5.6	sec. 26, T10N,R14E	45'+	2.5'
C.	At wood bridge opposite Sawtooth Valley Ranger Station and just below mouth of 4th of July Creek.	33,800 384.2	23,900 13.6	sec.8, T8N,R14E	66'	1 1/2'

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060201-051-02.82	
b	17060201-060-04.52	
c	17060201-071-00.05	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
A-B	320,100	159,270	49.8	86,010	26.8	43,750	13.6	31,070	9.7
B-C	451,40	115,700	25.6	197,120	43.7	100,100	22.4	38,480	8.5
Total	771,500	274,970	35.7	283,130	36.7	143,850	18.6	69,550	9.1

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Area (yd ²) (MR&SR)	Usable %	Spawning Area (yd ²)	% Usable
A-B	9,900 5.6	320,100	129,760	40.5	17,310	5.4
B-C	23,900 13.6	451,400	297,220	66.0	146,415	32.5
Total	33,800 19.2	771,500	426,980	55.4	163,725	21.2

Spawning area unavailable: (none in area surveyed).

Character of Watershed:

	Sta. A-B	Sta. B-C
Mountainous	X	X
Hilly	bordering valley	bordering valley
Rolling		
Flat	valley bottom 1/4 to 1/2 mile wide	valley bottom 1/8 mi lower end to 1 mi above
Swampy		X in some sections with springs in upper 8 miles
Wooded	x on mts. slopes only	x on lower mtn. slopes and along edge of valley only
Aspen	x + few willows along stream course	x valley floor and left valley wall of hills, semi open
Cultivated(%)	15% for hay and pasturage etc. about 1/3 valley bottom	15% mostly hay fields and pasturage and grazing all along valley floor
Character of Valley		

Character of Banks	0-150' where bordered by hills of valley wall. 0-8' avg 5' in valley bottom.	0-150' where it swings against valley wall. 5-15' through low bends cuts.
a)height and slope		
b)composition	Earth and gravel.	0-4' in open valley floor
Density of marginal vegetation	spotty at lower end, to dense willows in upper sections	moderate to very dense above lower 2 miles willows almost entirely and few alders and sage 3-10'high
Erosion		
a)of banks	considerable	considerable
b)of watershed	severe on right valley wall. (Sawtooth mtns.)	severe; particularly right. valley wall which is formed by Sawtooth mtns.

Diversions: (numbered beginning at Valley Cr.)

No.1 5300 yds. above Valley Cr, a local irrigation ditch take off on left bank. This is an open dirt walled ditch approx. 4 ft wide and 2ft deep, with a wood sluice headgate about 50 ft below the ditch opening. There is no dam, except a few stones forming a small diverter, that does not extend into the river for any distance and is no obstacle. There are no screens or protective devices of any kind. Approx 5 c.f.s.was being diverted at the time.

No.2 28,800 yds. above Valley creek on left bank. A pole fence with wires that has caught and held debris projects diagonally upstream and approx 2/3 across the stream to serve as a wing diverter. It is not a barrier at any time, as fish can go around it, but may be quite successful in diverting young downstream migrants into the ditch.' The ditch opening is 5'-6' wide in the bank, and 1 1/2' deep. At the time it had 6"-10f"of water in it and was diverting an estimated 4-5cfs. onto the flat beside the stream. There was no protective device of any kind.

No.3 Irrigation diversion on left bank @ 32,900 yds., Water is diverted into ditch by a piled rock wall 1 to 1 1/2 ft high extending diagonally upstream and about 1/3 across the stream. It is not a barrier, but is a good diverter for some of the young downstream migrants. The dirt walled ditch is approx 4 ft. wide and 1 ft deep. It had 6" of water in it at the head, and had no protective devices of any kind, and no headgate, unless they are located further down the ditch, which irrigates local fields by the river.

No.4 An old irrigation ditch of dirt construction takes off on the right bank @ 33,300 yds and about 500 yds below the bridge at Sta. C on the right bank. However it has apparently not been in use for some time and was partially slumped in several places, and contained no water

There may have been 1 or 2 other small local irrigation ditches above Valley Cr. that were missed in the dense and often very extensive willow brush along the stream, but no large ones, and only irrigating to a field by the stream itself.

Artificial Obstructions:

None except the wing dams at irrigation ditch take offs, none of which reach across the entire stream, and therefore do not block fish, although they do serve to divert some of the downstream migrants.

Natural Obstructions: none

Fluctuation in Water Level:

Between Sta.	Variation Ft.	Cause	Stream Volume est.	% of Stream bed Covered
A	1-4 ft.	spring run off	375 cfs	all, over 90%
B	1-3 ft.	spring run off	300 cfs	60 to 100 variable
C	1-3 ft.	spring run off	225 cfs	60 to 100 variable

*Note: The volume at (just above) the mouth of Valley Cr. was estimated by taking the U.S.G.S. records for the water year 1937-38 for the same days, as the survey, namely July 20-23 inc., and figuring the average flow for those 4 days. Since the Sta. is below Valley Cr., the avg. flow for those 4 days for Valley Cr. was then reduced, giving 354 cfs. Since this spring was the wettest in years, the stream flow would be slightly greater than the 1937-38 avg, and the estimate was increased to 375 cfs., which seemed to be a good estimate of the flow as seen and the time. The flow at Sta. B was estimated after deducting the estimated flow for Redfish lake outlet Cr. The flow at Sta. C. was further lowered by allowing for the flow of several observed springs and 3-4 small feeder tributaries.

Pollution:

The effluent of several small hot springs, slightly sulphurous in odor enters the stream above Redfish Lake outlet by the Rocky Mtn. Club Ranch. They had no apparent effect on fish, as trout fingerlings were observed within a few feet of their outlets and they are reported to run into the spring area in the winter.

Several small marshy seepage areas and drainage channels were covered with algae of the iron rust color and had a scum on the surface, apparently due to local decomposition. Trout fingerlings seemed to be absent in such side areas, but this material does not appear to have any appreciable effect on the stream.

Sheep and cattle droppings occur on many riffle areas but had

no apparent effect.

Fish (Salmon): Spring Chinook

No salmon were observed until well above Redfish Lake outlet stream. 1 Chinook was observed in a pool @20,700 yds (above Valley cr.), and another @ 23,500 yds. At 27,900 yds a dead female Chinook was found lying in a large pool, having but recently died. It was 37" long, the eggs well advanced, but not yet separated, There were 2 or 3 fungused holes in the body that may have been caused by a pitchfork or spear, but the main cause of death seemed to be from gill trouble. The gills were white, bruised and rather raw. It is possible that silt may have damaged it below Yankee Fork mouth, as the water is quite clear above that point.

With splendid spawning riffles, clear water and good resting pools there is a great scarcity of adult salmon in the area surveyed. This appears due mainly to two factors. 1. Unlimited and severe spearing and snagging in the entire river prior to 1940 when the area above the mouth of Redfish Lake outlet was closed to salmon fishing in order to serve as a spawning ground. Although too late to save but a remnant of former great runs, it was an excellent move as a better area of as great capacity for salmon spawning would be hard to find anywhere, However its full benefit is never realized because of the fact, (2) that spearing and snagging is still permitted below Redfish Lake outlet and the take of adult salmon from the resting pool at the Sunbeam dam in particular is a severe drain on the small present runs. (see card 14)

Many small salmonids, some of which were believed to be young chinook were seen in the small spring tributaries in the willow flats in the vicinity of the Rocky Mtn. Club Ranch.

Visibility was generally good, with the water very clear, but light reflection, riffle and eddy currents and welling, and thick willow brush along the banks made the possibility of overlooking some fish quite possible in so wide a stream, but the scarcity of spawners was quite evident.

The operator of a sawmill in the banks @ 18,600 yds stated that there were formerly hundreds of chinooks on the riffles near his house and for that matter in most of the riffles in the valley, particularly above Redfish Lake outlet, but that they had been speared out (see card 14). Others living along the river made the same statement, and apparently most of the riffles had had salmon on them in years past, which would indicate a run of many thousand spawners until recent years.

Fish (Other than Salmon):

1. Steelhead reported in spring; none seen.

2. Rainbow Trout: Fair no to abundant. Several 5" to 10" rainbow trout were caught in the 1st mile above Valley Cr. mouth while we were there from May through July, but the stream is overfished at present, and few fish over 6" long are caught per person per day in the main river, except at the 1st of the fishing season when a few good catches are made, apparently when the fish are moving upstream after high water period. Fingerlings 2-5" long are very abundant in the upper 10 miles surveyed. In one large pool with an undercut bank over 3 dozen were observed. In the side tributaries, such as the small channels in the flats above the Rocky Mtn. Club and by the Williams Ranch, which rise from springs at the foot of knolls in the valley floor, they are often in great numbers. One such side channel which are apparently splendid nurseries there were thousands on its 1/2 mile length. Whether they are steelhead or local rainbow are not known, and there maybe some of each. Some of these may also have been cutthroat or chinook fingerling as well.

3. Cutthroat trout: Fair number only. These made but a small part of the catches seen.

4. Whitefish: Fair no. Various sizes to well over a foot long. Some of the "pin minnows" observed in the shallows approx. 10 miles up may have been whitefish fry, and could serve as good feed for young trout and salmon.

5. Suckers: Reported. Saw a fish in pool @ 20,200 yds that appeared to be a sucker. No great numbers at the time however, and not positive identification.

6. Sculpins: fair to good no.

7. Dolly Varden Trout: Reported, none seen.

Stream overfished due to proximity to the road. 2-3 fishermen seen each day, but no good catches except early in season.

General Remarks:

Even above Valley Cr. the Salmon River is a good sized stream. The Stanley Basin, through which it runs is from 1/4 to over 6 miles wide. The left valley wall is a range of steep sloped rolling hills 100 to 300 ft high, open, and covered with sage and grass clumps. At the top there is often a clump of lodgepole pine or fir which may creep part way down the slope, particularly in the gullied water courses. These hills are backed by higher hills and then by higher mtn. peaks. The right valley wall is usually an abrupt upsweep to the steep rocky peaks of the rugged and serrated Sawtooth Range itself. This lower edge has a conifer stand that creeps out into the valley in places. The river has cut a channel from 5 to occasionally 30 ft deep, in the nearly flat meadow bottom, and has left behind a ribbon of low benches on either side.

These flat topped benches are covered with sage and grasses, or are irrigated to form hay fields and grazing for sheep and cattle, there being a series of ranches present, mainly along the left valley wall. Bordering the stream at the foot of the benches are the willow flats which exist as mere fringes along the stream below Redfish Lake outlet, to dense patches with some marshy spring areas above, that are sometimes 1/2 mile across particularly where the stream is braided. The banks are low except where they have swung against a low bench area, where they are 8 to 30 ft, or where it swings against the left valley wall just below Redfish Lake outlet where it is 100-250 ft high and has more gravel rather than mainly earth and gravel as elsewhere.

From Valley Cr. to Redfish Lake outlet the gradient is a bit greater than above, and the stream is more nearly a constant riffle area, with one or two stretches of rapids. The bottom is a cobble of from 4" to 2 ft boulders, and is not very good spawning area except for small patches or along the stream edges. The few pools are long and 3-4 ft deep with considerable current. By Sunny Gulch a few hundred yds. below Redfish Lake outlet the river has swung against the steep left valley wall and out through a 20-40 ft bench which has a large accumulation of boulders in it, and there are 2 or 3 better spots of spawning gravel.

Redfish lake outlet tumbles through a boulder bed cut in the bench to enter in a gully. There is stand if small lodgepole pine in this narrow bench area that crosses the valley floor at this point.

Above the Lake outlet @ 11,900 yds the road crosses to the left bank of the stream and the valley widens out immediately onto a wider meadow bottom through which the stream meanders. Good riffles appear, separated by small pools 3-6 ft deep, and the willows clumps 4-8, high, increase. The banks are low, 0-4 ft high and sometimes undercut, through usually held in place by willow roots. Gravel flood bars are in evidence beside the stream, which @ 13,100 yds and above is often broken or braided in 2 or 3 or more channels. This condition continues to above the Rocky Mtn. Club and Gillespie Ranch @ 19,700 yds, and contains some excellent spawning riffles with good resting pools between. Spawning area per 100 yds through this area varies from 20-80% usable, and appears to be fairly stable due to lack of sand and silt except in a few spots.

Above the Gillespie Ranch the stream has in the past cut several embayments in the valley bottom, benches which are 10-25 ft higher than the streambed. A series of springs rise from the foot of the benches for some distance along the stream above this point, particularly along the left side. Due to the flatness of the embayment areas between the benches and the stream bed, the springs cause a marshy condition, which in one case in an embayment approx. 400 yds across had heavy marsh grass in nearly knee deep water that

was very cold. A few springs are hot, one at the Gillespie Ranch being piped to the ranch house and to a swimming pool. One of the cold spring feeders that had a flow of 5-6 cfs. ran parallel to the main river and in several places within 'a few feet of it for over 1,200 yds. This tributary had a sandy bottom with patches of aquatic plants and grasses. It varied from 2 to 8 ft in width, and 4" to 2 ft in depth and was full of thousands of fingerling salmonids 2-5" long mainly rainbow. Several adult trout 6" to 8" long were also present. The young fish apparently run up into these shallow side streams shortly after emerging from the gravel and remain there, being protected from larger fish, until of fair size before they go out again into the river. These spring channel nursery areas are excellent rearing pools, and judging from the great numbers of fingerlings present enable a much higher percentage of the fish hatched to reach a fingerling size sufficient to take care of themselves in the main stream. This may account for the good name of the river as a fish producer up to recent years in spite of the human drain. This side channel is a perfect natural rearing station, and the surveyor could not help but think that if man provided a small amount of added feeding in these nursery runs; the poundage output might be phenomenal, as the riffle area seems to provide as good spawning conditions as any hatchery that could be built, and operates at no cost. One of the local residents stated that fish winter in considerable numbers in the larger spring holes, which are often pools that are several yds across.

Huckleberry Cr. entering the right bank @ 23,000 yds is 9-12 ft wide and 3-6 ft deep stream with a flow (at the time) of approx. 10 cfs. The bottom in the 1st 300 yds avgs 20-30-40-10. It has a moderate gradient for its lower end before passing into a cleft valley in the Sawtooths. Probably the lower 1/2 mile could hold a couple hundred spawners, but it has little value compared to the main river. In late summer it is probably so shallow that ascent is most difficult, or nearly impossible and freezing in winter may be too severe. Residents report that it has never been known to have salmon in it.

The usable spawning decreases somewhat in the vicinity of Huckleberry Cr, but there is still a good patch in every 100 yds, and some are quite extensive. Willows are thick, but the right valley side above the immediate cut in which the stream flows is a powdery dry sage brush flat extending 1/4 to 1/2 mile to the pine border at the beginning of the upsweep to the valley walls. The Sawtooths here are close, forming the right valley wall, and rising steep to sheer directly behind the belt of trees bordering the valley.

At 32,000 yds the stream has narrowed to 36 ft and a rapids strewn with much larger boulders is present. The rubble above this point is generally a bit too large for spawning, which exists in small patches only, and the remainder of the area surveyed to the

bridge just below Forth of July Cr. and opposite the Sawtooth Valley ranges Sta. is of much less value.

The area above this point to the head of the valley is said to have considerable more good spawning area, and should be surveyed when possible to do so.

There are no barriers or pollution in the area surveyed of 19.2 miles above Valley Creek mouth. There are 224 resting pools mainly 2-7 ft deep and usually of fair size. The riffles are generally of small value to spawning salmon below Redfish Lake outlet, but above that point there are many excellent ones. Of the total bottom area of 451,400 sq yds, in the 13.6 miles of stream above Redfish Lake outlet, 66% or 297,220 sq yds are of medium and small rubble available for spawning, and an extremely high amount of this is located on good riffles, and usable for spawning, the usable being 146,415 sq yds or 32.5%, which is one of the greatest for any similar stretch of stream yet surveyed in the Columbia River watershed. This is important because the Idaho state Fish and Game Dept. closed this area above Redfish Lake outlet to salmon fishing in 1940, in order that it could be used as a spawning area.

The older residents and ranchers along this section of the river report that there was an enormous run of salmon in past years, and that they were once almost uncountable on the spawning riffles. Wagon loads were even used as fertilizer. However during the last 10-30 years preceding the 1940 closure, the spearing and snagging parties had increased during the spawning season until the practice attracted people from Boise and other cities as well as local residents. Fungused fish were discarded after spearing and often as many fish were wasted as were utilized, according to reports.

During the last 10 years the toll has resulted in a final reduction to the point where the decimated run is in danger of complete extinction. A sawmill operator living beside this good spawning stretch stated that before the area was closed (1940) there were gangs of dozens driving the stream each night, particularly on the good riffles by the Pines (@ 18,600 yds which was classified as being 70 and 80 % usable spawning by the survey). He said that one rack bodied truck often carried a dozen men and boys and cars and trucks were parked in groups all along the road by his house. These men drove the salmon out of pools with long poles, and forming lines clear across the stream and armed with spears, pitchforks and even sharp sticks, speared anything that moved. So extensive was the practice that as he stated, "there was hardly a rock on my section (of the stream) that didn't have spear marks on it, and some of the weak old spawners could have been speared on the spawning beds by a kid with a willow stick. There isn't much left to protect--but I'm glad its closed now."

There is small wonder why only a handful of salmon were seen

in the stretch in 1941 even with the closure.

There is also at present a very detrimental factor operating to reduce the remnants of the run. Spearing and snagging is still allowed below the closed area in the rest of the stream. A few miles below Stanley in a small rocky gorge just above Yankee Fork, the State has blown a hole in the unused Sunbeam Dam. The river pours through the narrow opening in a very fast cascade or small fall onto a frothy pool below. Adult salmon moving upstream appear to hesitate in the pool before making the run into the torrent in the gap above. Here, on the rock walls of the pool gather a continual stream of snaggers through out the entire period of the spawning run. As many as 6-7 were seen snagging in the pool at one time, although the pool is not over 50 yds long and snag lines are thrown clear across it. Two chinook were taken the morning of July 6, 1941 in a single hour, and this after the height of the run had been reached. The store at Yankee Fork operates a smoke house and has records of the fish caught at the dam during the last 7 years. As many as 75 were taken in per day from this one pool, on two different days in June 1941. Mr. Davis who runs the Yankee Fork store estimates that only 1/4 to 1/5 of the salmon caught at the dam are brought to the store and had the following records of those brought to him to be smoked @\$.50 each.

1. In 1939 from July 11th through August 18th, 109 chinooks were brought to the store.

2. In 1940 from June 24th through Sept 4th, 84 chinooks were brought in.

3. In 1941 from June 9th through July 6th, 93 chinooks were brought in.

There was a large run of chinooks in 1935, and in 1939, the natives believing that a 4 year cycle of abundance operates.

Davis estimated that the number of chinooks caught per day at the dam was about 15 in 1939, 7-8 in 1940, and 10 in 1941.

There was a larger run of Blueback or Sockeye in 1938, Davis catching approx. 35 at the dam. The Blueback spawn in August and Sept (according to Davis a bit later according to some others) in Redfish Lake on reefs, while the local little Redfish (landlocked blueback) reportedly spawn at approx the same time, but in the tributaries to the lake.

Before the new channel was blasted around the Sunbeam dam, the chinooks and sockeye could not get through the tunnel which was full of water at times of high water, and many were snagged while waiting in the pool below. However they were said to have gone up through it or when low water was reached in the tunnel. One of the Merrill boys, (who act as guides) stated that he did not believe

that more than 1 in 10 chinooks got past the snaggers at the dam at the height of the run in June, and that less than that got by at the beginning or end of the run. It is small wonder that only scattering salmon ever get to the present protected spawning grounds above.

Sunbeam dam is not the only place that snagging is done, as it is conducted, along with spearing, anywhere along the river that salmon are seen, and is reported to take considerable toll on the other reported good spawning beds such as by the Robinson Bar several miles below the dam.

A huge gold dredge is now in operation (begun in Aug 1940) on Yankee Fork, and no settlement basins are provided. Consequently all the valley soil is being poured into the stream and rocks are deeply coated with mud. This yellow stream discolors the main Salmon for the entire distance below the mouth of Yankee Fork, and has doubtless rendered any spawning grounds below it useless by silting. Its effect on the upstream migrants is not known, but would not be of any benefit, and may cause some damage to the gills and perhaps death before spawning in some cases. One unspawned female found dead in the area surveyed had raw gill filaments with a diseased condition. The sediment may also cause the salmon to pause longer in the pool at the dam, where the first clear water is found in the river up to that point, and so allow a greater portion to be snagged out before spawning.

The salmon run, from data gathered at the Yankee Fork store, reach the Sunbeam dam in late May or early June with the height of a the run in June, and a tapering off through July. This time is similar to their appearance in the upper Middle Fork areas, but they apparently spawn a bit later in the upper main Salmon River than they do in the upper Middle Fork Tributaries. In the later, spawning commences in mid July and is completed by mid August. The eggs of the female salmon examined at Sunbeam dam on July 6th had not separated, nor had they in the 37" female found dead 27,900 yds. above Valley Fork in the main Salmon River on July 23, 1941, although in the latter case they were well developed and within a week or two of separating. Spawning probably begins in early August and is completed in Sept. in the upper main Salmon River.

The upper Salmon River has a very small run at present, probably less than 1000 ever get to spawn now, but is capable of supporting a very large run, as it did in the past, and many thousand salmon could be easily cared for with little competition, even on the 163,725 sq yds of usable spawning riffles in the 19.2 miles surveyed above Valley Cr., and more lies beyond the stretch surveyed. With the large spring fed nursery areas of the side channels in the middle of this stretch, the survival of the hatch should be unusually high. Artificial stocking will hasten the recovery. The run should be greatly built up in the future and at small expense if study and continued application of protective

measures is undertaken by the state of Idaho, which made a good start in closing the spawning area above Redfish Lake outlet to spearing and snagging. However natural recovery will be slow or nearly impossible unless the Sunbeam dam barrier is opened to a greater extent, eliminating the holding pool below it, or unless snagging is stopped there so that the few salmon that reach the upper river can also reach the spawning grounds unhindered. It may also in the future involve a study of and necessitate some change in the regulation of the commercial fishers on the lower Columbia to allow a greater escapement to the upper river, this later being a very sore point to the people in Idaho. The stream itself in the area surveyed has exceptional spawning potentialities for salmon, if the salmon can only reach the grounds.

Temperature Data:

None taken due to lack of thermometer. However temperature is not too high in summer, generally being, in the high 50's, but ice conditions in some winters is reported as bad, although sufficient pool area, and spring feeder nursery areas should provide winter shelter for fingerling in the area surveyed.

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
A-B (5.6 miles)	6	1.1	0	0	0	6	589
B-C (13.6 miles)	218	16.0	4	6	20	188	64
Total (19.2 miles)	244	11.9	4	6	20	194	653
			1.8	2.7	8.9	86.7	

Gradient:

No. published data available at present but gradient observed as follows

1. From Sta. A-B Valley Creek mouth to Redfish Lake outlet the gradient is moderate; almost continuous riffles with 1-2 rapids.
2. From Redfish lake outlet to Forth of July Cr. (Sta. A-B) it is moderate, but has less gradient than in stretch below, except for upper 1/2 mile which is about the same as below Redfish Lake outlet.

Tributaries:

No.	Name	Side Entered on	Distance Above Valley Cr.	Length	Width	Flow	Value to Salmon
1.	unnamed	R.B.	3,300 yd	2 mi.	6 ft(ch)	Trickle	none;

2. Sunny L.B. Gulch	7,800 yd	1 1/4 mi	2 ft(ch)	barely amt	nearly dry none; nearly dry passable some g o o d spawning 'above mouth above cascades & between big & little Redfish Lakes. Blueback runup it to lake. none
3. Redfish R.B. Lake outlet	9,900 yd (5.6 mi)	app2 1/2 mi.	36 ft stream not counting not counting Little Redfish Lake	app. 75 cfs	
4. Boundary L.B. Cr.	11,100 yd	2 1/2 mi	4' ch	dry	
5. Cleveland L.B. Cr.	11,500 yd	3 mi	4' ch	nearly dry	none
6. unnamed R.B. Cr. from Elk Meadows	17,200 yd	2 mi	2' ch	1-2 cfs	probably none sluggish, marshy, small little or none
7. Gold Cr. L.B.	19,200 yd	5 mi	3-5'	5 cfs	little or none believe used for irrigation by Rocky Mtn. Club mouth has little water and hard to troll.
8. Williams Cr. L.B.	19,700 yd	5 mi	3-7 ft	1-2 cfs	little or none at mouth used for irrigation above, comes back through a marshy area, hard to trace

No.	Name	Side Entered On	Distance Above Valley Cr.	Length	Width	Flow	Value to Salmon
9.	Unnamed spring	L.B.	20,300	3/4 mi	4-8'	5-6 cfs.	none for avg 3-4' spawners but feeder excellent nursery area & full of thousands of salmonid fingerling. Parallels main river for 1200 yds. Originates in big spring hole at foot of bench said to be good winter hole for fish. Several in all spring feeders along here of local origin 50-500 yds long but small. Good as nursery areas 1-2 hot springs below.
10.	unnamed spring feeder	L.B.	21,900	1/2 mi	4-15'	4-5 cfs	pt used a wide near irrigation on mouth on new ranch 4 pt of spring systems rising along bench edges local values as nursery and has fingerlings in it, none for spawning salmon.
11.	Huckle- Berry Cr.	R.B.	23,000 yd	6 mi app-	9-12'	10 cfs	salmon would enter lower 300 yd=20,30,40,10; probably very shallow and difficult in summer no run ever reported in the streams 3 branches about 3/4 mile up and small then.
12.	Fisher Cr.	L.B.	30,900	7-8 mi	est 8 ft	8-10 cfs	not seen due too many side channels in willow flats and believed used for irrigation so that little left at mouth.

The above tributaries were all that come in the section as surveyed in 1941 between Valley Cr. and the upper end of the survey (at bridge app Sawtooth Valley Ranger Sta).

Little Salmon River

River System: Salmon River
Stream Surveyed: Little Salmon River

Date of Survey: Oct 9, 1942, by Parkhurst and Bryant

The Little Salmon River enters the Main Salmon approximately 82 miles above the mouth of the latter, at Riggins, Id., in the SE4, S15, T24N, R1E, Boise Meridian.

The Little Salmon rises near the headwaters of the Weiser River in the Weiser Natl. Forest at an elevation of about 6000 ft. It flows in a northerly direction for a distance of 43 miles to its confluence with the main Salmon River. The stream was inspected for a distance of 34 miles, from New Meadows, Id. to the mouth.

The lower 24 miles of the stream is characterized by large amounts of large rubble and broken bedrock in the stream bed. The gradient is also fairly steep in portions of this section. There was a notable absence of suitable size rubble for spawning salmon.

In the upper 10 miles of that portion of the stream examined, the character of the stream changes suddenly to the opposite extreme condition. In this section the gradient is slight, and the stream flows sluggishly thru the high, grassy meadows. The bottom in this section is composed chiefly of mud and sand, and for this reason is also unsuitable for spawning salmon.

In the remaining 9 miles of stream above New Meadows, Id., which was not inspected, the principal tributaries are as follows:

(1) A small stream entering on the left bank 34.2 miles above the mouth, or 0.2 miles above New Meadows, is 7 miles long and flows from Fish Lake, which is a small mountain lake somewhat more than 1/3 mile long located at an elevation of 4,526 ft.

(2) Big Creek, entering on the left bank 34.7 miles above the mouth, is 13 miles long.

(3) Mud Creek, entering on the right bank 35.7 miles above the mouth, is 13 miles long. Little Mud Creek, its principal tributary, is 7 miles long.

Numerous inquiries were made of local residents living adjacent to the Little Salmon River, but there were no reports of any salmon having been seen or captured in the Little Salmon for several years. Since the highway parallels the river very closely from New Meadows to the mouth it would be very easy to find and kill any salmon in shallow water. This was probably a large contributing factor to the evident depletion of the run of Spring Chinook salmon in this stream. At present the stream is closely

posted against the snagging, gaffing, or otherwise unlawful capture of salmon, but this is only a recent regulation, and is difficult to enforce. The lack of good spawning area makes it probable that the stream never supported a large run.

Rapid River, the principal tributary to the Little Salmon, entering on the right bank 4 miles above the mouth of the latter, may be reached by a poor road for a distance of only 2 miles above its mouth. The stream extends for 21 miles, in addition to the West Fork of Rapid River, 9 miles long, as well as many smaller tributaries. It is reported that Rapid River supports a small run of Spring Chinook salmon.

Section a-b: from mouth to point 6.7 miles above

Date: Oct 9, 1942	Inspected by: Parkhurst & Bryant
River System: Salmon	Stream: Little Salmon River

Width: 48,	Avg. Depth: 1'	Flow: 210 cfs at Sta A
		180 cfs at Sta B

Rubble: % large 60, % med. 30, % small 10, % M & S 0
 % Usable sp. area: 20%

Accessibility: available at all times

Sp. riffles: numerous, fair quality

Resting pools: adequate number, poor cover

Gradient: Moderate	Water fluct.: 1-3'
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Banks: rock and earth, steep, 5-30' hi, avg 10' hi

Marg. veg.: sparse

Valley: narrow, V-shaped, 200-400 yd wide, slight amount of cultivation on a few terraces bordering stream, chiefly hay and pasture.

Watershed: extremely high, barren rocky hills or mountains, 800-1000, high, sparsely covered with grass and a very few pines.

Temperature: Water **54.5°F**, Air **68°F**

Tributaries:

Hailey Creek, l.b. about 1 mile above mouth, less than 1 cfs, steep, no value

Squaw Creek, r.b., about 1 mile above mouth, less than 1 cfs, steep, no value

Capt. John Creek, l.b., 3.3 miles above mouth, < 1 cfs,

steep, no value

Rapid River, r.b., 4.0 miles above mouth, about 21 miles long plus

West Fork Rapid River, 9 miles long, plus numerous smaller tributaries, discharge 25 cfs, small run of Spring Chinooks reported

Sheep Creek, l.b., 6.2 miles above mouth, less than 1 cfs, steep, no value

Remarks: too much large rubble for good spawning area

Section b-c: from b to hiway road bridge 5.8 miles above

Date: Oct 9, 1942

Inspected by: Parkhurst & Bryant

River System: Salmon

Stream: Little Salmon River

Width: 42, Avg. depth: 1, Flow: 172cfs at Sta C

Rubble: % large 70, % med. 20, % small 10, % M. & S. 0

% Usable sp. area: 10%

Accessibility: available at all times

Sp. riffles: numerous, fair quality

Resting pools: adequate number

Gradient: moderate

Water fluct.: 1-4,

Banks: large rock, steep, 4-8', avg. 5' high

Marg. veg.: fairly moderate, sparse in places, willow, sumach, a few pines

Valley: narrow, V-shaped, 200-400 yd wide, no cultivation

Watershed: very high, steep, barren, rocky hills, 800-1000, high, sparse cover of grass, very few small pines

Temperature: Water 56.0 F, Air 69.0 F

Tributaries:

Hay Creek, l.b., 8.2 miles above mouth, less than 2 cfs, steep, no value

Indian Creek, r.b., 10.2 miles above mouth, less than 1 cfs, steep, no value

Lockwood Creek, r.b., 12.3 miles above mouth, less than 1 cfs, steep, no value

Rattlesnake Creek, l.b., 12.3 miles above mouth, less than 2 cfs, steep, no value

Remarks: too much large rubble for good spawning area

Section c-d: from hiway road bridge at Sta C to hiway road bridge at Sta D, 6.3 miles above

Date: Oct 9, 1942 Inspected by: Parkhurst & Bryant
River System: Salmon Stream: Little Salmon River

Width: 39' Avg. depth: 1 1/2' Flow: 142 cfs at Sta D

Rubble: % large 70, % med. 20, % small 10, % M.& S. 0
% Usable sp. area: 10

Accessibility: available at all times

Sp. riffles: numerous, fair quality

Resting pools: adequate number

Gradient: moderate to fairly steep

Water fluct: 1-5'

Banks: rock, steep, 5-10' high

Marg. veg.: light, fairly sparse

Valley: narrow, V-shaped, 1/4 mile wide, some narrow benches bordering stream, no cultivation

Watershed: steep, high, hills, lightly covered with grass and scattered pines

Temperature: Water 54.0 F., Air 61.0 F.

Tributaries:

Fall Creek, r.b., 15.2 miles above mouth, 3 cfs, impassable falls at mouth

Elk Creek, l.b., 16.0 miles above mouth, 3 cfs, steep, no value

Camp Creek, r.b., 16.7 miles above mouth, less than 2 cfs, steep, no value

Boulder Creek, r.b. 17.4 miles above mouth, 16.0 miles long, 10 cfs, steep, no value

Trail Creek, r.b., 18.5 miles above mouth, less than 1 cfs, steep, no value

Hazard Creek, l.b. 18.7 miles above mouth, 10 cfs, impassable falls 1/4 mile above mouth

Remarks: too much large rubble for good spawning area.

Section d-e: from hiway road bridge at Sta D to Idaho County boundary line at Sta E, 5.3 miles above.

Date: Oct 9, 1942 Inspected by: Parkburst & Bryant ,
River System: Salmon Stream: Little Salmon River

Width: 30' Avg. depth: 9" Flow: 138 cfs at Sta E

Rubble: % large 60, % med 20, % small 10, % M.& S. 10
% Usable sp. area: 10

Accessibility: numerous small falls and cascades passable with difficulty at present low water

Sp. riffles: few, small

Resting pools: numerous, good

Gradient: very steep

Water fluct.: at flood stage rises 6-8' and floods adjacent area

Banks: bedrock and large rock, steep, 6-30' high, often forming sides of canyon

Marg. veg.: sparse, alder, pine, aspen

Valley: narrow, V-shaped canyon, 50-100 yd wide, no cultivation

Watershed: fairly steep hills, moderate cover of pine

Temperature: Water 53.5 F., Air 63.0 F.

Dam: 22.8 miles above mouth, with fish ladder, passable

Tributaries:
Round Valley Creek, r.b., 23.6 miles above mouth, 2 cfs, no value

Remarks: too steep a gradient and too much large rubble for good spawning area

Section e-f: from Idaho County boundary line at Sta E to Sta F at a point 4.8 miles above

Date: Oct 9, 1942 Inspected by: Parkhurst & Bryant
River System: Salmon Stream: Little Salmon River

Width: 45' Avg. depth: 3' Flow: 135 cfs at Sta F

Rubble: % large 0, % med. 10, % small 20, % M.& S. 70

% Usable sp. area: none

Accessibility: available with difficulty at low water

Sp. riffles: very few

Resting pools: numerous, almost continuous, poor cover

Gradient: slight Water fluct.: 2 ft.

Banks: earth, steep, 4' high

Marg. veg.: sparse, willow, sumach, few pines

Valley: flat, 1/4-1/2 mile wide, all in pasture and hay

Watershed: low hills, 150' high, moderate slope, moderate cover of pine

Temperature: Water 59.5 F., Air 67.0 F.

Dams: one low, temporary brush dam 2-3' high, passable with difficulty at low water

Falls: 24.3 miles above mouth, or 0.2 mile above Station E, a falls 8 foot high, passable around left side

Tributaries:

Six Mile Creek, l.b., 28.9 miles above mouth, less than 2 cfs, no value

Remarks: a few Salmonid fingerlings 1 1/4" long were seen.

Section f-g: from Sta F to Sta G at New Meadows, Idaho, 5.1 miles above.

Date: Oct 9, 1942

Inspected by: Parkhurst & Bryant

River System: Salmon

Stream: Little Salmon River

Width: 51' Avg. depth: 2, Flow: 125 cfs at Station G

Rubble: % to large 0, % to med 10, % small 20, % M.& S. 70

% Usable sp. area: none

Accessibility: available with difficulty at low water

Sp. riffles: none

Resting pools: continuous, poor cover

Gradient: slight Water Fluct.: 1-2 feet

Banks: earth, steep, 3' high, show some erosion

Marg. veg.: sparse, willow, alder, sumach

Valley: flat, 1 1/2 mile wide, all in pasture and hay

Watershed: low hills, 200' high, moderate slope, moderate cover of pine

Temperature: Water 60.0 F., Air 67.0 F

Tributaries:

Martin Creek, l.b., 29.9 miles above mouth, less than 1 cfs,
no value

Four Mile Creek, l.b., 30.5 miles above mouth, less than 1
cfs, no value

Three Mile Creek, l.b., 31.5 miles above mouth, less than 1
cfs, no value

Goose Creek, l.b., 33.0 miles above mouth, 14.0 miles long to
Goose Lake, impassable falls 8 1/2 miles above Little Salmon
confl., discharge 5 cfs.

Middle Fork Salmon River

River System: Salmon River

Stream Surveyed: Middle Fork of Salmon River

Date of Survey:

<u>Section Surveyed</u>	<u>Date Surveyed</u>	<u>By Whom Surveyed</u>
A-B mouth to Big Cr	In impassable canyon not surveyed passable to fish	
B-C Big Cr to Camas Cr	June 20-22, 1941	Parkhurst and Zimmer
C-D Camas Cr to Loon Cr	June 29, 1941	Frey and Bryant
D-E Loon Cr to Cougar Cr	July 8, 1941	Frey and Bryant
E-F Cougar Cr to Marble Cr	July 9-10, 1941	Frey and Bryant
F-G Marble Cr to Indian Cr	July 12, 1941	Frey and Bryant
G-H Indian Cr to Pistol Cr	July 15, 1941	Frey and Bryant
H-I Pistol Cr to Rapid River	July 17, 1941	Frey and Bryant
I-J Rapid River to Elkhorn Cr	July 20-21, 1941	Frey
J-K Elkhorn Cr to Sulphur Cr	July 22, 1941	Frey
K-L Sulphur Cr to Fall Cr	July 24, 1941	Frey
L-M Fall Cr to end @ confluence Bear Valley and Marsh Cr.	July 24, 1941	actual survey by Frey and interpolations from U.S.G.S. data by Bryant survey.

Source:

Formed by union of Bear Valley Creek and Marsh Creek in Central Idaho, approx 30 miles north-west of the town of Stanley, and in Section 23 township 13N, Range 10E. The Middle Fork for many miles below this point is the boundary between Custer County and Valley County.

Its drainage area is bounded by that of the Main Salmon River itself on the North and East, by the headwaters of the Payette River on the South and Southwest, and by the South Fork of the Salmon River drainage on the west.

Direction of Flow:

Exclusive of minor bends and loops, through often sharp or over 2-3 miles across, the main course of the river is nearly due north for 4.6 miles to Fall Creek, loops westerly 7.4 miles to Sulphur Creek then backs easterly 6.4 miles to Elkhorn Creek. It then runs north east several miles gradually veering more northerly to the mouth of Pistol Creek 14 miles further down. Below Pistol Creek it makes a 180° swing to the east to below Marble Creek. For about 2 1/4 miles between Marble and Thomas Creek it runs nearly south

again towards its point of origin. With minor loopings it swings back to run northeasterly for over 45 miles to the mouth of Camas Creek. It then runs almost due north 10 miles to the mouth of Big Creek, then gradually swings Northeast for 18 miles to enter the right bank of the Main Salmon River in Section 28, Township 23N, Range 15E.

Total Length:

U.S.G.S. distance from plan and profile map is 106 (105.9) miles. Lower 18 miles from mouth to Big Creek not surveyed, but taken as 18 miles from U.S.G.S. plan and profile maps. Total surveyed distance from mouth of Big Creek to point of origin was 155,700 yds or 88.5 miles. Same distance according to U.S.G.S. plan and profile maps was 154,700 yds or 87.9 miles. Total length of stream survey including lower 18 miles from mouth to Big Creek gave length of 187,400 yds or 106.5 miles. The U.S.G.S. distances were not known until the field survey had been completed, and the error of 1,000 yds or less than 0.6 miles in the total 106.5 miles is certainly small and a tribute to the accuracy of the field survey crews allowance for distance estimates in such rough country.

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		yds	miles	yds	miles			
A	at mouth	0	0	0	0	sec 28, T23N,R15E	--	--
B	mouth of Big Creek	31,700	18.0	31,700	18.0	sec 10 T20N,R14E	175'	4-6'
C	mouth of Camas Cr	30,400	17.3	62,100	35.3	sec 15 T18N,R14E	180'	4'
D	mouth of Loon Cr	17,900	10.2	80,000	45.5	sec 13 T17N,R13E	120'	4-5'
E	mouth of Cougar Cr	15,000	8.5	95,000	54.0	sec 7 T16N,R13E	130'	4'
F	mouth of Marble Cr	16,400	9.3	111,400	63.3	sec 8 T16N,R12E	150'	3-4'
G	mouth of Indian Cr	10,500	6.0	121,900	69.3	sec 35 T17N,R11E	170'	3-4'
H	mouth of Pistol Cr	8,500	4.8	130,400	74.1	sec 17 T16N,R11E	150'	6-8'
I	mouth of Rapid River	7,000	4.0	137,400	78.1	sec 32 T16N,R11E	110'	4'
J	mouth of Elkhorn Cr	17,700	10.0	155,100	88.1	sec 21 T15N,R10E	100'	6-8'
K	mouth of Sulphur Cr	11,200	6.4	166,300	94.5	sec 18 T14N,R10E	78'	4-5'

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		vds	miles	vds	miles			
L	mouth of Fall Cr	13,000	7.4	179,300	101.9	sec 34 T14N,R10E	63'	5-6'
M	confl of Bear Valley & Marsh Crks (pt. of origin)	8,100	4.6	187,400	106.5	sec 23 T13N,R10E	75'	10' (pool)

Totals: 187,400 106.5

NOTE 1: actually surveyed stations B to M incl= 155,700 yds or 88.5 miles.

NOTE 2: total distance station A-M from U.S.G.S. plan and profile maps= 186,400 yds or 105.9 miles. Since the lower 18 miles below Big Creek and the upper 3 (approx) below Marsh Creek were interpolated, the 85.5 paced (on horseback) distance of the of the field party was found to compare with surprising accuracy with the 84.9 miles by the U.S.G.S. survey from plan and profile maps an error of but 0.7%.

EPA River Reach Codes:

Station	HUC	SEG Rmi
1	17060206-001-00.00	
2	17060206-006-04.91	
3	17060206-049-04.93	
4	17060206-050-09.54	
5	17060205-001-08.00	
6	17060205-003-00.53	
7	17060206-008-05.05	
8	17060205-010-03.92	
9	17060205-016-02.73	
10	17060205-018-02.57	
11	17060205-020-05.47	
12	17060205-022-06.29	
13	17060205-022-10.96	

Character of Bottom Between Stations:

Station	Area (vd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
A-B NOT SURVEYED									
B-C	1971250	1272545	64.6	439945	22.3	147480	7.5	111280	5.6
C-D	846900	427680	50.5	250080	29.5	93635	11.1	75505	8.9
D-E	731300	357180	48.8	194770	26.6	107810	14.7	71540	9.8
E-F	800100	411140	51.4	250220	31.3	70735	8.8	68005	8.5
F-G	464700	240970	51.8	134320	28.9	44955	9.7	44455	9.6

G-H	398500	201030	50.4	118940	29.8	38885	9.8	39645	9.9
H-I	317800	158070	49.7	91710	28.9	31110	9.8	36910	11.6
I-J	673300	369260	54.8	199690	29.7	54775	8.1	49575	7.4
J-K	346100	150830	43.6	118050	34.1	36200	10.5	41020	11.6
K-L	350700	193900	55.3	107420	30.6	24290	6.9	25090	7.2
L-M	170900	100950	59.1	44660	26.1	13455	7.9	11835	6.9
TOTAL	7071550	3883555	54.9	1949805	27.6	663330	9.4	574860	8.1

Spawning Area Available and Usable:

Sta.	Distance Yds	mile	Total yds Bottom	Yds Avail Spawning (M.R.&S.R.)	% avail	Yds Usable Spawning	% usable
A-B	31,700		18.0				
B-C	30,400	17.3	1,971,250	587,425	29.8	201,120	10.2
C-D	17,900	10.2	846,900	343,715	40.6	37,313	4.4
D-E	15,000	8.5	731,300	302,580	41.4	39,293	5.4
E-F	16,400	9.3	800,100	320,955	40.1	22,991	2.9
F-G	10,500	6.0	464,700	179,275	38.6	12,729	2.7
G-H	8,500	4.8	398,500	157,825	39.6	13,426	3.3
H-I	7,000	4.0	317,800	122,820	38.9	11,203	3.5
I-J	17,700	10.0	673,300	254,465	37.8	15,117	2.2
J-K	11,200	6.4	346,100	154,250	44.6	13,225	3.8
K-L	13,000	7.4	350,700	131,710	37.6	5,921	1.7
L-M	8,100	4.6	170,900	58,115	34.0	4,551	2.7
TOTAL	187,400	106.5					
A-B	-31,700	-18.0					

Total 155,700 88.5 7,071,550 2,613,135 36.9 376,889 5.3

Spawning Area Unavailable: none

Character of Watershed:

Mountainous A-B, B-C, C-D, D-E, E-F, F-G
ROLLING TO HILLY, G-H, H-I, I-J, J-K, K-L, L-M

Hilly

Rolling

Flat

Swampy J-K x on R.B. between Prospect and Sulphur Creek

Wooded A-B x partly, E-F very lightly to open, F-G lightly,
G-H light, H-I light but increasing, I-J moderately
light, J-K moderate, K-L moderate, L-M moderately
dense

Open B-C x, C-D semi, D-E semi

Cultivated A-B --, B-C --, C-D Cl%, D-E <1%, E-F <1%, F-G <1%,
G-H <1%, % H-I <1%, I-J 0, J-K 0, K-L 0, L-M 0

Character of HAND DRAWN. PLEASE SEE ORIGINALS.
Valley

Character of
Banks

a)composition A-B rock and earth,
B-C rock and earth,
C-D earth and rubble,
D-E earth and rubble,
E-F earth and rubble,
F-G earth and rubble,
G-H earth and rubble,
H-I earth and rubble,
I-J earth and rubble talus,
J-K rock and talus little earth,
K-L talus and bedrock,
L-M talus and ???
b)height A-B 5'-2050', C-D 5'-1500', D-E 50'-1500',
E-F 5' to 1000', F-G 5'-20' few 300'-500',
G-H 5'-20', H-I 6'-1000', I-J 2'-4' any few
400'-800', J-K mainly 500'-1000', K-L 500'-1000',
L-M 500-1000

Density of A-B very sparse, B-C sparse, C-D sparse, D-E
Marginal light, E-F, marginal sparse, F-G sparse, G-H
Vegetation sparse, H-I sparse, I-J moderate,
K rather sparse, K-L rather sparse, L-M light

Erosion

a)banks A-B none, B-C none, C-D extensive, D-E extensive,
E-F slight to moderate, F-G extensive, G-H very
extensive, H-I moderately severe, I-J moderate,
J-K moderate, K-L moderate, L-M moderate to
severe

b)watershed A-B very slight, B-C very slight, C-D extensive,
D-E extensive, E-F moderate, F-G quite extensive,
G-H very extensive, H-I moderately severe, I-J
moderate, J-K moderate, K-L moderate, L-M
moderate to severe

Character of Watershed:

Mainly mountainous, but more smoothly rolling big hills above
Loon Creek up to Pistol Creek, becoming more rugged and higher
above that point.

Character of Valley:

Valley is a bit flaring with occasional canyons pinching it in up to Loon Creek. From Loon Creek to Pistol Creek it becomes more flaring and wider, with benches, often in a terraced series along one or both sides. Just below Cougar Creek it is more constricted by high hills sloping to the waters edge. Above Pistol Creek it narrows progressively until it is mainly in a canyon at the upper end.

Character of Banks:

Except for the canyonous stretches the banks are from 5 to 40 ft high, generally 20 - 30 ft along the benched side until above Little Loon Creek. the opposite side is usually as the valley wall, rising 500-1500 ft from the waters edge. The stretch above Loon Creek to Cougar Creek has banks as high steep high slopes 100-700 feet high. Above cougar to Rapid River is the bench series on one side 20-50 ft high and the valley walls beginning at the waters edge on the opposite side up 300-800 ft. Above Rapid River the banks become steeper until they are often sheer or very steep in canyons, and from 200-1500 ft high. Composition of the banks is mainly earth and rubble below Pistol Creek, with talus slopes and occasional bed rock cliffs in the canyons. Talus slopes increase in the upper section as the percentage of earth lowers the upper end being mainly talus and bedrock cliffs, and very steep to sheer.

Flora of the Watershed:

The surveyed section was semi arid and sparsely covered until near Cougar Creek. This lower section has occasional pine and fir trees in the gullies, or along the stream valley. The slopes were generally quite open, and had a scattered cover of sage, mountain mahogany, occasional clumps of rose bushes, gooseberries and currants, all scattered, with cheat grass clumps in between, and bare earth showing on most slopes, so scattered is the covering. The covering gradually increases upstream, until by Pistol Creek the Ponderosa pine furnishes a moderate cover, particularly on shaded slopes. Above this point the cover increases to moderate density, mainly of conifers and sage with grass clumps as the understory. Trees are small however. Above Elkhorn Creek the lower slopes and benches have a moderately dense covering of pine, with fir on the higher slopes.

Marginal Vegetation:

Usually scarce, but occurs in occasional clumps along lower sections of the benches until above Pistol Creek and Rapid River. Where it becomes moderately dense. It again becomes less dense above Elkhorn Creek through the canyonous upper stretches. It is seldom over a 10'-15' wide band along the streams margins, and there is spotty in the lower 2/3rds of the water course. Species

are alder, honeysuckle, roses, willow, thornapple, dogwood, currents, gooseberries, aspen or cottonwood, with occasional pine, fir and Rocky Mountain Maple.

Cultivation:

There are occasional small ranches on the wider benches, usually severed miles apart, only 3 or 4 of which are now occupied. These irrigate small areas for small gardens and crop forage. All the operated ranches are local below Rapid River, but the total cultivation is negligible in so vast an area.

Diversions: none as yet on entire stream

Artificial Obstructions: none as yet on entire stream

Natural obstructions:

There are no impassable falls or barrier on the entire stream. There are several cascades and small falls 3-4 ft high but they have a large volume of water going over them, and are no barrier to fish. They furnish some sport in recent years in "shooting the rapids and cascades" in Kayaks and small boats.

The only falls of any size that might bother salmon is the Sulphur Creek falls located 4,100 yds above the mouth of Sulphur Creek and 96.1 miles above the mouth of the river. They lie in a narrow box canyon and are a series of two cascades falls, with a pool between. Neither has a fall of more than 8 ft in one drop, and the 2 series together have a total drop of approx 20 ft. Their passage is made a bit difficult because of large boulders and rock slabs breaking the channel, particularly at the upper jump. They are readily passed at low water, but are passable with great difficulty at times of high water due to the volume and force of the confined flow in the rocky channels (see pictures). Natives claim that they are impassable at high water, but it did not appear so from actual observation. The salmon run probably does not reach them anyhow until after the high water of the spring run off, and salmon have always reached their spawning grounds above them.

Fluctuation in Water Level:

Sta.	Feet Variation	Cause of Fluctuation	Stream Volume	% of Bed covered
A-B	determined	all or nearly ing snows in mountains of watershed aggravated by narrowing of channel in canyons in some sections. Less flow in summer due to semi-arid	Spring runoff of melt-n	0 t
				all (at time of survey

climate of region.							
B-C	6-8'	II	II	est 5,000 cfs	II	II	
C-D	4-8'	II	II	not determined	II	"	
D-E	4-5'	II	"	II II	II	II	
	in wider places						
	6-10'						
	in narrow places						
E-F	5-8'	II	II	II II	II	II	
F-G	5'	II	II	II "	II	II	
G-H	5'	II	II	II "	II	II	
H-I	5'	II	II	II II	II	II	
I-J	2-4'	II	II	II II	II	II	
J-K	2-4'	II	II	" "	II	II	
K-L	2-4'	II	II	II II	II	II	
L-M	2-4'	"	II	II II	II	"	

No stream flows were taken by the survey party as the river was fairly high and too fast to accurately ascertain depths etc. The U.S.G.S. water supply paper #863, 1938, gives the following data on the Middle Fork. The station is at the Crandall Ranch 500 ft downstream from Brush Creek, approx 6 miles below the mouth of Camas Creek (sta C), and 29.4 miles above the mouth of the stream. The maximum discharge for the year 1938 was 16,600 cfs May 28th, the minimum 348 cfs on Dec 1. Maximum observed since station was operated was 17,000 cfs June 10, 1933. The mean flow in 1938 for June was 9,428 cfs for July 3,362 cfs. These figures would doubtless be a bit low if anything for the flow at the time of the survey, for it had been the "wettest spring in years" in the area. The spring run off starts in April, the high water period is in late May and early June. A relatively rapid drop occurs from late June to early July, followed by a slower drop from August until the low water period is reached in the winter months. In 1940 during the 1st week in July when the survey was under way the flow was probably about 5000 cfs at the Crandall Ranch station.

Pollution: none

Fish (Salmon):

Only 3 salmon were seen on July 17th in the river, these lying in the big deep pond caused by a wash out of a small tributary from a steep gully on the right bank about 3,800 yds above Pistol Creek and 134,200 yds above the mouth. The flash flood had dammed the Middle Fork with mud and rocks. Probably more salmon were present in water too deep to enable them to be seen in. Another salmon was seen that had been taken by fishermen from the "Big Hole" below the confluence of Bear Valley and Marsh Creeks. Others had been taken from the pool in the first three weeks of July. On July 14th a park party reported having seen several chinooks in a big pool between Indian Creek and Pistol Creek.

The Middle Fork is too large a stream to enable salmon to be

seen in great numbers unless a good vantage point is taken over a wide shallow riffle and watched over a continuous period. The great width, depth, generally fast flow and light distortion and reflection from the whirling waters makes it very difficult to spot scattered salmon moving upstream or laying in the deep resting pools, some of which are 10-20 ft deep and often located at the base of high rock ledge cliffs. Salmon had not started to dig redds on the riffles, an action that would have greatly helped in locating the fish.

The salmon run is reported by natives to reach the Middle Fork in June. A very large portion of those entering the Middle Fork apparently use it only for a passage through to it's tributaries where most of the spawning beds are located.

Salmon spawn early in this river system, beginning in July and completing spawning in late July or early August. The high altitude, causing cool nights and relatively low water temperatures in the summer, and early falls and severe, long, cold winters doubtless are important factors in making for this early spawning.

The run of salmon in the Middle Fork is said to be comparatively very small in 1941 and has been progressively smaller within the last few years. This report is essentially similar from the ranchers along the Middle Fork proper the Packers or "guides that take fishermen in to the "Big Hole" and on other places on the Middle Fork and by U.S. Forest Service Personal in the Middle and Upper watershed. The run is apparently a small remnant of its former great size (see also card 14). This is perhaps with the exception of the extreme lower portion of the river where Forest Service look outs reported a fairly good run in the lower Middle Fork tributaries up to Camas Creek.

Fish (Other than Salmon):

Species	Date	Very	Abundant	Fair	Scarce
<u>abundant</u>		<u>numbers</u>			
Steelhead	Spring reported			X <-- to x	
Rainbow trout	taken in June & July	x to	<-- x		
Cutthroat	taken in July by survey,			X	
	fall				reported caught through summer and
Montana Blackspots	" "			X	
Dolly Varden	reported, caught in tributaries			X to x	
Brook Trout	Reported present				X
Squaw Fish	reported present			X	
Whitefish	1 caught July 9			xto x	

The stream is said to be relatively free of suckers,

squawfish and chub, as are its tributaries which would be a help to spawning salmon none of the above were seen or taken either in the main streams or on any of its tributaries.

Steelhead: Reported by natives and Forest Service as running up the river and most of its tributaries in early spring (April - May). Sometimes locally called "spring salmon".

Rainbow Trout: The most numerous fish in the river. A year round resident in the main river in lower portions of the larger tributaries. Runs up nearly all tributaries in spring, and said to drop down out of smaller upper portions in winter. On June 28th caught one 6' long at mouth of Aparejo Creek. On July 10th took 6 avg 6-9" near mouth of Marble Creek. Took one 7 1/2" at 6300 yds above marble Creek and saw several others at intervals in pools. Caught one 8" long @ 4500 yds above Pistol Creek. These were taken without intensive fishing or great effort merely to test stretches to see what species present and in what relative numbers.

Cutthroat Trout: 9 taken below mouth of Cougar Creek, avg. 9-12" on July 10th, in spite of the fact that another party had fished the stretch 2-3 days before and left 10 unused trout strung up in Cougar Creek at the camp site on July 12th. Took a 10" cutthroat 5800 yds above Marble Creek while Dave was jotting down notes. Cutthroat were also taken in several tributaries and evidence intergrading with Blackspots in some cases.

Montana Blackspot trout: on June 28th one 9" long was taken near mouth of Aparejo Creek. Others taken from other tributaries.

Brook trout: some small "brooks" were seen in Little Loon Creek beaver ponds on July 9th. Guide states that occasional large brook trout have been taken near Little Loon Creek in the main Middle Fork.

Dolly Varden trout: one was seen below Aparejo Creek on June 29th. Others were taken and seen on tributaries and are reported in the Middle Fork in fair numbers.

Whitefish: one taken on July 9th below mouth of Cougar Creek. Known to have been taken in tributaries and in other sections of main river.

General Remarks:

The Middle Fork proper runs through semi arid country and has cut a fairly deep steep sided valley in the mountains and hills of the area. The country is quite rugged. The slopes steep, and 500 - 1500 ft high, often rising directly from the waters edge. River terraces and narrow benches usually border one side or the other from below Rapid river to below Big Creek. The upper and lower ends of the stream are in deep canyons, usually with talus slopes

or bedrock cliff walls. It was impossible to survey the stream from Big Creek to its mouth as it lies in an inaccessible trailless deep canyon with rock walls rising sheer for several hundred feet throughout most of its length. Vegetation is generally sparse and scattered, but gradually increases upstream until an open coniferous forest cover is present above Rapid River.

The stream gradient is moderate averaging 21-22 ft per mile below Camas Creek and increases progressively upstream until it averages slightly over 50 ft per mile in the upper 10 miles. There was an average of 15.6 good resting pool per mile, and there were numerous boulder pools as well. It has many long riffle areas, but the constant feeding of rubble by erosion from the steep slopes bordering the river, and the tremendous increase in volume during the annual spring run off of melting ice and snow from its large, high altitude, mountainous watershed tends to carry away most of the mud, sand, and even smaller rubble that might have accumulated in the pools and quieter areas. Thus it was found that the riffles of the main river, were largely composed of rubble too large for utilization for salmon spawning. The best spawning riffles were located at the foot of the larger pools and in smaller patches behind large boulders and along the stream margins rather than in the long big riffle stretches. Never the less the river has a total spawning riffle area capable of supporting a large salmon run.

The river is unpolluted, generally very clear and is free from all dams and obstacles to fish migration at present. Sulphur Creek falls is the only obstacle in the entire stream, and is passable with little difficulty at low water, and passable with greatest difficulty only for a short period of high water in the spring (late May and early June), and the salmon run usually does not get that far up until June. Almost the entire course of the river is in an underdeveloped wild section of the country and not reached by roads. There are only a few small ranches located along its 106 mile length. Consequently the human element has not bothered the salmon in main river to any appreciable extent. However the survey party learned that a road is being constructed in to a gold mine on Soldier Creek in order that a rolling mill may be installed. This will allow cars to drive within 1/2 mile of the Middle Fork proper and to the edge of the Idaho Primitive area and loose a multitude of fishermen, hunters and tourists into this heretofore remote area. It will undoubtedly modify the streams present condition and may mark the beginning of pollution of its waters. However the majority of the salmon run up its many good large tributaries to span, and there are reached by roads and fishermen. In recent years practice of snagging and spearing of salmon for sport has been conducted not only by local residents in the tributary spawning stream areas but by greater and greater numbers of "outsiders"

In the Marsh Creek spawning area alone the Forest Service

guard reported over 300 spearers and snaggers alone on July 4th weekend in 1939 and 1939. This force took practically all of the salmon in that spawning area, and other fishermen later patrolled the area and picked up the few later arriving salmon so that only scattered individual fish were reported to have spawned successfully. The Idaho state Fish and Game Commission abolished spearing and snagging on the upper tributaries in 1940, but the run had been reduced to a minimum before then and the survey party could find but few spawners in the tributaries above Camas Creek. Camas Creek and Big Creek were reported to still have a fair run, but the survey crew saw few fish, the run apparently not having reached its peak when the survey on that lower section was completed.

Other conditions in the drainage area also influence the salmon runs. Long and severe winters and bad ice conditions in the tributaries and the main stream are reported and should be further investigated to determine their effect on the eggs and fry. Cloudbursts called "water spouts" by the natives often wash masses of mud and debris into the tributaries and into the main stream. Evidence of such were seen in several places and could well have eradicated a large part of a years run in some cases by clogging gills and reducing available oxygen long enough to kill the fish before spawning, if the spawners were in the paths of such mud streams. Curiously there seemed to be but small runs at present in some of the remote tributaries such as Indian, Marble and Pistol Creeks although there are only one or two houses in the area and the streams seem quite well adapted for salmon runs. Extensive mining operations may have played a part in reducing runs in some tributaries in the past. A gold rush involving thousands of men took place up Marble Creek to Thunder Mountain and the entire area has been prospected and old placer sluices and sites are still to be found. Extensive placer operations may have driven salmon runs out of some of these remote tributaries through both damage to spawning fish and silting of the spawning beds, destroying eggs before hatching. Doubtless any adult salmon seen was immediately secured during the mining rushes for food, which was very scarce in camps so remote from supply sources. However, only Marble Creek had discoloration attributed to mining operations at present. Pollution from mines at the head of that stream is reported to have chemically made the water below unfit for drinking for a considerable period during the height of its operations and may have also effected the salmon in that stream at the time.

Regardless of the causes, the present run of salmon in the Middle Fork and its tributaries at least above Camas Creek is now at apparently its lowest level in history, and perhaps dangerously so. The system appears to be one of the best potential salmon producing streams still left available, unblocked and unpolluted in the entire Columbia River watershed. Its temperature and water supply is satisfactory and relatively unchanged as yet from the time when in the past, even but 20-30 years ago, it was said to be

teeming with salmon. It therefore should be protected, and its runs reestablished as rapidly as possible, both for the good of the people in Idaho and for the commercial fishermen in the lower Columbia.

If the river is kept in its present unpolluted state, and if any future developments along the Middle Fork and on its tributaries now used for spawning are fully equipped to protect the salmon and the fishing is properly regulated and laws enforced, the survey believes that the entire system can, with the proper attention and full cooperation of all Federal and State officials and private interests involved, particularly if aided by sufficient restocking programs, be built up to equal or even surpass its former very prolific production of salmon. This should be possible without any drastic and exceptionally expensive measures being taken provided steps in this direction are taken immediately by all concerned, for the river system at present offers one of the largest most readily accessible unspoiled natural production areas still left in the Columbia River watershed for the proper authorities to work with.

Temperature Data:

Station	Date	Hour	Air F	Water F	Skv
A-B	6/22/41	11:00AM	85 F	56 F	clear
B-C off mouth of Pole Creek 9.8 miles above sta B	6/21/41	9:00 AM	56 F	52 F	clear
C	6/20/41	8:30 AM	59 F	45.5 F	clear
C just above Camas Cr.	6/29/41	12:30 PM	61 F	51 F	overcast drizzling intermittently
NOTE TO WATER: both in Middle Fork and in Camas Cr.					
off mouth of Aparejo Cr 12,600 yds above sta C	6/30/41	9:15 AM	59 F	51 F	fair
D just above mouth of Loon Cr. 2,300 yds	7/8/41	2:00 PM	87 F	68 F	fair
above sta E off mouth of Little Loon Cr	7/10/41	10:45 AM	73 F	57 F	fair & clear
F just below Marble Cr	7/10/41	4:00 PM	89 F	63 F	clear
F just below Marble Cr	7/12/41	9:00 AM	59 F	54 F	clear
G	7/15/41	11:30 AM	78 F	60 F	clear
H	7/17/41	11:00AM	76 F	58 F	clear
I just below mouth of Rapid River cumulus & cumulonimbus	7/17/41	1:15 PM	83 F	61 F	70% cloudy
NOTE TO WATER: Rapid river at mouth = 58 F				(Marble Cr. = 67 F at mouth)	

Station	Date	Hour	Air F	Water F	Sky
I	7/20/41	11:00 AM	72 F	56 F	70% cloudy cumulus
J	7/22/41	8:30 AM	63 F	58 F	clear
K	7/22/41	4:45 PM	81 F	63 F	clear
NOTE TO WATER: Sulphur Cr. at mouth= 67 F					

Summer stream temperatures quite favorable. Winter temperatures said to be severe and ice conditions bad. Effect on salmon needs further investigation.

Pool Grades

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
A-B (18.0 miles)	Not surveyed						
B-C (17.3 miles)	837	48.4	176	253	201	207	79
C-D (10.2 miles)	51	5.0	21.0	30.2	24.0	24.7	158
D-E (8.5 miles)	78	9.2	33	8	3	7	168
E-F (9.3 miles)	26	2.8	64.7	15.7	5.9	13.7	111
F-G (6.0 miles)	13	2.2	7	23	2	46	313
G-H (4.8 miles)	29	6.0	9.0	29.5	2.6	59.0	96
H-I (4.0 miles)	135	33.8	8	2	12	4	161
I-J (10.0 miles)	30	3.0	30.8	7.7	46.2	15.4	146
J-K (6.4 miles)	117	18.3	3	3	1	6	152
K-L (7.4 miles)	26	3.5	23.1	23.1	7.7	46.2	165
L-M (4.6 miles)	42	9.1	11	4	2	12	404
Total (including sta A-B unsurveyed)							
106.5 miles							
TOTAL (88.5 miles SURVEYED)							
	1,384	15.6	340	408	238	398	1,953
			24.6	29.5	17.2	28.8	

Since the stream as surveyed above Camas Creek was done at a time when the water level was still falling after the spring run off, there would doubtless appear to be more resting pools during the summer particularly behind large boulders etc. which were indicated as good S6 pools with the quite fast moving water at the time of survey.

Gradient:

Sta. to Sta.	Distance mile	Drop ft.	Ave. drop per mile	Source of Data	Sta	Elevation
A(mouth)				Dept. Int. U.S.G.S. plan and profile maps Middle Fork of Salmon River		3,010 A
A-B	18.0	380	21.1	II	II	3,390 B
B-C	17.3	375	21.8	II	II	3,765 C
C-D	10.2	240	23.5	II	II	4,005 D
D-E	8.5	215	25.3	II	II	4,220 E
E-F	9.3	210	22.6	II	II	4,430 F
F-G	6.0	180	30.0	II	II	4,610 G
G-H	4.8	130	27.1	II	II	4,740 H
H-I	4.0	150	37.5	II	II	4,890 I
I-J	10.0	385	38.5	II	II	5,275 J
J-K	6.4	265	41.4	II	II	5,540 K
K-L	7.4	370	50.	II	II	5,910 L
L-M	4.6	245	53.3	II	II	6,155 M
Totals	106.5	3,145	29.5	II	II	
entire mi stream		ft	mi			

Gradient data should be very accurate, could be plotted with few feet error from U.S.G.S. Plan and Profile Maps. Distances from U.S.G.S. plan and profile maps of Middle Fork of Salmon River.

Tributaries of Middle Fork:

No.	Name of Creek	Side entered on	Distance above mouth mi.	Width ft est.	Flow cfs est.	Value to Salmon
1.	Goat	L.B.	1.2	8-10	10-15	approx 6 miles long not determined in unsurveyed section
2.	Color	R.B.	2.3	3-4	3	If " probably more very small
3.	Roaring	L.B.	3.8	8-10	15-20	not determined approx 7-8 mi long probably very steep and little value
4.	Nolan	R.B.	3.9	3	3-4	small 2 1/2 mi long probably no value
5.	Stoddard	R.B.	6.1	8-10	15	approx 5 miles long probably to steep and little value
6.	Cradle	R.B.	7.2	3	3	probably none very small 2 miles long
7.	Tumble	L.B.	7.3	3-4	3-5	I " small 2 1/2 mi
8.	Nugget	R.B.	8.2	3	3	II " very small 2 mi

No.	Name of Creek	Side entered on	Distance above mouth mi.	Width ft est.	Flow cfs est.	Value to Salmon
9.	Parrott	L.B.	8.3	5"	5	' ' little or none approx 5 mi long
10.	Ship Island	L.B.	11.7	10-15	15-20	not known probably steep but 7 mi long with mile long lake at head
11.	Papoose	R.B.	11.9	20-25	50	passable is over 10 mi long with several branches but may be to steep
12.	Golden	R.B.	13.5	8-10	10-15	passable very little 5 mi long
13.	Wall	R.B.	15.1	3-4	3	probably none steep and small 2 mi long

NOTE : the tributaries listed above (# 1-13 inc), were in the unsurveyed lower canyon. The width and flow are only approximations being estimated from comparison with other streams of similar size in the surveyed area. Length and location being determined from U.S.G.S. plan maps and U.S.F.S. Salmon National Forest Map. Stream from here on up were seen in the actual stream survey.

NOTE: distance from U.S.G.S. Plan and Profile maps of Middle Fork.

*14.	Big Creek	R.B.	18	75	175	good has a run of spring chinooks see survey write up
15.	Waterfall or Iron Creek	L.B.	18.2	20	50	too precipitous no value tho 7 mi long
16.	Bob Tail	L.B.	19.5	3-4	1-3	no value
17.	Kimmel	R.B.	20.4	2	0-2	no value
18.	Woolard	L.B.	20.5	2-3	dry	no value
19.	Survey	R.B.	21.2	2-3	1	no value to steep and small
20.	Rattle-snake	L.B.	21.3	2-4	2	no value to steep and small
21.	Wilson	L.B.	23.2	15	10	good salmon spawning stream not surveyed 12 mi long
22.	Soldier	R.B.	23.5	5	5	no value steep impassable
23.	Jack or	L.B.	24.8	5-6	5	no value steep impassable (Jackass) but 5 mi long
24.	Short	R.B.	27.2	2-3	2-3	not seen probably no value 2 mi + long
25.	Bernard	R.B.	27.6	4	4	not seen probably no value 4 mi long
26.	Pole	L.B.	27.8	4	5	no value 2 1/2 mi long

No.	Name of Creek	Side entered on	Distance above mouth mi.	Width ft est.	Flow cfs est.	Value to Salmon
27.	Reservoir	L.B.	28.7	2-3	dry	no value
28.	Brush	R.B.	29.4	10	2-20	no value 10-11 mi long
29.	Warm Springs	L.B.	30.0	6	2	no value
30.	Sheep	R.B.	30.5	10	2-15	no value 9-10 mi long
31.	Little Bear	R.B.	32.3	2	?	not seen small 1 mi long no value
32.	Aparejo	L.B.	32.5	2-3	1	no value 3 mi long
33.	Big Bear	R.B.	33.6	2	2	no value 3 mi long
*34.	Camas	L.B.	35.2	70	150	yes has good salmon run at present see survey write-up
35.	unnamed	L.B.	36.4	3	2	none to steep and small
36.	Grouse	L.B.	38.5	6	5	none, steep, with falls 5 mi long
37.	Little Aparejo	L.B.	41.5	3-4	2	none, steep, with falls 2 1/2 mi long
38.	Cub or Short Cr	R.B.	41.8	4	2-3	none, steep, 3 1/2 mi on U.S.G.S. map)
39.	(Big) Aparejo	L.B.	42.4	3	1	none steep 2 1/2 mi
40.	Norton	R.B.	43.8	6	6-10	little or none to shallow and steep although 7 1/2 mi long
41.	Tom	R.B.	44.2	2	1	none to small 2 mi long
*42.	Loon	L.B.	45.5	54	550	good moderately small run of spring chinook in stream 35 mi long see survey write-up
43.	Jack	R.B.	46.0	2	1/2-1	no value to salmon to small 2 mi
44.	White	R.B.	47.8	2	1	no value to salmon to small 4 mi long
45.	Bacon	R.B.	50.3	2	1/2-1	not seen no value to salmon 2 1/2 mi long
46.	Red Bluff	L.B.	50.7	4-5	4-5	little or no value to salmon 2 1/2 mi long
47.	Pine	R.B.	51.4	2	1/2-1	not seen no value to salmon 2 1/4 mi long
48.	Mahoney	R.B.	53.4	3	1	to small for salmon part diverted for irrigation 2 mi long.
49.	Cougar	L.B.	54.3	3	2	to small and diverted for irrigation 4 mi long
50.	Little Loon	L.B.	55.5	12	15-25	can have small run little small stream beaver dam barrier @ 3.3 mile 10 mi long

No.	Name of Creek	Side entered on	Distance above mouth mi.	Width ft est.	Flow cfs est.	Value to Salmon
51.	Cameron	R.B.	55.6	2	dry	no value to salmon 2 mi long
52.	Range	R.B.	57.9	1-2	nearly dry	no value to salmon 2 mi long
53.	Sunflower	R.B.	58.8	2	nearly dry	no value to salmon 2 mi long
54.	Little	L.B.	59.4	2	1	not seen no value to salmon 2 1/2 mi long
55.	Thomas	L.B.	60.5	5	2	little or no value to salmon most or all water used for irrigation 3 1/2 mi long
56.	Marble	R.B.	62.8	35-40	125-150	good salmon stream small run said to be present see survey 20 mi long
57.	Little Soldier	L.B.	63.6	3-4	2-3	little or no value to salmon 3 1/2 mi. long
58.	Teapot	R.B.	65.4	3	2	no value to salmon to steep 3 mi long
59.	Oreland (Creana Cr on U.S.G.S.)	L.B.	66.5	2	1/2-1	no value to salmon 1 mi long to steep
60.	Pung-go (Pungo, U.S.G.S.)	R.B.	67.3	7	5	no value to salmon 4 mi long to steep
*61.	Indian	R.B.	68.5	20	119	available for salmon measured small run said to 7/15/41 exist could support good run see survey 18-20 mi long
62.	Garden	R.B.	71.6	4		no value to salmon water diverted to Middle Fork Ranger sta for irrigation 3 1/2 mi. long
63.	Ranch	R.B.	72.4	2	dry	no value water diverted for placer mining on bench 2 mi long
64.	cow	L.B.	72.5	2	1	no value too small
*65.	Pistol	R.B.	73.2	25-30	171	available to salmon measured small run said to exist should have better one see survey 18 mi long
66.	Lake	L.B.	73.8	2-3	2	None to small 2 1/2 mi
67.	Cap	R.B.	74.4	2	1	none to small 1 1/2 mi
68.	Carmon	R.B.	76.4	2	1-2	none to small washed out by flood 2 1/2 mi

No.	Name of Creek	Side entered on	Distance above mouth mi.	Width ft est.	Flow cfs est.	Value to Salmon
69.	Mortar	R.B.	76.5	2	1	none to small 2 1/2 mi
*70.	Rapid River	L.B.	77.0	25-30	125-150	available for salmon has small run reported and more in tributaries see survey 15 mi long
71.	Artillery	R.B.	77.3	4-5	5	no value to steep 2 mi
72.	unnamed	L.B.	78.2	2	1	no value 1 mile too steep
73.	Dome	R.B.	78.5	4	3-5	no value very steep 3 mi long
74.	unnamed	L.B.	78.5	3-4	3	no value steep 1 1/2 mi long
75.	Greyhound	L.B.	79.7	3-4	3	no value very steep 5 mi long
76.	Lake (Forest Service misnamed by U.S.G.S. which places wrongly below Greyhound)	R.B.	80.6	3-4	3-5	no value so steep fish cannot enter 2 1/2 mi long
77.	Sheepeater	R.B.	82.3	1-2	2	none 93 F at mouth
*78.	Soldier	L.B.	83.5	10	30-40	Hot Springs outlet possibly a fair salmon stream except for mine operations 112 mile above mouth in 1942 8 mi long see survey
79.	Deerhorn	R.B.	85.3	4	3.5	no value to steep 3 mi
80.	unnamed	L.B.	86.9	3	3.5	no value enters over 40' cascade falls
*81.	Elkhorn	R.B.	87.0	15	25-40+	available to salmon but has log jamb see write up 8-9 mi
82.	Velvet	L.B.	90.3-	3	2	no value very steep 2+ mi long
83.	Spike	R.B.	90.4	2	1	no value steep 1 mi
84.	Ramshorn (Moorehead Cr U.S.G.S.)	R.B.	91.5	3-4	3-5	no value steep cascades 3+ mi long
85.	Prospect	R.B.	93.3	4	5	In marshy area value little if any 3 mi
*86.	Sulphur	R.B.	93.7	10-12	60-80	available for salmon see write up 14 mi
87.	Lincoln	L.B.	95.2	4	3-5	no value to steep 2 1/2 mi long
88.	Boundary	R.B.	95.6	4-5	6-8	value not known not seen 5 mi long
89.	unnamed	L.B.	96.3	3	3	no value to steep 1 mi
90.	Dagger	R.B.	96.6	6-8	6-8	value not determined 7 mi long
91.	Blue Bunch	R.B.	97.6	3	2-3	no value to salmon small steep 3 mi long

No.	Name of Creek	Side entered on	Distance above mouth mi.	Width ft est.	Flow cfs est.	Value to Salmon
92.	unnamed	L.B.	97.7	3-4	2-3	few yds 2 avail near mouth steep and small above 2 1/4 mi
93.	Chicken	L.B.	99.2	4	3-5	no value to steep 2 mi
94.	unnamed	L.B.	99.8	3	1	no value to small and steep 2 mi long
95.	unnamed	L.B.	100.8	3-4	2-4	no value to small and steep 2 mi long
96.	Fall	L.B.	101.2	15	15-20	possibly available for very few badly choked with dams and falls etc. little value present condition 5 1/2 mi long
*97.	Bear Valley	R.B.	106.5	33	250	available small run present see write-up
*98	Marsh	L.B.	106.5		275	available moderate run present see write-up

Middle Fork of Salmon River Distance

Checking station to station surveyed (paced on horses) distances compared with U.S.G.S. distances from plan and profile maps. Figures in parentheses = map figures used to be converted to nearest 100 yds even.

