IDAHO
DEPARTMENT OF FISH & GAME

Robert L. Salter, Acting Director

FEDERAL AID TO FISH AND WILDLIFE RESTORATION

Job Performance Report

Project F-73-R-2

Fishery Research

SUBPROJECT II: SALMON AND STEELHEAD INVESTIGATIONS

Study II: Salmon Spawning Ground Surveys

Period Covered: 1 March 1979 to 29 February 1980

by

Ronald L. Lindland, Regional Fishery Biologist Kent W. Ball, Regional Fishery Biologist Will W. Reid, Regional Fishery Manager

April, 1980

TABLE OF CONTENTS

Page

ABSTRACT 1

RECOMMENDATIONS 2

TECHNIQUES USED 2

FINDINGS 2

APPENDIX 11

LIST OF TABLES

Table 1. Salmon River drainage chinook salmon redd counts, 1979 3

Table 2. Clearwater River drainage chinook salmon redd counts, 1979 4

Table 3. Length frequency distribution for spring chinook kelts, 1979 5

Table 4. Length frequency distribution for summer chinook kelts, 1979 7

Table 5. Percent age composition, by sex, of spring chinook kelts, 1979 8

Table 6. Percent age composition, by sex, of summer chinook kelts, 1979 10

JOB PERFORMANCE REPORT

State of Idaho Name: SALMON AND STEELHEAD INVESTIGATIONS

Project No. F-73-R-2 Title: Salmon Spawning Ground Surveys

Study II

Period Covered: 1 March 1979 to 29 February 1980

ABSTRACT

Each year regional fishery biologists survey major chinook salmon spawning areas in their respective regions to count the number of redds constructed in trend count areas and to obtain age and sex composition data. The data are made available for trend analysis, management, and research use.

Redd counts, sex, and age data for 1979 are presented in a series of attached tables and maps.

Authors:

Ronald L. Lindland, Regional Fishery Biologist Kent W. Ball, Regional Fishery Biologist Will W. Reid, Regional Fishery Manager

RECOMMENDATIONS

The redd count surveys, sex and age composition data collections should be continued to provide management data.

OBJECTIVES

To count chinook salmon redds in established trend areas.
To obtain age and sex composition data of the chinook spawning population.

TECHNIQUES USED

Redd counts are made from low flying, fixed-wing aircraft, helicopter, or on foot depending on which technique is best suited for a particular stream. Redds are counted when preliminary observations indicate that spawning is over and before redds become obscure from algae and silt.

Carcass surveys ideally are made three times during post-spawning die-off to eliminate bias in sex ratios noted early and late in the season.

Chinook redd counts are included for selected tributaries of the Clearwater River to assist evaluation of reintroduction efforts.

FINDINGS

Redd count surveys and sex and age composition data collections were made during the late summer of 1979. These data are summarized in attached tables and maps.

A record low number of redds was counted in areas used by spring and summer run fish. This was forecast earlier as a failure of the 1975 brood year due to the impact of the 1977 drought, with the spring of 1977 being the timing of emigration of the 1975 brood years to the ocean.

The abundance of jack salmon kelts on the spawning grounds was again low in 1979, which gives rise to a forecast of small runs for 1980. The reason for this is not entirely clear, however, the 1976 spawning population was of low abundance and the progeny were subjected to the 1977 drought conditions during their fresh-water rearing period.

The usual aerial redd counts on the upper Salmon River system could not be made in 1980. A flying service that met State specifications was not locally available.

Table 1. Salmon River drainage chinook salmon redd counts, 1979.

