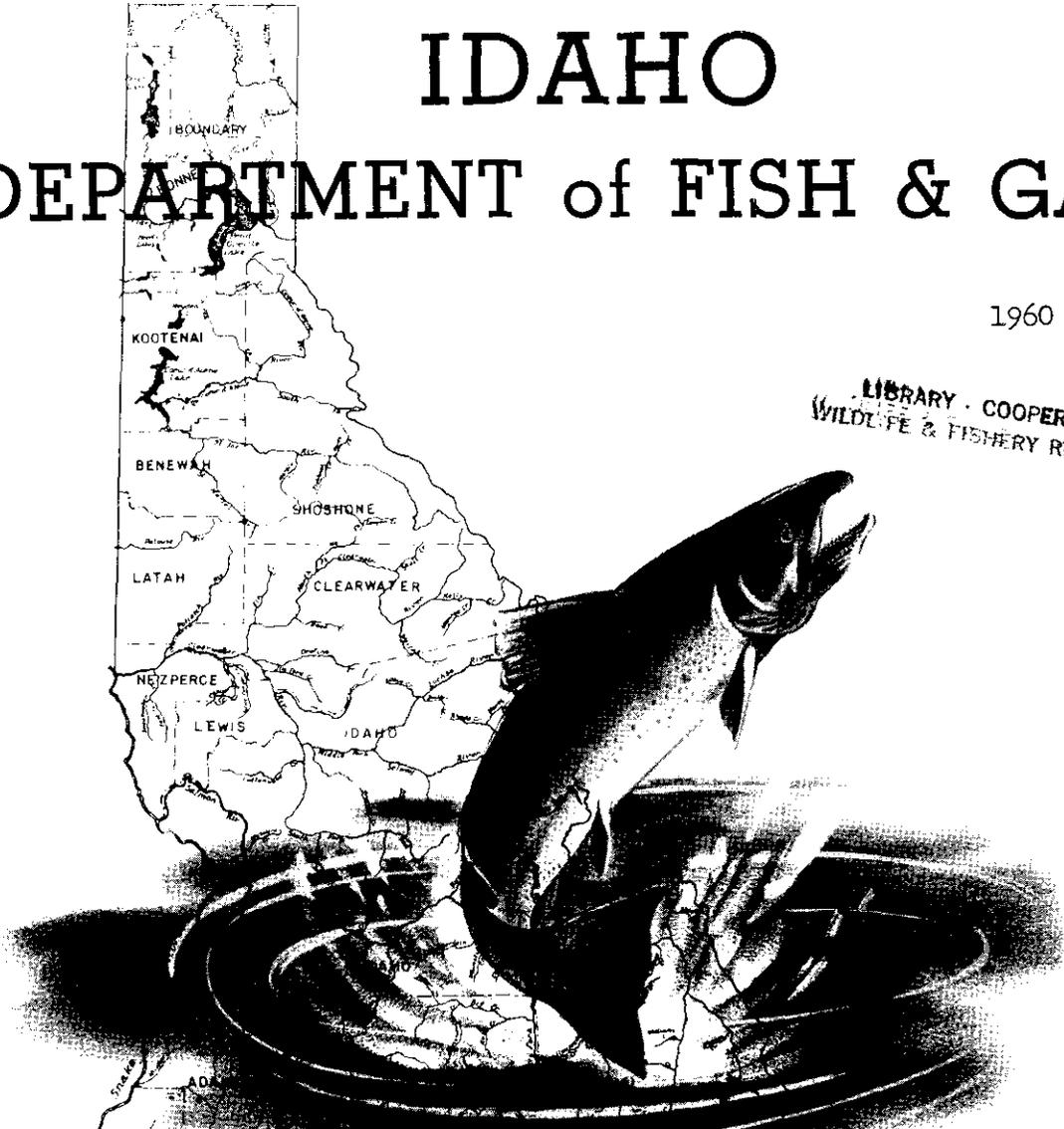


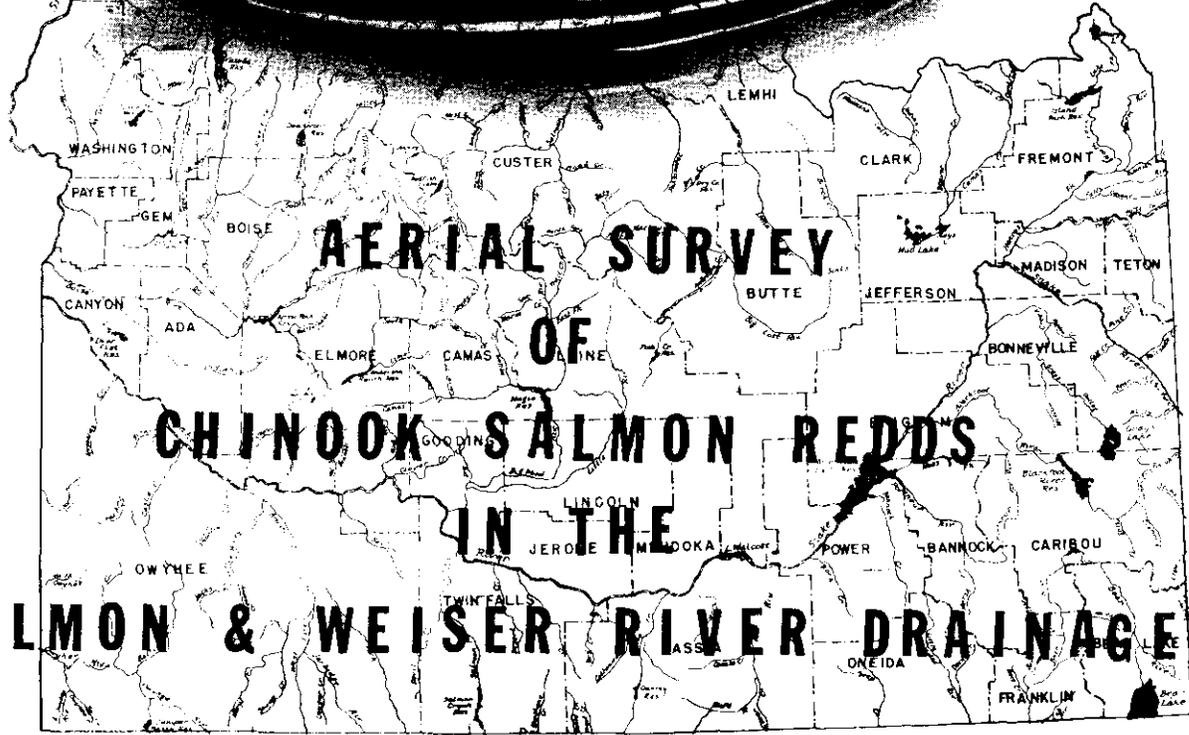
IDAHO DEPARTMENT of FISH & GAME

1960

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**AERIAL SURVEY
OF
CHINOOK SALMON REDDS
IN THE
SALMON & WEISER RIVER DRAINAGES**



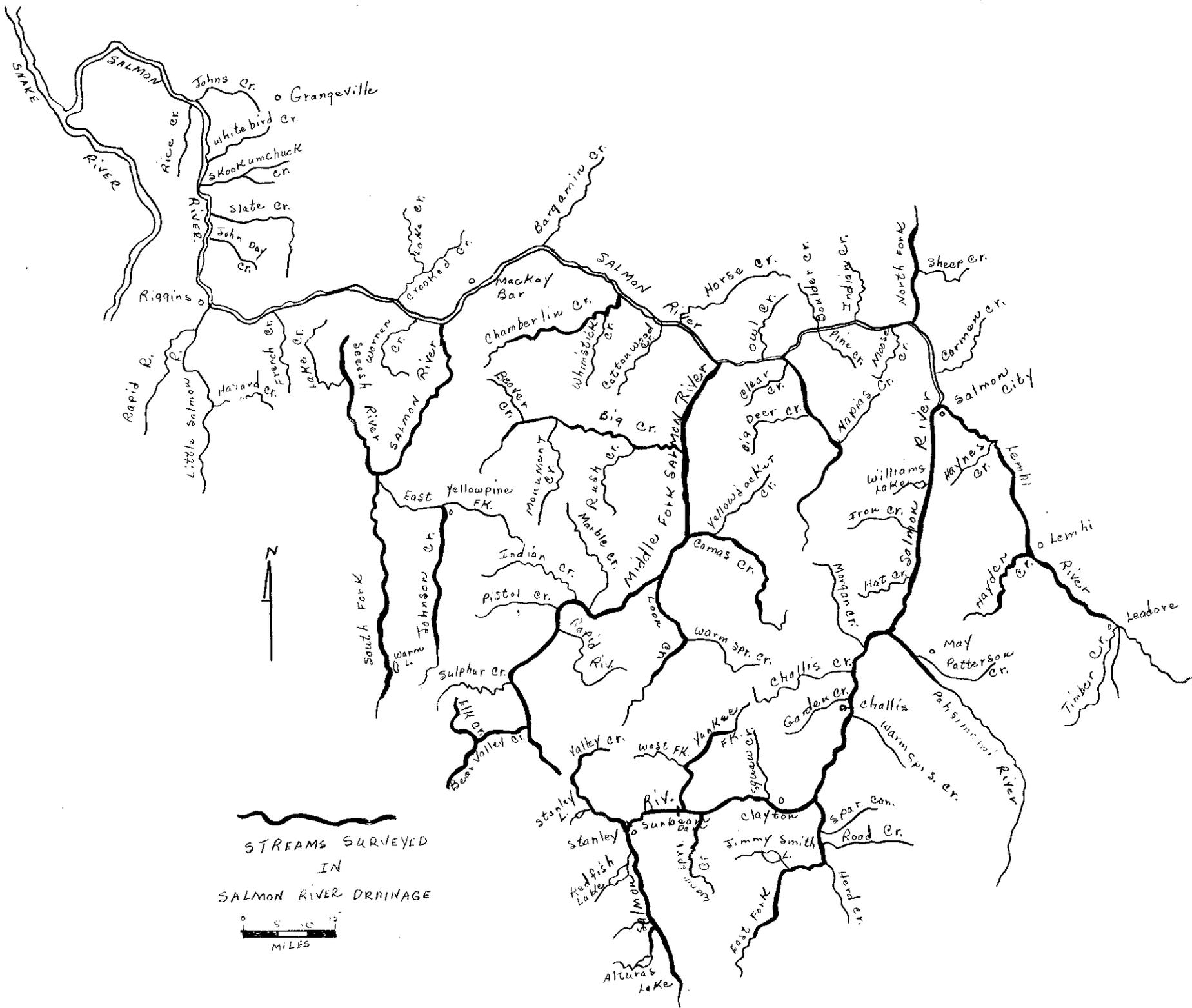
State of Idaho DEPARTMENT OF FISH AND GAME
Ross Leonard, Director

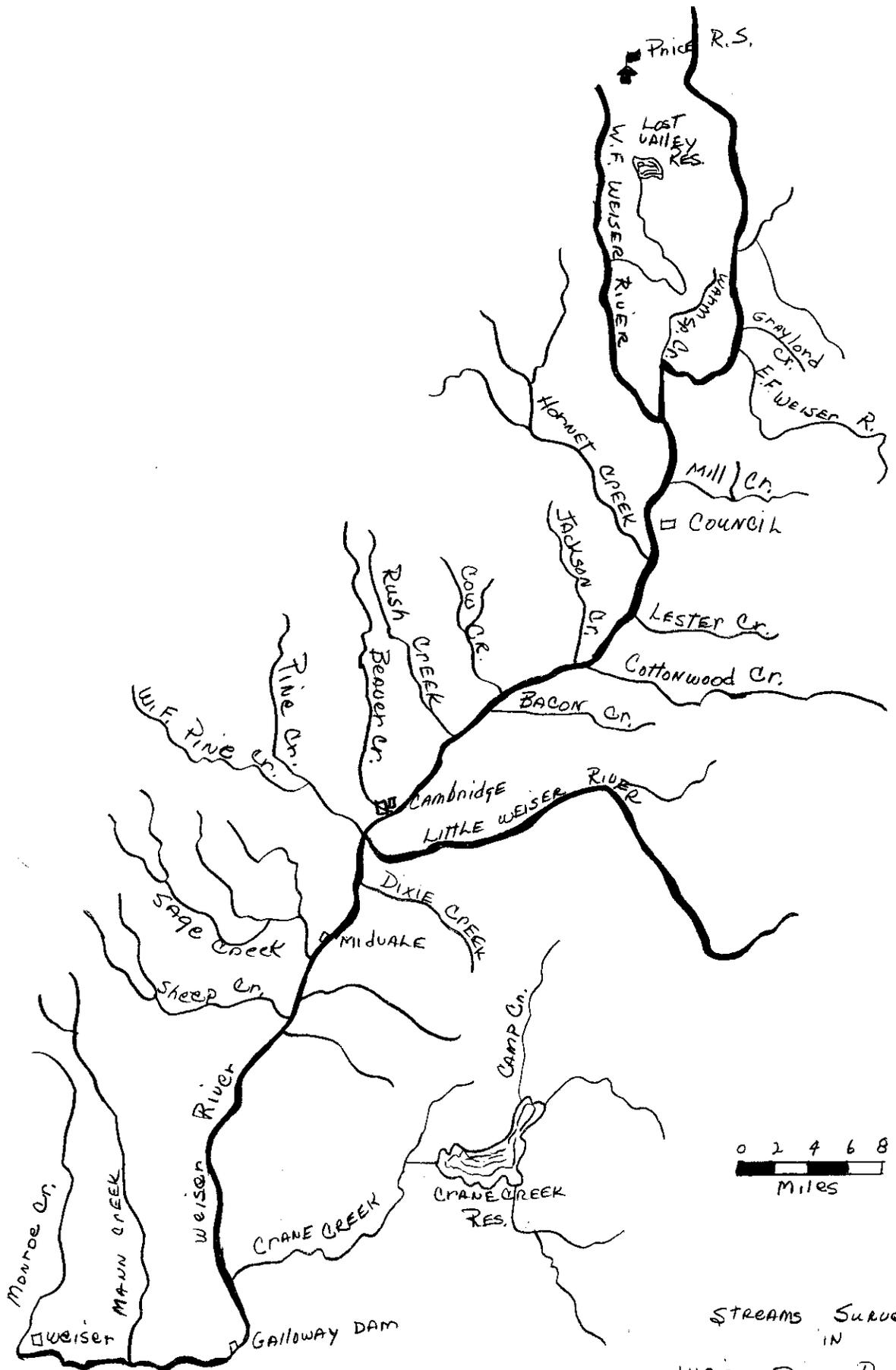
AERIAL SURVEY OF CHINOOK SALMON REDDS IN THE
SALMON AND WEISER RIVER DRAINAGES - 1960

By
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Fisheries Biologists

March, 1961

Funds Supplied in Part by the
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Fish and Wildlife Service Bureau of Commercial
Fisheries Contract Number 14-19-001-431





STREAMS Surveyed
IN
Weiser River Drainage

Aerial Survey of Chinook Salmon Redds
in the Salmon and Weiser River Drainages - 1960
Introduction

The survey of spring and summer chinook salmon redds in the Salmon and Weiser River drainages was continued in 1960, financed in part by funds made available through the United States Department of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries.