Sta A. at mouth, elevation 3,010 ft

Sta B. mouth of Big Creek, not surveyed above previous station, not surveyed above mouth, 31,700 (31,680) yds Map U.S.G.S. above previous station 18 miles, 31,700 yds Map U.S.G.S. above mouth 18 miles, elevation 3,390 ft.

Sta C. Camas Creek, 30,400 yds above previous station 17.3 miles, 62,100 yds above mouth 35.3 miles, 30,300 (30,280) yds Map U.S.G.S. above previous station 17.2 miles, 62,000 (61,950) yds Map U.S.G.S. above mouth 35.2 miles, elevation 3,765 ft.

Sta D. Loon Creek, 17,900 yds above previous station 10.2 miles, 80,000 yds above mouth 45.5 miles, 18,100 (18,130) yds Map U.S.G.S. above previous station 10.3 miles, 80,100 (80,080) yds Map U.S.G.S. above mouth 45.5 miles, elevation 4005 ft.

Sta E. Cougar Creek, 15,000 yds above previous station 8.5 miles, 95,000 above mouth 54.0 miles, 15,500 (15,490) yds Map U.S.G.S. above previous station 8.8 miles, 95,600 (95,570) yds Map U.S.G.S. above mouth 54.3 miles, elevation 4220 ft.

Sta F. Marble Creek, 16,400 yds above previous station 9.3 miles, 111,400 yds above mouth 63.3 miles, 15,000 (14,960) yds Map U.S.G.S. above previous station 8.5 miles, 110,500 (110,530) yds Map U.S.G.S. above mouth 62.8 miles, elevation 4430 ft.

Sta G. Indian Creek, 10,500 yds above previous station 6.0 miles, 121,900 yds above mouth 69.3 miles, 9,900 (9,855) yds Map U.S.G.S. above previous station 5.6 miles, 120,400 (128,385) yds Map U.S.G.S. above mouth 68.4 miles, elevation 4,610 ft.

Sta H. Pistol Creek, 8,500 yds above previous station 4.8 miles, 130,400 yds above mouth 74.1 miles, 8,400 (8,445) yds Map U.S.G.S. above previous station 4.8 miles, 128,800 (128,830) yds Map U.S.G.S. above mouth 73.2 miles, elevation 4740 ft.

Sta I. Rapid Creek, 7,000 yds above previous station 4.0 miles, 137,400 yds above mouth 78.1 miles, 6,700 (6,690) yds Map U.S.G.S. above previous station 3.8 miles, 135,500 (135,520) yds Map U.S.G.S. above mouth 77.0 miles, elevation 4890 ft.

Sta J. Elkhorn Creek, 17,700 yds above previous station 10.0 miles, 155,100 yds above mouth 88.1 miles, 17,600 yds Map U.S.G.S. above previous station 10.0 miles, 153,100 (153,120) yds Map U.S.G.S. above mouth 87.0 miles, elevation 5275 ft.

Sta K. Sulphur Creek, 11,200 yds above previous station 6.4 miles, 166,300 yds above mouth 94.5 miles, 11,600 (11,615) yds Map U.S.G.S. above previous station 6.6 miles, 164,700 (164,735) yds Map U.S.G.S. above mouth 93.6 miles, elevation 5540 ft.

Sta L. Fall Creek, 13,000 yds above previous station 7.4 miles, 179,300 yds above mouth 101.9 miles, 13,600 (13,552) yds Map U.S.G.S. above previous station 7.7 miles, 178,300 (178,285) yds Map U.S.G.S. above mouth 101.3 miles, elevation 5910 ft.

Sta M. end Bear valley and Marsh Creek, 8,100 yds above previous station 4.6 miles, 187,400 yds above mouth 106.5 miles, 8,100 (8,096) yds Map U.S.G.S. above previous station 4.6 miles, 186,400 (186,380) yds Map U.S.G.S. above mouth 105.9 miles, elevation 6155 ft.

Station A-B in big canyon impossible to survey

Station B-C Big Creek to Camas Creek surveyed by Parkhurst and Zimmer

Station C-I surveyed by Frey and Bryant

Station I-L surveyed by Frey

Station L-M actually surveyed lower 1300 yds; impassable trails prevented remainder; except from observation spots data distance from local people and U.S.G.S. plan and profile maps in office.

Big Creek

River System: Salmon River
 Stream Surveyed: Big Creek, tributary of the Middle Fork of the
 Salmon River

Date of Survey: 6/22-25/41, by Parkhurst and Zimmer
 (survey not completed)

Source: T20N, R8E

Total Length: 60+ miles of which 24.6 miles surveyed

Station Location:

Sta	Location	Distance above prev. Station vds miles	Distance above Mouth vds miles	Map Location	Width	Depth
a	at mouth	0	0	sec 10, T20N R14E	n/a	n/a
b	confluence Crooked Creek	24.6	24.6	sec 17, T21N R11E	n/a	n/a

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060206-006-04.91	
b	17060206-020-00.16	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-b	3,381,200	655,170	47.4	466,570	33.8	251,070	18.2		
8390	0.6								

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
a-b	24.6	1,381,200	717,640	52.0	481,985	34.9

Spawning Area unavailable and unusable: none

classification of stream based on amount of usable spawning rubble present:

Total Area(yd ²)	Usable Spawn. Rubble(yd ²)	Poor 0-10%	Fair 11-30%	Good 31-70%	Excellent 71-100%
1,381,200	481,985			34.9	

Classification of stream based on amount of spawning area (MR, SR) present:

Total Area(yd ²)	Spawning Area(yd ²) (MR&SR)	Poor 0-10%	Fair 11-50%	Good 31-70%	Excellent 71-100%
1,381,200	717,640			52.0	

Character of Watershed:

Mountainous	A-B X
Hilly	
Rolling	
Flat	
Swampy	
Wooded	scattered
Open	
Cultivated %	
Character of Valley	50-100 yds
Character of Banks	10-30' steep rock
Density of Marginal Vegetation	moderate
Erosion:	
a) banks	slight
b) watershed	slight
Diversions:	none

Artificial Obstructions: none

Natural Obstructions: none

Fluctuation in Water Level:

Sta	Ft. Variation	Cause	Stream Volume	% Stream Bed Covered
a-b	2-4 ft.	n/a		

Pollution: none

Fish (Salmon):

There were no salmon observed, but it was reported by one of the United States Forest Service rangers that there is a fair run of salmon in the stream.

Fish (other than Salmon):

Cutthroat and rainbow trout were very abundant. One large steelhead trout was observed.

General Remarks:

Rising in T20N, R8E, Big Creek flows in an easterly direction to join the Middle Fork of the Salmon River in S10, T20N, R14E. This stream is approximately 60 miles long of which 24.6 miles was surveyed 6/22-25/41. The survey was begun at the mouth and continued upstream as far as Crooked Creek confluence. The remainder of Big Creek will probably be surveyed at a later date.

The terrain through which Big Creek flows is extremely mountainous, especially that portion adjacent to the canyonous Middle Fork of the Salmon River.

From the mouth upstream for about 4 miles, the stream tumbles rapidly over hugh boulders and smashes noisily against the steep-sided bed rock canyon walls. The canyon through part of this section is so narrow that there is hardly room enough for a trail. Spawning riffles are lacking entirely, but the necessary deep holding pools are quite numerous.

Above the canyonous section described in the preceding paragraph, we find the valley considerably wider, averaging in most cases, about 1/4 mile. The gently sloping hillsides, covered with fairly dense fir and ponderosa pine, sage brush, mountain mahogany and cheet gums, are in striking contrast to the steep, barren and rocky canyon walls below. Excellent spawning riffles are very plentiful with some extending uninterrupted for 1/2 to 3/4 of a mile. Good resting pools are well distributed throughout.

Cutthroat and rainbow trout were fairly abundant in Big Creek, but there were no salmon observed. It was reported however, that there is a fair sized run of salmon using this creek. Several large steelhead were observed in one pool.

The only tributary of any consequence, between the mouth and Crooked Creek, is Monumental Creek. This is quite a large stream with a volume very close to that of Big Creek, at the point of confluence. This tributary was not surveyed.

Temperature Data:

Station	Date	Hour	Temperature		Skv
			Air	Water	
Station a	6-22-41	11:45	am	86 F	54 F clear
8300 yds	6-23-41	8:00	am	60 F	54 F clear
215600 yds	6-23-41	10:50	am	74 F	54 F clear
220600 yds	6-23-41	6:30	pm	78 F	60 F clear
20600 yds	6-24-41	8:00	am	63 F	52 F cloudy
31100 yds	6-24-41	1:00	pm	72 F	54 F cloudy
42900 yds	6-24-41	4:00	pm	74 F	48 F cloudy
Station b	6-25-41	8:15	am	52 F	46 F cloudy

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-b	666	27.1	36	27	264	339	202
(24.6 miles)			5.4	4.1	39.6	50.9	

Gradient:

Station	distance (miles)	total drop	avg drop per mile	Source of data
a to Monumental Creek	24.3	PTBM- Sta=3401 PTBM-Monumental Creek, 300 yds below Sta b = 4523, Total drop = 1122 feet	46.2	Plan and Profile map of Middle Fork Salmon River U.S. is Geological survey, Dept of the Interior 1930

Tributaries:

1. Breeching Creek, lt. bk, not seen
2. Burnt Creek, lt. bk, not seen
3. Dave Creek, rt. bk < 1/2 cfs, 3.5 miles above mouth
4. Eagan Creek, lt. bk, not seen
5. Goat Creek, rt bk, < 1/2 cfs, 5.0 miles above mouth
6. Cougar Creek, rt bk, < 5 cfs, no value, 5.7 miles above mouth.
7. Pioneer Creek, lt. bk, 5 cfs, no value, 7.7 miles above mouth.
8. Cliff Creek, rt bk, 5 cfs, no value, 7.6 miles above mouth

9. Rush Creek, lt bk, 8 cfs, no value, 8.5 miles above mouth
10. Canyon Creek, lt bk, not seen .
11. Cabin Creek, rt bk, 3 cfs, passable, 11.9 miles above mouth.
12. Cave Creek, rt bk, 3 cfs, passable, 13.5 miles above mouth
13. Conyer Creek, lt bk, <1 cfs, no value, 14.0 miles above mouth.
14. Doe Creek, lt bk, 1 cfs, no value, 15.0 miles above mouth
15. Garden Creek, rt bk, <1 cfs, no value, 15.9 miles above mouth.
16. Buck Creek, lt bk, 1 cfs, no value, 16.0 miles above mouth
17. Fawn Creek, lt bk, 1 cfs, no value, 17.0 miles above mouth
18. Coxey Creek, rt bk, dry, 17.9 miles above mouth
19. Bull Creek, lt bk, < 3 cfs, no value, 22.0 miles above mouth.
20. Acorn Creek, rt bk, not seen, probably to small
21. Routson Creek, lt bk, not seen
22. Bar Creek, lt bk, not seen
23. Monumental Creek, lt bk, 40 cfs, 24.3 miles above mouth
24. Crooked Creek, rt bk, 12 cfs, 24.5 miles above mouth

Camas Creek

River System: Salmon River

Stream Surveyed: Camas Creek, tributary of the Middle Fork of the Salmon River

Date of Survey: 6/17, 18, 19, 7/12/41 Parkhurst and Zimmer

Source:

Rises in T.16N, R.17E flows in a North and West direction to join the Middle Fork of the Salmon River in S.15, T.18N, R.14E.

Total Length:

38 miles of which 19.4 miles was surveyed.

Station Location:

Sta	Location	Distance above prev. Station vds miles	Distance above Mouth vds miles	Map Location	Width	Depth
a	at mouth	0	0	sec 14, T18N R14E	n/a	n/a
b	end of survey	19.4	19.4	sec 21, T17N R17E	n/a	n/a

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060206-049-04.93	
b	17060206-055-03.46	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
13,690 a-b	484,500	252,700	52.2	147,150	30.4	70,960	14.7		

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
a-b	19.4	484,500	218,110	45.0	82,895	17.1

Spawning Area unavailable and unusable: none

Classification of stream based on amount of usable spawning rubble present:

Total yd ² bottom	yd ² usable sp. rubble	Poor 0-10%	Fair 11-30%	Good 31-70%	Excellent 71-100%
484,500	82,895		17.1		

Classification of stream based on amount of spawning area (MR, SR) present:

Total yd ² bottom	yd ² usable sp. rubble	Poor 0-10%	Fair 11-30%	Good 31-70%	Excellent 71-100%
484,500	218,110			45.1	

Character of Watershed:

A-B

Mountainous

X

Hilly

Rolling

Flat

Swampy

Wooded

Open

sage brush, cheat, scattered conifer

Cultivated %

--

Character of
Valley

V steep, 100-200 yds

Character of
Banks

rocks, gravel, steep

Density of
Marginal
Vegetation

aspen, willow, scattered

Erosion:

a) banks

none

b) watershed

slight

Diversions: none

Artificial Obstructions: none

Natural Obstructions: none

Fluctuation in Water Level:

Sta	Ft. Variation	Cause	Stream Volume	% Stream Bed Covered
a-b	3-4 ft.			

Estimated flow at upper end of survey 7/12/41 50 cfs

Pollution: none

Fish (salmon):

There were no large salmon observed but a member of the survey party caught a small Chinook migrant. It was reported by the inhabitants of Myer's Cove that there is a small run of Chinook salmon using the stream each year.

Fish (other than salmon):

Rainbow and Cutthroat trout, ranging in size from 6-14" were very abundant 7/12, 17, 18, 19/41.

General Remarks:

Rising in T.16N, R.17E, Camas Creek flows in a North and West direction to form the Middle Fork of the Salmon River in 5.15, T.18N, R.14E. The stream is approximately 38.0 miles long of which 19.4 miles were surveyed in June of 1941.

From the mouth upstream for about 11 miles the stream bottom is composed largely of very large rubble and bedrock, with usable spawning rubble very scarce. In this section the gradient is quite steep with fast stream flow and many small pools in the Cascades. Marginal vegetation is quite sparse and the steep sides of the narrow valley, less than 100 yards usually, through which this part of the stream flows, and quite barren looking. Sage brush, cheat grass, mountain mahogany and a few junipers make up much of the ground cover. Huge masses of exposed broken rock are visible on nearly every slope. Old Indian paintings were opened at one place.

Above this area of large rubble and bedrock we find a section of very good spawning rubble extending upstream to about 1 mile above Myer's Cove, or approximately 5.3 miles in extent. Here the gradient is quite moderate and the valley widens out considerably, in one instance even to a half mile wide at Myer's Cove. In this section the marginal vegetation is quite dense and made up principally of species of *Alnus*, *Populus*, and *Cornus*. The hillsides are not quite as steep as below and scattered open stands

of pine are much in evidence.

Above this section of good spawning rubble we again find an area of stream bed predominately of large rubble and bedrock with spots of good spawning rubble present but very widely dispersed. Here again the valley is very narrow and in most cases hardly wider than the stream bed itself. The steep slopes are covered with grasses and sage brush, with fir and pine quite plentiful in open stands. The gradient is quite steep and small pools are very numerous in the Cascades.

Good resting pools for salmon are well scattered along the entire stream.

There were no large salmon observed but it was reported by the inhabitants of Myer's Cove that there is a small run of chinook salmon in Camas Creek. One small chinook migrant was caught by a member of the survey party.

Rainbow and cutthroat trout were found to be very abundant. The stream is fished to some extent in the early spring. Good catches were reported. Many trout ranging from 8-14" were caught by the members of the survey party, for the purpose of stomach analysis. Taking everything into consideration it could well be said that Camas Creek is a fairly good stream for spawning salmon, certainly it could support a much larger run than is now present.

Temperature Data:

Station	Date	Hour	Air	Water	Sky
7300 yds above Station a	6-19-41	12:00 noon	64.0 F	46.0 F	clear
12500 yds above Station a	6-19-41	9:30 am	58.0 F	46.0 F	clear
Confluence of Silver Creek	6-17-41	3:00 pm	64.0 F	46.0 F	cloudy
Bridge at Myer's Cove	7-12-41	8:30 am	67.0 F	47.0 F	cloudy
Station b end of survey	7-12-41	1:00 pm	75.0 F	47.0 F	cloudy

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6
a-b (19.4 miles)	1042	53.7	244	21	590	187	492
			23.4	2.0	56.6	18.0	

Gradient:

Station	distance (miles)	total dror,	avg drop per mile	Source of data
a - Myer's Cove	15.3	1376'	89.9	Salmon National Forest Map, Idaho 1937, U.S. Forest Service.

Tributaries:

1. Macarte Creek, rt bk, 3157 yds above station a, 3 cfs, no value.
2. Cinch Creek, rt bk, 3200 yds above station a, 2 cfs, no value.
3. Soda Creek, lt bk, 5210 yds above station a, <1 cfs, no value.
4. Cave Creek, lt bk, 6358 yds above station a, <1 cfs, no value.
5. Yellowjacket Creek, lt bk, 9000 yds above station a, 30 cfs, not surveyed, no trail.
6. Woodtick Creek, rt bk, 11390 yds above station a, 30 cfs, impassable, steep.
7. Dry Gulch Creek, lt bk, 13700 yds above station a, 1/2 cfs, no value.
8. Forge Creek, lt bk, 16300 yds above station a, 8 cfs, impassable.
9. Anvil Creek, lt bk, 17850 yds above station a, 1 cfs, no value.
10. Name unknown, rt bk, 21423 yds above station a, 3 cfs, no value.
11. Hammer Creek, lt bk, not seen.
12. Duck Creek, lt bk, 23150 yds above station a, 3 cfs, impassable beaver dam.
13. W. Br. Camas Creek, rt bk, (See Survey notes).
14. Castle Creek, lt bk, not seen.

West Fork Of Camas Creek

River system: Salmon River

Stream Surveyed: West Fork of Camas Creek, tributary of the Middle Fork of the Salmon River

Date Of Survey: July 12, 1941 by Zimmer

Source: rises in T17N, R16E

Total Length: 13 miles of which 6.4 miles was surveyed.

Station Location:

Sta	Location	Distance above prev. Station vds miles	Distance above Mouth vds miles	Map Location	Width	Depth
aa	at mouth	0	0	sec 6, T17N R17E	20'	10"
bb	mouth of Pole Creek	6.4	6.4	sec 21, T17N R16E	6'	6"

EPA River Reach Codes:

Station	HUC	SEG Rmi
aa	17060206-052-12.69	
bb	17060206-304-00.00	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
aa-bb	80,300	3,880	4.8	46,080	57.4	27,340	34.1	3,000	3.7

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
aa-bb	6.4	80,300	73,420	91.4	37,975	47.3

Classification of stream based on amount of usable spawning rubble present:

Total yd ² bottom	yd ² usable sp. rubble	Poor 0-10%	Fair 11-30%	Good 31-70%	Excellent 71-100%
80,300	37,975			47.3	

Classification of stream based on amount of spawning area (MR, SR) present:

Total Area(yd ²)	Spawning Area(yd ²) (MR&SR)	Poor 0-10%	Fair 11-50%	Good 31-70%	Excellent 71-100%
80,300	73,420				91.4

Spawning area usable and available:

Between stations	Total yd ²	MR.	SR	% of bottom
Sta aa to beaver dam	48,540			90.7

Spawning Area unusable and unavailable:

Between stations	Total yd ²	MR.	SR	% of bottom	when
Beaver dam to sta bb	24,880			92.8	L.W.

Note : At 6800 yds above the mouth are several large beaver dams which are impassable at low water.

Character of Watershed:

	aa-bb
Mountainous	
Hilly	X
Rolling	
Flat	
Swampy	
Wooded	Moderately dense fir and pine
Open	50%
Cultivated %	—
Character of Valley	V
Character of Banks	1-3 nearly perpendicular, earth and rock
Density of Marginal Vegetation	very dense--willow, alder, cottonwood

Erosion:

- a) banks slight
b) watershed none

Diversions:

Div. #1: right bank, 3500 yds above confluence with Camas Creek. Estimated flow = 3-5 cfs. Headgate present with nearby return to river. No protective devices. Dam described on Card 8.

Artificial Obstructions:

1. 3500 yards above confluence with Camas Creek. Irrigation dam, 1 1/2' high stones and boards. No obstacle to fish.

2. 6800 yards above confluence with Camas Creek two beaver dams, both barriers at low water.

Natural Obstruction: none

Fluctuation in Water Level:

Sta	Ft. Variation	Cause	Stream Volume	% Stream Bed Covered
a-b	1-1 ft.	n/a		

Pollution: none

Fish (Salmon):

None were observed, but it was reported that there is a small run of Chinook salmon using this stream.

Fish (other than Salmon):

A great many 6-12" rainbow and cutthroat trout were seen.

General Remarks:

The West Fork of Camas Creek rises in T17N, R15E with its initial origin in several small lakes in the vicinity of Woodtick Summit. The stream flows in northeasterly direction to join Camas Creek in S6, T17N, R17E.

Traveling upstream from the confluence we find the West Fork flowing, for about a half mile, through a nicely grassed valley approximately one half mile wide. It is in this area and in adjacent areas along the main Camas Creek, that the inhabitants of Myer's Cove haven't the succulent grasses which will later help to winter their stock. Incidentally, Myer's Cove is one's last

contact with civilization before entering the vastness of the spectacular Middle Fork Country.

As happens so commonly in this country, we again find the tough and knarled Artemesia, Atriplex and Chrysothammum on the dry and lifeless looking hillsides which push against the periphery of the moist grasslands until the grasses, "peter out," as a narrow finger along each stream bank.

The gradient of the first half mile is very moderate with excellent spawning riffles very numerous. As we leave this area and progress upstream the gradient becomes considerably steeper with many spawning areas present but less numerous than below. Pools are largely restricted to the smaller S3 pools. It was thought at the time of the survey that many of these were natural for salmon even though quite small. The valley becomes very narrow, in most instances less than one hundred yards wide, and often the stream bed itself constitutes the entire valley floor. Scattered stands of Ponderosa pine gradually make their appearance.

Old beaver cuttings were much in evidence all along the stream and several large beaver dams were found about 3.8 miles above the mouth. These dams were considered as low water barriers to any fish migration.

Rainbow and cutthroat trout were very abundant in the upper half of the section of stream surveyed. Most of the fish observed averaged 8-14" in length. There were no salmon observed but it was reported, by the inhabitants of Myer's Cove, that a small run of salmon usually frequents this stream.

Temperature Data:

Station	Date	Hour	Temperature		Sky
			Air	Water	
aa	7-12-41	8:30 am	67 F	46 F	cloudy
bb	7-12-41	3:00 pm	87 F	46 F	cloudy

Pool Grade:

Station	Resting	Resting	SlT1	SlT2	S2T1	S2T2	S6
	Pools	Pools/Mile	%	%	%	%	
aa-bb	4	0.6	0	0	4	0	163
(6.4 miles)			0.0	0.0	0.0	100.0	

Gradient:

Very moderate for the first mile but becoming fairly steep as one progresses toward the headwaters.

Tributaries:

1. Flume Creek, left bank, not seen
2. No name, 5050 yds above Station A, right bank, 3 cfs, no value.
3. No name, 7200 yds above Station A, left bank, $<1/2$ cfs, no value.
4. Pole Creek, 11400 yds above Station A, left bank, 8 cfs, end of survey.

Loon Creek

River System: Salmon River

Stream Surveyed: Loon Creek, tributary of the Middle Fork of the Salmon River

Date Of Survey: June 20 to 30, 1941 by D.G. Frey and Frank Bryant as follows:

Mouth up to Bennet Creek	June 30, 1941
Bennet Creek up to Biggs Ranch (Cold Spring Creek)	June 28, 1941
Biggs Ranch to Falconberry Ranch	June 30, 1941
Falconberry Ranch to Rock Creek	June 27, 1941
Rock Creek to Warm Springs Creek	June 26, 1941
Warm Springs Creek to Mayfield Creek	June 22, 1941
Mayfield Creek to upper end of survey	June 20, 1941

Source:

Drains North slopes of ridges in Salmon Mountains, heading high on slopes of Tango Mtn. in SW Central Custer County, Idaho and Challis National Forest.

Drainage area is separated by mountain ridges from that of Valley Creek and Yankee Fork (tributaries to main Salmon River) on the south; of Knapp, Winnemucca and Beaver Creeks to the SW; of the eastern tributaries to Rapid River and Little Loon Creek and of Cougar and Red Bluff Creek on the west; of Aparejo and West tributaries of Camas Creek to the north and east.

Main Loon Creek rises from several small spring fed tributaries high on mountain ridges to the west of Tango Mtn. in sections 21, 22, and 23, T13N, R13E.

Direction of Flow:

Mainly north. Flows northeast approximately 20 miles to mouth of Warm Springs Creek, then swings northwest 7.6 miles to the Biggs Ranch at the mouth of Cold Springs Creek, then veers back more northerly for 6.7 miles to empty into the left bank of the Middle Fork of the Salmon River in Section 13, Township 17N, Range 13E (on the boundary line between R13E and 14E).

Total Length:

34.3 miles, of which the lower 26.2 miles were surveyed in June 20-30, 1941.

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		vds	miles	vds	miles			
a	at mouth	0	0	0	0	sec 7, T17N R14E	54'	22-24
b	Cold Spring Cr	13300	7.6	13300	7.6	sec 18, T16N R14E	54'	18-20
c	Warm Springs Cr	11800	6.7	25100	14.3	sec 10, T15N R14E	57'	16-18
d	Phillips Cr	8700	4.9	33800	19.2	sec 30, T15N R14E	54'	14-16
e	Mayfield Cr	7400	4.2	41200	23.4	sec 13, T14N R13E	33'	12-14
f	End of Survey	4900	2.8	46100	26.2	sec 33, T14N R13E	24'	5-6"

EPA River Reach Codes:

Station	HUC	SEG Rmi
a		
b	17060206-050-09.54	17060205-958-00.00
c		
d	17060205-160-00.17	17060205-333-00.00
e	17060205-496-00.00	
f	17060205-679-00.00	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-b	197,700	95,520	48.3	65,570	33.2	18,465	9.3	18,145	9.2
b-c	235,000	79,960	34.0	77,800	33.1	51,810	22.0	25,430	10.8
c-d	137,400	70,400	51.2	45,750	33.3	14,470	10.5	6,780	4.9
d-e	96,800	35,500	36.7	29,040	30.0	22,580	23.3	9,680	10.0
e-f	15,900	7,000	44.0	6,010	37.8	1,840	11.6	1,050	6.6
(above available at all times)									
Total	682,800	288,380	42.2	224,170	32.8	109,165	16.0	61,085	8.9
(unavailable at all times)									
e-f	30,220	9,256	30.6	10,073	33.3	5,002	16.6	5,889	19.4
Grand									
Total	713,020	297,636	41.7	234,243	32.9	114,167	16.0	66,974	9.4

Spawning Area Usable and Available:

	Distance		Area	Available Spawning Area (yd ²)	%	Usable	%
Station	vds	miles	(yd ²)	(MR&SR)	Avail	Spawning Area (yd ²)	Usable
a-b	13,300	7.6	197,700	84,035	42.5	8,665	4.4
b-c	11,800	6.7	235,000	129,610	55.2	31,640	13.5
c-d	8,700	4.9	137,400	60,220	43.8	8,318	6.5
d-e	7,400	4.2	96,800	51,620	53.3	7,510	7.8
First Barrier	1,700	1.0	15,900	7,850	49.4	2,245	14.1
Total to Barrier	42,900	24.4	682,800	333,335	48.8	58,378	8.5
Grand Total	46,100	26.2	713,020	348,410	49.0	61.,383	8.6

Spawning Area unavailable and Unusable:

Station	Distance	Area (yd ²)	Area Unavail (yd ²)	% unavail	when avail	usable unavail (yd ²)	% usable unavail
e-f (only)	1.8 mi	30,220	15,075	49.9	AT	3005	9.9
Entire Stream	26.2 mi	713,020	15,075	2.1	AT	3005	0.4

Cause of Unavailability: a beaver dam with brush apron several feet wide thru which the water seeps. No opening large or continuous enough to swim thru and impossible for Salmon to jump that much laterally with no fall to guide them over projecting brush. This dam is located 1700 yards or approximately 1 mile above Mayfield Creek (Sta E), and is a total barrier at present.

Character of Watershed:

	a-b	b-c	c-d	d-e	e-f
Mountainous	lower more rolling to quite rugged	becoming more rugged	rugged	rugged-to fairly high rolling upper end	mountainous rugged

Hilly

Rolling

Flat
Swampy

Wooded	sparsely: to brush & scattered pine&fir	sparse to moderate	moderate below to scarce in upper	scattered to	scattered: open D. fir & pine stands & brush
Open	semi open			semi open brush, grass, sage, scattered pine, etc.	
Cultivated (%)	<2%, 1 sml reach at mouth & 1 at upper end	2-5%	<1%	C1%	<1%
Character of Valley	mainly narrow steep walled canyon, 3-4 box canyons, wide at mouth. to v	steep V canyon to \-/ above	V	v to _/ _/ below to V above	
Character of Banks	20-50' below to 1500' up valley walls along canyon; earth, talus & rock	5' upper valley to 500' lower canyon	usually is valley walls up to 1500' talus slopes & earth spots	10-30' in valley bottom with benches; up to 1500' as valley walls	2-5' dirt& gravel, occasion. 2000' as valley walls
Density of Marginal Vegetation	sparse to moderate; little or none in box canyon	scarce below to moderately dense above	fairly dense to patchy	moderate; spotty	moderately dense
Erosion					
a) banks	great	considerable	extensive	considerable great	moderately
b) watershed	great	very great	great	great	great

Diversions:

Diversion 1: on the right bank at the Falconberry Ranch 17,900 yards above the mouth. No dam present except a pile of rocks barely coming above water that extends diagonally out into stream for a few feet to divert water into ditch. At head of ditch was a wooden head gate or control box with drop board head. This

was 3 feet wide, 2 feet deep and several feet long, opening into an earth walled ditch at the lower end to run thru and irrigate the lower fields of the Falconberry Ranch. The drop board was open 1 foot, and water in the box was 7" deep. Approximately 3 cfs was being diverted at the time.

There was no protective devices what ever. The lower end of the ditch was not traced out, but unless it has an open return to the Creek, as is unlikely, it is dangerous to fingerling salmon moving downstream. In such case it should be screened, which would cost but little.

Diversion 2: at 40,100 yards above mouth (approximately 1200 yards below Mayfield Creek) was an old dam site, with a wooden sluice taking off to run down the R.B. Forest Ranger at Loon Creek says dam was formerly 14 feet high, but was broken out in 1938. Sluice formerly used for placer mines on benches below, but had been in disuse and broken up for many years now, and no danger to fish from it at present.

Artificial Obstructions:

1. Wooden plank and log dam located approximately 1200 yards below Mayfield Creek (Sta E). At present is only about 5 feet high and is passable at all times. However, the Forest Ranger at Loon Creek states that it was formerly about 14 feet high and served to supply water thru a wooden sluice and ditch system to placer mines on the benches below at the former settlement of Casto for a considerable distance. It has not been in use for many years, and in 1938 the dam was washed out or broken down to its present low height. It seems that it may have been helped to be lowered by a little work and dynamite in the hands of persons unknown, to benefit fish. At its former height it was undoubtedly a total barrier to salmon, and undoubtedly was an operating factor in reducing salmon runs in the stream in the past.

2. Brush and beaver dam at 42650 yards above mouth (14500 yards above Mayfield Creek) passable at present with difficulty.

3. Beaver dam 42690 yards (1490 yards above Mayfield Creek) passable with difficulty.

4. Beaver dam at 42980 yards (1780 yards above Mayfield Creek) 6' high and very wide, of brush construction, and large enough so brush is growing on downstream side. A pond almost 50 yards wide is formed behind the dam, and water seeps thru at intervals along the face, there being no main spillway. Salmon can neither swim up over or thru, nor jump over the wide brush apron and dam face at its present stage of construction. The dam is a total barrier until altered by flood or by man.

5. Beaver dam at 43400 yards above mouth. Drop only 3 feet but brush face allows too much seepage. It is a temporary low water barrier.

6. Beaver dam at 43600 yards. 3' drop passable at high water; temporary low water barrier due to seepage and width of brush face.

Natural Obstructions:

There were none found that were barriers to Salmon. Several cascade series in gorges, small falls and chutes were passable with difficulty but salmon could work past them.

Fluctuation in Water Level:

Sta	Ft. Variation	Cause	Stream Volume	% Stream Bed Covered
a-b	5'			100
b-c	3-8'			100
c-d	5'			100
d-e	3-8'			100
e-f	2-4'			100

Cause of variation: spring run off of winter accumulation of deep snows on high mountain ridges and slopes of the drainage. This is aggravated by the narrow rocky channels and box canyons along its course that allow little ponding or spreading out. In some years climatic conditions also cause ice flows to pile up and temporarily dam small sections and raise the water exceptionally for a while until the pile gives way.

Stream Volumes: estimated at 550 cfs. June 30, 1941
(tributaries alone estimated at 476 cfs)

Pollution:

None noted in entire stream other than a small amount of silt at times, but water generally was clear.

Fish (Salmon):

No salmon were seen. The salmon run had not started at the time the stream was surveyed, but probably did a few days later. Spring Chinook are reported to run the stream around the 1st week in July. Mr. Lovell, at the ranch at the mouth, said he thought he had seen one at his bridge, but was not sure, but they were due any day.

The run is apparently fairly small, since none of the people at the 3 ranches nor at the Ranger Station had ever seen any concentration of fish on the stream, excepting for reports of "a

fair number," apparently less than 100, "splashing on the good riffles by the Falconberry Ranch one summer a year or two back."

It is not known whether the young remain in the stream long or not. The stream gradient is so steep that this does not seem likely.

Fish (other than salmon):

<u>Species</u>	<u>Date</u>	<u>Very</u> <u>Abundant</u>	<u>Abundant</u>	<u>Fair No.</u>	<u>Scarce</u>
Steelhead	Spring			x (?)	
Rainbow				X (reported)	
Whitefish				X (reported)	
Dolly Varden				X (reported)	
Cutthroat				X (reported)	

Due to necessary haste on the pack trip, we did no fishing ourselves on Loon Creek. The reports on the above fish were gathered at the Forest Service Station and from the people at the 3 ranches along the river. On July 5th, 2 or 3 fair catches, mainly rainbow were reported at the Boyle Dude Ranch. Fishing is reported generally poor until after high water in the spring, and one or two persons were of the opinion that, due to frequent severe winters and ice conditions, most of the trout drop downstream in the fall, presumably to big holes in the Middle Fork, and run back up Loon Creek in the spring. Its largest tributary, Warm Springs Creek, apparently has a resident trout population the year round, but is less steep and fast in its middle portion where the fish were most numerous.

Tourists, etc., can drive as far as Phillips Creek and the area from Phillips Creek to the end of the survey is fairly heavily fished from late June until Fall. The upper end is harder to get at. Since one of the main traveled trails into the Middle Fork Country runs along Loon Creek, it is fished to a greater extent than many of its tributaries. People at the 3 ranches along its courses fish whenever they care to, and for a stream away from the roads it can be said to be moderately fished, but there is no commercial fishing on the stream.

General Remarks:

At its mouth, Loon Creek emerges between two benches from a canyon cut in the mountains. It enters the Middle Fork over a narrow bed rock cascade with a passable drop of 5-6 feet. The high hills or mountains near the mouth are more rounded, open and have considerable soil. The old Lovell Ranch on the irrigated benches furnishes color contrast from good green fields to the yellow and gray semi arid slopes about it that are sparsely covered with clumps of sage, scattered grasses, and occasional pine, etc.

Immediately above the ranch the valley narrows to approximately 50-100 feet wide at the bottom, with slopes becoming steeper and higher as one goes up stream. The creek runs fast thru a series of rushing cascades for over 1000 yards to Cache Creek. This stream comes out of a side gorge and is of similar gradient but small in volume (10 feet wide, 8-10 cfs) it furnishes water for irrigation on the Lovell Ranch, and is of little value to salmon.

Above Cache Creek for the next 2000 yards the stream tumbles thru a gorge cut in the Idaho batholith, its bare granite walls rising abruptly 300-1000 feet from the waters edge. Large rocks and boulders break the stream at intervals into small S6 pools and white water cascades. There is little spawning area so far in the stream, and very few real good resting pools in the lower 3-4 miles. Approximately 3 miles above the mouth a small, wider, pocket valley approximately 6-800 yards long opens up. The brush thickens along the flat, and the stream slows up to furnish several hundred square yards of usable spawning rubble. Above it again narrows in a gorge and tumbles in rough cascades until the next slightly wider pocket valley opens up at the Biggs Ranch 7.6 miles above the mouth. In all this stretch of fast water there were only 55 small resting pools and 8665 square yards of patchy usable spawning in 197700 square yards of bottom, and salmon would probably swim right thru this entire fast lower portion of the stream.

Above the Biggs Ranch the stream is a bit steep and has occasional pools and spawning riffles along benches between now very rugged steep rocky valley walls, 500-2000 feet high, and greatly cut up by erosion. Vegetation is very scattered even on slopes with soil.

Horse Creek, a steep 2 foot wide tributary is used to irrigate 2 or 3 small fields on benches above the Biggs Ranch. Another cleft and bare rock walled canyon follows for 2000 yards, during which the trail hangs on 50-250 feet above the cascades and occasional rock bound pools of the stream below.

At 15800 yards above the mouth the canyon opens out into the splendid 1 1/2 mile long meadow of the Falconberry Ranch. The stream slows and widens to swing thru this meadow in a series of continuous riffles that have the largest and best spawning areas of the entire stream. Although there is no large concentration of usable rubble (not over 35% in any 100 yard stretch), this is the largest and most continuous usable spawning area of the stream. The only reason why the usable spawning area in this stretch is not much greater is because the rubble is mainly just a little bit too large.

Cabin Creek enters on the left bank near the upper end of this valley, but is fairly shallow, and small, and approximately 1/3 is diverted to irrigate the upper Falconberry Ranch fields. There is

a USFS Guard Station at its mouth in summer and the Guard told us that the stream is dry or intermittent above the lower springfed 1/2 mile in mid summer, and he had never seen salmon attempt to go up it, although they could have at the time of the survey when the flow was approximately 10-12 cfs.

High benches backed by more rounded mountains border the stream from Cabin Creek to Rock Creek, with the valley narrowing at intervals up to the mouth of Warm Springs Creek. The right bank slopes and mountains now have a thin but increasing cover of conifers, mainly lodge pole pine, while willows, alders, dog wood, etc., are quite dense in patches along the stream from time to time.

There are more resting pools from the Falconberry Ranch on up to Warm Springs Creek than there were in the entire stream below it, there being several sizable deep rock bound pools that could hold many salmon apiece. The riffles between Horse Creek and Warm Springs Creek (thru the Falconberry Ranch) are said to have more salmon spawn on them than in all the rest of the entire stream during recent years, altho the run is at present not large. The usable spawning in the stretch from Station b-c, of 6.7 miles is 31640 square yards or over half that of the entire stream.

Warm Springs Creek is one of the two largest tributaries of the creek, and has been surveyed and written up. It is well stocked with trout, and salmon are said to run up it from Loon Creek, entering at 14.3 miles above the mouth.

From Warm Springs Creek to Mayfield Creek the width of the stream remains approximately the same as below, or 14-18 yards, but the gradient is a bit less steep, the stream flows less violently and the canyon or valley bottom is a bit wider. Above Warm Springs Creek there are a series of hot springs, particularly along the left bank. Above Phillips Creek it is bordered by benches 10 to 60 feet high on the right bank, the stream mainly following the left valley wall which is of open slopes, mainly cliffs and talus and gravel banks 300-1000 feet high. There are 2-3 narrow canyonous stretches below Phillips Creek with nearly vertical walls, but with fewer cascades than below. Above Phillips Creek there are many good riffles, but the usable rubble is considerably less extensive than in the Falconberry Ranch valley below. This area has been quite extensively worked over by placer mines in the past, which have left gravel heaps all along the creek. The main workings had been fed water by a wooden sluice and ditch systems that runs along the right bank for 2 miles or so from a wood and log dam located approximately 1200 yards below Mayfield Creek. At the time of mining quite a few years ago, the dam was reported to have been 14 feet high and blocked the salmon run. Fish were said to have attempted to jump it for several years, and then gradually ceased to appear. The dam was partially destroyed in 1938, and it is now only 5 feet high and can be jumped by salmon. This dam, the mining

operations, and taking of fish during the years of mining in the valleys was the big factor in the elimination of the former salmon run from the headwaters of Loon Creek and from its tributaries (Mayfield Creek, etc.) above the dam site. Only a few scattered salmon have been reported above the dam site since 1938 following several years of complete absence. It is possible that the run may gradually reestablish itself over a period of years if fully protected, or if aided by plantings. The road into Loon Creek from Stanley and Yankee Fork runs a bit below Phillips Creek, where there is a campsite of sorts. Tourists, fisherman and hunters drive down Loon Creek to this point in some numbers each year, and fishing is more extensive above Warm Springs Creek than below, due to availability from cars, a factor to be considered if salmon plants are made to revive the runs in the stream.

Above Mayfield Creek the stream becomes smaller, particularly above Trail Creek and after passing thru the benches of the upper Boyle Ranch with their irrigated fields. Here, 1700 yards above Mayfield Creek, beaver workings appear, and a wide, 6' high brush dam blocked further ascent by salmon at present. Water from the wide shallow pond above it seeped thru the brush face in several places and it could not be jumped. The survey was continued 3200 yards more, and several low water barrier beaver dams were encountered. Above the end of survey more beaver workings in the now small stream are reported and the stream becomes steep and has little value to salmon.

Loon Creek seems to be a good salmon stream, and its larger tributaries, Warm Springs Creek and Mayfield Creek can also support a considerable number of salmon, particularly the former. The water is clear, unpolluted, and there are now no barriers to salmon in the lower 24.4 miles of stream. There are only 3 ranches and 1 Forest Service Station along the stream, and one family at the mouth of Warm Springs Creek, and therefore the human element to bother spawning salmon is small, and operative only above Warm Springs Creek to any extent. Altho the Boyle Ranch is a dude ranch, it is managed by people interested in conservation and fishing. Mining operations are not being carried on at present, except for 2 prospectors above Phillips Creek, and the family at the mouth of Warm Springs Creek, who mainly do prospecting and try to sell doubtful claims to strangers.

One factor not to be overlooked is the menace to salmon from ice. The stream drainage area is mostly a mile or more above sea level, and winters are quite severe in the mountains, with low temperatures and much snow and ice reported. The road is blocked to the valley from November until spring. With a fairly steep gradient thruout the relatively few deep pools, anchor ice that lifts small stones is reported as being not infrequent in most years, depending on climatic conditions. Anchor ice in such a stream can do great damage to eggs in the gravel, or to newly hatched fry, and may also be a reason why the run is small at

present, particularly in the upper third of the stream. The section below Warm Springs Creek to the Biggs Ranch has more pools and would be least apt to be so affected, and luckily this has the best spawning area. The lower 8 miles of stream lacks pools and is fast, but lacks spawning rubble and would probably have few if any redds to be affected. There is also considerable damage possible from ice break up in the spring. At the Lovell Ranch ice flows and jams are said to tear the stream bed up in some years when particularly heavy spring rains and fast thaws cause rapid run off after a severe winter has made thick ice all along the stream. Such ice flows could do great damage even in the better middle portion.

In spite of these possibilities, Loon Creek should support good salmon runs, and the runs should be built up as soon as is possible.

Temperature Data:

Sta	Date	Hour	Air temp	Water temp	Skv
a (mouth)	6-30-41	12 noon	64 F	51 F	50% clear; white cumulus clouds
b (Biggs Ranch)	6-28-41	9:30 am	59 F	48 F	overcast; strats-cumulus
c*(Warm Springs Creek)	6-26-41	3:00 pm	70 F	51 F	overcast; slight drizzle
d (Phillips Creek)	6-22-41	12:15 pm	85 F	52 F	clear
e (Mayfield Creek)	6-20-41	9:00 am	52 F	42 F	clear

* water temperature at same time in Warm Springs Creek itself was 54 F.

Temperature seems suitable for spawning, but early fall low temperatures and severe winter temperatures may cause ice damage to eggs or fry in upper section in particular. Not determined as yet.

Pool Grade:

Station	Resting Pools-	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6
a-b (24.6 miles)	55	7.2	25.1	0	13	28	289
b-c (6.7 miles)	59	8.8	11.5	13	a	31	121
c-d (4.9 miles)	28	5.7	7.2	1	13	12	148
d-e (4.2 miles)	47	11.1	1	5	a	33	222
			2.1	10.6	17.0	70.2	

e-f	5	5.0	<u>0</u>	<u>0</u>	<u>0</u>	<u>5</u>	27
(1.0 miles)			0.0	0.0	0.0	100.0	
Total Below	194	7.9	<u>24</u>	<u>19</u>	<u>42</u>	<u>109</u>	807
Barrier(24.4 miles)			12.3	20.2	21.6	56.2	
Above Barrier	31	8.6	<u>0</u>	<u>0</u>	<u>3</u>	<u>28</u>	55
(1.8 miles)			0.0	0.0	9.6	90.3	
Grand	225	8.6	<u>24</u>	<u>19</u>	<u>45</u>	<u>137</u>	862
Total(26.2 miles)			10.7	a.4	20.0	60.1	

Gradient:

On the U.S. Plan and Profile maps of the Middle Fork of the Salmon River elevations are available for Loon Creek from its mouth up to the mouth of Warm Springs Creek.

The elevation at the mouth is a bit over 4000 feet. The 1st 3/4 mile has a gradient of only about 50 feet per mile, but from here on up to and past the Biggs Ranch (Station b) it is the steepest of the entire stream as far as surveyed. In the 1st 9 miles above the mouth, being mainly in gorges and rushing cascades of the rocky canyons the drop is 740 feet or 82+ feet per mile. From this point up to Rock Creek it drops only 160 feet in 4 1/2 miles or 35.5 feet per mile. This moderate area includes the good spawning riffles on the Falconberry ranch. From Rock Creek to Warm Springs Creek it drops 100 feet in 1 1/2 miles or 67 feet per mile. A bench mark of 5655 feet shows at the mouth of Canyon Creek (on Challis N.F. map), 8 1/2 miles above Warm Springs Creek, this stretch having a drop of approximately 73 feet per mile. The area above this to the end of the survey seemed about the same. The uppermost small mountain tributaries are of course the steepest part of the stream.

Tributaries:

1. Cache Creek, 1t bk, 1010 yards above mouth, 10' wide, 10-12 cfs, little, shallow stream 5 miles long, few salmon could use lower end, but reported as shallow, steep, and little usable rubble except at mouth.
2. Unnamed, 1t bk, approximately 2200 yards above mouth, 3' wide, 2-3 cfs, no value, so small we didn't even make it from trail.
3. Bennett Creek, 1t bk, 3950 yards above mouth, 5' wide, 2-3 cfs, no value, too small, steep, and rough.
4. Unnamed, rt bk, 3900 yards above mouth, 2' wide, 1 cfs, no value, hardly big enough to see.
5. Camp Creek, 1t bk, 6540 yards above mouth, 3, wide, 2 cfs, no value, a trickle tributary

6. Powder Creek, 1t bk, 7000 yards above mouth, 3' wide, 3-5 cfs, no value, falls above mouth.
7. Loon Creek, rt bk, approximately 8500 yards above mouth, 2' wide, 1-2 cfs, no value, too tiny, spring feed.
 - a. Bear Creek, rt bk, approximately 9000 yards above mouth, 3-4' wide, 3-4 cfs, no value, too small and steep.
9. Yellow Cat Creek, 1t bk, approximately 1100 yards above mouth, 2' wide, 2 cfs, no value, too small and steep
10. Cold Spring Creek, rt bk, 13,400 yards above mouth, 3' wide, 3-4 cfs, no value, too small and shallow
11. Horse Creek, 1t bk, 14000 yards above mouth, 3-4' wide, 2-3 cfs no value, too small, shallow, and steep (irrigates upper Biggs Ranch)
12. Mearney Creek, 1t bk, 15300 yards above mouth, 3' wide, 3 cfs, no value, too steep and shallow
13. Burn Creek, 1t bk, approximately 16200 yards above mouth, 1- 2' wide, 1-2 cfs no value, tiny, near dry in summer
14. Jack Creek, rt bk, approximately 17600 yards above mouth, 2-3' wide, 2-3 cfs, no value, too small
15. Indian Creek, rt bk, 18900 yards above mouth, 2-3, wide, 3-4 cfs, no value, too small and shallow
16. Cabin Creek, 1t bk, 19,000 yards above mouth, 8-10' wide, 10-15 cfs, fed by springs located mainly in lower 1/2 mile and gets too shallow above there in summer, used for irrigation, no salmon ever reported seen in it
17. Rock Creek*, 1t bk, 21400 yards above mouth, 9' wide, 10-15 cfs, no value, too rough and steep. See survey write up.
18. Peanut Creek, rt bk, 24300 yards above mouth, 1-2' wide, 1-2 cfs no value, only a trickle over steep rock faces, impassable AT
19. Warm Springs Creek*, 1t bk, 25100 yards above mouth, 24' wide 150 cfs, good salmon stream, see survey write up.
20. Cottonwood Creek, 1t bk, 29500 yards above mouth, 8' wide, a-10 cfs, gradient is steep and stream small, little value, but few could perhaps spawn near mouth only
21. Shell Creek, rt bk, 31800 yards above mouth, 8, wide, 8-10 cfs, 2 channels blocked by beaver dams, no value to salmon.

22. Phillips Creek, rt bk, 33800 yards above mouth, 2, wide, 1-2 cfs, no value--very small
23. White Creek, rt bk, approximately 35500 yards above mouth, 1-2' wide, 1 cfs, no value--tiny
24. Rat Creek, lt bk, approximately 36100 yards above mouth, 3' wide, 2-3 cfs, no value--small
25. Grouse Creek, rt bk, 36900 yards above mouth, 6, wide, 6-8 cfs, bit too steep and small, low in summer and too small
26. Canyon Creek, rt bk, 39500 yards above mouth, 5-6' wide, 8 cfs, in narrow side canyon, with many bad cascades, would be nearly too small to get up in most seasons. Little value if any.
27. Mayfield Creek*, lt bk, 41200 yards above mouth, 24' wide, 100-125 cfs, see survey write up for value to salmon.
28. Deer Creek, rt bk, 41950 yards above mouth, 2, wide, 2 cfs, too small--blocked by beaver dams right above mouth
29. Trail Creek*, rt bk, 42510 yards above mouth, 12' wide, 25-30 cfs, very little value, bad beaver dams in abundance all along. See survey notes.
30. Pioneer Creek*, lt bk, 44800 yards above mouth, 21, wide, 30-35 cfs, no value, is above total barrier beaver dams in Loon Creek, and can't be reached. Steep and cascades.
- * = stream has been surveyed and written up.

Rock Creek

River System: Salmon River
Stream Burvey: Rock Creek

(Typist Note: This write up is general and should be put on blank cards)

Rock Creek is a small, steep, white-water creek between Warm Springs Creek and Cabin Creek, the 17th tributary of Loon Creek, entering on left bank in Sec 34, T.16N, R.14E in the North Central section of the Challis National Forest of Idaho. It lies entirely in an uninhabited mountainous area in a steep, narrow canyon. Its banks are usually continuous with the valley walls and are often sheer vertical cliffs or long talus slopes below rocky outcrops several hundred feet high. These rocky slopes have a scattered covering of Douglas fir with sage and clumps of bunch grass between where there is soil enough. The narrow strips of marginal vegetation, mainly alder and dogwood, is quite dense.

The stream is approximately 7 miles long but has no large tributaries, and no trail along it. Its flow is not great, since it's drainage area is relatively small, being estimated at 10-15 cfs. It enters Loon Creek over a 4' bedrock fall, and several other small falls could be seen in the valley. The remainder of the stream has a very steep gradient and is mainly a series of cascades and whitewater.

Temperature at mouth was 48 F for water, 62 F for the air, with sky overcast and a slight drizzle, time 4:30 pm on June 26, 1941. There are no deep resting pools, or even few S2 pools, and spawning rubble is very scarce. No one has ever reported salmon in this stream, and it has no apparent value as a salmon stream, largely because of its small volume and steepness. Only the lower 400 yards were surveyed by D.G. Frey on June 26, 1941, but that was enough to see that the stream had no value as a salmon producer.

Warm Springs Creek

River System: Salmon River
Stream Surveyed: Warm Springs Creek

Date of Survey: June 23 to 26 inclusive, 1941 by D.G. Frey and
F.G. Bryant

Source:

Originated high on the western slopes of ridges between Parker Mountain, Twin Peaks, and White Mountain in the N.E. portion of the Challis National Forest of Idaho. Its drainage area is bounded by that of the Camas Creek system to the north of Loon Creek to the west, and Mayfield Creek to the south. On the east it is bounded by ~~several smaller~~ tributaries to the Main Salmon River in the vicinity of Challis Idaho, chief among them being the headwaters of Challis Creek and Garden Creek.

Most of its tributaries are in Townships 14N and 15N. However the upper end of the main stream heads in section 30 and 31, T.15N, R.17E. It is formed by the union of many small tributaries.

Direction of Flow:

Mainly N.W. to West. From point of origin it runs S.W. for approx 4 miles, then in the vicinity of the old Parker Mill it 'curves back to run nearly straight N.W. by W. for 2-3 miles until it picks up Trapper Creek from the south. It then abruptly turns North for 2 miles, and then in the next 4 miles it gradually loops westerly to run nearly due west in its last 4 miles to join the left bank of Loon Creek in sec. 10, T.15N, R.14E.

Total Length:

17 miles, of which the lower 20,500 yds or 11.6 miles were surveyed on June 23-26 1941 by Frey and Bryant.

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Width	Depth
		vds	miles	vds	miles		
a	at mouth	0	0	0	0	24'	6-18" avg
b	at mouth of Hot Cr	7900	4.5	7900	4.5	(pools 27'	1-3' deep) 6"-1' avg
C	at mouth of Mahoney Creek	4900	2.8	12,800	7.3	21,	6"-1' avg
c2	at mouth of Wickiup Creek	4000	2.2	16,800	9.5	23 *	8.7" avg

Sta	Location	Distance above prev. Station		Distance above Mouth		Width	Depth
		yds	miles	yds	miles		
d	500 yds above Parker Mill (end of survey)	3700	2.1	20,500	11.6	12	3-9" avg

* actually measured accurately, not estimated. Non starred are estimated only.

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-160-00.17	
b	17060205-083-00.03	
C	17060205-057-06.59	
c2	17060205-057-09.21	
d	17060205-409-00.10	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-b	66,600	23,380	35.1	23,950	36.0	12,050	18.1	7,220	10.0
b-c	41,760	8,956	21.4	18,650	44.7	8,212	19.7	5,942	14.2
c-d	53,000	15,510	29.3	16,250	30.7	13,130	24.8	8,110	15.3
Total	161,360	47,846	29.7	58,850	36.4	33,392	20.7	21,272	13.2

Spawning Area Available and Usable:

Sta	Distance between Stations	Total sq yds bottom	sq yds avail spawning area (MR & SR)	% avail	sq yds usable	% usable
A-B	7,900 yd or 4.5 mi	66,600	36,000	54.1	9,769	14.8
B-C	4,900 yd or 2.8 mi	41,700	26,862	64.4	10,146	24.4
C-D	7,700 yd or 4.3 mi	53,000	29,380	55.4	5,585	11.0
Total	20,500 yds or 11.6 mi	161,360	92,242	57.2	25,500	15.8

total of 25,500 sq yds or 15.8% of total bottom

Spawning Area Unavailable: none was actually unavailable at the time of survey. However the survey was stopped where nests of

beaver dams had become so numerous and difficult that it is doubtful if salmon could work upstream beyond that point.

Character of Watershed:

Mountainous	Sta A-B	x canyon in mountains rugged surroundings.
	Sta B-C	x less rugged more rounded increasing amount of soil on upper slopes in particular
	Sta C-D	mountainous to hilly canyon in lower section more open above and more rolling high hills backed by higher mountains
Hilly		
Rolling		
Flat		
Swampy		
Wooded	Sta A-B	open on lightly due to steep rocky slopes douglas firs, lodgepole pine with sage and grass clumps between R.B. more wooded than L.B.
	Sta B-C	moderately to patchy pine stands and few Douglas fir with sage brush interspersed with bunch grass etc; thinly fairly open coverings some open slopes with bushes
	Sta C-D	light to moderate few open slopes, cluttered fir and pine, sage, brush, and grass between.
Open		
Cultivated (%)	Sta A-B	none
	Sta B-C	none
	Sta C-D	none
Character of Valley	Sta A-B	\ / floor not over 75 yds wide in any place up 1/8 to 1/4 mile across
	Sta B-C	\ / more flat sections in valley floor wider valley 1/2 - 2 miles wide
	Sta C-D	\ / to \ / below, but _ / above solid rock gorge below gradually widening into high hills and mesas rounding above
Character of Banks	Sta A-B	steep usually talus rock and some earth few cliffs usually continuous as valley wall
		300-1800 ft high
	Sta B-C	12 to 15 ft high in canyon has channel

		cut in valley floor hence some true banks not valley walls snow earth and ground
	Sta C-D	2-8' in valley sections sheer solid rock through gorge from streams edge up 150-250 ft; talus above grading to earth and talus at upper end
Density of Marginal Vegetation	Sta A-B	moderately; inbound 10-50 ft wide along margins, willows, alder, poplar, buck brush
	Sta B-C	fairly dense; thickets of willow, alder, quaking Aspen, and thornapple on all valley floors
	Sta C-D	Willow, Aspen, Poplar, lodgepole pine stands at intervals moderate in spots dense in wider sections of valley floor
Erosion		
a) of banks	Sta A-B	great
	Sta B-C	considerable where not protected by vegetation
	Sta C-D	extreme in gorge and middle sections great above
b) of watershed	Sta A-B	very great
	Sta B-C	considerable where not protected by vegetation
	Sta C-D	very great

Diversions: none

Artificial Obstructions:

No	Location above mouth(vds)	Type	Passability	Remarks
1.	300	falls over	all times	3' falls made by a log lodged bedded log across the stream; no barrier
2.	1400	old beaver dam	all times	old dam not kept up lately
3.	3 0 0	old beaver dam	all times	old dam not kept up lately
4.	4780	log jamb dam	all times	has good spill over center 5' high at present .
5.	5950	log jamb dam	all times	old jamb sedimented in behind 3' high
6.	8760	beaver dam	passable	Filled in behind passable at 4' high with great time of survey; hard work to difficulty get over at low water
7.	9900	beaver dam	all times	low water, passable H.W. 4' high

No	Location above <u>mouth(yds)</u>	Type	Passability	Remarks
8.	11,000-	falls over	all times	numerous logs across creek
	11,300	bedded logs		have been bedded down and make small falls; all easily passable and benefit stream through making small pools and riffles
9.	11,200	beaver dam	all times	3' high
10.	14,100	beaver dam	all times	beaver works below gorge on 3-5' high flat has made sediment basin above with braided stream, passable around ends in 2-3 places at present
11.	15,200	bedded log dam	all times	4' high
12.	16,750	log jamb falls	all times	5' high
13.	18,000-	series of	all times	
	18,300	small debris log jambs and beaver workings		
14.	18,500-	numerous beaver workings	passable w/ difficulty	
	end of survey		all times	
15.	above end of survey	numerous	barrier	Those numerous beaver successive all times dams above the old beaver dams Parker Mill cause stump small channels and a maze for fish to get through. Although low, the brush on the face through which water seeps makes obstacles that would at present block salmon from getting any further up. Since these are fresh workings the conditions will not improve in the immediate future.

Natural Obstructions:

No.	Location		Nature	'Passability	Remarks
1.	800-2400	yd	smaller 2-5' high boulder falls and cascades	all times	series of cascades and small falls in narrow canyon difficult but passable
2.	3600-4400	yd	smaller 2-5' high boulder falls and cascades	all times	" " "
3.	5200-5900	yd	smaller 2-5' high boulder falls and cascades	all times	" " "
4.	9500- 15,800	yd	smaller 2-5' high boulder falls and cascades	all times	" " "
5.	10,200- 16,400	yd	smaller 2-5' high boulder falls and cascades	all times	" " "

Fluctuation in Water Level:

Feet Variation;	between Sta A-B	5-8 ft lower mile
		3-4 ft 2nd and 3rd mile
		2-5 ft upper mile by Hot Creek
	Sta B-C	2-5 ft through out
	Sta C-D	1-5 ft through out

Fluctuation seems to vary with the seasonal amount and rapidity of snow melt run off, and with seasonal rains. Is highest in the narrow canyons, particularly since gradient is fairly steep in those sections, and stream bed narrows, and little or no area for marginal overflow and ponding except in some sections between Hot Creek to a point 1000yds above Mahoney Creek. Beaver dams, particularly at upper end pond areas and increase the rise locally.

B. Stream Volume; The flow was taken by the float method at a small foot bridge just above the mouth of Wickiup Creek. 16,800 yds or 9.5 miles by stream above the mouth with an 20% drag factor deducted, the flow was 66.6 cfs. The flow at the mouth was estimated to be approx 150 cfs, and at sta. D at the upper end of the survey is approx 25-30 cfs.

C. Percent of Stream Bed Covered; Practically all of the stream bed was covered along the entire stream. This was due largely to the narrows of the stream valley, much of it being in narrow canyons. Inside of curves on small flats and above some beaver dams that had caused a braided stream had 10-20% uncovered for strips of a few yards.

Pollution:

No pollution was noted that had any apparent effect on fish. The stream was generally clear, but in several sections, particularly below Wickiup Creek and Hot Creek, the water was a grayish or milky in appearance. Although the exact cause was not determined it was believed to be caused by the effluent from the many hot springs in the drainage area. Trout were found within a few feet of hot springs in several places, so their effluent, although smelly, had no apparent ill effect.

Fish (Salmon):

1. No salmon were observed. However spring chinook are said to run up Warm Springs creek. The run was due, but had not reached the stream at the time of the survey. The run apparently enters the creek around July 4th or at least by the middle of July. We could gather little information of value about the salmon run, as apparently very few people get into this back country section that would notice and report on the runs.

The water was clear enough to have seen salmon had they been present.

It is presumed that in this stream, as in other tributaries to the Middle Fork, the salmon would spawn shortly after reaching the spawning beds, or during early August.

The stream should support a fair run in so far as accessibility, suitable water and temperatures, and spawning area are deciding factors. The stream seems quite free from molestation by humans, due to its entire course being miles from roads, and off the main traveled trails.

Fish (other than salmon):

Steelhead, spring: none seen said to run stream in early spring

Rainbow trout: June 24 and 25, 1941; fair number below Hot springs Creek, abundant from Hot Springs Creek to Eagle Creek. Very abundant from Eagle Creek vicinity past Mahoney Creek to chasm 1400 yds above Mahoney Creek. Fair number to abundant from there to Trapper Creek. Abundant to very abundant above Trapper Creek past Parker Mill in beaver pond section.

Cutthroat trout: June 25 1940; Fair number, taken in vicinity of Mahoney Creek appear to have crossed with Montana Blackspots in some cases.

Montana Blackspot: June 25 1940; Fair number, took specimens in vicinity of Mahoney Creek.

Dolly Varden: June 24 and 25 1940, Fair number taken in vicinity of Mahoney Creek and on up to chasm.

The fish caught were taken from just below Mahoney Creek up to the beaver ponds at the mouth of the rock chasm approx 1400 yds above Mahoney Creek. On June 24th, 1 1/2 hrs fly fishing, after 4 PM, yielded light Rainbow 6-10" long, and one 16" Dolly Varden.

On July 25th 500 yds of stream were fly fished at the mouth of Mahoney Creek between 4 and 5 PM and the catch was 9 Rainbow 6 - 9 1/2" 1 Montana Blackspot 10 7/8" and 1 Dolly Varden 18 1/4". At the same time the guide refished the section by camp and got half a dozen good rainbows and 2-3 cutthroat trout. Either could have caught many more too easily.

The fish were rather lazy and were plump and fat as possible and very well fed. Stomachs were nearly all full, the majority of the feed being insects that had fallen into the water. This section had good riffles, alder, willows and aspen arching over the stream to give shelter, shade and an added insect food source and trout numbered at least 2-4 to each small pool and 1-2 to each eddy. The more rapid stretches in the canyons below and above had fewer good pools and less fish but in the quicker stretches by beaver workings above Trapper Creek several trout 5- 10" could often be seen in a pool. Rainbow outnumbered all others at least 3-1. The stretch near the mouth is presumably most fished, the upper stretches being fished only occasionally each year, and the population is well maintained. Trout were caught within 10 ft of hot springs outlets.

General Remarks:

Warm Springs Creek comes out of a narrow steep walled canyon to enter Loon Creek in rugged fairly open country. Below Hot Creek the trail follows along the left bank, sometimes 50-100 ft above the stream, because of the steepness of the valley walls which descend with few exceptions to the waters edge. These walls are 300-1500 ft high; bed rock cliffs or long talus slopes from cliffs high above are usual. There are occasional earth covered slopes between these. The gradient is fairly constantly steep. The stream is a rushing succession of tumbling cascades over boulders and rocks, with no valley bottom more than 50 ft wide on either side at the most. Spawning area is spotty at the foot of small pools. There are no pools over 20 ft long or 3-4 ft deep, with but one or two exceptions in the entire stretch. Some cascade falls are 3-5 ft high but all are passable to salmon. Small eddies would serve to rest the salmon in this stretch. There is a fairly open covering of fir and pine along the more shaded right bank and valley walls, with sage, brush and bunch grass between. The left bank is much more barren and open.

The fact that the rubble is broken into fairly small pieces in

the talus, slopes erosion sections, makes the 9769 sq yds of accumulated small stretches of usable spawning area found in the 4 1/2 miles of stream. There were 2 or 3 wider bench-like quieter stretches in the upper 2 miles of this stretch that were the best spawning areas found.

Above Hot Creek the valley opens up considerably the valley walls become less steep, more rounded, and more long earth covered slopes appear. The stream gradient is less and good riffle area in greater abundance. Willow, aspen and alder flats occur between constrictions of the valley into 2-3 canyonous stretches 4-600 yds long. A few beaver dams are found on these flats, which are seldom over 2-300 yds across. These together with small log and trash jams caught on occasional large boulders furnish the S2 resting pools, none of which are very deep, but often protected by overhanging willows and brush. The left valley slopes are open mainly sage brush and scattered grasses clear to the top, with occasional pine and fir clumps. The right bank is more wooded, but none of the timber is large, seldom over 30-40' high. Approx 1,000 yds above Mahoney Creek a fine campsite was available with grass and shade made possible by springs along the foot of the sloping hills. There were many hot springs along this section that had temperatures of 109-112 F, but apparently they had no effect on fish. The milky appearance of the water in many sections was attributed to them.

The stream is in semi-arid country which accounts for the light vegetative coverings. Nights in June were very cool and days often very hot.

Beaver workings in an aspen and willow stand in this spring area had ponded a small flat and caused braided channels in which well fed trout were very abundant and easily caught.

Approx 1400 yds above Mahoney Creek the valley is closed by high rocky slopes through which the stream has cut a canyon, the next 300 yds being a gorge or chasm with sheer rock walls rising vertically 100-300 ft from the waters edge. Above this cleft, which must be traversed in the creek itself, a multitude of hot springs spout, from the rock walls and talus slopes for several hundred yards, some having a flow of 2-5 cfs. From here on up past Trapper Creek to the old Parker Mill site the valley is a narrow steep walled canyon with many talus slopes, and the stream again has a steeper gradient with many small boulder pools and mainly fast water. This stretch has more timber, mainly pine, fir, and aspen, both on the slopes and along the stream.

Above Parker Mill the hills again become more rounded and with more soil. The valley widens slightly and the stream is much smaller and broken into many small shallow ponds and flooded side channels by beaver workings in the now heavier aspen and willow thickets of the valley floor. At a point approximately 500 yds

above Parker Mill the survey was stopped because the beaver dams had become so many and difficult that it appeared that salmon could not get much further in the stream.

Warm Springs Cr. should be capable of having a good run of Spring Chinooks. There was a total of 25,500 sq. yd. of usable spawning rubble in the 11.6 miles surveyed. This was closely graded, and in some sections some of the larger rubble excluded in the usable estimate is nearly small enough to be classed as usable and might be used to some extent. Since the stream is off the most frequented trails and probably is never visited by salmon fishermen it should be one that would respond well to a series of plantings of fry or fingerlings to boost the natural run. It is unfortunate that the run was not on at the time of the survey so that its extent could be accurately determined, as reports on it are most meager. A Forest Service guard reported that chinook did run the stream at least to Trapper Creek.

Food is apparently plentiful as all trout taken were very fat and full of feed. The abundance of trout in the stream however probably exerts not a small influence on the productivity of natural spawned salmon through destruction of eggs and some small fish. Although abundance of feed may lessen the usual expected predation. The effect of ice and winter temperatures was not known. The stream runs its course in a valley that is 5000 to 8000 ft high and the winter conditions are undoubtedly quite severe. Never the less the stream appears to be a favorable one for a good number of chinooks, and they could be increased with the proper attention.

Temperature Data:

Station	Location (yds up)	Date	Time	Air	Water	Sky
A-B	4,500	6/23/41	18:30 AM	62 F	48 F	clear
1,000 yds above C	13,900	6/24/41	9:00 AM	75 F	50 F	clear
mouth of	17,000	6/24/41	12:30 PM	over 80 F	50 F	clear
Wickiup Cr Sta C2						

Temperature of Wickiup Creek at mouth June 24th at noon= 51 F

Temperature of Hot Springs @ 13,900 to 14,500 yds= 109 F to 112 F

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
A-B	68	15.1	1	0	17	50	310
(4.5 miles)			1.5	0.0	25.0	73.5	
B-C	27	9.6	0	0	7	20	30

(2.8 miles)			0.0	0.0	25.9	74.1	
C-D	50	11.6	<u>0</u>	<u>0</u>	<u>8</u>	<u>42</u>	274
(4.3 miles)			0.0	0.0	16.0	84.0	
Total	145	5.5	<u>1</u>	<u>0</u>	<u>32</u>	<u>112</u>	614
(26.2 miles)			0.7	0.0	22.1	77.2	

Gradient:

There is no published data available at present (ie no contour maps or elevations along the stream on the Forest Service maps used and no water supply papers) from which the gradient can accurately be figured. However a mean deduction can be made from the Challis National Forest Map. This gives a bench mark at the mouth of Warm Springs Creek of 5,053 ft. This is presumably a few feet above the mouth of the stream, which can be set at approx 5000 ft. The stream heads between Parker Mountain (elevation 9,128 ft) and Twin Peaks (10,378 ft.). The end of the survey is very close to Parker Mountain and can be set at approx 8000 ft. This gives a drop of 3000 ft in 11.6 miles of surveyed stream, or approx 260 ft per mile, which is about what the stream appeared to have.

The lower 3 miles were steeper than any, or approx 325 ft drop per mile. The next 4 1/2 miles were not so steep, being in the wider valley section below the gorge or approx 200 ft per mile. The upper 4 miles surveyed were again steeper, or approx 300 ft per mile, and the upper section above the end of the survey undoubtedly the steepest or well over 350 ft per mile.

Tributaries:

No.	Name	Side entered on	Distance above mouth (vds)	Width (ft)	Flow (cfs)	Value to Salmon
1.	Fir	R.B.	3,800	3-4	5-6	none, shallow and becomes very steep at once
2.	Bridge	L.B.	5,120	3	2-3	none shallow and becomes very steep at once
3.	Hot	L.B.	7,920	10	8-10	there is a beaver dam near the mouth that is very difficult. The stream is heavily over grown with brush. Salmon are said to use it, but it would take care of but few, due to difficulty of ascent at approx. present

[illegible]

Trapper Creek

River System: Salmon River
Stream Survey: Trapper Creek

Date of Survey: June 25, 1941 by D.G. Frey and F.G. Bryant

Source: Drains North and East slopes of Sherman Peak in North Central Custer County and Challis National Forest. Drainage area bounded by that of East Fork of Mayfield Cr. to S. and S.W., by the head of Yankee Fork (on opposite side of ridge) to the East, and by that of main Warm Springs Creek to the North. It is formed by 3 or 4 small tributaries heading on North slope of ridge east of Sherman Peak in sec. 29, T.14N., R.16E.

Direction of Flow: North, to enter right bank of Warm Springs Creek in sec. 29, T.15N., R.16E.

Approx Total Length: 7 miles of which the lower 2,850 yds or 1.6 miles above the mouth were surveyed.

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		vds	miles	vds	miles			
a	at 1st mouth low	500	0	500	0		12'	6" av
	water barrier							
c	1st total	2100	1.2	2600	1.5			
	barrier							
d	at end of	250	.1	2850	1.6		21'	4" av
	survey							

(Width and Depth estimated from observations)

*NOTE; the 21 ft depth was due to ponding by beaver dams; main stream here is 6-9 ft wide.

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-057-10.26	
d	17060205-058-00.54	

Character of Bottom:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-b	2,100	430	20.4	880	41.9	500	23.8	290	13.8
b-c	7,200	1480	20.6	2840	39.4	1870	26.0	1010	14.0
c-d	2,350	--	--	435	18.5	470	20.0	1445	61.5
Total	11,650	1910	16.4	4155	35.7	2840	24.4	2745	23.6

Spawning Area Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
a-b	500 .3	2,100	1,380	65.7	490	23.3

Spawning Area Unavailable:

Station	Distance	Area (yd ²)	Area Unavail (yd ²)	% unavail	when avail	usable unavail (yd ²)	% usable unavail
b-c	2,100 yds	7,200	4,710	65.4	LW	1,650	23.0
c-d	250 yds	2,350	905	38.5	AT	218	9.3
Entire Stream	2,350 yds	9,550	5,615	58.8	LW&AT	1,868	19.6

Cause of Unavailability:

a) 1st low water barrier (sta. b) is a beaver dam @ 500 yds (0.3 mi) above mouth, which is so wide that water seeps through, and can't be passed except at times of very high water.

b) 1st total barrier (sta. c) is 2600 yds (1.5mi) above mouth is 3 beaver dams and workings, impassable at at times. Temporary barrier that will remain until destroyed and beaver removed.

Character of Watershed:

Mountainous	x to
Hilly	X
Rolling	
Flat	
Swampy	
Wooded	moderately; Douglas Fir, Lodgepole pine, Spruce
Open	
Cultivated %	none
Character of valley	\ / little flat valley bottom except at mouth and just above Rush Creek
Character of Banks	2-4 ft in spots up as valley walls 500-1000 ft mostly earth and gravel and a few talus slopes and ledge rock out crops

Density of Marginal Vegetation quite dense; dogwood, alder, aspen and some willow, cottonwood, and pine

Erosion

a) of banks light to moderate
b) of watershed not much recent erosion, but considerable in past

Diversions: none

Artificial Obstructions:

NO.	Location above mouth (yd)	Type	Passability	Remarks
1.	590	Beaver dam	L.W. barrier	Dam is only about 3' high but brush front is about 10' wide through which water seeps so can't be jumped or swam over at low water
2.	615	beaver dam	passable with difficulty	2' high not so wide as previous dam and can be passed with difficulty
3.	2040	log jamb greatest	pass with small channel difficulty	log jamb and falls 5' high 1' wide that offers only possible passage may be a low water barrier but could be worked with difficulty at time of survey
4.	1200-2000	windfall trish jams	pass at times	several windfalls in 1/2 mile stretch but stream has dug holes under them
5.	2610	3 beaver dams	temporary total	3 beaver dams thick enough so water seeps through old barrier until holes barrier are made and kept open
6.	2700	2 beaver dams	pass with difficulty	hard work for salmon but might make it in time
7.	2800	2 beaver dams	pass with difficulty	hard work for salmon but might make it in time
8.	2850	3' beaver dam	temporary total barrier	water seeps through brush so fish can neither swim nor jump it at present

Natural Obstructions:

The only one seen in lower 1.6 miles surveyed was a 5' high cascade falls @ 1030 yds, passable at all times.

Fluctuation in Water Level:

A. Feet Variation; 2-3 ft in lower 1.6 miles surveyed

B. Stream Volume;

A; at mouth: estimated as 25-30 cfs

B; above Rush Creek: estimated as 8-10 cfs (2550 yds up)

C. % of Stream Bed Covered; generally all few bars exposed above beaver dam ponds

Pollution: None to affect fish. Slight discoloration in some stretches due to effluent from hot springs.

Fish (Salmon):

Spring Chinook said to go up Trapper Creek from Warm Springs Creek, but run had not showed up at time of survey. Probably arrives in 1st half of July. Extent of run not known and information lacking. Stream should be capable of handling a small run, although beaver dams block it 1.6 miles up.

Fish other than Salmon:

We could not secure data on possible steelhead runs, although they are said by a Forest Service guard to run up Warm Springs Creek and one would therefore believe they use Trapper Creek.

Rainbow trout up to 10" long and cutthroat and possibly Montana Blackspots were seen in beaver dam pools. Several red spotted trout 7-8" long were seen, but we could not get a good enough look to see whether they were Dolly Varden or Eastern Brook. Due to difficult trails we had not taken collecting equipment in on the horses above the upper Warm Springs camp. Rainbows predominate however and are abundant. Since Montana Blackspots and Dolly Varden were taken 2 miles below on Warm Springs Creek, there is no reason why they are not also in this stream in fair numbers.