Streams	1974	1975	1976	1977	1978	5-Yr avg.	1979
Spring chinook							
Alturas Lake Creek	42	60	16	85	303	101	29
Upper Salmon River	338	509	378	698	1,707	726	205
Upper Valley Creek	127	189	nc	18	141	119	25
Upper Yankee Fork	54	60	40	6	33	39	18
Upper East Fork	346	348	75	168	841	356	57
Herd Creek	13	11	27	6	26	17	2
Marsh Cr. Drainage	210	201	48	98	270	165	47
Lemhi River	248	366	241	474	796	425	154
North Fork Salmon R.	18	14	6	31	29	20	nc
Bear Valley Creek	130	215	76	129	184	147	69
Elk Creek	108	169	61	86	208	126	49
Sulphur Creek	30	50	14	5	64	33	15
Upper Big Creek	28	77	22	9	95	46	15
Subtotal	1,692	2,269	1,004	1,813	4,697	2,320	685
Summer chinook							
Lower Salmon River	40	45	44	94	349	114	nc
Lower Valley Creek	45	80	43	63	219	90	15
Lower East Fork	49	38	39	136	nc	66	33
Loon Creek	47	32	31	62	29	40	nc
South Fork Salmon R.	218	238	241	226	251	235	115
Johnson Creek	107	69	68	81	113	88	36
Secesh R.-Lake Cr.	21	10	17	27	91	33	20
Subtotal	527	512	483	689	1,052	666	219
Unclassified Spawners							
Camas Creek	172	128	61	84	148	119	15
Lower Yankee Fork	28	35	3	12	27	21	nc
West Fork Yankee Fork	20	55	11	37	98	44	13
Middle Fork Salmon R.	23	10	6	1	nc	10	nc
Subtotal	243	228	81	134	273	194	28
Total	2,462	3,009	1,568	2,636	6,022	3,180	932 1/

1/ If all usual streams had been counted, the total would likely have been near 1,000.

Table 2. Clearwater River drainage chinook salmon redd counts, 1979.

Streams	Number of redds counted in: 1974	1975	1976	1977	1978	5-Yr avg.	1979
Selway Drainage							
Selway River	66	21	58	97	125	73	21
Bear Creek	10	5	14	18	13	12	3
Running Creek	4	0	3	2	6	3	0
Whitecap Creek	2	1	4	1	nc	2	2
Moose Creek	15	4	15	23	17	15	4
Subtotal	97	31	94	141	161	105	30
Lochsa Drainage							
Crooked Fork 1/	22	6	36	51	37	30	6
Brushy Fork	6	4	13	15	25	13	12
Subtotal	28	10	49	66	62	43	18
South Fork Drainage							
Newsome Creek 1/	3	10	3	9	14	8	6
Crooked River 1/	5	41	8	50	23	25	2
Red River 1/	12	20	15	50	52	30	20
Subtotal 1/	20	71	26	109	89	63	28
Total	145	112	169	316	312	211	76

1/ Some counts differ from those reported in previous years. Revisions were made to improve year-to-year comparability of counting methods.

Table 3. Length frequency distribution for spring chinook kelts, 1979.

Fork Length (in)	Bear Valley Cr. Male	Bear Valley Cr. Female	Elk Creek Male	Elk Creek Female	Sulphur Creek Male	Sulphur Creek Female	Big Creek (upper) Male	Big Creek (upper) Female
22								
23								
Subtotal	0	0	0	0	0	0	0	0
24								
25								
26								
27	1			1				
28								
29								
30								
31								
Subtotal	1	0	0	1	0	0	0	0
32				1				2
33		1						
34		2						
35				1				
36						1		1
37				2		1		
38		5		1				2
39		1		1				
40								1
41	1		2					
42								
43								
44								
45			1					
Subtotal	1	9	3	6	0	2	0	6
Grand Total	2	9	3	7	0	2	0	6

Table3.(continued). Length frequency distribution for spring chinook kelts, 1979.

Fork Length (in)	Lemhi River		Marsh Creek drainage		Salmon River (upper)		Valley Creek (upper)		East Fork (upper)	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
20			1		2				1	
21					1					
22										
23										
Subtotal	0	0	1	0	3	0	0	0	1	0
24										
25										
26										
27										
28										
29					2					
30										
31						1				
Subtotal	0	0	0	0	2	1	0	0	0	0
32		2		1	1					
33						4				
34		2		1		2				
35				1	1	3		1		
36					1	4				
37						9				
38						5				1
39						5				1
40						1			1	
41					1	1				
42					4					
43					4					
44					1				2	
45					2					
46					1					
Subtotal	0	4	0	3	16	34	0	1	3	2
Grand Total	0	4	1	3	21	35	0	1	4	2

Table 4. Length frequency distribution for summer chinook kelts, 1979.