The number of redds counted in the Salmon River drainage was up approximately 69 per cent over comparable counts in 1959 (Table 1). The count of spring and summer chinook salmon over McNary Dam in 1960 was up only about 12 per cent over 1959. The increase in redds counted is probably due partly to the higher than normal percentage of females in the 1960 run.

Certain streams or stream sections such as the North Fork, upper Yankee Fork, Hayden Creek, and Herd Creek present problems which make it difficult to count from the air due to trees or brush obscuring the stream, or the presence of shadows during safe flying hours.

Streams such as the Marsh Creek drainage and upper Valley Creek are easily flown and visibility is good but many of the redds are not readily recognized from the air due to the lack of contrast in color between the redd and surrounding gravel. On the other hand, redds are easily recognized in streams such as the Lemhi River, but ground counts are necessary during years of heavy spawning because the redds cannot be separated and counted fast enough while passing over the streams in an airplane. During years of light to medium spawning aerial counts provide satisfactory results.

Large streams such as the Middle Fork and Salmon River can be counted most efficiently from an airplane.

During 1960, both aerial and ground counts were made on those streams where the redds were difficult to distinguish. Because of the difference between the number of redds counted from the air and from the ground it is planned to make both aerial and ground counts on these streams for the next 2-3 years so that comparative data will be available. The total number of redds listed in Table 2 for the Marsh

Creek drainage streams, Yankee Fork, and Valley Creek was obtained by the use of both ground and aerial counts. Since the counts in past years were made only from the air the total redds figure in Table 2 for the above listed streams may not be completely comparable with past years. The value listed under aerial redd count would be comparable for those streams.

Table 1. Comparable counts of redds in the Salmon River drainage, 1959 and 1960.

Stream	1959 count	1960 count	Per cent change over 1959	
			Increase	Decrease
Salmon River drainage above				
Middle Fork				
Lemhi River	524	1434	174	
Pahsimeroi River	117	216	85	
East Fork	315	525	67	
Yankee Fork	53	58	9	
Valley Creek	94	152	62	
Alturas Lake Creek	18	31	72	
Salmon River				
Above Stanley	502	720	43	
Stanley to Salmon	336	751	124	
Sub totals	<u>1959</u>	<u>3887</u>	<u>98</u>	
Salmon River drainage below				
Middle Fork				
Chamberlain Creek	189	369	95	
Middle Fork drainage				
Big Creek	313	511	63	
Camas Creek	70	112	60	
Loon Creek	123	334	174	
Sulphur Creek	100	79		21
Marsh Creek drainage	95	202	113	
Bear Valley Creek	381	386	1	
Elk Creek	516	346		33
Middle Fork	46	46	1/	
Sub totals	<u>1644</u>	<u>2016</u>	<u>23</u>	
South Fork Drainage				
Lake Creek and Secesh River	285	524	84	
Johnson Creek	294	517	76	
South Fork				
Stolle Meadows	297	882	197	
Below Stolle Meadows	1008	1424	41	
Sub totals	<u>1884</u>	<u>3347</u>	<u>78</u>	
Salmon River drainage totals	5676	9619	69	

1/ See survey narrative

Salmon River Drainage

Alturas Lake Creek

An aerial count was made on August 29 and 31 redds were observed. The count of redds in 1960 was 72 per cent higher than a comparable count in 1959.

Bear Valley Creek

Bear Valley Creek, from the dredges in Big Meadows to the Fir Creek pack bridge, was flown on September 2. Spawning was completed. The count from Big Meadows to Elk Creek was 18⁴ redds. The count from the confluence of Bear Valley and Elk Creeks to the Fir Creek pack bridge was 202 redds. Total number of redds counted in Bear Valley Creek was 386.

Beaver Creek

The aerial count was made on August 20, and 43 redds were observed. Ground counts were made on August 12 when 45 redds were counted with live fish on 11 of the redds and again on September 2 when 54 redds were counted with no live fish observed. The most efficient count of redds on this stream can be obtained with a ground count made about August 25. The count of redds in 1960 increased 19 per cent over a comparable count in 1959.

Big Creek

The area from Jacobs Ladder Creek to Logan Creek was counted from the ground on September 8. Spawning was completed and 155 redds were counted. The remainder of the stream from Logan Creek to the mouth was aerially surveyed on September 8 with 356 redds being counted. Spawning was still in progress but all observed live fish were on redds. Total number of redds counted in Big Creek was 511.

Camas Creek

Bad flying conditions interrupted two attempts to make an aerial count of this stream. Ground counts were made on August 20 when 83 redds were observed with live fish on 44 of the redds and again on September 8 when 112 redds were counted with live fish on 12 redds. Although the count in 1960 was made from the ground and the one in ¹⁹⁵⁹ was made from the air, it is believed that the counts obtained with the two methods will be comparable on this stream. The count of redds in 1960 was 60 per

cent higher than in 1959. A ground count of the Hidden Valley area on upper Camas Creek should be wade about the last week in August.

Capehorn Creek

The aerial count was made August 20 and 25 redds were observed. Ground counts were made August 12 when 32 redds were observed and live fish found on 11 redds and again on August 25 when 38 redds and no live fish were observed. The count in 1960 was 39 per cent higher than a comparable count in 1959.

Chamberlain Creek

Chamberlain Creek from Moose Creek to Lodgepole Creek was surveyed on September 8. Spawning was completed and 91 redds were counted. Based on past ground checks, the redd count was increased by 100 per cent, making the estimated number of redds for Chamberlain Creek 182.

Chamberlain Creek, West Fork

The West Fork of Chamberlain Creek was surveyed on September 8. Spawning was completed, A total of 187 redds was counted.

Elk Creek

The stream section from the Cascade-Stanley road to the confluence of Elk and Bear Valley Creeks was flown on September 2. Spawning was completed and 121 redds were counted. The stream area from the confluence of the North and West Forks of Elk Creek to the Cascade-Stanley road was counted from the ground on September 6 with 225 redds being counted. Spawning was completed. The total redd count for Elk Creek was 316.

Herd Creek

A large portion of Herd Creek, a tributary to the East Fork, is obscured by trees and bushes so that a usable aerial count cannot be made. A ground count was made September 4 and 89 redds were counted with live fish on one redd. The redds in this stream should be counted from the ground during the last week in August. Johnson Creek

The survey of Johnson Creek was made on September 11₄. Spawning was completed. Redds observed totaled 517. A total of 12 redds was observed above the Johnson

Creek Cascades, The count below Cox's Ranch must be considered minimum because of extensive super-imposition of redds.

Knapp Creek

The aerial survey was made August 20 and 12 redds were counted. Ground surveys were made on August 12 when 19 redds were observed with live fish on 9 redds and again on August 25 when 27 redds were observed with live fish on 1 redd. The count in 1960 was up 20 per cent over a comparable count in 1959.

Lemhi River

The aerial survey of the entire river was made on September 9 and 1077 redds were observed. A complete ground count of the river between Lemhi and Leadore was conducted September 9-10 and 1262 redds were observed with live fish on 311 redds. The total count for the entire river, using a partial ground count substitution because of the concentrated spawning, was 171 per cent higher than in 1959. Loon Creek

The aerial count of Loon Creek was made September 6 and 33L redds were observed. Most of the salmon spawning in Loon Creek occurs in the meadows adjacent to the Falconberry Ranch. The count of redds in 1960 was 172 per cent above the count in 1959. A ground count in the meadow area would probably be needed in years with an escapement larger than in 1960, as it was difficult to tally the redds fast enough due to their concentration.

Marsh Creek

The aerial survey was made August 20 on Marsh Creek above the Bear Valley - Stanley road bridge and 105 redds were counted. The aerial count from the bridge downstream to its mouth was made August 29 when 17 redds were counted. Ground counts of the area between the bridge and Knapp Creek were made on August 12 when 120 redds were observed and on August 25 when 148 redds were observed. Marsh Creek from Knapp Creek upstream was ground counted September 1 and 32 redds were observed. The count in 1960 was more than 29h per cent higher than a comparable count in 1959.

Pahsimeroi River

The aerial count was made September 19 when 216 redds were observed with a few live fish still present on the spawning grounds. The count in 1960 was 85 per cent higher than in 1959.

Panther Creek

Panther Creek was not flown in 1960 due to the high turbidity of the water caused by placer mining. All mining activity in the drainage has since ceased with no plans in sight to resume operations.

Salmon River

Aerial counts from Stanley_ upstream were made August 29 when 671 redds were counted and September 14 when 720 were counted. The number of redds between Stanley and the Sunny Gulch Sheep Bridge more than doubled between the first and last count and there was a slight increase between counts in the Decker Flat area. However, it appeared that most of the increase was in the lower end of Decker Flat while in the upper end the redds which were readily distinguished on the first count were difficult to count due to lack of contrast. This observation was substantiated by ground counts made September 6 when 333 redds with live fish on 174 redds were observed in the lower half of the Decker Flat area and 149 redds with live fish on only 15 redds were observed in the upper half. The count of redds in 1960 from Yankee Fork up-stream was 61 per cent higher than in 1959. The aerial count of the area above the sheep bridge should be made about September 7 while September 14 seems to be about right for the river between the sheep bridge and Yankee Fork,

The river between Yankee Fork and Warm Springs Creek, including the section known as Robinson Bar, contained 190 redds or 62 per cent more than in 1959. The river from Warm Springs Creek downstream to Salmon contained 335 redds or 157 per cent more redds than in 1959 but the count still did not approach the number counted in 1957. In contrast, the count of redds in many of the stream; nearly equaled the count of 1957 and in the Lemhi River exceeded it.

Salmon River, East Fork

An aerial survey of the East Fork was attempted in late August but rough flying

conditions made it necessary to terminate the count after only a portion of the stream had been counted. The next opportunity to count the East Fork from the air was on September 14 when 128 redds were counted from Herd Creek downstream to the mouth. Ground counts were made on the stream from Herd Creek upstream to Germania Creek on August 16 when 157 redds were observed with live fish on 87 redds and on September 4 and 7 when 397 redds were counted with live fish on 79 redds. Although it was not possible to count all of the East Fork from the air, it is believed that the ground counts would be comparable with aerial counts for the area involved. The count on the East Fork (excluding Herd Creek) in 1960 was 67 per cent above that in 1959.

Salmon River, Middle Fork

The aerial survey was made September 6 after an unsuccessful attempt August 29 and 46 redds were counted from the confluence of Bear Valley and Marsh Creeks downstream to Camas Creek where flying conditions became unsuitable. That portion of the Middle Fork from Camas Creek to Big Creek was not counted, and therefore it is not possible to indicate the amount of increase over 1959. Also counts in past years have included the lower end of Marsh Creek as part of the Middle Fork. The count in 1960 included only the Middle Fork. Such a breakdown will provide counts of the redds along the entire length of Marsh Creek and also provide comparable data with past year's surveys. A breakdown of the redds in the Middle Fork above Sulphur Creek and below was not made in 1960 due to an oversight.

Salmon River, North Fork

Since an adequate count of redds cannot be made from the air due to trees and brush, the North Fork was counted from the ground. On September 2, 91 redds with live fish on 29 redds were counted from Gibbonsville to the mouth. Salmon River, South Fork

The Stolle Meadows portion of the South Fork Salmon River was flown on September 9. Congestion of redds above Camp Creek was so great that an adequate aerial count could not be made and this stream section was later counted from the

ground. A total of 113 redds was aerially counted from Camp Creek downstream to Knox Bridge. A ground count of the stream above Camp Creek was made on September 10 and 769 redds were observed. Spawning was completed on both the aerial and ground survey. The total count for the Stolle Meadows area was 882 redds.

The South Fork from Knox Bridge to the South Fork Guard Station was aerially surveyed on September 21. A total of 1,424 redds was observed in this stream section. Spawning was completed.

The total count for the South Fork Salmon River was 2,306 redds.

Secesh River and Lake Creek

Lake Creek was flown on September 9. Spawning was completed and 185 redds were counted.

The Secesh River from Lake Creek to the mouth was surveyed on September 11. Spawning was completed. A total of 339 redds was observed.

A total of 524 redds was counted in the Secesh River and Lake Creek combined.

Sulphur Creek

The survey of Sulphur Creek was made on August 26. Spawning was completed and 79 redds were counted.

Valley Creek

The aerial survey was made September 5 above Stanley Lake Creek and September 14 below. The redds in the upper end of Valley Creek were difficult to distinguish and only 12 were counted. The redds in Valley Creek below Stanley Lake Creek were a little more easily recognized and 137 were counted. Ground counts from Stanley Lake Creek upstream to Lower Valley Creek Lake were made August 11 when 33 redds with live fish on 24 redds were observed; on August 24 when 77 redds with live fish on 43 redds were counted; and on September 5 when 83 redds with live fish on 6 redds were counted. The count in 1960 was 62 per cent above a comparable count in 1959. Yankee Fork

The aerial count was made August 29 when 43 redds were observed from Jordan Creek to the mouth. No redds could be distinguished in the stream above Jordan Creek from the air.

A ground count of Yankee Fork above Jordan Creek and the West Fork of Yankee Fork was made September 3 with 23 and 15 redds counted respectively. Yankee Fork above Jordan Creek should be counted from the ground about August 25. The count in 1960 was up 9 per cent over a comparable count in 1959.

Weiser River Drainage

The main Weiser River from the mouth of the Middle Fork Weiser River to Galloway Dam was aerially surveyed in 1960. Because of turbid water conditions and generally poor redd visibility, it has not been possible to consistently secure annual aerial redd counts on tributaries of the Weiser River and the Weiser above the Middle Fork. These areas were surveyed from the ground in 1960, Main Weiser River

Galloway Dam to Cambridge

This stream section was flown on September 9. No redds were observed.

Cambridge to Price Valley Ranger Station

Due to high and turbid water it was not possible to count this stream section in 1960.

Little Weiser River

Available spawning area in the Little Weiser River was ground surveyed on September 28. Spawning was completed and a total of 71 redds was counted. Middle Fork Weiser River

Available spawning area in the Middle Fork Weiser was ground surveyed on September 29. Spawning was completed. A total of two redds was observed. West Fork Weiser River

High and turbid water caused by unusually prolonged water release from Lost Valley Reservoir prevented redd counts in the West Fork Weiser River and the Main Weiser River from the West Fork to the Middle Fork.