General Remarks:

Trapper Creek lies high up in high hills and low mountains off Warm Springs Creek. The trail along it follows the narrow valley with several crossings in the lower 2 miles. The gradient is moderately steep, but there is a wider valley section at the mouth and another above Rush Creek where the stream swings at moderate speed between low banks. There are several good spawning stretches and the stream is protected by overhanging willows, aspens and alders with some fir and lodgepole pine stands that seem more dense than along Warm Springs Creek. There are 2-3 abandoned log cabins near the mouth. Beaver have staged a come back and their dams make the few good resting pools and trout ponds found. Windfalls have caused other small gouged out pockets and resting pools that are never large or deep, nor are there many. Above Rush Creek the stream is only 6-7 ft wide and 2-8 deep and is blocked by series of beaver dams some of which were so thick that they would stop

passage of salmon entirely. There was 490 sq yds of usable spawning rubble in the lower 500 yds of stream, and below the 1st beaver dam that was thought to be a low water barrier. There was 1650 sq yds of usable spawning rubble in the 2100 yds of stream above this L.W. barrier and below the 1st total barrier. The stream above this total barrier was small and of little apparent use to salmon due to finer sand and sediment predominating above series of beaver workings.

For its size, Trapper Creek should be a good salmon spawning stream, and would undoubtedly take care of several hundred salmon if no more beaver dams block the lower and best 1.6 miles of stream. It should be rechecked for new beaver dams before stocking, however, and could furnish increased spawning area only if beaver dams above were checked and opened up annually on appearance of the salmon runs. This could perhaps be arranged with the patrol of the National Forest when desired and if the run has been increased in numbers.

Temperature Data:

Station	Date	Hour	Air	Water	Skv
at mouth	6/25/41	11 AM	60 F	43 F	few high white clouds generally clear

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-b (0.3 miles)	1	3.3	0	0	0	1	8
b-c (1.25 miles).	9	7.2	0	0	1	8	26
c-d (0.1 miles)	6	60.0	0	0	2	4	
Total (1.6 miles)	16	10.0	0	0	3	13	34

Gradient:

No published data available. From survey observations the gradient of the lower 1.6 miles seemed moderately steep. Probably around 150'-175' per mile. Upper 2-3 miles undoubtedly very much steeper. It begins to become steeper at approx. 2000 yds above the mouth.

Tributaries:

No.	Name	Side	Distance above mouth(vds)	Width (ft)	Flow (cfs)	Value to Salmon
1.	none	R.B.	850	64-6		none; too steep several bad beaver dams in lower 1/4 mile
2.	none	R.B.	2490	22-3		none; too small and steep springs from side of mountain
3.	Rush	R.B.	2550	4-5		quite steep, frequent falls over bedded logs, rubble is 10-30-50-10 could support a few salmon near mouth

All tributaries above Rush Creek are small, usually not over 1/2 to 1 mile long and probably very steep and of no use to salmon. Salmon cannot reach them anyhow due to beaver dam barriers just above Rush Creek mouth.

Mayfield Creek

River System: Salmon River

Stream Surveyed: Mayfield Creek, tributary of the Middle Fork of the Salmon River

Date of Survey: June 21, 1941 by F.G. Bryant

Source:

a. Ultimate: drains area bounded by the Yankee Fork drainage system on the south and east, by Pioneer and central Loon Creek drainage on the west, and by Warm Springs Creek drainage on the north. It is separated from these various drainages by high and rugged peaks and ridges of the Salmon River Mountains.

b. Immediate: formed by the union of East Fork and West Fork of Mayfield Creek in Sec. 19, T14N, R14E and approximately 2 1/2 miles southeast of Loon Creek Ranger Station beside the dirt road leading to that station from Yankee Fork and Stanley.

Direction of flow:

WNW to empty into the left bank of Loon Creek in Sec. 13, T14N, R13E

Total Length: 2 1/2 miles, all surveyed on June 21, 1941.

Station Location:

Sta	Location	Distance above prev. Station vds miles	Distance above Mouth vds miles	Map Location	Width	Depth
b	at end mouth of survey	4400 0 2.5 0	4400 0 2.5 0		24' 21"	4-12 6-24

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-496-00.00	
b	17060205-584-00.00	

Character of Bottom Between Stations:

Station	Area (vd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-b	39,900	11,970	30.0	11,970	30.0	11,970	30.0	3990	10.0

spawning area available and usable:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
a-b	2.5	39,900	23,940	60.0	1,750	4.4

Spawning Area Unavailable and Unusable: none

Character of Watershed:

Mountainous X

Hilly

Rolling

Flat

Swampy

Wooded x partially where slope and soil allow

Open x partially, due to arid soil and large amount of rocks and talus slope

Cultivated % < 1% extreme lower end
Character of _/ above to _/ below
Valley

Character of high, steep, earth, talus and cliffs.
Banks Average 30 to 1500 feet

Density of patchy above lower 500 yards to light
Marginal along most of stream
Vegetation

Erosion:

a) banks great
b) watershed very great

Diversions:

Diversion 1: irrigation diversion on right bank 900 yards above mouth; leads directly to Boyles Ranch. No diversion dam. Open ditch, 4 foot wide at mouth on stream bank. Some 30 feet below this opening is sluice type control box with drop board headgate. This is 16" wide and 20" deep, and several feet long, below which the earth sided ditch leads to Boyle Ranch fields. The board head gate was down so as to allow 3 1/2" of water (depth) to shoot under it--quite fast. An estimated 3-5 cfs was being diverted at the time. There were no protective devices of any

kind, and some 50 yards below the headgates a 2" salmonid fingerling (species unknown) was seen, so a few fish apparently do get into the ditch.

Diversion 2: irrigation ditch on left bank at 1200 yards above mouth; leads to Boyles Ranch lower fields. No dam; opens direct onto stream side. Small wood headgate approximately 18" wide and 18" deep located at upper end of ditch, allowed water to flow 4" deep in wooden trough (or sluiceway), which finally emptied into an earth sided ditch. Drop board headgate, but no protective devices. Diverting 3-4 cfs at the time observed.

Diversion 3: water supply and irrigation diversion take off on R.B. at 1900 yards above mouth. Leads to Loon Creek Ranger Station near mouth. A small log and plank wing dam extends diagonally upstream, but not far out across the stream to "funnel" water into the ditch. At end of funnel is a wood sluice with a wooden drop headgate and control box, and having a bypass above the headgate. The sluice is 28" wide, 20" deep, and the headgate at upper end was closed at the time. Ten feet down the sluice, which is of 2" plank construction--is a (then open) 3" wide bypass for excess water to reenter the stream. Immediately below the bypass is a second wooden headgate, 7 foot of wood sluice behind this second gate led to a then dry dirt walled ditch along the stream side, gradually climbing up to the top of that right bank, which it reaches several hundred yards below, it then runs under the road, after having been aided across several cuts and washes in the steep gravel bank by wooden sluice sections. Springs and seepage from the bank along the way builds up the flow in the ditch to 2-3 cfs at the lower end. It has no protective devices whatever.

Original

(Note: make drawing on card for files after typing--from sketch in field notes.)

Artificial Obstructions:

1. 500 yards above mouth, beaver dam, passable AT, channel has been blasted open, pond on R.B. though.
2. 800 yards above mouth, windfall dam, passable AT, windfall has collected debris and sedimented above but has channel thru.
3. 1900 yards above mouth, log wing dam, passable AT, diversion wing stands few feet diagonally up stream above water ditch, but only slightly out into stream, which is 2/3 unblocked.
4. 2500 yards above mouth, beaver dam, passable AT with great difficulty, 4, high beaver dam can be jumped.
5. 2700 yards above mouth, beaver dam, passable AT with great difficulty, 5, high good pool above, passable

6. 3000 yards above mouth, beaver dam, passable AT with great difficulty, 4' high, good pool above, passable

7. 3100 yards above mouth, beaver dam, passable AT with great difficulty, 5' high, good pool above, passable

NOTE: between the last 2 beaver dams, other beaver workings divide the stream into several channels on a small flat in the stream bed, but believe salmon can work thru

8. 3400 yards above mouth, trash jamb, passable with difficulty, jamb at foot of rock cliff on left bank in a gash; steep gradient

9. 3600 yards above mouth, beaver dam, passable with difficulty, 5, high, should be examined at low water, as may possibly be a barrier then, but could not determine this at present.

Natural Obstructions:

None: cascades in steep area of the gash from 3400 yards to 4000 yards would be a bit difficult at extreme low or high water, but could be worked thru, as none are over 3-4'.

Fluctuation in Water Level:

3-6 feet, with possible 6-8 feet where stream is penned in between steep rocky slopes in narrow channel as at 3400 yards, but this is only for a short distance. No data available from water supply papers.

Flow estimated at approximately 100 cfs to 125 cfs at mouth.

Percentage of stream bed covered: usually the entire bed is covered. In one or two small flats, as above beaver dams, a few yards have 10-20% exposed along the sides.

Pollution:

None noted except some dirt washed in from road fills along stream during storms, but not serious thru here.

Fish (Salmon):

None seen. Run said to be late in Loon Creek and probably salmon had not yet reached this stream. Run said by Ranger at Loon Creek to reach Mayfield Creek in late June or early July. Run is much smaller recently than it was several years ago. Not much definite data available--but it seems that there are not many salmon that run Mayfield Creek at present.

Visibility was good. Water was clear, and salmon could have been seen.

There was a possibility that the few small salmonids seen

behind a beaver dam in a shallow pool on the right bank a short distance above the mouth were chinook fingerlings, but could not get close enough to accurately determine.

Fish (other than salmon):

<u>Species</u>	<u>Date</u>	<u>Abundance</u>
Rainbow	6-21-41	Fair number small fingerling
Steelhead	" "	none seen--said to reach stream, but not verified accurately
Cutthroat	" "	none seen--said to reach stream, but not verified accurately
Eastern brook trout	6-21-41	none seen said to have been planted above, but not verified

General Remarks:

Mayfield Creek is formed by the union of East and West Mayfield Creeks, although one would consider West Mayfield but a continuation of Mayfield, with East Mayfield coming in at an angle from another valley. The road to Loon Creek Ranger Station runs along close to most of the stream, which is in a small, narrow valley or canyon, mostly rock bound and with very steep walls. The gradient is pretty constantly fairly steep. Due to the large amount of rock present, there is sparse tree cover, except on the benches near the Boyle Ranch at the mouth, where it is fairly dense for several hundred yards. The area is fairly rugged and the stream fairly rough. At the lower end and at intervals, beaver workings have ponded a few yards of the stream, otherwise the stream lacks any good resting pools. Some of the small step like S6 pools can be used--but the current is great. Mayfield Creek is therefore a poor salmon stream, with spawning rubble scattered and patchy, few resting pools, and the remainder mainly fast white tumbling water. The beaver dams at present are not impassable barriers, and indeed their pools cause gravel deposit areas for spawning. A few dams are very difficult to get over. The valley is so narrow that trees and food would probably limit more extensive beaver workings.

Mayfield Creek is just about steep enough to eliminate any great building up of the present salmon run, but since it is so exposed in its position beside the road, it should be closed entirely to Salmon fishing, to allow what fish there are to fight the current and obstructions unmolested in their effort to reach and use such spawning beds as exist in it and its tributaries East and West Forks.

Temperature Data:

Station	Date	Hour	Air	Water	Sky
opposite mouth of E. Fork	6-21-41	10:30 am	65 F	43 F	slightly hazy

Ice conditions in winter is said to be quite severe in some years. Anchor ice may damage eggs or fry, as low water temperature would make for a fairly late development in the redds, and may be a reason why run is so small at present. Winter conditions need investigating before work is begun.

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-b (2.5 miles)	8	3.1	0	0	0	8	100
			0.0	0.0	0.0	100.0	

Gradient:

Fairly steep throughout, and quite fast, being quite steep in narrower sections of the canyon. On the Challis N.F. map, a bench mark of 5785 feet is located approximately 1/2 mile above the mouth of Mayfield Creek, and another of 6277 feet is located a short distance below the head or mouth of East Fork. Thus there is a drop of at least 492 feet in approximately 2 miles, or 246 feet per mile indicated for the stream.

Tributaries:

1. No name, rt bk, approximately 1600 yards above mouth, 1' wide, 1-2 cfs, no value to salmon spring feeder that at present empties not into stream but into Loon Creek Ranger Station water supply ditch.
2. No name, rt bk, 2500 yards above mouth, 2' wide, 4-5 cfs (est), no value to salmon spring feeder, very steep, comes in over cascades.
3. Nelson Creek, rt bk, 4000 yards above mouth, 3 to 6' wide, 10 cfs (est), very steep, cascades over boulder bed--little or no value to salmon.
4. East Fork Mayfield Creek, 1t bk, 4400 yards above mouth, 15, wide, 30-40 cfs (est), surveyed June 1941 usable by salmon.
5. West Fork Mayfield Creek, rt bk, 4400 yards above mouth, 21' wide, 30-40 cfs, surveyed June 21, 1941 usable to salmon to small extent, in reality this is an extension of Mayfield Creek itself.

West Fork of Mayfield Creek

River System: Salmon River

Stream Surveyed: West Fork Mayfield Creek, tributary of the Middle Fork of the Salmon River

Date of Survey: June 21, 1941 by F.G. Bryant

Source:

a) Ultimate: drains ridges separating it from East Fork of Mayfield Creek on the north and east, from Yankee Fork drainage on the south, and Pioneer Creek (Loon Creek tributary) drainage on the west. It is located in the central portion of the Challis National Forest and Custer County Idaho.

b) Immediate: originates high on the slopes of the ridge between Mt. Jordan and Estes Mountain in Sec 8, T13N, R15E.

Direction of Flow:

North from point of origin for approximately 1 3/4 miles, then NW for approximately 4 1/4 miles to join the East Fork of Mayfield Creek in Sec. 19, T14N, R14E, to form main Mayfield Creek.

Total Length:

Six miles, of which the lower 4600 yards or 2.6 miles were surveyed on June 21, 1941

Station Location:

Sta	Location	Distance above prev. Station vds miles	Distance above Mouth vds miles	Map Location	Width	Depth
b	end at mouth of	4600 0 2.6 0	4600 0 2.6 0		21' 9"	2-10"

survey

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-584-00.00	
b	17060205-684-00.00	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-b	24,000	5,990	25.0	7,300	30.4	7,710	32.1	3,000	12.5

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
a-b	4,600 2.6	24,000	15,010	62.5	1,565	6.5

Spawning Area Unavailable and Unusable:

None in area surveyed. However if beaver workings should be extended in the future, some of the dams may become barriers.

Character of Watershed:

Mountainous X

Hilly

Rolling

Flat

Swampy

Wooded lightly where soil allows, amid rocks

Open on slopes

Cultivated % none

Character of Valley V steep rock cliffs and talus slopes, some earth in upper portion

Character of Banks 3 to 1000' high as valley slopes

Density of Marginal Vegetation light to moderate, dense only in small patches as on beaver dam flats

Erosion:

- a) banks Considerable
- b) watershed Great

Diversions: none

Artificial Obstructions:

1. 300 yards up, beaver dam, passable AT with great difficulty, floods small flat in stream bed, can be negotiated after trying

hard.

2-6. 400 yards up, 5 beaver dams, passable AT with great difficulty, this series makes a maze of channels and pools, but can be passed eventually.

7. 1700 yards up, beaver dam, passable AT with great difficulty, dam 3-4 high and at foot of talus slope, more on right bank than on left, where a passage exists.

8-10. 2400 yards up, 3 beaver dams, passable AT with great difficulty, 3-5' high, small dams.

11-12. 2900 yards up, 2 beaver dams, passable AT with great difficulty, small dams passable at present.

13-14. 3100 yards up, 2 beaver dams, passable AT with great difficulty, both 4-5, high and quite bad to get over--but believe they can be passed after trial.

15-19. 3900 yards up, 4 beaver dams, passable AT with great difficulty, in small willow swamp in beaver made flat--quite difficult, due to water spread out.

NOTE: although these beaver dams were thought passable at the time of the survey, some may be built higher, or may become impassable at low water periods later in the year, but it would take actual examination at such later periods to be sure.

Natural Obstructions:

None of any size. Several logs sedimented in, and boulders that have rolled off the steep slopes bordering the stream cause small cascades and falls, but none that would hold up salmon.

Fluctuation in Water Level:

A water rise of 2-5 feet in the spring run off of melted snow is indicated by the banks. Due to debris, boulders in the stream, and beaver workings, it may reach 6-8 foot in such obstructed spots.

Stream Volume: a flow of 35-40 cfs was estimated at the lower end where it joins East Mayfield Creek. The flow at the upper end of the survey (below China Creek) was approximately 20- 25 cfs, estimated. No data is available from water supply papers.

% of Stream Bed Covered: usually the entire bed is covered, at least at the time it was surveyed. Gravel beds exposed between channels above beaver dams occasionally-amounted to 10- 30%.

Pollution:

None noted, except dirt washing in by rains from new road construction fills. CCC crews were working at widening and improving the road at the time it was surveyed. Wash is not serious as yet.

Fish (Salmon):

No salmon seen. Spring Chinook are reported to have been seen in small numbers in past years. The run had apparently not reached the stream at the time it was surveyed, but it is doubtful if more than a few fish use the limited spawning area available. The proximity to the road which follows the stream up the valley would make it easy to secure salmon if present on the small spawning areas.

The water was clear, and salmon could easily have been seen if present.

Fish (other than Salmon):

1. Steelhead: reported to reach the stream and spawn in limited numbers, but this was not verified.

2. Rainbow trout: a few fingerling trout were seen that were thought to be rainbow, but the white water made quick observations necessary and was not absolutely sure being beside the road, it is fished quite a bit, but is not a good trout producer at present. Two fishermen were known to take 3-4 rainbows 6-8" long.

3. Cutthroat Trout and Brook trout are said to be present in the stream. It is believed that all salmonids drop down stream in the winter due to ice conditions, and may completely evacuate this steep small stream.

General Remarks:

West Mayfield Creek is really a continuation on up the same valley of Mayfield Creek. It is in a narrow; rocky, steep sided, rough canyon, and has a steep gradient, moderating but slightly on a sort of bench near the upper end of the survey--and then growing steeper till it peters out high on the slopes'above the head of the valley. Where level enough it has beaver dams; which are not at present thought to be barriers to salmon. These hold gravel behind them to furnish some of the best spawning areas in the stream, although small in area. The road and the stream utilize about all there is of the narrow valley floor, which has occasional thickets of willows, poplar, aspen, etc., but the slopes are mainly rocky, and trees mainly pine and fir find soil only in spots. The rugged, rather barren valley gives one the suggestion that flash floods are very possible. There are a few good resting pools (18 S2T2) none

large or very deep, and only 1565 square yards of usable spawning area in the 2.6 miles surveyed. It seems doubtful if this ever would have a large run of salmon, mainly because of its steepness and fast current, but if desired the stream seemingly could be improved and regulated at a small effort and expense to maintain a small salmon run.

Temperature Data:

None taken--but in Mayfield Creek at the confluence of East and West Mayfield, the water temperature on June 21, 1941 was 43 F, Air 65 F, sky slightly hazy. Water apparently quite cool in summer, and said to have anchor ice that lifts rocks off the bottom during some winters. This would be bad for salmon eggs and fry in so fast and steep a stream. Before improvements are made this winter ice condition and the time of hatching of the salmon and their downstream movements should be ascertained.

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-b (2.6 miles)	18	6.9	0	0	0	18	390
			0.0	0.0	0.0	100.0	

Gradient:

There is no data available other than the bench marks on the Challis National Forest map. One of 6277 ft. is located just below the mouth of West Fork. Another is located on China Creek just above the upper end of the survey, and reads 6737 ft. Allowing 37 ft. for probable correction to get the approximate elevation at end of survey of 6700 feet, giving a rise of 423 feet in 2.6 miles of stream, or about 162 feet per mile. This is less steep than Mayfield Creek is below. Another bench mark of 8686 feet is located on the road just above the upper end of West Mayfield Creek. Allowing for an estimated correction for the head of the stream it must be about 8000 feet. This is approximately 4.4 miles by stream above the end of the survey, giving us a drop of approximately 1300 feet in 4.4 miles or about 300 feet per mile for all of the stream above the end of the survey, which is more than any other portion, as could be expected. These elevations also show a total drop of 1723 feet in 6 miles for the entire West Fork, or 287 feet per mile average for the stream as a whole, which is a quite steep gradient, and largely explains why the stream is a relatively poor one for salmon.

Tributaries:

1. No name, rt bk, 2500 yards above mouth, 1-2' wide, 1 cfs, no value to salmon--very small spring feeder

2. Mystery Creek, rt bk, 2800 yards above mouth, 3-5' wide, 6-8 cfs, a steep and shallow stream, it can be entered by salmon but would accommodate so few for a short distance it has very little value.

3. China Creek, rt bk, approximately 5000 yards above mouth, 3-5' wide, 10 cfs, could be entered by salmon, but is very shallow, and could support very few spawners.

NOTE: there is one more small tributary indicated on the map as coming in on the left bank approximately 1 mile above China Creek. This is so far up the valley that it would be very steep and of no use to salmon.

Neither China or Mystery Creek are more than 2 to 2 1/2 miles long and quite small, shallow, steep, rough, and have considerable boulder and rock bottom, and could support so few salmon that they are not worth surveying until Mayfield Creek has a surplus of Salmon, if ever.

East Fork of Mayfield Creek

River System: Salmon River

Stream Survey: East Fork of Mayfield Creek, tributary of the Middle Fork of the Salmon

Date of Survey: June 21, 1941 by D.G. Frey

Source:

Northwest slopes of mountain ridges between Estes Mountains and Sherman Peak in the central section of Challis National Forest and Custer County Idaho. Formed by the union of several small streams. One, the longest, originates in Set 4, T.13N, R.15E, and flows northeast approximately 4 miles to join another branch that has two short feeders, one rising in Sec 19, T.14N, R.16E and flowing southwest approximately 1 mile to join another rising in Dec 26, T.14N, R.15E.

Direction of Flow:

The combined branches make the true main stream which runs NNW approximately 3 miles then veers west and finally runs WSW approximately 6 miles to join with West Mayfield Creek in Sec 19, T.14N, R.14E, to form Mayfield Creek.

Total Length:

Up longest feeder is approximately 14 miles, of which the lower 3700 yards or 2.1 miles were surveyed on June 21, 1941.

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		vds	miles	vds	miles			
a	at mouth	0	0	0	0		18'	3-12"
b	end of survey	3700	2.1	3700	2.1		12'	

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-584-00.00	
b	17060205-056-06.56	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-barrier	3,300	1,310	39.7	1,210	36.7	390	11.8	390	11.8
barrier	16,660	5,512	33.1	5,626	33.8	3,006	18.0	2,516	15.1
to end of survey									
Total	19,960	6,822	34.2	6,836	34.2	3,396	49.9	2,906	42.6

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
a-barrier	600	3,300	1,600	48.4	450	13.6

Spawning Area unavailable and unusable:

Station	Distance	Area (yd ²)	Area Unavail (yd ²)	% unavail	when avail	usable unavail (yd ²)	% usable unavail
above barrier	3,130 yd	16,660	8,632	51.8	LW	3480	20.9

Cause of unavailability: a L.W.B. beaver dam at 590 yards above the mouth.

Character of Watershhd:

Mountainous X

Hilly

Rolling

Flat

Swampy

Wooded

Open X scattered timber, mainly fir, sage and brush patches

Cultivated % none

Character of Valley V 1/4 to 2 miles wide at top--narrow valley floor

Character of Bank On valley floor banks are of earth and gravel 2' high average, but mostly continuous with valley wall and as such are more rocky, 500-2000' high

Density of Marginal Vegetation moderate: alder, aspen, willows, and rose bushes, etc.

Erosion:

a) banks fair amount
b) watershed great

Diversions: none

Artificial Obstructions:

No.	location	type	passability	remarks
1	300 yds	beaver workings	AT	cuttings in several places extend across stream, but not bad dams as yet
2	590	beaver dam	barrier LW	large dam, passable at high water at present, but not at low water
3	1210	beaver dam	barrier LW	3' high and without pool to jump from, passable at time of survey, or high water only
4	1860	beaver dam	passable LW barrier	3' high passable at time of survey, but thought likely to be impassable at low water
5+	2400-2600	several beaver dams	passable AT	for 200 yds the stream has numerous small beaver dams breaking the stream into several channels, but passable
6	3150	beaver dam	passable AT	2' high not bad yet
7	3410	beaver dam	passable AT	
8	3530	log jamb	BLW	4, high jamb passable with difficulty at high water; probably a barrier at low water, should be seen then
9	3730	beaver dam	BLW	5' high, would even bother a lot of high water

Above the end of the survey was a meadow in which beaver dams were very numerous, and would be a great factor in preventing use of the stream for spawning by salmon.

Natural Obstruction:

Series of steep cascade falls 2700 yards to 2800 yards, a total drop of about 15 feet to 100 feet of stream. Very doubtful if fish can get over this stretch at low water, but needs actual examination at that time. Very difficult even at high water to get over. Passable best and with less exertion at times of moderate water flow.

Fluctuation in water level:

2-5 feet as indicated by water marks seen by the survey. This increase would be during run off of the melting snow from the high mountainous area the entire stream flows thru.

Stream volume estimated at about 30 cfs at the mouth.

Stream bed usually entirely covered except for the many boulders sticking up in the lower end of the stream.

Pollution: none observed

Fish (Salmon):

None observed. It is believed that the run was late and had not even got up Loon Creek at the time of the survey. Run believed to be very small according to reports from Boyles Ranch and Loon Creek Ranger Station personnel.

Visibility was excellent. Water was slightly turbid near the mouth, but fish, could have been seen if present.

It is believed that ice conditions in some winters might have a very adverse effect on any salmon eggs or fingerlings in the stream.

Fish (other than Salmon):

1. Steelhead reported to run up Mayfield Creek and presumably up East Fork in small numbers. Report not verified.
2. Rainbow: fair to good numbers, particularly in pools behind beaver dams.
3. Cutthroat: probably present, no specimens seen, but have been reported to have been taken in Loon Creek and probably run into East Fork.
4. Brook Trout: said to have been stocked into the Loon Creek watershed in the past. Should be a fair brook trout stream if stock is kept up.

NOTE: 9 fish, definitely salmonids, from 6-10" long were observed and fed in a pool at 1900 yards. These were either cutthroat or rainbows or both.

This stream is a bit off the beaten track, but has a fair trail, and is fished to some degree each year, and probably the few fisherman take out "big strings" and keep the population down. It is also fished by sheepherders.

General Remarks:

East Mayfield Creek comes in through a boulder strewn bed from a side canyon bordered by steep high rocky walls. Douglas fir grow where possible to obtain foothold and enough water on the steep slopes, making a thin covering, interspersed with bunch grass, sage brush, etc. The valley is narrow near the mouth and fairly steep. Quite steep cascade series are encountered at intervals, between which the more moderate stretches are bordered with thickets of alder, aspen, willows. Beaver colonies have recently been at work on the stream and several dams from low water barriers in the area surveyed. Archie Murchie, U.S. Forest Ranger at the Loon Creek station says that there were very few dams in 1938, but that the beaver have taken over the stream since then.

Above the rougher, steeper area in the canyon of the lower 1 1/2 miles, the stream levels out at intervals and has some good spawning riffles, with cascades in between. At the end of the survey, 3700 yards above the mouth, the valley opens out into a considerable wider meadow area. The stream appeared to be a succession of beaver dams with pools behind and riffles at the pool heads. Murchie says that there are some good riffles in this area if salmon could get to them.

It appears that the stream could support a much greater salmon run than it does. However, since beaver works will probably increase even more in the future, and the stream already has several dams that are barriers at low water and quite difficult at high water--it will be increasingly difficult if not impossible for salmon to get up the stream in sufficient numbers and far enough to use much of the spawning area without a great deal of improvement work being done on the stream. If this stream must be developed there would have to be: 1) further stocking of the stream with salmon. 2) Eliminating salmon fishing on waters of Loon Creek, Mayfield, and East Mayfield Creeks, until the increase was great enough to be self perpetuating. 3) Annual opening of the many beaver dams and obstructions when the salmon run reaches the stream, probably by dynamiting, together with patrol work, at least during the month of July each year. Since the run is already apparently at a low level, and this expanse would be very costly, the stream had better be left to the beavers and trout until an area salmon restoration program has been worked out and adopted. The stream is small and the beaver dam pools should make good trout

fishing in the stream, which appears to be the easiest and least costly thing to develop in the stream under its present condition. It should be remembered, however, that the stream has (as reported) had a run in the past, and probably could be cleaned out and utilized in the future if it was deemed necessary and funds were provided for the work.

Temperature Data:

Station location	Date	Time	Air temp.	Water temp.	Skv
just above mouth	6-21-41	10:30 am	65 F	44 F	slightly hazy
end of survey	6-21-41	2:15 pm	67 F	52 F	slightly hazy,
3730 yds up					generally fair

Temperature apparently good for salmon or trout development. However, winter ice conditions should be investigated if any attempt is considered on improving the run. Beaver dams recently put in probably would furnish water storage areas that can freeze over and insulate against formation of anchor ice.

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6
a-barrier	2	6.6	0	0	0	2	9
(0.3 miles)			0.0	0.0	0.0	100.0	
above barrier	30	16.6	0	0	3	27	47
(1.8 miles)			0.0	0.0	10.0	90.0	
Total	32	15.2	0	0	3	29	56
(2.1 miles)			0.0	0.0	9.0	91.0	

Gradient:

There is no data available from which the gradient of East Fork can be computed. It can be estimated however by comparison with West Fork. Both forks head up at about the same height on the mountain ridges, and join to form Mayfield Creek. Assuming the same total drop for East Fork as west, or 1723 feet, there would be an average drop in 123 feet per mile for the 14 miles of stream. This seems to be a good figure from the observations made during the survey, it being a longer stream and less steep than West Fork which has a drop of approximately 287 feet per mile. From observations it was noted that the lower 1 1/2 miles are quite steep, but the valley opens above into a long meadow that is much less steep, at least for the 3-4 miles that could be seen. Presumably the upper 2-4 miles are the most steep of the entire stream.

Tributaries:

1. No name, left bank, 800 yards above mouth, 1-2' wide, 1-2 cfs, no value to salmon

2. No name, right bank, 2190 yards above mouth, no value--stream runs under talus slope and is not visible except where it enters the creek, not accessible to salmon

3. No name, right bank, 3610 yards above mouth, 5 cfs, enters thru 4 different channels in 30 yard stretch, too steep gradient above to be of value to salmon

These are the only tributaries seen by the survey. Above the end of the survey are several other small tributaries, but only one is named (Ibex Creek). None appear on the map to be over 1 or 2 miles long, and therefore probably too steep and small for use by salmon, except one or two branches in the steep mountainous upper end of the stream, which are 3-4 miles long, but are in a very steep section and probably have very little spawning area in them.

Trail Creek

River System: Salmon River
Stream Surveyed: Trail Creek

Date of Survey: June 20, 1941 by F.G. Bryant

Source:

Drains ridges east of Feltham Creek Point in west central Custer county and Challis National Forest, Idaho. Ridges separate its drainage from the several upper tributaries of Rapid River, on the west, from Canyon and Deer Creeks (on both tributaries of Loon Creek) on the N.E., from Loon Creek on the S.E. and E., and from the heads of Beaver and Winnemucca Creek to the S.W. it is formed from springs, rising high on the ridge slopes just below Feltham Creek Point and has few tributaries of any size. Heads in sec. 35, T.14N., R.13E.

Direction of Flow:

N.N.E. from head for approximately 2 1/4 miles, then east approximately 4 miles to join the right bank of Loon Creek in Sec. 14, T.14N., R.13E.

Total Length:

6.3 miles, of which the lower 2 were surveyed on June 20, 1941 by F.G. Bryant.

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		vds	miles	vds	miles			
a	at mouth	0	0	0	0		12'	6-12"
b	2 miles above mouth	0	0	10,000	5.7		6"	3-4"

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-545-00.00	
b	17060205-598-00.00	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-b	14,500	2,980	20.6	3,890	26.8	3,930	27.1	3,700	25.1

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable	
a-b	50	0.03	200	140	70	40	20

mouth up

50 yds to L.W. barrier beaver dam

Spawning Area unavailable and unusable:

Station	Distance	Area (yd ²)	Area Unavail (yd ²)	% unavail	when avail	usable unavail (yd ²)	% usable
50 yds above to 1st total barrier	950 yds	4,000	2,220	55.5	LW	460	11.5
1st total barrier to end of survey	2,500	10,300	5,460	53.0	AT	915	8.9
Total	3,450	14,300	7,680	53.7		1,375	

Area Unavailable at Low Water: is caused by a beaver dam 5' high silted in above and with water cascading through brush on its face so that salmon can get over only during periods of high water. It blocks area from dam into 50 yds above mouth to next total barrier dam 950 yds above it.

Area Unavailable at all times: caused by a beaver dam 6-8' high, silted in above, with water falling in broken small cascades through brush on face; brush prevents any chance to swim up and poor take off in shallow pool below, and depth of brush dam would prevent possible jumping over. Blocks salmon from area above dam which is located 1,000 yds above stream mouth.

Character of Watershed:

In lower 2 miles surveyed

Mountainous x (in canyon bordered by mountain ridges)

Hilly

Rolling

Flat

Swampy In spots only where beaver dams have made very small flats

Wooded Partially particularly left bank slope

Open Partially, particularly R.B. slope with scattered grass and sage brush clumps

Cultivated (%) none cattle, sheep and horse grazing however

Character of Valley _/_

Character of Banks Steep 3-200 ft as valley wall earth and gravel and talus slopes with bed rock cliffs above

Density of Marginal Vegetation dense in most sections for 10-50 ft wider strip along stream. More open above Rabbit Creek

Erosion

- a) banks moderate to severe
- b) of watershed great

Diversions:

D1. Irrigation ditch on R.B., 800 yds above mouth. Irrigates fields on Boyles Ranch, 1/2-3/4 mile below. A piled rock wing dam avg 1 ft high extends diagonally upstream and divert part of stream down ditch along rt. bank. Upstream opening 6 ft. wide and avg 8" deep. Narrows to earth banked ditch headed by a wooden sluice or control box 50 ft below. This box is 21" wide with water 10" deep. Has drop board gate, opened at time of survey. No protective devices of any kind. Estimated flow in ditch as 3-5 cfs.

D2. Irrigation ditch on R.B. 1,000 yds above mouth. Takes off at the right end of 6-8 high total barrier beaver dam, which is silted to top above.

The immediate opening from stream into ditch at dam is 5' wide narrowing several feet below to a wooden control box fitted for drop board headgate. Control box 33" wide, and had 12 1/2"

Artificial Obstructions:

No.	Yds above mouth	Nature	Passability	Description
1.	50	beaver dam	barrier low water	5' high silted above to top water falling brokenly through brush on face
2.	1,000	beaver dam	total barrier	6-8 ft high silted to top brush face 8-10 ft deep through which water cascades and prevents *possible jumping pool below only 6-8" deep
3.	1,100	debris falls	at times	log bedded in stream 4' falls
4.	1,350	beaver dam	with difficulty	8' high grand fill above new channel being opened on left
5.	1,400	beaver dam	end bad L.W.	8' high fairly recent construction cascades through brush in 3 places top is 3' upstream from foot poor pool to jump from below
6&7	1,500	2 beaver dams	at times	low dams both passable with difficulty
8	1,600	2 beaver dams	with great difficulty	6-8 ft high gravel filled above difficult jump
9	1,700	2 beaver dams	with great difficulty	6 ft high old small log jamb 3-4 ft high now sedimented in above but broken through in 3-4 places no it is now passable
11&12	2,100	2 brush jams	with great difficulty	2-3 ft high brush and debris jammed in channel and cemented in with debris and sediment
13&14	2,200	beaver dams	temporary total barrier	7-8 ft. high old dam pushed out and later rebuilt and silted in flow filters through brush on face blocking salmon

No.	Yds above mouth	Nature	Passabilty	Description
15-19	2,400	5 beaver dams	with difficulty	two 4'high dams in series all passable with difficulty
20-23	2,500	4 beaver dams	with difficulty	1-3' high fairly recent construction and small passable with difficulty
24-26	2,600	3 beaver dams	with difficulty	3 dams in the 100 yds stretch 1 is 5' high others lower but all passable with great difficulty
27-29	2,700	3 beaver dams	with difficulty	small dams these have flows enough in one at least one spill on each to get fish over 2 ft high passable
30	2,800	1 beaver dam	with difficulty	
31	2,900	1 beaver dam	with difficulty	2 ft high passable
32-33	31-3,300	3 beaver dams	with difficulty	low 2 ftdams passable

Natural Obstructions:

One small 3 ft high falls located 2,300 yds above mouth, and 400 yds above mouth of Rabbit Creek. Passable at all times.

Fluctuation in Water Level:

A rise of 1-4 ft was indicated in spots along the bank. The Loon Creek Forest Ranger stated that the stream usually was about 1/3 higher in the spring due to run off of melted snow, and 1/3 lower in summer during the dry season (as compared with water conditions at the time of the survey). It has less fluctuation than Loon Creek and other streams in the area due to the fact that the right bank had a fairly well protected (by high ridges) southern exposure, causing the snow to start melting earlier in the spring than elsewhere, making the run off more continuous over a greater period of time, and therefore causing a gradual rise rather than a quick high rise. The many beaver dams also slightly retard the flow by ponding, tending to make it more gradual.

Flow:

Estimated at approx 25-30 cfs. From 80 to 95% of the stream bed is covered and in narrow sections all of it is covered.

Pollution: none

Fish (salmon):

No salmon were seen in the stream but it is possible that the run had not yet gotten up Loon Creek this far. The Forest Ranger and proprietors of a the Boyle Ranch stated that they had never seen salmon in the stream. With the many beaver dams that are present, it is doubtful if any run exists in the stream today.

The water was clear as a crystal, visibility was very good, and if any fish had been present, they could easily have been seen. This year at least, the salmon run had not got up to the Boyle Ranch at the time of survey on June 20th probably arrives after July 1st.

Fish other than Salmon:

The stream appeared to contain few fish of any kind at the time of survey. Boyles and the Ranger stated that occasionally a few rainbow were taken later in the season in the lower end, but that the stream was not considered a good fishing stream.

Ice conditions in these narrow canyon streams are said to be severe in the winter, and since the stream is small and with very few deep pools, there is a possibility that any fish in this stream may drop down into Loon and on into the deeper pools there is a possibility that any fish in this stream may drop down into Loon and on into the deeper pools of lower Loon and the Middle Fork during winter months and run back on the tail end of the spring freshet. If they do the beaver dams would bother or prevent them getting very far upstream. This would account for us not seeing them in the stream at the time of the survey. This belief seemed very substantial to the Forest Ranger and guard at the Loon Creek station.

In the summer the stream seems capable of supporting trout in the many beaver pools, could they but once get up over the brush dams.

General Remarks:

Trail Creek runs through a \ / canyon with high steep slopes reaching to the waters edge in most sections. Only in the lower 100 yds where it comes out of the canyon into the Loon Creek valley it is bounded by hills. The right bank is mainly earth and gravel covered with scattered grasses, weeds, sage, mahogany brush and a few stunted pines. Its slope is steep, but is less so than the left bank, and rises from 200-1000 ft along the entire lower 2 miles surveyed. In some places these slope is open enough to see nearly to the ridge top, which is moderately timbered with conifers, mainly pine. This side serves mainly as horses and cattle range pasture for the Boyle ranch, but deer tracks are quite

thick. Occasional weathered rock outcrops stand out on the slopes. The left valley wall is more rugged, rocky and precipitous and a bit higher. There are many rocky outcrops and eroded cliffs and bluffs, particularly near the top of the canyon slope, below which talus slopes fan out, often to the waters edge. A thin to moderate covering of brushes and conifers is present wherever there is enough soil on the steep slopes for them to practical, due to the small amount of spawning that could be made available, and winter ice conditions should be investigated thoroughly before it is even attempted. With an apparently small run in Loon Creek, there would be no need to spend money on Trail Creek at present.

Temperature data: none available. Thermometer on order at office.

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-b (2 miles)	43	21.5	0 0.0	0 0.0	7 16.3	36 83.7	223

Gradient:

No elevations or published data available. Gradient is moderately steep in lower mile, and a bit less steep in 2nd mile above mouth. Fairly constant drop all along stream, with beaver dams making a series of steps with small shallow pools above the dams. and fairly fast water in between.

Tributaries:

No.	Name	Side	Distance above mouth vds	Width ft.	Flow cfs	Value to Salmon
1.	none	R.B.	1,550	1	1	small spring feeder to steep for salmon 20 ftfallsto 50yds
2.	Rabbit	R.B.	1,900	3-6	6-8	up 500 yds up it becomes small and shallow with many bed rock climbs and small falls and not good for salmon

No other tributaries in area surveyed, 4-5 more show on the map above the survey, but none are over 1 mile in length and would be too small and steep to be of any value to salmon.

Pioneer Creek

River System: Salmon River
Stream Survey: Pioneer Creek

Date of Survey: June 20, 1941 by D.G. Frey

Source: Drains west of ridge between Mt. Jordan and Tango mountains in the S.W. central part of the Challis National Forest and Custer county Idaho. Drainage area bounded by that of Loon Creek on the west and north, Mayfield Creek on the N.E. and tributaries of W. Fork of Yankee Fork on the south. Separated by mountain ridges, usually high from the other drainage systems. Main stream originates by union of 2 short streams in sec. 17, T.13N., R.14E. Farthest tributary above mouth heads in two small high mountain ponds in sec. 24, T.13N., R.13E.

Direction of Flow: N. N. W. to join L.B. of Loon Creek in sec. 27, T.14N., R.13E.

Approximate Total Length: Approximately 6 miles, of which the lower mile was surveyed. Survey terminated because of steepness of stream and lack of suitability for salmon.

Station	Width	Depth
a (at mouth)	21	4" to 1 1/2' avg (est)
b at (end of survey 1 mile above)	15	3" to 10" avg (est)

Station Location: none taken stream too short and difficult

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-644-00.00	
b	17060205-055-00.00	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
all	9,400	5,730	61	2,580	27.0	940	10	150	2
(1,700 yds)									

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area(yd ²) (MR&SR)	% Avail	Usable Spawning Area(yd ²)	% Usable
all	1700 1	9,400	3,520	37	255	2.7
(mouth to end of survey)						

Spawning Area Unavailable: none actually barred, but continued steep and series of cascades render it so difficult to ascend that it is doubtful if it is used much by salmon.

Character of Watershed:

Mountainous	x
Hilly	
Rolling	
Flat	
Swampy	
Wooded	x lightly; open stands of Douglas Fir and lodgepole pine etc.
Open	
Cultivated (0)	none
Character of valley	\ / scarcely no flat land in whole valley
Character of banks	mostly continuous with valley walls 500-1500 ft high
Density of Marginal Vegetation	quite dense aspen; alder, willow, roses, etc.
Erosion of	
a) banks	extensive
b) watershed	very great

Diversions: none

Artificial Obstructions: none but too steep (above)

Natural Obstructions:

Beyond one 2 ft **falls as a** minor obstacle (passable all times). There are **no definite** obstructions. However the continuous Cascades etc. are so tiring that they probably discourage any good run of salmon from using the stream.

- a) Fluctuation in Water Level; 2 ft avg
- b) % of Stream bed covered; usually all
- c) Stream Volumes; est 30-35 cfs

Pollution: none

Fish Salmon:

None seen; Run had apparently not got up this far. Obtained no data on run up Pioneer from Loon. Believe very few if any, due to cascades, general steepness and lack of spawning area.

Fish (other than Salmon):

None observed, but it is believed that since there are rainbow and cutthroat trout in Loon Creek, there should be some in Pioneer, at least in summer months. In winter months they probably drop

downstream and may even vacate the stream, as bad ice conditions are reported on streams in this vicinity. Could get no data on steelhead either.

General Remarks:

Pioneer Creek was explored for only a mile above the mouth, but that seemed enough. The stream is in a narrow valley and banks run up as valley walls often to great heights. The gradient is very steep, resting pools and spawning area lacking. The stream is almost a succession of small cascades and boiling "white" water that would be very discouraging to salmon, altho no actual obstacles were encountered in the lower mile. The upper reaches are said to be quite steep, as well they could be in this high rugged country. Altho no data could be obtained as to whether salmon even enter the stream, it is safe to say that the stream has little value as a salmon producer, nor could it be improved to any great extent. Its future as a fishing stream would seem to depend on stocking with brook, cutthroat or R.B. trout, and well regulating the fishing so that it could serve as a small nursery stream for trout to move down into Loon Creek.

Temperature data:

None available, but should be satisfactory or cool in summer, winter conditions may be bad however.

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
all as surveyed 1 mile	2	2	0 0.0	0 0.0	1 50	1 50	40

Gradient:

No data available. It was very steep, even in the lower mile and the upper 5 miles are probably even steeper. Gradient probably 250-350 ft per mile in lower mile or two and 500-800 ft per mile in the upper, with an estimated total drop of approx 3,000 ft in 6 miles of stream. The steeper upper 3 miles of stream is however very small and would be of no use to salmon.

Tributaries:

Tributaries to Pioneer Creek only one was observed in the lower mile that was surveyed, it entered the left bank 1,610 yds above the mouth, had an estimated flow of 5 cfs and was too steep and small for use by salmon to any extent. It had an estimated 8% grade near the mouth.

Little Loon Creek

River System: Salmon River
 Name of Stream: Little Loon Creek

Date of Survey: July 9, 1941 by D.G.Frey and F.G. Bryant

Source: Mountain slopes in N.W. portion of Challis National Forest in Idaho. Its drainage area is bounded by that of Cougar Creek on the North, Loon Creek to the East and Southeast, Rapid River to the South and Southwest, Little Creek to the West and the main Middle Fork the Salmon on the Northwest. It originates in sec 23, Township 15N. Range 12 E. It empties into the left bank of the Middle Fork of the Salmon River in section 13, Township 16N, Range 12E.

Direction of Flow: Northeast 5-6 miles to pick up Blue Lake Creek coming into the left bank from the south, -through Northwest 5- 6 miles to its mouth.

Approx Total length: 11 miles, of which the lower 3.3 miles were surveyed up to bad beaver dams.

Station Locations: none taken; small stream

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-928-00.04	
b	17060205-996-00.00	
c	17060205-049-02.40	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-b	13,100	3,160	24.1	5,140	39.2	2,860	21.8	1,940	14.8
b-c	8,700	2,250	25.9	2,630	30.2	1,840	21.1	1,980	22.7
Total (3.3 miles)	21,800	5,410	24.8	7,770	35.6	4,700	21.6	3,920	18.0

a-b: lower 2 mi to 1st L.W. Barrier (avail A.T.)
 b-c: 1.3 miles above 1st L.W. Barrier (unavailable L.W.)

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area(yd ²) (MR&SR) *	% Avail	Usable Spawning Area(yd ²)	% Usable
a-b mouth to 1st low water barrier	3,520 2.0	13,100	8,000	61.1	2,545	19.4

Spawning Area unavailable and unusable:

Station	Distance	Area (yd ²)	Area Unavail (yd ²)	% unavail	when avail	usable unavail (yd ²)	% usable
above 1st L.W. barrier to end of survey	1.3 mi	8,700	4,470	51.4	LW	1,030	11.8

Cause of unavailability; A beaver dam two miles above the mouth, through which the water seeps. Lack of overflow at times of low water prevents even a chance to jump the barrier.

Character of Watershed:

Mountainous	x
Hilly	
Rolling	
Flat	
Swampy	
Wooded	sparse Douglas Fir and yellow pine
Open	
Cultivation (%)	none
Character of Valley	\ / to \ _ /
Character of Banks	earth and rubble. or talus and bed rock in narrows 2-5' immediate; 50-300 ft as valley walls
Density of Marginal Vegetation	dense, bushes, alders etc.
Erosion	
a) of banks	moderate; being stopped by beaver dams
b) of watershed	great

Diversions: none

Artificial Obstructions:

No.	Location yds up	Type	Passability	Remarks
1.	960	4' beaver dam	with difficulty	worse at low water
2.	1220	3' log jamb	with difficulty;	
3&4	1300	2-2' beaver dams	with difficulty	worse at low water
5.	1500	2' beaver dam	with difficulty	worse at low water
6.	1560	3' log and brush jamb	with difficulty	worse at low water
7.	1730	4' brush jamb	with difficulty	most water seeps through dam small spill on mtn side very difficult
8.	1960	3' beaver dam	with difficulty	

No.	Location vds UP	Type	Passability	Remarks
9.	2200	3' beaver dam	with difficulty	
10.	2920	3' log and brush jamb	with difficulty	
11.	3460	4' brush dam	L.W. barrier	most water seeps through 1 small spill-- passage questionable at times G.L.W.
12.	3480	3' brush and beaver dam	with difficulty	
13.	4350	5' brush dam and cascades	L.W. barrier	passable with great difficulty at high water
14.	4370	2' beaver dam	with difficulty	
15.	4760	4' falls and log jamb	with difficulty	
16.	4940	bad beaver dam	B.L.W.	2 channels right impassable left possibly passable high water only
17.	5120	3' beaver dam	with difficulty	
18.	5460	3' beaver dam	B.L.W.	passable with great difficulty at high water only
19.	5590	3' beaver dam	great difficulty	
20.	5640	3' beaver dam	great difficulty	
21.	5750	3' beaver dam	great difficulty	
22.	5830	3' beaver dam	great difficulty	
23.	5860	3' beaver dam	total barrier	water all small seepage trickles

Natural Obstructions:

1. Little Loon Creek enters the Middle Fork over a steep 6' drop bedrock cascade falls with rocks protruding above surface of water which is spread thin. It is doubtful if many salmon could enter the stream over this barrier at low water, but such could only be judged at the time, when it was passable with very great difficulty.

2. A 5' cascade falls 700 yds above the mouth. no barrier.

A. Fluctuation in Water Level; Approx 2'-3' rise indicated during spring run off from mountainous watershed.

B. Stream Volume; estimated @ 15-25 cfs

C. % of Stream Bed Covered; all or 80% or over in wider areas.

Pollution: None to speak of. Stream was slightly cloudy or milky at time of survey, possibly due to effluent from hot springs further upstream. No apparent effect on fish; trout numerous and plump in beaver ponds.

Fish: Salmon. Mr. Freese the district ranger stated that Little Loon Cr. had formerly had a run of salmon, but that with the beaver taking over the stream in the past few years they had apparently petered out. No information on a present run could be obtained. With the beaver dams so numerous it is doubtful if there is one, although a few may use the lower 2 miles below the 1st low water barrier. This stretch could hardly care for more than a small run for it has approx 2545 sq yds of usable spawning rubble. No salmon were seen, and while it may arrive later, it is doubtful, as fish were entering in the upper Middle Fork tributaries at this time. Its present value as a salmon stream is very small, due largely to the many beaver dams. Visibility was only fairly good; cloudy water.

Fish (other than Salmon):

Species	Date	very Abundant	Abundant	Fair #	Scarce
Rainbow	seen 7/9/41		x		
Brook trout	7/9/41			x	
Dolly Varden	7/9/41			x	
Whitefish	7/9/41		x to	x	
Steelhead	7/9/41	probably present			
(Spring) Cutthroat	7/9/41	probably present			

The stream is a good trout stream due largely to its many beaver ponds and great amount of overhanging brush. Several trout could often be seen in a single small pond. Stream not fished to any great degree at present, as it is off the beaten track and the Forest Service has let the trail fill up with brush and small trees.

General Remarks:

Little Loon Creek is a small stream with moderately steep gradient. It flows through a narrow valley that has earth and talus slopes with bedrock ledges and cliffs in the narrow canyonous sections. The walls are steep, 100- 500 ft high, with a tangle of brush willows usually 6-15 ft high and bushes choking the narrow valley floor. The slopes are open with the occasional pine and fir and sage and grass clumps. At intervals the valley widens to 100-200 ft wide beaver pond flats. The trail makes numerous crossings. There are several cascades, and beaver dams every few yards, the first being located 900 yds above the mouth, and these are difficult to get over because of the small flow of water seeping through the brush fronts during normal or low water periods

when the salmon would be running the stream. The beaver have apparently taken over the stream with the last few years, and as long as they are present, the stream will be of no value as a salmon producer. Due to its small size it could care for but a small run at best, and seems of more value as a trout producer in the many beaver ponds. West Fork was about 6 ft wide, and 2-4" deep, too small for salmon to go up far in the summer.

Temperature Data:

Station	Date	Time	Air	Water	Sky
at mouth	7/9/41	9:45 AM	61 F	47 F	60% clear
at end of survey	7/9/41	12:45 PM	79 F	52 F	clear
5800 yds above					

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
all	28	8.5	0	0	10	18	136
(3.3 miles)			0.0	0.0	35.7	64.3	
mouh to end of survey							

Gradient:

Elevation at mouth interpolated from U.S.G.S. plan and profile maps of Middle Fork of Salmon River = 4250 ft. Source heads in mountain areas of- 9,900 ft height (U.S.F.S. map) so elevation at upper end of stream is approx 8,500-9,000 ft. This gives a drop of 4200-4700 ft in 10 miles or approx 420-470 ft per mile avg for the entire stream. However the avg gradient in the lower 3.3 miles surveyed is not that steep and probably not over 100-150 ft per mile, or moderately steep.

Tributaries:

No.	Name	Side entered on	Distance above mouth	Width est.	Flow cfs	Value to salmon
			(approximate)			
1.	West Fork R.B.		3120 yd	6'	3-5	very little passable for some distance above mouth but very shallow; 4-5 mi long
2.	Ranger	L.B.	2.1 mi	2-3'	1-2	not seen too small dense brush; 2 mi long
3.	Doe	R.B.	3.4 mi	4-5'	2-4	? 3 1/2 mi long
4.	Castle Fork	L.B.	5 1/2 - 6 mi	3-4'	2-4	? 3 mi long

No.	Name	Side entered on	Distance above mouth (aproximate)	Width est.	Flow cfs	Value to salmon
5.	Blue Lake	L.B.	7.5 mi	5-6	5-8	? 4 1/2-5 mi long
6.	Corley	R.B.	7.7 mi	2-3	1-2	? probably none smallsteep 1 1/2 mi long

NOTE* Only west Fork was inspected for 2-300 yds others were above the end of the survey, except Ranger Creek which was not seen in the dense brush on the valley bottom. Salmon cannot reach any of these upper tributaries due to blocking beaver dams on Little Loon Creek proper @ 3.3 miles up. Size flow and distances estimated from U.S.F.S. map of area and comparing with other streams of similar size in the area that had been inspected.

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-b mouth to Trail Cr (10.8 mi)	235,400	113,370	48.2	65,330	27.8	33,160	14.1	23,540	10.0

spawning Area Available and Usable:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable	
a-b	18,900	10.75	235,400	98,490	41.8	9,660	4.1

Mouth to
Trail Cr.
(total distance
surveyed)

Spawning Area Unavailable: none in area surveyed

Character of Watershed:

mountainous	x
Hilly	
Rolling	
Flat	
Swampy	
Wooded	
Open	
Cultivated %	1 % , Mitchell Ranch
Character of valley	\ / to \ _ /
Character of Banks	steep 5' in valley bottom; 300-2000 ft as valley walls, earth, rubble, talus, bed rock cliffs
Density of Marginal Vegetation	spotty = moderately thick
Erosion	
a) banks	great
b) watershed	very great

Diversions: none seen

Artificial Obstructions: none

Natural Obstructions: none

Fluctuation in Water Level:

A. Ft variation; 3-5 ft

B. Stream volume approximately 125-150 cfs est.

C. % of Stream Bed Covered; 90-100% few stretches 80 % in wider sections

No published data available on stream flow. No severe fluctuation indicated. Spring run off of winter snow accumulation

causes rise in spring, receding in June-July and nearly moderate at time of survey. Probably enough water for salmon at any time in the 10 miles surveyed.

Pollution:

Water discolored a dirty white, diluted in lower 3-5 miles so bottom can be seen okay but increases progressively up stream, until above end of survey at Trail Cr, (which comes in clear) bottom cannot be seen in over 6" of water. People on Hood Ranch on Middle Fork said it came from talc beds further up, but this was not verified. The Forest Ranger at Sea Foam stated that it may come from the Sunnyside Mine which was perhaps reopened due to higher prices of because the war. This mine is near the headwaters some 10 miles further up, and is a quite large one. It is said that at the Mitchell Ranch (3 miles above mouth) the Marble Creek water had always been used for stock feed and drinking purposes, but a few years ago after having trouble with the stock and not feeling well from drinking it himself, the rancher sent samples in to the state to be analyzed and the report came back that it was polluted and unfit to drink. There is no other agency on the stream other than the mines that could have been responsible and it is thought that mine waste water and possibly chemicals such as cyanide may be emptied into the stream by the mines, causing the pollution. This pollution may well have been the main reason for the dwindling of a formerly .pa reported good run of salmon in the stream, and the nature and source of the pollution should be determined and eliminated if possible and necessary before any program for restoration of salmon in this stream is undertaken.

Fish (Salmon):

No salmon were seen in the stream. Visibility was poor above the Mitchell Ranch, but fair to good below there. The run, if any, should have been in the stream at the time of the survey, but there was no evidence of it. If there is one it is very small. It is reported to have a small run, according to a Forest Guard questioned, as well as other people along the stream. The run was once very large according to stories told by residents along the Middle Fork. It was large enough so that fish could be heard splashing on the riffles by the Mitchell Ranch. Former mining activities on the stream may have seriously reduced the run. During the prospecting rush several hundred mines were in the area, which is very remote from food. supplies. Doubtless any salmon on spawning riffles was utilized for food, and together with mining pollution may have caused the decline. Whatever the cause, the result is a negligible run at present, as far as could be ascertained.

Fish (other than salmon):

1. Steelhead: reported in small numbers, none seen
2. Rainbow trout: seen in pools July 11. Abundance hard to determine due to poor visibility in cloudy water above
3. Whitefish, Cutthroat, Dolly Varden and Sculpins should also be present - but were not actually taken for identification. The creek is far from roads and reached only by pack trips and so there is little fishing in the stream.

General Remarks:

Marble Creek, at least in the lower 10 miles surveyed, flows in a narrow canyon that it has cut in the mountains. In the lower 2 miles the canyon is very narrow, the sides rising from the waters edge up as very steep slopes from 200-600 ft high, generally 2-300 ft. The trail is notched out of the walls, which are of earth and rubble with bedrock outcrops protruding at intervals. The gradient is quite constant and fairly steep, causing fast riffles and few pools of any size. It gradually widens above 2 miles a low 50-75 yds wide strip appearing beside the stream. At 3 miles up it widens out into a pocket valley in which the Mitchell Ranch is located. This valley is a mile long and 1/8 to 1/4 mile across, with 2-3 irrigated fields on the flat, through which the stream swings at a more moderate pace. At 4 miles or so begins to narrow progressively, being bordered by smaller benches, until at 7 miles a bed rock bluff 2-300 ft high cuts across the valley. The creek has knifed a passage through this leaving a gorge nearly 200 yds long, and only as wide as the stream itself, with sheer rock walls 100-200 ft high, which grade back steeply to mountain tops over 2000 ft above the creek. A narrow valley 50-75 yds wide runs from here on up to Trail Creek, with narrows, usually a tumbling ledge or talus slopes pinching steeply in every few hundred yards. There are only a few cascades, in spite of the narrow steep sloped canyon. There are few large deep pools, except in the big gorge, but sufficient small pools for a salmon run.

No evidence of salmon was observed at the time of the survey, and only a small run exists at the most. Mining pollution at the head of the stream in the past may have been the main factor in reducing the former runs that are reported to have existed in the stream. This condition should be thoroughly investigated before restocking is undertaken, but if properly controlled, the stream seems capable of supporting a good salmon run. It has no obstructions or diversions, has sufficient water, good temperature and enough spawning area to support a run.

Temperature Data:

Station	Date	Hour	Air	Water	Sky
at mouth	7/11/41	9:30 AM	56 F	52 F	cloudy
at end of survey 50 yds below mouth of Trail Creek	7/11/41	3:30 PM	75 F	64 F	30% cumulus clouds
In Trail Cr,	7/11/41	3:30 PM	75 F	62 F	30% cumulus clouds at mouth

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-b (10.75 miles) mouth to Trail Cr (end of survey)	49	4.6	13 26.5	0 0.0	2 4.1	34 69.4	708

Some of the S6 boulder pools would serve as resting pools for a few salmon, as they presumably would spawn within a short time of reaching the stream.

The SlT1 pools are concentrated in the gorge strip for the most part, the S2T2 pools being scattered along the whole stretch.

Gradient:

Elevation at the mouth (accurately from U.S.G.S. plan and profile maps of the Middle Fork) is 4430 ft. Elevations of several peaks near which tributaries head ranges from 7768 to 9475 ft. The elevation at the Sunnyside mine, near the head of the main stream is given on the U.S.F.S. Payette National Forest Map as 8538. Using this figure we have a total drop for the 24 miles total length, of 4108 ft, which should be quite accurate. This amounts to a drop of 171 ft per mile. The average for the 10 miles surveyed to the mouth of Trail Creek seemed somewhat less, or around 100-125 ft per mile. The upper 5 miles is in mountain valleys and should be much the steepest.

Tributaries:

No.	Name of Creek	Side	Distance above mouth(yd)	Width est. (feet)	Flow (cfs) est.'	Value to Salmon
1.	unnamed	L.B.	2200	1	1	good drinking cold spring water no value to salmon

No.	Name of Creek	Side	Distance above mouth(yd)	Width est. (feet)	Flow (cfs) est.	Value to Salmon
2.	Spring	L.B.	5400	3	5	Little value shallow only 3" deep and small pt of water used for irrigation on Matched Ranch 2 1/2 mile long
3.	unnamed	R.B.	8600	2	1	no value too shallow small
4.	Prospect	R.B.	12,300	3	3	none too small and shallow 2" deep 2 mi long
5.	Burn	L.B.	12,700	3	3	none small and steep short ways above mouth in canyon 2 mi long
6.	Canyon	R.B.	13,200	3	3	Little or none shallow 3" deep steep above; 5 mi long
7.	Doe	L.B.	15,900	1	1	none too small; 2 mi long
8.	Birch	R.B.	16,700	3	3	very little if any shallow 2" deep and small; 4 1/2 mi long
9.	Hog Back	L.B.	18,100	2	' 2	none small only 2" deep 2-1/2 mi long
10.	Trail	R.B.	18,900	12-18	10-20	yes reported to be passable in lower miles or so then blocked by beaver dams. Said to have had salmon in past but beaver cutting off some area. Small present run reportednotverified. 9 mi long.
11.	Grays	L.B.	11.3 mi	2	2	little or none too small; 2mi long
12.	Mink	R.B.	12.2 mi	3	3	probably little or none too small; 3 mi long
13.	Cougar	L.B.	12.5 mi	1-2	2	probably none too small 2 mi long
14.	Placer	L.B.	13 mi	2	2	probably none too small 2 1/4 mi long
15.	Fuse	R.B.	14 mi	1	1	none 1 1/2 mi long
16.	Dynamite	L.B.	14.2 mi	8-12	10-15	possibly is big enough if not too steep; 7 mi long
17.	Buck	R.B.	15.5 mi	3	3-4	probably little or none; 4 mi long

No.	Name of Creek	Side	Distance above mouth(yd)	Width est. (feet)	Flow (cfs) est.	Value to Salmon
18.	Little	R.B.	16.2 mi	3	3-4	possibly little near Cottonwood mouth too small for much; 4 mi long
19.	Big	L.B.	17.2 mi	8-12	10-15	probably a little if not Cottonwoodblocked by beaver dams; 7 mi long
20.	Cornish	L.B.	18.7 mi	3	3	little if any too small; 3 mi long
21.	Safety	R.B.	20.2 mi	2	2	very little or none too small; 2 1/2 mi long

NOTE# Tributaries above Trail Creek were not seen. Estimates of size and flow are based on comparison with map size with tributaries below Trail Creek of similar size that were actually inspected. It was reported by a Forest Service guard that the larger tributaries, such as Trail Creek Big Cottonwood etc. had had salmon in them that had been seen (not this year prior to time of survey).

Indian Creek

River System: Salmon River
 Stream System: Indian Creek, tributary of the Middle Fork of the Salmon River

Date of Survey: July 13-15, 1941 by D.G. Frey and F.G. Bryant

Lower 5900 yards surveyed July 15, 1941
 Next 4500 yards surveyed July 14, 1941
 Upper 13600 yards surveyed July 13, 1941

Source:

Originates high on east slope of mountain ridges just north of Pistol Rock in the Idaho Primitive area of the Payette National Forest. Source is in Section 20, Township 17N, Range 9E. Drainage area separated by mountain ridges from various creek headwaters of the East Fork of the South Fork of the Salmon River on the West and North; of Marble Creek to the North, Northeast, and East; of Pringo Creek and Middle Fork of the Salmon on the Southeast and East; of Pistol Creek on the south.

Direction of Flow:

Mainly southeast. Flows northeast from point of origin approximately 6 miles to pick of Big Chief Creek coming in from the north, then runs east, gradually bending southeast for the remaining 13.6 miles to enter the right bank of the Middle Fork of the Salmon River in Section 35, T17N, R11E.

Total Length:

21.6 miles, of which the lower 13.6 miles were surveyed by pack trip with horses.

Station Location:

Sta	Location	Distance above prev. Station vds miles	Distance above Mouth vds miles	Map Location	Width	Depth
a	at mouth	0	0		n/a	n/a
b	end of survey	13.6	13.6		n/a	n/a

EPA River Reach Code:

Station	HUC	SEG Rmi
a	17060205-008-05.05	
b	17060205-009-13.62	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
barrier	153,300	62,090	40.5	51,510	33.6	23,070	18.2	16,530	10.8
barrier	47,700	19,260	40.4	14,310	30.0	9,360	19.6	4,770	10.0
-b									
Total	201,000	81,350	40.5	65,820	32.7	32,530	16.2	21,300	10.6

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
a- barrier	15,100 8.6	153,300	74,680	48.7	12,090	7.9

Spawning Area unavailable and unusable:

Station	Distance	Area (yd ²)	Area Unavail (yd ²)	% unavail	when avail	usable unavail (yd ²)	% usable unavail
barrier- b	5.0 mi	47,700	23,670	49.6	LW	5,290	11.1

Cause= log jamb located 15100 yds or 8.6 miles above mouth. Impassable to chinook or steelhead at low water level. Could easily be removed. Actually steelhead would arrive before low water period is reached and so can pass above it. Chinook run would arrive probably before low water period and so would also get above it for the most part. Barrier probably effective from late July to the following spring in most years.

Character of Watershed:

a-b

Mountainous

X

Hilly

Rolling

Flat

Swampy

Wooded

lightly below, to moderate above 10 miles

Open

Cultivated % none

Character of lower Valley V canyon, \ / in upper mile surveyed, and
3 miles

Character of Banks earth and rubble in spots; talus and bedrock predominating 3' in valley floor; 300 to 2000 feet as valley walls for most part

Density of in Marginal Vegetation thick patches in wider areas, thin to sparse narrows

Erosion:
a) banks great
b) watershed very severe

Diversions: none

Artificial obstructions:

No.	Location	Type	Passability	Remarks
1	6800 yds	old log jamb	AT	old jamb; stream has spread out around it
2	7600 yds	old log jamb	AT	old jamb; good channel opened around right end
3	8700 yds	old log jamb	AT	old jamb; opened up so passage unimpeded
4	10700 yds	old log jamb	AT	old jamb; opened up so passage unimpeded
4&5	13900-14000 yds	2 log jambs	AT	2 jambs passable at present located in bottom of canyon with sheer walls, logs all along valley floor above jambs
6	15100 yds	log & debris	BLW	Salmon have to jump jamb 5' high and 8' upstream in one jump to clear projecting logs in front of dam and then hit a very narrow opening in the logs above, over which the water falls into the brush and logs closely packed below. There is only 8-10" of fast water to jump from. Is passable with greatest of difficulty even at high water. Could easily be removed however. Stream may cut channel thru rt bank and circumvent it

			if debris doesn't also choke new channels, as there is a debris floatpacked in for several feet above.
7	20000 yds natural log dam	AT	5' high sedimented in above it. Can be jumped if they aim straight and don't impale themselves on projecting sticks. Channel being cut around right bank side
a	23600 yds log jamb	BLW	5-6' high, sedimented in above, with seepage along front. Water goes over in one place when high enough and can then be jumped with danger of injury. Can be removed easily.

Natural Obstructions:

The only natural obstacles is a series of 2 falls at 20300 yards above the mouth. A bedrock cliff has been cut through here for 150 yards, which has a steep gradient. Falls are located at lower end. Stream has been pinched in by large slabs and bedrock til only 5-8' wide. The first falls is 3 feet high, with a second just above it 7 feet high. Water spouts thru between rock slabs or boulders, and it is a hard target to hit because of a slight twist in the channel and 6-7 foot slope in all to top. Believed to be a low water barrier and passable at high water. Chinooks and steelhead would normally reach it before water is too low, but it is still a difficult proposition, although not large. Pool below is very small to jump from, but can get a fair take off if they wait their turn. could be blown out quite easily.

Fluctuation in Water Level:

Ft. variation: 3-5 feet except in narrows where sheer rock walls bound stream, through 5-8 feet. Only 2-3 feet in the meadow in the upper mile or just below Big Chief Creek.

Stream Volume: measured at 119 cfs with 0.8 drag factor for rough bottom included (148.8 cfs without drag factor) flow taken 7-15,-41.

% of Stream Bed Covered: all in narrows of canyons, 10-60% uncovered in the wider flats of lower 3 miles and in the occasional smaller pocket flats in the middle section, but for short distances only and then mainly are flood bars exposed.

Pollution: none

Fish (salmon):

No Salmon were seen. A party of packers, met at the upper meadow below Big Chief Creek, stated that they had never heard of salmon being seen above the vicinity of the mouth, but that they had heard of some there. Since salmon were in the tributaries of the Middle Fork above and below Indian Creek, there should have been a few seen if a run of any magnitude existed. Visibility was good and the water clear. Although it was impossible to observe the stream at close hand through the deep canyon, the water was visible from the trail, and fishing was conducted in the stream at three separate campsites and no salmon were stirred up.

Planting a run in the stream should produce results, as the stream seems well fitted for a salmon run, if late summer water levels are not too low, as hardly seems possible in a stream of this size, and if winter ice conditions are not too severe.

Fish (other than Salmon):

1. Steelhead: probable in spring. None seen.
2. Rainbow Trout: most numerous fish in stream. Several taken from single pool July 13, 1941, 10400 yards above mouth at first campsite, and others seen. Abundant to very abundant.
3. Cutthroat trout: second most abundant fish. Several taken at campsite, ranging from 6-16" long. Apparently are interbred so that variations between true cutthroat and Montana Blackspot exist, judging from the several specimens taken July 13, 1941.
4. Montana Blackspot trout: in fair number only. Specimen caught at campsite for absolute identification, July 13, 1941.
5. Dolly Varden trout: fair number only. One taken July 13 at first campsite, and another very small specimen approximately 5" taken at camp approximately 1 mile below Big Chief Creek and 2-3 others seen.
6. Whitefish: fair number indicated, 3-4 seen in pool at first campsite. One taken July 13, 1941.
7. Fresh water sculpin: seen.

The stream is not extensively fished, as there are no human habitations along the stream, which can be reached only on foot or horseback. Parties occasionally pack in from Stibnite on trail coming in just below Big Chief Creek. One such party of 5- 6 persons had a gunny sack with many fish in it, mainly rainbow and cutthroat and had practically cleaned the 2 mile stretch below Big Chief Creek of trout on July 14th. Only three small fish were caught by the second campsite after they had left. This probably

happens only a few times each year however, and few people ever fish the stretch from Tomyhawk Creek down to within a couple miles of the mouth. The campsite by the Middle Fork of Indian Creek indicated fair usage, and the lower two miles are probably fished more often by sheepherders and pack trip parties going down the Middle Fork on fishing trips.

General Remarks:

In the lower 6000 yards the stream runs at a moderate gradient in a small flat bottomed valley approximately 50-200 yards wide. The valley walls rise steeply from the valley sides, to tops of high rounded lightly forested hills near the mouth, but these rapidly become more rugged and ridge like and 150-500 feet high. Mainly pine and some fir make up the covering of the slopes, and from occasional clumps with brush, cottonwoods, alder, and willow in a fringe along the stream and in scattered clumps or patches on the valley floor. In this stretch the banks of the stream are low, 2-5 feet, with gravel bars and shallow abandoned channels indicating that in the spring high water rises over the banks in places. Bed rock and talus are not prominent, dirt and stones predominating. There are small spawning patches all along with occasional pools, none very large or deep.

Just above the Middle Fork of Indian Creek the valley narrows, the walls are steep to sheer bedrock cliffs with talus or earth and rubble slopes 60-200 feet high to the waters edge. These are backed by steep earth and rubble but less sheer slopes to mountain tops 1000-1500 feet above the stream. The gradient increases slightly, and the spawning rubble becomes scattered, the bottom being composed for the most part of rubble 6-12" in diameter, a bit too large for designation as usable spawning rubble. At 7300 yards a small flat valley floor approximately 75 yards wide is present for 100-200 yards, through a narrows again, and then a long stretch of 50 yards wide flood floor between very steep and high walls. The floor through this stretch is littered with strewn logs washed up from old log jams, all of which are now open and passable. The trail then mounts high up along the right bank which is very steep and semi open. The left bank is the steepest, with many cliffs 100-300 feet high backed by slopes of 60-75 degrees to mountain tops, 1500-2500 feet above the waters edge. At 9600 yards the creek cuts thru a sheer rock gorge 150-300 feet deep, and the trail is hung on the right bank, which although it is seldom more than 100-300 feet laterally from the streams edge, is 200-400 feet above it. This condition continues with a slight widening to 10400 yards where a recent cloud burst had gouged out a former trickling tributary channel on the steep right bank to a depth of 10-15 feet, almost as if with a steam shovel, and the wash had dammed Indian Creek to form a pond 150 yards long in the canyon bottom, along which we made camp. Vegetation is light thru this section. Scattered pine lightly cover the slopes, particularly along the small steep water courses. Sage and undercropping of brush and

grass clumps make the total picture, but it is still only lightly covered so that deer can be seen moving on slopes 1/2 mile away.

This deep, steep walled, narrow canyon continues for 2-3 miles, with rocky knobs and eroded bluffs and cliffs bordering the stream, and the trail is hung 3-500 feet above the waters edge for the most part, for there is no chance to get up the narrow valley bottom which is nearly all occupied by the stream itself. The creek is 3" to 2' deep, with no large pools, the boulders that break the fast riffles and small rapids forming the main pools. Salmon would be protected here by the fact that the stream is too difficult to get at in the canyon.

At approximately 13000 feet a small strip 10-50 feet wide appears along the stream edge and the trail drops down to the stream level, crossing it to avoid bluffs and talus slopes in several places in the next 7500 yards. 600 yards above Wickiup Creek mouth, a 75 yards wide meadow on an old flood bed borders the stream, with hot springs dribbling out of the banks.

Bushes increase along the stream thru this section, and at 15100 feet a log and brush jamb is present that would be a barrier at low water, and is difficult to pass at high water, and questionable at the time. A 5' high and 8' lateral jump from a poor take off in little water is necessary to clear the barrier, which could easily be removed. A narrow bench and tree and brush covered meadow 100 yards wide is present just above Guis-Guis Creek mouth, continuing for some 600 yards, and in which a good usable stretch of spawning rubble exists. Above this meadow at 16300 yards the valley narrows again, and shortly the trail is forced up more talus slopes on the right bank just below Wampum Creek. From here on up past Papoose and Little Indian Creek the stream occupies mainly the entire bottom of a deep canyon, the trail running within view of it, but 4-600 feet above it. The country is now quite rugged with steep ridges, talus slopes and bed rock cliffs separating small tributaries in deep steep canyons and gorges. From Little Indian Creek the trail comes down to bounce over a rough, narrow valley floor by the stream bed again. At 20000 yards another log jamb is encountered in a small glen, but it is being cut around by a new channel along the right bank in the trail. 300 yards above, an eroded bare rock cliff area has been cut thru by the stream, and for 150 yards, cascades are present, with 2 falls at the foot of the jumble of rock. The stream narrows to 6-8 feet to get thru this small cleft, and the lower falls of 3' height is backed by a second 7 foot high between rocks. There is a small pool to jump from, a narrow hole between jutting rocks to hit, and it looked like a possible L.W. barrier and difficult even at high water. Could be blasted out fairly easily to make sure salmon could get above.

800 yards above the falls a grassy meadow is encountered, the valley slopes have moderated rapidly to high hills covered

moderately with pine, fir, and cottonwoods near the creek. A green grassy basin over 2-400 yards wide and 1/2 mile long exists. This is quite open save for scattered pine and brush clumps along the edge of the stream, which meanders along at a slight gradient, having many small shallow pools caused largely by small brush and log jams. There is good spawning area in patches thru this area, which is the best campground with plenty of horse feed that we have seen on the Middle Fork survey. This meadow grades into a bench bordered narrower meadow which continues up the valley at a slightly greater gradient. Earth and gravel slopes grade upward gradually to the rounded mountain slopes that border this high altitude valley. The mountain tops look more like a series of hills 500-800 feet high after the rugged 1500-2000 foot canyon slopes below. This valley is 1/2 to 1 mile wide, and pine and fir largely cover its slopes with grassy spots occasionally, and thick brush of alders, willow and cottonwoods along the creek bed. The survey was stopped at Big Chief Creek. The valley continued 1/2 mile wide above this in a wooded area for at least a mile that could be seen.