Fork Length (in)	Johnson Creek Male	Johnson Creek Female	Lake Creek Secesh River Male	Lake Creek Secesh River Female	South Fork Salmon River Male	South Fork Salmon River Female
20	1				2	
21	1				2	
22						
23					1	
24						
Subtotal	2	0	0	0	5	0
25						1
26	1					
27						
28						
29						
30						
31						
32						
33						2
Subtotal	1	0	0	0	0	3
34					1	4
35	1					1
36	1	2				
37	1					1
38	1					
39		1				
40						
41						
42					1	
43						
44						
45						
46						
Subtotal	4	3	0	0	2	6
Grand Total	7	3	0	0	7	9

Table 5. Percent age composition, by sex, of spring chinook kelts, 1979.

Stream and age group	Males	Females	Males & Females
Bear Valley Creek			
Age group 3_2	0	0	0
Age group 4_2	50	0	9
Age group 5_2	50	100	91
	100	100	100
	(n=2)	(n=9)	(n=11)
Elk Creek			
Age group 3_2	0	0	0
Age group 4_2	0	14	10
Age group 5_2	100	86	90
	100	100	100
	(n=3)	(n=7)	(n=10)
Sulphur Creek			
Age group 3_2	0	0	0
Age group 4_2	0	0	0
Age group 5_2	0	100	100
	0	100	100
	(n=0)	(n=2)	(n=2)
Big Creek (upper)			
Age group 3_2	0	0	0
Age group 4_2	0	0	0
Age group 5_2	0	100	100
	0	100	100
	(n=0)	(n=6)	(n=6)

Table 5. (continued). Percent age composition, by sex, of spring chinook kelts, 1979.

Stream and age group	Males	Females	Males & Females
Lemhi River			
Age group 3_2	-	0	0
Age group 4_2	-	0	0
Age group 5_2	-	100	100
	-	100	100
	(n=0)	(n=4)	(n=4)
Marsh Creek Drainage			
Age group 3_2	100	0	25
Age group 4_2	0	0	0
Age group 5_2	0	100	75
	100	100	100
	(n=1)	(n=3)	(n=4)
Salmon River (upper)			
Age group 3_2	14	0	5
Age group 4_2	10	3	5
Age group 5_2	76	97	90
	100	100	100
	(n=21)	(n=35)	(n=56)
Valley Creek (upper)			
Age group 3_2	-	0	0
Age group 4_2	-	0	0
Age group 5_2	-	100	100
	(n=0)	(n=1)	(n=1)
East Fork (upper)			
Age group 3_2	25	0	17
Age group 4_2	0	0	0
Age group 5_2	75	100	83
	100	100	100
	(n=4)	(n=2)	(n=6)

Table 6. Percent age composition, by sex, of summer chinook kelts, 1979.

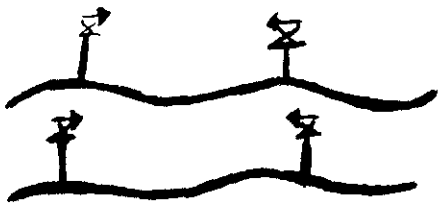
Stream and age group	Males	Females	Males & Females
Johnson Creek			
Age group 3_2	29	0	30
Age group 4_2	14	0	10
Age group 5_2	56	100	60
	100	100	100
	(n=7)	(n=3)	(n=10)
Lake Creek and Secesh River			
Age group 3_2	0	0	0
Age group 4_2	0	0	0
Age group 5_2	0	0	0
	0	0	0
	(n=0)	(n=0)	(n=0)
South Fork Salmon River			
Age group 3_2	71	0	31
Age group 4_2	0	33	19
Age group 5_2	29	67	50
	100	100	100
	(n=7)	(n=9)	(n=16)