Table 2. Number of chinook salmon redds counted in Salmon River drainage, 1960.

Stream	Date surveyed	Miles surveyed	Aerial redd count	Percent spawning completed	Ground count adjustment ^{1/}	Total redds
Alturas Lake Creek	8/29 & 9/2	6	31	100	2	33
Bear Valley Creek	9/2	27	386	100		386
Beaver Creek	8/20 & 9/2	10	43	100	11	54
Big Creek	9/8	36	511 ^{2/}	100		511
Camas Creek	9/8	10	3/	100	112	112
Capehorn Creek	8/20 & 8/25	6	25	100	13	38
Chamberlain Creek	9/8	23	91	100	91	182
Chamberlain Creek, West Fork	9/8	4	187	100		187
Elk Creek	9/2	24	346 ^{2/}	100		346
Herd Creek	9/4	4	3/	100	89	89
Johnson Creek	9/14	34	517	100		517
Knapp Creek	8/20 & 8/25	6	12	100	15	27
Lemhi River	9/9 & 9/10	61	1077	100	357	1434
Loon Creek	9/6	30	334	100		334
Marsh Creek	8/20 & 8/29	15	122	100	75	197
Pahsimeroi River	9/19	18	216	100		216
Salmon River						
Above Stanely	8/29 & 9/14	30	720	100		720
Stanley to Salmon	9/14 & 9/19	119	751	100		751
Salmon River, East Fork	9/4 & 9/14	33	525 ^{2/}	100		525
Salmon River, Middle Fork	9/6	75	46	100		46
Salmon River, North Fork	9/2	20	3/	100	91	91
Salmon River, South Fork						
Stolle Meadows area	9/9 & 9/10	7	882 ^{2/}	100		882
Knox Bridge to S. F. G. S.	9/21	28	1424	100		1424
Secesh River and Lake Creek	9/9 & 9/14	33	524	100		524
Sulphur Creek	8/26	12	79	100		79
Valley Creek	9/5 & 9/14	17	152	100	72	224
Yankee Fork	8/29 & 9/3	17	58	100	43	101

^{1/} Aerial counts adjusted due to unfavorable observation conditions.

^{2/} Partial ground count substitution.

^{3/} See survey narrative.

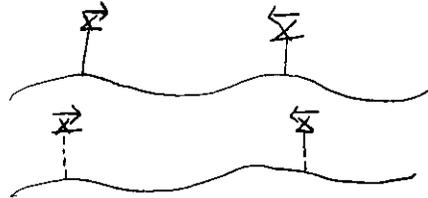
Table 3. Number of chinook salmon redds counted by aerial and ground survey, Weiser River, 1960

Stream	Date surveyed	Miles surveyed	Aerial redd count	Ground count	Percent spawning completed	Total redds
Weiser River:						
Galloway Dam to Cambridge	9/9	28	0	--	---	
Cambridge to Price Valley	---	--	-	--	---	
Weiser River, Little	9/28	16	-	71	100	71
Weiser River, Middle Fork	9/29	8	-	2	100	2
Weiser River, West Fork	----	--	-	--	---	