All of the smaller tributaries to Indian Creek are mainly too small and steep to be of any use of salmon except for small patches within a few yards of their mouths. The Middle Fork of Indian Creek is blocked by a 4 foot beaver dam 20 yards above its mouth that was passable with great difficulty. Possibly the lower 1/4 mile of this 5' wide stream could be used. The same was true of Si Ah Creek and Little Indian Creek. Papoose Creek was a bit larger, 6-10 feet at least, and in a big, deep, side canyon and possibly the lower 1/2 mile could have been used before it becomes too steep. Big Chief Creek ran thru a boulder bed near its mouth, and had brush jams that were very bad, and questionable. It has little value until cleared, if ever needed. Unless blocked by beaver dams there was probably some good spawning area for 2-3 miles above the survey's end.

Indian Creek apparently has no run of spring chinook at present. None were seen, and they should have arrived, judging by presence in other tributaries above. It is hard to understand why there is not a good run in this stream, unless winter ice conditions are so severe that the eggs or fry are damaged, or have been in the past. There is sufficiently good clear unpolluted water with suitable moderate summer temperatures. There are no diversions or barriers in the lower 15000 yards, and possibly the L.W. Barrier log jamb and falls are not effective barriers to salmon due to the fact that salmon should reach them by early July when there could be water enough to enable them to be passed. There are no roads to the area, little sport fishing (see Card 13) and no human habitation along the stream. There was over 12000 square yards of usable spawning below the first low water barrier, and at least 5200 square yards above it, with the possibility that some of the other rubble mixed in with the larger rubble could also be used.

Trout taken were plump and indicated that there should be enough food for small salmon while in the stream before going to the ocean.

Unless winter stream conditions are found to be detrimental there seems no reason why, with a small effort made to open up the one or two small possible low water barriers in stream, introduced runs of spring chinook should not establish and maintain themselves in this stream.

There is a possibility that there is a small run of steelhead in the stream, but we saw none.

Temperature Data:

Sta	Date	Hour	Air temp	Water temp	Skv
a	7-15-41	11:00am	73 F	57 F	clear
5900 yds above mouth	7-15-41	4:00pm	--	63 F	clear
5900 yds above mouth	7-15-41	9:00am	57 F	51 F	clear
10,400 yds above mouth	7-14-41	7:00am	36 F	45 F(est)	clear

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-barrier (8.6 miles)	106	12.3	0	10	13	a3	318
barrier-b (5.0 miles)	25	5.0	0	0	0	25	367
Total (13.6 miles)	131	9.6	0	10	13	108	685
			0.0	7.6	9.9	82.4	

Gradient:

Elevation at mouth of Indian Creek is 4610 feet (USGS Plan and Profile maps of Middle Fork of Salmon River). There are no other elevations given on U.S.F.S. maps along the stream, but the various tributaries head near the tops of mountain ridges with peak elevations of between 8042 feet (Mule Hill) to 9475 (Red Peak), and 9722 (Big Baldy); Pistol Rock at the head is 9169 feet high. Thus the head of the Creek is approximately 8000 feet in elevation at least, and a 3500 foot drop in 13.6 miles is indicated, or approximately 260 feet per mile. The lower 3 miles is quite moderate and probably not over 100 feet per mile. The middle section is steeper, probably 150 feet per mile, the upper meadow section approximately 125 feet per mile, and the extreme upper end probably the steepest. The gradient is quite persistent

throughout, there being few pond areas or good sized cascades or falls. The greatest single drop was the 7 foot falls, an exception, the stream being mostly long, fairly fast, clear riffles and some rapids, with now and then small pools. There are no "big holes."

Tributaries:

1. East Fork, rt bk, 200 yds above mouth, 1 cfs, 4 1/2 miles in length, no value to salmon.
2. Unnamed, rt bk, 3010 yds above mouth, 1 cfs, no value to salmon
3. Mowitch Creek, rt bk, 4160 yds above mouth, 1 cfs, 3 miles in length, no value to salmon
4. Middle Fork, rt bk, 6400 yds above mouth, 5, wide, 5-6 cfs, 5 miles in length, very little value to salmon, could use lower 2-300 yds, but small and probably blocked by beaver dams above, 1- 4, high near end of mouth, steep above.
5. Endvah Creek, 1t bk, 6700 yds above mouth, 3, wide, 3-5 cfs, 2 1/2 miles in length, no value to salmon, too small and steep
6. Cultus Creek, 1t bk, 10300 yds approximately above mouth, 2, wide, 1 cfs, 2 1/2 miles in length, no value to salmon, too small and steep
7. Tomyhawk Creek, rt bk, 11500 yds above mouth, 3, wide, 3 cfs, 2 1/2 miles in length, no value--bit too small; rode up it for 1250 yds to trail crossing in steep gully
- a. Si-Ah Creek, 1t bk, 12100 yds above mouth, 5-6, wide, 5-6 cfs, 3 1/2 miles in length, little or no value--gets steep up canyon short distance above mouth
9. Unnamed, 1t bk, 14000 yds above mouth, 3' wide, 2-3 cfs, length unknown, no value to salmon, a 35, falls over bed rock ledge is present 100 yds up, impassable AT
10. Wickiup Creek, rt bk, 14200 yds above mouth, 2, wide, 1 cfs, 2 1/4 miles in length, no value--too steep and small even for most trout
11. Guis Guis Creek (sign) or Quis-Quis Creek (maps), rt bk, 15300 yds above mouth, 3, wide, 3-4 cfs, 2 1/2 miles in length, no value-- impassable to salmon
12. Wampum Creek, 1t bk, 17300 yds above mouth, 3, wide, 2-3 cfs, 2 1/2 miles in length, no value--30, falls into creek at mouth impassable AT

13. Papoose Creek, 1t bk, 18700 yds above mouth, 6-8, wide, 6-10 cfs, 4 miles in length, little value--in a big canyon; possibly a little spawning in lower mile, steep gradient above
14. Little Indian Creek, rt bk, 19700 yds above mouth, 6' wide, 6-10 Cfs, 3 1/2-4 miles in length, little value--near mouth, perhaps in lower mile or so. Bottom 40, 30, 20 to probably too small and steep above there.
15. Unnamed tributary, 1t bk, 20800 yds above mouth, 1' wide, 1 cfs, 1/2-1 mile in length, no value--too tiny; at end of meadow
16. Kiawah Creek, rt bk, 22600 yds above mouth, 3' wide, 5 cfs, 2 1/4 miles in length, little value--quite shallow 2-3 inches deep at most, little value if any
17. Big Chief Creek, rt bk, 24000 yds above mouth (13.6 miles), 6' wide, 8-10 cfs, 5 1/2 miles in length, in a long side valley possibly some value but boulders near mouth and blocked by brush jams in many places. Little value in present condition, some if cleaned out.

Pistol creek

River System: Salmon River
Stream Survey: Pistol Creek

Date of Survey: July 15 and 16, 1941, by D.G. Frey and F.G. Bryant,
Tabulation and card write up by F.G. Bryant

Source: Formed by the confluence of Big Pistol Creek and Little Pistol Creek in Sec. 14, T.16N, R.10E, in NE corner of Payette National Forest, Valley County, Idaho.

Direction of Flow: East to confluence with the right bank of the Middle Fork of the Salmon River in Sec 17, T.16N, R.11E

Total Length: 6000 yards or 3.4 miles, survey pacing.

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		vds	miles	vds	miles			
a	at mouth	0	0	0	0	sec 17, T16N R11E	33'	1.9'
b	confl Big & Little Pistol Cr	6000	3.4	6000	3.4	sec 14, T16N R10E	33'	1.5' (est.)

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-010-03.92	
b	17060205-012-00.10	

Character of Bottom Between Stations:

Between Station	Total yd ² bottom	LR	%	MR	%	SR	%	MS	%
a-b	63700	25410	39.9	22560	35.4	9065	14.2	6665	10.4

Spawning Area available and usable:

Between Stations	Distance vds	Total sq m1 vds bot.	sq Yds avl sp (MR&SR)	% avail	sq yds usable	% usable	
a-b	6000	3.4	63700	31625	49.6	3179	5.0
all							

Spawning Area unavailable and unusable: none

Character of Watershed:

Mountainous	x
Hilly	
Rolling	
Flat	
Swampy	
Wooded lightly	
Open	
Cultivated %	none
Character of valley	_/ shaped valley
Character of banks	earth and gravel, talus slopes and rock
cliffs	at intervals
Density of Marg Veg.	quite dense, 10-100 ft back, open in few
strips	
Erosion: banks	quite extensive--flooded in spring on
valley	floor
watershed	great--rugged steep tributary canyons

Diversions: none

Artificial Obstructions:

1. Small log jamb at 2400 yards, passable AT, channel around right end
2. Trash dam at 5200 yards, 3 foot high, passable AT, channel around right end

Natural Obstructions: none

Fluctuation in water level: 2-4 feet in valley in spring run off

Stream volume: 171 cfs on 7-17-41 at mouth measured down from bridge with 0.8 drag factor included

% stream bed covered: mainly all at time of survey except for small bars on inside of curves, and occasional 10-20% for short distances on 1 side.

Pollution: none noted

Fish (salmon):

Spring Chinook have been reported in Pistol Creek in the past, but we could find no evidence of any. None were seen, and none were reported by the Forest Guard who has a camp near the mouth. Other than possible damage by ice in the winter, there appeared to be no reason why a run of salmon should not exist. With its tributaries it seems well suited for salmon spawning, but never the less a run would have to be started by plantings. There is a bare possibility that a few salmon may come up later, but they were already up tributaries way above these creeks, so it seems

doubtful.

Fish (other than salmon):

Steelhead are reported to run this creek in the spring. None seen, but were reported by a Forest Guard packing grub into the Forest Service lookout on Bald Mountain, who stopped in at our camp on Pistol Creek.

Rainbow Trout. Abundant. On July 15 we caught several in a pool formed by beaver dams and washouts of small tributaries above the campsite and by the mouth of Thirty-Two Creek. These varied from 5" to 13-14", average 5-9", and were plumb and in good condition.

Cutthroat trout: fair to abundant in number, but much less than rainbow. Caught one on fly in a riffle above camp of July 15th, that was 15" long and 2-3 other smaller ones. Guide also took 3-4 large ones.

Probably dolly varden and perhaps whitefish exist in the stream, but we didn't happen to take any.

Visibility was fine. Water clear and trail close to it on valley bottom for long stretches.

It is said to be fished by occasional sports parties packing in to both the upper and lower ends. Also, fished occasionally by Forest Service employees in summer, but on the whole is not reached by many during the year. The extreme upper end and the heads of tributaries to the left bank of Big Pistol Creek is reached by a road from Landmark. (See write up of Big Pistol Creek.)

General Remarks:

Pistol Creek enters the Middle Fork from a narrow, steep walled, side valley. Its flow is fairly fast, and its gradient constantly moderately steep throughout. The valley bottom varies from about 50 yards wide to 300 yards wide in a few stretches. The stream has 2 to 30 foot banks in the valley floor, but generally only 2-5' high. There are numerous rubble patches and small flood channels on the floor indicating that it overflows its banks in the spring by 1 to 3 or 4 feet in several places. In many stretches one bank or the other is continuous with the valley wall which rises quite steeply for 1-200 feet and then a bit less steeply to the ridge and mountain tops bordering the valley it has cut. These ridges increase from 100-300 feet high near the mouth to 1-2000 feet or more a mile or so above. They are covered with a moderate or light growth of fir and pine, mainly the later, with alder, willow and cottonwood clumps bordering the stream margins and in clumps or small stands along the valley floor. The valley walls are both earth and rubble, the right side in particular, with some talus, bed rock slopes and outcrops, a occasionally sheer cliffs,

particularly on the left wall.

The bottom rubble is fairly evenly mixed throughout with definite spawning concentrations of any size only occasional. There were no large deep pools, the largest being a pool 3-4 feet deep and approximately 100 yards long behind a brush jamb at 5300 yards. Eddies behind boulders (S6 pools) and the smaller S2 pools would furnish resting places for a run of salmon. None of the tributaries are large enough to be of any importance to salmon until Big and Little Pistol Creeks are reached. These both are quite large and have several miles of spawning area available. (This sentence was either underlined or marked through. Together these 2 tributaries and the 3 miles of main stream make a good stream area for salmon.) The water is cold enough in summer, and in sufficient volume; there are no obstacles, diversions and pollution (i.e., none noted at this time) and beyond Forest Service summer guard camps, there are no human habitations along the stream to bother salmon, a road approaches the upper end of a few small tributaries to Big Pistol Creek, but not the main stream. If there were a salmon run present, (and no evidence of one was obtained) doubtless a large portion of it would go through the 3.4 miles of main Pistol Creek to spawn in its 2 tributaries, Big and Little Pistol Creeks. The late summer and early fall water flow should be investigated, together with the winter ice conditions. If these are not detrimental, then the possible occasional cloud burst washing large quantities of mud into the stream is about the only reason why the stream should not support a good run of salmon. 32 Creek had been gullied out by such a cloud burst in 1938, (see picture of deposit at mouth), and other small tributaries have evidence of flash floods that could be detrimental to Salmon runs if they occur at the time when Salmon (or eggs and fry) are in the stream. This is true of this whole portion of the Middle Fork drainage due to its great height, steep ended slopes with small vegetative cover and lack of reservoir areas. If the fall water level and winter ice conditions are found to be not detrimental, then the stream seems quite capable of having planted runs of spring Chinook succeed. Trout do well in the stream, and a steelhead run in the spring is reported to exist.

Temperature Data:

<u>Station</u>	<u>Date</u>	<u>Hour</u>	<u>Air</u>	<u>Water</u>	<u>Sky</u>
a just above mouth at bridge	7-15-41	2:15 pm	79 F	60 F	50% clouds cirrus and cumulus
4000 yds above mouth	7-16-41	7:15 am	50 F	51 F	clear

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-b (3.4 miles)	35	10	0	0	1	34	171
					2.85	97.1	

Gradient:

There is no data on gradient available. The elevation at the stream mouth is 4740 feet (U.S.G.S.). The gradient is moderately steep, probably approximately 125 feet per mile for a rough estimate.

Tributaries:

1. no name, enters on lt bk, 1960 yards above mouth, 1' wide, 3/4 mile length, < 1 cfs, no value--spreads out over an alluvial fan at mouth of gradient over 45
 2. unnamed, enters on rt bk, 3040 yards above mouth, 1-2' wide, approximately 1 mile long, < 1 cfs, no value too small and steep
 3. unnamed, enters on rt bk, 4690 yards above mouth, 1' wide, 1 mile long, < 1 cfs, no value too small and steep
 4. Twenty Five Creek, enters on rt bk, 4870 yards above mouth, 2, wide, 1 mile long, < 1 cfs, no value too small and steep
 5. Thirty Two Creek, enters on lt bk, 5140 yards above mouth, 3-5' wide, 3 1/2 miles long, 5 cfs, no value--too small and steep and has been gullied by flash flood in 1938 spread over alluvial fan at mouth
 - 6B. Big Pistol Creek, enters on lt bk, 6000 yards above mouth, 14-15 miles long, 75-80 cfs, salmon can use several miles of stream to beaver and brush barriers
 - 6L. Little Pistol Creek, enters on rt bk, 6000 yards above mouth, 14-15 miles long, 75-80 cfs, salmon can use several miles of stream to beaver and brush barriers
- Confluence of 6B and 6L forms main Pistol Creek.

Big Pistol Creek

River System: Salmon River
Stream Survey: Big Pistol Creek

Date of Survey: July 16, 1942 by F.G. Bryant. Card write up and Tabulation by F.G. Bryant

Source: High on mountain ridges in Sec. 12, T.15N, R.8E in eastern section of the Payette National Forest of Idaho.

Direction of Flow: N.E. by E. to confluence with Little Pistol Creek in Sec. 14, T.16N.,R.10E.

Approx Total Length: 15 miles of which the lower 5.9 miles (10,300 yds) up to Twenty Two Cr. were surveyed.

*NOTE; On many maps Big Pistol Creek is considered as part of Pistol Cr., with Little Pistol Cr. as a tributary to the one stream. However, references in the field usually referred to Pistol Creek as that portion from the Middle Fork of the Salmon up to Little Pistol Cr., and referred to the portion above (the south branch) not as Pistol, but as Big Pistol Cr. The survey write up uses this as a basis for its survey.

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		yds	miles	yds	miles			
A	at mouth confluence W/ little Pistol to form Pistol Cr.	0	0	0	0	Sec 14, T16N,R10E	18'	6"-12"
B	At mouth of Twenty-two Mile Cr.	10,300	5.9	10,300	5.9	Sec19, T16N,R10E	15'	5"-8"

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-012-00.10	
b	17060205-964-00.00	

Character of Bottom Between Stations:

Area									
Station	(yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-b	63,700	25,390	39.9	19,080	29.9	12,860	20.1	6,370	10.0

Spawning Area Usable and Available:

Distance		Area		Available Spawning Area (yd ²)	%	Usable Spawning Area (yd ²)	%
Station	vds miles	(yd ²)	(MR&SR)	Avail			Usable
A-B	10,300v 5.9	63,700	31,940	50.1		8,510	13.4

Spawning area unavailable: None at time of survey. There were however 2 bad brush beaver dams, one @ 8000 yds, and another at 8700 yds that were difficult at any time, and their passability in some seasons at low water is questionable and could not be actually determined at the time. They could be easily removed, and were not listed as L.W. Barriers at present.

Character of Watershed:

Mountainous x
 Hilly
 Rolling
 Flat
 Swampy 2-3 small willow flats on 50-100 yd wide in valley
 bottom above 7500 yds. (above Pop Gun Cr.) also @
 3700 yds

Wooded
 Open
 Cultivated(%) none
 Character of valley _ / to \ / below _ / above. 7500 yds

Character of Banks earth mainly in valley bottom 2-6 ft high avg 3'
 earth and rubble or talus and bedrock in canyon
 stretches as valley walls 300-1000 ft

Density of Marginal Vegetation dense in flats, moderate to light and patchy in
 narrows

Erosion
 a) of banks considerable
 b) of watershed considerable

Diversions: none

Artificial Obstructions:

#	Location vds up	Type	Passability	Remarks
1	3700	beaver dam	OK At times	Small willow beaver dam flooded area with several small side pond and channels.
2	5000	log and brush jamb	with difficulty at times	3' falls through and over jamb in a very narrow cleft canyon Hard but passable.
3	5200	log and brush jamb	with difficulty at times	Brush and log jam dam 3-5' high. Hard but passable.
4	7400	beaver dam	with difficulty at times	Passable at times because of outlet over a flat rock at right bank edge of dam. Beaver colony apparently moved or tripped out.
5	8000	beaver dam	with difficulty at times questionable at low water	3' beaver dam 5' wide filled above with gravel only 6" hole to jump from below and most of spill is three projecting brush. Passable at the time examined but questionable at low water in some seasons one of those you couldn't determine at the time.
6	8200	beaver dam	passable at times	Small passable with great difficulty @ low water.
7	8700	beaver dam	questionable at low water	5' high beaver dam built against a rock bluff on the left end and rocks on the other. 'Filled in above it with rubble. Very difficult due to seepage and projecting brush and old dam above it had been washed out. This could be easily removed.

#NOTE CARD 8;

Beaver dams are reported above the surveys end and all should be investigated and made passable before stocking the stream.

Natural Obstructions: None in area surveyed

Fluctuation in Water Level:

Sta to Sta	Ft variation	Cause	Stream volume	% stream bed covered
a-b	2-4 in open sections 3-5' in narrows in in willow flats	spring run off spring run off aggravated by brush and beaver dams	est 75-80 cfs at mouth	90-100

* NOTE; The small willow and grass flats evidently become ponds in the spring high water periods; in the narrows the slope of the banks is so steep that it causes a higher water rise through the constricted areas.

Pollution: none noted

Fish (Salmon):

A small run of spring chinook is said to have existed in the past. The survey saw none. The Forest guards and Packer had seen none, and the run should have been in the stream, as they were clear up to Marsh Cr. above here. It is doubtful if any run exists at present in the stream, which seems strange. Beyond beaver dams, which can be seasonally opened, the stream seems a very good one for salmon if winter conditions are found satisfactory.

Fish (other than Salmon):

We took no fish from Big Piston, but trout were seen in pools, and the population is doubtless about the same as in Pistol Cr. where rainbow and cutthroat were taken approx 1 mile below Big Pistol Creek. Estimated as follows

1. Steelhead; fair run reported in spring. No evidence seen
2. Rainbow; abundant to very abundant in pool sections
3. Cutthroat; fair number to abundant

Possibly Dolly Varden and Whitefish also present.

General Remarks:

Big and Little Pistol are about the same size at the mouth. Just above the mouth the stream is about 18 ft wide, and varies from 3" deep near the shore to 6-12" deep at the center, and occasionally 2 ft, and has a moderately steep gradient. It runs or tumbles along in a series of shallow riffles. In the lower 3200 yds below the mouth of .45 Creek it has a series of small flats or basins 50-75 yds wide, separated from each other by a pinching, in of the valley slopes to form narrows. The left bank frequently is continuous with the valley wall and fairly steep, 2-300 ft high near the mouth and well over 500 ft high below .45 Cr. It has a moderately dense covering of conifers. The right bank is 2-5 ft high in the valley similar to the left where continuous with the valley wall, but is less steep, less rocky, and more open. There is little or no sage, but small grass clumps exist under scattered trees, mostly pine. The small soap bowl shaped basins are usually 150 -200 yds long and have bushes, mainly willow and alder, and a few trees. Deer trails are frequent, usually a foot wide and over 2 inches deep in the soil. There is a small narrow canyon from

2500 yds to 2800 yds.

Forty Five Creek comes in in a long arc to empty into the left bank in a small Y shaped flat. Its valley is about the same size as that of Big Pistol above the junction, or approx. 1/4 mile across ridge tops, which are steep. A few Salmon can use this tributary for some distance, its gradient being moderate enough.

There are two or three small pocket basins or flats in the next 1500 yds above Pistol Creek with grass and some trees, and between these basins the valley floor is approx 30 yds wide, with some fair spawning patches in the stream.

At 5000 yds the river bears to the west and narrows almost abruptly into a steep walled canyon over 800 yds long. A bed rock ledge over 150 ft high rises at the mouth of this canyon, which is so narrow it is like a knife cleft. The left wall is a very steep talus slope or bedrock cliff 300 - 800 ft high, backed by higher mtn. Tops forming Pistol ridge which forms the boundary of the southern edge of the watershed. The right wall is a bit less steep and high and semi open. The stream here is in rapids and there is a small log and trash jamb between the rocks in the channel near the mouth that has a difficult 3, falls. With one or two small 20 - 60 ft wide pockets the valley gradually widens or flares in the next 1200 yds above the canyon to Pop Gun Cr. but the gradient is steeper, and little spawning area is present. Another steep gradient three a rough brushy section of the valley is present for several hundred yards above Pop Gun Cr., and at 7400 yds above the mouth, another larger willow flat 300 yds long is encountered. A beaver dam passable at all times forms a pond, above which there is some fair spawning rubble. After another faster stretch, another beaver dam is located at 8000 yds. This dam is a bad one, 5 ft wide and the water falls three brush on a front 3 ft high, and there is a bad take off, there being only 6 - 8" of water below ~~it~~ to jump from. This dam was very difficult to get over at the time, and its passage at low water is questionable. However, salmon should reach it in July and before low water period would make it a barrier. Above the shallow pool above the dam is some of the best concentration of spawning rubble in the stream so far. The stream winds three willow bush flats about 100 yds across, with occasional gravel and earth benches to the streams edge. Another bad beaver dam similar in conditions to the one just described exists at 8700 yds, but is built in a rocky narrows, and could more easily be washed out by a flood, as an older one above it has apparently been. The stream cuts three rocky soil benches 8 - 25, high for 200 yds and then onto a willow and grass flat or meadow basin again, then another bench and another basin. Three these wet basin bottoms the spawning gravel has accumulated in several good concentrations.

The survey was terminated at the mouth of Twenty Two Creek, but a Forest Service guard stated the stream continues much the

same for another 4 -5 miles.

Most of the beaver works, particularly the lower ones appeared to have been abandoned in the East 2 - 3 years, as there was little evidence of fresh cutting. Perhaps they had cleaned out the larger food trees, (poplar etc, were lacking below) and moved to better feed areas, or perhaps had been trapped out. Deer trails were plentiful, but none of the animals were seen as there had been below on Pistol Cr, but sheep had just swept the valley nearly clean which was perhaps the reason why, even tho this is supposed to be in the heart of the Idaho Primitive area.

There was no evidence of pollution, and no human inhabitants in the area to bother salmon. A road is built in along the upper rim of the watershed from Landmark along Pistol ridge to Lucky Lad mine below the head of Forty Five Creek. This enables sport fisherman to reach the heads of the upper tributaries to Big Pistol, and the Forest Guard reported that the headwaters are moderately fished. Few fish the area surveyed.

The stream had no evidence of a salmon run existing in it at the time, although they have been reported in years past, and a steelhead run is reported at present. It is hard to understand why this stream does not have a salmon run in it. If fall low water conditions are not too severe, as does not seem probable in so large a drainage area, and if winter ice conditions are found to be not detrimental to eggs and fry then the stream should be capable of sustaining a good salmon run. It has no large resting pools, but the smaller (S2) pools and beaver ponds should suffice. There was an estimated 8510 sq yds of spawning area in the 5.9 miles surveyed alone, and more reported above. Approx 50% of the total 63,700 sq yds of bottom is of suitable size for available spawning rubble.

The survey was of the option that if beaver dams are kept open and fall and winter stream conditions for eggs and fry are found to be satisfactory that a salmon run could be successfully started from plantings in the stream.

Temperature Data:

Station	Date	Hour	Air	Water	Skv
A at mouth	7/16/41	9:10 am	67 F	51 F	clear

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6
a-b (5.9 miles)	50	8.5	0	0	0	50	255
			0.0	0.0	0.0	100	

Gradient:

No elevation data available. Gradient was moderate in the basin and willow flat areas, and moderately steep in the narrows between the basin areas. Est 75 - 100 ft per mile in the basins and 100 - 150 ft per mile in the narrows.

Tributaries:

#	Name	Side entered	Distance above on mouth vd	Width ft	Flow cfs	Length mi	Value to Salmon
1.	Forty Five	L.B.	3200	6	5	7	possible to use lower end
2.	Pop Gun	R.B.	6500	2	1-2	1 1/2	none too small
3.	Twenty Two	R.B.	10,300	2	1-2	2	none; too small
4.	Gun	L.B.	6.5 mi			1 1/2	est too small
5.	Forty Four	R.B.	8 mi			4 1/2	?
6.	Chokebore	L.B.	8 1/3			2	
7.	Automatic	L.B.	9 mi			3	
8.	Luger	L.B.	10 1/2			6	
9.	Thirty eight	R.B.	12 1/2			3 1/2	

Tributaries above .22 Creek were not seen.

Little Pistol Creek

River System: Salmon River
Stream Surveyed: Little Pistol Creek

Date of Survey: July 16, 1941 by D.G. Frey
Tabulation and card write up by F.G. Bryant

Source: high on mountain ridges just south of Chilcoot peak on the eastern side of Chilcoot Pass. Originates from union of many small feeders, the main one heading in Sec. 1, T.16N, R.8E

Direction of Flow: a bit north of east for approximately 6 miles, than southeast approximately 7 miles to confluence with Big Pistol to form Pistol Creek in Sec 14, T.16N, R.10E

Approximate Total Length: 13-14 miles, of which the lower 7 miles (12200 yards) up to the mouth of Springfield Creek were surveyed.

Station Location:

Sta	Location	Distance above prev. Station yds miles	Distance above Mouth yds miles	Map Location	Width	Depth
a	at mouth	0 0	0 0	sec 14, T17N R10E		
b	at mouth of Springfield Cr (end of survey)	12140	12140	sec 36, T17N R9E		

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-012-00.10	
b	17060205-012-07.24	

Character of bottom between stations:

Station	Total yd ² bottom	LR	%	MR	%	SR	%	M&S	%
a-b	84100	28370	33.7	29790	35.4	16990	20.2	8950	10.6

Spawning Area available and usable: none, except few yards at mouth

Spawning Area unavailable & usable:

Between stations	Distance yds	mi	Total sq yds bottom	sq yds unavl sp area	% unavl	Sq yds not usable	% not usable
a-b	12200	7.0	84100	46780	55.6	13065	15.5

When unavailable: all unavailable at low water

Cause: a low water barrier log jamb approximately 90 yards above the mouth renders the whole stream unavailable at low water. However, the salmon may reach it before it becomes a low water barrier.

Character of Watershed:

Mountainous	X
Hilly	
Rolling	
Flat	
Swampy	
Wooded	X
Open	
Cultivated %	none
Character of valley	_/
Character of banks	earth, rubble, bedrock usually continuous with valley wall. In valley bottom 1'-4'
Density of Marg Veg.	dense
Erosion: banks	moderate
watershed	moderate

Diversions: none

Artificial Obstructions:

1. 90 yards up, log jamb, BLW passability, pass with difficulty at high water
2. 2200 yards up, log jamb, ok AT, passable around left end
3. 4140 yards up, log jamb, pass with some difficulty
4. 11650 yards up, brush jamb, BLW passability, little overflow, mostly seepage through brush. Difficult at high water.

Other numerous old or smaller log jambs occurs at intervals, there being several between 2500-3500 yards. All unlisted are passable through a wide breach however, and as such are not barriers at all at present.

Natural Obstructions: none in area surveyed

Fluctuation in water level: approximately 2 feet

Stream volume: estimated 75-80 cfs, was approximately half that of Pistol Creek, which was measured at the mouth.

% of Stream bed covered: varies. In several wider stretches

where channel has been shifted or spread out by brush jams, etc. as near mouth, from ~~10-60%~~ is uncovered. The majority is all covered or less than 10% uncovered.

Pollution: none noted

Fish (Salmon):

None observed. Very doubtful if any run exists at present, and if any is a mere handful. Run of considerable size reported to have existed some time back, but none reported in last few years. Stream seems well suited except for clearing out brush barriers, etc. If fall low water conditions are O.K., (and they should be) and winter freezing not severe enough to damage eggs and fry then it should be a good salmon stream, but run will have to be introduced.

Fish (other than salmon):

1. Steelhead: Forest Service packer and guard reported a run present in the spring. We saw no evidence in July.
2. Rainbow: abundant in pools, the dominant species
3. Cutthroat: probably fair number, to abundant in some sections, estimates based on catch in main Pistol Creek approximately 3/4 mile below mouth of Little Pistol.
4. Dolly Varden and Whitefish: probably present. No fishing done in this stream; catches made 3/4 mile below mouth

Little Pistol is probably less fished than Big Pistol, as the roads do not reach it or the tributary heads, making hiking or packing in necessary.

General Remarks:

Little Pistol Creek is a fairly rugged mountainous area, moderately covered with a coniferous forest. It is not unlike that of Big Pistol Creek, which was described in some detail.

From the mouth to Foresight Creek, 2300 yards up, there is considerable flat land in the valley bottom, which is covered with conifers and grass. The gradient is low and numerous brush and log jams caught in the quite dense marginal vegetation have caused the stream to be considerably dissected. There are good S2 pools above these small log and brush jams and usually good spawning rubble in the riffles and the head of the pools. This condition continues with a slight increase in gradient for the next 2000 yards or so, and then the valley gradually closes in to form a steep walled canyon which runs up to Savage Creek at 9850 yards. There are, however, usually narrow flat strips along one side or the other of

the stream, thus forming a narrow canyon floor up to 40 yards wide. This narrow floor is a dense jungle of alders and dogwood. Trigger Creek at 6450 yards up enters from a side valley through three channels on a small flat and probably could be used by Salmon only near the mouth in the canyon section. The rubble is larger, the gradient considerably steeper, there is less usable spawning area and several series of cascades and fast water are present.

Above Savage Creek the valley again widens a bit, the gradient becomes less, the rubble smaller and more log and brush jams appear with small pools above them and some good riffles. Approximately 1000 yards above Savage Creek the gradient again becomes steeper, with cascades and rapids quite prominent and with less spawning area. There is a second bad brush jamb, a barrier at low water due to seepage, at 11600 yards. The survey was stopped at Springfield Creek, the stream being of little value for spawning at that point, due to steep gradient.

As with the several large tributaries of the Middle Fork right bank in this remote and uninhabited rugged country, there is no apparent reason indicated why salmon runs do not exist, or why they have disappeared in fairly recent times. The occasional log and brush jams that are barriers perhaps at low water are subject to washing out, and can probably be passed in June or early July before low water period and when the salmon run should be in the streams. Mining, causing pollution and excessive taking of spawners on the riffles could hardly seem to have been an important cause as there is no evidence of any extensive mining along the stream. Flash floods of mud from steep mountainside small tributaries after cloud bursts have undoubtedly occurred, but could hardly have effected more than one or two years runs at a time. Fall low water may expose some side spawning gravel bars and destroy some eggs, but could hardly have got a large percentile due to the occasional flats with a large drainage area which indicate it would not be entirely too low. Severe winter freezing and ice damage to eggs and fry is a possible answer, and should be investigated, but the gradient as a whole seems hardly steep enough, at least below Springfield Creek, to cause loss of all of a hatch. Whatever the cause, there is no run, or at most possibly a small number that evaded detection, unless they arrive later than in the upper tributaries of the Middle Fork, and after the date of the survey. Trout seem abundant, large, and well fed, and seemingly the stream is a fine one for salmon if the brush barriers are removed and planted runs established after fall and winter conditions investigated. Most of the tributaries are too small and steep to be available, but over 13065 yards were found usable for spawning below Springfield Creek mouth in the main stream.

Temperature Data:

<u>Station</u>	<u>Date</u>	<u>Hour</u>	<u>Air</u>	<u>Water</u>	<u>Skv</u>
a	7-16-41	9:10 am	67 F	51 F	clear

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-b (7 miles)	44	6.3	0	0	9	35	423
					20.5	79	

Gradient:

No elevation data available with any accuracy of determination. Elevation at mouth of Pistol Creek is 4740 feet (USGS Plan and Profile maps), therefore at the mouth of Little Pistol is approximately 5000 feet. The mountain ridges enclosing its drainage are seldom over 3 miles air line from the stream, particularly to the north, and the peaks along this ridge are all close to, or over, 9000 feet. By Big Baldy above the head of Colt and Trigger Creek is 9722 feet, Chilcoat Mountain at the head of Little Pistol is 9020 feet. Thus the stream has a total drop of approximately 3500 feet in 13-14 miles. The gradient in the first two miles is low to moderate, under 100 feet per mile estimated. In the canyon below Savage Creek, and in the faster water at the upper end of the survey by Springfield Creek it is steeper, or over 100-150 feet per mile. The upper end, not surveyed, is undoubtedly very steep on the mountain ridges.

Tributaries:

1. None, enters on rt bk, 610 yards above mouth, 1' wide, few yards in length according to map, 1 cfs, no value to salmon, spring feeder
2. Foresight Creek, enters on rt bk, 2360 yards above mouth, 5' wide, 4 1/2 miles in length according to map, 5 cfs, no value to salmon, too steep gradient
3. No name, enters on rt bk, 3960 yards above mouth, 1-2' wide, 1 1/2 miles in length according to map, 1 cfs, no value to salmon, too steep gradient
4. No name, enters on rt bk, 4590 yards above mouth, 1-2' wide, 1 1/2 miles in length according to map, 4 cfs, no value to salmon, too steep gradient
5. No name, enters on lt bk, 5200 yards above mouth, 1-2' wide, 1 1/2 miles in length according to map, 1 cfs, no value to salmon, too steep gradient, blocked at mouth by beaver dam
6. Colt Creek, enters on rt bk, 5260 yards above mouth, 3' wide, 2 1/2 miles in length according to map, 2 cfs, no value to salmon--too steep
7. Trigger Creek, enters on rt bk, 6460 yards above mouth, 6' wide,

4 miles in length according to map, 8 cfs, little or no value to salmon, 3 channels at mouth make difficult to enter, steep above, few square yards at mouth only.

8. Remington Creek, enters on lt bk, 7740 yards above mouth, 2' wide, 2 miles in length according to map, 5-8 cfs, no value to salmon, too steep and rugged channel inaccessible.

9. No name, enters on lt bk, 9250 yards above mouth, 1' wide, 3/4 mile in length according to map, 1 cfs, no value to salmon--too small and steep, inaccessible

10. Savage Creek, enters on rt bk, 9850 yards above mouth, 3' wide, 3-4 cfs, little or no value to salmon--too steep and narrow

11. Winchester Creek, enters on lt bk, 9880 yards above mouth, 2' wide, 2 1/2 miles in length according to map, 2 cfs, no value to salmon--too steep, 50 degree gradient

12. Stevens Creek, enters on rt bk, 11930 yards above mouth, 3' wide, 2 1/2 miles in length according to map, 3 cfs, no value to salmon--too steep

13. Springfield Creek, enters on rt bk, 12140 yards above mouth, 6' wide, 5 miles in length according to map, 5-8 cfs, little value to salmon--possible near mouth, small and steep above

(the above streams were inspected during survey 1941)

Note: tributaries #14 and up were not seen, being above the survey. Date is estimated from maps of U.S. Forest Service, Payette National Forest, and from comparison with size of streams inspected below them.

14. Unnamed, enters on lt bk, approximately 7.5 miles above mouth, estimated 2' wide, 2+ miles in length according to map, approximately 2 cfs, no value to salmon, probably too small and steep

15. Martin Creek, enters on lt bk, approximately 9 miles above mouth, estimated 2' wide, 2 1/2 miles in length according to map, approximately 2-3 cfs, no value to salmon--probably too small and steep

16. Unnamed, enters on lt bk, approximately 9.7 miles above mouth, estimated 6' wide, 5-6 miles in length according to map, approximately 6-8 cfs, possibly a little value to salmon--tributary from Pistol Lake

17. Unnamed, enters on lt bk, approximately 12.5 miles above mouth, estimated 3' wide, 2 1/2 miles in length according to map, approximately 2-3 cfs, no value to salmon--small and too steep.

Rapid River

River System: Salmon River

Stream Surveyed: Rapid River, tributary of the Middle Fork of the Salmon River

Date of Survey: July 17 & 18, 1941 by D.G. Frey and F.G. Bryant

Source:

Drains the NW section of the Challis National Forest and Custer County, Idaho. Drainage area bounded by that of Middle Fork of Salmon River and Little Soldier Creek on the north; the Little Loon Creek and head of Loon Creek to the northeast, east and southeast of Beaver Creek to the south, and Fall, Soldier, Greyhound and other small creeks tributary to the Middle Fork of the Salmon River on the West.

Rapid river is formed by the union of Pinyon Creek and Bernard Creek in sec. 15, T.14N. R. 12 E.

Direction of Flow:

With minor looping it runs a bit north of west for approximately 5-6 miles to pick up Vanity Creek just north of the Seafoam Ranger Station. It then runs north approximately 7 miles to the mouth of Sheep Creek: In the next three miles to Cabin Creek it swings in a big loop to the west, and runs Northwest from Cabin Creek approximately 4 miles to its confluence with the left bank of the Middle Fork in sec. 32, T.16N., R. 11 E.

Total Length:

Approximately 20 miles, of which the lower 12.6 miles to the mouth of Float Creek were surveyed.

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		vds	miles	vds	miles			
a	at mouth	0	0	0	0	sec 32, T16N R11E	24'	6-18"
b	at mouth of Cabin Creek	7400	4.2	7400	4.2	sec 3, T15N R11E	30'	6-15"
c	at mouth of Lucinda Creek	7300	4.2	14700	8.4	sec 19, T15N R12E	24'	6-15"
d	at mouth of Float Creek	7500	4.3	22200	12.6	sec 1, T14N R11E	21'	6-12"

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-016-02.73	
b	17060205-097-00.00	
c	17060205-041-00.00	
d	17060205-041-04.81	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-b	74,300	23,820	32.1	26,070	35.1	17,925	24.1	6,485	8.7
b-c	58,200	24,620	42.3	17,540	30.1	10,220	17.6	5,820	10.0
c-d	57,800	24,800	42.9	16,580	28.7	10,640	18.4	5,780	10.0
Total	190,300	73,240	38.5	60,190	31.6	38,785	20.4	18,085	9.5

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
a-b	7400 4.2	74,300	43,995	59.2	18,909	25.5
b-c	7300 4.2	58,200	27,760	47.7	4,950	8.5
c-d	7500 4.3	57,800	27,220	47.1	1,930	3.3
Total	22,200 12.6	190,300	98,975	52.0	27,669	14.5

Spawning area unavailable and unusable: none

Character of Watershed;

	a-b	b-c	c-d
Mountainous	X rugged	X	X
Hilly			
Rolling			
Flat			
Swampy			
Wooded			
Open	at present; burned off, increasing above to light	light to moderate	moderate
Cultivated (%)	none	none	none

Note : Stream is entirely in a big, narrow canyon, usually very steep, with a lot of rock and rubble outcrops and talus slopes. Small flats occur at intervals such as at Cabin Creek.

Artificial Obstructions:

No.	Location	Type	Passability	Remarks
1	4960 yds up	log jam	all times	4 ft high: not an effective barrier
2-4	14000-14200 yds	log & brush jams	all times	couple trees & logs & drift in narrow gash canyon making small dams.
5	19900	" "	all times	Old one now circumvented. No barrier at all.
6	21500	brush dams	all times	Trash collected on logs, etc. & from small pools. No barriers.

Natural Obstructions: none

Fluctuation in Water Level:

Sta	Ft. Variation	Cause	Stream Volume	% Stream Bed Covered
a-b	2 ft.	spring run off of melted snows	est 150'	mostly all 1st 3 mi, 50-70% last mi
b-c	5"	"	est 130,	90% to all
c-d	5"	"	est 120'	nearly all

Pollution: none noted

Fish (Salmon):

None observed: water was clear and no deep large pools, so if any present they must be few and far between. No spawning evidenced. Seafoam Ranger says there has been a small run in the past into Vanity and Seafoam Creeks. Run must be very small. Stream seems a very good one for a considerable run. Introduction of a run of Spring Chinook should be successful and have great potentialities if winter conditions are checked and found not detrimental.

Fish (other than Salmon):

1. Steelhead: reported, but vaguely so. None seen. Small run probably present in the spring.

2. Rainbow: fair number. Abundant in beaver ponds on flats. Caught 1 from horseback July 17th, when saw 3-4 in pool by trail. Took 8 more below mouth of Cabin Creek that night.

3. Cutthroat: 2-3 taken below Cabin Creek afternoon of July 17th, but not as numerous as rainbows by far.

Probably dolly varden, whitefish and sculpins exist, but did not see or take any. Only fished that one night for an hour or so. Stream appears to have fewer fish than Pistol Creek, etc., probably because of swift water and more people going along it by trail on way in to the Middle Fork from Sta from Ranger Station road.

General Remarks:

The name Rapid River describes the stream in its lower 2 miles. It is a nearly continuous white water stretch with steep gradient, and no pools except S6 in the cascades. The rubble is too large for spawning and the entire stretch is of no value to Salmon or trout, except that passage thru it is unhampered. The stream occupies nearly the entire bottom of a narrow rough rocky canyon with bare rock walls rising as cliffs or steep slopes of

mainly talus and rubble for 200-800 ft., and backed by high mountain slopes. A 30 day fire several years ago destroyed every vestige of plant covering except for a few scattered weeds and small bushes that have sprung up since, willow and alder.

In the third mile the valley bottom widens to a flat, 25-50 yds wide, thru which the stream courses at a more moderate pace. Good riffles and smaller good useable rubble appear, from 30 to 50% of the bottom being usable for salmon spawning in 800 yds of stream.

At 4600 yds the high canyon walls again pinch in to the streams edge for 3-400 yds, to emerge onto another bit wider willow-alder flat with splendid riffles and an unusually high continuous concentration of spawning rubble amounting to from 60 to 70% of the total bottom. This very good stretch extends from 5000 yds to 7000 yds, and in it are small S2T2 resting pools at quite regular intervals. The flat, with numerous beaver ponds along the stream edge, but none blocking the main channel, extends up above the mouth of Cabin Creek, being over 300 yds wide and a tangle of bushes and swamp grass with shallow bushy areas ponded by the beaver dams. Several 6-10" trout, mostly rainbows, were taken in this stretch, one being caught from on horseback from a pool by the trail.

Cabin Creek is small, and only a very small area at the mouth is suitable for salmon, it being too bouldery and steep above.

Above Cabin Creek the valley narrows progressively, to approximately 30 yds wide at 7700 yds, 20 yds at 7900 yds and 10 yds at 8100 yds. The walls are steep, 300 ft or more high and of more rock than dirt. Pine and other trees have appeared and are increasing upstream. There is a small pocket flat approximately 75 yds wide and 150 yds long with bushes and grass at 9100 yds, and a fairly good but small patch of spawning rubble exists there.

Immediately above this pocket, rocky cliffs close in on the stream to form a narrow canyon with fast C1 riffles and cascades. The rubble becomes too mixed for much use for spawning due to the increased gradient, there being but small patches behind boulders or in a narrow vein along the streams edge, and not over 5% usable. This condition continues to the mouth of Sheep Creek at 12100 yds, with two small willow and grass flats in the stretch. Sheep Creek had a flow of 10-12 cfs, and was approximately 6 feet wide. The bottom rubble in the lower 200 yds was 50-30-10-10 to 60-20-10-10. It quickly becomes rougher and steeper, as it lies in a rocky brush bordered gully and has little value to salmon except at the mouth.

For 500 yds above Sheep Creek there was another good concentration of spawning rubble, with one very good (70% usable) 75 yd long riffle. The right bank here is a 200 ft high rotten rock cliff and the left a narrow rubble and earthy bench backed by

eroded steep slopes, largely talus, and several hundred feet high. Bushes and trees border the stream edge where it is possible to get a foothold. Several deer were feeding by the stream. At 13700 yds 2 old trash jams, now broken thru had concentrated some usable rubble above them at the foot by talus and slide areas. At 14200 ft 2-3 tree, log and trash jams, one with a 3 ft falls in a rocky narrows, existed with small pools above them. The canyon now has become deeper and its walls higher and steeper. The trail is forced up 2-300 ft on the left bank to follow along earth covered shoulders above cliffs that the stream has cut thru, and between these shoulders are mainly long steeply inclined talus slopes, some 1000 ft high. These steep talus slopes apparently feed large rubble (6-18") into the stream so fast that with its steep gradient there is little time to concentrate the smaller rubble for spawning use, there being but 2-3 sq yds here and there.

Lucinda Creek at 14700 ft comes out of a steep side gully and had been washed and gauged out by a cloudburst (probably in '38) which dug a 15-20 ft deeper channel out of the slopes and spread it out to a depth of several feet and for 50 yds or more thru the trees to the river at its mouth. It now enters thru two of the several channels in this rubble littered floodfan and is of no use to salmon. Trees exist wherever earth gives them a foothold, being a fairly uniform covering on the right bank, for 50-100 yds up the left bank, and in fingers up the slopes above that, but the upper slopes are usually more talus and rock cliffs, with talus fingers clear to the waters edge at intervals. It is a very rugged country.

The canyon continues with increasing depth and steepness above Lucinda Creek. More earth is appearing with trees on the left bank by now, and the right bank is very steep, usually 70 to sheer, and 5-800 ft backed by steeper slopes to ridge tops above. There is little spawning rubble, due to fast water and mixed bottom, except for small patches, until another very small flood gauged tributary, Bruin Creek, is reached at 16900 yds. Above Bruin Creek the talus slopes feeds smaller rubble into the stream and this is broken up further in the water by mechanical action to increase the spawning area to average 10-20% on a series of fine riffles on a more moderate gradient. Spawning would be excellent for over a mile thru here if the rubble was not just a bit too large and mixed. Above Opal Creek at 19300 yds the stream becomes steeper, rougher and poorer again.

Sulphur Creek at 20000 yds in approximately 5' wide and 5" deep and salmon can use the bottom area for several hundred yds above the mouth, but it then becomes too steep rough and small for to be of any value.

From Sulphur Creek to Lime Creek at 21500 there is little spawning, usually patchy, and there are white water rapids at intervals. Lime Creek has also been scooped out by a cloudburst recently.

The stream continues steadily' fast, with the rubble on the riffles just a bit too large and too mixed for good spawning, until the survey was stopped at the mouth of Float Creek. Float Creek and the area above appear to have possibilities, but lie in steep walled canyons several hundred feet deep, with brush and trees now thick enough to make the going quite difficult and extremely slow when off the main trails. The spur road from the Seafoam Ranger Station is located about 200 yds up the slopes from Float Creek.

The Forest Ranger at the Seafoam Ranger Station reports a run of spring chinook in Rapid River. He says that they have been seen in Vanity Creek, and even in little Seafoam Creek by the Ranger Station personnel as well as having been seen in the main stream. The run cannot be very extensive at present however, as no salmon were seen below Float Creek, and there are no big deep pools that any large number could have been overlooked in. The S2 pools are all comparatively small, but salmon would have been seen in some of them if there was any considerable concentration in the stream. Some salmon in Marsh Creek, some 15 miles above Seafoam Ranger Station by air line, had even completed spawning by July 24th, yet there was no digging on the riffles of Rapid River. Some stretches in the canyon had to be viewed from the trail on the canyon walls 2-300 ft above, but the water was crystal clear and never over 3 ft deep, as the bottom could easily be seen, even from that height.

Rapid River definitely appears to be one of the best potential salmon streams tributary to the Middle Fork so far. It had a total estimated useable spawning area in the 12.6 miles from the mouth to Float Creek, of 27669 sq yds (14.5%) and 98975 sq yds of available, or 52% of the total bottom. Over 18000 yds of the 27669 useable was in the 2 miles of fine spawning riffles below Cabin Creek. There is the added possibility that some of the larger and mixed rubble in the upper 8 miles could also be used if the good riffles should ever become crowded, and there seems little possibility of that with no fish in evidence at the time of the survey. With no diversions, pollution, dams or obstructions, there seems little improvement necessary on the stream except to plant and protect salmon runs. The area below Float Creek is reached by trail only and the stream is but lightly fished, except in the vicinity of Float Creek at the end of the road.

The several tributary streams that had been gullied deeply by flash floods shows that a mud wash due to a cloudburst on the rugged steep slopes might kill off a portion of a run in the stream below at infrequent intervals, but it would hardly seem to blame for so small a run in so good a stream.

The Sea Foam mine on Harlan Creek, a small tributary to Float Creek may have caused some pollution in the past, and the Greyhound Mine on Sulphur Creek may also have contributed to the cause, but no evidence of pollution was found during the survey. Trout taken were plump and doing fine. Winter ice conditions, with anchor ice a certainty in some seasons due to the fairly steep and continuous

gradient and few pools could damage fry or eggs, and should be investigated. If found to be not too severe, this stream should be capable of maintaining a good big run of several thousand spawning spring chinook.

Temperature Data:

Station	Date	Hour	Temperature				Sky
			Air		Water		
a, at mouth	7-17-41	1:15 pm	83 F		58 F		70% cloudy
b, at Cabin Creek, 4 mi up	7-17-41	5:00 pm	73 F		59 F		60% cloudy

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6
a-b (4.2 miles)	20	4.8	0 0.0	0 0.0	7 35.0	13 65.0	234
b-c (4.2 miles)	34	10.6	0 0.0	0 0.0	0 0.0	34 100.0	177
c-d (4.3 miles)	19	4.4	0 0.0	0 0.0	0 0.0	19 100.0	263
Total (12.6 miles)	73	5.8	0 0.0	0 0.0	.7 9.6	66 90.4	674

Gradient:

No accurate surveyed data available except that elevation at mouth of Rapid River is 4890 ft (USGS plan and profile maps). The upper tributaries all head up on high mountain ridges with peaks over 9000 ft high. The lower tributaries head up between 8000-9000 ft. The total drop from head to mouth is approximately 3500-4000 ft. The gradient is moderate on the flats, where the best spawning occurs, and probably averages not over 100 ft per mile. In the canyons and more rapid stretches it is probably about 150 ft per mile, moderately steep, with the tributaries much steeper.

Tributaries:

No.	Name	Side	Distance above mouth	Length	Width (ft)	Flow cfs	Value to Salmon
1.	unnamed	RB	3960 yd	.75 mi	2'	1-2	none, inaccessible, steep
2.	Hardscrabble Creek	RB	6800 yd	2.5 mi	2'	3	few yd ² @ mouth, to small, rough & steep salmon
3.	Cabin Creek	LB	7420 yd	2.5 mi	3'	3-4	II II

4.	Potterwine	LB	7700	yd	1.75	m	1.5,	1	none, too small
5.	unnamed	LB	9100	yd	est	.5	1.5,	1	" "
6.	Spruce Ck	LB	10,000	yd	1'	mi	1.5'	1	" "
7.	Sheep Ck	LB	12,100	yd	6-7	mi	6'	10-12	a few fish can use area near mouth, rough and steeper above. Little if any value.
8.	Lucinda Ck	LB	14,700	yd	3.5	mi	3,	3	none; has been gullied out by a flash flood, & entrance through 2 small channels on rubble fan.
9.	Aspen Ck	LB	15,550	yd	1.25	mi	1,	1	none; too small.
10.	Bruin Ck	LB	16,900	yd	1.25	mi	1,	1	none; too small.
11.	Garnet Ck	RB	17,500	yd	1.5	mi	1.5,	1	gullied by flash flood. none; too small and steep.
12.	Pearl Ck	RB	18,400	yd	1	mi	.75'	.5	" "
13.	Opal Ck	RB	19,300	yd	.5-.75		1'	1	" "
14.	Bridge Ck	LB	19,800	yd	.5	mi	.5'	.5	" "
15.	Sulphur Ck	RB	20,000	yd	5+	mi	5,	8-10	small amt spawning near mouth. Rough and steeper above.
16.	Lime Ck	LB	21,500	yd	4	mi	3'	2	none; has been gullied out by flash floods.
17.	Float CK (*)	RB	22,200	yd	8	mi	10'	25-50	Possibilities, needs to be surveyed.
(Tribes above Float Creek were not examined by survey and are roughly estimated from maps.)									
18.	Drop Ck	LB	14.5	mi	.75	mi	1.5,	1	none; too steep & small
19.	Vanity Ck (*)	RB	14.6	mi	7+	mi	10,	25-50	possibilities; run reported in past. needs surveying. Mostly in deep canyon.
20.	Shady Ck	RB	16.2	mi	3.5	mi	3-4,	5	?
21.	Casto Ck	RB	17	mi	2.75	mi	3'	5	?
22.	Fontey Ck	LB	17.4	mi	1	mi	1'	1	none; too small & steep
23.	Duffield Ck	LB	18.5	mi	7	mi	10'	25-40	possibilities. Should be looked at, though difficult.
24.	Pinyon Ck joins	LB	20	mi	3	mi	4'	5-6	probably none, quite small
25.	Bernard Ck	RB	20	mi	3.5	mi	4,	5-6	?, a little possibly.

(*) note: These streams are large enough to have possibilities and should be surveyed if possible, but are in quite rugged canyonous country and will be difficult to get at and work, often no trails available.

Soldier Creek

River System: Salmon River
Stream Survey: Soldier Creek

Date of Survey: July 21, 1941 by D.G. Fry
Card write up by Bryant

Source: Soldier Lakes, located to the west of Mt. Mills and southwest of the southern end of Greyhound ridge in sections 23,24,25, and 26, T.14N., R.10E. Drainage area lies between that of Greyhound and Fall Creeks, and the head is near the upper end of Float Creek, tributary to Rapid River.

Direction of Flow: A bit west of North from source to confluence with left bank of the Middle Fork of the Salmon River in section 23, T.15N., R.10E.

Approx Total Length: 8 miles of which the lower 3 miles were surveyed.

Station Location:

Sta	Location	Distance above prev. Station yds	miles	Distance above Mouth yds	miles	Map Location	Width	Depth
a	at mouth	0	0	0	0		n/a	n/a
b	end of survey		3.0		3.0		n/a	n/a

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-018-00.00	
b	17060205-037-02.01	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
all	18,200	5,580	30.2	7,930	43.6	2,760	15.2	1,930	10.6
mouth to 3 miles up									

Spawning Area Usable and Available:

Station	Distance vds	miles	Area (yd ²)	Spawning Area (yd ²) (MR&SR)	Usable % Avail	Spawning Area (yd ²)	Usable %
all	5,300	3.0	18,200	10,690	58.7	895	4.9

spawning Area Unavailable: none in lower 3 miles surveyed. Beaver dams reported in next 3 miles that would bother salmon.

Character of Watershed:

Mountainous x rugged
 Hilly
 Rolling
 Flat
 Swampy
 Wooded x coniferous forest
 Open
 Cultivated (%) none
 Character of valley V only 1 or 2 places with average flat valley
 Character of Banks bottom 2' high in valley; usually is valley walls
 mainly gravel and talus
 Density of Marginal Dense
 Vegetation
 Erosion (of banks) Moderate
 Erosion of moderate to severe
 Watershed

Diversions: none

Artificial Obstructions:

No.	Location vds. UP	Type	Passability	Remarks
1.	360	Brush jamb	all times	
2.	470	Log and brush jamb	all times	Passable with considerable difficulty.
3.	1400	log jamb	A.T. difficult	A bad log jamb.
4.	1680	log and debris dam	A.T. difficult	2 ft falls over big log with debris behind it.

(Beaver dams reported bad above end of Survey)

Natural Obstructions: none in area surveyed

Fluctuation in Water Level:

- A. Feet variation; 2 ft indicated on banks
- B. Stream volume; rough est; 20 - 40 cfs
- C. % of stream bed covered; usually all

Pollution: None yet. Probably will be considerable after 1942 with establishment of a gold mine roller mill on the stream. (see card 14)

Fish (salmon):

None reported or seen. Visibility very good. A Mr. Wurnett (sp?), part owner of mine on stream, stated that to his knowledge, and he has fished the stream for over 4 years now, there are no salmon or steelhead in Soldier Cr., nor have they ever been seen in it.

Fish (other than Salmon):

Mr. Wurnett, mine owner states that in the last 4 years he has caught, Rainbow Trout, cutthroat trout, and Montana Blackspot trout in the stream. He reported also that there are no steelhead, no brook trout, no dolly varden trout, or White fish in the stream.

General Remarks:

This stream apparently does not get too low for salmon due to the 6-8 small mtn lakes at its head. It is rarely over 15' wide and has no deep or large pools. The gradient is moderately steep in the area surveyed, with many rapids and S6 pools. There are only 2 small flat valley bottoms in the 3 miles surveyed, most of the rest being in a narrow steep walled canyon. The valley slopes are steep, often reaching to the waters edge, and mainly of gravel and talus.

One half mile above the mouth a gold mine roller mill is being built this year, and is expected to be put in operation by 1942. The mine at this site is owned by a Mr. Wurnett and Mr. Brockman, and has been run for the past 4 years, but is getting into the pay lode now. A bulldozer is going to push a road in to the mine to enable machinery for the mill to be brought in either in the fall of '41, or the spring of '42. This will affect this section of the Middle Fork in two ways; first, the roller mill will undoubtedly pollute Soldier Creek and to some extent the virgin Middle Fork below it with either mine waste or chemicals, or both. Second, and perhaps worst, unless the road is kept closed to the public it will open up this section of the Middle Fork to tourists, fishermen and hunters coming in by car for the first time in history.

The stream at present seems capable of handling a small run of salmon, but with the mine and roller mill in operation after 1942 its value will probably be totally lost. It should be investigated before any stocking is considered.

Temperature Data:

<u>Station</u>	<u>Date</u>	<u>Hour</u>	<u>Air</u>	<u>Water</u>	<u>Sky</u>
at mouth	7/21/41	9:10AM	53 F	48 F	clear

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2- %	S2T1 %	S2T2 %	S6
all (3.0 miles)	19	6.3	0	0	2	17	111
			0.0	0.0	10.5	89.5	

Gradient: The elevation at the mouth of Soldier Creek is 5145 feet, (U.S.G.S. profile map Middle Fork Salmon River). Soldier lakes at the head are on a ridge estimated at between 8000 and 8500 feet elevation (Forest Service Maps). The average drop per mile for the entire stream is approx. 400 feet. The gradient in the lower 3 miles is less steep, estimated at 150 - 200 feet per mile or moderately steep. There is no accurate data available.

Tributaries:

No.	Name	Side entered on	Distance above mouth	Length approx.	Width	Flow	Value to Salmon
1.	Thecket	R.B.	3720 yd	3 mi	3 ft	3 cfs	none too steep and small
2.	unnamed	L.B.	3800 yd'	1/4 mi	1 ft	1 cfs	none too steep and small
3.	Muskeg	R.B.	3 1/4 mi est.	4 mi	3-4 ft	5 cfs	? above end of survey not seen.

Elkhorn Creek

River System: Salmon River
Stream Survey: Elkhorn Creek

Date of Survey: July 21, 1941 by D.G. Frey
Tabulations and Card write up by F.G. Bryant

Source: Ridge slopes S.E. of Pistol Ridge. Pistol ridge separates its drainage from that of Forty Five Cr., (trib to Pistol Cr.) on the North. Bordered by Deerhorn Cr. on N.E., Ramshorn and Sulphur Cr. drainage on the South. Originates from union of several small tributaries, main ones heading in sec. 33 and 34, T.15N., R.9E.

Direction of Flow: East and Southeast to join right bank of Middle Fork of Salmon River in sec. 21, T.15N., R.10E.

Approx. Total Length: 8+ miles, but marked as intermittent in upper 5 miles on U.S.F.S. maps. Lowest mile only surveyed, as stream then appeared of little value to salmon.

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		yds	miles	yds	miles			
a	at mouth	0	0	0	0		n/a	n/a
b	end os survey		1.0		1.0		n/a	n/a

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-018-02.57	
b	17060205-209-00.00	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.		M.R.		S.R.		M&S	
			%		%		%		%
a-b	5,500	2,450	44.5	1,950	35.5	550	10.0	550	10.0
b-c	3,400	1,360	40.0	1,260	37.1	440	12.9	340	10.0
Total	8,900	3,810	42.8	3,210	36.1	990	11.1	890	10.0

a-b: 1st 1100 yds avail AT
b-c: next 700 yds unavail LW

Spawning Area Available and Usable:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable	
a-b	1,100	0.6	5,500	2,500	45.5	0	0
1st 1100 yd to 1st low water barrier							

Spawning Area Unavailable and Unusable:

Station	Distance	Area (yd ²)	Area Unavail (yd ²)	% unavail	when avail	usable unavail (yd ²)	% usable unavail
b-c	0.4 mi	3,400	1,700	50.0	LW	77	2.3
above 1st 1100 yds and 1st LW barrier							

Cause: a log jamb sedimented in above and with spill thru a brush and trash front that prevents jumping at times of low water. Location 1100 yds above mouth.

Character of Watershed:

Mountainous **x** rugged
 Hilly
 Rolling
 Flat
 Swampy
 Wooded **x** coniferous forests
 Open
 Cultivated (%) none
 Character of **V to _ /**
 valley
 Character of Banks 1-20 **ft** in valley bottom; as valley walls
 often talus, bed rock, gravel
 Density of Marginal very dense
 Vegetation
 Erosion a) of banks moderately severe
 b) of watershed moderately severe

Diversions: none

Artificial Obstructions:

1. 190 yds above mouth. Bad log and brush jamb. Difficult. Passage questionable at low water.
2. 760 yds above mouth. Bad log and brush jamb. Passable with difficulty

3. 1160 yds above mouth. Bad log and brush jamb. Barrier at low water; seepage thru brush face.
4. 1850 yds above mouth. Bad log jamb. Appears to be barrier at all times till removed.

Natural Obstructions:

1. 1000 yds above mouth. 4' cascade falls. Passable with some difficulty.
2. 1200 yds above mouth. 5' cascade falls. Passable with some difficulty.

Fluctuation in Water Level:

- A. Ft. variation; 1-2 ft indicated on banks
- B. Stream Volume; *ca 20 cfs est.
- C. % of stream bed covered; all, or nearly all.

Pollution: none noted

Fish (Salmon): none seen.

Apparently no run in the stream at present, as fish were in Marsh Cr. at this time. Visibility good. Stream has little value for salmon.

Fish (other than Salmon): none observed.

Rainbow probably present and perhaps cutthroat, but none seen in section covered. No fishing attempted.

General Remarks:

Elkhorn lies in a rugged mountainous country, and is mostly in a steep sided canyon, the slopes being mainly of talus, gravel or bedrock, with a coniferous forest covering the area. There is little flat land in the valley bottom. The banks are often continuous with the valley walls, and the marginal vegetation is very dense on the small flats and benches encountered. It consists of dogwood, alder, willow, rose bushes, thornapple and some conifers. A trail had been opened up the creek in years past, but was practically obliterated and useless to follow at present.

The gradient is fairly steep, with continuous white water from which boulders project in the lower area surveyed, with few exceptions. There were several log and trash jams and 2 cascade falls. A log jamb at 1160 yds was considered a low water barrier, as it had been sedimented in behind, and the water fell thru a mass of logs and brush on the front that would make jumping almost an impossibility. It would be passable if the water were raised a foot or so the stream, but such high water conditions are probably in existence only earlier in the spring before salmon reach the stream.

At the end of the survey a 50' log jamb appeared to be impassable at all times.

The stream appears to have little or no value to salmon in its present condition and since it has no run at present and is comparatively small, it hardly seems worth attempting to improve it, as the time and money could better be spent on other larger tributaries that need the attention and have much greater potentiality. There was no usable rubble below the 1st low water barrier @ 1100 yds and only 77 sq yds in the 1st mile.

Temperature Data:

Station	Date	Hour	Air	Water	Sky
at mouth	7/21/41	3:30pm	81 F	58 F	10% cloudy cumulus

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-b (1.0 mile)	5	5	0 0.0	0 0.0	2 40.0	3 60.0	108

Gradient: The mouth of Elkhorn Cr. is 5275 ft in elevation (U.S.G.S. plan and projects). It heads on ridges close to 8000 ft high. Average drop per mile for entire stream estimated @ 350 feet. Average drop per mile for lowest mile as surveyed est. @ 150 ft per mile, or moderately steep.

Tributaries:

No	Name	Side enters on	Distance above mouth	Length	Width	Flow est	Value to salmon
1.	Mine Cr	R.B.	1190 yd	2 1/4 mi	2 ft	1-2cfs	none; steep inaccessible
2.	Lucky Cr.	L.B.	1 3/4 mi est.	3 1/2 mi	3-4 ft est.	5-6 cfs	? probably non barrier below i in main stream at present
3.	unnamed	L.B.	2 mi est.	5 mi	5 ft est	10 cfs	? probably non barrier below it in main stream at present

Sulphur Creek

River System: Salmon River

Name of Stream Surveyed: Sulphur Creek

Date of Survey: July 23, 1941, by D.G. Frey

Card write up and tabulations by F.G. Bryant

Source: Main stream is formed by the union of several small tributaries in the southwest part of Township 14N., R.8E, near the central portion of the eastern edge of the Payette Nat. Forest Idaho. The two main head tributaries originate in sections 19 and 32, T.14N. R.8E.

The drainage of Sulphur Cr is bordered by that of Elkhorn and Ramshorn Creeks on the North, and by Bear Valley Cr. and its tributary Elk Cr. on the South. On the west, separated from it by a height of land, is the South Fork of the Salmon River.

Direction of Flow: mainly east to confluence with the right bank of the Middle Fork of the Salmon River in sec. 18, T14N, R.10E.

Approx Total Length: 19 miles, of which the lower 10 miles were surveyed up, to the mouth of Honeymoon Creek.

Station Location:

Sta	Location	Distance above prev. Station vds	miles	Distance above Mouth vds	miles	Map Location	Width	Depth
a	at mouth	0	0	0	0		n/a	n/a
b	end of survey		10.0		10.0		n/a	n/a

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-020-05.47	
b	17060205-485-00.00	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
all (mouth to Honeymoon Creek)	139,500	19,940	14.3	42,540	30.5	38,860	27.9	38,160	27.4

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
all (mouth to Honeymoon Creek)	17,700 10.	139,500	81,400	58.4	36,977	26.5

Spawning area unavailable or unusable: none in area surveyed

Character of Watershed:

Mountainous x
 Hilly
 Rolling
 Flat
 Swampy x in middle portion
 Wooded x conifers, pines, and fir
 Open
 Cultivated (%) < 1%
 Character of Valley ___/ 1/2 mile wide bottom at times; narrower above end of survey
 Character of banks
 a) composition dirt and rubble below, mainly dirt above
 b) height and slope 1-4' in valley; vertical to sloping
 Density of Marginal vegetation very dense; often overhanging stream (alder and willow)
 Erosion
 a) of banks extensive
 b) of watershed quite extensive

Diversion: none

Artificial Obstruction:

No.	Location vds	Type	Passability	Remarks
1.	1900 up	log jamb	all times	2' drop, big jamb, but passable at present.
2.	1900 *5000	logs in stream	all times at present	Many logs strewn along stream, in clusters and singly, from fire in 1940. In some places they are already beginning to group up into jams and many form barriers in the future which must not be allowed to happen.
3	16,820 .	log jamb	all times	No barrier.

Natural Obstructions:

No.	Location	Type	passability	Remarks
1.	190 yd	cascade falls	all times	no barriers; 4 foot drop
2.	17,220	2 ft falls	all times	no barriers; 4 ft drop

Fluctuation in Water Level:

A. Feet Variation; 1-2 ft due to spring run off

B. Stream Volume; est; 40 -60 cfs

C. % of Stream Bed Covered; 1st 1200 yds all or nearly all. 1300-2200 yds 40-90% ; 2200-4600 yds = all to end of survey have few stretches all covered, but mostly have from 60-90% covered, with a few flat areas with but 30 to 50 % covered through the willow flat area.

Pollution: none noted

Fish (Salmon):

Species: Spring Chinook; stretch; lower 10 miles (all is surveyed); Fish actually seen; alive 128, dead 0; fish not seen but estimated probably present; more known present; total fish seen or estimated present in stream; 128+; # Redds; 0 ; Date; July 23, 1941; Visibility, excellent

One chinook was seen 1900 yds above the mouth. 3 more were seen scattered between 3800 yds and 5000 yds. This lower stretch is mainly fast water. In the willow flat meadow above this stretch and below Honeymoon creek the majority were seen in pools, over 15 being counted in one S2 pool. 118 Chinooks were seen between 5100 yds and 10,100 yds. Only 6 were seen above 10,100 yds; 2 @ 11,100 yds, 1 at 14,600 yds, 1 at 14,800 yds, 1 @ 15,400 yds, 1 @ 16,800 yds. The count was not entirely complete, although the stream was waded for the most part, but a few more were thought to have been hidden under banks and overhanging vegetation. These fish had apparently but recently arrived in the stream and perhaps the entire run had not yet ascended from the Middle Fork. They had not yet started to dig redds on the riffles. In addition a large number of salmonids 3-5 long were seen in the meadow pools, many of which were thought to be chinook fingerlings.

Fish (other than Salmon):

Species	Date	Very abundant	Abundant	Fair #	Scarce
Rainbow trout	7/23/41	x fingerlings		x adult	
cutthroat	7/23/41			x to	x
Whitefish	7/23/41			x	
Sculpins	7/23/41			x	

Rainbow; Large schools of salmonid fingerling 3-5" were present in the middle meadow section pools. Some of these appeared to be chinook fingerlings and others rainbow. Whether some of the rainbow fingerlings were steelhead fingerlings could not be determined. No adult steelhead were seen, and no reports were obtained as to whether or not a run existed. A few adult rainbows up to 10" long were seen.

Cutthroat trout; One 14" fish seen clearly over a riffle. Some of the large number of fingerlings could also have been cutthroat.

Whitefish; 11 whitefish were counted and others thought present.

Sculpin; several seen at intervals along the stream.

General Remarks:

The lower 3 miles of Sulphur creek have a moderately steep gradient, being mainly a series of rapids and fast riffles with few small S2 and more S6 pools. The area is or was forested with conifers of small size, being mainly lodgepole pine and fir. The marginal vegetation is very dense along the stream as far as was surveyed. There had formerly been a trail up the creek, but it had been neglected and was worse than none, so the survey was conducted largely by walking up the stream bed itself. There is an old disused ranch just above the mouth, but another, the Parker Ranch, approx. 4 miles upstream has recently started to graze cattle in the valley, and these may bother salmon redds to some extent in the future. The area just above the mouth was burned over in 1940, and logs are scattered along the stream between 1900 and 5000 yds up. Some have already been collected into small log clusters and jams may be formed by spring flood waters in the future, but should not be allowed to block salmon if possible. This lower 3 miles has little value to salmon.

Above 4800 yds the valley opens out into a broad flat meadow often 1/2 mile across to the foot of the valley slopes. This meadow area is of a swampy nature and covered with bush willows so dense that one cannot walk along the banks. This meadow extends up to the end of the survey at the mouth of Honeymoon creek. Through this meadow the stream meanders with a slight to moderate gradient.

On each curve is an S2 pool, often with undercut banks and overhanging vegetation making them fine protected resting pools for Salmon. There were 249 S2 pools in the 10 miles surveyed, most of them being in the meadow area. Between the pools were good riffles. Due largely to the low gradient, there was very little large rubble, only 14.3% or 19,940 sq yds of the entire bottom of 139,500 sq yds being of the type, and 16,920 sq yds of this large rubble was located in the rougher 1st 3 miles of stream below the good meadow area. 81,400 sq yds or 58.4% of the total bottom is of available spawning, and the riffle area in the meadow section is so good that a total of 36,977 sq yds or 26.5% of the total bottom was designated as usable by spawning salmon. Many riffle areas were 70% usable. There is practically none of the meadow area that is wasted for potential salmon use, either being in resting pools or as usable spawning riffles between the pools.

Better yet, there were 128 adult chinooks counted in the pools, and undoubtedly a few more not seen that were hidden under the banks. These had apparently but recently arrived, as there was no evidence of attempted redd digging on the riffles, (Marsh Creek and its tributaries had salmon already digging), and there is a possibility that the entire run had not yet got up from the Middle Fork. Most of these salmon were in the meadow area between 5,000 and 10,000 yds above the mouth, their distribution being given on card 12 of this write up.

Salmon can and probably do run the stream even above the survey section at the mouth of Honeymoon creek, but the valley closes in above that point and appeared to get steeper and being smaller is probably no where near as good as the 7 miles immediately below Honeymoon creek.

Honeymoon creek and perhaps the lower end of the North Fork are the only tributaries of any size to be of much use to spawning salmon, as most of the tributaries were found to be merely short small spring feeders of from 1 to 3 cfs flow.

Judging by the swampy nature of the meadow section there is probably sufficient water in the stream in the summer and fall to cover the spawning beds, and a spring run off rise of not over 2 ft or so was evidenced along the banks.

This meadow area also appeared to serve as a huge nursery, as there were large numbers of salmonid fingerling 3-5" long in the pools all along, some of which were clearly rainbow trout and others that appeared to be chinook fingerlings. If they were, it is one of the few tributaries of the Middle Fork that they were seen in.

Trout present seemed well fed, and whitefish were also seen all along the meadow pools, but in no great number. No suckers were seen, and we were told that there were none in the tributaries

to the Middle Fork.

There were no dams, diversions, obstacles, or pollution in the stream. It is protected from human interference by lack of trails or roads, and by the bordering willow swamp tangle which is very difficult to get through, although cattle from the Parker ranch will eventually tramp paths through it. A road skirts the upper end of the stream, but does not follow it at any place.

All in all this is one of the best salmon streams tributaries to the Middle Fork, and although relatively small in size, it can care for several thousand spawning salmon and should be protected and kept open and its run increased, which will require but little effort or expense in the immediately future.

Temperature Data:

Station	Date	Hour	Air	Water	Skv
at mouth	7/23/41	8:00AM	59 F	53 F	clear
at mouth	7/23/41	11:15AM	75 F	54 F	30% cloudy
Honeymoon Cr (10 miles up)					

NOTE* Warm Springs at Fuller Ranch @ 600 yds up had temperature of 107 F.

NOTE* Temperature at Honeymoon Creek at mouth = 52 F @ 11:15 AM. Temperature seems fine.

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
all	249	24.9	0	0	82	167	209
(10 miles)			0.0	0.0	32.9	67.1	
as surveyed, mainly mouth to Honeymoon Cr. in lower 3 mi.							

Gradient: Elevation at mouth of Sulphur Creek = 5,540 ft. (U.S.G.S plan and profile maps). Elevation at head of Sulphur Creek is estimated at approx 7,000 feet (no accurate data available). The gradient just above the mouth is moderately steep. It lessens at 2100 ft to a slight extent, and picks up again at 11,700 ft., only to lessen a few hundred yds above, and run with a low moderate gradient through the willow flats for the rest of the way up as far as surveyed, (to Honeymoon Creek). It appeared to get steeper a short distance above that tributary.