APPENDIX

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 Salmon River

SURVEY DATE Aug 27, Sept 4,5, 1979

STREAM Salmon River

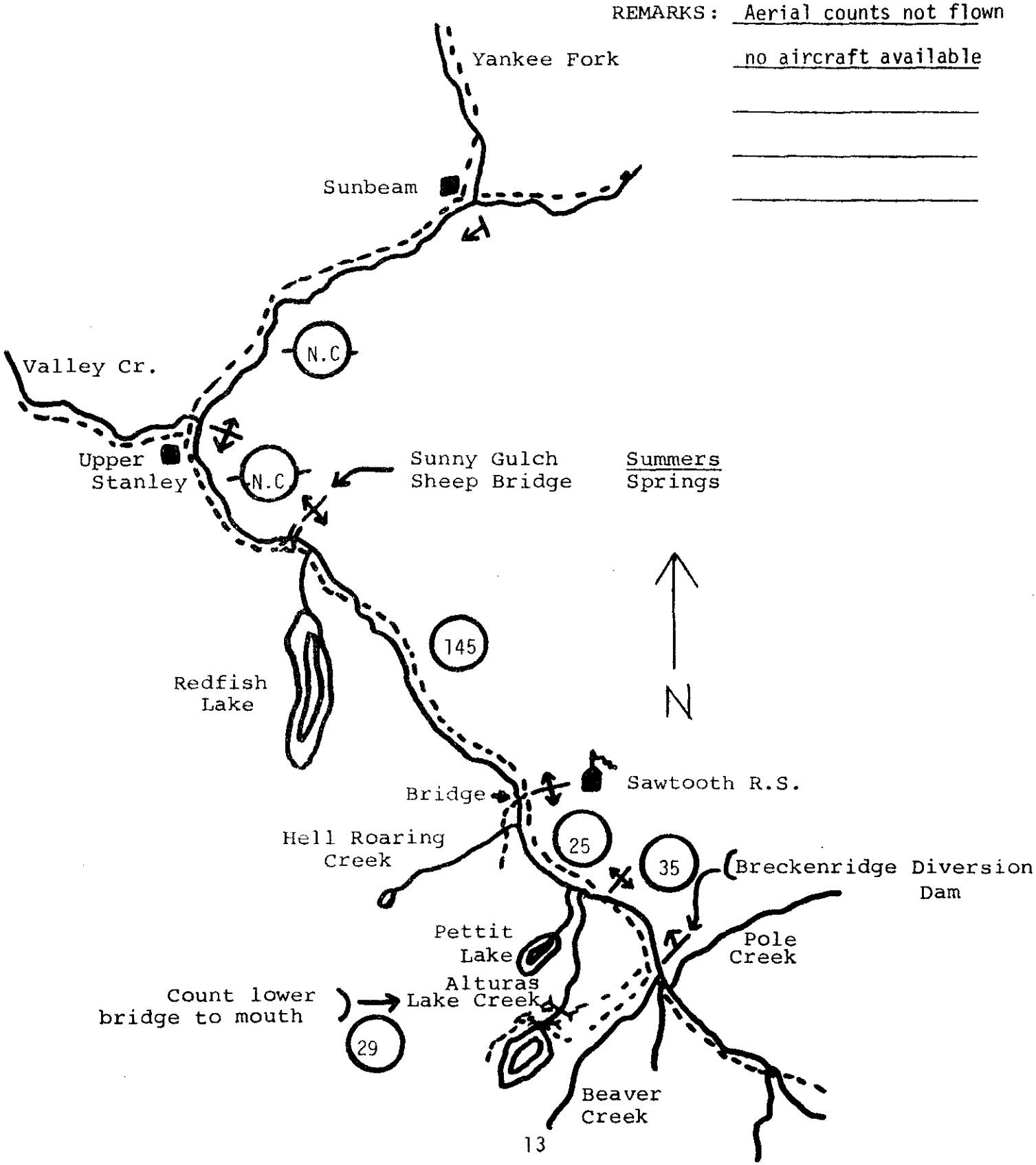
MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS Good

OBSERVER Ball, Reingold, Jeppson, Marshall

TIMING: Early On Time Late (mark one)