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LEGEND

Ground Survey Sections



Aerial Survey Sections

Ground Redd Counts



Aerial Redd Counts



Aerial-Ground Check Areas



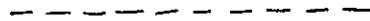
Aerial-Ground Check Area Count



Migratory Block



Road



Trail



Forest Service Stations



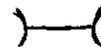
Landing Strip



Fence



Pack Bridge



Highway Bridge



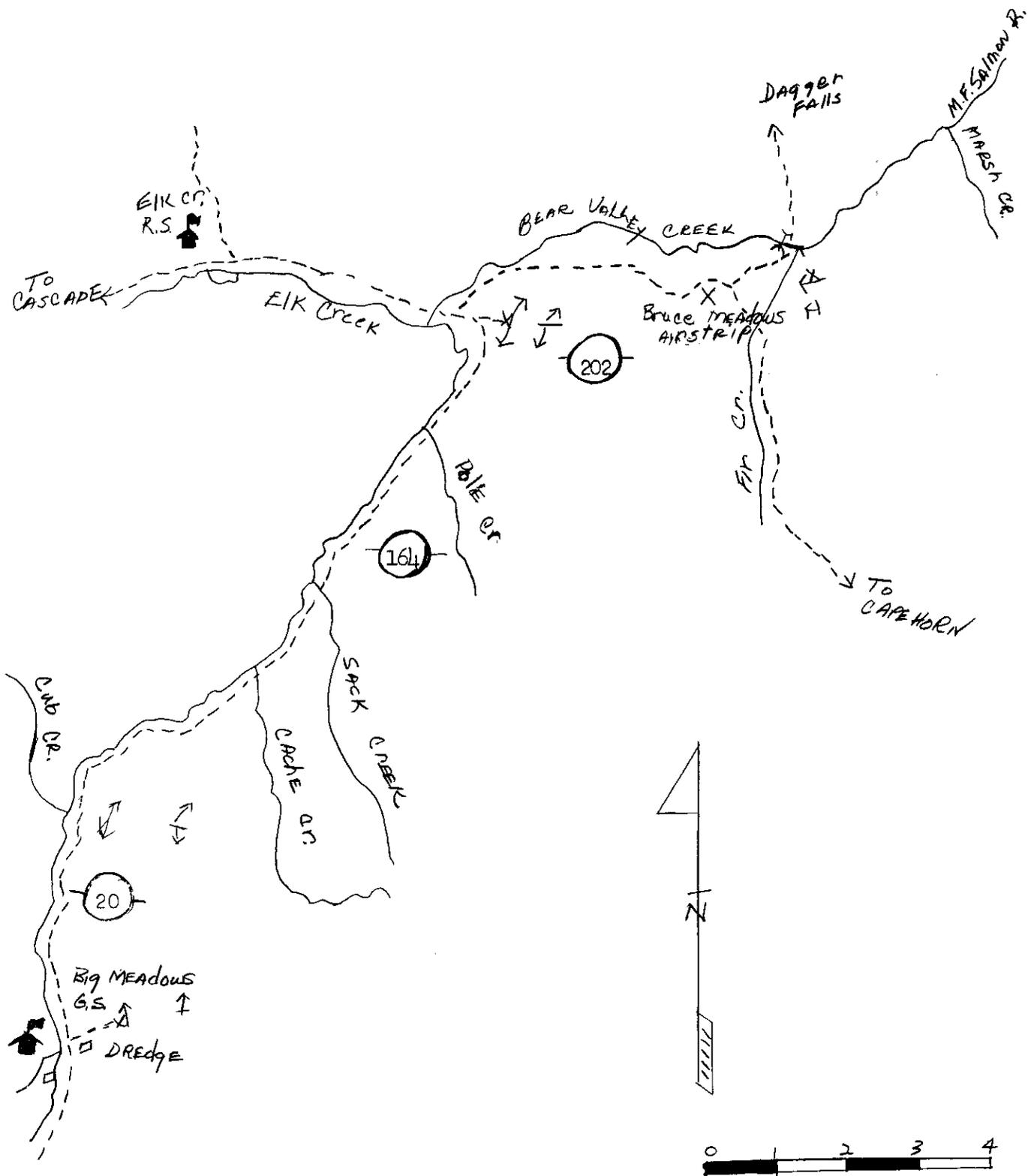
DRAINAGE Middle Fork Salmon River

SURVEY DATE 9/2/60

STREAM Bear Valley Creek

MAP SCALE 1/2" = 1 mile

OBSERVATION CONDITIONS Excellent



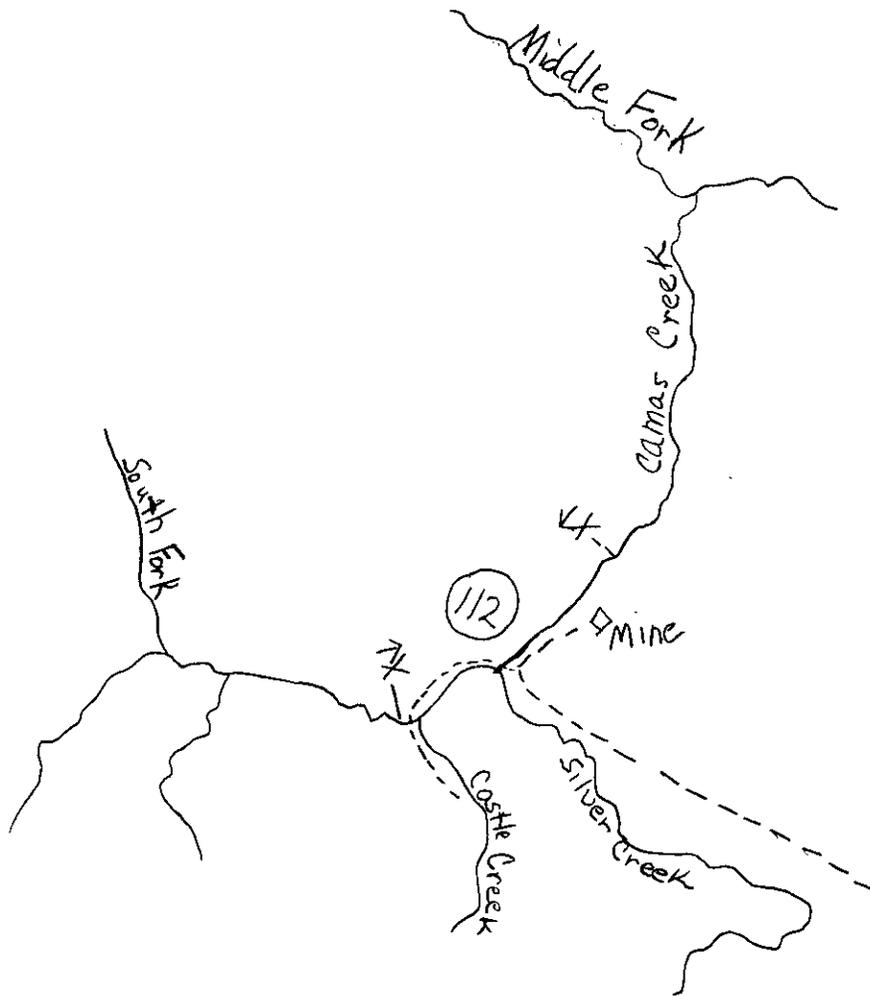
DRAINAGE Salmon River

SURVEY DATE 9/8/60

STREAM Camas Creek

MAP SCALE $\frac{1}{4}'' = 1 \text{ mile}$

OBSERVATION CONDITIONS Excellent



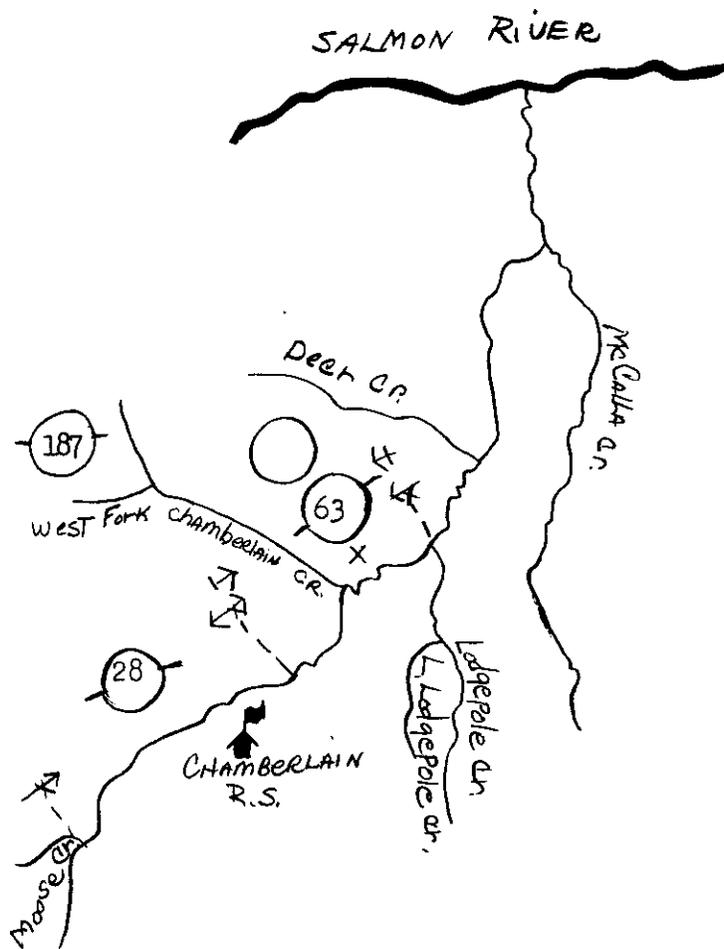
DRAINAGE Salmon River

SURVEY _____

STREAM Chamberlain Creek

MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS _____



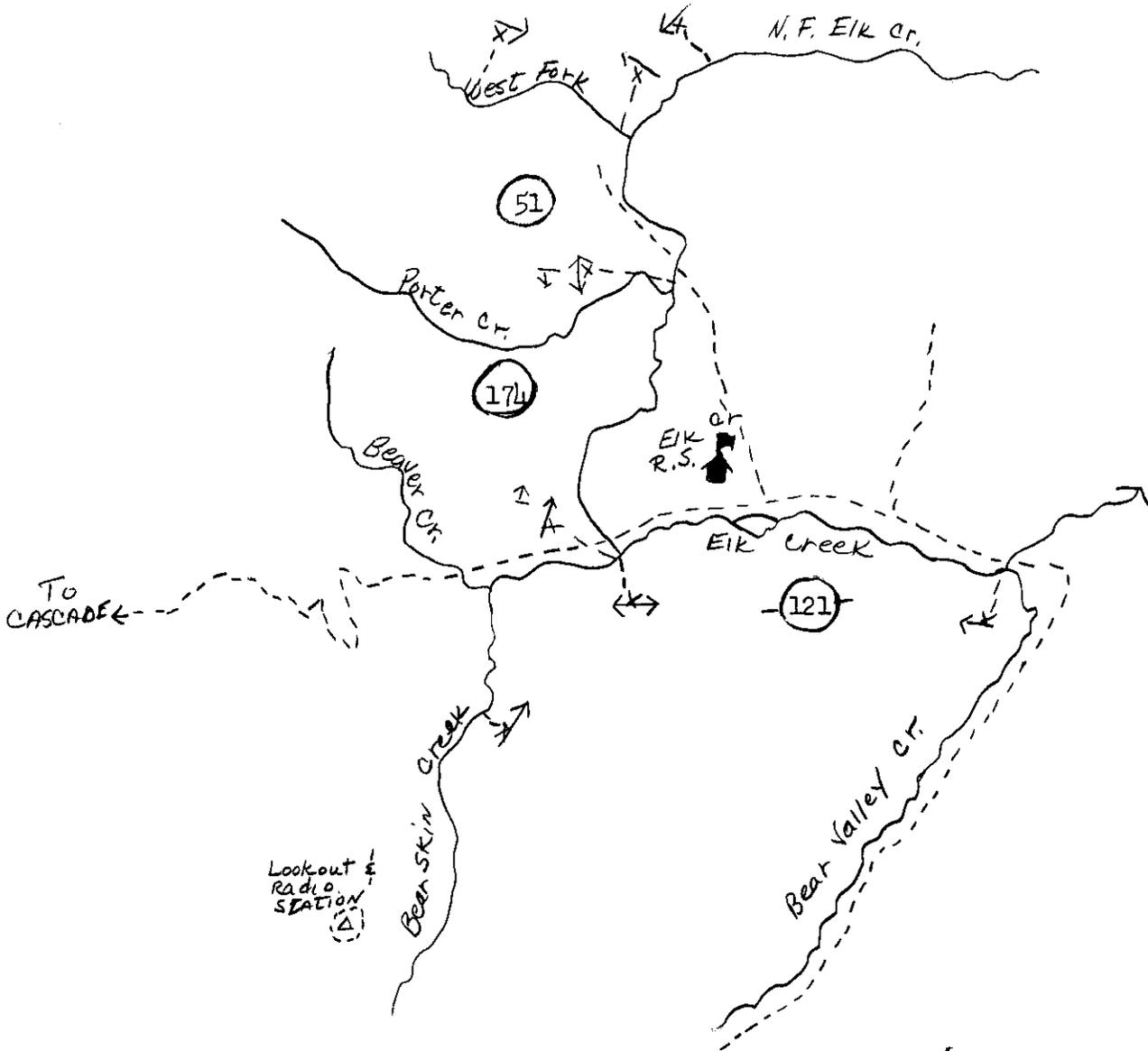
DRAINAGE Middle Fork Salmon River

SURVEY DATE 9/2 & 9/6/60

STREAM Elk Creek

MAP SCALE $\frac{1}{2}'' = 1$ mile

OBSERVATION CONDITIONS Excellent



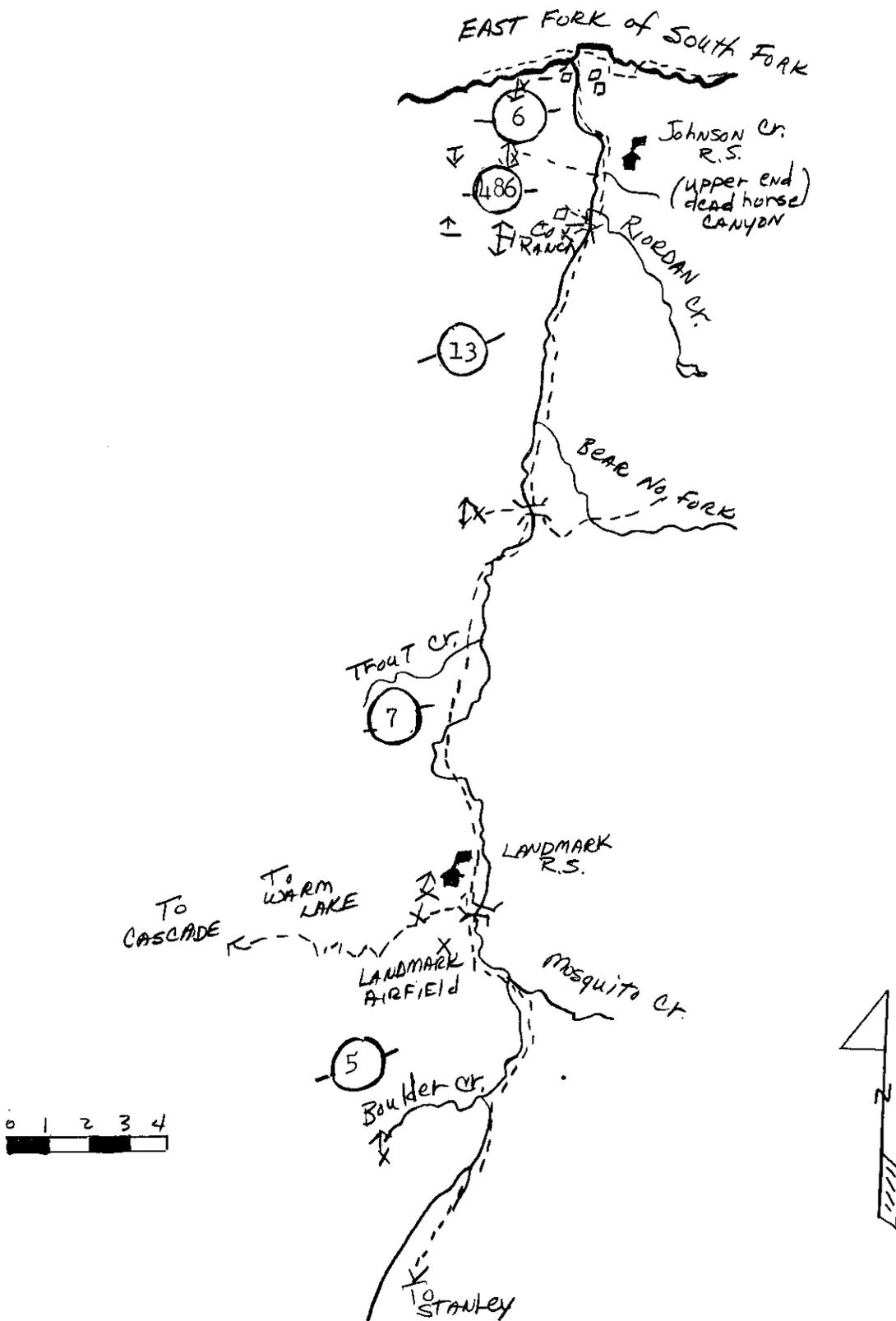
DRAINAGE East Fork of South Fork

SURVEY DATE 9/14/60

STREAM Johnson Creek

MAP SCALE $\frac{1}{4}'' = 1 \text{ mile}$

OBSERVATION CONDITIONS Good



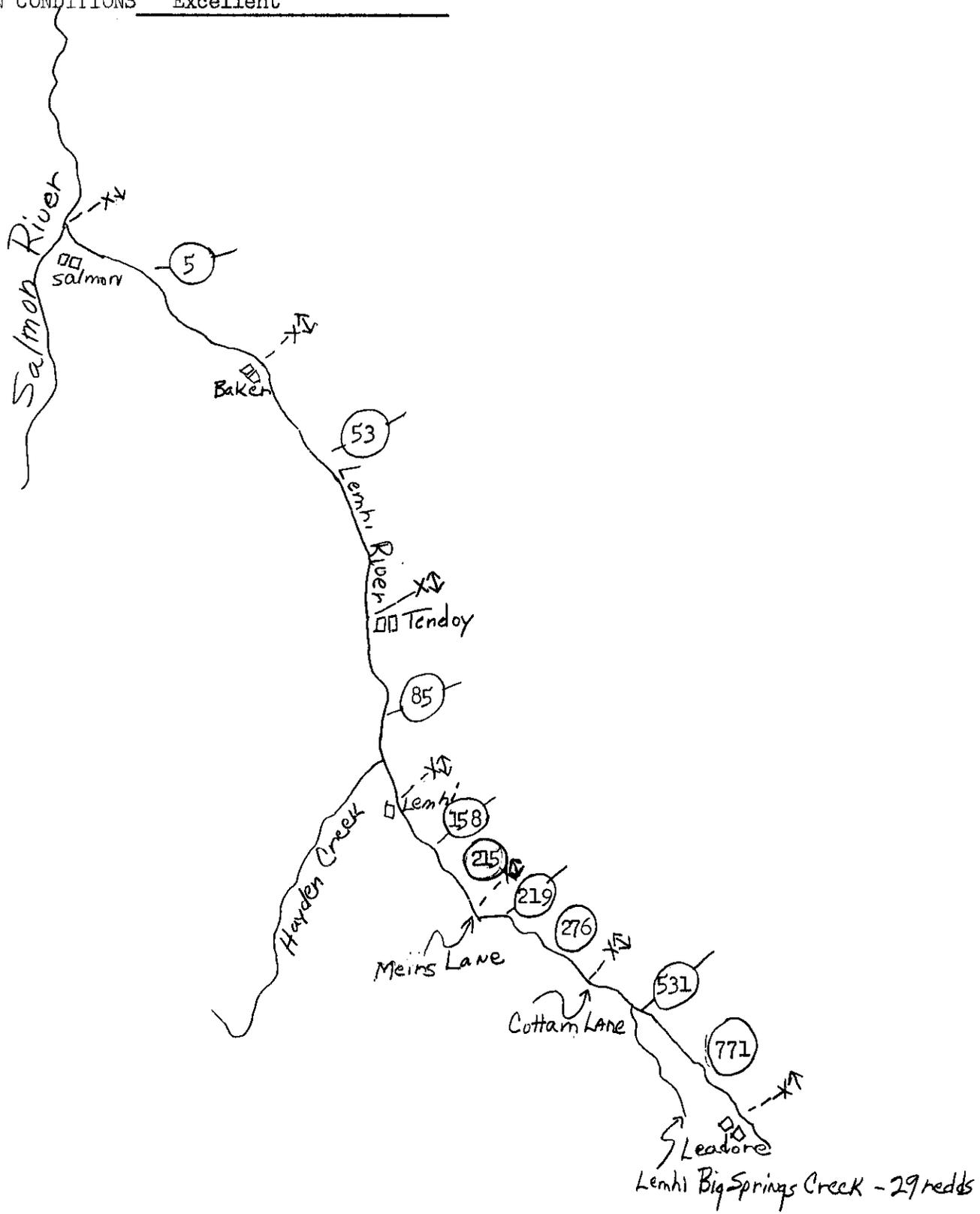
DRAINAGE Salmon River

SURVEY DATE 9/9/60

STREAM Lemhi River

MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS Excellent



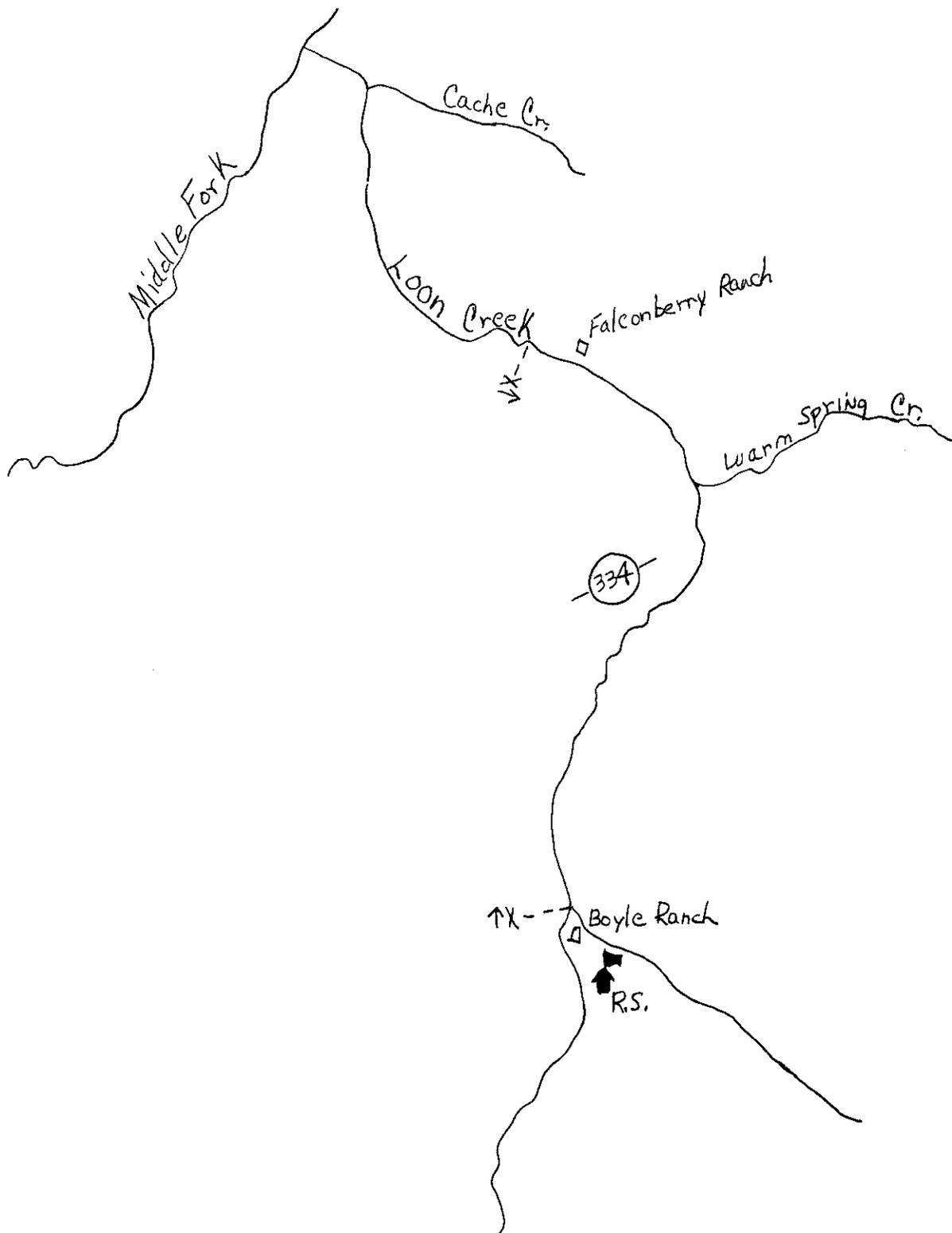
DRAINAGE Salmon River

SURVEY DATE 9/6/60

STREAM Loon Creek

MAP SCALE 1/3" = 1 mile

OBSERVATION CONDITIONS Excellent



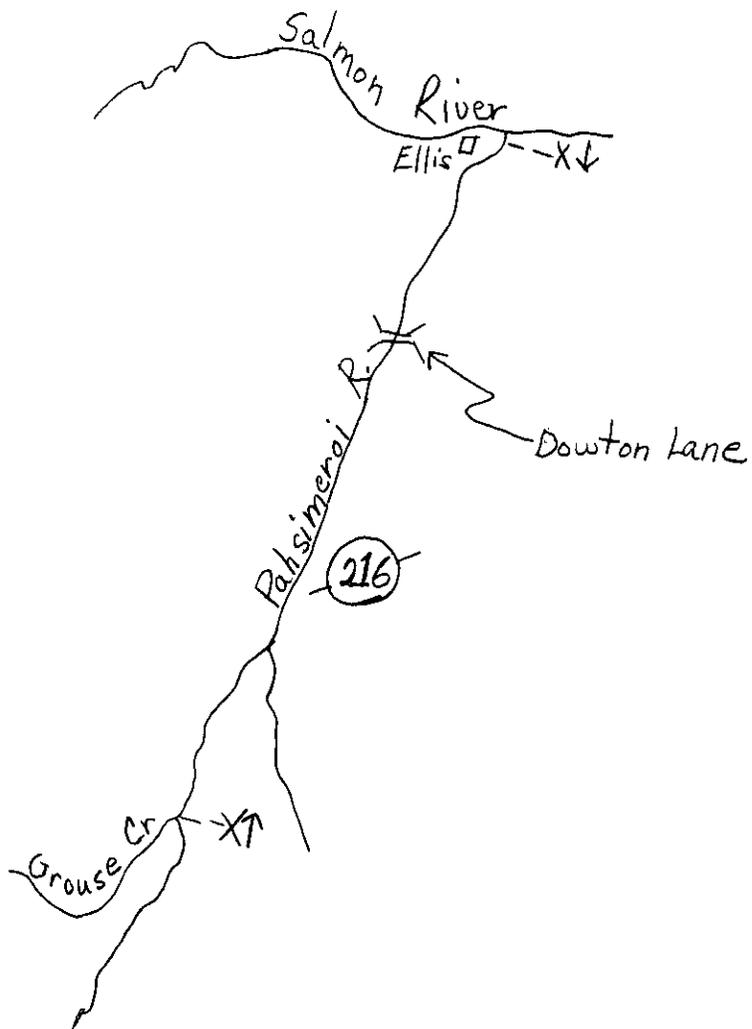
DRAINAGE Salmon River

SURVEY DATE 9/19/60

STREAM Pahsimeroi River

MAP SCALE 1/16" = 1 mile