Tributaries:

No.	Name	Side	Distance above mouth yd	Length miles	Width feet	Flow cfs	Value to Salmon
1.	unnamed	L.B.	2,640		1	1	none too small and steep
2.	unnamed	R.B.	5,090		1	1	none too small and steep
3.	Bluemoon Cr	R.B.	5,100		2	2	none enters stream over 3' beaver dam
4.	Silvermoon Cr	L.B.	10,320	2 1/2	1	1	none too small
5.	Fullmoon Cr	L.B.	11,020	6	2-3	1-2	none too small and steep inaccessible
6.	unnamed	R.B.	11,720		3	2	probably none small and all sand bottom
7.	unnamed	R.B.	12,070		12	5	salmon can enter this slough like section but it was a question as to whether it was a tributary or a side channel no time to
8.	unnamed Cr	L.B.	13,190			1	possibly a few could use area at mouth but too small to be of much value
9.	Moonshine Cr	L.B.	14,820	3 1/2	3	2-3	none dam at mouth inaccessible to salmon
10.	unnamed	R.B.	15,280		5	3	A few salmon can use it near mouth if it does not become too shallow in late summer possibly is but a side channel
11.	unnamed	R.B.	16,640		2	2	none too small
12.	unnamed	R.B.	16,910		1	1	none too small
13.	unnamed	R.B.	16,990		1	1	none too small
14.	unnamed	R.B.	17,010		1	1	none too small
15.	unnamed	R.B.	17,070		1-2	1-2	none too small
16.	unnamed	R.B.	17,270		1	1	none too small inaccessible steep
17.	Halfmoon Cr	R.B.	17,320		1	1	none too small and steep
18.	Honeymoon	R.B.	17,700		8-10	5-10	probably used by salmon to some extent
19.	North Fork	R.B.	12 1/2 miles	7	5-6 est	5-8	? not seen probably some use

NOTE* Due to the density of marginal vegetation, and lack of

trails (and of course signs) through the swampy meadow areas the names of the tributaries could not absolutely be determined, but as listed they check fairly well as to location and size on the Forest Service maps. Several, like tributaries # 7 and 10 appeared to be sloughs or side channels of the main stream, but time could not be taken on the difficult terrain to follow these up, and they were not very important to salmon. Other were but small spring feeders.

Salmon could go above Honeymoon Creek but the survey could not cover further distance at the time.

Marsh Creek

River System: Salmon River

Stream Surveyed: Marsh Creek, tributary of the Middle Fork of the Salmon River

Date of Survey: July 24 & 25, 1941, the lower 9400 yds by D.G. Frey, and the upper 10,600 yds by F.G. Bryant,

Source:

Ultimate: Marsh Creek and its tributaries drain the southwest corner of the Challis Nat. Forest and Custer County Idaho, N.W. of the Valley Creek drainage. Mountain ridges separate its drainage from the Warm Springs section of the Payette River drainage on the southwest, and from the other tributaries to the middle fork of the Salmon drainage on the N.W., N. & N.E., including that of Bear Valley Cr on the N.W., Rapid River headwaters to the North and Loon Creek and its tribs to the N.E. Its headwaters nearly meet the upper end of the Valley Creek section of the main Salmon River drainage on the southeast.

Immediate: Marsh Creek proper heads in a long open, 1/2 to 1 1/2 mile wide mtn valley, in Sec. 32, T.12N, R.12E. This upper marshy headwaters section is so nearly flat that at Blind Summit, where Marsh Creek starts from seepage and springs to flow N.W., and where Valley Creek starts to flow S.E., or in the opposite direction, that one can hardly discern a difference in slope with the naked eye.

Direction of Flow:

N.W. from head to confluence with Bear Valley Creek to form the Middle Fork of the Salmon River in Sec. 23, T.13N., R.10E.

Total Length:

14 1/2 miles, of which the lower 11.4 miles (20,000 yds) were surveyed. The survey was stopped just below the Cape Horn Landing Field when it was evident that, because of the flat gradient and marshy nature of the section, the small portion above had little or no value to spawning salmon.

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		vds	miles	vds	miles			
a	at mouth	0	0	0	0	sec 23, T13N R10E	66'	n/a
b	mouth Cape	0	010,000	5.7		sec 3,	45'	3-24"

	Horn Creek			T12N R11E	
c	End of	20,000	11.4	sec 24,	9' 12"
	Survey			T12N R11E	

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-022-10.96	
b	17060205-033-00.00	
c	17060205-080-00.17	

Character of Bottom between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-b	148,100	57,000	38.5	56,160	37.9	18,350	12.4	16,590	11.2
b-c	61,600	6,580	10.7	21,460	34.8	23,450	38.1	10,110	16.4
Total	209,700	63,580	30.3	77,620	37.0	41,800	19.9	26,700	12.8

Spawning Area Available and Usable:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
a-b	10,000 5.7	148,100	74,510	50.3	11,830	8.1
b-c	10,000 5.7	61,600	44,910	72.9	20,930	34.0
Total	20,000 11.4	209,700	119,420	56.9	32,760	15.6

Spawning Area Unavailable and Unusable: None

Character of Watershed:

	Sta a-b	Sta b-c
Mountainous	X small (canyon) particularly lower	X bordering to right of valley (N.W.end Sawtooths)
Hilly	extreme upper portion	X on left of valley bottom with mtns (Salmon R mts. behind)
Rolling		
Flat		X valley bottom .5-1.5 mi wide to foot of slopes
Swampy		X particularly upper 4 mi surveyed (& above to head)

Wooded	X coniferous forest	X moderate on slopes (conifers)
Open		X open in valley bottom
Cultivated (%)	None	X None-but cattle & some sheep graze all thru area
Character of Valley	_ / above to \\ / below	
Character of Banks	2-10' high above, but often continuous with valley wall; some cliffs; composition earth, rubble and bedrock.	0-5', avg 3' high earth & some mixed earth & gravel; grasses and willow bushes hold it together, so often undercut and with side channels.
Density of Marginal Vegetation	alder, willow, dogwood dense in flat area, more sparse in narrow canyonous sections	thick willow brush in plots separated by long marsh grass areas, but not over 3'-4' high
Erosion a) Banks	moderate	considerable: undercut, over hang & many abandoned channels & holes etc.
b) Watershed	moderate	moderate

Diversions: none

Artificial Obstructions:

None, 1-2 beaver dams were seen on side channels only, but none as yet in main stream.

Natural Obstructions: none.

Fluctuation in Water Level:

Sta	Ft. Variation	Cause	Stream Volume(cfs)	% Stream Bed Covered
a-b	2-4' *	#	275-300(est)	90-100%
b	1-3'	"	120(est)	100%

Sta	Ft. Variation	Cause	Stream Volume(cfs)	% Stream Bed Covered
b-c	1-3'	"	60(est)	90-100%

#=due to flat valley & winding stream slowing, run off

*NOTE: Due to rush of work, no flows were taken by survey party as had been intended. The following data is obtained from the U.S.G.S. Water Supply Paper 863 for 1938, covering part 13, the Snake River Basin, p. 198. The U.S.G.S. water gaging sta was located by our survey at 8100 yds above the mouth of Marsh Cr, and 800 yds below mouth of Beaver Cr. The Supply paper lists it as being in Sec 34, T.13N., R.11.

Drainage area above this point 138 sq miles. Records available for Sept 1928 to Sept 1938 as follows:

Avg discharge for 10 years: 198 cfs
 Maximum discharge for 1938, May 28 & June 6 & 7: 1940 cfs
 1928-38 period: 2,340 cfs, June 9, 1933
 Minimum discharge for 1938: 60 cfs, Nov 30
 1928-38: 35 cfs (est) Nov 26-30, 1929

Mean discharge for water year 1937-38 = 292 cfs
 Discharge on July 25, 1938 = 238 cfs

Discharge at time of survey probably equals or exceeds those of other July records due to unusually wet season or approx 275-300 cfs. (U.S.G.S. evidently considers Middle Fork of Salmon to extend to junction of Marsh and Beaver Cr, but U.S.F.S. maps and local people do not consider it so.)

Pollution: none.

Fish (Salmon):

Species: Spring Chinook

Between Sta	No fish seen Alive	No fish seen Dead	No fish est present/not	Total fish present	No of redds	Date	Visibility in stream
a to b	0	0	possibly 25 max.	25		7-25-41	excellent clear
b to c	9*		" 5	14	5	7-24 25-41	" "
Total	9*		30	39	5	7-24 25-41	"

*Includes 1 fish later seen killed by poacher.

According to every person in the vicinity that knew Marsh Creek it was formerly full of spawning salmon from one end to the other, as were all its accessible tributaries, and good runs

continued until 16-20 years ago, when the unregulated custom of spearing and snagging salmon increased until it not only involved local residents but people from as far distant as Boise and other large population centers. It reached its height in late 30's. The following information on salmon runs was secured by questioning Irvin Spencer, U.S. Forest Service Guard at Cape Horn Guard Station from 1939 on, and who had to patrol the streams and the camps in the vicinity daily.

The salmon appear in late June or early July, spawning shortly after arriving on the spawning beds, or in late July, the process being completed by early August. In 1939, the run appeared on the 28th of June, and was heavy during the following two weeks, both in Marsh Creek proper,, and its tributaries Beaver, Cape Horn (and lower Banner Cr) and Knapp Cr. He was certain of the date as he checked on 2 fellows that camped on the stream for 2 weeks waiting for the run to appear. The run was fairly good, with 5-10 salmon every 100 yds on the main spawning riffles (above mouth of Cape Horn Cr). Spearing and snagging parties appeared at once and from July 1st until the end of spawning season there wasn't a day but saw 20-25 fishing parties camped on Lolo, Beaver and Bull Trout Campgrounds. On July 4th there were over 500 people estimated at the campgrounds taking fish. This huge group wiped out practically every fish in the stream system that day, since the stream is fairly shallow, and easy to get at. Subsequent parties patrolled the stream and picked up all late arriving salmon as they straggled in. It is a wonder if a dozen fish escaped the mob to spawn and maintain the run that year. This must have been true for several preceding years, as evidenced by the fact that but 9 salmon were seen in Marsh Creek by the 1941 survey crew.

In 1940, the first year that spearing and snagging was forbidden by state law on Marsh Cr and tribs, there was a fair run. On his patrol he reported seeing dead spawned out salmon on Marsh, Beaver, Cape Horn and a few on Knapp Creek in late July and early August, this in spite of some suspected poaching.

In 1941 there were (according to Spencer) no salmon seen in the upper Marsh Creek spawning grounds until after July 4th, the run being late and very small, as our survey indicated. That poachers were taking some of the few that did appear was quite evident, as footprints--half dug redds with no fish present, clubs and poking poles found in the bushes etc., indicated. A man engaged in rodent control for the Biological Survey told me on the 23rd that he had seen a party of 3-4 fellows who had been snagging get driven out of Marsh Creek meadow spawning grounds by the appearance of a State Warden, but that they came back as usual after he left and got 4-5 salmon off the beds. This was probably the same party we saw take salmon on July 24th off the spawning beds and secured evidence and moving pictures of, that later caused their arrest and conviction by the District Supervising Warden Lee Clark.

According to Spencer Little spawning takes place in lower Marsh Creek below the bridge and Lolo Campgrounds. The salmon run up thru the meadow above Cape Horn Cr (which is also utilized) as far as Knapp Creek. They do not appear to go on up Marsh Creek Proper above this point, but some do turn up Knapp Creek itself. The survey party found this to be true in 1941. No fish or redds were seen below the mouth of Cape Horn Creek. The first chinook was seen 3000 yds above that point, and the fish and redds counted all were located from that point on up to the mouth of Knapp Creek, the stretch having good spawning grounds all along.

No fish or redds were seen above Knapp Cr, and this area will probably never be utilized until the area below becomes over crowded--which won't be for some time judging by its present depleted run. The stream above Knapp Cr is small, marshy, flat, and sluggish, being silted in many areas and has an increased amount of sand, not making for good spawning area.

No salmon fing. were seen, and it is expected that the previous years hatch had left long before on its way to the Pacific.

Due to the springs in this upper area, winter ice conditions probably do not bother the spawning area, as it may in the faster moving lower 5 miles.

Fish (other than Salmon):

Species	Date	Very Abundant	Abundant	Fair No.	Scarce
Steelhead	Spring		small size *		
Rainbow	7/23-25 1941		x 3-6"		over 6-8" occasional
Cutthroat	"				reported by fishermen
Dolly Varden				x2	(small) x reported by fish- ermen
Sculpin				x seen by survey on bottom pool sites	
Whitefish				x seen in pools in upper 5 miles	

* fish said to come up, but statement not verified.

Stream lays in open meadow near the road and is heavily

fished, which apparently has removed most large trout early in season. Examined 3-4 catches by fishermen on July 23-25, and found only rainbows up to 8", mostly 5-6 1/2". Saw one over 9". Good number of 3-4" finger seen that may have been stocked in. Trout are apparently caught before they can reach any size. Several whitefish were seen in the larger pools in the upper meadow.

General Remarks:

The mouth of Cape Horn Creek divides Marsh Creek into two sections of approximately equal length, but with entirely different characteristics.

From the mouth up to Cape Horn Creek, Marsh Creek is a steadily descending, boulder strewn, fast moving stream with few good large pools, little good spawning area and little quiet water. It is closely bordered by forested slopes that in many stretches rise abruptly from the waters edge as steep rock cliffs or high gravel and rock slopes. Occasional flatter areas occur at long intervals, and in such lie a few pools, better riffles and some spawning rubble that at present seems to be passed up by any Chinook entering the stream.

At Lolo Bridge it enters a wide, open and nearly flat high mountain meadow which sends a similar but smaller open meadow branch off up Cape Horn Creek. Abruptly the current slows, large rubble decreases, and a series of small but usable resting pools with good spawning riffles is encountered for the entire meandering 5 miles to Knapp Creek. This is the good spawning area of the stream, well supplied with cold spring seepage. Above this point it is too flat, small, and sluggish, consisting mainly of long 1' deep marshy bordered pools that are worth little to spawning salmon. Its main tributaries supply a large part of its flow. Beaver Creek at its mouth is approx 2/5 the size of main Marsh Cr, Cape Horn Creek is about equal in size to Marsh Creek above it, and little Knapp Creek near its head is equal to if not slightly larger than the marshy bordered stream above its mouth.

Chinook salmon have apparently utilized nearly all the spawning area available in the stream until spearing and snagging in the 1920s and 30s caused each succeeding years run to be smaller until at the time of survey only a few salmon could be found to maintain the species. (See details on Card 12.) The closing of the stream to spearing and snagging of salmon in 1940 was barely in time to preserve a remnant of the former good runs, and preludes any opening to fishing in the future for several generations if the salmon of the stream are to be saved from extinction.

Marsh Creek is a small but ideal spawning stream, and has, should and can support and maintain good runs in the future if aided by proper regulation and enforcement of such regulations.

Temperature Data:

Sta	Date	Hour	Temp air	Temp, water	Skv
a	7-25-41	11:15 am	67°F	53°F	overcast
b	7-25-41	8 am	58°F	49°F	overcast

(actually 600 yds below b)

The water remains cool thru summer due to: 1) cold springs along Marsh Cr and its tribs. 2) High altitude. Ice conditions between sta a and b may be severe in winter, but probably not on the meadow and spawning area above b, which has many pools and spring seepage.

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-b (5.7 miles)	23	4.0	1 4.3	4 17.4	1 4.3	17 73.9	150
b-c (5.7 miles)	157	27.5	0 0.0	0 0.0	38 24.2	119 85.8	14
Total (11.4 miles)	180	15.8	1 0.6	4 2.2	39 21.7	136 75.6	164

NOTE 1: S6 pools between sta b-c are mostly small pools below boulders.

NOTE 2: S₂ pools above sta b include many that are under 3 ft deep (avg 1 to 2 ft in upper 2-3 miles surveyed) but in this stream they are used as resting pools, and serve their purpose well, as the salmon spawn shortly after reaching them. Some of these pools are long and continuous, particularly above Knapp Creek, but such are broken up into a number of pools of approx 50 sq yds area to compare with the pools below for tabulation purposes.

Gradient:

Between Sta	Gradient	Sta elevation*
a-b	moderate & fairly constant	
b-c	slight & fairly constant	approx 6625, -sta c
above c to head	very slight & fairly constant	approx 6650, at head

* elevations not known at mouth or at sta b, but were estimated for sta c and at head from elevations near those spots on the Challis N.F. map, and deductions made for estimated difference between there and the stream.

Tributaries:

No	Name	Side entered	Distance above mouth entered at	Size (width)	Flow (cfs)	Value to Salmon
1	none	L.B.	1510 yds	?	1-2	none-too steep
2	none	L.B.	2420 yds	?	1 apr	none-steep unacce-ssable
3	none	L.B.	2440 yds	?	1 "	" " "
4	none	R.B.	2800 yds	?	2 "	" " "
5	none	L.B.	4440 yds	?	5 "	(60° gradient) " has 2 branches each steep & unacce-ssable
6	none	L.B.	5000 yds		1	none
7	Collie Cr ?	R.B.	6020 yds	6'	4	lower 200 yds only, usable, bottom 0-40-40-20 then becomes too steep
8	none	R.B.	6880 yds		1-2	no value
9	none	R.B.	7430 yds		1	" "
10	Little Beaver Cr ?	R.B.	8580 yds	6'	5-7	should be surveyed
11	Beaver Cr*	L.B.	9000 yds	33'	100 est.	good salmon stream surveyed July 1941
12	Lola Cr	R.B.	9300 yds	5'	6	not used by salmon according to all reports small; falls 2 mi up
13	Cape Horn*	R.B.	10000 yds	27'	60	good salmon stream surveyed July 1941
14	none	L.B.	13500 yds	?	1	none: small spring feeder, didn't see it but could have been one of several small springs sections
15	Thatcher	R.B.	15900 yds	2-3'	2	too small to be of value to salmon, only 2-3" deep at mouth
16	none	L.B.	16350 yds	1'?	1 est	none spring feeder
17	none	L.B.	17500 yds	1"	1	" " "
18	Knapp Cr*	L.B.	17700 yds	12'	15 "	salmon use this approx partially surveyed est.lower end 1941, to be completed later

No	Name	Side entered	Distance above mouth entered at	Size (width)	Flow (cfs)	Value to Salmon
19	none	L.B.	17730 yds	1.5'	1	no value, spring feeder or seepage
20	none	L.B.	18000 yds	1'	.5	" " " "
21	Swamp Cr	R.B.	18100 yds	?	?	not seen too marshy but dries up in Aug. according to FS Guard
22	Kelly Cr ?	L.B.	18400 yds	?	1	comes in broken as several springs or seepage, no value for spawning
23	Vader Cr	R.B.	20100 est	?	?	reported dry most of year by FS Guard
24	Dry Cr	L.B.	20400 est	?	?	no value, dry early
25	Flat Cr	R.B.	21500 est	?	?	no value, reported

NOTE: Outside of Knapp and Thatcher Creeks, the upper meadow tributaries are hard to locate, as there are side pools, channels and seepage all thru the area, particularly above Knapp Cr, but this later area is not used by salmon from all reports and from examinations of the 2300 yds above Knapp Cr by the 1941 survey.

Beaver Creek

River System: Salmon River

Stream Surveyed: Beaver Creek, tributary of the Middle Fork of the Salmon River

Date of Survey: July 29, 1941, by D.G. Frey and F.G. Bryant

Source:

Rises in springs on the slopes of Feltham Cr. Point, one of the lesser peaks of the Salmon River sites in Custer County and in the Challis National Forest of Idaho; exact location is Sec 35, T. 14N, R. 12E.

Direction of Flow:

Southwest to join the left bank of Marsh Creek in Sec 3, T. 12N., R. 11E.

Total Length:

Estimated to be 15+ miles from Challis N.F. map, of which the lower 10.7 miles were surveyed. Survey terminated due to lack of water in creek.

Station Location:

Sta	Location	Distance above prev. Station vds miles	Distance above Mouth vds miles	Map Location	Width	Depth
a	at mouth	0	0		33'	3-12"
b	Shake Creek				30'	2-6"
c	Winnemucca Creek	10.0			9'	1-4"
d	end of survey	10.7				

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-032-04.01	
b	17060205-063-00.00	
c	17060205-036-08.20	
d	17060205-036-09.40	

Character of Bottom between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-c	157,900	34,940	22.1	58,730	37.2	40,600	25.7	23,630	15.0

Spawning Area Available and Usable:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
a-b	18,800 10.7	157,900	99,330	69.9	35,040	22.2

Spawning Area Unavailable and Unusable: None.

Character of Watershed:

	Mouth to Shake Cr (aprox 5 mi)	Shake Cr to end of survey 10.7 miles
Mountainous		X 10 mi & up
Hilly	X (bordering stream valley)	X
Rolling		
Flat	stream valley in meadow 1-500 yds wide	flat valley bottom up to 9.5 miles
Swampy	in lower end, .5 to 1 mile above in mouth, in stream valley	
Wooded	lightly wooded hills border valley	patches & small pines 7-8 mi up then much thicker wooded area about 10 mi
Open	X in most parts of valley	along valley bottom 5-7 miles up
Cultivated (%)	none: badly sheeped off 3-5 mi up	none: sheeped bare in most areas, 5-10 mi up
Character of Valley	\ / wide meadow moderate grade	_/ to \/
Character of Banks	earth & some boul- ers 5-30' high, avg below 4' in valley	avg 2-3' earth & boulders up to 10 mi avg 15' up about 10 mi earth & rock ledges above 10 mi

Density of	patches of moderate-	scattered patches of
Marginal	ly dense brush &	pine & brush
Vegetation	occasional pine	(willows)
	reach stream from	more thin dense trees
	valley slopes,	light to moderately
	particularly in	dense up to 10 miles
	lower 2 mi along	
	R.B.	
Erosion		
a) banks	Moderate-meandering	moderate below 10 mi
		to floor of valley
		considerable above
		10 mi in mtn canyons
b) watershed	Moderate-meandering	

Diversions: none.

Artificial Obstructions:

1. Log jam, small @ 7400 yds above mouth, passable at all times.

Natural Obstructions:

None in area surveyed. Above Bear Creek (9800 yds up) there are, however, occasional stretches where the stream spreads out over gravel bars and becomes so shallow in summer low water periods, as at the time of survey, that it would be very difficult for salmon to pass, since the water runs only 1-3" deep between the small rocks of the gravel bars.

Fluctuation in Water Level:

1. Variation in water level: 3-4' (est) at mouth
1-3' (est) at highway bridge 10
miles up
2. (Est) flow at mouth: approx 90 cfs, July 29, 1941
(Est) flow at upper end of survey: 10-15 cfs, July 29, 1941
3. Causes of fluctuation: there are a large number of springs having a volume of 1/2-2 cfs trickling in all along the lower 10 miles of the stream. There are also several small spring fed tributaries coming out of the hills in this stretch that account for the larger flow at the mouth.

Since the stream flows in a wide and fairly flat valley between 1 and 10 miles above the mouth--it has spread out to run in a wide, but shallow channel between low banks of from 0 to 3 or 4 ft high, or has in several places cut a braided series of shallow channels. It can thus take care of the winter snow melt run off, and seasonal rains without much vertical rise, which if it was avg 2-3 ft would flood large areas of the valley bottom.

The earth composition of the hilly slopes bordering the lower 10 miles, which are at least moderately wooded in most cases, appears to absorb a large amount of rain and melted snow, which it feeds in gradually thru the many small seepage spring feeders and aids in preventing flash floods, except in the case of occasional "cloud bursts." The high altitude with the accompanying cold nights, even in mid summer, would tend to delay and make more uniform the melting and run off of the winter snow accumulations, a fact that also could account in part for the small vertical water rise indicated along the stream banks. Only in the upper few miles of the stream does it flow in steep sided canyonous stretches that make for quick run offs and higher flood conditions.

It should be noted that this summer there was a very unusual amount of rainfall, yet the stream was quite low above the lower 5 miles when surveyed. Only about 80% and in some stretches less than 50% of the stream bed was widened in the flat meadow area.

Pollution:

1. Silting occurred in quiet stretches throughout, and could bother the eggs on a few spawning riffles if the stream was not cleaned by a fall water rise, a condition we could not ascertain at the time. A good portion of the silt appeared to have been knocked into the stream by sheep which had grazed the meadow nearly bare from 3 to 10 miles up, and the loose earth had been tramped off the very low banks as they crossed and recrossed the stream all along. In many cases the stream bottom that had good spawning rubble had been freshly tramped over by flocks of sheep, a condition that would be bad if it also occurred after the salmon had spawned.

2. Sheep droppings in the shallow water were noted all along above the Forest Camp grounds.

3. Recommendations: Sheep should be (and perhaps are) removed from the upper valley when the salmon spawning time is reached, and the severe over grazing better regulated so that grass and bushes can take hold along the banks to prevent erosion (since this is on Forest Service land, it should be able to bring this about with a little diplomacy) and silting to a greater extent.

Fish (Salmon):

<u>Fish actually seen</u>	<u>No. salmon in addition est present</u>	<u>No redds seen</u>
11	2	24

Of the above none were seen in the lower 2 miles, nor from 8 miles on up. 4 chinook, + 2 estimated present in a silt stirred up small pool, and 17 redds were found between 3000 and 6100 yds up. No more were seen between 6100 and 11300 yds up. Then between 11300 yds and 14300 yds, 7 chinook and 7 redds were seen.

The count is believed to be quite accurate because 1) the water was perfectly clear. 2) It was extremely shallow, spread out and from 1" to 6" avg depth with 1 ft in the narrower channels, 3) the few resting pools were all shallow, generally small, and mostly unprotected by overhanging banks or brush. None were over 5 ft deep, and most avg from 1-3 ft deep, and not over 10 yds across, the entire bottom being quite easily seen. Only a very few fish have been missed in shaded spots or riffles, and if lying there in shallow water should have been scared up by the observer on the edge.

The Cape Horn Forest Guard (U.S.F.S.) stated that until the last 10 years Beaver Creek was packed with spawning salmon in July, and later the spawned out dead could be seen on most all riffles. However, the State of Idaho had allowed spearing and snagging up to and including 1939, and that beginning on the fourth of July holidays, dozens of spearers and snaggers had driven the open stream from end to end, singly and in groups, and taken nearly every salmon present in the stream, at least such was the case in 1938 and 1939 when he was on duty there, and that it was a miracle if any stragglers were left to spawn. Since 1940 when spearing and snagging was prohibited on the stream, there were few salmon left from the previous runs to spawn. This appears to be the reason why so few fish remained in the run at the time of the survey. The stream is so open it should be closed to all salmon fishing, and can support a much greater number of spawners than it does in its present depleted state.

Fish (other than Salmon):

1. Steelhead trout are said to run up the stream early in the spring before the July run of spring salmon. However, none were seen by the survey party, nor could accurate reports be obtained from persons in the Cape Horn area.

2. Other fish: 1) Rainbow trout. Only one or two rainbow trout were seen in the stream, and due to its open and shallow nature it probably has but a small population at present. The Beaver Creek Forest Camp located aprox 2 1/2 miles above the mouth may have given fishermen a chance to take most of the fish in the past.

General Remarks:

Beaver Creek emerges as a small stream from the mountains, and since too shallow water was encountered at the end of the survey (10.7 miles aprox) the remaining 3-4 miles, lying in canyons and having a steep gradient are probably of little use to salmon. At the highway bridge above Winnemucca Cr, aprox 10 miles up, it emerges from the hills into a fairly flat bottomed valley. It spreads out into a wide channel, breaking up into several channels at intervals and meanders shallowly with a slight gradient from there to the mouth at Marsh Creek. The lower mile is a bit steeper

and over larger rubble than above, although no cascades or falls are encountered in the area surveyed. Springs are frequent, and seepage along the 2nd mile from the mouth marks a wet almost swampy condition. The meadow is for the most part fairly open, but with almost sparse vegetation due to over grazing by sheep. The slopes are wooded, but not densely, with small pine predominating. The stream occasionally cuts thru an earth or gravel bank particularly on the right bank which more closely follows the slopes bordering the valley. The wide shallow channel has accumulated many gravel bars, most of which would be much better for spawning use were the stream a bit deeper. The banks are usually quite low (2-3 ft), and cut in a few places by gravelly flood bars..

The stream lacks good, big, deep, protected resting pools. However, since the salmon spawn within a very short time after reaching the stream, the 131 smaller resting pools in the 10 mile stretch undoubtedly give adequate protection from all but human predators. The reason for some stretches not having spawners on them (see Card 12) is apparently because of (1) low water making the riffles a bit too shallow for comfortable utilization, and (2) the depleted present run is not forced to use such areas because the few fish present can pick the best areas only.

The salmon are all spring run fish, reaching the stream in June, and due to the very cold water and short season, because of the high altitude (over 6,500 ft) spawns shortly after entering the stream, or during late July for the most part, with spawning being completed by early August. No young were seen in the stream, nor could we get data on when they hatched or moved out of the stream. The low water temperature and very early fall season in the area would lead one to believe that they could not hatch much before the following spring. If such is the case, ill damage to the stream bottom may greatly influence the mortality rate. Stanley residents report bad anchor ice in nearly all of the streams in the vicinity most every winter.

Beaver Creek in the past has been a very good salmon producing stream, in spite of its small size. During the last 10-20 years, however, roads and campsites have been developed enabling people to reach the stream during the spawning run, and the unrestricted spearing and snagging parties have nearly exterminated the runs, particularly during the years from 1930 to 1939. Laws were passed preventing this practice after that period, and a few fish remain to maintain the run in the stream. With proper restrictions enforced, and aided a good restocking program the stream should have its run increased in the future.

Temperature Data:

<u>Sta</u>	<u>Date</u>	<u>Hour</u>	<u>Air Temp</u>	<u>Water Temp</u>	<u>Skv</u>
Beaver Creek	7-29-41	8:30am	48 F	45 F	overcast, fog

Forest Camp Rd
Bridge @ 3000 yd

1st road bridge 7-29-41 12:15am 64 F 50 F 70% cloudy
above Winnemucca
Cr @ 17,500 yd

NOTE: Although stream is quite open and shallow, and the day time solar warming is considerable during the summer months, the high altitude causes cold nights even in summer, and together with the large number of cold spring feeders tends to keep the water temperature quite low and suitable for salmon. While it would also tend to lessen fungus and possible disease, the possibility of winter freezing and anchor ice damage to eggs and fry in the stream should be considered.

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 3	SlT2 3	S2T1 3	S2T2 3	S6
a-b (4.8 miles)	47	9.8	0	3	14	30	86
b-c (5.1 miles)	82	16.1	0	0	7	75	43
c-d (0.8 miles)	2	2.5	0	0	0	2	26
Total (10.8 miles)	.131	12.1	0	3	21	107	155
			0.0	2.2	16.0	81.7	

Gradient:

No data is available: i.e., no U.S.G.S. reports or maps giving accurate elevations along the stream are available.

From observations at time of survey: the gradient is moderate in the lower 10 miles, being fairly flat in the middle meadow area (2-9 miles up), with a very slightly steeper gradient in the lower 2 miles. It becomes more steep in the upper 1 1/2 miles surveyed, and continues steeply to head of stream in the mouth.

Tributaries:

No.	Name	Size (width)	Flow	Side of stream trib enters on	Distance above mouth at which trib enters
1	none	3'	1 cfs	L.B.	3580 yds
2	none (Laidlow Cr ?)	3'	1 cfs	L.B.	4020 yds
3	none	3'	1 cfs	L.B.	5220 yds
4	none	2'	1 cfs	R.B.	5300 yds

5	none	1-2'	1-2 cfs	R.B.	6430 yds
6	Shake Cr	4'	3-5 cfs	L.B.	8350 yds
7	none	2'	1/2 cfs	L.B.	8950 yds
8	none	2'	1/2 cfs	L.B.	9000 yds
9	none		1 cfs +	R.B.	9400 yds
10	Bear Cr	5'	8 cfs	L.B.	9800 yds
11	none	1 1/2'	1 cfs	L.B.	10700 yds
12	Crystal Cr	3-4'	4-5 cfs	L.B.	10800 yds
13	none	1'	1/2-1 cfs	R.B.	12800 yds
14	Winnemucca Cr	18'	8 cfs est	R.B.	15700 yds
15*	none	3'	1-2 cfs	L.B.	18200 yds
16	none	2'	< 1 cfs	L.B.	18490 yds

*15 trib is probably Feltham Cr, which, according to the Challis N.F. map, enters first above the uppermost highway bridge.

NOTE 1: in the lower 2 miles there were several springy areas, particularly along the left bank, that drained in thru small channels; we did not have time to explore back on the meadow to see if they headed up into small streams, but even if they did they would not be big enough to be utilized by salmon.

NOTE 2: a few very small tribs and spring feeders may have been missed due to the braided nature of the stream in the lower 10 miles.

Cape Horn Creek

River System: Middle Fork of the Salmon River

Stream Surveyed: Cape Horn Creek

Date of Survey: The lower 8000 yds were surveyed on July 24 and 25, 1941 by F.G. Bryant, the next 1700 yds up to the mouth of Banner Creek were surveyed on July 28, 1941 by D.G. Frey and F.G. Bryant.

Source: Cape Horn Creek runs through a mountain meadow in a ridge bound pocket opening on the NE onto Marsh Creek meadow at Lola Forest Camp. Connecting ridges separate it from Lola Cr drainage on the N & NE, from Fir Creek side on the Bear Valley drainage on the West, and from Gates Spring an Canyon Cr sections of the Payette River drainage to the south. The pocket ends in the corner where Custer, Valley and Boise county lines connect on the western border of Challis National Forest of Idaho. Cape Horn Creek itself heads in Sec. 32, T. 12N, R. 10E. and runs NE for 2 miles, then east 2 miles to pick up Banner Cr coming in from the south, then back NE for 5 1/2 meandering miles to the left bank of Marsh Creek. Of the*approx total length of 9 1/2 miles, the lower 5 1/2 miles from Marsh Cr up to its only tributary of any size, Banner Creek, was surveyed in July 1941.

Station Location: Due to shortness of stream no stations were taken.

a mouth

b lower 5000 yds

c upper 4700 yds

EPA River Reach Codes:

<u>Station</u>	<u>HUC</u>	<u>SEG Rmi</u>
a	17060205-033-00.00	
b		
c	17060205-034-02.38	

Depths:

<u>Location</u>	<u>Distance</u> <u>above prev.</u> <u>Station</u>	<u>Distance</u> <u>above</u> <u>Mouth</u>	<u>Width</u>	<u>Depth</u>
	<u>yds</u>	<u>miles</u>	<u>yds</u>	<u>miles</u>
100 yds	100	0	0	0
above mouth				
Approx	1700	1.0	1800	1.0
1 mile up				
Approx	1700	1.0	3500	2.0
2 miles up				
Approx	1700	1.0	5200	3.0
3 miles up				
Approx	1800	1.0	7000	4.0

24' 2"-1.5'

21' 3-6"

18' 3-6' riffles

21' 2-6' pools

av 6"

24' 6"-2'

4 miles up
 Approx. 2700 1.5 9700 5.5 15' 3-6" riffles
 5.5 miles up 1-2' pools
 (approx below mouth of Banner Cr)

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-b	34,800	6,300	18.1	12,870	37.0	12,150	34.9	3,480	10.0
b-c	28,900	4,270	14.8	10,700	37.0	10,030	34.7	3,900	13.5
Total	63,700	10,570	16.6	23,570	37.0	22,180	34.8	7,380	11.6

Spawning Area Usable and Available:

Station	Distance		Area (yd ²)	Available Spawning Area(yd ²) (MR&SR)	% Avail	Usable Spawning Area(yd ²)	% Usable
	yds	miles					
a-b	5,000	2.8	34,800	25,020	71.9	14,125	41.2
b-c	4,700	2.7	28,900	20,730	71.7	13,995	48.3
Total	9,700	5.5	63,700	45,750	71.8	28,120	44.1

Spawning Area Unavailable: None in the area surveyed. However, beaver dams and shallow water at the upper end of the survey at present render any additional area above unavailable at all times.

All Area as Surveyed

Mountainous	Bordering above lower 2 miles
Hilly	Lower 2 miles
Rolling	
Flat	(in valley bottom, immediately along
stream only)	
Swampy	In valley bottom from 3100 yds on up
	to Banner Creek except for small
intervals	
Wooded	All slopes bordering valley
Open	Valley bottom for most part;
	occasional patches of pine, birch and
	tamarack
Cultivated %	None--sheep and cattle grazing
Character of Valley	100 yds to 600 yds across flat
	bottom
Character of Banks	Generally low, 1-3 ft, except
	occasional cut banks 15-10 ft high
Density of marginal	Grass or thick willows bushes, 3-5'
	vegetation high in meadow,
occasional	small pine stands

Erosion a) banks Moderate; undercutting on meandering
flat meadow bottom
b) watershed Considerable to great

Diversions: None

Obstructions: None in area surveyed.

Just above the mouth of Banner Creek at end of survey, beavers have taken over the meadow, causing stream to branch out into several channels, each blocked by an impassable beaver dam. Salmon cannot ascend the main Cape Horn Cr above this point. The stream is so small above this point, however, that it would probably not pay to attempt to remove and keep these removed until the spawning population of salmon has been built up to a greater extent, which won't happen for several years at the most.

Natural obstructions: None in area surveyed.

Fluctuation in Water Level:

In area surveyed: 1-2 ft indicated by banks. Any greater rise would flood portions of valley bottom, which may happen at time of spring run off in some years, but not indicated recently, at least has done no evident damage.

Stream volume: estimated at approx 60 cfs at mouth; but only approx **10-15** cfs above Banner Cr mouth.

% of stream bed uncovered: usually none in meadow sections. **10-20%** elsewhere, with 1 or 2 wide gravel bars exposing up to 30%.

Pollution: None noted, stream clear

Fish (Salmon):

Species: Spring Chinook

Stretch	Spawning fish Alive	fish seen Dead	seen Total	No in addition est present but not seen	No of Redds seen	Date
lower 2 mi (3600 yds)	1	0	1	0	1	7-24-41
2nd 2 mi (3600-7000 yds)	10	0	10	possible 4-5 under banks	8	7-24 & 7-25-41
rest of stream (upper 7000 to 9700 yds)	33	4	37	possible 6-8 under banks	46	7-25-41

Observation conditions good. Water very clear. Only fish that could have been missed in this small stream would have been those under banks, that wouldn't scare out, and don't believe there were many as we worked this very slowly and carefully.

These salmon came up Marsh Creek in June and July, spawning from mid July to mid August, 1 dead spawned out fish was found, and several abandoned redds, 'and many nearly completed. There were few good resting pools in the lower 2 miles, and no spawning activities, except for one redd nearly 2 miles up. Most of the spawning takes place in the meadow areas, 2-5 miles up. When the stream was bordered and protected by willow bushes, and has a well balanced alternation of good riffles and resting pools.

Apparently there were much heavier runs in the past, but as is the case of Marsh and Beaver Creeks, several hundred spearers and snaggers had nearly eliminated the runs prior to 1940 when the practice was forbidden. However, poaching still takes place, as several abandoned empty redds were found and one dressed off carcass, as well as one fish seen with a fresh spear gash on its back and side. The full spawning area is not utilized by the few fish left, and the run could and should be built up in the future.

No fry were recorded, but no sitting was attempted.

Fish (Other **Than** Salmon):

Species	Date	Very Abundant	Abundant	Fair No	Scarce
1. Steelhead Trout:		none seen.	Reported present before salmon in early spring, but report needs further checking.		
2. Rainbow Trout.	July 24, 25, 28, 1941.			X	
On July 24 a Mr. Brown caught a dozen small ones 4"-7" in the lower mile of stream. Others were seen on riffles with salmon and in pools above, but none over 8-9" observed. Pretty well fished out due to road following up valley.					
3. Whitefish				X	
Seen in 2 or 3 pools and on 1 riffle with salmon.					
4. Sculpins				X	
Seen at intervals on pool bottoms and in shallows; fairly abundant.					

General Remarks:

Cape Horn Creek runs through a series of mountain meadows in a valley pocketed by mountain ridges, opening onto Marsh Creek at Lolo Forest Camp bridge. The dirt road from Stanley follows the right side of the valley to the ridge across the head that separates it from the Fir Creek drainage of Bear Valley. The

valley is nowhere over 1/2 mile wide, constricted in two or three places by branches that run in from the bordering steep slopes. The ridges are only 1-200 ft high hills near the mouth, but increase to 800-1000 ft along the upper reaches, and are more cut up into small peaks and points. There are considerable bed rock ledges and talus rock sites in this upper area, although trees, mainly conifers, grow wherever they can obtain footing.

The stream maintains a fairly constant flow even in midsummer because it is fed by many springs flowing from the foot of the benches bordering its course. These springs are very numerous and of fair size in the lower 3 miles of the stream, particularly along the right bank, and the water is cold. For instance in a 200 yd stretch, 1200-1400 yds above the mouth, over a dozen separate springs rise at the foot of a 20' high knoll or bench, on the right bank between the road and the creek, each having a flow of 1/4 to 1 cfs with 2 or 3 much larger ones flowing 1-2 cfs.

In the lower 1 1/4 miles the stream ripples shallowly through a grassy spring fed meadow 100-600 yds wide, with small pine clumps reaching the stream bank from the valley slopes, particularly along the left bank. At 2000 yds it has a small stretch of 1-3 ft diam. boulders in its bed. At 2600 yds it swings against the left valley wall at the foot of a very steep rock cliff 150-180 ft high, then back between low benches and at 3100 yds the valley opens out into a mountain meadow covered with coarser grasses and willow bushes 3-5 ft high. With the exception of the stretch between 400 and 6400 yds which had no salmon in it, from here on up to Banner Creek the stream has a good alternation of small resting pools 3 to 8 ft deep, often with overhanging banks held by the roots of willows and grasses for protection, with good riffles in between. Salmon were seen all along this area and watched at their redd digging. The fish were not badly fungused, one or two being unmarked except for raw tails caused by digging. The spawning season was apparently at its height, as one spawned out dead fish was found, and another dying. It was noted that there was a preponderance of females in the stream, and small jack salmon were seen paired up on redds and unmolested by any larger males which usually drive jacks away from the females on the redds. There were several unattended females digging redds.

It was quite evident that poachers had been operating along the stream since the redds had been started. There were several partially dug redds that had no fish near them for some distance to either side, and fresh boot tracks were seen along the stream's edge. One such abandoned redd apparently about completed, and in good median sized gravel, dug 8" and more deep, was opened up, but there were no eggs in it. Not far above we found the guttings of a fairly recently dressed fish on the side of the stream. One fish was seen that had a gaping fresh spear wound from its back down its side, that could not have been caused by any natural occurrence. Proximity to the road, yet a screen of bushes makes poaching fairly

inviting in the streams best spawning area.

Salmon cannot run up the creek above Banner Cr due to beaver dams, but some do continue up Banner Cr.

No young were noted, nor could we obtain information on them.

Cape Horn Cr is said to have been packed with spawning salmon until they fought for the riffles, as was the case of all those streams in the Upper Marsh Cr drainage, but this was back 10-20 years. Spearing and snagging was permitted up through 1939, and in recent years nearly eradicated the run each year, only occasional stragglers being missed. This would account for the fact that here are only about half a hundred spawners in the stream this year. The stream was so small and water so clear that one could not miss many going as slowly and carefully as we did over the spawning grounds.

Suggestions for improvement are the same as for Beaver and March Creeks nearby. Cape Horn Cr can support a much larger run than at present. Although it is a small stream it has excellent spawning riffles, some good resting pools and clear, cold unpolluted water. It should be properly stocked and stocking would hasten its recovery.

Temperature Data:

No temperatures taken, due to lack of a thermometer which had been "on order" in the office for months. Water was cool, below **60°F** during the summer, and usually **45-52°**. The temperature in the mouth of Banner Cr, July 28th at 4:45 pm, sky cloudy, was water **49°F**, air **62°F**, which seems normal for the stream.

There would be much less danger of anchor ice in this stream in the winter than in Beaver Cr, due to the many spring feeders along its course, and more and deeper pools.

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6
a-b	62	22.1	2	0	8	52	107
(5,000 yds)			3.2	0.0	12.9	83.9	
b-c	62	23.0	4	0	14	44	85
(4,700 yds)			6.5	0.0	22.6	71.0	
Total	124	22.5	6	0	22	96	192
(9,700 yds)			4.8	0.0	17.7	77.4	

Gradient:

No data available on elevations or gradient. From observations made at time of survey, the entire 5 1/2 miles

surveyed of the stream had a slight to moderate gradient, it being a bit steeper in the lower 2 miles than in the 2 flat meadow area; the gradient becomes steeper in the uppermost 2 miles (not surveyed) where the stream heads up on the ridges above the valley.

Tributaries:

No above mouth	Name	Size (width)	Flow	Side entered on	Distance above mouth enters
1	None	6"	.5 cfs	R.B.	200 yds
2	None	1'	2 cfs	R.B.	1200 yds
3	None	6"	.5 cfs	R.B.	2200 yds
4	None	1'	1 cfs	R.B.	2800 yds
5	None	2'	1 cfs	R.B.	4600 yds
6	None	2'	2 cfs	R.B.	4730 yds
7	None	1'	1 cfs	R.B.	8000 yds
8	Banner Cr*	15'	15 cfs (est.)	L.B.	9700 yds

* Surveyed 1941

Note : there are many places where springs empty in or seepage from spring areas empty in, particularly in the lower 2 miles, that are not listed here, as they rise within 10 to 50 ft from the stream banks for the most part, and have a flow of but 1/4 to 2 cfs each. Any over 1 cfs is included in the above list of tributaries. There are 10 to 20 emptying in @ from 1200 to 1400 yds on the right bank, none are usable by salmon except Banner Cr.

Banner Creek

River System: Salmon River
 Stream **Surveyed:** Banner Creek, tributary of the Middle Fork of the Salmon River

Date of Survey: July 28, 1941 by D.G. Frey and F.G. Bryant

Source:

Ultimate. Drains the N and NE side of ridge between Boise County and Custer County near Bull Trout Lake. Originates in Sec. 3, T.11N, R.10E.

Direction of Flow:

N.N.E. to join left bank of Cape Horn Creek in Sec. 24, T.12N, R.10E.

Total Length:

Main stream, excluding its longest tributary, Bench Creek = 4 miles; length including Bench Cr and main stream below it, 7 1/2 miles; of which 0.7 miles were surveyed.

Station Location:

Sta	Location	Distance above prev. Station vds miles	Distance above Mouth vds miles	Map Location	Width	Depth
a	at mouth	0	0		15'	4-12"
eos	(end of survey)	1200	1200		12'	5"

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-034-02.38	
eos	17060205-034-04.11	

Character of Bottom between Stations:

Station	Area (vd^2)	L.R.	%	M.R.	%	S.R.	%	M&S	%
a-eos	5500	850	15.5	2280	41.5	1450	26.4	920	16.7

Spawning Area Available and Usable:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
a-eos	1200 0.7	5500	3730	67.8	1865	34.0

Spawning Area Unavailable:

None unavailable in area surveyed. However, the stream gets quite steep above the survey end, and is of little use to salmon. An inspection showed that a log jam sedimented in above was in place 7-800 yds further up, rendering spawning above it impossible in its present condition.

Character of Watershed:

Mountainous	above end of survey (in very steep rock canyon)
Hilly	in 2nd half mile
Rolling	X in lower 1/2 mile
Flat	X to rolling
Swampy	
Wooded	X above lower 1/4 mile
Open	X to scattered trees on meadow bottom lower 1/4 mi
Cultivated %	none--sheep grazing near mouth
Character of Valley	narrow steep walled V canyon, 100- 200 ft high above lower 3/4 mi
Character of Banks	lower 1/2 mi earth 3-4' high, next 1/4 mi 3-30' earth and rock
Density of Vegetation	clumpy brush lower 1/4 m, Marginal moderately thick above
Erosion	
A) of banks	moderate lower 3/4 mile; great above.
B) of Watershed	great
Diversions:	none

Artificial Obstructions:

1. There were no barriers in the area ~~surveyed~~.
2. Due to the increased steepness of the stream at the end of the survey, a short inspection trip was made by car on the Bull Trout Lake canyon road, which follows Banner Cr. A log jam several feet high was found wedged between the nearly vertical rock walls of the narrow canyon, about 6 to 800 yds above end of survey. This had been filled in behind with sediment, and the dam thus formed was a low water barrier to Salmon. Since the salmon run up the stream during low water (July - Aug) to spawn, it will exclude them from spawning above until the barrier is removed. Above and below the barrier are many bad cascades and small falls over bedrock and with so little water volume at the time of survey, as to seriously hinder salmon from passing higher into the Canyon.

Natural Obstructions:

1. None in area surveyed. Several cascades and small falls in steep canyon above would be very difficult for salmon to get over.

Fluctuation in water level:

1. No records available other than survey notes. At mouth 1-3' rise indicated; at upper end of survey 1-4' rise indicated. Probably greater rise in rock canyon above.
2. Flow estimated 15 cfs at mouth by survey.
3. % of bottom area covered: all, except 1 or 2 bars on inside of bends in stream which were 10-40% uncovered.

Pollution: None.

Fish (Salmon):

Species: Spring Chinook. 3 female chinook, and 1 other seen. Remains (guttings left by poacher) of another female half spawned out found in lower 100 yds.

Visibility good. Stream waded for most part and little possibility of any salmon being overlooked.

Run reported to reach stream in June or early July. Spawning at its peak at time of survey; would be completed by mid August. 7 redds were seen in 3/4 mile surveyed. Too steep from there up into canyon for spawning.

Young not seen, and time of their descent to ocean is not known.

Fish other than Salmon:

1. Steelhead: reported to spawn in stream by one person in valley, none seen.
2. Rainbow: small no of legal sized fish. Several fingerlings seen.
3. Whitefish: 2-3 seen in pools; small population

General Remarks:

Banner creek is the only tributary to Cape Horn Creek of any size, and the only one utilized by Salmon for spawning. The lower 1/4 mile is in a meadow in Cape Horn Cr. Valley, the stream being 15' wide and bordered by grass, 3-4' willow bushes, and scattered pines, and has a slight gradient. The gradient increases in the next 1/4 mile, and the trees are thicker along its banks, which are earth and rock 3-8' high for the most part. At 1200 yds the survey was stopped because the gradient suddenly increased to cause a tumble of fast water from there on up to a canyon 3-400 yds above. The Canyon has very steep rock sides, and the stream occupies nearly the entire bottom of the gash which is 1-200 ft deep. A recently built road cut along the right wall has furnished occasional gravel and earth slide banks. Cascades and small bedrock and boulder falls are frequent in the lower canyon, with little water to jump from during summer months when the run is on. The small sedimented log jam approx 6-800 yds above the end of survey and in the canyon mouth prevents salmon from getting up thru the Canyon to utilize any spawning that may exist above. Since the stream above is a mountainous area, it is quite small, and since the present depleted run of fish does not fully utilize the spawning area below (see Cape Horn Cr survey write up), it is not of paramount importance at present, to spend time on the difficult survey further up.

Recommendations for improvement are the same as those listed for Cape Horn Creek, involving closure and proper protection, so that the present small runs could be built up to better utilize the stream, even thou small.

Temperature Data:

Station	Date	Hour	Temperature		Sky
			Air	Water	
a	7-28-41	4:45 pm	62 F	49 F	sky cloudy

The cold water is clear and suitable for spawning. Anchor ice in winter may damage stream bed, but such needs investigating.

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-eos (0.7 miles)	15	21.4	0	0	1	93	34
			0.0	0.0	7.0	93.0	

Gradient: no data available other than our survey

Lower 1/4 mile: Slight to moderate

Next 1/4 mile: Moderate

Next 1/4 mile (end of survey): Moderate

to increasingly steep

End of survey to Canyon 1/2 mile above:

Steep

Tributaries:

No	Name	Width	Flow	Side	Entered on	Distance above mouth entered at
1	no name	2'	1.5 cfs	R.B.		90 yds
2	no name	?	fairly	R.B.		1.5 miles map est small
3	no name	?	small	L.B.		2 miles map est
4	Newman Cr	?	small	L . B .		2.1 miles map est
5	Bench Cr	?	largest trib.	L.B.		2.25 miles map est

Note : All tribs except Bench Cr are not over a mile or so long. Bench Creek rises behind Copper Mtn and flows mainly NW and then a short distance N to join Banner Cr. It is approx 4 1/2-5 miles long, and presumably would have a flow of about 5 cfs.

Knapp Creek

River System: Salmon R.
Stream Surveyed: Knapp Cr.

Date of Survey: July 25, 1941, by F.G. Bryant
(survey not completed)

Source: Drains SW side of a ridge separating it from the heads of Loon Cr to the North and Yankee Fort to the East. Bordered by lower ridges that separate it from Winnemucca and Beaver Creek drainage to the NW, and from East Fork of Valley Cr on the SE. Entire drainage is in SW section of Custer County and Challis Nat. Forest of Idaho.

Its main farthest source is in the small Knapp lakes and springs on a saddle between Cabin Cr Peak; Red Mtn. and Tango Peak of the Salmon River Mtns., in sections 27 and 28, T. 13N., R. 13E.

Direction of Flow: S.W. to join L.B. of Marsh Cr. in sec. 13, T. 12N. R. 11E.

Approx Total Length: 15 miles, of which the lower 0.8 mile (1300 yards) had been surveyed in 1941. Survey not yet completed.

Width of Depth: At mouth--Width 15', depth 1"-3".

Station location: none taken as yet.

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-035-03.87	
b	17060205-067-00.00	

Characters of Bottom between Stations:

Sta location	Total sq yds bottom	L.R.		MR		SR		MTS	
			%		%		%		%
mouth to 1st (lower 1300 yds)	4800	670	14	1630	34	1730	36	770	16

Spawning Area Usable and Available:

Station	Distance yds miles	Area (yd ²)	Available Spawning Area (yd ²)		%	Usable Spawning Area (yd ²)		%
			(MR&SR)	Avail		Area (yd ²)	Usable	
a-b	1,300 .75	3,360	2,352	70	1,225	25.6		

NOTE: Avail. spawning area (2,352) calculated as 70% of total area, 3,360 sq. yds.

Spawning area unavailable and unusable: none in lower 1300 yds surveyed in 1941.

Character of Watershed:

Mouth to 1st bridge
lower 1300 vds

Mountainous

Hilly

Rolling

X

Flat

X

Swampy

X in spots

Wooded

Open

X willow brush patches 2-4' high

Cultivated (%)

none, cattle and sheep
grazing

Character of Valley

Character of Banks

after undercut; earth &
some ground, 2-4' high

Density of Marginal Vegetation

moderately thick brush
patches in places

Erosion

a) banks

moderate

b) watershed

moderate

Diversions: none

Artificial Obstructions: none

Natural obstructions: none

Fluctuation in water level: Est 1-4 ft in spring from snow melt run off, and in late fall due to fall rains; also because of meandering lower channel.

Stream Volume: Estimated 10-15 cfs at mouth on July 25, 1941

% of stream bottom covered = 70-90%. 100% in places.

Pollution: none

Fish (Salmon): none seen. Two abandoned partially dug redds seen in lower 1300 yds. Looks like the Marsh Cr Poachers had removed the fish.

Irvin Spencer, USFS Guard at the Cape Horn Guard Sta on Knapp Cr, states that salmon do run up Knapp Cr from Marsh Cr. They arrive in late June or early July and are usually spawned out by mid August, when dead fish are seen along the riffles. Amount of water in stream determines how far up salmon go. In favorable years they can go up at least 3 miles. Beaver dams from 2 miles on up limit their movements at present above that point. Above this, the stream is small, particularly in mid summer when the water is often quite low, but it never gets entirely dry in the lower half.

In 1939 a good number came up Knapp Cr, but were cleaned out by spearers and snaggers.

In 1940 a fairly good run made Knapp Cr, and apparently spawned, as dead salmon were seen on many riffles in late Aug. (stream closed to spearing for 1st time). In 1941 very few salmon had been seen and the run was small at most.

Knapp Cr run could probably be built up until it is much larger than at present, but it is not a large stream, and spawning will probably be limited by beaver dams and low water to the lower 3 miles.

Fish (other than Salmon):

1. Rainbow: two fishermen were seen to take 3-4 trout approx 4 1/2-5" long in stretch between bridge and mouth. Fishermen's paths along the sides indicate that it is well fished, and trout seldom live long enough in this small stream to reach any size.

2. No other fish were actually observed.

General Remarks: Upper Knapp Cr is said to be steeper, rough and small, but the lower 3-4 miles have a moderate to low gradient and lie in a small hill bordered valley approx 100-400 yds wide that opens onto the broad Marsh Cr valley. This lower portion has willow thickets 3-5 ft high along the stream with grassy patches between, and a few scattered clumps of pine that become more numerous upstream. The riffles are quite numerous and good for spawning. The pools are small and usually shallow, being 1- 4' deep, but undercutting on bends with the brush overhang gives added protection in many cases, and they serve adequately as resting pools, since the salmon spawn shortly after entering the stream. Low water appears to limit the spawning on some riffles, as several had only 1-3" of water running over them in the lower 1300 yds surveyed. (See Card 12 as regards salmon runs in the stream.) Knapp Cr should be closed at all salmon fishing and recommendations for its improvement are the same as those listed for Marsh Cr.

Temperature data: none available, but it appears to be satisfactory for salmon spawning, and probably is kept cool by springs and the cool nights of the high altitude.

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6
a-b	25	33	1	0	9	15	0
(.75 miles)			4		36	60	

Gradient: no elevation data available. Gradient in lower 1300 yds is slight to moderate.

Tributaries:	River system	Salmon R
	Main River A	Salmon R
	Branch AM	Middle Fork of Salmon R
	Trib AM (98)	Marsh Cr
	Trib AM (98) (18)	Knapp Cr

Tribs to Knapp Cr not listed because they all appear small and without names on the available maps, and it is therefore necessary to conduct further survey before they can be located accurately.

Bear Valley Creek

River System: Salmon River

Stream Surveyed: Bear Valley Creek (tributary to Middle Fork of Salmon River)

Date of Survey: July 25 to 27 inc., 1941 by DG Fry & FG Bryant
Card write up & tabulations by FG Bryant

Source: rises on a height of land at the upper (southern) end of the Big Meadows section of Bear Valley, southeast of Whitehawk Mtn and near the east central edge of the Payette National Forest, Idaho. Source is in sec. 33, T11N, R8E.

Its drainage area is bounded by that of Sulphur Creek, Boundary and Dagger Creek on the north, and Marsh and Cape Horn Creeks on the east, all of these being tributary to the Middle Fork of the Salmon River. On the south it is bordered by the drainage of Clear Creek, Five Mile, Eight Mile, and Warm Springs Creek, and on the west by that of Deadwood River; all of the latter streams are part of the South Fork of the Payette River.

Direction of Flow: East, curving north in the 1st 1 1/2 miles; north approximately 5 1/2 miles to the mouth of Cub Creek; northeast for approximately 15 miles to the mouth of Parker Creek (approximately 2 1/2 miles below Elk Creek), then east for a winding 6 miles through Ayero meadow before curving NE again for approximately 2 1/2 miles to its confluence with Marsh Creek to form the Middle Fork of the Salmon River in sec 23, T. 13N, R.10E. Main course is NE.

Approximate total length: 37 miles, of which the lower 26.8 miles were surveyed.

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		vds	miles	vds	miles			
a	at mouth	0	0	0	0	sec 23 T13N R10E	42'	
b	mouth Elk Creek	19500	11.1	19500	11.1	sec 34 T13N R9E	60'	est 6'
c	mouth Sack Creek	11800	6.7	31300	17.8	sec 20 T12N R9E	36'	est 3'
d	upper end of survey	15900	9.0	47200	26.8	sec 3 T11N R8E (approx)	18'	est 2'

NOTE: Depths are variable , due to large number of pools in stream. Riffles average much less and were waded.

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-022	10.96
b	17060205-025	04.40
c	17060205-027	04.57
eos	17060205-028	04.34
d	17060205-028	07.16

Character of Bottom Between Stations:

Sta	Total sq yds bottom	LR sq yds	%	M sq yds	R %	SR sq yds	%	M&S sq yd	%
a-b	432,400	78660	18.2	81910	18.9	130060	30.0	141770	32.8
b-c	138,100	19805	14.3	44405	32.2	47030	34.1	26860	19.4
c-d	138,900	12280	8.8	31780	22.9	57670	41.5	37170	26.8
total	709,400	110745	15.6	158095	22.9	234760	33.1	205800	29.0

Spawning Area Available and Usable:

Between Sta	Distance bet sta yds mi	Total sq yds bott	sq yds avail (MR&SR)	% avail	sq yds usable	% usable
a-b	19500 11.1	432400	211970	49.0	79000	18.2
b-c	11800 6.7	138100	91435	66.2	44890	32.5
c-d	15900 9.0	138900	89450	64.4	23245	16.7
total	47200 26.8	709400	392855	55.4	147135	20.7

Spawning Area Unavailable and Unusable: none in area surveyed

Character of Watershed:

	Sta a-b	Sta b-c	Sta c-d
Mountainous	x 1-2000 ft high	x bordering valley	x bordering valley
Hilly	x to bordering valley bottom	x to bordering valley	x to bordering valley
Rolling			
Flat	in valley above lower 4 miles	in valley 1/2 3mi wide	in valley bottom 1/2-2 mi wide
Swampy	in upper meadow lower 4 miles	in valley	in valley bottom
Wooded	on slopes bordering valley	on valley slopes	on valley slopes
Open bottom,	on meadow flat	on valley	on valley
	above lower 4 mi	bottom	less above

Cultivated (%)	none, extensive grazing	none, extensive grazing	none, extensive grazing
Char. of Valley	\ / lower 4 mi to \ - / above	\ _____	\ —
Char of banks			
a) composition	earth & rubble 5-200', steep as valley walls (lower 4 miles)	earth 2-30'	earth 2-30'
b) slopes	earth mainly 3-4' (in meadows above)	occ cut gravel bank	avg 3'
Density of Marg. Vegetation	willows: dense at lower & upper ends, sparse in middle	willows: 3-8' dense; few, more open spots	willows: 3-4' dense below to moderate above
Erosion			
a) banks	extensive	extensive	extensive
b) watershed	moderate to quite severe below	moderate	moderate

Diversions: none in area surveyed

Artificial obstructions: none in the main stream as surveyed. There were 3-4 beaver dams on side channels between 24,000 & 24,400 yards that ponded part of the willow meadow section, the water returning a seepage through and over the banks 300-500 yds below; Beginning 3-4 miles above the end of the survey a spot inspection discovered several beaver dams, which were scattered through the upper 3-4 miles of the Big Meadow Section. These were low, 2-4' high, built of the small bush willows on the meadow and do not as yet block the stream, although they make passage difficult in some cases. These colonies may work downstream in the future and perhaps make barriers. There were a few old disused beaver dams below Sack Creek, but no barriers, most of them being on side channels.

Natural obstructions: none

Fluctuation in Water Level:

A. Feet Variation: sta a-b 2-3 ft est.
 sta b-c 2-4 ft est.
 sta c-d 2-3 ft est.
 above surveyl-2 ft est.

B. Stream volume est. 225-250 c.f.s. This had been the wettest spring in years, and the flow is based on U.S.G.S. flows for July 1938, which are probably low if anything.

The U.S.G.S. gauge sta. was located by the survey at approximately 4 miles above the stream mouth, and just below Fir Creek. U.S.G.S.

records for the period 1921-1938 show a maximum discharge of 3,450 c.f.s. on June 9, 1933, and a minimum of 28 c.f.s. on Nov. 11, 1931. High water period due to spring run off of melted snows on the high watershed apparently reaches a flood stage in early May, with highest water usually around 2000 cfs occurring normally during the last week in May and the 1st or 2nd week of June. It drops rapidly in late June, and more slowly from July on. Low water period of 80-120 c.f.s. is reached in late September, October and November, with fall rains raising it but little. Dec. to Mar. records are lacking due to winter inaccessibility of the area. Since the watershed is all above 6150 ft elevation (at mouth), early fall freezing at the time of very low water may affect the salmon eggs or fry considerably in some years. Anchor ice etc. may cause damage during the winter at any time. The large number of pools doubtless protect the young fish from more extensive damage from shifting gravel bars, etc. Bottom shifting is caused by the tremendous increase of volume during the spring runoff. Winter stream conditions need to be studied further on this stream as with most of the high altitude tributaries to the Middle Fork.

C. % of streambed covered. At the time of the survey the lower 4 miles, being located in a canyon, had the bottom generally all covered.

Pools generally covered all of the bottom from bank to bank in the meadow area above but on the riffle areas gravel bars were often exposed, and from 20-50% of the bottom was often uncovered; occasionally as high as 60-80% was found uncovered on curves with bars on the inside.

Pollution: none noted, except occasionally locally from cattle grazing on the meadows, and with no apparent effect.

Fish (Salmon--Spring Chinook):

Sta	Fish seen alive	Fish not seen dead	Fish est present	Total	# redds counted	Date	Visibility
a-b	11 in pool @ 15100 yd		2-3	13-14	0	7-26-41	fairly good except for light refl.
b-c	6 in pool	1	5-6	11-12	3 pos 1 other	7-26-41	some 1 secs poor due to lightrefl. from big pools, stream pretty good.
c-d	0	0	3		1 pos 1 other	7-26-41	" 'I
Tot.	17	1	7-9	24-26	4 pos 2 others just started		

A very small remnant of a spring chinook run is present, and

spawning apparently was just starting at time of survey. The 1 dead female was found just above the mouth of Elk Creek, was 37" long and was spawned out; 3-4 ripe eggs being left. The other fish were seen in two pools, and although moving about, did not run up onto the riffles while observed. No salmon were actually seen about the 1 pool @ 21,100 yds (1600 yds above Elk Creek) that contained 6, but 2-3 were thought to have been in a pool just above. Four redds were observed; the others may have been fresh depressions on riffles caused by grazing cattle or fishermen crossing, as no fish were seen near them, nor were they very large. No small salmon were definitely observed, although a fisherman and a state game warden reported that some fingerlings 4-6" long believed to be young chinook are occasionally caught by trout fishermen. The later said that he believed at least some may stay in the stream during the summer following their hatching, judging by their size.

Several fishermen, some being natives, reported that several years ago the run was much larger, and that spearing and snagging parties had taken large numbers prior to 1940 when the practice was forbidden. The last 3-4 years had seen few fish in the run. One fishermen reported that 4-5 years ago he had seen 50 big chinook lying on the bank by Sack Creek that were just left there by spearing and snagging parties. This practice seemed to be one of the main reasons why the rim is now so decimated. The stream seems quite capable of supporting a large run of salmon, although winter ice conditions may also be a factor to be considered.

Two Forest Service employees at the Fir Creek Campground reported a pool approximately 2 miles above Fir Creek that contained at least 35 chinook in 1940, and it may have been the same pool in which 11 were counted by the survey.

Fish (other than salmon):

1. Steelhead: reported but none seen.
2. Rainbow: abundant up to 7" in length. No large fish seen in catches of several fishermen examined, or in the stream itself. Larger fish are said to be all fished out. 3-4 fishermen had catches of 10-20 fish, all rainbows average 5-7" only. Many smaller fingerlings seen. Many in a pool @ 5800 yds were seen jumping for flies, several being in the air at once. Most of the fishermen were fishing above Elk Creek, with the area above Sack Creek having several fishermen.
3. Whitefish: abundant; mostly seen in upper meadow pools. 4 in a pool @ 33,200 yds were over 1 ft long.
4. Sculpins: several seen. Curiously there were no cutthroats seen in the stream or in the several catches examined. No suckers were seen.

Bear Valley Creek is heavily fished, particularly in the meadow section above Elk Creek. It is quite accessible from the road for several miles above that point, particularly above Sack Creek, where the stream is but from 10 to 300 yds from the road.

General Remarks:

Bear Valley Creek joins Marsh Creek to form the Middle Fork of the Salmon River in a big deep pool locally known as the "Big Hole." Guides take parties to this pool to catch many salmon before they go into either of the two tributaries, and since the "Big Hole" is in the Middle Fork it is still open to spearing and snagging.

The lower 1/2 mile of Bear Valley is in a canyon, with little flat valley bottom and has a fairly steep gradient. Cascades and rapids are numerous, clear up to the mouth of Fir Creek 4 miles above. Above the lower 1/2 mile the valley gradually widens, and has benches bordering the stream backed by steeper forested slopes. Rubble through this area is mainly too large and there is little usable.

Above Fir Creek the valley widens into a flat, often swampy, grass and willow covered meadow from 1/2 to 3 miles wide. This stream meanders and swings through this meadow with but a slight gradient, and is usually 30-40 ft wide. Pools become more numerous and larger, although few are over 5' deep. Riffles between the pools are usually composed of small gravel and the amount of good usable rubble is considerable. The banks are low, usually 2-4' high, and bordered by willows 5-8' high interspersed with grass areas. There are many good resting pools for salmon, although many are not over 2-4' deep. Aquatic vegetation covers many of the riffle areas, particularly where the current is slight, and probably interferes with spawning in some instances. Above 8500 yds, the small gravel increases and in many cases is almost entirely pea gravel and almost too small for good spawning due to possible shifting with resulting smothering of eggs or fry. One pool with 11 chinook in it was seen @ 15,100 yds. The channel is sometimes braided, and new channels are being cut through curves on the flat. Above 14,800 yds small spruce and fir growth more closely approach the stream, and larger rubble appears @16,000 yds. About every 100 yds stretch has at least 10% usable spawning, and some riffle areas run 50-60%. The valley has low benches pinching into the stream's edge just below the mouth of Elk Creek @ 19,500 yds.

Above Elk Creek the willow brush is generally thick, and 4-8' high. Walking along the banks is difficult, both because of the brush, and also because of hidden holes in the banks, beaver drag paths and side slough like embayments, usually silted. One 37" spawned out female chinook was found in this stretch below a pool containing at least 6 chinooks. 3-4 redds were observed, but were not far advanced. At 22,400 the stream cut through a 10-25' gravel bank covered with small pine and fir, and then at 23,000 yds the

valley opened up into another brushy meadow with a large number of cattle grazing on it. In the next 2 miles there were several side channels on which beaver had made dams and ponded the water back through the brush. It returned as small falls over the banks below, or through many small seepage channels. This made a sort of swampy area. The willows here are mainly only 2-4, high but still in thickets that often have to be circled. The banks are low 0 to 3, high and often undercut along the edges of pools, with some sections caved in. Pools are even more numerous than below, and riffles between would have more suitable spawning than they do, which is 20-60%, if it were not for the increasing amount of aquatic vegetation on them. Large rubble has decreased until there is seldom over 10%. This condition of meadow and stream continues for most of the remainder of the surveyed area.

Above Cache Creek the valley is from 1/2 to 1 mile wide, but with less usable spawning rubble due largely to mixing of sand with the small and medium rubble, and more silting occurs. Pea gravel predominates, and appears quite shifty where not tied down by aquatic vegetation. The valley narrows in several places, mostly by low benches sloping to the stream which, above Cache Creek, follows the left side of the valley fairly close to the road. This area is heavily fished, but the catches were all small rainbow 5-7" long, larger fish apparently having been fished out.

From 41,000 yds to the end of the survey the stream looped and meandered all over a wide stretch of more open meadow. Here the riffles are deeper and more sluggish, and pools area and numbers are highest. Aquatic vegetation largely water buttercup is often present on the bottom of both pools and riffles. The stream is 2-4' deep with some deeper pools. The stream often appears to be in a near slough condition with rubble all very small, there being practically no medium or large, but mostly all pea gravel and sand and a bit of silt, due to the low gradient in the sluggish twisting channels. It was doubtful if salmon would use much of this type of rubble at all until there was more competition for the better riffles in the stream. If this section could be straightened out, it would be less than half as long and have better riffles. There are dozens of oxbows and the necks of some 100 yds long loops are often only 5-10 yds across.

The survey was stopped @ 47,200 yds, but a spot inspection of the next 6 miles showed that the stream continued much the same to the upper end of the meadow area. It is much smaller at 5 miles above the end of the survey and above Big Meadows guard station the stream was only 5-10 ft wide and 1-2 ft deep, and a bit faster. It is crossed at intervals by 2-4, high beaver dams of willow brush, which here grows only 2-3 ft high. These dams would be difficult to get over at low water, but none were barriers at the time. At the head of the meadow where the stream comes out of the woods it is quite small, being 3-4, wide and only 3" to 6" deep.

Bear Valley Creek has a high percentage of available and usable rubble. 147,135 sq yds were believed to be good usable spawning located on suitable riffles. This amount is undoubtedly lowered however when it is remembered that although the survey was conducted in late July when the spawning season was just beginning in the stream, the water level continues to drop through the summer and does not rise appreciably during the fall rains, as is the usual case with streams at a lower elevation. With the low water period reached in September and remaining low through Nov., much of the riffle area usable in July would be uncovered and subjected to severe freezing and ice conditions that occur at this high altitude in late fall and early winter. Nevertheless, this stream has had reportedly very much larger runs in the past, and could support much larger runs in the future. Thousands more salmon can be taken care of than exist in the stream at present, for the summer water temperature is satisfactory, there is no pollution, diversions, or obstacles to salmon migration, either up or down. Resting pools are very numerous, and spearing and snagging, the worst drain on the stream in recent years, was forbidden by law in 1940, too late to preserve but a remnant of the former runs, but if aided by stocking and protection in the future the stream should produce many times its present output of salmon.

Temperature Data:

Sta	Date	Hour	Air	Water	Sky
a (mouth)	7-25-41	11:15 am	67 F	58 F	70% cloudy, thunder shower coming up
11300 yds up	7-26-41	9:00 am	58 F	56 F	overcast
Ayers Meadow					
b Elk Creek mouth	7-26-41	12:30 pm	72 F	60 F	overcast, starting to rain, thunder shower coming up
c Sack Creek mouth	7-27-41	9:30 am	57 F	52 F	overcast
Sack Creek				50 'F	
cl Cache Cr mouth	7-27-41	11:00 am	67 F	55 F	70% cloudy, cumulus
Cache Creek				54 F	

Summer temperature very satisfactory. Winter temps need checking to determine possibility of damage by freezing and anchor ice to eggs and fry.

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-b (11.1 miles)	66	5.9+	1	6	3	56	
b-c	232	34.6	15	9	40	168	

255

(6.7 miles)			6.5	3.9	17.2	72.4	
c-d	375	41.7	<u>3</u>	<u>1</u>	<u>17</u>	<u>354</u>	
(9.0 miles)			0.8	0.3	4.5	94.4	
Total	673	25.1	<u>19</u>	<u>16</u>	<u>60</u>	<u>578</u>	
(26.8 miles)				2.8	2.4	8.9	85.9

Gradient:

Sta	Distance above mouth	Tot.	Drop	Avg drop per mile	Source of data	elev.
a mouth	0	0		0	USGS Plan & Profile Mid Fk Sal R	6155
app 3/4 mi above sta b (mouth Elk Cr)	11.8 mi	245'		20.8'	USFS Payette Nat Forest Id Map	6400
app 1 1/2 mi above sta c (mouth Cache Cr)	17.9 mi	215'		27.2'	" "	6615

The gradient above Cache Creek to the end of the survey continues about the same, or probably about 30 ft per mile. The upper 5-6 miles are slightly greater, probably approximately 50 ft per mile up the end of Big Meadows as far as the stream was inspected. This slight gradient and flat bottom valley is what causes so many pools and riffles with the high percentage, 20.7% of usable spawning rubble in the area surveyed.

Tributaries:

No	Name	Side entered	Dist. mouth	Approx length	Width (mouth)	Flow	Value to salmon
1	Hot Spring	LB	1100y	few yds	many tribs	1-2 cfs	none, temp over 120 degrees F
2	unnamed	LB	2130-2170	2.5mi		52	branches, both small, no value
3	unnamed	LB	2740	3 mi		1	none, steep & small
4	unnamed	RB	3990	2 mi		2-4	none, too steep inaccessible
5	unnamed	LB	4480	1 mi		2-3	none, " "
6	unnamed	RB	5000	1 mi		1	none, " "
7	unnamed	RB	6800	1 mi		1	none, " "
8	Fir Cr	LB	7170	8 mi	10'	8-15 EST	probably will take care of a small no of salmon near mouth, steeper above 1st mile

9	Ayers Cr	RB	8500ap	4 mi		5-10	not seen due to many side channels in meadow
10	unnamed	LB	9710	2.5mi		2	none, shallow & appears to be blocked by brush jamb
11	Wyoming Cr ?	LB	12980	5 mi		1-2 EST	none, flat gradientbeaver dams on it
12	Poker Cr	RB	13500ap	3 mi		?	not seen due to dense brush & braidedstream
13	Chip Cr	RB	14000ap	2 mi		?	? " "
14	unnamed	LB	16240	? 6'		1-2	none, too small for salmon
15	Elk Creek*	RB	19470	18-20mi		90-120	has salmon run at present, see survey write up
16	unnamed	LB	23000	?		1	none
17	Pole Cr ?	LB	23800	3 mi 3-5'		4-5	none, blocked bybeaverworks brush etc., looks like a big spring area
18	unnamed	RB	30800	1 mi		3/4	none, spring feeder-small
19	Sack Creek *	LB	31300	5.5mi 4,		10-15	a few possibly too small & shallow for many. Beaver works.
20	unnamed	RB	32200	2 mi 3'		1	none, too small
21	Cache Creek *	LB	34200	8 mi 3-5'		15-25	possibly a few could enter, no run at present
22	unnamed	LB	35530	1.5mi 3'		2	little or none; small
23	unnamed	LB	37700	.5 mi		1.5	" "
24	Sheep Trl Cr	RB	38400	4 mi 4-5'		8	little; quite sandy, but passable near mouth at least
25	unnamed	LB	41600	2.5mi 2'		1	none, too small
26	unnamed	LB	42200	2 mi 1-2'		1	" " spring feeder
27	Cub Cr ?	RB	43200	3 mi 2-3		2	" " and shallow
28	unnamed	RB	45300	2.5 mi		1	" "

Many other small tribs, mostly springfeeders coming in from edge of meadow mostly 1/2 - 1 1/2 miles long. 3-4 are 2-3 miles long, but unnamed on the map and not over 2-5 cfs for any. Little use to salmon.

Elk Creek

River System: Salmon River

Name of Stream Surveyed: Elk Creek (tributary to Bear Valley Creek, tributary to Middle Fork Salmon River)

Date of Survey: July 28, 1941 by D.G. Frey and F.G. Bryant. Card write-up and tabulations by F.G. Bryant.