REMARKS: Aerial counts not flown no aircraft available



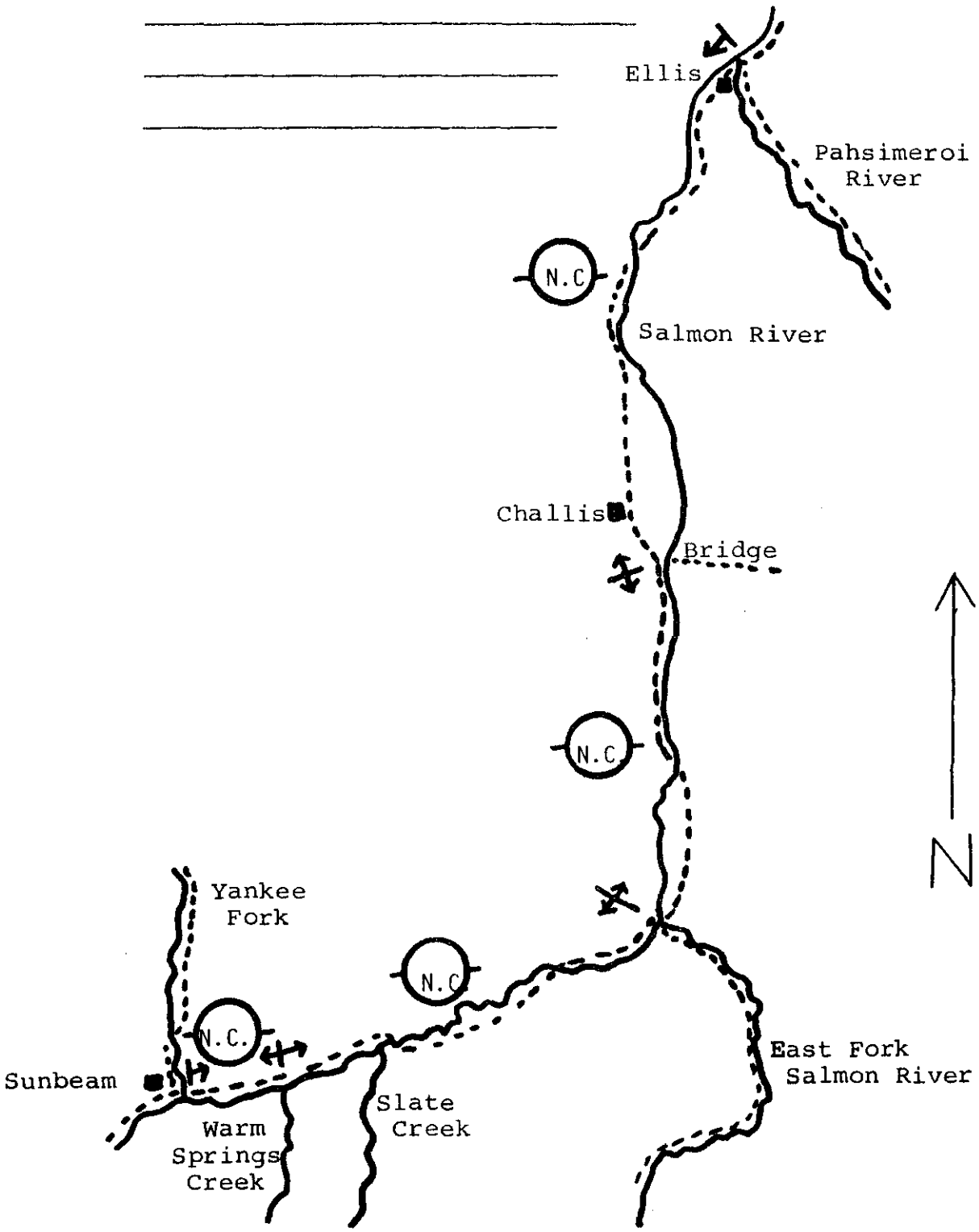
DRAINAGE Salmon River SURVEY DATE _____

STREAM Salmon River MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS _____ OBSERVER _____

TIMING: Early On Time Late (mark one)

REMARKS: Not flown - No aircraft available.