OBSERVATION CONDITIONS Excellent



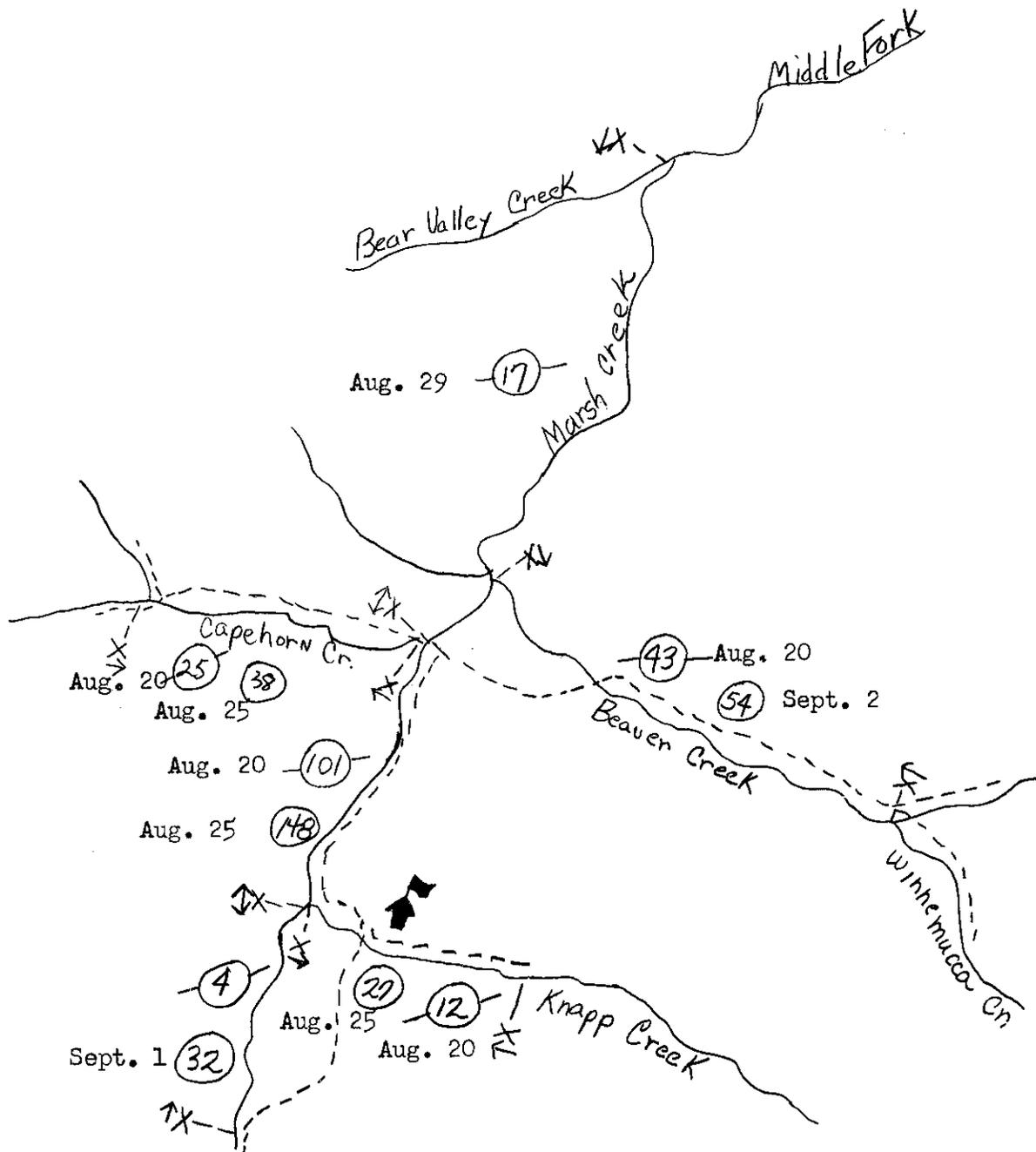
DRAINAGE Salmon River

SURVEY DATE 8/25 - 9/2/60

STREAM Marsh Creek Drainage

MAP SCALE 2/3" = 1 mile

OBSERVATION CONDITIONS Excellent



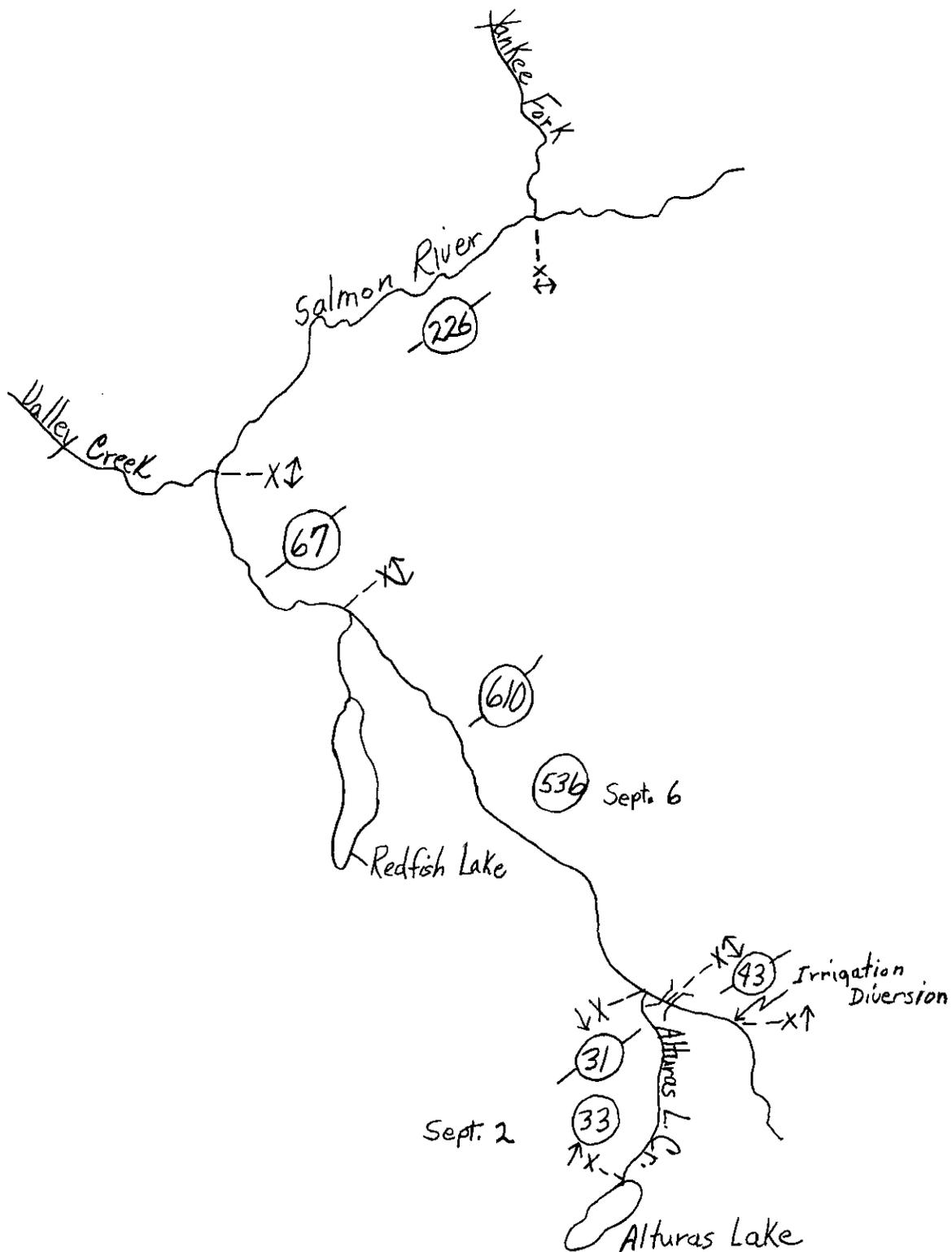
DRAINAGE Salmon River

SURVEY DATE 9/14/60

STREAM Salmon River

MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS Excellent



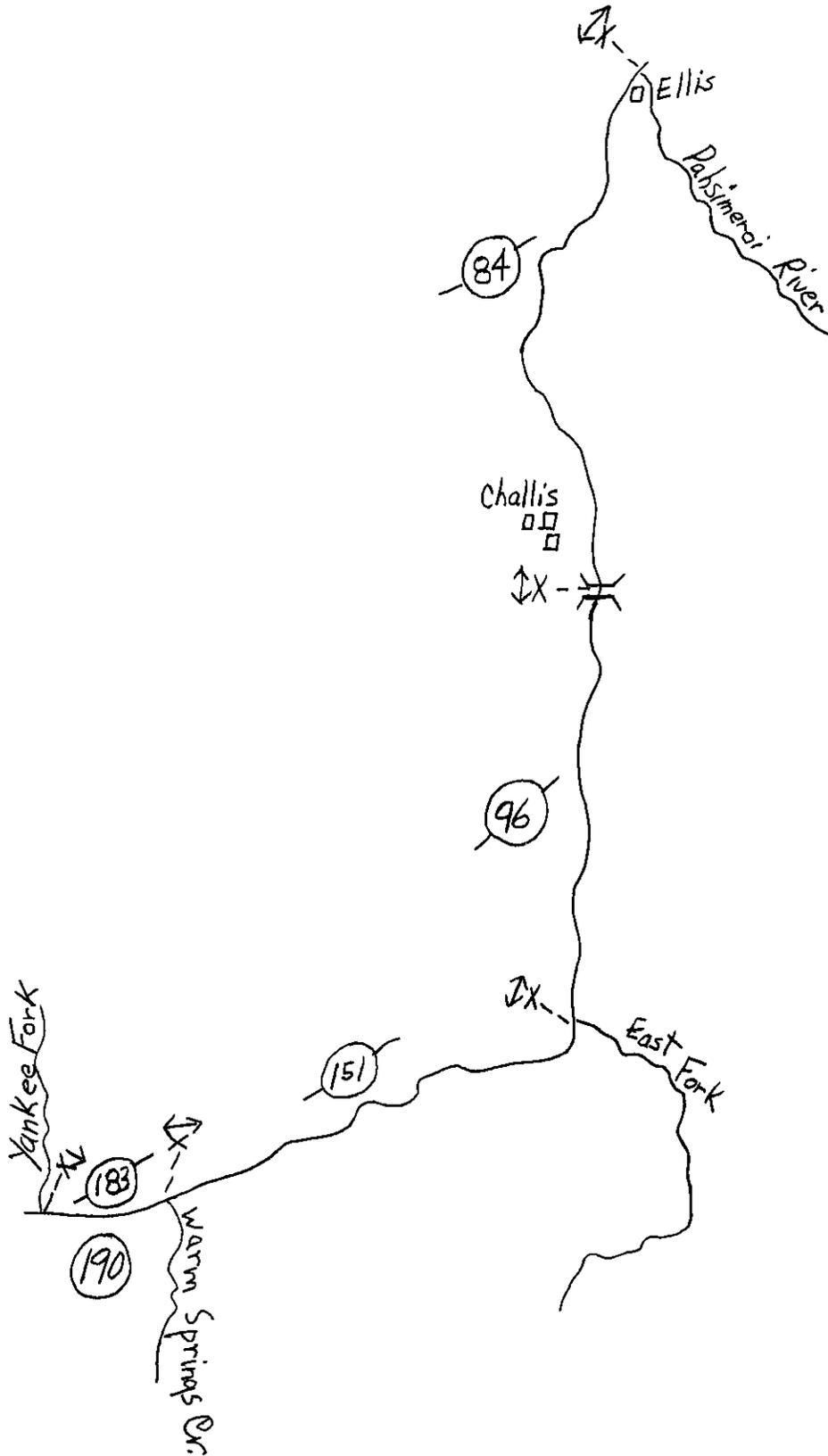
DRAINAGE Salmon River

SURVEY DATE 9/19/60

STREAM Salmon River

MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS Excellent



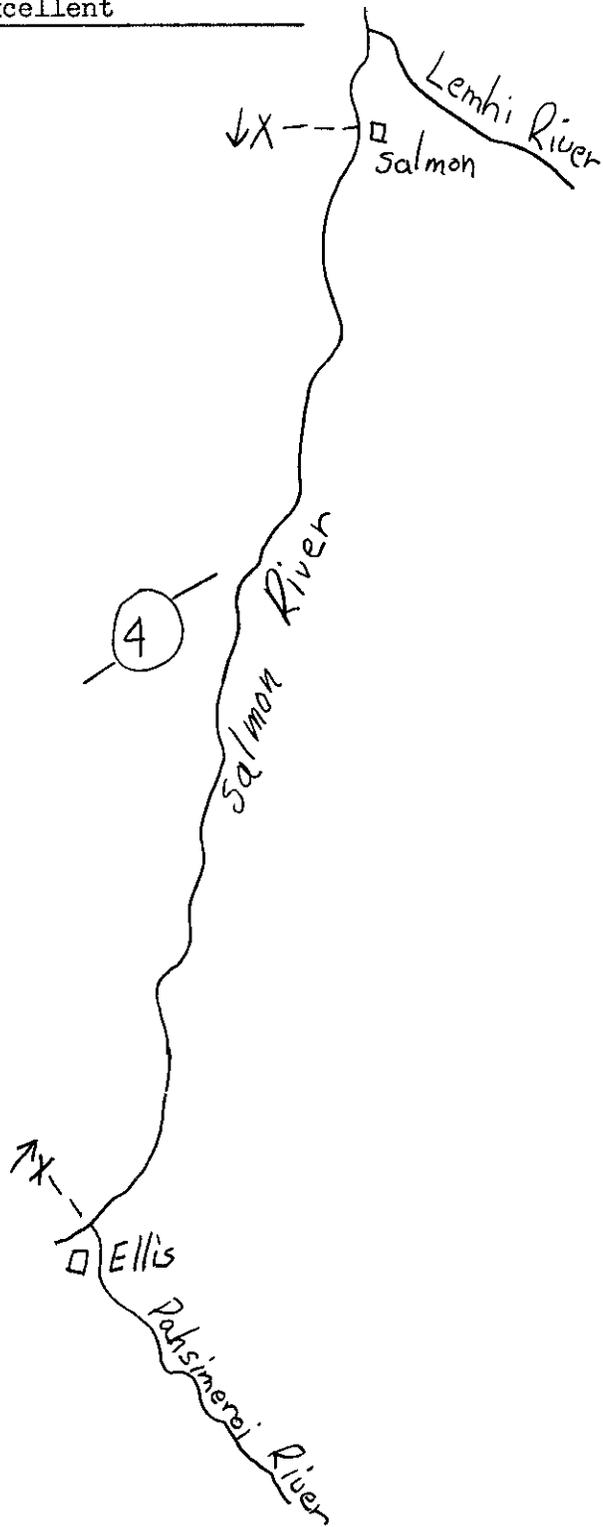
DRAINAGE Salmon River

SURVEY DATE 9/19/60

STREAM Salmon River

MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS Excellent



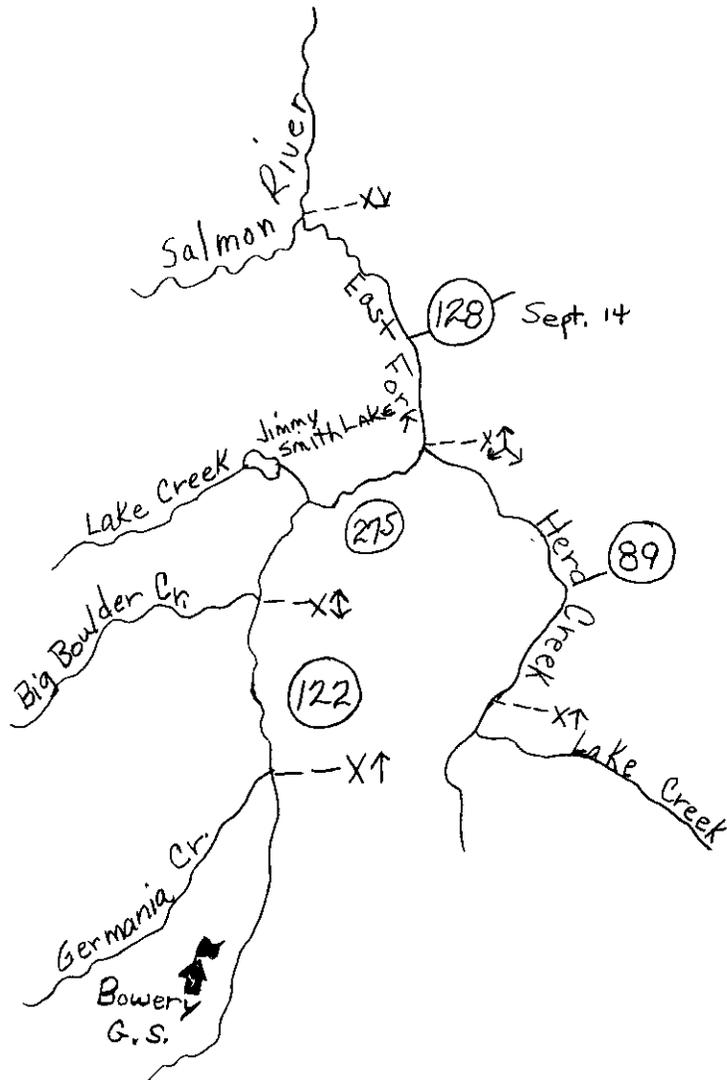
DRAINAGE Salmon River

SURVEY DATE 9/4 & 9/14/60

STREAM East Fork of Salmon River

MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS Excellent



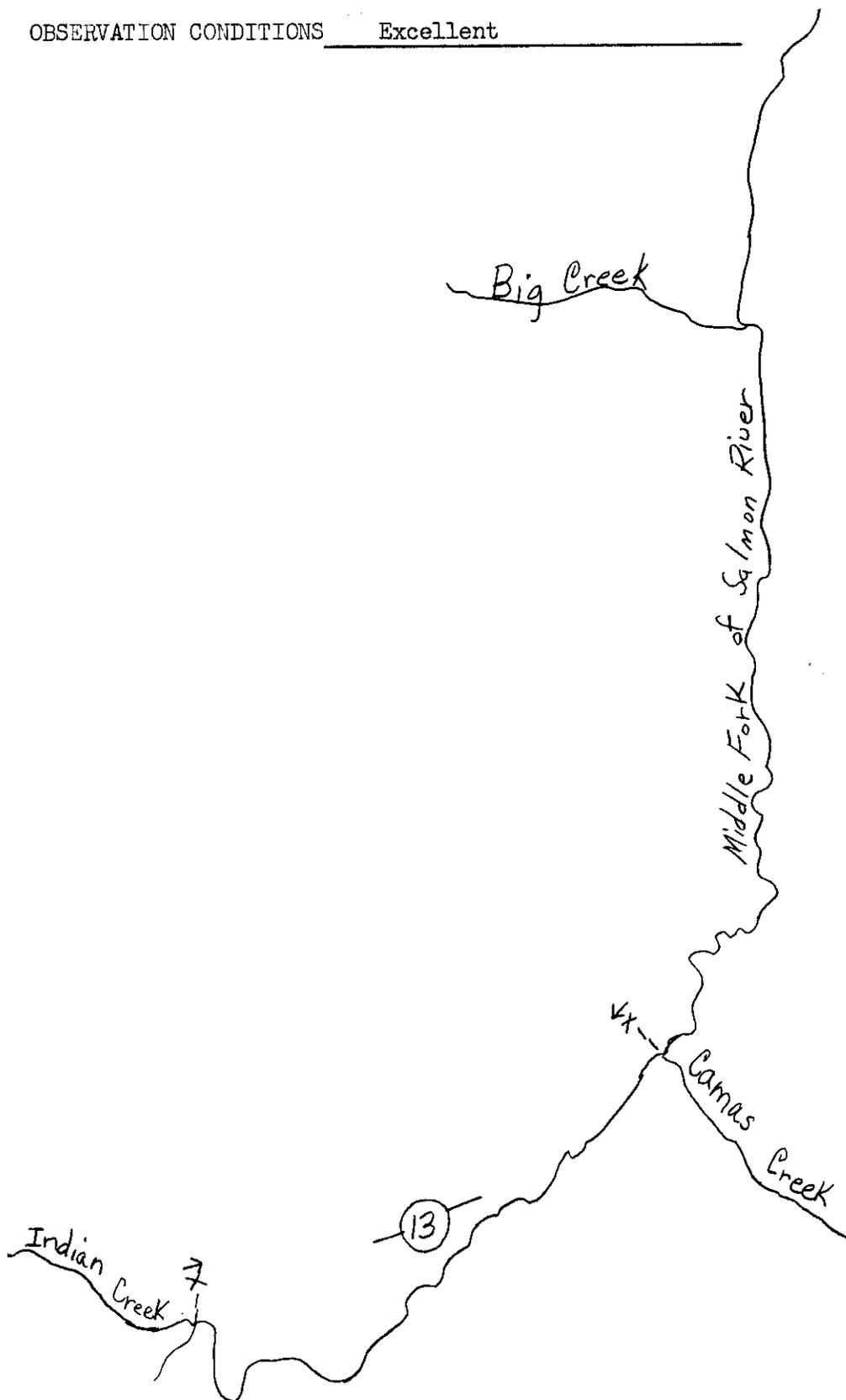
DRAINAGE Salmon River

SURVEY DATE 9/6/60

STREAM Middle Fork of Salmon River

MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS Excellent



DRAINAGE Salmon River

SURVEY DATE 9/6/60

STREAM Middle Fork of Salmon River

MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS Excellent



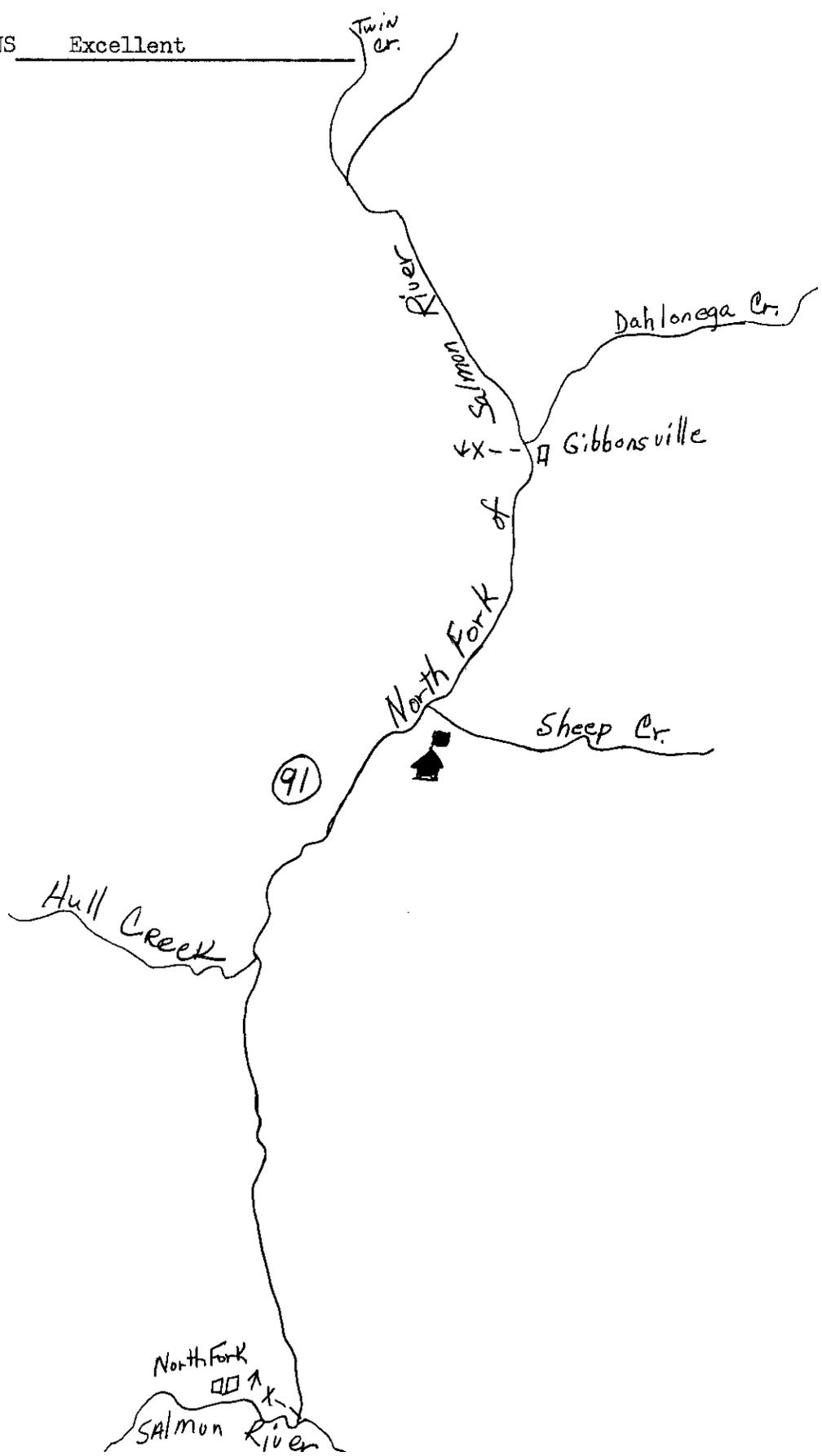
DRAINAGE Salmon River

SURVEY DATE 9/2/60

STREAM North Fork of Salmon River

MAP SCALE 1/2" = 1 mile

OBSERVATION CONDITIONS Excellent



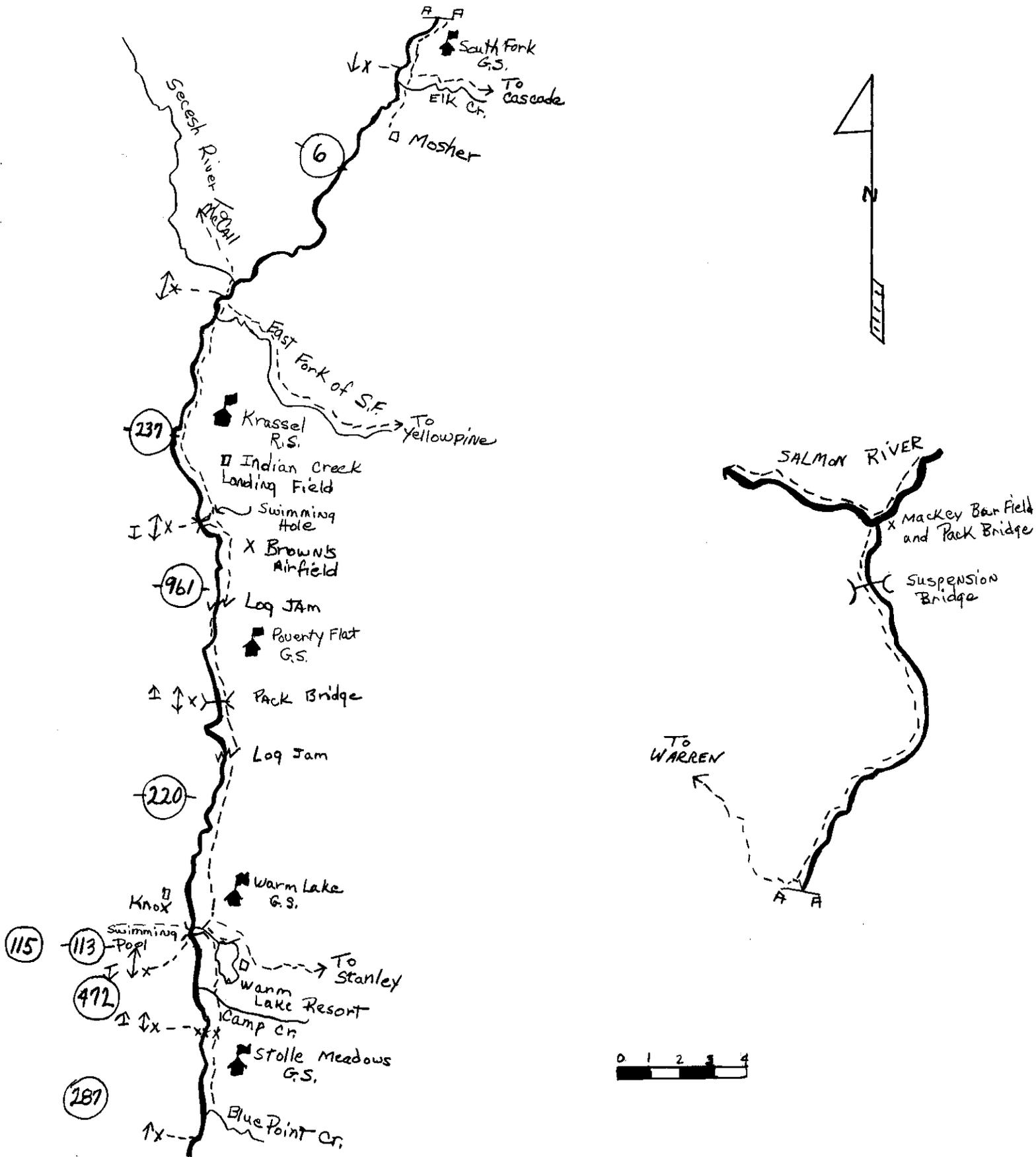
DRAINAGE Salmon River

SURVEY DATE 9/9 - 9/10 & 9/21/60

STREAM South Fork of Salmon River

MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS Good



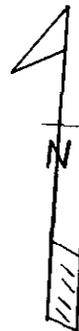
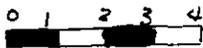
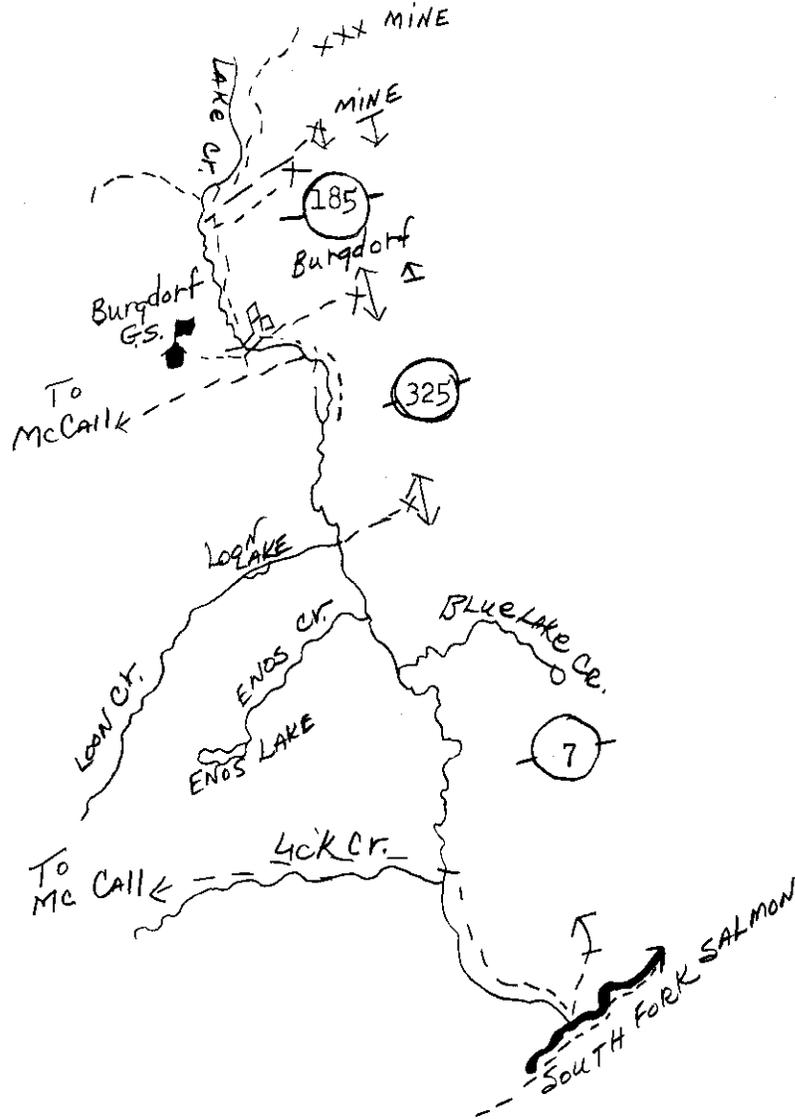
DRAINAGE South Fork Salmon River