Source: Main Elk Creek rises in Sec 23, T14N, R8E, but is a fairly small stream until it is joined by the North Fork and West Fork of Elk Creek in Sec. 11, T13N, R8E. North Fork originates in Sec. 3, T13N, R9E, and West Fork originates in Sec 5, T13N, R8E. The stream is located over the center of the eastern boundary of the Payette National Forest of Idaho. Elk Creek drainage is separated from that of Sulphur Creek by a height of land to the north. It is bordered by the headwaters of Dagger Creek and Poker Creek to the East, Bear Valley Creek to the South and southeast, and Deadwood River of the South Fork of the Payette drainage on the west.

Direction of Flow: Due south for a slightly crooked 15 miles to a point just below Twin Bridges on the road. There it picks up Bearskin Creek coming in from the west and south, and then makes a nearly right angle turn to run to the east approximately 17 miles to its confluence with the right bank of Bear Valley Creek just above the road bridge in Sec 34, T13N, R9E.

Approximate Total Length: 22 miles from the Forks to the mouth, of which the lower 23,000 yds, or 13.1 miles were surveyed. West Fork is approximately 4 miles long, and North Fork approximately 5 1/2 miles long in addition. Bear Skin Creek, its largest tributary, is itself over 10 miles long.

Station location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		vds	miles	vds	miles			
a	at mouth approx 90 yds above road bridge	0	0	0	0	sec 34, T13N R9E	36'	3'ap
b	Twin Bridge above Elk Cr ranger station	13400	7.6	13400	7.6	sec 35, T13N R8E	27'	18"ap
c	End of survey, 1000 yds above mouth of Porter Creek	9600	5.5	23000	13.1	sec 13, T13N R8E	24'	?

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-027-04.57	
b	17060205-026-08.82	
c	17060205-026-13.67	

Character of Bottom between Stations:

Sta	Total sq		LR		MR			SR			M&S				
	yds	bottom sq	sq	yds	%	sq	yds	%	sq	yds	%	so	yds	%	
a-b	141	400		250	0.2	37	240	26.4		45	070	32.0	58	840	41.5
b-c	85	300		1950	2.3	15	790	18.5		33	710	39.5	33	850	39.8
Total	226	700		2200	1.0	53	030	23.4		78	780	34.7	92	690	40.9

Spawning Area Available and Usable:

Sta	Distance		Total		%	sq yds		%
	yds	miles	sq yds	avail so		SD	usable	
a-b	13400	7.6	141400	82310	58.2	10380		7.3
b-c	9600	5.5	85300	49500	58.1	30685		36.0
Total	23000	13.1	226700	131810	58.1	41065		18.2

Spawning area unavailable: none in area surveyed. Beaver dams reported to block stream 2-3 miles above survey's end.

Character of Watershed:

	Sta a to b	Sta b to c
Mountainous		
Hilly	bordering valley bottom	bordering valley bottom
Rolling		
Flat	X valley bottom 1 mi below to 1/4 mi wide above	x valley bottom 100 yds to 1 mi wide
Swampy	X in spots in valley bot.	X in spots
Wooded	X slopes & edges of valley - conifers	X slopes - conifers
Open	X valley bot. except for bushes & small tree clumps	X valley bot. except willows brush & sm timber stands
Cultivated (%)	none: grazed by cattle	none: grazed by sheep & cattle
Character of Valley	____/	_/
Character of Banks	0-5' gradual to steeper often undercut	avg 2' high often undercut & slumped
a) height of slope	avg 2-3' few beaches	
b) composition	mainly earth & gravel	earth below to gravel & earth above

Density of marg veg	moderate to dense in 5' to 100 yd wide band of willows mainly some cheat grass openings	dense in patches, mostly willows with grass etc on higher portions
Erosion:		
Banks	Considerable due to undercutting	extensive
Watershed	moderate	moderate to extensive

Diversions: none

Artificial Obstructions: None. However, there may be in the immediate future, for beaver have either migrated in, or been planted in the meadow area above Twin Bridges, and some new beaver dams have just been started in the vicinity of Porter Creek mouth.

Natural obstructions: none

Fluctuation in water level:

A. Ft. variation: 2-4 ft near mouth
2-3 ft in middle section
1-2 ft in upper section

Cause: spring run off of melted winter snow accumulation and spring rains. Low water period in summer and fall to early winter.

B. Stream volume est. 90-120 cfs at time of survey; considerably lower in fall.

C. % of stream bed covered = usually all or nearly all in lower 7 miles; from 60 to 100% covered in upper reaches. Many bars exposed on inside of curves accounts for most exposure. There are a few beaches.

Pollution: none noted, except locally from grazing cattle, which does no harm.

Fish (Salmon--adult spring chinook):

Sta	Fish seen alive	Not seen dead	est present	Total fish est present	No redds	date	visibility
a-b			1 reported by Elk Cr ranger sta ap 4 mi up	probably a few present	1	7-28-41	poor to fair due to light refl from pools
b-c	5	1	several possible	?	16	"	" "
Total	5	1	1	7-50 est.	17		

Light reflected from dark colored pools on a cloudy day and rain on the surface at many times made visibility very poor over many pool sections. Probably a few more salmon present than seen, but there is but a few for so large a stream. Reported to have been

extensively speared and snagged out prior to 1940. One dead chinook, female, 35" was found just above highway bridge at sta b. Others were scattered on riffles between sta c (7 miles up) and mouth of Porter Creek. One redd was seen above Porter Creek and salmon can run the stream above the end of the survey for 2-3 miles (reported). This upper meadow area is said to have had a larger run a few years back, but certainly has very few fish at the present time.

A fair number of young chinook fish 3-5 long were seen along the creek, both above and below Twin Bridges. Salmon were apparently well into the spawning season at time of the survey.

Fish, other than salmon:

A. Rainbow trout: fair number small rainbow trout reported to be caught by fishermen; very few of any size however. A considerable number of rainbow fish were seen along the stream.

B. Whitefish: fair number, several seen over 1 ft in length, and others smaller.

The stream is moderately fished due to the road along the lower 7 miles (within 50-500 yds). It is less fished in the upper meadow section a mile or so above Twin Bridges.

General Remarks:

Elk Creek is a large tributary, but is rather sluggish due to a low gradient, at least in the area surveyed. It is practically entirely in a series of nearly flat meadows from 100 yds to 1 mile wide. These meadows are covered with thickets of brush willows 3' to 8' high, being slightly smaller in size in the upper meadows. Between these willow areas are small sections 3-4 ft higher that have a covering of grasses and other low vegetative forms. There are a few patches of scattered conifers, mainly lodgepole pine, reaching from the valley slopes toward the rivers edge. The willows are usually quite dense along the stream banks.

The stream meanders a lot, causing a very large number, of pools to be formed. Few are over 6 feet deep except in the lower 7 miles where a few S1 pools are 8-9 ft deep at the deepest point. Many of the pools have undercut or even slumped bank edges where the sod has been underwashed, and these furnish additional hiding places for salmon. Because the whole valley bottom is nearly flat, there are several abandoned channels, oxbow cutoffs, and flood channels encountered. Some of these are slough like, and are difficult to get around. Beaver holes and animal runs covered with grass and brush are also frequent along the banks.

The stream itself lacks large rubble, particularly in the lower 7 miles, where there are but few concentrations of any extent. Due

to the flat gradient and rather wide channel that has been cut, the current is not very fast, and the rubble is predominantly pea gravel and sand with silt in some of the quieter stretches. There are many good riffles, but the rubble composition on them is of such small material that it can easily be shifted with a rise of water, and some bars or riffles at the heads of deeper pools were observed to be shifting steadily even at normal water level periods. Because of this fact the lower 7 miles in particular, and to a lesser extent the rest of the section surveyed, has been assigned much less usable rubble than would appear to be present at a first glance, and considering the large amount of available spawning rubble in the stream. It is also probably the main reason why the salmon at present pass up these lower 7-8 miles of riffles where the fineness of the rubble would probably cause the eggs to be uncovered before hatching time has been reached. The salmon seen were all in the upper 5 miles, as were 16 of 17 redds seen, and in this upper stretch there are more riffles having a greater amount of medium and larger rubble mixed with the pea gravel, which tends to make better and more enduring and productive redds.

Although there is no cultivation on the valley bottom, cattle are grazed in considerable numbers, and both cattle and sheep were found in the meadow above Twin Bridges. These cross the stream at the heads of the riffle areas between the deep pools, which is exactly where the spawning redds are dug, and if grazing continues beyond the 1st week or so in August, there is a real possibility that considerable damage is done to the eggs in the gravel before they are hatched, particularly since there is a considerable number of cattle grazed here.

Beaver have either recently migrated into the upper meadow, or have been placed there from another region by conservation agents. Several newly started dams were found in the vicinity of Porter Creek, and these may become barriers in the future if not kept open by human agents during the spawning run of the salmon.

Since the road parallels the right bank of the stream in its lower 7 miles to Twin Bridges, and is at no time over 50 to 500 yds from the stream in that section, there is considerable fishing for trout even above for a few miles into the less accessible upper meadow area. The stream appears to have most of the larger trout fished out, as none were seen over 6-8" long. There was a fair number of fingerling trout seen, and some fish. chinook as well. Whitefish were the only other fish observed to be present in any numbers.

Since there are no obstructions, diversions, or pollution, and the water temperature and volume seems quite satisfactory, the stream seems capable of handling many more salmon than it does at present. Although visibility was relatively poor in the pools due to light reflection, aggravated by rain squalls at the time of the survey, there were few salmon seen, and even if many were overlooked, there is still but a very small run in existence at the present time.

From all information that could be obtained from people in the area it was quite evident that the practice of spearing and snagging that was allowed prior to 1940 was so extensive as to decimate former good runs in this stream as it apparently has in the other streams of the area, and although it is now forbidden by law, this comes so late that recovery will be very slow unless aided by plantings from some other source. The stream seems quite capable of a great increase in the future under a proper management and rehabilitation program.

Temperature Data:

Sta	Date	Hour	Air	Water	Skv
b	7-28-41	9:30am	52F	53F	overcast, thunder storm coming up

Due to the many deep pools and spring area there is probably less chance of damage to eggs and fry by freezing than there is in many tribs to the Middle Fork, but such could be investigated to make sure.

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-b (24.6 miles)	427	56.1	38 8.9	38 8.9	30 7.1	321 75.1	0
b-c (6.7 miles)	167	34.0	3 1.8	7 4.2	33 19.8	124 74.3	2
Total (13.1 miles)	594	45.4	41 6.9	45 7.6	63 10.6	445 75.0	2

NOTE: pool count as listed is based on a 50 sq yd area for each pool. Actually several as listed often made up a single continuous long pool stretch.

Gradient:

Elevation at the mouth of Elk Creek is 6155 ft (USGS Plan and Profile map of Middle Fork of Salmon River). There are no other accurate elevations, but the gradient is low or slight for the entire stream as surveyed.

Tributaries:

1. no name, l.b., approximately 800 yds above mouth, 6 mi long, not seen, too many sloughs and side channels and surveyed down other side. Little value.
2. Tennessee Creek, r.b., 2700 yds above mouth, 3 1/4 mi long, 3-

4' wide, 3 cfs, little value. Possibly a few could use it but quite small and shallow.

3. Nameless Creek, r.b., 5200 yds above mouth, 3 1/2 mi long, 3' wide, 2 cfs, no value, too small a few can enter, but very shallow.

4. no name, l.b. 12600 yds above mouth, 6" wide, 1 cfs, no value, spring feeder.

5. Bear Skin Creek, l.b., 12700 yds above mouth, 10 miles long, 12-15, wide, est 20-25 cfs, ? probably usable if not blocked by beaver dams. Lower end of slough like strip needs surveying.

6. no name, r.b., 16660 yds above mouth, ?, 6" wide, 1 cfs, no value; spring feeder; inaccessible.

7. no name, l.b., 16690 yds above mouth, 3' wide, 2-3 cfs, no value; too small and becomes steep directly above.

8. no name, r.b., 18110 yds above mouth, 1' wide, 1 cfs, no value; too small; spring feeder.

9. Porter Creek, l.b. 21290 yds above mouth, 6 mi long, 7' wide, 5-10 cfs, possibly a few; shallow.

10. Unnamed Creek, r.b., approx. 14.3 miles above mouth, 5 mi long, est 6' wide, 10 cfs, not seen

11. West Fork, l.b., approx. 16 miles above mouth, 5 mi long, est 5-6' wide, not seen

12. North Fork, r.b., approx. 16.2 miles above mouth, 6 mi long, est 6-7' wide, not seen.

NOTE: tributaries above Porter Creek were not seen by survey.

Sack Creek

River System: Salmon River
Stream Surveyed: Sack Creek, tributary to Bear Valley Creek
(tributary to the Middle Fork of the Salmon River)

Sack Creek is a small stream, being approximately 5 1/2 miles long. The lower 1 1/2 miles were inspected on July 27, 1941 by F.G. Bryant. It originates from springs near the base of mountains and hills to flow almost due north, through a long meadow, bending westerly in the last half mile to enter the left bank of Bear Valley Creek in sec. 20, T. 12N, R.9E.

It is 6 ft wide at its mouth, and has an estimated flow of approximately 10-15 c.f.s. It has cut through a low bench on which the Bear Valley road is located but 50 yds above its mouth. Two beaver dams are present in the lower 200 yds, which were barely passable at the time.

Rubble composition is as follows: the meadow above 700 yds is from 1/4 - 3/4 mile wide, open, and covered with knee high bush willows and thick grass and moss, forming a wet spongy coat over almost all of the meadow due to spring feeders with no real channels. The stream itself has a slight to moderate but fairly continuous gradient. The water is everywhere in motion, so that it can hardly be said to have pool areas at all, but rather 2 ft deep riffles between smaller shallow riffles that are only about 2-3 inches deep. Aquatic plants cover large areas of the stream bottom.

Salmon could probably work up through the lower 2 miles of this stream, if they didn't try to turn around in but a few of the wider places, but the stream would take care of but few fish.

In the lower 1 1/2 mile surveyed there was a total bottom of 3500 yds, 700 sq yds LR; 1090 of MR; 1050 of SR; 660 of M&S; 2140 of (MR&SR) available spawning (61.2%); and 490 sq yds of usable or 14%.

There are only about 8-10 small pools that could be called small S2 pools, no S1 pools.

No pollution, diversions, etc. Water clear and temperature satisfactory in summer. How low the water gets in the fall and how severe the winter ice conditions are is not known. It may be that the springs in the meadow keep the stream open under the snow. It is a better small trout nursery than salmon stream.

EPA River Reach Codes:

<u>Station</u>	<u>HUC</u>	<u>SEG Rmi</u>
a	17060205-027-04.57	
b	17060205-091-00.00	

Character of Bottom Between Stations:

Lin	wid	total	% rubble								% usable		sq yd
yds	yds	bott.	LR	MR	SR	M&S	LR	M&S	MR	SR	MR&SR		
(by stretches)													
200	2	400	20	40	30	10	80	40	160	120	280	5	10
700	2	1400	20	30	30	20	280	280	420	420	840	10	140
1700	1	1700	20	30	30	20	340	340	510	510	1020	20	340
2600		3500					700	660	1090	1050	2140		490
											61.2%		14%

Station Location:

Sta	Location	Distance above prev. Station vds miles	Distance above Mouth vds miles	Map Location	Width	Depth
a	at mouth	0	0		n/a	n/a
b	end of survey	3800	2.2		n/a	n/a

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060205-108-00.00	
b	17060205-029-01.59	

Character of Bottom:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
all as surveyed 2.2 mi. up from mouth	15,400	3,360	21.9	6,360	41.4	2,800	18.2	2,880	18.7

Spawning Area Available and Usable:

Between stations	Distance		Total sq yd bottom	Available spawning [MR & SR)		Usable spawning	
	yds	mi.		sq yds	%	sq yds	%
all	3800	2.2	15400	9160	59.5	3145	20.4

Spawning Area Unavailable: None in area surveyed.

Character of Watershed:

Mountainous	
Hilly	X below to X above bordering
valley	
Rolling	
Flat	x meadow bottom between
valley walls.	112 - 1 1/2 miles wide
Swampy	
wooded	on slopes bordering valley
bottom	
Open	x valley bottom (but willow
brush)	
Cultivated (%)	none; but used for cattle grazing
Character of Valley	\ /
Character of Banks	height: 2 ft steep to vertical, few
	beaches.
	Composition: earth and
gravel	
Density of Marg. Veg.	dense in patches, mainly willow
Erosion of Banks	extensive
of Watershed	moderate to extensive

Diversions: none

Artificial obstructions: none

Natural obstructions: none

Fluctuation in water level:

- a. Feet variation: approximately 2 ft (due to spring run off of winter snows)
- b. Stream volume: est. 15-25 c.f.s.
- c. % of Stream bed covered: All, or nearly all throughout. A few 10-20% patches uncovered or inside of curves now and then

Pollution: none noted

Fish (Salmon): none seen. A local farmer reports that to his knowledge no salmon have ever run into this stream. There was no evidence of any present at the time of the survey.

Fish (Other than Salmon): a fisherman had taken several small, 5-7" rainbows near the mouth of the stream. Apparently the most common fish in the stream, but never reaching any large size, probably due at present to the considerable amount of fishing in the stream. Accessible at the mouth from a fairly good road in the summer.

General Remarks:

Cache Creek is a small stream, averaging 10-15' in width and 3-8" deep on riffles near the mouth. It has 35 S2 resting pools, mostly small, but often protected by undercut banks and overhanging willow brush. There are no large or deep pools. It flows in a long side valley with a flat, semi open meadow bottom 1/2-1 1/2 miles wide, in the lower 2 1/2 miles. This meadow is covered by clumps, often dense, of bush willows, interspersed with grass, yarrow and other low vegetation forms. Some areas are springy and wet. The stream meanders through the valley with a low to moderate gradient. Its rubble composition is mainly a bit too large on the riffles to be real good, extensive spawning areas, and weeds and aquatic vegetation cover many sections rendering other riffles of small value. The valley slopes rise fairly steeply as large hills or low mountains, and are covered with a fairly dense growth of small sized conifers, mainly lodgepole pine, with a few fir and spruce. In some spots this growth creeps out onto the valley floor, particularly at the narrower upper end. The stream leaves the meadow and becomes steeper 2.2 miles up at the end of the survey.

The stream is passable to salmon and some numbers could spawn in the stream. However, according to reports no salmon run has ever used the stream, there was none present at the time of the survey, and due to its relatively small size it seems better left as a trout stream until the run in the main Bear Valley Creek has been built up, after which a small run might be introduced by plantings.

Temperature Data:

Station	Date	Hour	Air	Water	Sky
at mouth	7-27-41	11 am	67 F	54 F	70% cloudy--cumulus

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6
a-b (2.2 miles)	35	15.9	0	0	8	27	2
					22.8	77.2	

Gradient: The elevation at the mouth of Cache Creek is approximately 6615 ft (U.S. Forest Service Payette National Forest Map). The gradient is low to moderate in the lower 2.2 miles of meadow as surveyed. Above this it becomes steeper.

Tributaries: There were no tributaries in the stretch surveyed, and none indicated big enough to name on the Forest Service Map. Two tribs approximately 2 1/2 miles long show on the map in the upper 2-3 miles. Four small lakes or ponds, one named Lost Lake, are connected in the upper mile and a half of the stream.

Panther Creek

River System: Salmon River
Stream Surveyed: Panther Creek

Date of Survey: 7/11/41, Parkhurst and Zimmer

Source: Rises in T.18 N, R.18 E flows in a Northerly direction to join the main Salmon River in S 18, T.23 N, R.18 E

Approximate Length: 65 miles of which 10.5 miles was surveyed July 11, 1941.

Panther Creek: A creek below Nupias Creek confluence was too turbulent to permit surveying.

Station Location:

Sta	Location	Distance above prev. Station vds miles	Distance above Mouth vds miles	Map Location	Width	Depth
A	Bridge 100 yds above confl w/ Salmon River	0	0	sec 18 T23N R18E	41'	17.8"
B	Bridge at 13300 confl of Deep Creek	7.6	13300	sec 27 T21N R19E	29'	12.5"
C	Bridge at 11800 C.C.C Camp	6.7	25100	sec 25 T20N R18E	25'	8.7"
D	Confl of 8700 Musgrove Creek	4.9	33800	sec 35 T20N R18E	12'	6.0"

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060203-004-00.00	
b	17060203-013-00.00	
c	17060203-017-00.00	
d	17060203-018-00.00	

Character of Bottom Between Stations:

Station	Total Bottom (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%	Usable	% Rubble
A-Nupias Cr		NOT	SURVEYED								
B-Nupias	11400	4820	42.3	4580	40.2	2000	17.5			4520	39.7
B-C	155200	27970	18.0	84770	54.6	41920	27.0	540	0.4	75095	48.4
C-D	17100	3890	22.8	7960	46.6	5250	30.6			2830	16.6

Nupias

Cr. to

Sta D	183700	36680	20.0	97310	53.0	49170	26.8	540	0.2	82445	44.9
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Classification of Stream based on Amount of Usable Spawning Rubble Present:

Total yd2 bottom	Yd2 usable sp. Rubble	Poor 0-10%	Fair 11-30%	Good 31-70%	Excellent 71-100%
183,700	82,445			44.9%	

Classification of Stream Based on Amount of Spawning Area (MR,SR) Present:

Total yd2 bottom	Yd2 Spawning area(MR,SR)	Poor 0-10%	Fair 11-30%	Good 31-70%	Excellent 71-100%
183,700	146,480				79.7%

Spawning Area (available):

Stations	Yd2 MR,SR	% of total bottom
Nupias Cr to Sta B	6,580	57.7
B-C	126,690	81.6
C-D	13,210	77.3

Spawning Area (unavailable): none

Character of Watershed:

	A-B	B-C	C-D
Mountainous			
Hilly	x	x	x
Rolling			
Flat			
Swampy			
Wooded		x slightly	x
Open	x		
Cultivated %	<1%	<1%	<1%
Character Valley	V steep sides 100-300 yds	V steep sides 50-100 yds	V 100-200 yds
Character Banks	4-8' steep earth, rock	5' avg steep rock, earth	5' avg steep rock, earth
Density Marg. Veg	scattered	fairly dense	dense along stream
Banks	slight	slight	slight
Erosion Watershed	slight	slight	slight

Diversions:

1. 4.6 miles by car above confluence with Salmon River. Irrigation dam and diversion. Diversion on right bank, no gates, dry 7/13/41.

No protective devices. Dam is passable

2. 5.4 miles by car above confluence with Salmon River. Abandoned dam, 2' high, passable, formerly supplied water for mining.

3. 5.2 miles above sta B. Irrigation dam and left bank diversion. Estimated 1 cfs diverted 7/11/41, no protective devices. Dam is passable. Ditch 8" av depth, 4' av width.

Artificial Obstructions:

1. 4.6 miles, by car, above confluence with Salmon River. Irrigation dam, 2' high, single logs, braced by stones, 50, wide, passable

2. 5.4 miles, by car, above confluence with Salmon River. Abandoned dam, 2' high

3. 2,910 yds above sta. B. Beaver dam, 18" high, spill in center, Passable

4. 5.2 miles above sta. B. Irrigation dam, single log with boards in front, 1 1/2, high, 70, long, passable with difficulty at low water.

5. 1,925 yds. below sta. C. Large brush dam, 4' high, passable with difficulty, at low water

6. 500 yds above sta.C. Large brush dam, 3, high, passable with difficulty.

Natural Obstructions: none

Fluctuation in Water Level:

Sta. A-B= Estimated 2-3'	Estimated flow- A= 150 cfs
B-C= Estimated 2-3,	B= 30 cfs
C-D= Estimated 4-5,	c= 15 cfs
	D= 3 cfs

Pollution:

Mining silt from Nupias Creek enters Panther Creek 19.9 miles above confluence with Salmon River. Water is extremely turbid (chocolate color) from Leesburg mines located near headwaters of Nupias Creek.

Fish (Salmon):

<u>Sta.</u>	<u>Number</u>	<u>Date</u>
A-B	--	7/11/41
B-C	1	7/11/41
C-D	3	7/11/41

Fish (other than Salmon):

No other fish were observed, but local residents reported fair trout fishing in the spring.

General Remarks:

Rising in T 18 N, R 18 E, Panther Creek flows in a Northerly direction to join the main Salmon River in S 18, T 23 N, R 18 E. The stream is approximately 65 miles long of which 10.5 miles, above the Nupias Creek confluence, was surveyed in July 1941.

It was impossible to survey that portion of Panther Creek (approx 19.9 miles) below the confluence of the extremely turbid Nupias Creek. This turbidness is carried by the Leesburg gold mining operations near the headwaters of the creek. At the time of the survey Nupias Creek was emptying about 90 cfs of this very muddy water into Panther Creek, making it impossible to survey Panther Creek below this point. It was observed however that between Nupias Creek confluence, and the mouth of Panther Creek large rubble and boulders were very much in evidence, protruding prominently above the water level. Riffle areas of small rubble were very scarce. The gradient is quite steep through this section, being about 33 feet to the mile. The valley, 100 to 300 yds wide, is v shaped with very steep rocky sides. Marginal vegetation is quite dense and is composed chiefly of willow, cottonwood, alder, shad bush, and a few fir and pine. The terrain of the watershed is very hilly through this section with the slopes covered with sage brush, a few pine and fir and large quantities of bare rock.

The topography, above Nupias Creek confluence, remains very hilly but there is considerably more pine and fir present on the hillsides. The valley remains narrow with very steep rocky sides, except at the extreme upper end, near the confluence of Moyer Creek. Here the valley is roughly 1/4 to 1/2 mile wide, with gently sloping sides covered with sagebrush and cheatgrass. The gradient through this section remains quite steep and for a distance of about 1 1/2 miles above Sta. B we still find a great deal of large rubble present, but along with it this is also considered usable spawning rubble. Beyond this mile and a half mark we find a very marked decrease in the amount of large rubble with an accompanying great increase of usable spawning rubble. Except for a few isolated small areas, wherein the large rubble predominates, the remainder of the stream is in excellent condition for maintenance of a good sized run of salmon. Good resting pools are sufficiently numerous.

Several large Chinook salmon were observed during the course of the survey. It was reported, that of late, the run has been consistently growing smaller.

There were no obstructions of any consequence in Panther Creek and the two small irrigation ditches observed, although unscreened at the time of the survey, could easily be screened if it was ever deemed advisable. The only tributary of any size is Nupias Creek, but because of its extremely turbid water and very steep gradient was considered of no value what so ever.

Temperature Data:

Sta.	Date	Hour	Air	Water
A	7/13/41	11:55 AM	82.0 F	62.5 F
B	7/13/41	10:45 AM	72.0 F	53.0 F
C	7/13/41	10.20 AM	77.0 F	52.0 F
D	7/11/41	4:30 PM	74.0 F	52.0 F

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6
a-Nupias Cr	NOT	SURVEYED					
b-Nupias Cr	3	3.7	0	0	2	1	55
			0.0	0.0	66.7	33.3	
b-c	28	5.7	0	2	4	1	196
			0.0	28.6	57.1	14.3	
c-d			0	0	0	0	22
			0.0	0.0	0.0	0.0	

Gradient:

From Salmon National Forest map U.S.F.S. 1937
 Confluence with Salmon River ----- B.M.= 3165
Mouth of Nupias Creek, 19 miles upstream - B.M.= 4847
 Total drop 1682 ft

Tributaries:

1. Garden Creek rt bank dry at time of survey
2. Hot spring creek lt bank <1/2 cfs no value
3. Clear creek rt bank not seen
4. Beaver creek rt bank <1/2 cfs no value
5. Trail creek lt bank <1/2 cfs no value
6. Gant creek lt bank not seen
7. Big Deer creek rt bank not seen
8. Little Deer creek rt bank not seen
9. Little Jureano creek lt bank dry at time of survey no value
10. Big Jureano creek lt bank dry at time of survey no value
11. Cliff creek lt bank dry at time of survey no value
12. Nupias creek lt bank estimated flow 90 cfs very turbid, mine silt, largely bedrock, boulders, no value impassable cascades 1.4 miles above mouth
13. Deep creek lt bank 4 cfs passable very little

		value
14. Spring creek	lt bank	<1 cfs no value
15. Fawn creek	lt bank	< 1/2 cfs no value
16. Blackbird creek	rt bank	3 cfs no value
17. Copper creek	lt bank	< 1/2 cfs no value
18. Woodtuck creek	lt bank	3 cfs no value
19. Moyer creek	lt bank	8 cfs 8' wide, 3" deep nearly choked with brush
20. Musgrove creek	rt bank	3 cfs 8' wide, 3-4" deep no value
21. Porphyry creek	rt bank	< 1/2 cfs no value
22. 4th of July creek	rt bank	< 1/2 cfs no value
23. Corral creek	rt bank	< 1/2 cfs no value
24. Cabin creek	rt bank	< 1/2 cfs no value
25. Silver creek	rt bank	3 cfs nearly dry no value
26. Opal creek	lt bank	< 1/2 cfs no value
27. Weasel creek	lt bank	< 1/2 cfs no value
28. Mink creek	rt bank	< 1/2 cfs no value
29. Otter creek	lt bank	< 1/2 cfs no value

North Fork of the Salmon River

Reconnaissance Survey: July 10, 1941
by Parkhurst and Zimmer

General Remarks:

The North Fork enters the Main Salmon River on the left bank at North Fork, Idaho, about 22 miles downstream below Salmon, Idaho. The stream is approximately 23 miles long.

The North Fork from the mouth up to the confluence of Pierce Creek, 17 miles above, was very turbid, due to a large hydraulic gold mining operation at Gibbonsville, 11 miles above the mouth, as well as numerous placer mines on both the North Fork and on Pierce Creek.

Above Pierce Creek the North Fork was clear, but was only flowing about 3 cfs. Moreover, above Pierce Creek the stream runs along the bottom of a steep, rocky canyon less than 100 yards wide. This upper section is of no value to salmon because of the slight flow, steep gradient, and large proportion of bedrock and boulders.

The lower section of the stream is of no value to salmon because of the extremely heavy mining pollution. It is probable that even if mining operations cease, the heavy silt deposits over the spawning areas would render the stream valueless to salmon. Indeed, mining pollution in previous years has probably been a major factor in exterminating the former run of Chinook salmon into this stream. There were no reports of salmon having been seen in the North Fork for many years.

Lemhi River

River System: Salmon River
 Name of Stream: Lemhi River

Date of Survey: June 30, 1941 to July 8, 1941 by Parkhurst and Zimmer

Source: Ultimate rises on the west slope of the Continental Divide, near the summit of the Bitterroot Mts, near the boundary between Idaho and Montana. The Lemhi was the first stream with Pacific Slope drainage which was encountered by Lewis and Clark on their expedition to the mouth of the Columbia River. The stream drains part of a the southwest slope of the Bitterroot Mts, and the northwest slope of the Lemhi Range, or that portion of Lemhi County, Idaho, lying east of the Salmon River.

Immediate: The stream is formed by the union of several small streams - Timber Cr., Texas Cr., and Eighteenmile Mile Cr., at the town of Leadore, Idaho., in S 28, T 135, R 26 E, Boise Meridian.

Direction of Flow: The stream flows in a general northwesterly direction from its source to its confluence with the Salmon River at the town of Salmon, Idaho.

Approximate Total Length: The stream is 58.7 miles long, and was completely surveyed.

Station Location:

Sta	Location	Distance above prev. Station		Distance above Mouth		Map Location	Width	Depth
		vds	miles	vds	miles			
A	road bridge --	--	--	733	0.4	sec 5, T21N,R22E	32	7.9
B	Hiway brid. Near Baker Id.	21,167	12.0	21,900	12.4	sec 33, T21N,R23E	61	11.2
C	Hiway brid.	12,600	7.2	34,500	19.6	sec 31 T20N,R24E	71	11.25
D	First Hiway bridge above Tendoy, Id	14,500	8.2	49,000	27.8	sec 5, T18N,R24E	52	12.5
E	Hiway brid at Lemhi Id	11,400	6.5	60,400	34.3	sec 28, T18N,R24E	22	14.7
F	Sideroad Bridge	21,700	12.3	82,100	46.6	sec 3, T16N,R25E	29	8.9
G	Hiway brid Leadore Id.	21,250	12.0	103,350	58.7	sec 28, T16N,R26E	17	5.5

EPA River Reach Codes:

Station	HUC	SEG Rmi
A	17060204-509-00.00	
B	17060204-006-00.00	
C	17060204-008-04.61	
D	17060204-015-00.00	
E	17060204-688-00.00	
F	17060204-835-00.00	
G	17060204-037-05.53	

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
Mouth-A	6,197	100	1.6	3,439	55.5	2,009	32.4	649	10.5
A-B	352,303	7,250	2.1	163,241	46.3	140,371	39.8	41,441	11.8
B-C	235,400	4,410	1.9	133,930	56.9	93,500	39.7	3,560	1.5
C-D	208,500	5,890	2.8	117,740	56.5	75,310	36.1	9,560	4.6
D-E	198,300	8,970	4.5	108,570	54.8	76,490	38.6	4,270	2.2
E-F	233,300	2,210	.95	116,190	49.8	98,730	42.3	16,170	6.9
F-G	253,350	-----	---	98,345	38.8	139,985	55.3	15,020	5.9
Total	1,487,350	28,830	1.9	741,455	49.8	626,395	42.1	90,670	6.1

Spawning Area Available:

Entire stream available only at high water. The power dam located 1936 yds above the mouth is a barrier at low water. Since during low water the water power diversion at this dam takes all the water except a small amount of seepage, and does not return any of it to the Lemhi, the entire stream must be considered unavailable at low water.

Spawning Area Unavailable:

Entire stream unavailable at low water, see explanation on Card #4.

Character of Watershed:

	Mouth-B	B-C	C-D	D-E	E-F	F-G
Mountainous						
Hilly	x	x	x	x	x	x
Rolling						
Flat						
Swampy						
Wooded						
Open	x	x	x	x	x	x
Cultivated%	10	10	10	10	10	10

Character of valley	Flat-saucer below-above 3-2 mi wide	saucer 2 1/2 mi wide	saucer 2-1 mi wide	saucer 1-1/2 mi wide	saucer 1/2-3 mi wide	saucer-flat 3-5mi wide
Character of banks	earth 2-3'	earth& gravel 2-5'	earth& gravel 2-5'	earth& gravel 3-5,	earth& gravel 1-3'	mostly earth 1-3'
Density of Marginal Vegetation	cotton-wood maple, willow, alder, berries very dense	cotton-wood maple, willow, alder, very dense	cotton-wood willow, alder, berries, very dense	cotton-wood willow, alder, berries, very dense	cotton-wood willow, alder, roses, berries very dense	willow, grass, alfalfa, clover, moderate
Erosion of banks	slight	none	none	none	none	none
Erosion of watershed	slight	no recent	no recent	no recent	no recent	no recent

Diversions:

1. Right bank, irrigation, 467 yd above Sta A, no width, no average depth, 1/2 cfs, 6/30 1941, no screens, small rock wing, extends 10' right bank, no intake, no return, no headgate.

2. Left bank, power, 1203 yd above Sta A, 32' width, 3' 6" depth, 312 cfs, 7/8 1941, no screens, wood across entire stream 1203 yd above sta A, intake-2 bypass gates not in operation, return-none to Lemhi, headgates- return goes to main Salmon R.

3. right bank, irrigation, 4,167 yd above Sta. A, 30' width, 1' 4" depth, 20 cfs, 6/30/41, no screens, brush 3' high 30' long on side channel 350 yd below take off, no intake, return- 2,250 yd below intake see sketch, headgates- 2 iron gates in wooden plank frame see sketch.

4. right bank, irrigation, 12,417 yd above sta. A, 11' **width,, 2'** 6" depth, 30 cfs, 6/30/41, no screens, wood 3' high at **diversion** take off 50' long, intake- yes, return- ?, 2 headgates.

5. right bank, irrigation, 13,607 yd above sta A, 2' width **dry,** dry flow, 6/30/41, no screens, small wood wing dam at take off side channel, no intake, no return, no headgates.

6. right bank, irrigation, 13,645 yd above sta A, 8' width, 2' depth, 5+ cfs, 6/30/41, no screens, temp log on side channel at take off, no intake, no return, no headgate.

7. left bank, irrigation and stock, 17,367 yd above sta A, 9' width, 3" depth, <2 cfs, 7/1/41, no screens, no--dam cable held log and debris at take off, no intake, no return, no headgate.

8. left bank, irrigation, 17,537 yd above sta A, 8' width, 1' 6" depth, 5 cfs, 7/1/41, no screens, no--dam cable held log at take off, no intake, no return, one large wooden gate 8' wide just below take off.

9. right bank, irrigation, 9,950 yd above sta B, 8' width, 6" depth, <5 cfs, 7/2/41, no screens, no dam, intake - yes, no return, 2 wood gates each 30" wide and 4' high.

10. left bank, irrigation, 11,260 yd above sta C, 3' width, 3" width. <1 cfs, 7/3/41, no screens, no dam, no intake, no return, no headgate.

11. left bank, irrigation, 700 yd above sta D, 8' width, 2' width 5 cfs, 7/3/41, no screens, plank wing dam extends 40' at take off: no intake, no return, no headgates.

12. right bank, irrigation, 2,950 yd above sta D, 4' width, 1' depth, <5 cfs, 7/3/41, no screens, stones 1' high across entire stream at take off, intake yes, no return, one wood gate in wood frame at take off.

13. right bank, irrigation, 4,800 yd above sta D, 4' width 1' 2" depth, 6 cfs, 7/3/41, no screens, plank and debris 60' long across entire stream at take off, intake yes, return yes, no headgate.

14. right bank, irrigation, 6,200 yd above sta D, 3' width 10" depth, 3 cfs, 7/3/41, no screens, no dam, no intake, return yes, no headgate.

15. left bank, irrigation, 9,100 yd above sta D or 100 yd above Stayden Cr., 3' width, 8" depth, 3 cfs, 7/5/41, no screens, logs and horses 2' high 50' long across entire stream at take off, no intake, no return, one headgate at take off.

16. right bank, irrigation, 300 yd above sta E, 3' width, 1' 6" width, 4 cfs, 7/5/41, no screens, stone dam 3' high **across entire** stream at take off, no intake, no return, no headgate.

17. right bank, irrigation, 3400 yd above sta E 4' width, 2' depth, 10 cfs, 7/5/41, no screens, perpendicular iron pipes with boards between 50' long 2' high across entire stream, by pass to river, return ?, no headgate.

18. right bank, irrigation, 3,450 yd above sta E, 4' width, 10" depth, <5 cfs, 7/5/41, no screens, stone dam 2' high 45' long across entire stream at take off, no intake, no return, no headgates.

19. left bank, irrigation, 250 yd above sta F, 2 1/2' width, 6" depth, 1 cfs, 7/6/41, no screens, small board wing dam 20' long and 1' high at take off, no intake, no return, one headgate at take'

off.

20. right bank, irrigation, 275 yd above sta F, 3, width, 6" depth, 1 cfs, 7/6/41, no screens, small wing dam single log and boards 1' high at take off, no intake, no return, no headgates.

21. left bank, irrigation, 3,900 yd above sta F, 4, width, 10" depth, 12 cfs, 7/6/41, no screens, small rock wing dam 1' high 30, long at take off, intake--yes, return ?, one headgate 4' wide and 3, high at take off.

22. left bank, irrigation, 6,000 yd above sta F, 15, width, 4" depth, 5 cfs, 7/6/41, no screens, small rock wing dam 40' long 1' high at take off, intake--yes, no return, no headgates.

23. left bank, irrigation, 7,800 yd above sta F, 8' width, 12" depth, 8 cfs, 7/6/41, no screens, dirt and rock wing dam 30' long and 1, high at take off, intake yes, no return, no headgate.

24. left bank, irrigation, 9,650 yd above sta F, 4' width, 8" depth, 2 cfs, 7/6/41, no screens, board and dirt wing dam 30, long and 2, high at take off, no intake, no return, no headgates.

25. left bank, irrigation, 15,711 yd above sta F, 3, width, 3" depth, 1/2 cfs, 7/7/41, no screens, small brush wing dam, no intake, no return, no headgates.

26. right bank, irrigation, 21,200 yd above sta F or 50 yd below end of survey at Leadore, 8, width, 6" depth, 4 cfs, 7/7/41, no screens, earth and log dam 3, high and diagonal across stream diverts almost entire flow into ditch, no intake, return- yes 1/4 mi below take off, no headgates.

Artificial Obstructions:

1. 467 yd above sta A, small loose rock wing dam, passable A.T., The entire stream both above and below obstruction 2 is passable only at high water limited availability -therefore due only to obstruction 2 located above temporary irrigation loose rock wing dam.

2. 1,203 yd above sta A, power dam, passable H.W., The dam is of wood construction approx 50 ft long 6, 3" drop to wooden apron and a 6" spill over the crest, 3-2 cfs was being diverted leaving approx 15 cfs in the river. It is 3000 ft from the dam to the penstocks. See accompanying sketches of dam and diversions, photos and general remarks on Card 14 permanent dam.

3. 3,817 yd above sta A, small brush dam, passable all times, located on side channel, brush dam 3' high 30, long. The power dam (obstruction 2) renders the entire stream unavailable except at hi-water. Temporary, irrigation dam, no obstruction to upstream

fish.

4. 12,417 yd above sta A, plank dam with stone abutments, passable at high water, dam is 50' long 3' drop with spill from 3" to 24" no fishway see accompanying sketch. Permanent irrigation dam across entire stream.

5. 13,607 yd above sta A, small wood wing dam on side channel, passable at all times, temporary irrigation wing dam no obstruction to upstream fish.

6. 13,645 yd above sta A, log and driftwood dam, passable at all times, temporary irrigation dam across entire channel not a barrier many passages available to fish through holes in dam.

7. 17,367 yd above sta A, cable held log diverter, passable at all times, very temporary cable held log and debris diverter into irrigation ditch no barrier.

8. 17,537 yd above sta A, cable held log diverter, passable at all times, very temporary cable held log diverter into irrigation ditch no barrier.

9. 700 yd above sta D, plank wing dam with rock weighted horses, passable at all times, temporary irrigation wing dam extends 40, into stream no obstacle to upstream fish.

10. 2950 yd above sta D, loose stone dam, passable at all times, temporary irrigation dam across entire stream 1' high no obstacle to upstream fish.

11. 4,800 yd above sta D, plank and debris dam, passable at all times, temporary irrigation dam extends across entire stream but full of holes many passages available to fish; 60' long, 2' high.

12. 9,100 yd above sta D, logs and wood horse dam, passable at all times, temporary irrigation dam across entire stream no obstacle to upstream migration of fish; dam 50' long, 2' high.

13. 300 yd above sta E, stone dam in shape of half circle, passable at all times, permanent irrigation dam can be jumped by salmon--no fishway 3' spill over crest extends across entire stream, 3' high.

14. 3,400 yd above sta E, dam of perpendicular iron pipes with boards between, passable at all times, temporary irrigation dam 50, long 2' high 5" spill over crest no obstacle to salmon extends across the entire stream.

15. 3,450 yd above sta E, loose stone dam, passable at all times, temporary irrigation dam no obstacle to upstream salmon, extends across entire stream 45' long, 2' high.

16. 250 yd above sta F, small board wing dam, passable at all

times, temporary irrigation dam extends 20, into stream 1' high, no obstacle to upstream fish.

17. 275 yd above sta F, small board wing dam, passable at all times, temporary irrigation dam single log and boards 1' high, no obstacle to upstream fish.

18. 3,900 yd above sta F, small rock wing dam, passable at all times, temporary irrigation wing dam extends 30', 1, high, no obstacle to upstream fish.

19. 6,000 yd above sta F, small rock wing dam, passable at all times, temporary irrigation wing dam extends 40', 1' high, no obstacle to upstream fish.

20. 7,800 yd above sta F, small dirt and rock wing dam, passable at all times, temporary irrigation wing dam extends 30', 1' high, no obstacle to upstream fish.

21. 9,650 yd above sta F, small board and dirt wing dam, passable at all times, temporary irrigation wing dam extends 30', 2' high, no obstacle to upstream fish.

22. 15,771 yd above sta F small brush wing dam, passable at all times, very temporary irrigation wing dam, no obstacle to upstream fish.

23. 50 yd below Leadore, Id, earth and log dam, passable at all times, temporary irrigation dam 3' high diagonally across entire stream, no obstacle because fish can go up diversion return and pass dam.

Natural obstructions: none

Fluctuation in Water Level:

Causes: Rapid run off from melting snow in June and July causes high water period. Extensive irrigation in late summer causes extreme low water period in August and September.

Average approx. Stream Flow

sta	ft variation	cfs	Date
mouth		15	July 8, 1941
A-B	1-4	327 measured	7/8/41
		200	7/8/41
C-D	1-3	150	7/8/41
D-E	1-3	120	7/8/41
sta	ft variation	cfs	Date
E-F	1-2	30	7/8/41
F-G	1-2	15	7/8/41
Leadore		5	7/8/41

END OF SURVEY

U.S. Geological Survey Water Supply Paper #863 - Snake River Basin

Staff gage on Lemhi River 700 ft upstream from diversion gates of power canal, Idaho Power Co.

Date	Maximum Daily Discharge cfs	Minimum Daily Discharge cfs	Mean Daily Discharge cfs
Oct.1937	186	64	132
Nov.1937	205	178	190
Dec.1937	209	157	189
Jan.1938	194	137	163
Feb.1938	262	160	183
Mar.1938	301	164	205
Apr.1938	440	186	243
May.1938	890	157	322
June1938	1,260	705	836
July1938	1,260	96	512
Aug.1938	89	48	68.5
Sept1938	99	70	80.9

Pollution:

In the first mile above the mouth there are several toilets set out over the river bank and discharging untreated sewage into the stream. Insofar as fish are concerned this pollution is not present in sufficient amount to interfere with their migration.

Throughout the stream there was observed a thin, even layer of fine silt covering the rubble. This is attributed mainly to the returns of muddy water from the large number of small irrigation ditches. This deposit seldom formed more than 10% of the bottom and was not considered heavy enough to interfere with the successful utilization of the salmon spawning area. This assumption is arbitrarily based on the fact that the silt deposit was thin enough so as not to hinder the rubble evaluation, even the smallest silt covered rubble types being clearly outlined in the stream bottom.

Fish (Salmon):

Species: Spring Chinooks

Only the first few Chinooks are able to surmount the Idaho Power Co's dam during the June high water period. Due to the Idaho Power Co's diversion of 300 cfs, the remnant of the former excellent Spring Chinook run into the Lemhi now come up the ditch to the tailrace of the power plant, where they encounter an impassable barrier. Some of these fish are said to finally drop

back and spawn in the less than 1/2 mile of ditch between the power plant and the main Salmon River. That a few early Chinooks get over the power diversion dam located 1936 yd above the mouth is evinced by the statement of a farmer living 30 miles above the mouth, who said that in the summer of 1940 he counted 48 redds in the stream section opposite his field. The power plant superintendent stated that he saw large numbers of fingerlings in the forebay during the Spring. He has watched them come out the tailrace, and states that only occasionally has he seen one belly up, stunned by the wheels. The U.S. Fisheries sub - station at Salmon formerly racked the Lemhi near the town of Salmon and took all the spawners, but of recent years the run has become so depleted that the hatchery has discontinued its salmon work, and no longer racks the stream.

We saw no salmon nor redds in the Lemhi during the survey period (June 30 - July 8, 1941). However, due to the thin layer of fine silt over the rubble throughout the stream, salmon redds may have been present but indistinguishable from the remainder of the stream bottom.

Fish (other than Salmon):

Species	Date	Very abundant	Abundant
Rainbow	July 8, 1941	x sta C to end	x mouth to sta C
Cutthroat	July 8, 1941	x sta C to end	x mouth to sta C
Whitefish	July 8, 1941	x sta C to end	
S u c k e r s	July 8, 1941		x mouth to sta C

Limit catches of trout are the usual occurrence among sport fishermen on the Lemhi. Most of the trout are small, averaging 7-8 inches, but most catches include several 12 - 14 inch trout.

General Remarks:

The Lemhi River runs down the center of a wide, fertile valley. Where this valley merges with the Salmon River valley, several miles above the mouth of the Lemhi River, the Lemhi valley is approximately 3 miles wide. The valley gradually narrows until it is approx. 1/2 mile wide at the town of Lemhi, 34 miles above the mouth. From the town of Lemhi the valley gradually widens as one proceeds upstream, so that at the termination of the survey at the town of Leadore, 58.7 miles above the mouth, it opens out onto a mountain plateau about 5 miles wide.

The topography of the watershed is very hilly throughout, the hills tending to lose their rolling character and becoming gradually steeper as one proceeds upstream. The covering of the hills is in general very sparse and semi-arid. Cacti, sage brush, tumbleweed, cheat, a few other grasses, and a few scattered Jack pines along the ridges, comprise the covering of the hills. As one

proceeds upstream a few more Jack pine and fir are found near the tops of the hills, but the trees remain generally few and scattered.

The valley is very fertile and is almost entirely used for pasturage, and for large crops of alfalfa, timothy, and clover all under extensive irrigation.

The marginal vegetation along the stream banks is very dense, in fact impenetrable in many places, and affords excellent cover for fish, as well as providing plenty of terrestrial insects for fish food. Cottonwood, maple, willow, alder, berries, and many shrubs unfamiliar to us from the coast were found in dense profusion.

Salmon can spawn throughout the stream, the stream being practically one long continuous good spawning bed, broken only by occasional small pools, which are often formed by the presence of irrigation wing dams. The gradient is moderate throughout, appearing just right for good spawning. The rubble is practically all of the medium and small types, with a small amount of sand and silt throughout.

From the mouth to the town of Lemhi a great many small irrigation ditches take off. These are usually not over 2 ft wide and 2 or 3 inches deep. Every field seems to have one or more of these small ditches, which in most cases do not even possess a wing dam at the take off, but merely resemble a plough furrow. These small ditches average about 4 to the mile on the side of the river surveyed, and since the marginal vegetation is so dense as to be almost impenetrable, probably as many more were missed on the opposite side of the stream.

Below the town of Lemhi, as irrigation is intensified during the late summer months, the drain of so many small ditches greatly reduces the volume of the stream during that period. Also, the returns from the larger ditches cause the stream to be slightly turbid from the town of Lemhi all the way downstream to the mouth.

There is not a fish screen on any diversion on the Lemhi. On such an irrigation system, employing a myriad of small ditches taking off directly from the river, instead of the usual system of a few large ditches possessing a series of laterals, it is of course not feasible to screen all the ditches. The damaging effect of so many small ditches on the downstream migration of salmon fingerlings is not known, but it is possible that taken altogether they may be a serious factor in the survival of the downstream migrants. All of the downstream migrants are forced to go through the wheels of the power plant located about 1/2 mile above the Salmon River confluence. The two power wheels are Allis - Chalmers, low speed, reaction type. One is a double - runner, 360

R.P.M. The other wheel is a smaller, 300 R.P.M. Together they turn out 560 K.W. They are run under a 38 foot head. There are no protective devices in intakes except for iron grizzlies, one with 2 1/2" spacing, and one with 2" spacing. Although it is reported that only occasionally is a downstream migrant seen stunned and injured in the tailrace, some sort of fish screen should be installed in the diversion, preferably just below the bypass at the take off.

A flow was taken in the power ditch on July 8, 1941, and gave a result of 312 cfs. There was approximately 15 cfs in the river bed below the dam, which was impassable to fish at the existing water stage. There was a slight spill at the power house end of the ditch (see photo), as the plant could not quite handle all the water it was taking. Three weeks previously (about June 15) the head gates were shut down more, and there was much more water going over the dam, so that the dam seemed easily passable at that high water period. However, it develops that only the first few Chinooks of the run pass over the dam before the plant starts taking all the water. The power plant utilizes 300 cfs. Any time the U.S.G.S. gaging station 700 ft. above the diversion take off indicates more than 300 cfs for the river we may assume that, if the headgates are partially closed down and the by pass at the headgates is open, so that there is no spill over at the end of the ditch, the amount over and above 300 cfs is going down the river bed where it belongs. Unfortunately, during most of the Chinook run the plant cannot get 300 cfs, takes all the water, and has to run diesel auxiliaries in order to generate sufficient power. Chinooks in considerable numbers come up to the tailrace, and are said to finally drop back and spawn in the less than 1/2 mile of ditch between the plant and the main Salmon River. So long as the power plant continues to operate under the present conditions the entire Lemhi River will be unavailable to salmon at low water which in this case constitutes almost the entire time that the fish are seeking to enter the stream. The only remedy is to construct a fish ladder from the tailrace up into the diversion ditch. This is sorely needed and would not be expensive undertaking.

Whether it is the power plant, the extensive irrigation, the spearing of fish on the spawning beds, or the operations of the U.S. Fisheries Sub station at Salmon that have decimated the former large run of Chinooks in the Lemhi is a matter of conjecture. Probably it is some combination of these lethal factors that is responsible for present conditions. I have been told repeatedly by reliable persons that the hatchery racked the Lemhi for years, took all the spawners, and never put any fish back in the Lemhi. The hatchery does not have the water supply nor the other facilities for rearing very many fish.

Temperature Data:

Sta	Date	Hour	Air	Water	Skv
A	7/8/41	9:00am	69.0 F	59.0 F	bright and clear
B	7/8/41	10:30am	75.0 F	58.0 F	bright and clear
C	7/8/41	11:15am	78.0 F	58.0 F	bright and clear
D	7/8/41	11:50am	84.0 F	57.0 F	bright and clear
E	7/8/41	12:10pm	85.0 F	58.0 F	bright and clear
F	7/8/41	12:45pm	82.0 F	59.0 F	bright and clear
G	7/8/41	1:05pm	78.0 F	54.0 F	bright and clear

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S3-6
mouth-a (0.5 miles)	9	18.0	0	0	4	5	3
a-b (12.0 miles)	122	10.2	0.0	0.0	44.4	55.6	66
b-c (7.2 miles)	53	7.4	0	0	88	34	74
c-d (8.2 miles)	97	11.8	0.0	0.0	51	2	96
d-e (6.5 miles)	26	4.0	0	0	96.2	3.8	27
e-f (12.3 miles)	61	5.0	0.0	0.0	83	14	246
f-g (12.0 miles)	26	2.2	3.8	0.0	88.5	7.7	163
Total (58.7 miles)	394	6.7	0	0	56	5	675
			0.0	0.0	91.8	8.2	
			0	0	19	7	
			0.0	0.0	73.1	26.9	
			1	0	324	69	
			0.25	0.0	82.2	17.5	

Gradient:

Station	Distance in miles	Total Drop	Av.Drop / Mile	Source of Data	Station Elevation	Gradient
Mouth-A	1/2					moderate
A-B	12.0					moderate
B-C	7.2					moderate
C-D	8.2					moderate
D-E	6.5					moderate
E-F	12.3					moderate
F-G	12.0					moderate

Station	Distance above mouth mi	# of miles above prev elevation	Elevation (ft above seal	Av. drop / mile(ft) from previous elevation
At Salmon (near Sta. A)	0.4		3980	
Lemhi (Sta. E)	34.3	33.9	5200	36.0 (6.8% grade)
Leadore (Sta G)	58.7	24.4	6225	42.0 (8.0% grade)
end of survey				$\frac{5280}{42} = 125$, or 1' drop /125'
				1/ 125 = 8% grade

Source of data; Map published by Junior Chamber of Commerce of Salmon, Idaho.

Tributaries:

# above mouth	Name	Side	Distance above mouth of parent	Width ft	Flow cfs	Value to Salmon
1.	Kirtley Cr	L.B.	2.5mi	small	inter-mitt	none
2.	Mulkey Cr.	R.B.	7.5mi	small	intermitt	none
3.	Geertson Cr.	L.B.	8.0mi	small	intermitt	none
4.	Bohannon Cr.	L.B.	10.0mi	small	intermitt	none
5.	Baker Cr.	R.B.	10.0mi	small	intermitt	none
6.	Wimpey Cr.	L.B.	12.5mi	42	75 cfs	excellent for 1/2 mi then a large amount of sand
7.	Withington Cr	R.B.	13.0mi	small	inter-mitt	none
8.	Pratt Cr.	L.B.	15.0mi	small	intermitt	none
9.	Kadletz Cr.	R.B.	15.5mi	small	intermitt	none
10.	Sandy Cr.	L.B.	17.5mi	15	10 cfs	too much sand
11.	Haynes Cr.	R.B.	18.5mi	small	intermitt	none
12.	Kinney Cr.	L.B.	19.0mi	small	intermitt	none
13.	Warmspring Cr	L.B.	21.0mi	9	5 cfs	a potential warm water hatchery supply
14.	Baldy Cr	R.B.	22.0mi	small	intermitt	none
15.	Patte Cr.	L.B.	23.0mi	small	intermitt	none
16.	Agency Cr.	L.B.	25.5mi	small	intermitt	none
17.	McDevitt Cr.	R.B.	27.5mi	small	intermitt	none
18.	Muddy Cr	R.B.	28.5mi	small	intermitt	none
19.	Hayden Cr.	R.B.	34.0mi	27	60 cfs	too high velocity and too much large rubble, just fair
20.	Yerian Cr	L.B.	37.0mi	small	intermitt	none
21.	Schwartz Cr.	R.B.	38.5mi	small	intermitt	none
22.	Reese Cr.	L.B.	41.0mi	small	intermitt	none
23.	Dutch Cr.	R.B.	42.0mi	small	intermitt	none
24.	D.C. Cr.	R.B.	43.5mi	small	intermitt	none
25.	Peterson Cr.	L.B.	44.5mi	small	intermitt	none
26.	Mill Cr.	R.B.	46.0mi	small	intermitt	none

27.	Walter Cr.	R.B.	48.0mi	small	intermitt	none
28.	Lee Cr.	R.B.	50.0mi	small	intermitt	none
29.	Little 8 mile	L.B.	51.0mi	small	intermitt	none
# above mouth	Name	Side	Distance above mouth of parent	Width ft	Flow cfs	Value to Salmon
30.	Eightmile Mile	R.B.	52.0mi	small	internitt	none
31.	Timber Cr.	R.B.	58.0mi	18	5 cfs	good spawning area
	END OF SURVEY AT LEADORE, ID					
			58.7mi			
32.	Canyon Cr.	L.B.	59.5mi	9	2 cfs	too steep
33.	Eighteen mile Forks	L.B.	60.0mi	12	2 cfs	small but good spawning area
34.	Texas Cr.	Forks	60.0mi	12	2 cfs	small but good spawning area

ADDENDUM

July 8, 1941
Lemhi River

General Remarks:

The Lemhi is practically one long continuous good spawning bed from its confluence with the main Salmon River at Salmon City upstream through the Lemhi Valley to Leadore Id., a distance of 50 miles by road and about 60 miles by river. Near Leadore Id. the Lemhi is formed by a number of small tributaries. The Lemhi itself at this point has dwindled to 5 cfs and can no longer be distinguished from its tributaries, such as Timber Cr.

The Lemhi is preponderantly composed of medium sized rubble although above the town of Lemhi an increasing amount of small rubble is noticed as one proceeds upstream.

From the mouth to the town of Lemhi a great many small irrigation ditches take off. These are usually not over 2 ft wide and 2 or 3 inches deep. Every field seems to have one of these small ditches, which in most cases do not even possess a wing dam at the take off, but merely resemble a plough furrow. These small ditches average about 4 to the mile on the side of the river surveyed, and since the marginal vegetation is so dense as to be almost impenetrable, probably as many more were missed on the opposite side of the stream.

Although we surveyed other streams while waiting for the Lemhi to clear up, we found that even after the recession of the high water the Lemhi was slightly turbid as far upstream as the town of Lemhi, due to the returns from the many small ditches, which often

carry considerable silt. There was a slight amount of silt deposited through out most of the stream, even above Lemhi where the water was perfectly clear, but this seldom formed more than 10% of the bottom, and was not thick enough to hinder the rubble evaluation nor its utilization by spawning fish.

We are told that below Lemhi, as irrigation is intensified during the late summer months, the drain of so many small ditches greatly reduces the volume of the stream. Above Lemhi there is less irrigation and the stream maintains a more constant flow during the hot summer months.

The Idaho Power Co. operates a plant approx. 700 yd above the Salmon River confluence. It is 3000 ft up the power ditch from this power plant to the diversion dam (see Zimmer's sketch of dam, also photos). We took a flow in the power ditch today (July 8, 1941) and got a result of 312 cfs. There was approximately 15 cfs in the river below the diversion. There was a slight spill at the power house end of the ditch (see photo). As the plant could not quite handle all the water they were taking. When we first came to Salmon City 3 weeks ago the head gates were shut down more and there was much more water going over the dam, so that the dam seemed easily passable at that high water period. However it develops that only the first few Chinooks of the run pass the dam before the plant starts taking all the water. The plant superintendent says that in other years they were taking every drop of water by this date, but the heavy rains this year have held the river up. The power plant can utilize 300 cfs. Anytime the Reclamation Bureau and Geological Survey gauging station just above town indicates more than 300 cfs for the river we may assume that, if the headgates are partly closed down and the by pass is open so that there is no spill over at the end of the ditch, the amount over and above 300 cfs is going down the river bed where it belongs. Unfortunately, during most of the Chinook run, from now on, the plant cannot get 300 cfs, takes all the water, and has to run diesel auxiliaries to obtain power. The superintendent says that Chinooks in considerable numbers come up to the tailrace and finally drop back and spawn in the < 1/2 mile of ditch between the plant and the main Salmon River. That a few early fish get over the dam is evinced by the fact that the superintendent sees large numbers of fingerlings in the forebay in the spring. He has watched them come out the tailrace and says that only occasionally does he see one belly up, stunned by the wheels.

The power Co. has rights to more water than they get, but they have to let the farmers above irrigate in order to sell them electricity.

The 2 power wheels are Allis - Chalmers, low speed, reaction type. One is a double runner 360 RPM. The other is a smaller 300 RPM. Together they turn out 560 KW. They are run under a 38 ft head. There are no protective devices on intakes except for iron

grizzlies one with 2 1/2" spacing, and one with 2" spacing.

A fish ladder is sorely needed from tailrace up into diversion ditch. This would not be an expensive undertaking.

Whether it is the power plant, the irrigation, the spearing, or the operations of the U.S. Fisheries Station at Salmon that have decimated the former large run here is a matter of conjecture. I have been told repeatedly by reliable persons that the hatchery racked the Lemhi for years, took all the spawners, and never put any fish back in the Lemhi. The hatchery does not have the water supply nor other facilities for rearing very many fish.

Wimpey Creek

River System: Salmon River
Stream Survey: Wimpey Creek, tributary to the Lemhi River

Date of Survey: July 1, 1941

Survey by: P. Zimmer

Wimpey Creek enters the Lemhi River on the left bank at a point 12.5 miles above the mouth of the Lemhi. The stream is from 30 to 42 feet wide for the first half mile above the confluence, and contains much excellent salmon spawning area in this section. Above the first half mile the stream is much smaller, being from 15 to 18 feet wide and containing a large amount of sand. For this reason there is only a fair amount of usable salmon spawning area in the upper section of the stream. The stream was surveyed for a distance of 2100 yards or 1 1/4 miles. No barriers were encountered, and the availability of the stream to spawning salmon is influenced only by a low water barrier near the mouth of the Lemhi, the parent stream. At the time of survey the stream was discharging approximately 75 cfs. The watershed is identical with that of the Lemhi. Marginal vegetation was also very dense. The gradient was moderate throughout. Trout (rainbow and cutthroat) are very abundant throughout the stream. Salmon (Chinooks) formerly spawned in considerable numbers in this stream, considering its short course. The stream is 8 miles long, but inasmuch as the stream heads almost on top of the continental divide, only about 3 miles of stream from the mouth has a suitable gradient for spawning fish, the remainder being too steep. No salmon were seen during the survey. There is no pollution nor any diversions on Wimpey Creek. This stream constitutes a good young salmon and trout rearing stream.

EPA River Reach Codes:

<u>Station</u>	<u>HUC</u>	<u>SEG Rmi</u>
a	17060204-006-00.00	
b	17060204-070-00.00	

Pahsimeroi River

River System: Salmon River

Stream Surveyed: Pahsimeroi River, tributary to the Main Salmon River)

Date of Survey: July 9, 1941

General Remarks:

The Pahsimeroi is remarkable in that, although it is a good sized stream at the mouth (150 cfs), it dwindles very rapidly upstream. The date of observation was not at the extreme low water period, in fact, rains have been very heavy up to now and extensive irrigation has not been resorted to, yet the Pahsimeroi dwindles to 1 cfs at a station 5 miles above May, Idaho, or 18 miles above the mouth. We were told that the stream disappears in a "sink," and this seems to be the case.

Irrigation ditches are very small, but very numerous, without dams. The ground is porous and takes water without hardly leaving a wet spot on the surface of the ground.

Marginal vegetation is very dense willow--often impenetrable.

The Pahsimeroi Valley is a broad, flat bunch grass and sage covered plain, 4-5 miles wide and 40 miles long. It is a favorite haunt of herds of antelope, some of which we observed.

Patterson Creek enters the Pahsimeroi 2 miles below May, Idaho. Patterson Creek is turbid because of placer mine operations. It flows down a very narrow side gulch into the Pahsimeroi Valley. The flow is 2-3 cfs in Patterson Creek. The gradient is fairly steep, considerable large rubble and bedrock is found, in the upper 12 miles. In the lower 9 miles it closely parallels the Pahsimeroi on the left bank. The stream has no value to salmon.

Because of rapid diminution of volume of Pahsimeroi River, we conclude it is of little value to salmon.

Reconnaissance Survey July 9, 1941. By Parkhurst and Zimmer.
General Remarks by Parkhurst and Zimmer

The Pahsimeroi River enters the Main Salmon on the left bank at a point 18 miles downstream below Challis, Idaho. The stream is approximately 30 miles long.

The Pahsimeroi is remarkable in that, although it is a good sized stream at the mouth (150 cfs at date of survey), it diminishes very rapidly upstream. the date of observation was not

at the extreme low water period, in fact, rains had been very heavy up to that date, and farmers had not yet been forced to resort to extensive irrigation. Yet the Pahsimeroi dwindled to 1 cfs at a station 5 miles above May, Idaho, or 18 miles above the mouth. We were told that the stream disappears in a "sink," and this seems to be the case, as the soil is very porous in this section, and absorbs water without leaving even a wet spot on the surface of the ground.

The Pahsimeroi Valley is a broad plain, 4 to 5 miles wide and about 40 miles long. It is moderately covered with sage brush and bunch grass, and is the favorite haunt of herds of antelope, some of which were observed.

Irrigation ditches are very numerous, but are all very small and without diversion dams or any fish protective devices.

Because of the rapid diminution in volume of the Pahsimeroi River we conclude that it is of little value to salmon. There were no reports of salmon entering the stream in recent years. Rainbow and Cutthroat trout of legal size are abundant in the lower section of the stream, but scarce above due to lack of water.

Water Fluctuation:

From geological survey water supply paper No. 863, Part 13, Snake River Basin, 1938. Staff gage in W 1/2 Sec. 25, T16N, R20E, 10 miles NW of May.

Records available: Oct 1929 to Sept 1938

Extremes: maximum discharge water year 1937-38, 258 cfs, July 4
 minimum discharge water year 1937-38, 84 cfs, May 26
 1930-38: maximum discharge 279 cfs, Dec 10-14, 16, 17, 1929
 minimum discharge 75 cfs, Apr 28, 1934

EPA River Reach Codes:

Station	HUC	SEG Rmi
a	17060202-505-00.00	
b	17060202-001-00.08	
c	17060202-001-05.56	
d	17060202-006-00.00	
e	17060202-007-00.79	

Section a-b, from confluence with Salmon River up to bridge 7/10 mile above.

Date: July 9, 1941	Surveyed by: Parkhurst & Zimmer
River System: Salmon	Name of Stream: Pahsimeroi River
Width: 42, Avg Depth: 2,	Flow: 50 cfs

Rubble: % large, 0; % med., 30; % small, 60; % M.& S., 10.
 % Usable spawning area: 60
 Accessibility: Available at all times.

Sp. Riffles: numerous, good

Resting Pools: numerous, good quality, good overhanging brush cover

Gradient: moderate Water Fluctuation: 1-2'

Banks: steep, 1-3' high, gravel and earth

Marg. Veg.: extremely dense; almost all willow

Valley: narrow, V-shaped, 1/4-1/2 mile wide, some pasture and hay

Watershed: hilly, barren except for a little sage and grass.

Temperature: Water 58.0 F; Air 88.0 F; Time 1:10 pm

Section b-c, from station b to point 4.6 miles above.

Date: July 9, 1941	Surveyed by: Parkhurst & Zimmer
River System: Salmon	Name of Stream: Pahsimeroi River
Width: 30'	Avg Depth: 10" Flow: 30 cfs

Rubble: % large, 0; % med., 50; % small, 40; % M.& S., 10.

% Usable spawning area: 75
 Accessibility: Available at all times.

Sp. Riffles: numerous, good quality; almost continuous riffles on one side or the other.

Resting Pools: adequate number, good quality, good overhanging brush cover

Gradient: moderate Water Fluctuation: 1-2'

Banks: steep, 1/2-2' high, gravel and earth

Marg. Veg.: extremely dense; almost all willow

Valley: flat, 1/2-1 1/2 mile wide, some pasture and hay

Watershed: hilly, barren except for some sage, a little grass, and a few Jack pines on the ridges .

Temperature: Water 58.0 F; Air 87.0 F; Time 12:50 pm

Diversion: Many small open irrigation ditches located throughout;

no dams; no fish protective devices

Section c-d, from Station C to point 13 miles above

Date: July 9, 1941	Surveyed by: Parkhurst & Zimmer
River System: Salmon	Name of Stream: Pahsimeroi River
Width: 12' Avg Depth: 8"	Flow: 5 cfs

Rubble: % large, 0; % med., 30; % small, 60; % M.& S., 10.

% Usable spawning area: 50

Accessibility: No dams nor barriers, but great decrease in volume of flow due to natural sinks and many small ditches, rendering headwaters inaccessible to salmon at low water

Sp. Riffles: all good shallow riffle area	Resting Pools: none
Gradient: moderate	Water Fluctuation: 1/2-1'

Banks: steep, 1/2-2' high, mostly earth

Marg. Veg.: extremely dense; almost all willow

Valley: flat, 1 1/2-4 miles wide, very little cultivation, 10% in pasture and hay

Watershed: hilly, sparse cover of sage, bunch grass, and a few Jack pines on the ridges

Temperature: Water 62.0 F; Air 84.0 F; Time 12:20 pm

Diversion: Many small open ditches located throughout; no dams; no fish protective devices

Pollution: some silting throughout, due mainly to returns from irrigation ditches, and due also to placer mining above, particularly on Patterson Creek, the principal tributary

Station d-e, from Station D to point 8.4 miles above

Date: July 9, 1941	Surveyed by: Parkhurst & Zimmer
River System: Salmon	Name of Stream: Pahsimeroi River
Width: 5' Avg Depth: 3"	Flow: 1 cfs

Rubble: % large, 0; % med., 30; % small, 60; % M.& S., 10.

% Usable spawning area: none at time of observation because of lack of water

Accessibility: Inaccessible to salmon at time of observation because of low volume of flow Sp. Riffles: no value at time of observation because of lack of water; also considerable silt; would be good spawning area with an adequate flow of water

Resting Pools: none

Gradient: moderate

Water Fluctuation: 1/2-1'

Banks: steep, 1/2-1 mostly gravel and earth

Marg. Veg.: dense; willow, alder, cottonwood, berries

Valley: flat, 4 miles wide, very little cultivation Watershed:
hilly, sparse cover of sage, bunch grass, and a few Jack pines on
the ridges

Temperature: Water 60.0 F; Air 84.0 F; Time 11:30 am

Diversions: several small open ditches the same size as the main
stream; no dams; no fish protective devices.

Pollution: some silting throughout, due to returns from irrigation
ditches.

REDFISH LAKE CREEK

River System: Salmon River

Stream Surveyed: Redfish Lake Creek (tributary to Salmon River)

Date of Survey: July 20, 1941 and October 8, 1942 by F.G. Bryant

General Remarks:

This stream empties into the right bank of the upper Salmon River approximately 5 miles above the town of Stanley, Idaho. The stream itself is divided into three parts by Big Redfish and Little Redfish Lakes.

The upper portion is seven miles in length, from the point of origin of the creek high in the Sawtooth Mountains, just southeast of Elk Peak, to the point where it empties into the southwest end of Big Redfish Lake. This section is very steep and is reportedly blocked by impassable falls a short distance above its mouth. The upper portion is mainly a succession of cascades and falls, has no value to salmon, and was therefore not surveyed in detail. Several small mountain lakes drain into this section of the creek, which never goes dry.

Big Redfish Lake is approximately 5 miles long and a mile--or just under a mile--wide. Its north and south shores are bordered by steep mountain slopes, the highest peak being Mt. Heyburn, altitude 10,229 ft., whose rocky slopes descend abruptly through the timberline to the lake shore. The lake itself is about 6,500 feet above sea level. Its water, being fed by melted snows, is always cold and clear. The lake freezes over in the winter, although it is quite deep to within a few feet of shore in all but one section. Its shores are forested with conifers, mainly lodgepole pine.

The outlet is located at the opposite or northeast end of the lake where it is bordered by sandy and gravelly benches. Near the outlet is a lodge and Forest Service public campground and beach. Its only other tributaries, Fishhook Creek and a small intermittent stream from the tiny Bench Lakes, empty within a mile of the outlet.

The only road to the lake comes in from the Stanley-Ketchum Road to the resort by the outlet, and an extension has been built for a bit over a mile around the lower east side of the lake beyond the outlet. By the end of this road, a small sand and gravel bar has been built up along the shore of the lake, being covered with from 1 to 10 feet of water. It is on this gravel bar that sea run **blueback** spawn, having run up the Columbia, Snake, and Salmon river for over a thousand miles from the Pacific. Approximately 200 spawners were observed on the bar on October 7 and 8, 1942. These fish spawned in water only 2 feet deep and from within 15 feet of

the shore on out into water 6-8 feet deep and 50 yards off shore where the bottom becomes softer as the water becomes deeper. These spawners seemed most active when a breeze created small waves and probably at the same time a light along-shore current. At this time of the year, the mornings are often calm until about 10 o'clock A.M., when a slight southwest breeze usually starts up. This breeze usually becomes stronger as the day progresses and dies down only at nightfall. There was little active digging of redds while the water was calm. We could not find any evidence of bottom seepage, although there may have been some slight general seepage in the bar.

The older residents state that they have never know the sea-run "redfish" to spawn in any other part of the creek and lake drainage, but the present run is now but a remnant of the former runs. It is believed that the cause of the decline is mainly due to the construction of the Sunbeam Dam on the Salmon River at Yankee Fork. This dam had no fish ladder, and people living at the dam site and other natives stated that during the time of its existence the only passage above it was through a tunnel about 3-4 feet in diameter through the rock beside the dam. This tunnel was usually full of water, and with the entire head of the river behind it, the force was so great that salmon swimming into it were ejected back into the pool below, where they were usually snagged or caught out sooner or later by sportsmen. Only an occasional fish got past this barrier to maintain the run. Although this barrier has been partially blasted out, there is still snagging losses at the dam that are a severe drain on the meager portion of the run now existing. Full protection might enable the stock to increase, but it could be hastened and made less of an uncertainty if this measure were coupled with a regular stocking program.

Big Redfish Lake is also populated with the smaller resident landlocked blueback or sockeye, locally called "Little Redfish." These reported to be seldom over a foot or so in length, and spawn not on the bar in the lake, but in the outlet stream during August.

The second portion of Redfish Lake Creek is that from the outlet of Big Redfish Lake to the inlet of Little Redfish Lake. This section is approximately 1-1/2 miles long, cutting through gravelly benches in the mid section to a marshy area in the lower 1,000 yards above Little Redfish Lake. It is from 18 to 60 feet wide, 5 inches to 3 feet deep, and the water is crystal clear and cool. The first 500 yards below Big Redfish Lake has a slow current and is almost a pool area, having gravelly patches and some small riffle areas that are estimated as having 20-30% usable spawning for salmon. A log jam, passable with difficulty, is followed by small boulder cascades and rapids, to a big embayment in the stream at 800 yds. This is approximately 100 x 50 yards in size, and 1-3 feet deep, with a sandy bottom and very slight current. The next 200-300 yards have 30% usable spawning area on good riffles as the stream narrows to approximately 25-30 feet in

width in back of a now unused CCC camp. This is followed by 500 yards of steeper boulder cascades of slight value, to two big pools above the highway bridge 1,600 yards below the lake. From the bridge to Little Redfish Lake, the stream flows slowly through a marshy flat with a tangle of dead pines and bushes. The stream is wider--75 to 100 feet--the current slow and the bottom in 1-3 inches in diameter, but mostly of the so called "pea gravel" bottom and estimated as 80% usable. Except for the slight current and shallowness, the area could almost be termed a pool. It seemed strange that there are no salmon using this stream section.

Little Redfish Lake is small and shallow. It is nearly circular in shape and approximately 1/2 mile across. It is marshy along its edges except on the back or west side where the slopes are steeper toward the mountains. Sea-run sockeye or blueback are reported to never have used this lake for spawning. There are trout in it, and some minnows were seen.

The lower portion of Redfish Lake Creek, that from Little Redfish Lake outlet to the Salmon River, is 1,200 yards long. From the outlet down 800 yards to a point just above the Forest Service Sheep Bridge, the stream is like the stretch just above Little Redfish Lake. It is a quietly flowing stream, over 100 feet wide at the lake, narrowing to about 45 feet at the Sheep Bridge. It is bordered by a low swampy area and its bottom is nearly uniform small gravel, from pea gravel to 3 inches in diameter with few pieces over a foot in diameter. It is from 6 inches to 2 feet deep, and it was estimated at 80% usable for salmon spawning. The character changes abruptly by the sheep bridge, for the stream has cut a steeper channel through the benches of the remaining 400 yards to the Salmon River. Here it tumbles and rushes through a boulder bed cascade series that has no spawning value and is so broken up that it would bother salmon trying to get through the section, but, although a bit difficult, it is no barrier. This lower section was surveyed on July 20, 1941.