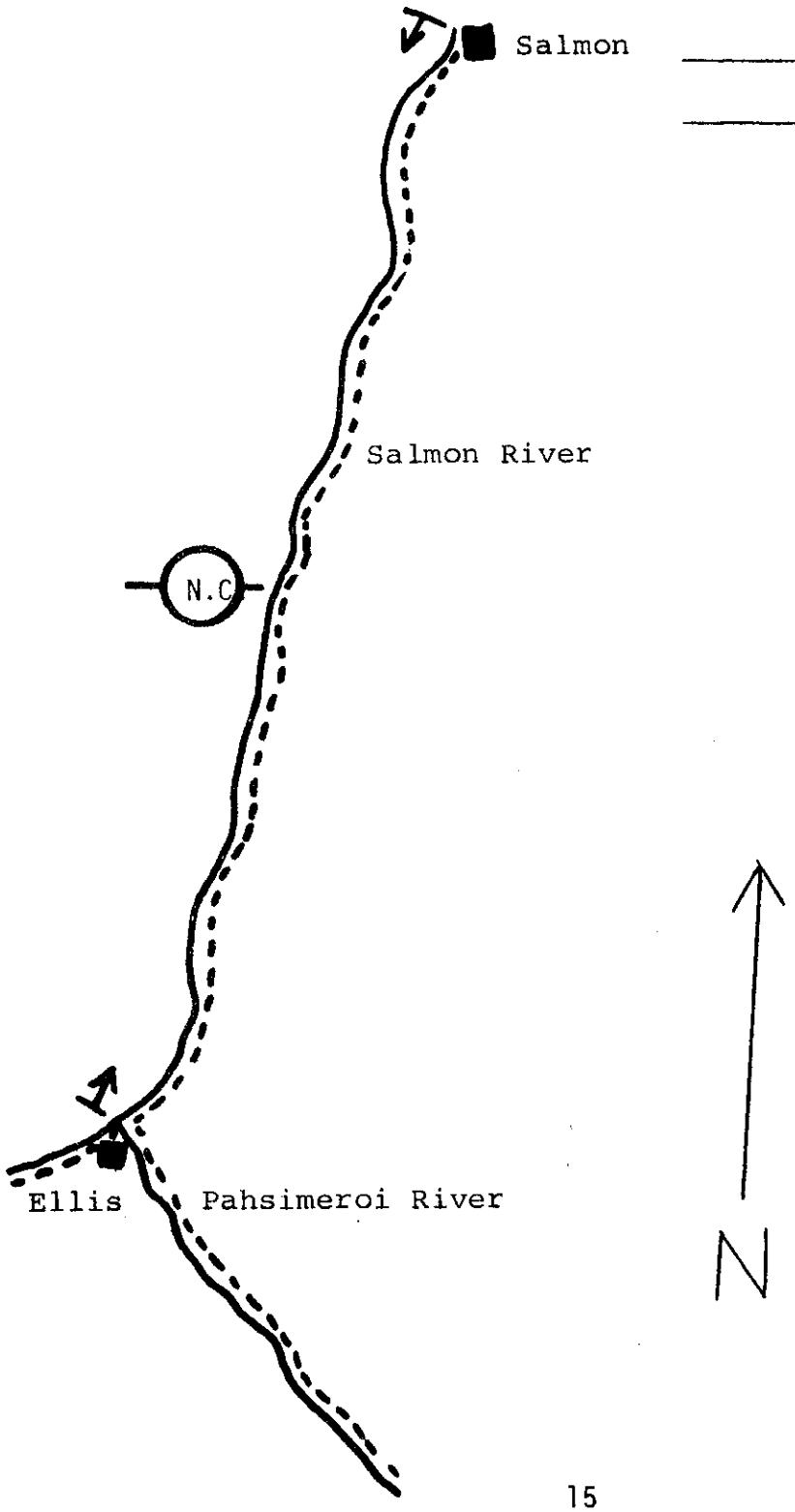
DRAINAGE Salmon River SURVEY DATE _____

STREAM Salmon River MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS _____ OBSERVER _____

TIMING: Early On Time Late (mark one)