SURVEY DATE 9/9 & 9/14/60

STREAM Secesh & Lake Creek

MAP SCALE $\frac{1}{4}'' = 1$ mile

OBSERVATION CONDITIONS Good



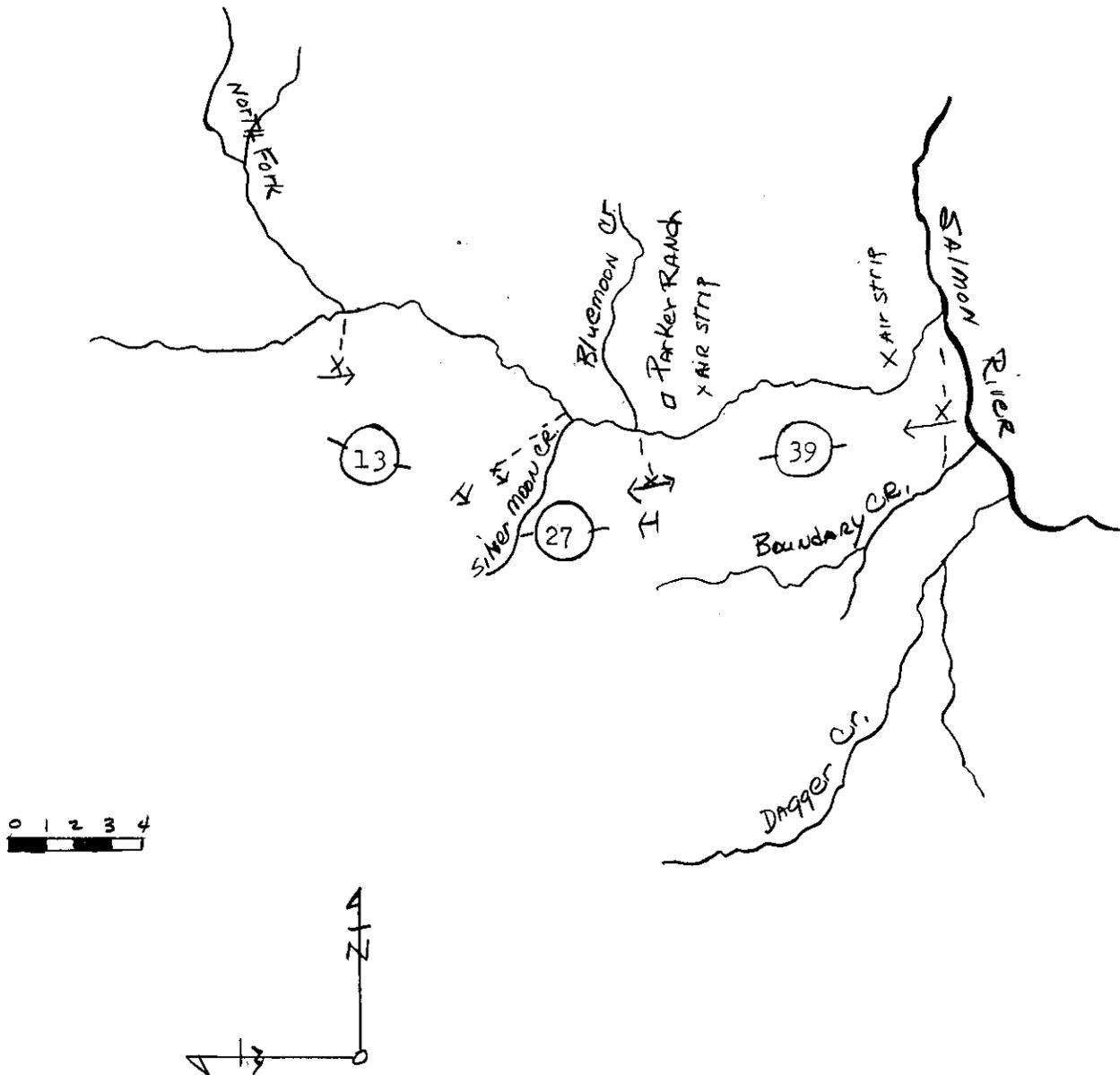
DRAINAGE Middle Fork Salmon River

SURVEY DATE _____

STREAM Sulphur Creek

MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS _____



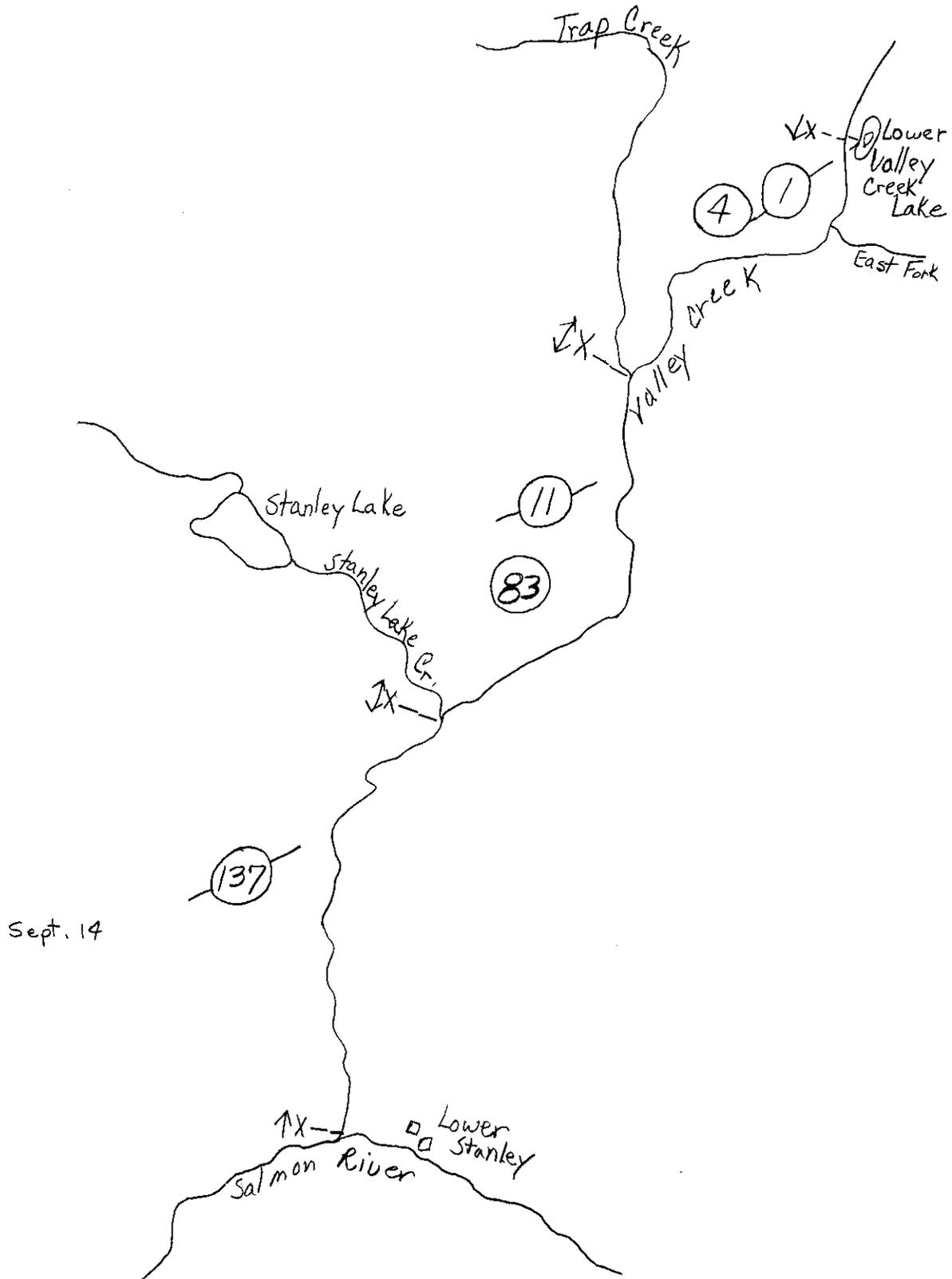
DRAINAGE Salmon River

SURVEY DATE 9/5 & 9/14/60

STREAM Valley Creek

MAP SCALE 2/3" = 1 mile

OBSERVATION CONDITIONS Excellent



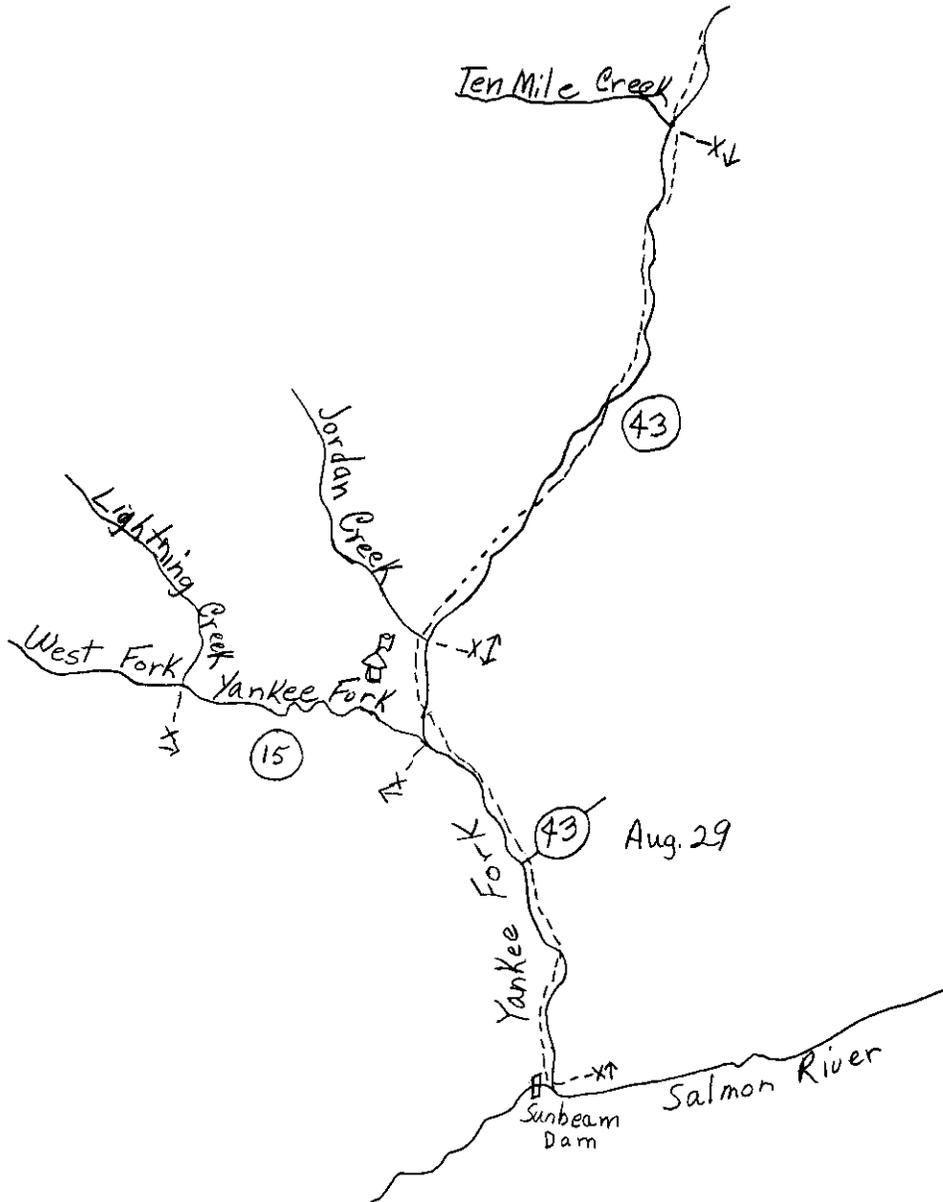
DRAINAGE Salmon River

SURVEY DATE 8/29 & 9/3/61

STREAM Yankee Fork

MAP SCALE 1/3" = 1 mile

OBSERVATION CONDITIONS Excellent



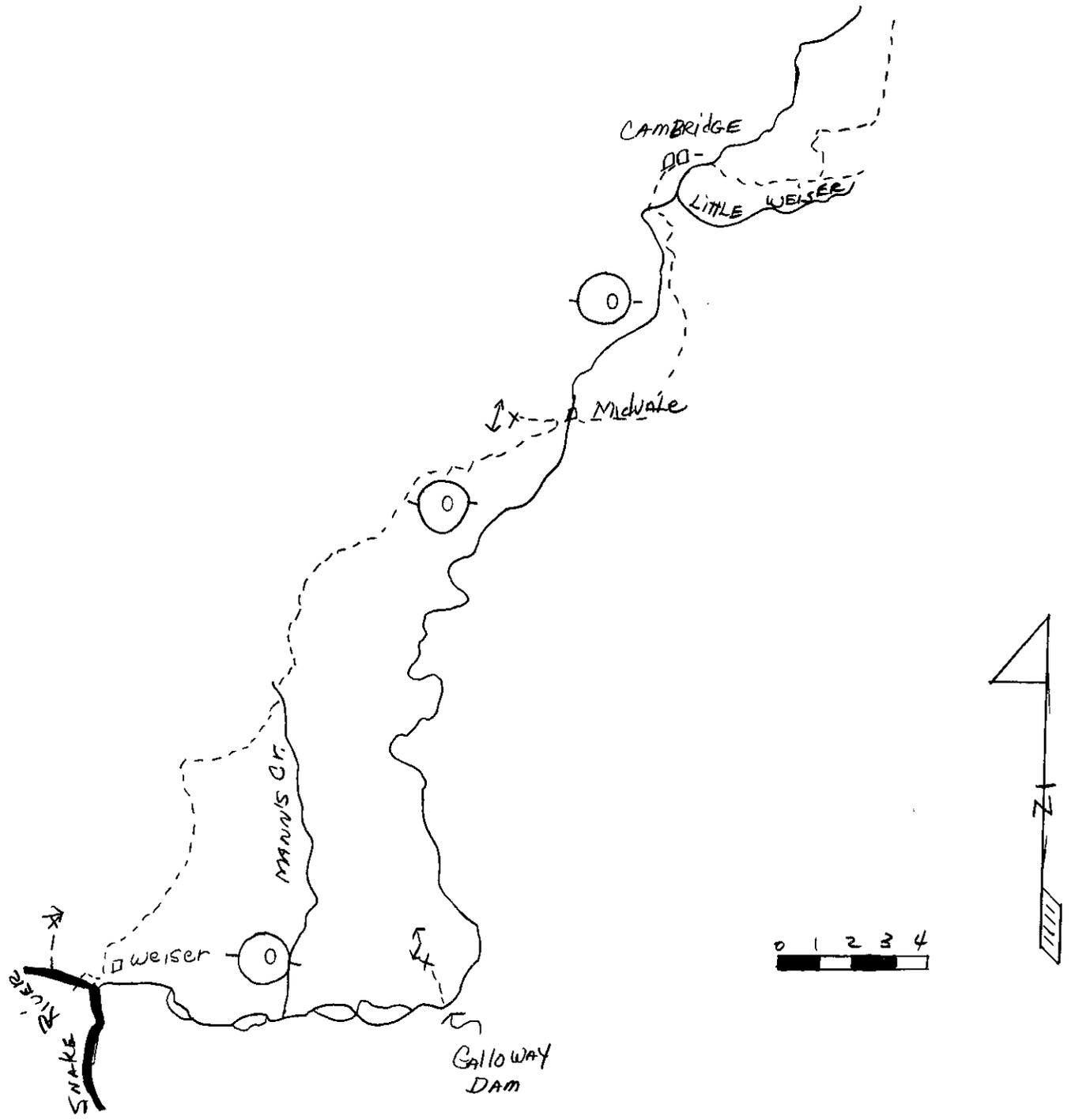
DRAINAGE Weiser River

SURVEY DATE 9/9/60

STREAM Weiser River - Weiser to Cambridge

MAP SCALE $\frac{1}{4}'' = 1 \text{ mile}$

OBSERVATION CONDITIONS Excellent



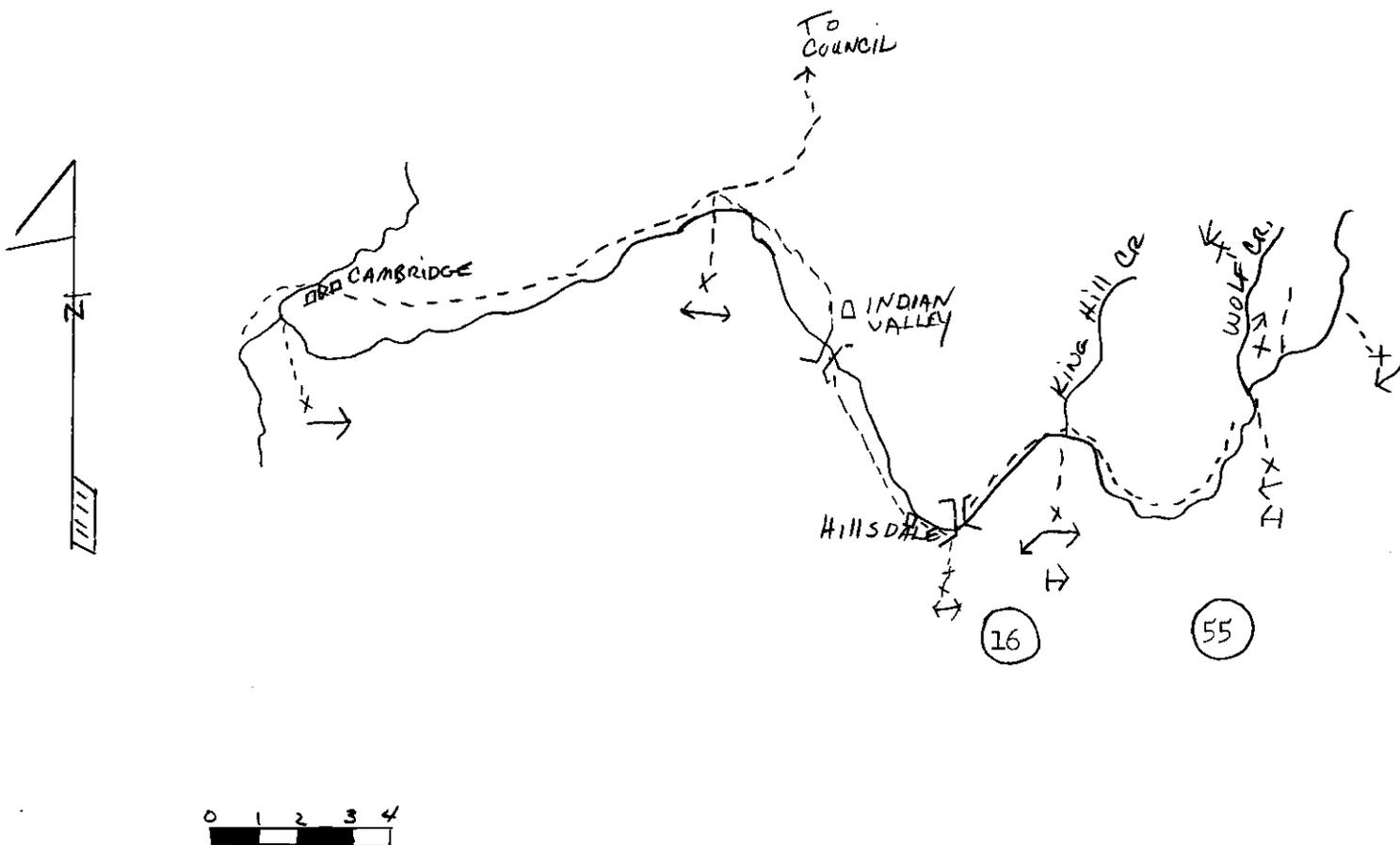
DRAINAGE Weiser River

SURVEY DATE 9/28/60

STREAM Little Weiser

MAP SCALE $\frac{1}{4}'' = 1$ mile

OBSERVATION CONDITIONS Good



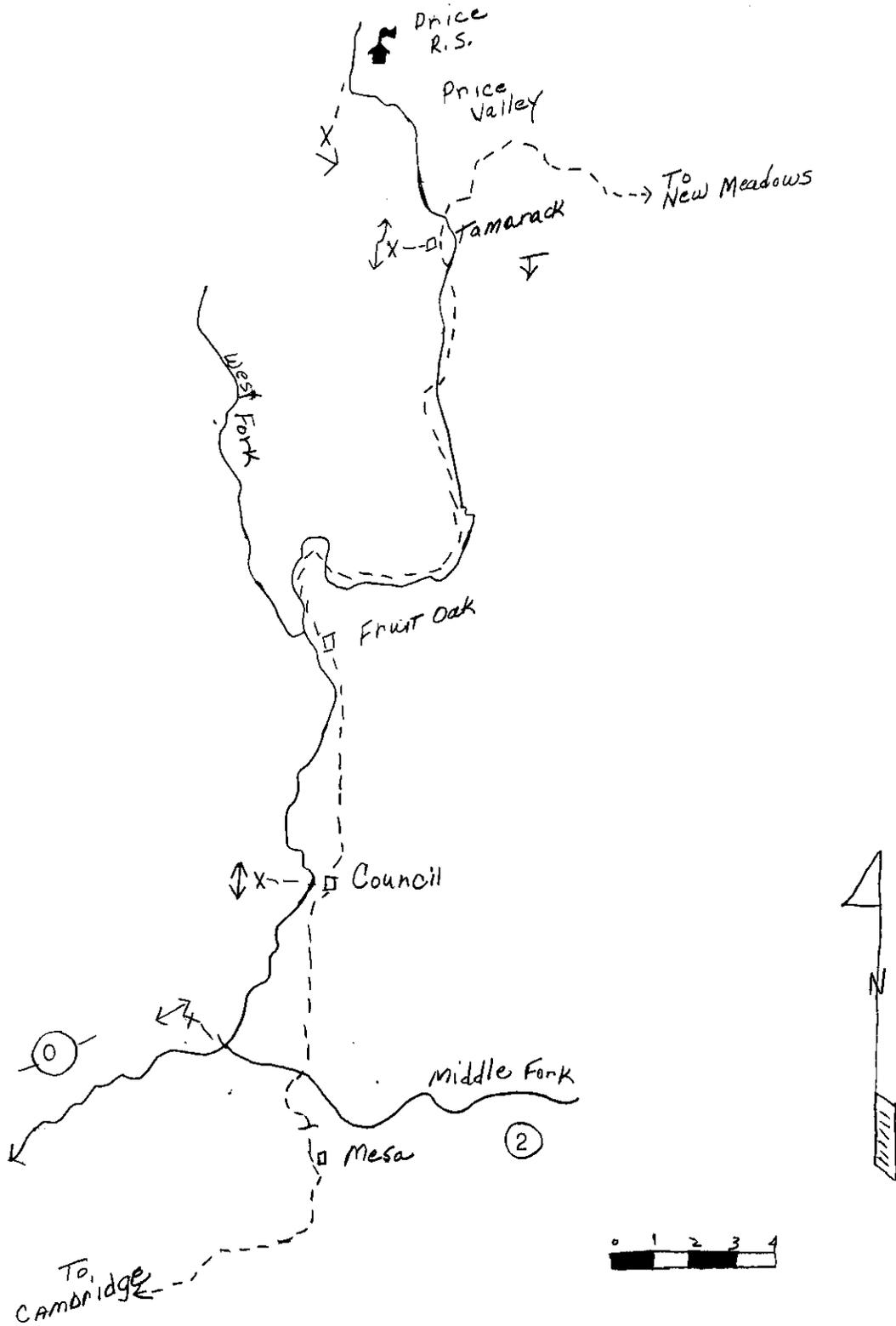
DRAINAGE Weiser River

SURVEY DATE 9/29/60

STREAM Weiser River - Cambridge to Price Valley

MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS Good



DRAINAGE Middle Fork Salmon River

SURVEY DATE 9/8/60

TREAM Big Creek

MAP SCALE $\frac{1}{4}$ " = 1 mile

OBSERVATION CONDITIONS Excellent