No salmon were seen in the creek below the outlet of Big Redfish Lake. Residents state that no chinook have ever been known to enter it, and that the sea-run blueback pass directly through to the Lake. There were 73,000 square yards of bottom in the stream as surveyed between Big Redfish Lake and its confluence with the Salmon River. Of this total, 50,480 square yards or 69% was of gravel of suitable size as to be available for spawning. It was estimated that there were 45,090 square yards of 61.8% actually usable for spawning. This is exceptionally high, but the only factor that the survey party could ascertain that might lower this estimate was that in some years with a smaller run off from the melting mountain snow banks, the current in the widest and best spawning areas might be a bit slower than is usually preferred by the salmon. This usable area will be but potential, however, until stocked with sea-run salmon.

REDFISH LAKE CREEK

SECTION A: CONFLUENCE WITH SALMON RIVER TO LITTLE REDFISH LAKE

Lineal Yds	Width in Yds	Total Yd ² Bottom	% of rubble LR MR SR MS				LR	MR	SR	MS	Available Spawning (MR+SR)	%usable for Spawning	Sq. Yds Usable for Spawning
100	12	1,200	70	15	10	5	840	180	120	60	300	0	0
200	12	1,200	"				840	180	120	60	300	0	0
300	12	1,200	"				840	180	120	60	300	0	0
400	20	2,000	10	40	40	10	200	800	800	200	1,600	80	1,600
500	20	2,000	"				200	800	800	200	1,600	"	1,600
600	20	2,000	"				200	800	800	200	1,600	"	1,600
700	20	2,000	"				200	800	800	200	1,600	"	1,600
800	20	2,000	"				200	800	800	200	1,600	"	1,600
900	20	2,000	"				200	800	800	200	1,600	"	1,600
1000	20	2,000	"				200	800	800	200	1,600	"	1,600
1100	20	2,000	"				200	800	800	200	1,600	"	1,600
1200	20	2,000	"				200	800	800	200	1,600	"	1,600
1200		21,600					4,320	7,740	7,560	1,980	15,300		14,400

SECTION B: LITTLE REDFISH LAKE TO BIG REDFISH LAKE

Lineal Yds	Width in Yds	Total Yd ² Bottom	% of rubble LR MR SR MS				LR	MR	SR	MS	Available Spawning (MR + SR)	%usable for Spawning	Sq. Yds Usable for Spawning
SECTION B-1													
1000	33	33,000	10	30	50	10	3,300	9,900	16,500	3,300	26,400	80%	26,400
(HIGHWAY BRIDGE) End of 1941 Survey													
SECTION B-2													
1100	20	2,000	0	10	50	40	—	200	1,000	800	1,200	50	1,000
1200	10	1,000	20	20	30	30	200	200	300	300	500	10	100
1300	6	600	50	20	20	10	300	120	120	60	240	0	—
1400	6	600	"				300	120	120	60	240	0	—
1500	6	600	"				300	120	120	60	240	0	—
1600	8	800	"				400	160	160	80	320	5	40
CCC Camp													
1700	10	1,000	10	20	40	30	100	200	400	300	600	30	300
1800	10	1,000	"				100	200	400	300	600	30	300
1900	13	1,300	10	20	30	40	130	260	390	520	650	20	260
2000	13	1,300	"				130	260	390	520	650	20	390
2100	13	1,300	"				130	260	390	520	650	30	390
2200	13	1,300	20	20	30	30	260	260	390	390	650	20	260
2300	13	1,300	"				260	260	390	390	650	20	260
2400	13	1,300	20	10	30	40	260	130	390	520	520	30	390
2500	17	1,700	10	10	30	50	170	170	510	850	680	20	340
2600	13	1,300	30	10	20	40	390	130	260	520	390	20	260
2600		51,400					6,730	12,950	22,230	9,490	35,180		30,690

SUMMARY (SQUARE YARDS)

SECTION A: MOUTH TO LITTLE REDFISH LAKE

SECTION B: LITTLE REDFISH LAKE TO BIG REDFISH LAKE

Location	Lineal Yds.	Total Sq. Yds. Bottom	LR	MR	SR	MS	Available Spawning (MR+SR)	Sq. Yds. Usable for Spawning
Sec. A	1,200	21,600	4,320	7,740	7,560	1,980	15,300	14,400
Sec. B	2,600	51,400	6,730	12,950	22,230	9,490	35,180	30,690
TOTALS	3,800	73,000	11,050	20,690	29,790	11,470	50,480	45,090
			15%	28%	41%	16%	69%	62%

Mann Creek

River System: Snake River

Stream Surveyed: Mann Creek, tributary of the Weiser River

Date of Survey: August 17-28, 1941, by Frey and Bryant

Source:

From a number of small streams in the low mountains of T14N,R6W and T14-15N,R5W, in west central Idaho.

Direction of Flow: South southeast and south

Total Length:

33 miles, of which 28.7 miles to the confluence with Spring Creek were surveyed

Station Location:

Sta	Location	Distance Above Prev. Station		Distance Above Mouth		Map Location	Approx	
		Yds	Miles	Yds	Miles		Width	Depth
A	At mouth					NW4, S8'	-	
	confl Weiser R					T10N, R4W		
B	US Highway					Sec 22'	-	
	95 Bridge					T12N, R5W		
C	Side bridge					Sec 10'	-	
	200 yds above					T12N, R5W		
	site of pro-							
	posed dam							
D	Confl Adams					NE4, S21'	5.4"	
	Creek					T13N, R5W		
E	Confl Spring					Sec 9 7'	3.0"	
	Creek					T14N, R5W		

EPA River Reach Codes:

Station	HUC	SEG Rmi
A		
B		
C		
D		
E		

Character of Bottom Between Stations:

Station	Area (vd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
A-B	60,200	4,610	7.7	20,770	34.5	12,150	20.2	2,678	37.7
B-C	13,660	1,731	12.7	5,404	39.6	2,168	15.9	4,357	32.0
C-D	50,790	11,418	22.5	19,065	37.5	11,799	23.2	8,508	16.8
D-E	31,540	10,068	31.9	10,576	33.5	6,834	21.7	4,062	12.9
Total	156,190	27,827	17.8	55,815	35.7	32,951	21.1	39,597	25.4

Spawning Area Usable and Available:

Station	Distance vds miles	Area (vd ²)	Available Spawning Area (vd ²) (MR&SR)	% Avail	Usable Spawning Area (vd ²)	% Usable
A-B	1,600	4,800	3,030	63.1	12	0.2

Spawning Area Unavailable and Unusable:

Station	Distance (yds.)	Area (vd ²)	Area Unavail (vd ²)	% Unavail	When Avail	Usable Unavail (vd ²)	% Unavail
A-B	18,840	55,400	29,890	54.0		645	1.2
B-C	4,700	13,660	7,572	55.5		871	6.4
C-D	13,130	50,790	30,864	60.7		6,212	12.2
D-E	12,220	31,540	17,410	55.2		1,592	5.0
Entire Stream	48,890	151,390	85,736	56.6		9,320	6.2

Cause of Unavailability: Where the county road crosses Mann Creek is a temporary plank dam 5'6" high supported by four sawbucks. The dam is located near the upstream end of a concrete apron approximately 25' long. The dam is said to be passable in spring when the flash boards are removed. A number of other irrigation dams upstream are likewise low water barriers. Several of the diversions remove all of the water from the river channel.

Character of Watershed:

	A-B	B-C	C-D	D-E
Mountainous			x	x
Hilly			x	x
Rolling	x			

Flat

Swampy

Wooded

x rather
sparse x

Open

x

x

Cultivated

60%

20%

5%

0%

Character
of Valley

saucer

deep
saucer

saucer
to v

V

Character
of Banks

volcanic
bedrock
3'-12'
willow,
alder,
vines

bedrock &
rubble
2'-10'
willow,
alder

rubble &
earth
1'-10'
willow,
thorn-
apple,
alder

mostly
rubble
1'-4'
willow,
alder,
birch
dogwood

Density of
Marginal
Vegetation

dense in
patches

dense in
patches

dense in
patches

dense in
patches

Erosion

a) Banks

extensive

moderate

considerable moderate

b) Watershed

quite
extensive

moderate

moderate

extensive
in places

Diversions:

Diversion 1: irrigation, R.B., 20' above dam at county road bridge, approximately one mile above mouth of stream. 6' wide. No screens or headgates. Dam is a low water barrier.

Diversion 2: irrigation, L.B., 20' above dam at county road bridge, approximately one mile above mouth of stream. Flows through 30" culvert beneath road. Loose boards here act as headgate. No protective devices.

Diversion 3: irrigation, L.B., 3,580 yards above county road bridge, approximately one mile from mouth of bridge. Wooden headgate, 26" deep, 60" wide, 12" from bottom of ditch. Flow approximately 4-6 cfs. No screens. Diversion dam constitutes a low water barrier.

Diversion 4: irrigation, L.B., 4,290 yards above county road bridge. Not taking water at time of survey. Possible brush dam.

Diversion 5: irrigation, R.B., 8,440 yards above mouth of river. 2-3' wide, 6" deep. Flow approximately 3-4 cfs. No protective devices. Temporary stream and earth dam diverts the water. Low water barrier.

Diversion 6: irrigation, R.B., 11,140 yards above mouth of river. No water being taken. No headgates or protective devices. Broken down diversion dam. Low water barrier.

Diversion 7: irrigation, R.B., 11,640 yards above mouth of river. 3' wide, 9" deep. Ditch takes 2/3 of water in stream. Rest seeps through a 2' temporary dam - a low water barrier. No headgates or protective devices.

Diversion 8: irrigation, R.B., 13,140 yards above mouth of river. 4' wide. No screens. Wooden headgate of 3" planks operated by wheel and screw. Closed at time of survey. Permanent, cement dam with 10' apron. Low water barrier.

Diversion 9: irrigation, R.B., 13,440 yards above mouth of stream. Not in present channel of river. No water being taken. No protective devices. Small wing dam.

Diversion 10: irrigation, L.B., 14,640 yards above mouth of stream. 16" above present water level. Not taking any water. No screens. Wooden headgate 32" wide, 4' high. Log and turf dam. Passable.

Diversion 11: irrigation, R.B., 4,750 yards below US 95 bridge. 3' wide, 6" deep. Takes approximately half flow of river. No headgate or screens. Passable rock and turf dam.

Diversion 12: irrigation, L.B., 1,530 yards below US 95 bridge. Takes all the water that gets past Diversion 13. Less than 1 cfs. No screens or headgates. Earth diversion dam. Low water barrier. Channel dry below here.

Diversion 13: irrigation, R.B., 1,380 yards below US 95 bridge. 4' wide. Takes all water except approximately 1 cfs. Wooden headgate 5, x5', 6" above bottom. No screens. Temporary earth and stone diversion dam. Low water barrier.

Diversion 14: irrigation, L.B., 410 yards above US 95 bridge. 2' wide. Not taking any water at present. No headgates or screens. Log and hay diversion dam - low water barrier.

Diversion 15: irrigation, L.B., 2,420 yards above US 95 bridge. 4' wide. Not taking any water at present. No headgates or screens. Diversion dam of brush, rocks and logs. Low water barrier and passable with some difficulty at high water.

Diversion 16: irrigation, R.B., 270 yards below Station C. 6' wide. Taking approximately 10 cfs - all of water except less than 1

cfs. Concrete dam and headgate box. Wooden headgate. No screens. Dam is a low water barrier.

Diversion 17: irrigation, L.B., 1,700 yards above Station C. 1' wide. Now dry. Small trash dam at takeoff. No screens or headgates.

Diversion 18: irrigation, R.B., 1,800 yards above Station C. 42" wide. Headgates of 2" planks. Headgate pulled out of slab and twisted downstream. Taking approximately half of stream flow. No screens. Concrete dam and headgate box. No barrier.

Diversion 19: irrigation, R.B., 4,100 yards above Station C. 6' wide at takeoff, narrowing quickly to 18". No headgates or screens. Most of water by-passed back into stream channel approximately 150 yards below takeoff.

Diversion 20: irrigation, R.B., 4,700 yards above Station C. Old ditch takeoff. No longer used. Heavily silted in.

Artificial Obstructions:

1. Dam at county road bridge one mile above mouth of stream. 5'6" high, 22' wide. Made of boards resting against four wooden sawbucks with a 45 degree slope. Rests on upper end of concrete apron 18' long. Concrete abutments. Low water barrier. It is reported that the dam is not completely taken out in spring, offering considerable difficulty to steelheads at high water.

2. Galloway ditch siphon (concrete) 160 yards above the county road bridge. 50' long, approximately 10' outside diameter. In the fall of 1940, a concrete apron 10-15' wide (couldn't be seen because of turbidity of water) was installed to prevent undercutting of the siphon. When the diversion dam below is completely out the siphon and apron constitute an almost complete barrier to steelheads and salmon. When the dam is in during the summer the backwater nearly covers the siphon. At these times, however, the dam is a barrier.

3. Log and board across stream at 930 yards above county road bridge. Temporary low water barrier.

4. Dam for diversion #3 at 2,580 yards above county road bridge. 30' wide. Dam 2' high with 13" flashbands on top retained by two wooden horses. Dam of concrete with concrete abutments. Concrete apron 7' wide, with a 2' drop into a ps3T2 pool. Dam silted in behind flash boards. No spill over flash boards. Less than 1 cfs seeps beneath. Low water barrier.

5. Diversion dam for diversion #5 at 8,440 yards above mouth of stream. Dam of straw and turf. 1' high. Approximately 1 cfs gets over and through the dam. Temporary low water barrier.

6. Diversion dam for diversion #6 at 11,140 yards above mouth of stream. Made of boards, turf and trash. 2' high. No spill. Temporary low water barrier.

7. Diversion dam for diversion #7 at 11,640 yards above mouth of stream. Made of boards, turf and trash. Nearly 2, high. No spill, only seepage. Temporary low water barrier.

8. Diversion dam for diversion #8 at 13,140 yards above mouth of stream. Concrete, approximately 30, wide, apron 10' wide with 16" drop to pool 2-4' deep. Flash boards 2' high resting against two wooden horses. Concrete abutments. Low water barrier.

9. Diversion dam for diversion #10 at 14,640 yards above mouth of stream. Made of log and turf. No barrier. Fish can swim through hole beneath at low water.

10. Diversion dam for diversion #11 at 4,750 yards below US 95 bridge. Of rocks and turf. 1' high. Small spill in one spot. No barrier.

11. Diversion dam for diversion #12 at 1,530 yards below US 95 bridge. No water for 70 yards of more below here. Made of earth. Small. Temporary low water barrier.

12. Diversion dam for diversion #13 at 1,380 yards below US 95 bridge. Of earth and stones. 1' high, 2' wide, slants downstream to head of diversion. No spill. Only 1 cfs seeps through dam. Temporary low water barrier.

13. Diversion dam for diversion #14 at 410 yards above US 95 bridge. Of log and hay. 2, high, 3, wide. Slopes downstream across channel. Temporary low water barrier.

14. Diversion dam for diversion #15 at 2,420 yards above US 95 bridge. 3' high, 6, wide. Slants downstream from right to left bank. Made of brush, rocks and logs. No spill. Water seeps through slowly. Temporary low water barrier. Passable with some difficulty at high water.

15. Beaver dam at 2,770 yards above Station B. 2' high. No spill, only seepage near bottom of dam. Temporary low water barrier.

16. From 3,100 yards to 4,410 yards above Station B, the river channel is dry in many places and almost dry in others. The diversion at 4,410 yards takes all the water except less than 1 cfs which sinks beneath the gravel. Temporary low water barrier.

17. Diversion dam for diversion #16 at 270 yards below Station C. Made of concrete. 23' between abutments, divided into two 10.5' sections by a 2' concrete bulkhead in the center. Dam 2' wide with 11' drop at downstream end. Two overlapping flash boards 22" high dam the water. No spill over top. Less than 1 cfs seeping beneath

right flash board. Low water barrier.

18. 3' cascade-falls blocked with logs and brush, 520 yards below Station E. Temporary low water barrier.

19. 30" falls over a big log. Another log 1, in front, preventing fish from getting a good jump. 220 yards below Station E. Temporary low water barrier.

20. Log jam and falls at 110 yards below Station E. 3' high. Appears to be a temporary low water barrier.

Natural Obstructions: None

Fluctuation in Water Level:

Sta	Ft. Variation	Cause	Stream Volume	% Stream Bed Covered* Estimated	Calculated
A-B	6	Severe flooding	45	49.9	
B-C		40		40.4	
C-D	4-8	75		72.9	
D-E	1-4	78		77.7	

* The conclusion is that for a general picture of the stream it is sufficiently accurate to estimate the percentage of stream bed covered.

Cause of Variation: It appears that rather severe floods have occurred between stations A-B. A stream flow taken 50 yards below the Adams Creek confluence on 8/28/41 was 11.4 cfs. The water is so extensively used for irrigation, however, that portions of the stream bed below here were entirely dry..

Stream Volumes: USGS records are available only for 1937 and 1938. An isolated record for April 18, 1937, shows 119 cfs at the US 95 bridge. In late 1937 a staff gauge was set up in S11,T12N,R5W, 12 miles above the mouth. Water Supply Paper 863 lists an average discharge at this station for the period October, 1937, through September, 1938, of 73.1 cfs with a maximum of 835 and a minimum of 0.7. The extreme fluctuation in discharge is the result of the summer dry season in this semi-arid country and the extensive use of water for irrigation

Pollution:

There is no pollution in the stream, except minor amounts from barnyards.

Fish (Salmon):

No salmon ascend Mann Creek past the diversion dam and siphon at the county road bridge 1 mile above the mouth of the stream. Reports of chinook salmon ascending Mann Creek are very vague.

Fish (other than salmon):

Below Station C there were large schools of catostomid or cyprinial fish up to 6" long in the pools. The fish remained close to the bottom, apparently eating the algae growing on the rocks.

Between Stations D and E a few small rainbow ~~trout~~ were observed. A few eastern brook trout are reported in the stream.

Steelheads ascend the stream. Earl Roberts, the ranger at the Mann Creek Station above Adams Creek, reports that steelheads ascend Adams, Hitt, Fourth of July, and Bear Creeks but do not go up Stacy Creek and probably do not enter Porcupine Creek. In 1938 there were a few steelheads caught in Adams Creek, in 1940 a few in Hitt Creek. According to Watermaster T.C. Wood steelheads were caught in the Mann Creek canyon in 1941.

Survival conditions for fish are very extreme at times. Roberts reports that in 1938 the water was so low the stream was almost dry for some distance above the guard station. In that year trout were seined from the pools and moved to streams containing more water.

General Remarks:

The water of Mann Creek is extensively used for irrigation. Watermaster T.C. Woods reports 24 water rights on the river, for 20 of which diversions were found. None of the diversions is screened. The dams associated with eleven of the diversions are low water barriers. Diversion #16, located just below Station C, takes all the water from the stream except less than 1 cfs which seeps beneath the flash boards on the dam. For half a mile below the dam the channel is entirely dry in places, almost dry in others. Gradually the flow builds up again through seepage and irrigation by-passes. When it has become only a few cfs in volume another ditch takes nearly all the water. The procedure is repeated several more times before the mouth of the stream is reached. Even without irrigation, the flow of the stream can be very small. Roberts, the Ranger at the Mann Creek Station, said that in 1938 the stream was almost dry for some distance above the station--above all diversion takeoffs--so dry in fact that trout were seined from the pools and transported to streams which had more favorable conditions for the fish.

At the county road bridge, one mile above the mouth of the stream, there is a 5.5' plank diversion dam at the upper end of a

concrete apron 18' long. Normally there is scarcely any water getting by the dam in summer, all of it being taken by two diversions, one on either side of the dam. 150 yards above here, water in the Galloway ditch is siphoned "under" the river by means of a concrete siphon about 10' outside diameter. In the fall of 1940, a concrete apron 10' or more wide was constructed to prevent undercutting of the siphon. Not only is the system a low water barrier but it also offers considerable difficulty at high water. For if the diversion dam is entirely removed in the spring as some people claim, then the siphon with this apron would be very difficult for fish. If a 3' section of the dam is left in as Woods claims, however, then the siphon would constitute no difficulty because of the backwater from the dam. But the dam itself located on a long concrete apron would be difficult for fish to get over. If any attempt is made to maintain or increase the small run of fish in the stream something will have to be done about this mess.

Below Station C the stream flows through a rather broad agricultural valley void of trees except along waterways and in farm yards. Most of the rubble is heavily coated with algae and often the pools are covered with a dense mat of filamentous algae. Water temperature follows air temperature closely, reaching 80 degrees or more. Thousands of scrap fish (chubs?) in large schools have taken over this lower section of the stream.

Above Station C the stream continues in an agricultural valley for a short distance, then enters a narrow canyon for a ways, then courses through a narrow V-shaped valley to the terminus of the survey. Water temperature is more favorable to salmonid fishes here. Gradient is rather steep, pools small.

The stream has little value for chinooks and all reports of this species entering the stream were very vague. All the tributaries appear to be too small to maintain the fish over the summer. In the mainstream there are few suitable holding pools.

A few steelheads manage to ascend the stream each year. Roberts reported that several were caught in Adams Creek in 1938 and in Hitt Creek in 1940. Woods reported that several steelheads were seen in the canyon above Station C in 1941 though other people claimed no steelheads could get past the Galloway ditch siphon this spring.

The site for the proposed Mann Creek or Spangler Dam is 230 yards below Station C. There is considerable opposition to this dam among the farmers in the valley. Each landowner supplied with water will have to pay \$2.50 per acre per year for forty years. One farmer who has a 160 acre farm has three 40's lying along the stream and one 40 away from the stream. The farmer now gets sufficient water from the river. Yet the farmer would have to pay for the entire 160 if the dam were installed. This would amount to \$400 a year or \$10 per acre for the section of his property which now does not receive adequate water.

Temperature Data:

Station	Date	Hour	Air Temp	Water Temp	Sky
County road bridge 1 mi above mouth	8/18/41	3:30 pm	81 F	75 F	30% cloudy; cumulus
4,740 yds above mouth	8/18/41	2:00 pm	79 F	75 F	50% cloudy; cirro-stratus & cumulus
7,240 yds above mouth	8/17/41	1:15 pm	89 F	82 F	30% cloudy; cirrus & cumulus
4,500 yds below Station B	8/17/41	12:30 pm	87 F	75 F	clear: few cirrus & cumulus clouds
Station B	8/17/41	9:40 am	79 F	70 F	clear; few cirrus clouds
Station B	8/24/41	9:45 am	68 F	65 F	80% cloudy; cumulus, alto- cumulus & cirrus
Station C	8/24/41	1:00 pm	75 F	68 F	90% cloudy; alto-stratus & cumulus
8,200 yds above Station C	8/26/41	8:45 am	55 F	53 F	overcast; drizzling slightly
Station D	8/26/41	11:30 am	62 F	53 F	overcast; stratus; raining
1,400 yds above Station D	8/28/41	1:15 pm	64 F	56.5	hazy; cirro- stratus
Confl Hitt Creek	8/28/41	9:30 am	54 F	48 F	60 % cloudy; cirrus & cirro-stratus
480 yds above Hitt Creek	8/28/41	12:30 pm	58 F	53 F	--
2,120 yds below Station E	8/28/41	12:15 pm	56 F	54 F	hazy; cirro- stratus
Station E	8/28/41	12:00 n	54 F	49 F	50 % cloudy; cirrus

Pool Grade:

Sta	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S3T1 %	S3T2 %	S5T1 %	S5T2 %	S6
A-B (11.6 miles)	369	31.9			71	141	22	135			
	78				19.2	38.2	6.0	36.6			
B-C (2.7 miles)	175	28.9				1208	6.4	7609	713	2.6	
C-D (7.5 miles)	175	23.3			42	120	1	11		1	89
D-E (6.9 miles)	175	9.7			24.0	68.6	0.6	6.3		0.6	
					13	45	1	7		1	407
					19.4	67.2	1.5	10.4		1.5	
Grand Total (28.7 miles)	689	24.0			126	316	29	213	1	4	496
			18.3	45.9	4.2	30.9	0.1	0.6			

Gradient:

Sta	Distance (miles)	Total Drop	Avg Drop Per Mile	Source of Data	Elevation
A-B	11.6	400'	34.5'	USGS Weiser quad	A 2,180
B-C	2.7	190'	70.4'	USGS Weiser quad	B 2,580
C-D	7.5	1,180'	157.3'	USGS Weiser quad	C 2,770
D-E	8.9 mod steep		(200')	D 3,950	

Tributaries:

No.	Name of Creek	Side Entered On	Location	Est. Flow	Miscellaneous
1	---	R.B.	S19,T11N,R4W	dry-intermittent	Not observed
2	---	R.B.	S1S,T11N,R4W	"	" "
3	---	R.B.	S18,T11N,R4W	"	" "
4	---	L.B.	4,140 yds below Sta B	<1 cfs	Spring feeder
5	---	R.B.	S31,T12N,R4W	dry-intermittent	Not observed
6*	---	R.B.	S13,T12N,R5W	"	Not observed
7	Fir Creek	L.B.	S15,T13N,R5W	---	Not observed
8	Adams Creek	L.B.	Station D S9,T13N,R5W	2-3 cfs	4' wide, 3" deep
9	Stacy Creek	L.B.	3,300 yds above Sta D	2 cfs	2-4' wide, 2-6" deep
10	4th July Ck	L.B.	4,300 yds above Sta D	<5 cfs	9' wide, 2" deep
11	Hitt Creek	R.B.	7,200 yds above Sta D	3 cfs	3-4' wide 4" deep
12	Deer Creek	R.B.	3,350 yds below Sta E	1 cfs	2' wide, steep
13	Bear Creek	L.B.	2,810 yds below Sta E	2-3 cfs	3' wide, rather steep

14	Mulmick Gulch R.B.	1,720 yds below Sta E	<1 cfs	2, wide, steep
15	Spring Creek R.B.	Station E S9,T14N,R5W	1 cfs	2-3' wide, 3" deep

* The map of Weiser National Forest shows ten small intermittent tributaries between here and Fir Creek. None of them was observed during the survey of the stream.

Pine Creek

River System: Snake River

Stream Surveyed: Pine Creek, a tributary of the Weiser River

Date of ~~Survey~~: August 27, 1941, by Frey and Bryant

Source:

Arises in low mountains separating the Pine Creek drainage from the immediate Snake River drainage. Source in S16, T10S, R4W, in Washington County, Idaho. Has several large tributaries.

Direction of Flow:

Flows in a general southeast direction from its source to the confluence with the Weiser River near Cambridge, Idaho.

Total Length:

16 miles, of which 6.7 miles were surveyed. The survey was not completed.

Station Location:

Sta	Location	Distance Above Prev. Station		Distance Above Mouth		Map Location	Width	Depth
		Yds	Miles	Yds	Miles			
A	Confluence with Weiser River	0	0	0	0	SE1/4, S10 T14N, R3W	13'	
B	Road bridge	6,200	3.5	6,200	3.5	SW1/4, S32 T11S, R3W	15'	
End	Irrigation dam and diversion	5,600	3.2	11,800	6.7		9'	

EPA River Reach Codes:

Station	HUC	SEG Rmi
A		
B		

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
A-B	26,500	245	0.9	8,770	32.8	5,405	20.4	12,080	45.6
B-end	24,600	4,130	16.8	7,270	29.6	7,380	30.0	5,820	23.7
Total	51,100	4,375	8.6	16,040	31.4	12,785	25.0	17,900	35.0

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
A-B	2,300	9,900	5,440	54.9	1,050	10.6

Spawning Area Unavailable and Unusable:

Station	Distance	Area (yd ²)	Area Unavail (yd ²)	% Unavail	When Unavail	Usable Unavail (yd ²)	% Unavail
A-B	3,900	16,600	8,735	52.6	LW	1,430	8.6
B-end	5,600	24,600	14,650	59.6	LW	2,495	10.1
Stream		41,200	23,385	56.7	LW	3,925	9.5

Cause of Unavailability: An irrigation dam at 2,300 yards constitutes a temporary low water barrier.

Character of Watershed:

	A-B	B-end
Mountainous		
Hilly	x	x
Rolling	x	
Flat		
Swampy		
Wooded		
Open	sagebrush, bitterbrush grasses, few juniperus	sagebrush, bitter- brush, grasses, few juniperus
Cultivated %	50%	10%

Character of Valley	fairly flat, merging with valley of Weiser River	narrow, often V- shaped. Only 100 yds wide in places
Character of Banks	2-15', average 4' Mostly earth and rubble, some bedrock	2'-50'. Earth, and bedrock in places
Density of Marginal Vegetation	willow, alder, dogwood thornapple, rose, wild cucumber. Very dense.	cottonwood, alder, dogwood, rose. Very dense, almost impenetrable
Erosion		
a) Banks	moderate	moderate
b) Watershed	moderate	extensive

Diversions:

Diversion 1: 1,620 yards above mouth, R.B. Old diversion, now 3, above water level. Unrepaired. No water. No screens.

Diversion 2: 2,360 yards above mouth, L.B. 3' wide, 4 cfs. Wooden headgate 34" wide, 36" deep. No protective devices.

Diversion 3: 4,510 yards above mouth, L.B. 3' wide, 3 cfs. Wooden headgate 3, wide, 4' deep. No protective devices.

Diversion 4: 1,000 yards above Station B, L.B. 30" side. No water flowing at time of **survey**. No protective devices.

Diversion 5: 2,300 yards above Station B, R.B. 16" wide. Now **1.5'** above water level. No water being taken. No protective **devices**.

Diversion 6: 5,600 yards above Station B, R.B. 36" side, water 2, deep in ditch. Wooden headgate wide open. No protective devices.

Artificial Obstructions:

1. 2,300 yards above Station A. Diversion dam formed by two large cottonwood logs backing up large rocks, the upstream side of which is covered with earth and straw. No spill over top. Water seeps through structure. 2, high. Temporary low water barrier.

2. 4,510 yards above Station A. One cottonwood log 10" in diameter backing up rocks and dirt, forming a diversion dam. Water seeps through upstream **portion of dam**. **1' high**. No barrier.

3. 1,000 yards above Station B. Diversion dam formed by two 1' x 2" planks on top of rock facing. Water flowing between planks and beneath lower one. No spill. Passage difficult for fish more than 6" long. Stone and mortar abutments.

4. 2,300 yards above Station B. Dam of loose rocks topped with a strip of corrugated iron backed by a plank. Stream goes around both ends and over top. No barrier.

5. 5,600 yards above Station B. Diversion dam of boards, rocks, and turf 20" high. Leakage, small spill, no place to jump as there is only 4' of water below the dam. Low water barrier.

Natural Obstructions: None

Fluctuation in Water Level:

Sta	Ft. Variation	Cause	Stream Volume	% Stream Bed Covered
A-B	2-5'	rapid runoff	10-15 cfs	90%

Cause of variation: rapid runoff from the open, semi-arid valley walls

Stream Volumes: Staff gauge located 300' upstream from West Falls confluence. Records available for period May through September, 1938. Maximum discharge 235 sec ft on June 5. Minimum discharge 3 se ft on August 29, September 1,2,5. Mean dishcarge 138 sec ft in May to 4.7 sec ft for September.

Pollution:

Water was somewhat turbid from silt. Clouds up rapidly after rains. On August 19, the stream was heavily Loaded with reddish silt after recent rains. One dead sheep, a dead cow, and a garbage dump were found. Farm pollution common.

Fish (salmon):

None observed. A small run of spring chinooks is said to use the stream.

Fish (other than salmon):

None observed. Water was too turbid for good visibility. Some trout (rainbows) are caught in the upper portion by fishermen. A small run of steelheads enters the stream.

General Remarks:

Below the West Fork confluence, Pine Creek runs in a broad agricultural valley continuous with that of the Weiser River. The city of Cambridge is located on the combined floodplain. Above

West Fork the valley becomes narrower, and there is considerably less agricultural flat land at the bottom.

The semi-arid climate necessitates the use of water for irrigation. Water-master T.C. Woods at Weiser said there are 21 individual diversions arising from Pine Creek, of which the survey crew located six, all small and unscreened. Dams associated with these diversions are small and mostly temporary. Many of them are passable at any season, but a few constitute barriers at low water. Two such were found in the surveyed portion of the stream.

Seasonal variation in flow is great, producing difficult conditions for migratory fish at low water. In addition, the Galloway Dam in the main stream near the town of Weiser makes Pine Creek- and all other tributaries above the dam unavailable at low water.

Water temperatures tend to be high, pools are small, and much of the rubble is covered with silt and a scum of brownish-colored algae.

Natives maintain that a small run of spring chinooks ascend the stream in most years, yet the stream cannot be said to appear very favorable for these fish.

Temperature Data:

Sta	Date	Hour	Air Temp	Water Temp	Sky
A	8/27/41	10:00 am	64 F	58 F	80% cloudy: cirro-stratus and cumulus
B	8/27/41	1:45 pm	69 F	61 F	overcast: cirro-stratus and cumulus

Pool Grade:

Sta	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S3T1 %	S3T2 %	S5T2 %	S6
A-B (3.5 miles)	134	38			10	111	1	3	9	1
B-end (3.2 miles)	129	41			7.5	82.8	0.7	2.2	6.7	-
					89	39	1	-	-	-
					69.0	30.2	0.8	-	-	-
Grand Total (6.7 miles)	263	39			99	150	2	3	9	1
					37.7	57.0	0.8	1.1	3.4	

Gradient:

No figures available. The gradient was fairly shallow below the forks and moderate above the forks.

Tributaries:

1. West Fork Pine Creek, 1,800 yards above Station B, L.B. Very dense marginal vegetation, 6' wide, approximately 5-7 cfs. Needs to be surveyed.

Middle Fork Weiser River

River System: Snake River

Stream **Surveyed:** Middle Fork of the Weiser RiverDate of **Survey:** August 20-22, 1941, by Frey and Bryant

Source:

Arises in S28 and S29,T17N,R2E in Adams County, Idaho, in some mountains of moderate elevation separating the Weiser River system from the North Fork Payette River.

Direction of Flow:

From its source the river flows south for ten miles, then west for 15 miles to its confluence with the Weiser River.

Total Length: 25 miles, of which 14.9 miles were surveyed.

Station Location:

Sta	Location	Distance Above Prev. Station		Distance Above Mouth		Map Location	Width	Depth
		Yds	Miles	Yds	Miles			
A	Confl with Weiser	0	0.0	0	0.0	SE1/4,S6 T15N,R1W	9'	
B	us 95 bridge	4,000	2.3	4,000	2.3	NW1/4,S10 T15N,R1W	20'	
C	Mesa dam	13,700	7.8	17,700	10.1	NW1/4,S9 T15N,R1E	56'	
D	Falls	8,460	4.8	26,160	14.9	sec 7 T15N,R2E	18'	

EPA River Reach Codes:

Station	HUC	SEG Rmi
A		
B		
C		
D		

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.		M.R.		S.R.		M&S	
			%		%		%		%
A-B	21,300	4,500	21.1	7,920	37.2	6,260	29.4	2,620	12.3
B-C	80,000	22,090	27.6	29,350	36.7	15,660	19.6	12,900	16.1
C-D	58,800	24,640	41.9	20,910	35.6	6,660	10.3	6,590	10.2
Total	160,100	51,230	32.0	58,180	36.4	28,580	17.82	11,110	13.8

Classification of stream based on amount of usable spawning rubble and area present:

	Area (yd ²)	Usable Spawning Area (yd ²)	Quality (yd ²)			
			Poor (0- -10.5%)	Fair (10.6- -30.5%)	Good (30.6- -70.5%)	Excellent (70.6- -100%)
Estimated usable rubble	160,100	6,970	5,450	1,520	---	---
Spawning rubble (MR + SR)	160,100	86,760	---	540	85,820	400

Spawning Area Usable and Available:

Station	Distance		Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	%	Usable	
	vds	miles				Spawning Area (yd ²)	% Usable
A-B	4,000	2.3	21,300	14,180	66.6	2,255	10.6
B-C	13,700	7.8	80,000	45,010	56.3	2,948	3.8
Total	17,700	10.0	101,300	59,190	58.4	5,203	5.1

Note : Although this portion of the stream is below the Mesa Dam, a low water barrier, it is reported that in a normal year the entire stream below the dam is dry during July, August, and part of September. Hence, in a normal year the entire stream must be considered inaccessible at low water.

Spawning Area Unavailable and Unusable:

Station	Distance	Area (yd ²)	Area		When	Usable	
			Unavail (yd ²)	% Unavail		Unavail (yd ²)	% Unavail
C-D	8,460'	58,800	27,570	45.9	LW	1,767	3.0
Above Sta D	17,600'	---	---	---	AT	---	---

Notes :

1. The Mesa Dam at Station C is a low water barrier (see pictures).

2. The falls at Station D is a barrier at all times (see pictures).

3. The stream below Station C is really unavailable at low water because it is normally dry during July, August, and part of September.

4. The entire stream is unavailable at low water because of the Galloway Dam on the main Weiser River.

Character of Watershed:

	A-B	B-C	C-D
Mountainous			X
Hilly	X	X	X
Rolling			
Flat			
Swampy			
Wooded		scattered ponderosa pine	ponderosa pine, Douglas fir, shite fir, few spruce, moder- ately dense
Open	X	X	
Cultivated %	30%	20%	<1%
Character of Valley	\ /shaped 1/4 mi wide	\ /shaped- 200-400 yds; some narrows in upper 3 miles	\ /shaped - no flat land at bottom; few benches; 400- 1600 yds wide
Character of Banks	Avg 3-6'; gravel & earth; some lava outcrops	0-200', avg 3-6'; some lava outcrops	2-10" sometimes continuous with valley walls; rubble, earth, lava bedrock
Density of Marginal Vegetation	willow, alder, dogwood, aspen, thornapple, thistles; dense to very dense	willow, alder, dogwood, aspen, thornapple, thistles; dense to very dense	willow, alder, thornapple, rose, dogwood; quite dense
Erosion			
a) Banks	moderate	moderate	moderate
b) Watershed	moderate	moderate	moderate

Diversions:

Diversion 1: 1,700 yards above Station A, R.B, 2' wide, 6" water in ditch. Wooden headgates nearly falling apart. No protective devices.

Diversion 2: 3,900 yards above Station A, L.B.. Open ditch 3' wide. No headgates, approximately 5 cfs being taken. No protective devices.

Diversion 3: 3,830 yards above Station B, L.B., 3-4' wide, 10" deep. Flow approximately 5 cfs. No headgates or protective devices.

Diversion 4: 5,560 yards above Station B, L.B., 4' wide, 7" water. At least half flow of river being taken. No headgates or protective devices.

Diversion 5: 5,960 yards above Station B, L.B., 9" wide, 7" deep. Flow approximately 1-2 cfs. Crude wood headgate frame with no boards in it. No protective devices.

Diversion 6: 6,760 yards above Station B, L.B., 12" wide, 8" of water in sluice. Approximately 3 cfs being taken. Young 2" rainbows seen in lower part of ditch and several more in upper part. Wooden slide headgate 40' below takeoff. No protective devices,.

Diversion 7: 8,060 yards above Station B, L.B., 24" wide, 4.5" deep, approximately 3 cfs. No headgate or screens. Some small trout present.

Diversion 8: Mesa diversion at Station C, R.B.. 54" side, average 20" deep. 43 cfs being taken. Concrete head structure containing two headgates 4' wide, 40" deep, operated by hand wheel and screw. Water enters wooden flume almost immediately. No protective devices. Many trout reported stranded in orchards at Mesa in some years. Usually takes entire flow of stream during July, August, and part of September.

Artificial Obstructions:

1. 5,560 yards above Station B. Loose rock diversion dam 1' high. Temporary barrier at extreme low water.

2. 5,960 yards above Station B. Two logs faced upstream with turf and debris. Diverts water into small ditch. Temporary low water barrier.

3. Mesa dam at Station C. The dam consists of a 56' wide wooden apron in three steps: the first step is 9'4" long with a drop of 18" at the lower end; the second step is 7'4" long with a drop of 18" at the lower end; the third step is 15' long with a drop of 33" into a gS2T2 pool (see pictures). The dam has low log abutments at either side. Low water barrier. No fishway.

Natural Obstructions:

1. 25' falls over a bedrock ledge at Station D. The falls are in two stages separated by a sloping ledge 8' wide. Barrier at all times.

Fluctuation in Water Level:

Sta	Ft. Variation	Cause	Stream Volume	% Stream Bed Covered
A-B	3-5			80
B-C	3-5			65
C-D	3-6			90

Stream Volumes:

Flow records from Water Supply Paper 863, p. 172.

Staff gauge 2.5 miles upstream from confluence with Weiser at old highway bridge. During October, 1937, through September, 1938:

Maximum discharge	-	1,380 sec ft on May 1
Minimum discharge	-	0.1 sec ft on Aug 31
Mean discharge.	-	167 sec ft

Pollution:

Considerable silt washes in during rainy weather. One day the stream may be clear and the next day cloudy. This results from the rapid runoff on the open watershed.

Fish (salmon):

None observed. A few spring chinooks have been reported to ascend the stream, but there are scarcely any suitable pools for them.

Fish (other than salmon):

Steelheads are reported to use the stream in fair numbers. Rainbow trout are caught by fishermen. Cutthroats have been recently stocked in the stream by the State Fish Commission.

General Remarks:

The Middle Fork of the Weiser River appears to have little value for salmon or steelheads in its present condition. The Mesa diversion, located 7.8 miles above the mouth of the stream, has the court granted right to take every drop of water during the irrigation period. As a result the stream is said to be dry below the dam during July, August, and part of September in a normal summer. The dam in connection with this diversion, consisting of a wooden apron 56' wide and 32' long in three steps, is a low water barrier, and a serious obstacle in higher water as well. Only 4.8 miles of stream above the dam is usable, because of an impassable 25' falls in the main stream. Yet the Middle Fork is reported by some to have the best steelhead run of all the tributaries of the Weiser River.

Any fish using the upper portion of the river would have to come up in May or June to get past the dam. Spawning below the dam does not appear very likely to be successful because of the small flow of water and high temperatures in the summer. Fingerlings hatched above the dam would have difficulty getting downstream during the irrigation season. Natives report that large numbers of trout fingerlings have been observed in the Mesa orchards after coming down the ditch.

The lower portion of the stream is open with scarcely any trees on the valley slopes. Sage brush and bunch grass predominate. As one ascends the stream, ponderosa pines become more abundant, especially on the shaded slopes; and in the upper portions of the watershed in the vicinity of the falls fairly dense strands of Douglas fir, white fir, ponderosa pine, and a few spruce occur. The open nature of the watershed promotes rapid runoff with resultant silting of much of the stream bed, especially below the dam.

Resting pools for the most part are small and shallow and of little value in retaining large migratory fish over a period of several months. Stream temperatures tend to be high, even above the dam. Rubble averages large for good spawning areas. The portion of the river above the dam is almost continuous white water.

Conditions in the Middle Fork are further complicated by conditions in the main Weiser River. The Galloway Dam, located a short distance above the town of Weiser, is a low water barrier. During summer the Galloway Ditch takes all or nearly all of the flow in the stream, quite frequently there being less than 9 cfs below the dam. This condition would make it not only difficult for large fish to ascend at low water but also for downstream migrants to pass during the same period.

Temperature Data:

Sta	Date	Hour	Air Temp	Water Temp	Skv
B	8/20/41	10:20 am	69 F	62 F	overcast; water quite turbid
5,560 yards above Sta B	8/20/41	2:15 pm	77 F	67 F	30% clear; cirro-stratus & cumulus
900 yards below Sta C	8/21/41	10:10 am	64 F	57 F	clear
4,510 yards above Sta C	8/21/41	12:15 pm	76 F	57 F	clear, except for 2 large thunderheads
4,510 yards above Sta C	8/22/41	2:45 pm	81 F	60 F	70% clear; cumulus
D	8/22/41	12:30 pm	67 F	53 F	70% clear; cumulus

Pool Grade:

Sta	Resting 99 miles)	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S3T1 %	S3T2 %	S5T1 %	S5T2 %	S6
A-B	(2.3	44			23	76					2
					23.2	76.8					
B-C	133 (7.8	17			14	97	2	20			42
					10.5	72.9	1.5	15.0			
C-D	31 (4.8	6				25		5		1	128
						80.7		16.1		3.2	
Grand	263	18			37	198	2	25		1	172
Total	(14.9 miles)		14.1	75.3	0.8	9.5		0.4			

Gradient:

No exact figures are available on the gradient. The gradient was fairly shallow in the lowest two miles and became progressively steeper upstream. Above Station C the gradient was fairly steep, the river being almost continuous white water.

Only one station elevation is available, that of Station B, which is approximately 3,900 ft (Weiser National Forest Map, 1938).

Tributaries:

- 1,000 yards above Station A, R.B., 1 cfs. May be leakage from irrigation ditch.
- 1,900 yards above Station A, L.B., 2-3 cfs. May be irrigation bypass.
- 1,010 yards above Station B, L.B., <1 cfs.
- 2,540 yards above Station B, L.B., 3' wide, 1-2 cfs. No value to salmon.
- 6,460 yards above Station B, L.B., >1 cfs, 3, wide.
- 7,660 yards above Station B, L.B., 10, wide channel. Bone dry.
- 40 yards below Station C, L.B., 2' wide, 1-2 cfs. Steep. No value to salmon.
- 3,900 yards above Station C, R.B., approx 1 cfs. Steep. Inaccessible.
- Warm Spring Creek, 3,980 yards above Station C, L.B., 3, wide, 2-3 cfs. Steep. Too small for salmon. Temperature 69 F at 12:15 pm.
- 4,440 yards above Station C, L.B., 1 cup/min. No value.
- 5,160 yards above Station C, L.B., <1 cfs.
- 5,230 yards above Station C, L.B., 2, wide, <1 cfs. No value.
- 6,310 yards above Station C, L.B., 4, wide, 2-3 cfs. Steep. No value to salmon.
- 7,160 yards above Station C, L.B., 2' wide, <1 cfs. No value to salmon.
- 7,260 yards above Station C, R.B., approx 1 cfs. Steep. No value to salmon.
- Cabin Creek, 7,460 yards above Station C, L.B., 3, wide, 2-3 cfs. Too small for salmon.

17. 7,570 yards above Station C, R.B., 2' wide, <1 cfs. No value to salmon.

Payette River

River System: Snake River
 Stream Surveyed: Payette River (Mouth to Forks)

Date of Survey: August.1-5, 1938, by Hanavan, Parkhurst, Wilding,
 and Morton

Source:

Confluence of North and South Forks of the Payette River at
 Banks, Idaho, Sec 29, T9N,R3E (Payette National Forest Map).

Direction of Flow:

Total Length: 72.5 miles, of which 66 miles were surveyed

Station Location:

Sta	Location	Distance Above Prev. Station		Distance Above Mouth		Map Location	Width	Depth
		Yds	Miles	Yds	Miles			
A	Confl with Snake River	0	0	0	0	Sec 30 T9N,R5W	300'	6"
B	US Highway 30 bridge south of Payette		4		4	Sec 4 T8N, R5W	350'	2 1"
c	Bridge north of New Plymouth, ID		9		13	Sec 28 T8N,R4W	219'	47"
D	Bridge 19 mi above mouth		6		19	Sec 12 T7N,R4W	--	--
E	Bridge north of Letha, ID		8		27	Sec 36 T7N,R3W	130'	50"
F	Bridge at Emmett, ID		8		35	Sec 7 T6N,R1W	165'	52"
G	Bridge below Black Canyon Dam		5		40	Sec 27 T7N,R1W	--	--
H	Bridge at Montour, ID		7		47	SE1/4,S21 T7N,R1E	264'	28"
I	Bridge at Horseshoe Bend, ID		9		56	SE1/4 of SW1/4,S27 T7N,R2E	240'	2 1"
J	Highway bridge 2 mi north of Horseshoe Bend		4		60	sw1/4,s14 T7N,R2E	150'	30"
K	Confl of North & South Forks at Banks, ID		12.5		72.5	Sec 29 T9N,R3E		

EPA River Reach Codes:

Station	HUC	SEG Rmi
A		
B		
C		
D		
E		
F		
G		
H		
I		
J		
K.		

Character of Bottom Between Stations:

Sta	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
A-B	638,400	31,540	5.0	175,670	27.5	170,040	26.5	261,150	41.0
B-C	1,155,500	100,990	9.0	264,910	23.7	415,220	37.2	334,380	31.1
D-E	978,800	109,180	1.5	315,020	39.5	234,970	29.5	233,940	29.5
E-F	1,122,200	128,600	11.4	250,850	22.8	365,950	34.0	252,820	26.0
F-G	700,000	191,110	27.3	362,190		382,040		249,370	22.4
G-H	(unsurveyed lake above dam)			241,170	30.2	173,590	26.2	124,130	16.3
H-I	1,455,300	474,290	40.4	318,090	27.4	194,520	16.7	179,100	15.5
J-K	926,600	435,230	41.0	75,870	17.8	57,210	13.4	117,990	27.8
			47.0	197,360	21.2	96,940	10.4	197,070	21.4
Tot	7,863,600	1,652,040	21.0	2,171,130	28.5	2,090,480	26.5	1,949,950	24.0

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
A-B			345,710	54.0		
B-C			680,130	60.9		
C-D			549,990	69.0		
D-E			616,800	62.9		
E-F			744,230	66.2		
F-G			384,760	56.4		
Total			3,321,620	61.5		

Spawning Area Unavailable and Unusable:

Station	Distance	Area (yd ²)	Area Unavail (yd ²)	% Unavail	When Avail	Usable Unavail (yd ²)	% Usable Unavail
Lake above dam	unsurveyed						
H-I			512,610	44.1			
I-J			133,080	31.2			
J-K			294,300	31.6			
Total			939,990	35.6			

Character of Watershed:

	Lower Part	Upper Part
Mountainous		
Hilly		X
Rolling		X
Flat	X	
Swampy		
Wooded		
Open	X	X
Cultivated	30%	2%
Character of Valley		
Character of Banks		
Density of Marginal Vegetation		
Erosion		
a) Banks		
b) Watershed		

Diversions:

Location	Dam Type	Width	Depth	Headgate	Cfs	Remarks
D1-(A) 4 mi above mouth near Sta B	Temporary; Horses, rubble, & planks; No barrier	20'	24"	Concrete; No screen	40	18" spill over dam drop 1'; no return
D2-(B) below bridge at Station D	None	3-30" culverts		None	--	Not operating at time of survey
D3-(C) below Letha Bridge Station E	Rubble wing dam; no barrier	9'	8"	None	12	No screen; no return
D4-(D) 4 mi above Letha Bridge	Rubble wing dam; no barrier	30,	24"	Concrete 30' wide 9' deep	300	No screens; water returns few miles below
D5-(E1) 5 mi above Letha Bridge	Temporary horse & plank; no barrier	15'	8"	Wood 6'x12'	6-7	Same dam supplies both ditches
D5-(E2) "	Crest 450' Drop 6" no barrier	8'	5"	Wood 8'x12'	3-4	
D6-(F) below Emmett Bridge Station F	None	12'	12"	None	4	No screens, headgate, or return
D7 1.7 mi above Emmett R.B.	Rock dam 3' falls passable	Farmers co-op		Concrete	200	Flows through Emmett
D7a 2.2 mi above Emmett LB	Wing dam passable	no protective devices			5	Small ditch
D8-(G) below Black Canyon 1 mile	Big boulders no barrier 300' wide 6" spill 3-5' high	18'	48"	Concrete 18' wide 4' thick 3 gates	144	No screens or return
D9-(H) (1) Black Canyon Dam	Concrete 96' high; no ladder; large ditches at each end of dam; complete barrier					No screens; data available from screen survey

D10-(J) 1 mi above bridge at Horseshoe Bend Station J	No dam; concrete apron; no barrier except at low water	40'	144"	Concrete 36' wide 16' high	400- 700	Diverts to power plant 4 mi below; flowing 500- 700 cfs; may divert entire river at lowest water stage; no screen
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Artificial Obstructions:

1. Black Canyon Dam, located forty miles upstream from the mouth of the Payette River, and about five miles above the city of Emmett, Idaho, was build in 1923 by the Reclamation Service to obtain power and water for irrigating the broad, flat valley below.

It is a huge concrete structure 125' high, 96' from spill to tail pond, and stretches across the valley at this point (about 1/3 of a mile). There are no fish ladders at present so the dam forms a complete barrier to all fish migrants.

Many temporary obstructions occur as shown in ****Diversions**** section, but none of them are impassable barriers at present.

Natural Obstructions: None

Fluctuation in Water Level:

Three factors affect the water level fluctuations on the Payette River:

1. Normally according to "Surface Water Supply of the US", Part 12, p. 130, there was a mean discharge in 1932 in cfs of less than 1,000 in October to 2,750 cfs in March; 6,560 cfs in April; 12,200 cfs in May; 9,810 cfs in June; 2,260 cfs in July; and about 1,500 cfs for August and September.

2. During the spring and summer much of the water from the Main Payette River is diverted for irrigation purposes as can be noted readily from section on ****Diversions****.

3. Dams at Black Canyon, Deadwood, Payette Lakes, and on the tributaries of the North Fork may be so regulated as to control the flow of the river throughout the year, especially the Deadwood and Power Payette Lake Dams.

Pollution:

At Payette, Idaho, all village sewage is dumped into the river. At Emmett, Idaho, a saw mill supplements village sewage. However, the flow of the river seems to be great enough to dilute it rapidly and carry it away, as no offensive results were observed. The heavy

silting of the rubble in the lower portion of the river is undoubtedly due to the muddy water returning to the river from the irrigation ditches.

Fish (salmon):

Not a single salmon reported or seen. Run has been completely wiped out.

Fish (other than salmon):

The lower river below Black Canyon Dam is alive with carp, suckers, and small cyprinids are very abundant. Some bass, catfish, and a few trout were reported chiefly from the cooler drainage ditches.

General Remarks:

Tonoaraphy

Below Black Canyon Dam the Payette River flows through an irrigated farming valley from two to eight miles wide. The surrounding hills are low, arid, and covered with sage brush. Above the dam the valley is narrow with a few farms at Montour and Horseshoe Bend. In this section the surrounding hills are higher and above Horseshoe Bend a few pine trees appear in the more protected ravines. In this area the valley becomes narrow, almost canyonous in places.

Character of the Stream

From the mouth to Black Canyon Dam the gradient is, for the most part, moderate. Heavy silting was noticed for the first 20 or 25 miles, seriously limiting the more favorable riffle areas. This silting is largely caused by numerous drainage ditches carrying mud from irrigated fields into the river. Above this area, i.e., up to Black Canyon Dam the river has many wide riffles over small and medium-sized rubbles. In many places along this portion of the river there are high white sandstone cliffs. The river banks are usually steep and straight up and down, 12 to 20 feet high, and composed of black earth, gravel and sand. Sometimes these banks are composed of various sized rubble talus slopes. Considerable erosion was noted especially below Emmett, where large rubble abutments wrapped in woven wire casings have been constructed along the curved banks in a effort to control this serious problem. This bank cutting continues to enlarge the rubble flood plain and adds to the silting of the lower river. Few trees of any kind line the river banks--lots of reeds grow at the river's edge.

Above Black Canyon Dam the impounded water extends six miles to Montour. A considerable amount of good spawning area was reported to be covered by this lake. From Montour good riffle areas are numerous

for sixteen miles to a point above Horseshoe where the river becomes steeper. From here to the confluence of the North and South Forks, a canyon confines the stream to a narrow channel and favorable spawning riffle areas are scattered. The marks on the banks, etc., indicate a water fluctuation of from six to twelve feet variation in the water level during the year (see ****Fluctuation in Water Level****). The river flows slowly and deep for the most part in this upper portion.

There are no obstacles to upstream migrants below Black Canyon Dam. Ditches in this section are supplied by wing dams or by low temporary structures. There were no dams above Black Canyon with the exception of a concrete apron adjoining the Horseshoe Bend diversion of the Idaho Water Power Company. This apron can be built up during low water periods to divert almost the entire flow to the power house four miles downstream. Hazards to possible downstream migrants are several unscreened ditches located in this section from the mouth of the Payette to the Horseshoe Bend diversion (see ****Diversions****).

Fish Population

The depletion of the salmon run in the Payette River was well advanced long before the construction of the Black Canyon Dam was undertaken. Reports by old residents agree that at least thirty years ago a former diversion dam located a few miles below Horseshoe Bend prevented upstream salmon from passing that point. For the ensuing fifteen years the chief salmon spawning areas were located near Montour and the mouth of Squaw Creek. When the Black Canyon Dam was constructed in 1923, the dam at Horseshoe Bend was no longer needed and was removed. For the past fifteen years a constantly diminishing number of salmon have been reported at the Black Canyon Power House. Last year, 1937, the attendant saw two salmon; this year, 1938, none were seen.

Rough fish were abundant throughout the lower section of the river. Below the dam, the carp were very numerous, while above the dam squawfish predominated. Suckers and small cyprinids were very abundant throughout this area. Bass and catfish were reported, but are not intensively fished. In the winter whitefish and a few trout were taken both above and below the dam. Trout are reported in a few of the cooler drainage ditches below Emmett as well as in the upper portions of Squaw Creek and its tributaries. Below the dam the water temperatures ranged from 67-75 degrees F with an average of 68 degrees F during the survey period.

Temperature Data:

Sta	Date	Hour	Air Temp	Water Temp	Skv
A	8/ 1/38	1:30 pm	92 F	80 F	Clear
B	8/ 1/38	11:00 am	84 F	74 F	Clear
few mi above	8/ 1/38	3:15 pm	84 F	78 F	Clear
B	8/ 2/38	11:30 am	66 F	67 F	Clear

Sta	Date	Hour	Air Temp	Water Temp	Skv
3 mi above	8/ 2/38	2:00 pm	74 F	71 F	Clear
C	8/ 1/38	10:00 am	66 F	67 F	Fair
E	8/ 3/38	3:45 pm	88 F	77 F	Bright
F	7/30/38	2:10 pm	107 F	77 F	Bright
F	7/31/38	1:00 pm	91 F	77 F	Bright
F	8/ 4/38	10:30 am	87 F	73 F	Clear
2 mi above F	8/ 4/38	11:00 am	78 F	72 F	Clear
G	7/31/38	2:30 pm	91 F	72 F	Clear
Average below	Black Canyon Dam		84 F	74 F	
H	8/ 6/38	12:00 n	81 F	67 F	Clear
I	7/31/38	2:30 pm	89 F	75 F	---
I	8/ 6/38	11:30 am	80 F	69 F	Clear
J	8/ 6/38	12:30 pm	82 F	64 F	C l e a r
5 mi below					
Banks	8/ 5/38	10:30 am	77 F	62 F	Clear
Average between Black Canyon					
and Banks			82 F	67.4 F	

Pool Grade:

Sta	Dist (mi)	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6 %	Total
A-B	4.0	5	1.3		3	1	1		5
B-C	9.0	51	5.7	44	60	20'	20		51
C-D	6.0	67	11.1	86	4		3	6	67
D-E	8.0	88	11.0	59	8				88
E-F	8.0	81	10.1	88	12				81
F-G	5.3	62	11.8	85	3				62
G-H	6.7	Lake above Black Canyon Dam - unsurveyed		97	3				
H-I	9.0	87	9.6	64	11	2	4		87
I-J	4.0	58	14.5	80	13	2	5		61
J-K	12.5	170	13.6	42	18	1	1		200
Tot	72.5	669	9.2	66	30	2	2		
				87					
				100					
				53		5		3	
				86		9		5	
				78	70	2	20	30	
				39	35	1	10	15	
				512	117	11	29	33	702
				76.5	17.5	1.6	4.3	4.9	

Gradient: Moderate below the dam; slightly steeper above the dam.

North Fork Payette River

River System: Snake River

Stream Surveyed: North Fork Payette River

Date of Survey: August 5-13, 1938

Source: Payette, Upper Payette and Little Payette Lakes

Direction of Flow:

Total Length: 120 miles, 115.7 miles surveyed

Station Location:

Sta	Location	Distance Above Prev. Station		Distance Above Mouth		Map Location	Width	Depth
		Yds	Miles	Yds	Miles			
A	Confl of North & South Forks at Banks	0	0.0	0	0.0	S28,SW4 T9N,R3E	96'	2.3'
B	Big Eddy		11.0		11.0	S9,NE4 T10N,R3E	280'	3.0'
C	Bridge at Smith's Ferry		8.0		19.0	Sec 10 T11N,R3E	327.'	1.7'
D	Bridge 1 mi below Cascade		20.0		39.0	S36,SW4 T14N,R4E	222'	1.7'
E	Bridge near Arling		16.0		55.0	S16,NE4 T15N,R3E	156'	3.3'
F	Bridge 3 mi NW of Donnelly		15.0		70.0	S6,SW4 T16N,R3E	165'	1.6'
G	Bridge 3.5 mi W of Spink		7.0		77.0	S29,N1/2 T17N,R3E	105'	3.0'
H	Dam at outlet of Payette Lake		15.4		92.4	S8,SW4 T18N,R3E	117'	
I	Upper end of Payette Lake		6.0		98.4	S10,SW4 T19N,R3E	120'	
J	Foot bridge at Fisher Creek		4.0		102.4	Sec 26 T20N,R3E	45'	0.9'
K	Dam at outlet of upper Payette L		5.5		107.9	S31,E1/2 T21N,R3E	48'	0.6'
L	Bridge at N end of Upper Payette L		2.2		110.1	S19,S1/2 T21N,R4E	46'	2.3'
M	Bridge 50' below Squaw Meadows		2.0		112.1	S8,SW4 T21N,R4E	11'	0.8'
N	Terminus of survey		3.6		115.7	S5,N1/2 T21N,R4E	18'	

EPA River Reach Codes:

Station	HUC	SEG Rmi
A		
B		
C		
D		
E		
F		
G		
H		
I		
J		
K		
L		
M		
N		

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
A-B	534,300	403,800	75.5	48,320	9.0	14,230	2.6	67,950	12.7
B-C	556,800	137,190	24.6	4,520	0.8	660	0.1	414,430	74.4
C-D	1,319,600	257,950	12.0	126,080	5.8	394,760	18.3	1,369,710	63.7
E-F	1,135,600	5,800	1.8	1,550	0.17	3,600	0.27	1,290,490	97.7
F-G	500,700	--	0.5	1,150	0.1	1,470	0.1	1,127,180	99.2
G-H	810,600	51,620	6.3			38,830	7.7	461,870	92.2
H-I	Payette Lake			126,560	15.6	368,060	45.0	264,360	32.6
I-J	205,900	51,750	47.3	16,330	7.5	24,990	11.5	158,670	73.4
K-L	Upper Payette Lake			37,680	34.6	15,970	14.6	3,300	3.0
L-M	49,300	192,450	66.3	5,140	17.5	2,810	9.5	1,900	6.4
				60	0.1			45,200	99.3

Spawning Area Usable and Available:

All unavailable due to Black Canyon Dam

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
A-B			62,550	11.70	9,830	1.84
B-C			5,180	0.90	0	0.00
C-D			520,840	24.24	16,620	0.77
D-E			5,150	0.39	0	0.00
E-F			2,620	0.23	0	0.00
F-G			38,830	7.75	2,050	0.01
G-H			494,620	61.01	240,660	29.68

H-I	Payette Lake				
I-J		41,320	19.13	15,490	7.17
J-K		53,650	49.35	22,550	20.74
K-L	Upper Payette Lake				
L-M		7,950	27.13	1,520	5.18

Spawning Area Unavailable and Unusable:

All above spawning area is unavailable. If ladder is built over Black Canyon Dam all above Station D is unavailable due to mill pond and power house dams at Cascade and one mile above Cascade.

Character of Watershed:

Mountainous	Banks to Alpha and Norwood to terminus
Hilly	Low hills border the flat valley from Alpha to Norwood
Rolling	
Flat	Alpha to Norwood
Swampy	Certain parts of Squaw Meadows
Wooded	Hills and mountains of entire watershed
Open	Alpha to Norwood, valley up to 10 miles wide
Cultivated	Alpha to Norwood only, approximately 50%

Character
of Valley

Character
of Banks

Density of
Marginal
Vegetation

Erosion

a) Banks

b) Watershed

Diversions:

All irrigation water is taken from tributaries entering from the east of valley.

Diversion 1: Power diversion, 1 mile above Cascade, 6' pipe to

power plant 300 paces below, 2" grizzle over end of pipe.

Diversion 2: Fish hatchery diversion for water supply, 500 paces below outlet of Payette Lake, 1/4" grizzle screen.

Artificial Obstructions:

Location	Character	Height	Protective Devices
			Type, Efficiency
Cascade	mill pond, logs and planks	4,	None, passable at high water, impassable at low water
1 mi above Cascade	Power Dam	7'	None, impassable
Outlet Payette Lake	Water level control logs and planks	5'	None, passable normally; impassable at extreme low water
Outlet Upper Payette Lake	Water level control dam logs and planks cement wings	9,	None, impassable all times

Note: All dams are small and low and fish ladders could easily be constructed.

Natural Obstructions: None

Fluctuation in Water Level:

Fluctuation: 4-6 feet

Cause of Variation: Spring runoff and opening of control dams at the outlets of Payette Lakes

Stream Volumes: 573 cfs at Station D
75 cfs at Station J

Pollution:

City sewage one-half mile below McCall; not serious, although it is untreated.

Fish (salmon):

None. Former runs of Chinook, steelhead and sockeye before the construction of dams at Horseshoe Bend and Black Canyon Dam above Payette.

Fish (other than salmon):

Species	Date	Very Abundant	Abundant	Fair No.	Scarce
Steelhead					
Rainbow	8/08/38				X
Whitefish	8/12/38			X	
Dolly Varden					
Cutthroat					
Squawfish	8/12/38		X		
Brook trout	8/12/38			X (Squaw Meadows)	
Shiner Minnow	8/09/38		X		
Redfish	8/13/38			X (Payette Lakes)	
Suckers	8/12/38		X (in some areas)		

General Remarks:

Topography

Due to topographic variations the country can be conveniently divided into three separate regions, from Banks to Alpha, a distance of 27 miles; Alpha to Norwood, a distance of 59 miles; and Norwood to Squaw Meadows, a distance of 29 miles.

In the section from Banks to Alpha the river flows through a narrow V-shaped valley bordered by high rugged mountains. The river bed has been further narrowed by railroad and highway construction on either bank. The mountains are moderately covered with pine, spruce, alder and cottonwoods. Marginal vegetation is sparse. The gradient is steep such that the river is a series of cascades and small falls.

The region from Alpha to Norwood is a wide flat valley up to ten miles wide bordered by low hills. Much of the region is cultivated in peas, grains and alfalfa. Irrigation water for these farms is taken from the tributaries on the east side of the valley. Considerable logging operations are carried on in the mountains east of the valley. Marginal vegetation consists of a few conifers, and many stands of cottonwood, willow, hawthorn and some sagebrush.

The region from Norwood to McCall is a valley up to four miles wide. The river cuts through a narrow canyon on the west side of the valley. The banks of the river are 150-200 feet high, steep and heavily timbered. The Fish and Game Department of Idaho was building a trout hatchery about 1/4 mile below the outlet of Payette Lake. Above Payette Lake, which is six miles long, the country is mountainous and thickly timbered. The valley is narrow and V-shaped. Upper Payette Lake is 5.5 miles above the lower lake and is 2.2 miles long. Above this lake the region is steep for two miles then flat at Squaw Meadows which appears to be the basin of a former bog lake.

Character of Stream

(a) Banks to Alpha. This section of stream has a steep gradient and flows through a narrow canyon. As such it is a long series of cascades and low falls with numerous S6 pools. The bottom is composed chiefly of large boulders and large rubble with sand in the few quiet areas. The conditions are not suitable for spawning fish. The width was seldom over 150' and averaged about 70'. The volume was estimated as 600 cfs.

(b) Alpha to Norwood. The stream through this section has a sluggish to slow gradient such that it winds through the wide valley. The bottom is composed almost entirely of sand with a few patches of small rubble. The width varied from 150'-250'. In some areas the bottom supported growths of Potamogeton, Sagittaris and filamentous algae. The banks throughout were low and composed of loose sandy material generally supporting a sparse growth of marginal vegetation. Flood plains were numerous, being extensive areas of sand. The section is not a favorable fish habitat.

(c) Above Norwood the stream gradient is moderate and with an even distribution of large, medium and small rubble makes a favorable fish habitat. There are many long riffle areas and resting pools. The volume was estimated as between 500-600 cfs. The sewage of the city of McCall empties into the river 400 paces below the lake. Although it is untreated it is not a serious pollutant. Natives of the region reported that salmon once spawned in the section. Three bottom samples were taken covering three square feet from a fast riffle over medium and small rubble. Bottom fauna were abundant as shown by the following counts: caddis larvae and pupae 145; Simuliidae 13; Ephemeridae nymph and pupae 38; Tipulidae 6; Annelid 29; Hydrachnid 2; Coleoptera larvae 4, adult 2; Cottus 1; Pyanaria 2.

Above Payette Lake the stream is considerably smaller and estimated as 75 cfs. The section up to Upper Payette Lake, a distance of 5.5 miles, has a moderate gradient with the bed chiefly of sand although there are patches of medium and small rubble thus affording some spawning area. Above Upper Payette Lake for two miles the gradient is moderate and the bottom chiefly large and medium rubble. Extensive riffle areas provide spawning grounds which are used by the little redfish of the lakes. The stream through Squaw Meadows winds through a flat valley which appears to be the remnant of a former acid bog lake. The channel is narrow and deep with the bottom composed of mud and sand. Above Squaw Meadows the stream has a rapid gradient consisting of a series of cascades and small falls.

Dams

Dams are located at the mill pond at Cascade, the power plant reservoir one mile above Cascade, and the water control dams at the outlets of Payette and Upper Payette Lakes. None have protective devices and all except the outlet of Payette Lake are barriers. The

mill pond is constructed of planks and logs with cement abutments. The width is 180' the drop four feet, and the spill four inches to a plank apron. The power plant reservoir is built of cement with three wooden gates in the center. The width is 192" the drop seven feet and the spill three inches to a cement apron. A six foot metal conduit pipe takes water to the power house 400 yards below. A two inch grizzly protects the opening of the pipe. The dam at the outlet of Payette Lake is made of logs and planks with cement abutments. The crest is 117 feet and the drop five feet with the water spilling over the center and through various leaks. Although there is no fish ladder the dam is normally passable. The lake level had recently been raised at the time of observation.

Fish Population

The bulk of the fish population consists of suckers, squawfish, chubs and minnows. Several rainbow and brook trout were seen above and below Payette Lake. In the lakes are whitefish, trout and little redfish. The latter are remnants of the former sockeye run into this system.

Temperature Data:

Sta	Date	Hour	Air Temp	Water Temp	Skv
A	8/19/38	4:00 pm	78 F	69 F	Bright
B	8/ 4/38	2:40 pm	80 F	71 F	Clear
D	8/11/38	1:30 pm	79 F	68 F	Clear
E	8/11/38	2:30 pm	78 F	69 F	Clear
F	8/11/38	3:15 pm	78 F	69 F	Clear
G	8/10/38	1:00 pm	84 F	65 F	Clear
H	8/12/38	4:00 pm	72 F	67 F	Cloudy
J	8/14/3/	12:00 n	55 F	54 F	Cloudy
K	8/14/38	1:00 pm	54 F	61 F	Rain
L	8/14/38	1:30 pm	54 F	53 F	Cloudy
M	8/14/38	2:00 pm	52 F	54 F	Cloudy

Pool Grade:

Sta	Dist (mi)	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6	Total
A-B	11.0	235	21.36	18	42	4	171	666	901
				7.7	17.9	1.7	72.8		
B-C	8.0	188	23.50	71	9	72	36	396	584
				37.8	4.8	38.3	19.1		
C-D	20.0	240	12.00	114	18	38	70	509	749
				47.5	7.5	15.8	29.2		
D-E	16.0	178	11.10	23	56	28	71	64	242
				12.9	31.5	15.7	39.9		
E-F	15.0	117	7.80	34	3	54	26	39	156
				29.1	2.6	46.2	22.2		

345

F-G	7.0	113	3.80	<u>16</u>	<u>5</u>	<u>6</u>	<u>86</u>	0	113
				16.3	5.1	6.1	87.7		
G-H	15.4	315	20.40	<u>76</u>	<u>18</u>	<u>79</u>	<u>142</u>	355	670
				24.1	5.7	25.1	45.1		
H-I	6.0	Payette Lake							
I-J	4.0	58	14.5	<u>33</u>	<u>4</u>	<u>5</u>	<u>16</u>	53	111
				56.9	6.9	8.6	27.6		
J-K	5.5	58	10.5	<u>2</u>	<u>0</u>	<u>35</u>	<u>21</u>	409	467
				3.4	0.0	60.3	36.2		
K-L	2.2	Upper Payette Lake							
L-M	2.0	8	4.0	<u>1</u>	<u>0</u>	<u>7</u>	<u>0</u>	233	241
				12.5	0.0	87.5	0.0		
M-N	3.6	72	20.0	<u>35</u>	<u>7</u>	<u>16</u>	<u>14</u>	6	78
				48.6	9.7	22.2	19.4		
Tot	115.7	1582	13.54	<u>423</u>	<u>162</u>	<u>344</u>	<u>653</u>	2730	4312
				26.7	10.2	21.7	41.3		

Gradient:

No topographic data available.

Banks to Alpha - moderate to steep
 Alpha to Norwood - slow
 Norwood to terminus - moderate

Tributaries:

1. Howell Creek, 6 mi above Station A, 1 cfs, impassable.
2. Bat Creek, 3 mi above Station B, 1 cfs.
3. Round' Creek, 4 mi above Station C, not seen.
4. Bogus Creek, 3 mi above Station C, not seen.
5. Boulder Creek, 5 mi above Station C, not seen.
6. Fawn Creek, 7 mi above Station C, 4 cfs, steep, falls, impassable.
7. Murdy Creek, 10 mi above Station C, 1 cfs, steep, impassable.
8. Clear Creek, 11 mi above Station C, not seen.
9. Big Creek, 3 mi below Station D, 20 cfs.
10. Pearsol Creek, 0.5 mi below Station D, 20 cfs.
11. Willow Creek, 2 mi above Station D, not seen.
12. Duck Creek, 3 mi above Station D, not seen.
13. Grandmas Creek, 4 mi above Station D, not seen.
14. Hot Creek, 6 mi below Station E, small.
15. Gold Fork Creek, 2 mi above Station E, see survey report.
16. Boulder Creek, 4 mi above Station E, small, slow, all sand.
17. Lake Fork Creek, 6 mi above Station E, see survey report.
18. No-name, 3 mi below Station F, 3 cfs.
19. No-name, 3 mi below Station F, 3 cfs.
20. No-name, 3 mi below Station F, 2 cfs, brook trout abundant.
21. No-name, at Station F, 1 cfs, trout fingerling, temperature 51 degrees.

22. No-name, 1.75 mi above Station F, 2 cfs, slow, sand and mud.
23. No-name, 10 mi above Station G, 1 cfs, trout fry abundant.
24. No-name, 10 mi above Station G, 3 cfs, gravel bottom.
25. No-name, 11.5 mi above Station G, 2 cfs.
26. Elin Creek, 0.5 mi above Station I, not seen.
27. Landing Creek, 0.5 mi above Station I, not seen.
28. Yockwah Creek, 1 mi above Station I, not seen.
29. Box Creek, 3 mi above Station I, not seen.
30. Lahash Creek, 3 mi above Station I, not seen.
31. Fisher Creek, at Station J, 20 cfs.
32. Pearl Creek, 5 mi above Station J, 1 cfs.
33. Deep Creek, 5 mi above Station J, 2 cfs, falls, impassable.

Clear Creek

River System: Snake River

Stream Surveyed: Clear Creek, tributary of North Fork of Payette River

Date of Survey: August 19, 1938, by Parkhurst and Morton

Source: Clear Creek rises in S24,T14N,R5E

Direction of Flow:

Flows southwest to the right bank of the North Fork of the Payette River 29 miles above its mouth--near Alpha, Idaho

Total Length: 18 miles of which 6.3 miles were surveyed

Station Location:

Sta	Location	Distance Above Prev. Station		Distance Above Mouth		Map Location	Width	Depth
		Yds	Miles	Yds	Miles			
A	Mouth of Clear Water	0	0.0	0	0.0	Sec 32 T13N,R4E	-	-
B	6.3 mi above mouth above Skunk Creek		6.3		6.3	Sec 2 T12N,R4E		

EPA River Reach Codes:

Station	HUC	SEG Rmi
A		
B		

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.		M.R.		S.R.		M&S	
			%		%		%		%
A-B	50,400	1,060	2.5	2,340	4.5	5,640	11.0	41,360	82.0

Spawning Area Usable and Available: None, due to Black Canyon dam

Spawning Area Unavailable and Unusable:

Station	Distance	Area (yd ²)	Area Unavail		When Avail	Usable Unavail	
			(yd ²)	% Unavail		(yd ²)	% Unavail
A-B			7,980	15.5		2'090	4.0

Character of Watershed:

Mountainous	in upper portion
Hilly	in upper portion
Rolling	
Flat	in lower section
Swampy	
Wooded	sparsely in upper section
Open	in lower section
Cultivated	10% (much grazing and hay land)

Character
of Valley

Character
of Banks

Density of
Marginal
Vegetation

Erosion
a) Banks

b) Watershed

Diversions:

Diversion 1: Wing dam and ditch for Ditch Creek Ranger Station about 1 cfs diverted at end of survey.