REMARKS: Not flown, no aircraft available



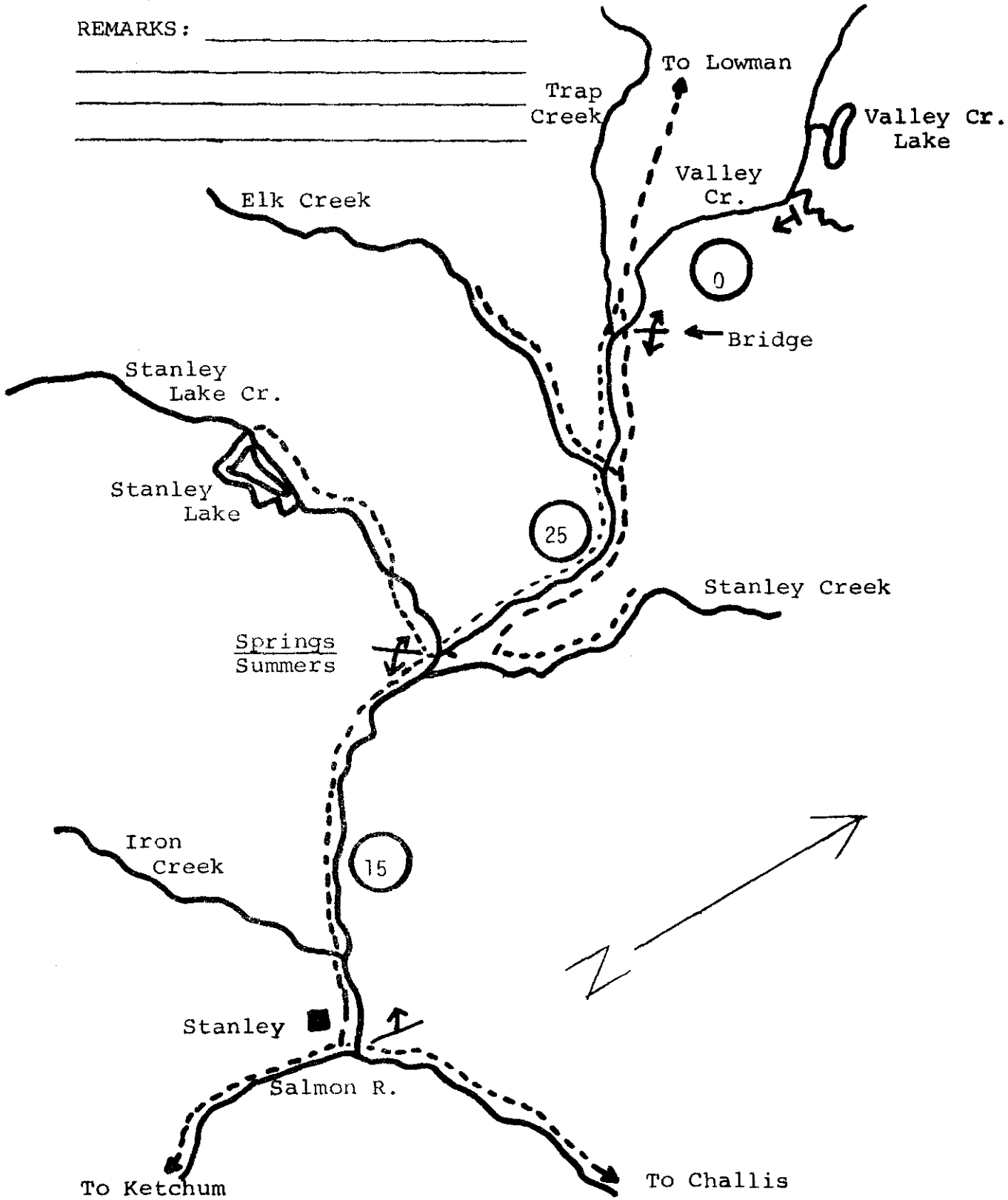
DRAINAGE Salmon River SURVEY DATE August 22, Sept 4, 1979

STREAM Valley Creek MAP SCALE 2/3" = 1 mile

OBSERVATION CONDITIONS _____ OBSERVER Pierson, Brooks, Marshall, Jeppson

TIMING: Early On Time Late (mark one)