Artificial Obstructions:

1. Wing dam at Ranger Station--low and passable.

Natural Obstructions: Many beaver dams in lower portions

Fluctpation in Water Level: Slight, if any.

Pollution: None

Fish (salmon): None seen nor ever reported

Fish (other than salmon):

The lower portion had large schools of 6" minnows and foot-long suckers and whitefish with a few squawfish amongst them. Squawfish were more common upstream and a few (3 or 4) cutthroat trout were seen in the upper part of the survey.

General Remarks:

The lower part (first mile) of this creek meanders through a wide, flat hay meadow and is generally shallow and sandy; banks 3-4' high and stream bed 12'-18' wide everywhere. In the second and third mile there are occasional deep holes and a number of beaver ponds. These holes were full of whitefish, large minnows and suckers and were in one area about one mile below US Highway Bridge.,

Temperature Data:

Sta	Date	Hour	Air Temp	Water Temp	Sky
A	8/19/38	1:30 pm	64 F	54 F	Clear
B	8/19/38	12:30 pm	69 F	60 F	Clear

Pool Grade:

Sta	Dist (mi)	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6	Total
A-B	6.3	106	18	16		74	16	206	312
				5.0		23.0	5.0	67.0	

Gradient:

Slight in lower portion--moderate in middle portion and steep in upper part.

Big Creek

River System: Snake River
 Stream Surveyed: Big Creek, tributary of North Fork of Payette River

Date of Survey: August 18, 1938

Source: Rises in mountains in Idaho in S24,T15N,R5E

Direction of Flow:

Flows southwest to the right bank of the North Fork of the Payette River about 30 miles above its confluence with the South Fork near Belvidere, Idaho.

Total Length: 18 miles of which four were surveyed

Station Location:

Sta	Location	Distance Above Prev. Station		Distance Above Mouth		Map Location	Width	Depth
		Yds	Miles	Yds	Miles			
A	Mouth of Big Creek	0	0.4	0	0.4	Sec 17 T13N,R4E		
B	Irrigation dam at end of survey		5.0		5.4	Sec 2 T13N,R4E		

EPA River Reach Codes:

Station	HUC	SEG	Rmi
A			
B			

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.		M.R.		S.R.		M&S	
			%		%		%		%
A-B	63,200	240	0.4	80	0.1	1,090	1.5	61,790	98.0

Spawning Area Usable and Available: None due to Black Canyon dam

Spawning Area Unavailable and Unusable:

Station	Distance	Area (yd ²)	Area Unavail		When Avail	Usable	
			(yd ²)	% Unavail		(yd ²)	% Unavail
A-B			1,170	1.6		0	0.0

Character of Watershed:

Mountainous	in upper part
Hilly	in upper part
Rolling	mostly
Flat	
Swampy	
Wooded	in upper portion but timber is rapidly being stripped off
Open	in lower part (timber all cut off)
Cultivated	5% or less
Character of Valley	
Character of Banks	
Density of Marginal Vegetation	
Erosion	
a) Banks	
b) Watershed	

Diversions:

Diversion 1: four miles upstream is an impassable 25 foot high dam of rock, logs and debris that diverts about 15 cfs into an irrigation ditch (see artificial obstructions).

Artificial Obstructions:

An irrigation dam four miles upstream with crest, 100', drop 25', spill, seeps through rocks, abutments of big boulders, logs and debris. This dam diverts about 15 cfs down a dirt irrigation ditch 8' wide and 4' deep with water at 1 average depth at time of survey. Wooden headgate, no screens, no return.

Natural Obstructions:

Numerous impassable log jams below dam and a series of beaver

dams below that.

Fluctuation in Water Level: 3-4' controlled somewhat by ditch.

Pollution: None

Fish (salmon): None seen or ever reported.

Fish (other than salmon):

A few trout were seen (3 or 4)--whitefish, squawfish and minnows were seen in fair numbers

General Remarks:

Topography

In the upper portions the creek flows through high hills sparsely covered with conifers. These hills have been all logged **off**. A few small ranches are scattered through this region. In its lower portions, the hills become lower and more flat as it approaches the North Fork. This area is mostly open pasture with scattered pines and patches of second growth timber near the river bottoms. Many large cattle ranches through here.

Character of Stream

The bottom of this little creek is almost 100% sand with some small brownish and white pea gravel in spots. The banks are three to four feet high and generally quite steep--appear more or less freshly eroded. A series of large beaver dams floods a considerable area two miles above the mouth.

Temperature Data:

Sta	Date	Hour	Air Temp	Water Temp	Skv
A	8/18/38	3:15 pm	62 F	64 F	Clear
B	8/18/38	2:30 pm	73 F	64 F	Clear

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6	Total A-
B (5 mi)	112	23	1	110		1	2	114 09
98.2	0.9							

Gradient: **Slight**

Tributaries:

1. Horse **Creek**, above dam, **carries** half of the water volume, but

like Big Creek is generally very sandy.
There were no tributaries below the dam.

Gold Fork Creek
North Fork Gold Fork Creek

River System: Snake River, North Fork Payette River
Stream Surveyed: Gold Fork Creek, North Fork Gold Fork Creek

Date of Survey: August 17, 1938

Source: Runoff from high mountains' T16-17N,R5E

Direction of Flow:

Total Length:

40 miles, 18.5 surveyed on Gold Fork, 6.9 surveyed on North Fork Gold Fork

Station Location:

No stations were taken but the stream has been divided into convenient six mile sections.

Sta	Location	Distance Above Prev. Station Yds Miles	Distance Above Mouth Yds Miles	Map Location	Width	Depth
Gold Fork Creek:						
AA	Mouth, confl with NFork Payette, 5 mi NW of Arling	0 0.0	0 0.0	Sec 4 T15N,R3E	15'	-
BB		6.0	6.0		21'	
cc		6.0	12.0		60'	
DD	Terminus of survey, 900 paces above Lodgepole Ck	6.5	18.5	Sec 28 T16N,R5E	18'	
North Fork Gold Fork Creek:						
AAA	Mouth, 600 paces above water control dam	0 0.0	0 0.0	N1/2,S27 T16N,R4E	30'	-
BBB	Terminus of survey, Sloans Peak Trail crossing, .25 mi above Rapids Ck	6.9	6.9	NE4,S34 T17N,R4E	30'	-

EPA River Reach Codes:

Station	HUC	SEG Rmi
AA		
BB		
CC		
DD		
AAA		
BBB		

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
Gold Fork Creek:									
AA-BB	100,500	0	0.0	320	0.4	11,930	11.8	88,250	87.8
BB-CC	110,300	7,760	7.0	28,900	26.2	32,180	29.1	41,460	37.5
CC-DD	95,900	14,210	14.8	16,790	17.5	19,700	20.5	45,200	47.1
North Fork Gold Fork Creek:									
AAA-BBB	118,200	3,470	2.9	59,280	50.1	32,200	27.2	23,250	19.6

Spawning Area Usable and Available:

None, due to Black Canyon dam.

Spawning Area Unavailable and Unusable:

Station	Distance	Area (yd ²)	Area Unavail (yd ²)	% Unavail	When Avail	Usable Unavail (yd ²)	% Usable Unavail
Gold Fork Creek:							
AA-BB			12,250	12.1		3,180	3.1
BB-CC			61,080	55.3		12,570	11.3
CC-DD			36,490	38.0		7,090	7.3
North Fork Gold Fork Creek:							
AAA-BBB			91,480	77.3		52,720	44.6

Cause of Unavailability: Black Canyon Dam at Emmett and water control dam twelve miles above **the** mouth of Gold Fork Creek

Character of Watershed:

Mountainous	all above lower 7 miles
Hilly	lower 7 miles
Rolling	lower 7 miles
Flat	lower 4 miles

Swampy

Wooded all above lower 7 miles

Open lower 4 miles

Cultivated 30% in lower 4 miles

Character
of Valley

Character
of Banks

Density of
Marginal
Vegetation

Erosion
a) Banks

b) Watershed

Diversions:

Diversion 1: 12 miles above mouth, left side of water control dam, diverts 95% of creek during irrigation season, approximately 30-40 cfs. Concrete and wood headgate with 2" grizzly. Width of ditch ten feet, depth three feet.

Diversion 2: Placer mine ditch, 17 miles above mouth.

Artificial Obstructions:

1. 12 miles above mouth, concrete dam, wood spill; 15' high, no protective devices, barrier.

2. 17 miles above mouth, rock dam, 2' high, no protective device, passable.

Both fish ladder and screen could easily be constructed.

Natural Obstructions: None

Fluctuation in Water Level:

Variation: 3-4 feet

Cause of Variation: spring runoff and regulation of the water control dam

Stream Volumes: 40 cfs at mouth, 25 cfs at terminus of survey

Pollution:

Slight pollution from placer mine 17 miles above mouth, only through silting of the stream.

Fish (salmon): none

Fish (other than salmon):

<u>Species</u>	<u>Date</u>	<u>Very Abundant</u>	<u>Abundant</u>	<u>Fair No.</u>	<u>Scarce</u>
Steelhead					
Rainbow	8/17/38			X	
Whitefish	8/17/38			X	
Dolly Varden					
Cutthroat					
Squawfish	8/17/38		X below dam		
Minnows	8/17/38		X below dam		
Brook trout	8/17/38			X in North Fork	

General Remarks:

Topography

The lower section of stream, about six miles, flows through the west side of the Payette Valley which is flat, wide and rather barren. Some of the area is cultivated and used as pasture for sheep and cattle. The hills are low up to the vicinity of the water control dam 12 miles above the mouth. Marginal vegetation in the lower area is sparse. Above the dam the hills are high and steep and the canyon V-shaped and narrow. Towards the upper end of the stream the country is mountainous and heavily timbered. Extensive logging operations are being carried on.

The lower mile or so of the North Fork flows through a valley about a half mile wide. The valley gradually enters into low foothills then a high mountainous area. Marginal vegetation consisting of alder, willow, pine, spruce, tamarack and brush was dense to moderately thick. Logging operations were removing considerable amounts of the cover.

Character of Stream

The first six miles of the stream averaged between 20'-30' wide. The bottom consists chiefly of sand and some small gravel. Above the lower six miles the bottom consisted of 35-50 percent sand and about twice as much small and medium rubble as large. The gradient is slow in the lower section and moderate in the upper region. Marginal vegetation is moderately dense except in some areas where willows are thick. Although medium and small rubble combined make up most of the bottom there is little spawning area due to the abundance of sand and silt especially in the lower 14 miles surveyed. Above this region

the gradient is steeper and there is less sand in the stream bed. A water control dam is located 12 miles above the mouth. The structure is concrete with wooden splash boards. A ditch takes practically all of the water during irrigation season and returns the water four miles below thus leaving the four miles below the dam almost dry. It is doubtful if fish could find enough water in the stretch to swim through. There are no protective devices to migratory fish on the dam to the ditch. Above the end of the survey the stream divides into four or five small branches.

North Fork

The lower two miles of stream flows through a lightly farmed valley about one mile wide. The bottom of the stream consists chiefly of sand and small gravel thus providing little spawning area. The upper end of the stream is an ideal fish habitat with numerous pools and riffles and the bottom composed mainly of medium and small rubble. Marginal vegetation is moderately thick in the upper five miles. The stream was observed three miles above the terminus of the survey where it was not over 12 feet wide and too steep for migratory fish and spawning beds.

Fish Population

Below the dam are squawfish, whitefish and other small cyprinids in abundant numbers. In a pool below the dam several rainbow were seen. Rainbow and a few cutthroat were noticed in the North Fork and a fisherman reported good brook trout fishing in Rapids Creek.

Temperature Data:

Sta	Date	Hour	Air Temp	Water Temp	Skv
AA	8/17/38	10:00 am	80 F	58 F	Clear
BB	8/17/38	1:00 pm	70 F	59 F	Clear
cc	8/17/38	4:00 pm	68 F	57 F	Clear

No temperatures were taken on the North Fork.

Pool Grade:

Sta	Dist (mi)	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6	Total
Gold Fork Creek:									
AA-BB	6.0	109	18.1	2	0	104	3	2	111
				1.8	0.0	93.6	2.7		
BB-CC	6.0	110	18.3	46	1	48	15	25	135
				34.0	0.7	35.5	11.1		
CC-DD	6.5	146	22.4	10	0	42	94	165	311
				3.2	0.0	13.5	30.2		
North Fork Gold Fork Creek:									
AAA-BBB	6.9	78	11.3	0	0	15	63	14	92
				0.0	0.0	16.3	68.4		

Total	25.4	443	17.4	<u>58</u>	<u>1</u>	<u>209</u>	<u>175</u>	206	649
				13.1	0.2	47.2	39.5		

Gradient: Topographic maps not available

Tributaries:

Gold Fork Creek:

1. Flat Creek, 1 mi below dam, not seen.
2. North Fork, 12.5 mi above mouth, see report.
3. French Creek, 4 mi above dam, 1 cfs, mud and silt.
4. South Fork, 5 mi above dam.
5. Foolhan Creek, 1.5 mi below terminus, 19 cfs.
6. Spruce Creek, 0.5 mi above Foolhan Creek, not seen.
7. Lodgepole Creek, 0.25 mi above Spruce Creek, not seen.

North Fork Gold Fork Creek:

1. Sloans Creek, 0.5 mi above mouth, not seen.
2. Kennelly Creek, 5.5 mi above mouth, not seen.
3. Paddy Creek, 6.5 mi above mouth, 5 cfs.

Lake Fork Creek

River System: Snake River

stream Surveyed: Lake Fork Creek, tributary to North Fork Payette River

Date of Survey: August 15, 1938

Source: Little Payette Lake

Direction of Flow:

Total Length: 23.5 miles; 19.5 miles surveyed.

Station Location:

The first four miles from the mouth to the highway bridge were not surveyed.

Sta	Location	Distance Above Prev. Station		Distance Above Mouth		Map Location	Width	Depth
		Yds	Miles	Yds	Miles			
AA	Highway bridge near Donnelly	0	0.0	0	4.0	S9,SE4 T16N,R3E	12'	10"
BB	9 mi above AA		9.0		13.0	Sec 14 T17N,R3E	30'	8"
cc	Dam at outlet of Little Payette Lake		6.5		19.5	S13,NW4 T18N,R3E	21'	24"

EPA River Reach Codes:

Station	HUC	SEG	Rmi
AA			
BB			
cc			

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.		M.R.		S.R.		M&S	
			%		%		%		%
AA-BB	118,200					29,010	24.5	89,190	75.4
BB-CC	253,000	31,840	12.6	63,670	25.1	82,480	32.6	75,010	29.6

Spawning Area Usable and Available:

None, due to Black Canyon Dam on lower Payette.

Station	Distance vds miles	Area (yd ²)	Available Spawning Area (yd ²) (MR&SR)	% Avail	Usable Spawning Area (yd ²)	% Usable
AA-BB			29,010	24.5	3,540	3.0
BB-CC			146,150	57.7	53,720	21.0

Spawning Area Unavailable and Unusable:

All listed above due to Black Canyon Dam, no obstruction on Lake Fork Creek.

Character of Watershed:

Mountainous

Hilly upper 3 miles only

Rolling upper section

Flat lower 10 miles

Swampy first 5 miles and small area 2 miles below lake

Wooded upper 2 miles

Open first 4 miles

Cultivated 10% lower 8 miles

Character
of Valley

Character
of Banks

Density of
Marginal
Vegetation

Erosion
a) Banks

b) Watershed

Diversions:

Diversion 1: 2 miles above Spink, 2' dam across stream.

Diversion 2: 13.4 miles above Station AA (500 paces above county road bridge), 75 cfs diverted.

Diversion 3: 14.4 miles above Station AA, log wing dam.

Diversion 4: 14.5 miles above Station AA, rock wing dam, 5-6 cfs diverted.

Diversion 5: 1 mile below outlet of Little Payette Lake, 144 cfs diverted.

Diversion 6: 1 mile above power house at inlet to Little Payette Lake, 20 cfs diverted to the power house flume.

Artificial Obstructions:

1. 2 miles above Spink, low log dam, no protective device.

2. 13.4 miles above Station AA, 2, log and board dam, cement abutments, no protective device.

3. 1 mile below outlet of lake, 2' concrete dam and flash boards, no protective device.

4. Outlet of Little Payette Lake, 15, rock fill dam, no protective device.

5. 1 mile above inlet to lake, 20, dam, rock fill and cement, no protective device.

Natural Obstructions: None

Fluctuation in Water Level:

Variation: considerable variation as irrigation ditches take 90% of the water during the growing season.

Cause of variation: spring runoff and regulation of the irrigation dams and ditches.

Stream Volume: less than 10 cfs below Station BB, and 220 at the outlet of the lake.

Pollution:

Temporary pollution from pea crops during the short picking season.

Fish (salmon): None

Fish (other than salmon):

Species	Date	Very Abundant	Abundant	Fair No.	Scarce
Steelhead					
Rainbow	8/15/38				X
Whitefish					
Dolly Varden					
Cutthroat					
Brook trout	8/15/38				X
Squawfish	8/15/38			X	
Other Cyprinids	8/15/38			X	

General Remarks:

Towoqrawhv

The first five miles of the stream flows through the Payette Valley which is partially farmed in this region. The region up to two miles below the lake is flat surrounded by low rolling hills. Vegetation is rather sparse consisting of marsh grass, willows, alder, cottonwood and pine and spruce in the vicinity of the lake. The country is steeper and the hills higher near the lake. Little Payette Lake is approximately 1.75 miles long. Above the lake the stream flows through a narrow rocky gorge for 0.5 mile then levels off near the McCall power reservoir one mile above the inlet.

Character of Stream

The first four miles of the stream were not surveyed as it was considered useless as a fish habitat. The width was from 12-20 feet, the volume 8-10 cfs and the bottom consisted entirely of sand. For the next nine miles the stream wanders through a flat region. The current is slow and the bottom chiefly of sand and some small rubble. Very little of the stream was considered as suitable spawning area. Above Station BB the gradient is moderate thus forming riffle and pool areas, the bottom contains a fairly even distribution of rubble providing suitable spawning grounds. Three irrigation diversions take out about 90% of the water. The upper of the irrigation dams is located 0.5 mile below the outlet of the lake and is a partial barrier to fish in low water as there is a long series of cascades and low falls just below the dam. Marginal vegetation of the upper area is dense. Little Payette Lake is dammed at the outlet in order to control the irrigation water. The dam is a rock fill with a cement spill which is dry during the irrigation season. The water is piped under the rock fill through a four foot pipe during low water level. The dam has no fish ladder and is impassable to fish.

One mile above the inlet of Little Payette Lake is a water storage reservoir. The dam is a rock fill with board and cement

spill. The drop is 20' and as there is no fish ladder the dam is a permanent barrier. Approximately 20 cfs of water are diverted into a pipe flume to run the small power house near the lake inlet.

Fish Population

Squawfish and small cyprinids (shiners) are numerous in some areas. A few rainbow and brook trout were seen. Redfish were reported in Little Payette Lake but none were seen.

Temperature Data:

Sta	Date	Hour	Air Temw	Water Temw	Sky
BB	8/15/38	12:15 pm	67 F	62 F	Clear
cc	8/15/38	2:15 pm	67 F	65 F	Clear

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6	Total
AA-BB	140	15.4		2	65	73		140
				1.4	46.4	52.1		
BB-CC	157	15.1	17	6	65	69	154	311
			10.8	3.8	41.4	43.9		
Total	297	15.2	17	8	130	142	154	451
			5.7	2.7	43.77	47.8		

Gradient:

Topographic maps not available.

The gradient is slow to two miles below the lake, above it is moderate.

Tributaries: None

South Fork of the Payette River

River System: Snake River
 Stream Surveyed: South Fork of the Payette

Date of Survey: August 21-25, 1938, by Hanavan, Parkhurst, Wilding and Morton

Source:

Benedict Creek and Tenlake Creek rise from Ingeborg Lake (Sec 9,T7N,R12E) and Vernon Lake (Sec 12,T7N,R12E) respectively.

Direction of Flow:

Flow north to unite and form the South Fork which flows north to Grandjean, thence west to unite with the North Fork at Banks as the Main Payette.

Total Length:

85 miles, of which 77 miles were investigated, and 69 miles surveyed.

Station Location:

Sta	Location	Distance Above Prev. Station		Distance Above Mouth		Map Location	Width	Depth
		Yds	Miles	Yds	Miles			
A	Highway Bridge across mouth at Banks	0	0.0	0	0.0	Sec 28 T.9N,R3E	96'	2.5'
B	Confl of the Middle Fork		7.0		7.0	Sec 21 T.9N,R4E		
C	Grimes Pass Power Dam		11.0		18.0	Sec 16 T.8N,R5E		
D	Confl of the Deadwood River		14.0		32.0	Sec 32 T9N,R7E	108'	4.0'
E	Bridge at Lowman, Idaho (840 cfs)		4.0		36.0	Sec 27 T.9N,R7E	150'	1.6'
F	Bridge at Kirkham Hot Springs		5.0		41.0	Sec 32 T.9N,R8E	30'	11.5'
G	Jordan Bridge		3.0		44.0	Sec 34 T.9N,R8E	48'	9.0'
H	Tenax or Casner Bridge (just below Tenmile Creek)		9.0		53.0	Sec 16 T.9N,R9E	75'	3.0'
I	Grandjean Hot Springs		16.3		69.3	Sec 32 T10n,R11E	100'	1.5'
J	Fern Falls		7.7		77.0	Sec 17	25'	2.0'

(75-100 cfs)

T.8N,R12E

EPA River Reach Codes:

<u>Station</u>	<u>HUC</u>	<u>SEG Rmi</u>
A		
B		
C		
D		
E		
F		
G		
H		
I		
J		

Character of Bottom Between Stations:

<u>Station</u>	<u>Area (yd²)</u>	<u>L.R.</u>	<u>%</u>	<u>M.R.</u>	<u>%</u>	<u>S.R.</u>	<u>%</u>	<u>M&S</u>	<u>%</u>
A-B	390,000	206,310	52.9	29,790	7.6	3,350	0.8	150,550	38.7
B-C	878,900	304,420	34.6	212,400	24.1	154,730	17.6	207,350	23.7
C-D	589,400	370,740	62.9	76,210	12.9	31,320	5.4	111,130	18.8
D-E	265,300	117,860	44.4	58,840	22.1	46,430	17.5	42,170	16.0
E-F	272,600	145,050	53.2	69,810	25.6	29,470	10.8	28,270	10.4
F-G	132,000	74,230	56.2	23,010	17.4	13,190	9.9	21,570	16.5
G-H	470,400	333,230	70.8	41,150	8.7	30,650	6.5	65,370	14.0
H-I	784,400	485,020	61.8	154,920	19.7	73,980	9.4	70,480	9.1
I-J	Unsurveyed								

Tot 3,783,000 2,036,860 53.8 666,130 17.6 383,120 10.1 696,890 18.5

Spawning Area Usable and Available:

None because of the Black Canyon Dam below Banks, Idaho.

Spawning Area Unavailable and Unusable:

<u>Station</u>	<u>Distance</u>	<u>Area (yd²)</u>	<u>Area Unavail (yd²)</u>	<u>% Unavail</u>	<u>When Avail</u>	<u>Usable Unavail (yd²)</u>	<u>% Usable Unavail</u>
A-B			33,140	8.4		12,890	3.3
B-C			367,130	41.7		186,210	21.1
C-D			107,530	18.3		26,060	4.4
D-E			105,270	39.6		38,590	14.5
E-F			99,280	36.4		41,330	15.1
F-G			36,200	27.3		14,510	10.9
G-H			71,800	15.2		14,230	3.0
H-I			228,900	29.1		74,250	9.5
I-J	Unsurveyed						
Total			1,049,250	27.7		408,070	10.7

Cause: Black Canyon Dam

Character of Watershed:

Mountainous	X all along
Hilly	X
Rolling	
Flat	
Swampy	
Wooded	X in upper portion
Open	X in lower portion
Cultivated	Less than 1%
Character of Valley	
Character of Banks	
Density of Marginal Vegetation	
Erosion	
a) Banks	
b) Watershed	

Diversions: None

Artificial Obstructions:

1. The Grimes Pass Power Dam (Sec 16,T.8N,R5E) is a concrete structure 180' wide and 60' high located 17.5 miles above the confluence of the North and South Forks of the Payette River. It is not equipped with fishways nor any type of protective device except a 1 1/4 inch grizzly above the drop gates. Two pipes, each six feet in diameter, carry water to the turbines. The dam, therefore, is an impassable barrier to all migrating fish.

Natural Obstructions:

There are a number of falls on the South Fork, and they all seem to be concentrated in two areas: 1) about 25 miles above the mouth,

or near Long Gulch Creek, and 2) at the end of the survey or Fern Falls. At 23 miles upstream the entire river goes over a passable 6' falls. At 24 miles a series of 2' and 8' falls over a 10' slant is passable. At 26 miles a series of three falls, the highest of which is 15' forms a natural impassable barrier over which the natives claim the salmon never passed. Fern Falls, located 7.5 miles above Grandjean is a series of 3' to 6' falls that looks like a winding staircase about a half-mile long, passable for steelhead, but doubtful for salmon.

Fluctuation in Water Level:

US Gauge Station report from Surface Water Supply of US, .1932, US Dept. of the Interior.

Month	Mean cfs during 1931-32	
	at mouth (near Banks)	at Garden Valley Station
January	350 (est. ice)	290
February	396	307
March	990	556
April	2,510	1,290
May	5,640	3,550
June	5,140	3,740
July	1,850	1,380
August	1,490	1,360
September	1,410	1,270
October	443	364
November	387	297
December	350 (est - ice)	290
Avg for year	1,750	1,220

The discharge and flow of the South Fork is controlled by the operation of gates in Deadwood Dam on the Deadwood River. Although the stream rises as much as 15' in the lower canyonous areas, the average fluctuation for the entire stream is about 6' from mean low water to mean high water level. Ordinarily the rocky nature of much of the banks and parts of the watershed does not permit an appreciable amount of erosion. However, in other areas there is considerable erosion due to the fact that the floral covering of the watershed is not sufficient to hold back the spring run-off. Anchor-ice is formed above Lowman during the winter, and when the ice goes out in the spring, it scours the stream bed severely in places.

Pollution: None observed or reported.

Fish (salmon):

None seen or reported. There used to be a run in the Middle Fork, but it has been killed off years ago.

Fish (other than salmon):

Species	Date	Very Abundant	Abundant	Fair No.	Scarce
Suckers	8/38			X esp. below Grimes Pass Dam	
Squawfish	8/38			X esp. below Grimes Pass Dam	
Whitefish	8/38			X esp. above Grimes Pass Dam	
Rainbow trout	8/38			X esp. above Grimes Pass Dam	

General Remarks:

Towosrawhy

The South Fork of the Payette River flows through a narrow canyonous valley for its first five miles. The nature of the watershed in this lower portion is all extremely mountainous; rocky hills encroaching closely upon the stream. The mountains are sparsely covered with sagebrush and dry grass, especially on the southern slopes. The northern slopes are sparsely covered to moderately covered with Idaho white and yellow pine. The river banks are very high, steep, and rocky (see photos) and the marginal vegetation is a scant growth of willows.

The Garden Valley area is about seven miles upstream. This section exhibits a considerable topographical change. The valley widens to a half mile at its widest portions. The stream in this area is bordered by cultivated fields. Above Garden Valley R.S. (13 miles upstream) the river valley narrows rapidly and reverts again to the canyon type. From this point to Lowman the watershed is practically barren, consisting of high rocky hills with a thin covering of lichens, earth, and grass with a few pine trees here and there. From Grimes Pass to the Deadwood River the perpendicular canyon walls make it impossible to travel up the stream bed, so we had to follow a highway cut into the side of these rock walls which at Timber Point was 900' straight up from the river bottom. Above the Deadwood River the valley of the South Fork widens considerably. The high rocky hills recede a short distance from the river forming a narrow valley instead of a steep canyon.

From Lowman to Grandjean the river meanders through a narrow valley and in many places it is cutting sharply into the low rolling hills bordering it, and occasionally cutting through pinkish bedrock box canyons. Above Grandjean the rugged peaks of the Sawtooth Mountain Range are everywhere. This extremely mountainous area is one of notable scenic beauty. Above Grandjean the valley widens, but is lined on each side by these jagged, snow-covered ranges. About five miles above Grandjean is a large swamp known as Big Meadows which surrounds the river for a couple of miles. About eight miles above Grandjean are the Fern Falls--a series of falls and cascades

that look for all the world like a flight of winding stairs. These extend for between 1/4 and 1/2 mile and mark the end of our survey in 1938.

Character of Streambed

The rubble in the area from the mouth of the South Fork to the confluence with the Middle Fork consists mostly of large boulders and bedrock interspersed with fine sand which we consider practically entirely unsuitable for salmon spawning.

From the confluence of the Middle Fork for seven miles upstream there are numerous shallow riffles flowing over a marked increase of medium and small types of rubble. We consider this type of bottom suitable for spawning. This conclusion was confirmed by old residents of the district, who all report that the Garden Valley district was the main salmon-spawning area in the South Fork of the Payette before the run was blocked by dams.

At the end of this area the valley reverts once more into the canyon type, and about three miles above this rubble area is the Grimes Pass Power Dam (see "Artificial Obstructions") which is an insurmountable barrier to migratory fish. From the dam to the confluence with the Deadwood River, **the river** bottom is composed once more of large boulders and bedrock interspersed with fine sand and a minimum amount of medium and small rubble, and flows alternately through deep pools and deep riffles in a manner similar to the lower eight miles of the river. This area is practically entirely unsuitable for salmon spawning. There are several small falls in this section, and at a distance of 8.7 miles above the dam is a series of falls with one of 15'. Old residents say that salmon were never **seen** above these falls.

From the confluence of the Deadwood River and the South Fork of the Payette River to Lowman **the river** winds from one side of the wider valley to **the other**, forming wide shallow riffles at the bends. There is a decided increase in the amount of medium and small rubble in this **area** which makes it more suitable for spawning.

From Lowman to Grandjean the streambed contains large amounts of bedrock, large boulders and sand; although there are scattered rubble beds in this area. Five miles above Lowman are the Kirkham hot springs and at Grandjean are the Sacajawea hot springs, both of which are piped into bathhouses for public use. Warm Springs Creek was lined with hot springs also. At Big Meadows there is practically no gradient, and the river flows sluggishly over mud and fine sand, winding back and forth through a wide grassy swamp, a typical flat high mountain meadow. Above the meadows the river is remarkably devoid of pools, being a continuous fast, steep, shallow riffle. Seven and a half miles above Grandjean are the Fern Falls, a series of winding cascades and low falls which is easily passable to Steelhead, but doubtfully so for salmon. The 1938 survey ended at

the falls.

Fish wowulation

Very few if any fish were observed below Grimes Pass Dam, and the only species noted there were Squawfish and suckers. Foot-long Whitefish, and 6" rainbow or cutthroat trout were fairly common above the dam. Bottom samples, and trout fish stomachs were collected above Lowman.

During 1937, 150,000 rainbow trout fingerlings were planted in the South Fork. During our survey in August, 1938, we observed creel after creel limit of these little fish, especially on Sunday. This stream is certainly heavily fished by Boise residents, as are its tributaries. A well-developed road all along the river clear up to Grandjean with nice roadside campgrounds at frequent intervals make it easily accessible to all. Guests at our table at Marches in Lowman told of parties taking from 100-400 fish out in a trip of a few days duration. There are bigger trout in the river, as we took a few ten to twelve inches and saw many more while collecting stomachs from the fishermen along the river. It is as beautiful trout water as this writer (Morton) has ever seen, and as long as this section of the river above Grimes Pass Dam will probably never be inhabited by either salmon or steelhead, it should be more carefully patrolled and controlled to preserve it as a trout stream. This would be a particularly easy stream to patrol and control.

As far as salmon are concerned, the runs were all killed off after a dam was constructed near Horseshoe Bend on the main river many years ago. At present the Black Canyon Dam on the main river is an impassable barrier to all migratory fish. However, if at some future period the Bureau saw fit to see a fish ladder constructed over this dam, the areas around Garden Valley and up the Middle Fork could be once more available to migratory salmonids, and at once. The Idaho public would have to be educated to cooperate with such a program to make it function.

Temperature Data:

Sta	Date	Hour	Air Temw	Water Temw	Skv
A	8/19/38	4:00 PM	?	69 F	Clear
B	8/21/38	10:30 am	60 F	55 F	Clear
Bridge above Station B	8/21/38	1:30 pm	77 F	55 F	Clear
D	8/28/38	4:30 pm	90 F	65 F	Partly cloudy
E	8/28/38	4:00 pm	86 F	62 F	Partly cloudy
F	8/28/38	12:00 n	70 F	59 F	Clear
Emma Creek below G	8/23/38	10:15 am	64 F	54 F	Clear
G	8/28/38	4:00 pm	84 F	60 F	Clear
H	8/28/38	4:30 pm	82 F	58 F	Clear
Salt Lick	8/23/38	10:00 am	69 F	54 F	Clear

Camp
I (Fern Falls) 8/26/38 3:30 pm 70 F 58 F Partly cloudy

Pool Grade:

Sta	Dist (mi)	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6	Total
A-B	7.0	132	19.0	89	10	16	17	177	309
				28.0	3.0	6.0	6.0	57.0	
B-C	11.0	83	7.5	64		16	3		83
				77.0		19.0	4.0		
C-D	14.0	316	22.5	202	2	101	11	297	613
				32.0	1.0	16.0	3.0	48.0	
D-E	4.0	19	4.7	7		8	4	162	181
				4.0		5.0	2.0	89.0	
E-F	5.0	210	42.0	51	6	84	69	2	212
				28.0	1.5	38.0	32.0	0.5	
F-G	3.0	49	16.3	27	1	2	19	30	79
				33.0	2.0	5.0	23.0	37.0	
G-H	9.0	57	6.3	24	1	28	4	239	296
				7.0	1.0	9.0	3.0	80.0	
H-I	16.3	725	44.4	97	4	258	366	310	1035
				9.0	3.0	24.0	35.0	29.0	
Grand Total	69.3	2626	37.8	561	24	513	493	1217	2808
				19.0	3.0	18.0	17.0	43.0	

Gradient:

Station	Distance (miles)	Total Drop	Avg Drop Per Mile	Source of Data
F-H	12	420'	35'	Sheet C of Plan and Profile Map of Payette River above
H-I	17	900'	51'	Horseshoe Bend, Idaho USGS 1927

From the mouth to Middle Fork the gradient is fairly steep, then gradual or moderate between Stations B and C (Grimes Pass Dam). From C to D the gradient becomes steep once more and then moderate from D to G. From Stations G to H it is steep, and from H to J it is alternately moderate and steep.

Tributaries:

No.	Name	Bank	Miles from mouth	Length (mi)	Est. Flow cfs	Notes
1	Deer Creek	R.B.	5.00	7.0	--	Unobserved
2	MF Payette	L.B.	7.25	45.0	150	See survey notes
3	Alder Creek	R.B.	12.00	9.0	20	Passable
4	Rash Creek	R.B.	13.00	4.5	3	Impassable
5	Poorman Creek	L.B.	14.00	2.0	<1	Impassable

6	Horn Creek	R.B.	15.00	3.0	--	Unobserved
7	Nelson Creek	L.B.	15.00	2.5	dry	---
8	Bunah Creek	R.B.	16.00	1.5	--	Unobserved
9	Reservoir Ck	R.B.	16.00	4.0	--	Unobserved
10	Carpenter Ck	L.B.	16.00	3.0	dry	---
11	Danskin Creek	L.B.	19.00	6.0	dry	---
12	Gallagher Ck	L.B.	22.00	2.0	<1	Impassable
13	Big Pine Creek	L.B.	23.00	8.0	5	Impassable
14	Long Gulch Ck	L.B.	25.00	2.0	3	Impassable
15	Hole-in-the Wall Creek	R.B.	27.00	3.0	--	Unobserved
16	Rattlesnake Ck	L.B.	28.00	1.5	<1	Impassable
17	Deadwood River	L.B.	31.00	40.0	500-	See survey notes
			1000			
18	Rock Creek	R.B.	36.00	11.0	--	Unobserved,
19	Clear Creek	L.B.	36.00	20.0	35	See survey notes
20	Lick Creek	L.B.	38.00	4.0	<1	Impassable
21	Steep Creek	R.B.	38.00	2.0	1	Impassable
22	Huckleberry Ck	R.B.	39.00	3.0	5	Impassable
23	Kirkham Creek	L.B.	40.00	5.0	5	Impassable
24	Green Creek	R.B.	41.00	1.5	dry	---
25	Emma Creek	R.B.	42.00	2.0	<1	Impassable
26	Archie Creek	R.B.	44.00	3.0	--	Unobserved
27	Jackson Creek	R.B.	47.00	3.0	--	Unobserved
28	Fence Creek	L.B.	47.00	5.0	--	Unobserved
29	Fivemile Creek	L.B.	50.00	8.0	15	Passable
30	Kettle Creek	L.B.	51.00	2.5	--	Unobserved
31	Killis Gulch Creek	R.B.	51.00	3.0	--	Unobserved
32	Richards Creek	R.B.	52.00	2.5	--	Unobserved
33	Eightmile Ck	L.B.	52.00	18.0	35- 50	See survey notes
34	Little Tenmile Creek	L.B.	54.00	1.5	--	Unobserved
35	Tenmile Creek	R.B.	54.00	16.0	35- 50	See survey notes
36	Casner Creek	L.B.	55.00	3.5	3	Impassable
37	MacDonald Ck	R.B.	56.00	3.0	5	Impassable
38	Blue Jay Creek	R.B.	57.00	2.5	--	Unobserved
39	Chapman Creek	R.B.	58.00	4.0	7-10	Impassable
40	Warm Springs Creek	L.B.	59.00	22.0	80	See survey notes
41	Jenny Creek	L.B.	60.00	2.5	<1	Impassable
42	Burn Creek	L.B.	61.00	1.5	<1	Impassable
43	Wolf Creek	R.B.	62.00	5.0	<1	Impassable
44	Fox Creek	L.B.	63.00	18.0	3	Impassable
45	Canyon Creek	L.B.	64.00	--	50	See survey notes
46	Camp Creek	L.B.	65.00	2.5	3	Impassable
47	Bear Creek	L.B.	66.00	3.0	20	Passable
48	Wapiti Creek	R.B.	66.00	6.0	--	Unobserved
49	Grandjean Ck	L.B.	68.00	1.5	--	Unobserved
50	Trail Creek	L.B.	69.00	4.0	5	Passable; sandy

51	Barron Creek	L.B.	72.00	9.0	15	Passable; sandy & rocky
52	Goat Creek	L.B.	74.00	7.0	5	Passable

Lake, Garden, Pinchot, Pitch and Fall Creeks, from 77 to 82 miles above mouth and from 1-5 miles long were unobserved. They flow in below the confluence of Benedict and Tenlake Creeks mentioned in Source data.

Middle Fork Payette River

River System: Snake River

Stream Surveyed: Middle Fork Payette River

Date of Survey: August 23-24 and 31, 1938.

Source:

Various springs and tributaries from high mountain region. T13-14N,R5-6E, Payette National Forest.

Direction of Flow: SSW to North Fork Payette River

Total Length: 41 miles, 31.8 miles surveyed

Station Location:

Sta	Location	Distance Above Prev. Station		Distance Above Mouth		Map Location	Width	Depth
		Yds	Miles	Yds	Miles			
A	Mouth, confl North Fork	0	0	0	0	NW4,521 T9N,R4E	48'	---
B	Bridge at Garden Valley		2.0		2.0	W2,S15 T9N,R4E	70'	---
C	Bridge on road from Fisher Ranch to Deadwood Lake		7.0		9.0	sw4,s14 T10N,R4E	59'	10"
D	Bridge 0.2 mi above Bell Ck		5.0		14.0	SE4,S36 T11N,R5E	93'	48"
E	Bridge 0.5 mi below Boiling Springs		10.0		24.0	SE4,S21 T12N,R5E	40'	8"
F	Confl with Bull Creek		7.8		31.8	W2,S31 T13N,R5E	27'	---

EPA River Reach Codes:

Station	HUC	SEG Rmi
A		
B		
C		
D		
E		
F		

Character of Bottom Between Stations:

Station	Area (yd^2)	L.R.	%	M.R.	%	S.R.	%	M&S	%
A-B	56,700	1,690	2.98	660	1.14	1,490	2.62	52,860	93.22
B-C	263,100	15,690	5.96	40,680	15.46	44,540	16.92	162,190	61.64
C-D	210,800	53,360	25.30	52,800	25.04	25,940	12.30	78,700	37.33
D-E	261,100	102,830	39.38	53,250	20.40	7,120	2.72	97,900	37.50
E-F	182,600	77,040	42.19	34,400	18.88	22,430	12.28	48,740	26.70
Tot	974,300	250,610	25.72	181,790	18.65	101,520	10.45	440,390	45.20

Spawning Area Usable and Available:

Station	Distance vds miles	Area (yd^2)	Available Spawning Area(yd^2) (MR&SR)	% Avail	Usable Spawning Area(yd^2)	% Usable
A-B			2,150	3.76	150	0.26
B-C			85,220	32.38	15,520	5.89
C-D			78,740	37.34	21,580	10.23
D-E			60,370	23.12	22,980	8.80
E-F			56,830	31.11	28,390	15.54

Spawning Area Unavailable and Unusable: None

Character of Watershed:

Mountainous steep and high, upper 20 miles

Hilly lower 10 miles

Rolling

Flat lower 14 miles

Swampy

Wooded sparse lower 7 miles, dense above

Open lower 5 miles

Cultivated 40% lower 7 miles

Character
of ValleyCharacter
of Banks
Density of
Marginal

Vegetation

Erosion

a) Banks

b) Watershed

Diversions:

None on Main River

Diversion 1: Anderson Creek - most of stream diverted.

Diversion 2: Scriber Creek - most of stream diverted.

Artificial Obstructions: None

Natural Obstructions: None

Fluctuation in Water Level:

Variation: 3-4 feet

Cause of Variation: rains and spring runoff

Stream Volumes: 100-150 cfs estimated

Pollution: None

Fish (salmon): None

A large run of salmon spawned in the Payette system before the Black Canyon dam was put in just above Emmett. Salmon have been reported at the base of the dam up to the past few years. The Middle Fork is reported to have been the most favorable spawning grounds for the chinook of the former run.

Fish (other than salmon):

Species	Date	Very Abundant	Abundant	Fair No.	Scarce
Steelhead					
Rainbow	8/23/38			X	
Whitefish					
Dolly Varden					
Cutthroat					

Trout fishing was reported to have been very good about ten years ago before the flood that scoured the entire stream.

General Remarks:

Topography

The stream flows through a flat wide valley for the first four miles. The region is extensively farmed. Rolling, barren hills enclose the valley. Above the vicinity of Warms Springs Creek the country becomes steeper and the valley narrow. The mountains are heavily wooded, high and steep. Above Bell Creek for one-half mile is a steep box canyon and also above Silver Creek for a half mile. In the region of Boiling Springs the valley is flat and about three-quarters of a mile wide surrounded by high mountains thickly timbered with pine and spruce. Above Boiling Springs the valley narrows and becomes rather steep. Boiling Springs flow about 1-2 cfs. The temperature is near boiling and the water is loaded with iron and sulphur compounds.

Character of Stream

In about 1929 a cloudburst occurred that flooded and scoured the river and caused considerable erosion of the banks. This flood deposited large amounts of mud, silt and sand throughout the entire river system, thus covering much of the former good spawning areas. The stream bed up to the region of Big Bulldog Creek is mostly mud and sand. The current is slow and the banks low with considerable areas of flood plain. Above this point the stream is faster and the bed is composed of almost equal parts of large rubble and sand. Above Station D and up to Rattlesnake Creek there are long series of steep cascades and low falls. These series of 3-5' falls make the passability difficult although none of the falls were regarded as complete barriers. The stream up to Station E has a moderate gradient. Large rubble and sand predominate the bottom composition. Several good spawning stretches were located. Two series of falls and cascades in box canyons occur, such that passability is partially obstructed. Immediately above Station E and to Boiling Springs the banks are low, the vegetation moderately dense and the gradient moderate. This stretch of about a half mile is very good spawning area and in former years was heavily utilized by spawning chinooks. Above Boiling Springs the stream is steep with the bottom composed chiefly of large rubble and sand.

Vegetation is sparse up to Warm Springs Creek and moderate to dense above, consisting of pine, spruce, willow, alder and cottonwood. There is little erosion.

The stream is reputed to have been the principle spawning area of the former chinook run on the south fork. Natives of the region reported a large run of chinooks some 15-20 years ago. Trout fishing was good up to ten years ago.

Temperature Data:

Sta	Date	Hour	Air Temp	Water Temp	Skv
C	8/23/38	2:45 pm	88 F	70 F	Part cloudy
D	8/24/38	11:00 am	78 F	62 F	Clear
E	8/31/38	4:00 pm	75 F	58 F	Raining

Pool Grade:

Sta	Dist (mi)	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6	Total
A-B	2.0	20	10.0	3		1	16		20
				15.0		5.0	80.0		
B-C	7.0	127	17.8	14	6		107		127
				11.0	4.7		84.2		
C-D	5.0	70	13.8	8	1	7	54	231	301
				11.4	1.4	10.0	77.1		
D-E	10.0	195	19.5	45	4	75	71	323	518
				23.1	2.1	38.5	36.4		
E-F	7.8	83	10.6	11	2	53	17	197	280
				13.3	2.4	63.9	20.5		
Total	31.8	495	15.6	81	13	136	265	751	1246
				16.4	2.6	27.5	53.5		

Gradient:

Station	Distance (miles)	Total Drop	Avg Drop Per Mile	Source of Data
A-B	2.0		20'	estimated
B-C	7.0		40-50	estimated
C-D	5.0		40-50	estimated
D-E	10.0		150-200	estimated
E-F	7.8		100-150	estimated

Topographic data not available

Tributaries:

1. Anderson Creek - near Garden Valley, 3 cfs diverted for irrigation.
2. Gooseberry Creek - 2 miles above Garden Valley.
3. Warm Spring Creek - 2.5 miles above Garden Valley.
4. Pyle Creek - 1 mile above Warm Spring Creek.
5. Sriver Creek - 1 mile above Pyle Creek, >1 cfs at mouth, diverted, former salmon run, good trout fishing in upper section.
6. Lightning Creek - at Station C.
7. Big Bulldog Creek - 2 miles above Station C, >1 cfs.
8. Tie Creek - 2 miles above Station C.
9. Wildcat Creek - 2.5 miles above Station C.
10. Boon Creek - 0.5 mile below Station D.
11. Bell Creek - 0.2 mile below Station D, >1 cfs.

12. Rattlesnake Creek - 2.5 miles above Station D, >2 cfs, steep, boulders and sand.
13. Trail Creek - 0.5 mile below Rattlesnake Creek, small, not good for spawning.
14. West Fork Creek - 0.5 mile above Trail Creek, small, falls, impassable.
15. Silver Creek - 1 mile above Trail Creek, see survey report.
16. Skull Creek - 2 miles below Station E, small, not good for spawning.
17. Wetfoot Creek - 1 mile below Station E, 4 cfs, gravel bed, steep.
18. Bryan Creek - 2 miles above Station E.
19. Dash Creek - 2.5 miles above Station E, 5 cfs, steep.
20. Groundhog Creek - 2.5 miles above Station E, 3 cfs, steep.
21. Lake Creek - 3 miles above Station E, 2-3" sand and gravel, steep.
22. Goat Creek - 3 miles above Station E, >2 cfs.
23. Bull Creek - at Station F, 25 cfs, sand and gravel, reported to have good trout fishing.

Silver Creek

River System: Snake River

Stream Surveyed: Silver Creek, tributary of Middle Fork of ~~P~~ayette River

Date of Survey: August 31, 1938, by Parkhurst and Morton

Source: Silver Creek rises in mountains in S36,T13N,R6E

Direction of Flow:

Silver Creek flows southwest to the right bank of the Middle Fork of the Payette River 20 miles above its mouth.

Total Length: 15 miles, of which 11 have been surveyed

Station Location:

Sta	Location	Distance Above Prev. Station		Distance Above Mouth		Map Location	Width	Depth
		Yds	Miles	Yds	Miles			
A	Mouth	0	0	0	0	Sec 9 T11N, R5N	25'	
B	Peace Valley Bridge		6		6	Sec 35 T12N, R6E	18'	
C	End of survey about 1 mi above last bridge		5		11	Sec 9 T12N, R6E	12'	

EPA River Reach Codes:

Station	HUC	SEG	Rmi
A			
B			
C			

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.		M.R.		S.R.		M&S	
			%		%		%		%
A-B	68,300	15,510	23.0	10,810	16.0	5,060	7.0	36,920	54.0
C-D	42,600	12,790	30.0	8,340	20.0	8,010	18.0	13,460	32.0
Summary									
	110,900	28,300	25.0	19,150	17.0	13,070	13.0	50,380	45.0

Spawning Area Usable and Available:

None because of Black Canyon dam

Spawning Area Unavailable and Unusable:

Station	Distance	Area (vd ²)	Area Unavail (vd ²)	% Unavail	When Avail	Usable Unavail (vd ²)	% Usable Unavail
A-B			15,870	23.0		0	0
B-C			16,350	38.0		1,040	2.4
Entire Stream			32,220	30.0		1,040	1.0

Character of Watershed:

Mountainous	X
Hilly	
Rolling	
Flat	
Swampy	
Wooded	moderately to scattered pine covering
Open	
Cultivated	none
Character of Valley	
Character of Banks	
Density of Marginal Vegetation	
Erosion a) Banks	
b) Watershed	

Diversions:

Diversion 1: A 5,. log dam has recently been built 8.5 miles upstream to impound waters for a small irrigation ditch to the Silver Creek Ranger Station. The logs - really posts are set on end and two or three were removed from the middle of the structure to permit the

free passage of the creek at the time of our survey.

Artificial Obstructions: See "Diversions" above.

Natural Obstructions:

A number of impassable log jams were found in the lower portion. The upper portion especially near Silver Creek Ranger Station had many beaver dams.

Fluctuation in Water Level: variation of 3-6 feet.

Pollution: None, water tastes bad however.

Fish (salmon):

None seen although reports indicate that Silver Creek once supported a salmon run years ago (see "General Remarks").

Fish (other than salmon):

Trout fry and fingerlings; less than one dozen (refer to "General Remarks").

General Remarks:

Topography

Mountains moderately covered with pine and spruce timber. Valley .25-1.0 mile wide. Dense brush and steep rock-walled canyon in lower portion. Middle portion has a wide flood plain through which river meanders, pastured and open in places and very brushy in others. Upper portion of stream becomes quite open between steep timber-covered mountain banks.

Character of Stream

First six miles flows through a steep rocky canyon with 300, cliffs in places and a 5' falls two miles up. In this area the stream is made up of many small pools and cascades with the bottom 50-50 large boulders imbedded in sand. Many log jams are present many of which are impassable at present. From Peace Valley Creek to Ucon Creek the creek becomes shallow, not over 6" deep in any riffles and very few pools, if any, over 2' deep. Many beaver dams in this area. The bottom is chiefly of silver-colored mica and whitish sand with a-few scattered rubble areas. Above Ucon Creek, the Silver gets down to 9-12, wide and contains a goodly variety of rubble mostly large and medium size. There are no pools except little S6's. Above upper bridge where the creek forks the right hand fork takes off through a narrow and deep canyon of solid rock which shows a series of 10' falls which are impassable.

Fish Population

Natives of these parts claim that Silver Creek once supported a good salmon run as did the upper Middle Fork. That was years ago, of course, before the Old Horseshoe Bend dam was constructed. It was an excellent trout stream until a cloudburst a few years ago left it choked with sand for the most part. Although it still has all the appearances of good trout stream only about a dozen trout fry or fingerlings were seen in the eleven miles surveyed--no minnows, squawfish, whitefish or suckers.

Temperature Data:

Sta	Date	Hour	Air Temp	Water Temp	Sky
A	8/31/38	10:00 am	72 F	58 F	Clear
B	8/31/38	11:00 am	71 F	55 F	Clear

Pool Grade:

Sta	Dist (mi)	Resting Pools	Resting Pools/Mile	S2T1 %	S2T2 %	S6	Total
A-B	6	122	20.3	122		215	337
				100.0			
B-C	5	41	8.2	41		203	244
				100.0			
Total	11	163	44.88	581	100.0		

Gradient:

Gradual in lower portion; moderate in middle and steep in upper portion.

Tributaries:

All are dry or less than 1 cfs except the following:

1. Peace Valley Creek - 6 miles above the mouth on R.B., empties about 15 cfs into Silver Creek. It is from 6-12, wide and shallow although it flowed over medium and small rubble at its mouth. Passable if it had more water.
2. Ucon Creek - 9 miles upstream on R.B., 8-10 cfs, flowing over large boulders in series of cascades and falls. Impassable.

Deadwood River

River System: Snake River
 Stream Surveyed: Deadwood River

Date of Survey: August 29, 1938, by Hanavan, Parkhurst, Wilding and
 Morton

Source:

Deadwood River rises in mountains near Tyndall Corral in Sec
 23,T14N,R7E.

Direction of Flow:

Flows due south 14 miles through Deadwood Reservoir which is 3-4
 miles long thence south 20 miles more to the left bank of the South
 Fork of the Payette River 30 miles from its mouth.

Total Length: 45 miles, of which 13.7 miles were surveyed.

Station Location:

Sta	Location	Distance Above Prev. Station		Distance Above Mouth		Map Location	Width	Depth
		Yds	Miles	Yds	Miles			
A	Mouth of Deadwood	0	0.0	0	0.0		97'	1.2'
B	Nine miles upstream		9.0		9.0			
C	Confl of No Man's Creek							
D	Deadwood Dam		5.0				60'	1.0'

EPA River Reach Codes:

Station	HUC	SEG Rmi
A		
B		
C		
D		

Character of Bottom Between Stations:

Station	Area (yd^2)							
	L.R.	%	M.R.	%	S.R.	%	M&S	%
A-B	239,170	59.0	63,930	16.0	1,620	0.4	102,780	24.6
B-C	Unsurveyed							
C-D	86,640	57.0	30,920	20.0	15,930	10.0	18,610	13.0
Totals	325,810	58.0	94,850	16.0	17,550	5.0	121,390	21.0

Spawning Area Usable and Available:

None because of Black Canyon, Grimes Pass and Dams.

Spawning Area unavailable and unusable:

Station	Distance	Area (yd^2)	Area Unavail (yd^2)	% Unavail	When Avail	Usable Unavail (yd^2)	% Usable Unavail
A-B			65,550	16.4		500	0.1
C-D			49,850	30.0		10,630	7.0
Total			112,400	21.0		11,130	2.0

Character of Watershed:

Mountainous	X
Hilly	
Rolling	
Flat	
Swampy	
Wooded	X (moderately)
Open	
Cultivated	None
Character of Valley	
Character of Banks	
Density of Marginal Vegetation	
Erosion	
a) Banks	
b) Watershed	

Diversions: None

Artificial Obstructions:

Deadwood Dam was built across the Deadwood River about 20 miles above its mouth; concrete 120' high, 360' crest; no fish ladder; water squirting 50' downstream from mouth of pipe before it hits gravel. Two large pipes out of the bottom; flow controlled by gates; built by US Bureau of Reclamation. No power equipment at dam.

Function is purely flow control for irrigation purposes on the Main Payette below Black Canyon.

Natural Obstructions: None

Fluctuation in Water Level:

Flow is controlled by gates. Compare flows from "Surface Water Supply in US" records for 1931-2.

Month	Mouth (Station A)	At Dam (Station D)
January	40.0	1.0 (gates closed)
February	40.0	1.0 (gates closed)
March	91.3	1.0 (gates closed)
April	279.0	1.0 (gates closed)
May	859.0	1.0 (gates closed)
June	568.0	1.0 (gates closed)
July	204.0	35.5
August	851.0	791.0
September	889.0	847.0
October	94.3	42.5
November	44.6	1.0 (gates closed)
December	40.0	1.0 (gates closed)

. Pollution: None

Fish (salmon): None seen or ever reported

Fish (other than salmon):

None seen and should be none or very few because of low water conditions when gates in dam are shut.

General Remarks:

Topography

The river flows between steep, high, sparse to moderately forest-covered mountains. The timber is coniferous mostly yellow-boled white and yellow pine. There is no sign of human habitation anywhere along the river from the Dam down.

Character of Stream

Data shows the bottom is composed mostly of large rubble of which the lower and central portion is chiefly composed. A deep box canyon extends from Sam's Creek to No Man's Creek, and the Deadwood Dam gates are open mostly in August and September and closed during the fall and winter allowing no water to escape. This extreme fluctuation of water level prohibits the development of any fish population--much algae growth was observed in the upper portions of the river.

Temperature Data:

Sta	Date	Hour	Air Temp	Water Temp	Skv
A	8/28/38	4:00 pm	81 F	64 F	Partly Cloudy
B	8/29/38	12:30 pm	86 F	55 F	Clear
C	8/29/38	2:30 pm	85 F	56 F	Clear
D	8/29/38	6:30 pm	72 F	42 F	Clear, sunny and warm

Pool Grade:

Sta	Dist (mil)	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6	Total
A-B	9.0	107	12	23	1	47	36	716	823
				21.5	0.9	43.9	33.6		
B-C		Not surveyed							
C-D	5.0	104	21	23		72	9	307	411
				22.1	0.0	69.2	8.7		
Tot	14.0	211.	15.1	46	1	119	45	1023	1234
				21.8	0.5	56.4	21.3		

Gradient:

Moderate in upper part. Send for "D" Sheet of "Plan and Profile of Payette River above Horseshoe Bend", US Geological Survey, printed in 1927. Steep in lower and middle portions.

Artificial Obstructions:

Deadwood Dam was built across the Deadwood River about 20 miles above its mouth; concrete 120' high, 360' crest; no fish ladder; water squirting 50' downstream from mouth of pipe before it hits gravel. Two large pipes out of the bottom; flow controlled by gates; built by US Bureau of Reclamation. No power equipment at dam.

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Pollution: None

Fish (salmon): None seen or ever reported

Fish (other than salmon):

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General Remarks:

Topygraphy

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Character of Stream

Data shows the bottom is composed mostly of large rubble of which the lower and central portion is chiefly composed. A deep box canyon extends from Sam's Creek to No Man's Creek, and the Deadwood Dam gates are open mostly in August and September and closed during the fall and winter allowing no water to escape. This extreme fluctuation of water level prohibits the development of any fish population--much algae growth was observed in the upper portions of the river.

Temperature Data:

Sta	Date	Hour	Air Temp	Water Temp	Sky
A	8/28/38	4:00 pm	81 F	64 F	Partly Cloudy
B	8/29/38	12:30 pm	86 F	55 F	Clear
C	8/29/38	2:30 pm	85 F	56 F	Clear
D	8/29/38	6:30 pm	72 F	42 F	Clear, sunny and warm

Pool Grade:

Sta	Dist (mi)	Resting Pools	Resting Pools/Mile	SlT1 %	SlT2 %	S2T1 %	S2T2 %	S6	Total
A-B	9.0	107	12	<u>23</u> 21.5	<u>1</u> 0.9	<u>47</u> 43.9	<u>36</u> 33.6	716	823
B-C		Not surveyed							
C-D	5.0	104	21	<u>23</u> 22.1	<u>72</u> 0.0	<u>9</u> 69.2	<u>8.7</u>	307	411
Tot	14.0	211	15.1	<u>46</u> 21.8	<u>1</u> 0.5	<u>119</u> 56.4	<u>45</u> 21.3	1023	1234

Gradient:

Moderate in upper part. Send for "D" Sheet of "Plan and Profile of Payette River above Horseshoe Bend", US Geological Survey, printed in 1927. Steep in lower and middle portions.

Tributaries:

1. No-name, 1.3 miles from mouth, R.B., >1 cfs.
2. No-name, 1.6 miles from mouth, L.B., >1 cfs.
3. No-name, 1.8 miles from mouth, L.B., 2 cfs, impassable.
4. No-name, 3.2 miles from mouth, R.B., >1 cfs.
5. No-name, 4.2 miles from mouth, L.B., <1 cfs.
6. No-name, 4.5 miles from mouth, L.B., >1 cfs.
7. Stevens Creek, 5.8 miles from mouth, R.B., 3 cfs, impassable
8. No-name, 7.5 miles from mouth, L.B., 2 cfs, impassable.
9. Pine Creek, 8.1 miles from mouth, R.B., 3 cfs, impassable.
10. Sam's Creek, 8.8 miles from mouth, L.B., 3 cfs, impassable.
11. Lorenzo Creek, unsurveyed, R.B.
12. Scott Creek, unsurveyed, L.B.
13. Nine Mile Creek, unsurveyed, L.B.
14. No Man's Creek, 15 miles from mouth, R.B., 5-10 cfs, passable.
15. Six Mile Creek, 15.5 miles from mouth, L.B., 5 cfs, passable.
16. Whitehawk Creek, 17 miles from mouth, R.B., 10-15 cfs, passable.
17. Three Mile Creek, 17.3 miles from mouth, L.B., >1 cfs.
18. Warm Springs Creek, 18 miles from mouth, R.B., 10 cfs, passable.
19. Wilson Creek, 19.5 miles from mouth, R.B., 5 cfs, passable.

Clear Creek

River System: Snake, South Fork Payette River

Stream Surveyed: Clear Creek

Date of Survey: August 28, 1938

Source: Springs and runoff from high mountain range, T10-11N,R8-9E

Direction of Flow:

Total Length: 20 miles, 15.6 miles surveyed

Station Location:

Sta	Location	Distance Above Prev. Station		Distance Above Mouth		Map Location	Width	Depth
		Yds	Miles	Yds	Miles			
AA	Mouth, near Lowman, Idaho	0	0.0	0	0.0	SE4,S27 R7E,T9N	33'	11"
BB	Confl Long Creek		5.0		5.0	NW4,S12 R7E,T9N	24'	10"
cc	Confl Elkhorn Creek		9.0		14.0	Sec 10 R8E,T10N	21'	
DD	1.5 mi above CC		1.5		15.5	SE4,S2 R8E,T10N	15'	

EPA River Reach Codes:

Station	HUC	SEG Rmi
AA		
BB		
cc		
DD		

Character of Bottom Between Stations:

Station	Area (yd ²)	L.R.		M.R.		S.R.		M&S	
			%		%		%		%
AA-BB	91,700	50,570	55.1	16,220	17.6	1,350	1.4	23,560	25.6
BB-CC	146,200	88,960	60.8	30,770	21.0	7,140	4.8	19,330	13.2
CC-DD	16,000	10,790	67.4	2,720	17.0	1,170	7.3	1,320	8.2

Spawning Area Usable and Available:

None, due to Black Canyon dam and Grimes Pass dam

Spawning Area Unavailable and Unusable:

Station	Distance	Area (yd ²)	Area Unavail (yd ²)	% Unavail	When Avail	Usable Unavail (yd ²)	9 Usable Unavail
AA-BB			17,570	19.1		720	0.7
BB-CC			37,910	25.9		3,260	2.2
CD-DD			3,890	24.3		120	0.7

Cause of Unavailability: Black Canyon and Grimes Pass dams

Character of Watershed:

Mountainous X entire region

Hilly

Rolling

Flat

Swampy

Wooded X entire

Open

Cultivated None

Character of Valley

Character of Banks

Density of Marginal Vegetation

Erosion

Diversions:

Diversion 1: 1,000 paces above mouth, log and rock wing dam, 0.5 cfs, diverted, return 100 paces downstream, no screen, not a barrier to upstream migrants

Artificial Obstructions: None

Natural Obstructions: None

Fluctuation in Water Level:

Fluctuation: 2-3 feet

Cause of Variation: spring runoff

Stream Volumes: 40 cfs estimated at mouth

Pollution: None

Fish (salmon): None

Fish (other than salmon):

Species	Date	Very Abundant	Abundant	Fair No.	Scarce
Steelhead					
Rainbow	8/28/38			X (hatchery plants)	
Whitefish					
Dolly Varden					
Cutthroat	8/28/38				X

Note : Fishing intensity is high. Fishermen caught many 5-6" rainbow which had been planted the year before by Idaho Fish Commission.

General Remarks:

Topography

The entire stream flows through a steep mountainous region. Vegetation is dense throughout consisting of pine, spruce, alder, hawthorn, and marginal willows. There are a few summer cabins in the canyon but no cultivation. All tributaries flow through steep ravines and are inaccessible to migratory fish due to the steep gradients.

Character of stream

The entire stream is a series of cascades, fast riffles and small pools. The gradient is steep throughout. The bottom is composed of boulders, large rubble and sand, with but few areas of suitable spawning gravel. The volume was estimated as 40 cfs and probably increases four to six times during the spring runoff. The banks are densely covered and there is little erosion.

Fish population

The fish population consists chiefly of 5-6" rainbow planted by the state as fingerlings the year before. A few cutthroat were being caught by the numerous fishermen. Natives report that fishing was once very good in the stream.

Temperature Data:

Sta	Date	Hour	Air Temp	Water Temp	Skv
AA	8/28/38	4:45 pm	84 F	62 F	Bright
BB	8/25/38	3:00 pm	66 F	49 F	Rain

Pool Grade:

Sta	Dist (mi)	Resting Pools	Resting Pools/Mile	S1T1 %	S1T2 %	S2T1 %	S2T2 %	S6	Total
AA-BB	5.0	16	3.2	0	0	5	11	357	373
				0.0	0.0	1.3	2.9		
BB-CC	9.0	67	7.3	1	0	47	19	413	480
				0.2	0.0	9.7	3.9		
CC-DD	1.6	13	8.1	0	0	13	0	84	97
				0.0	0.0	13.4	0.0		
Total	15.6	96	6.2	1	0	65	30	854	950
				1.0	0.0	67.7	31.3		

Gradient:

Station	Distance (miles)	Total Drop	Avg Drop Per Mile	Source of Data
AA	500'	100'	USGS	
BB	10.6	100-150'	estimated	

Tributaries:

No	Name	Bank	Location	Notes
1	Graney Creek	L.B.	0.5 mi above Sta AA	Not seen
2	Miller Creek	R.B.	0.5 mi above Sta AA	Not seen
3	Pine Creek	L.B.	2.0 mi above Sta AA	1 cfs
4	Ash Creek	L.B.	3.0 mi above Sta AA	>0.5 cfs
5	Park Creek	R.B.	3.0 mi above Sta AA	Not seen
6	Long Creek	R.B.	At Station BB	2 cfs, steep
7	Cup Creek	L.B.	2.5 mi above Sta BB	1 cfs, steep
8	O'Keefe Creek	R.B.	3.0 mi above Sta BB	3 cfs, steep
9	Blacks Creek	L.B.	3.5 mi above Sta BB	Not seen
10	Corral Creek	L.B.	5.0 mi above Sta BB	0.5 cfs, steep
11	Pole Creek	L.B.	5.5 mi above Sta BB	2 cfs, steep
12	Big Spruce Ck	L.B.	7.0 mi above Sta BB	2 cfs, mod grade
13	Fern Creek	R.B.	8.0 mi above Sta BB	Not seen
14	Horse Creek	L.B.	8.0 mi above Sta BB	Not seen
15	Elkhorn Creek	L.B.	At Statio CC	1.5 cfs, steep
16	Monument Creek		0.5 mi above Sta CC	3-4 cfs

Eight Mile Creek

River System: Snake River
 Stream Surveyed: Eight Mile Creek, a tributary of South Fork
 Payette River

Date of Survey: August 27, 1938, by Z.E. Parkhurst

Source:

Rises from group of small lakes near Red Mountain, Sec 29,
 T11N,R9E.

Direction of Flow:

Flows south to left bank of South Fork of Payette River 52
 miles above its mouth or confluence with the North Fork.

Total Length: 14 miles of which 2.3 miles were surveyed.

Station Location: None

EPA River Reach Code:

Character of Bottom Between Stations:

Station	Area (yd^2)	L.R.	%	M.R.	%	S.R.	%	M&S	%
	23,400	7,390	31.0	8,420	35.0	4,800	20.0	2,790	14.0

Spawning Area Usable and Available:

None, due to Black Canyon and Grimes Pass Dams.

Spawning Area Unavailable and Unusable:

(See attached Summary Sheet)

Character of Watershed:

Mountainous X

Hilly X

Rolling

Flat

Swampy

Wooded X
Open

Cultivated None

Character
of Valley

Character
of Banks

Density of
Marginal
Vegetation

Erosion
a) Banks
b) Watershed

Diversions: None

Artificial Obstructions: None

Natural Obstructions: None

Fluctuation in Water Level: None observed

Pollution: None

Fish (salmon): None seen nor ever reported

Fish (other than salmon): Well stocked with 6-8" rainbow trout

General Remarks:

Eightmile Creek tumbles down over a fairly steep gradient in hills that rise into mountain ranges, fairly well timbered, narrow valley, typical of South Fork Payette Country. There is some spawning area in the first mile but water is generally pretty fast. Above the East Fork the gradient increases rapidly and the rubble larger, forming a steep fast trout stream.

Temperature Data:

Sta	Date	Hour	Air Temp	Water Temp	Skv
Mouth	8/27/38	10:00 am	61 F	49 F	Clear

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	S1T1 %	S2T1 %	S2T2 %	S6	Total
A-B (2.3 mi)	44	19.1	<u>1</u>	<u>40</u>	<u>3</u>	<u>153</u>	187
			0.5		1.5	82.0	

Gradient: Moderate first mile, steep above East Fork

Tributaries:

In area surveyed, the only tributary observed was 1.5 miles upstream, the Eask Fork of Eightmile, of about 10 cfs, of cascade nature delivering about half the volume of the creek; passable with difficulty; a series of small pools behind boulders and cascades, steep canyonous banks, no spawning area, dense brush.

Tenmile Creek

River System: Snake River

Stream Surveyed: Tenmile Creek, a tributary of South Fork of Payette

Date of Survey: August 27, 1938, by W.M. Morton

Source: Rises in Sec 36 and Sec 37, T9N,R10E (two small creeks).

Direction of Flow:

Flows west thence north to the left bank of the South Fork of the Payette River about 54 miles above its mouth

Total Length: 13 miles of which 3 miles were surveyed

Station Location:

Sta	Location	Distance Above Prev. Station		Distance Above Mouth		Map Location	Width	Depth
		Yds	Miles	Yds	Miles			
A	Mouth (est 30-50 cfs)	0	0.0	0	0.0		25'	8"
B	3 mi upstream		3.0		3.0			

EPA River Reach Codes:

Station	HUC	SEG Rmi
A		
B		

Character of Bottom Between Stations:

Lot	Area (yd ²)	L.R.	%	M.R.	%	S.R.	%	M&S	%
1 mi	15,000	9,550		2,250		1,660		1,540	
2 mi	13,600	7,390		2,540		2,020		1,650	
3 mi	13,700	5,380		2,600		3,060		2,660	
Total	42,300	22,320	52.0	7,390	20.0	6,740	15.0	5,850	13.0

Spawning Area Usable and Available:

None because of Black Canyon and Grimes Pass Dams

Spawning Area Unavailable and Unusable:

Station	Distance	Area (yd ²)	Area Unavail (yd ²)	% Unavail	When Avail	Usable Unavail (yd ²)	% Usable Unavail
Entire Stream			14,130	35.0		0	0.0

Character of Watershed:

Mountainous	X
Hilly	X
Rolling	
Flat	
Swampy	
Wooded	X
Open	
Cultivated	1% Casner Ranch nearby
Character of Valley	
Character of Banks	
Density of Marginal Vegetation	
Erosion a) Banks	
b) Watershed	

Diversions:

About two miles upstream a 2' high dam of logs and rocks deflects about 5-8 cfs into an irrigation ditch for the nearby Casner Ranch near the mouth of the creek. No screens of course.

Artificial Obstructions:

Only the small dam mentioned in Diversions. This is only a temporary structure and not an impassable barrier as water spills over it.

Natural Obstructions:

The little creek contains numerous log jams; several big ones located above the small dam mentioned above are impassable to all except very small fish.

Fluctuation in Water Level: Very little noted--perhaps 3-5'

Pollution: None

Fish (salmon): None seen nor ever reported.

Fish (other than salmon):

Well stocked with 6" and 8" rainbow trout--larger ones seen in upper portion.

General Remarks:

High and steep mountains on each side, one side covered with dry grass and open with signs of pasturing; the other side densely brushy. Typical of this South Payette area. The lower portion of the stream is about 25' wide and is a continuous series of cascades and small pools over well-rounded large rubble (2-4' in diameter). No holes or riffles over 2' deep. Watershed is fairly open below and after winding through a small flat meadow it flows rapidly through a narrow valley where the shores are very brushy and the creek has cut numerous channels around the many log jams and dams.

Temperature Data:

<u>Sta</u>	<u>Date</u>	<u>Hour</u>	<u>Air Temp</u>	<u>Water Temp</u>	<u>Sky</u>
At mouth	8/27/38	10:45 am	70 F	51 F	Clear

400

Pool Grade:

Station	Resting Pools	Resting Pools/Mile	S2T1 %	S6	Total
A-B	11	3.7	<u>11</u> 100	30	41
3 miles			<u>11</u> 100	40	51

Gradient: Steep throughout

Tributaries:

Any tributaries in area surveyed were either dry or flowing less than 1 cfs.

Warm Springs Creek

River System: Snake River
stream Surveyed: Warm Springs Creek, tributary of South Fork of
the Payette River

Date of Survey: August 27, 1938 by M.G. Hanavan

Source:

Rises from Bull Trout Lake as Spring Creek which joins Gates
Creek to form Warm Springs Creek. Gates rises in Sec. 25,
T12N,R9E.

Direction of Flow:

Flows straight south to confluence with Springs Creek, which
in turn flows due south to the left bank of the South Fork of the
Payette River 59 miles above its mouth.

Total Length: 16 miles of which 2 miles were surveyed.

Station Location: None

Width and Depth: 15-35 feet wide

EPA River Reach Code:

Character of Bottom Between Stations:

(See summary sheets attached).

Spawning Area Usable and Available:

None due to Black Canyon and Grimes Pass Dams,

Spawning Area Unavailable and Unusable:

(See summary sheets attached).

Character of Watershed:

Mountainous	X
Hilly	X
Rolling	

Flat

Swampy

Wooded X

Open

Cultivated None

Character
of Valley

Character
of Banks

Density of
Marginal
Vegetation

Erosion
a) Banks

b) Watershed

Diversions: None

Artificial Obstructions: None

Natural Obstructions: None

Fluctuation in Water Level: Flow at mouth 70-80 cfs.

Pollution: None

Fish (salmon): None seen nor ever reported.

Fish (other than salmon): Well stocked with 6"-8" rainbow trout.

General Remarks:

Valley narrow, steep rocky foothills to mountains, well-timbered with mostly second growth stuff which soon develops into a steep-sided rocky box canyon.

Mostly cascades and small pools and riffles over large boulders and bedrock that develop into a series of 5' falls in upper portions. A few boiling springs empty into the creek at Bonneville Warm Springs about one mile upstream.

Temperature Data:

<u>Sta</u>	<u>Date</u>	<u>Hour</u>	<u>Air</u> <u>Temp</u>	<u>Water</u> <u>Temp</u>	<u>Skv</u>
Mouth	8/27/38	11:00 am	78 F	55 F	Clear
End of Survey	8/27/38	3:30 pm	86 F	60 F	Clear

Pool Grade: (See summary sheets attached).

Gradient: Steep

Tributaries:

Canyon Creek

River System: **Snake River**
 Stream Surveyed: **Canyon Creek**

Date of Survey: **August 26, 1938 by J.L. Wilding**

Source:

Rises between Bull Trout Lake and Copper Mountain in Sec 10,T11N,R10E

Direction of Flow:

Flows south to the left bank of the South Fork of the Payette River 64 miles above its mouth

Total Length: **11 miles of which 4.2 miles were surveyed**

Average Width: **18'**

Station Location: **None**

EPA River Reach Codes:

Character of Bottom:

<u>Length</u>	<u>Area</u> (yd ²)	<u>L.R.</u>	<u>%</u>	<u>M.R.</u>	<u>%</u>	<u>S.R.</u>	<u>%</u>	<u>M&S</u>	<u>%</u>
4.2 mi	44,500	32,760	73.0	9,870	22.0	1,360	4.0	510	1.0

Spawning Area Usable and Available:

None because of Black Canyon and Grimes Pass Dams

Spawning Area Unavailable and Unusable:

See attached Summary Sheets

Character of Watershed:

Mountainous X

Hilly X

Rolling

Flat

Swampy

Wooded X

Open

Cultivated None

Character
of Valley

Character
of Banks

Density of
Marginal
Vegetation

Erosion
a) Banks

b) Watershed

Diversions: None

Artificial Obstructions: None

Natural Obstructions:

A log jam at 4,800 paces above mouth splits river into three small channels; water drops 4' through sticks and logs. Appears impassable.

Fluctuation in Water Level: 3-4 feet.

Pollution: None

Fish (salmon): None seen nor ever reported

Fish (other than salmon): A few rainbow trout

General Remarks:

Topography mountainous, moderately covered with conifers and

aspen. The valley is never over 0.25 mile wide. In the first two miles, the creek has a very steep gradient, and consequently is a series of cascades and small falls through a deep, rocky gorge. For a short **ways** above this area, there is a small amount of small rubble and then the creek goes into an even steeper canyon than before.

Temperature Data: None

Pool Grade: S6 - 54 pools. Total 54.

Gradient: Generally steep

Tributaries:

Three unnamed tributaries flow into area surveyed; all less than 3 cfs.