REMARKS: _____



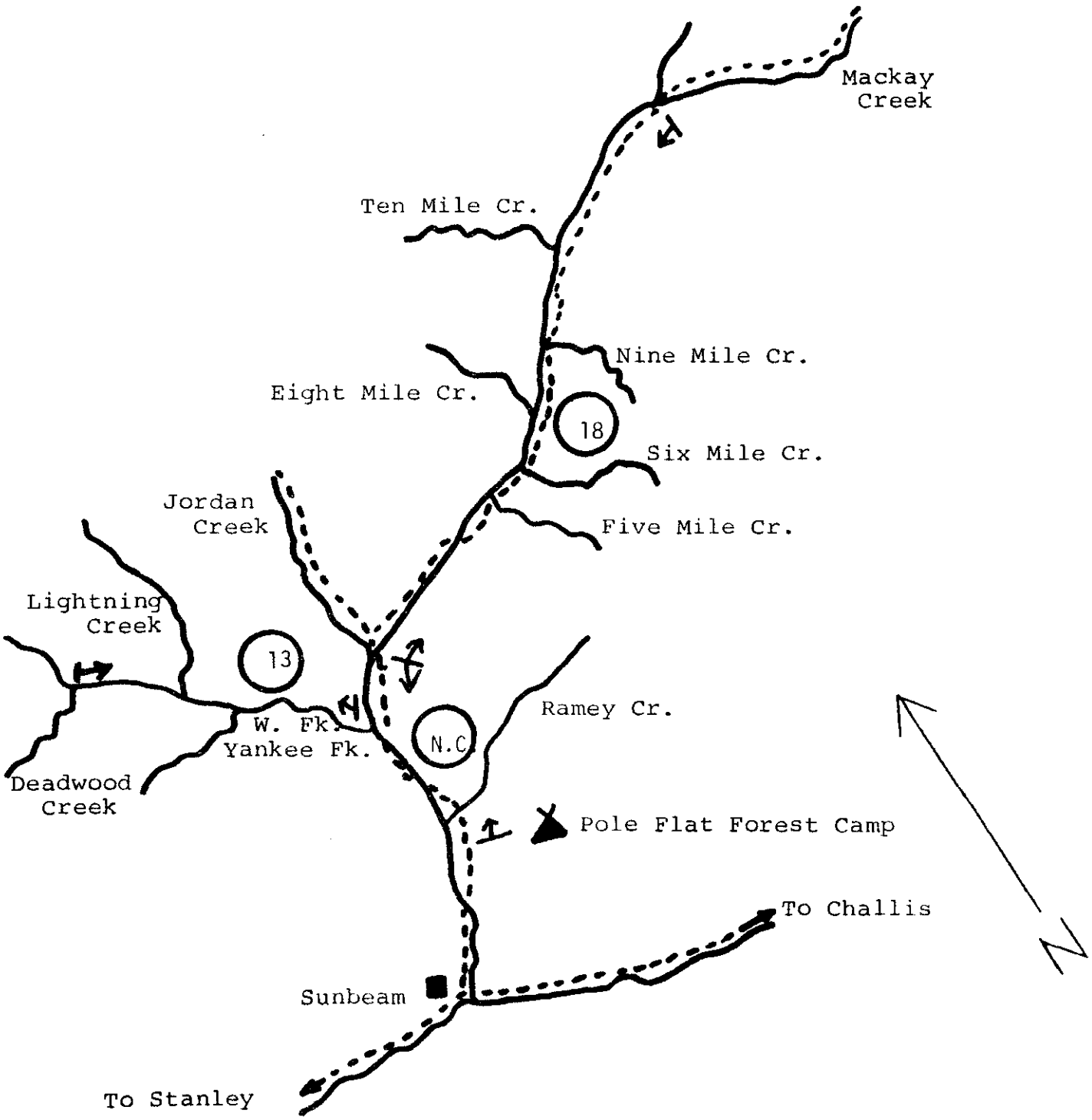
DRAINAGE Salmon River SURVEY DATE August 20, 21, 1979

STREAM Yankee Fork MAP SCALE 1/3" = 1 mile

OBSERVATION CONDITIONS Fair OBSERVER Ball, Marshall, Brooks, Pierson

TIMING: Early On Time Late (mark one)

REMARKS: Lower sections not flown, no aircraft available



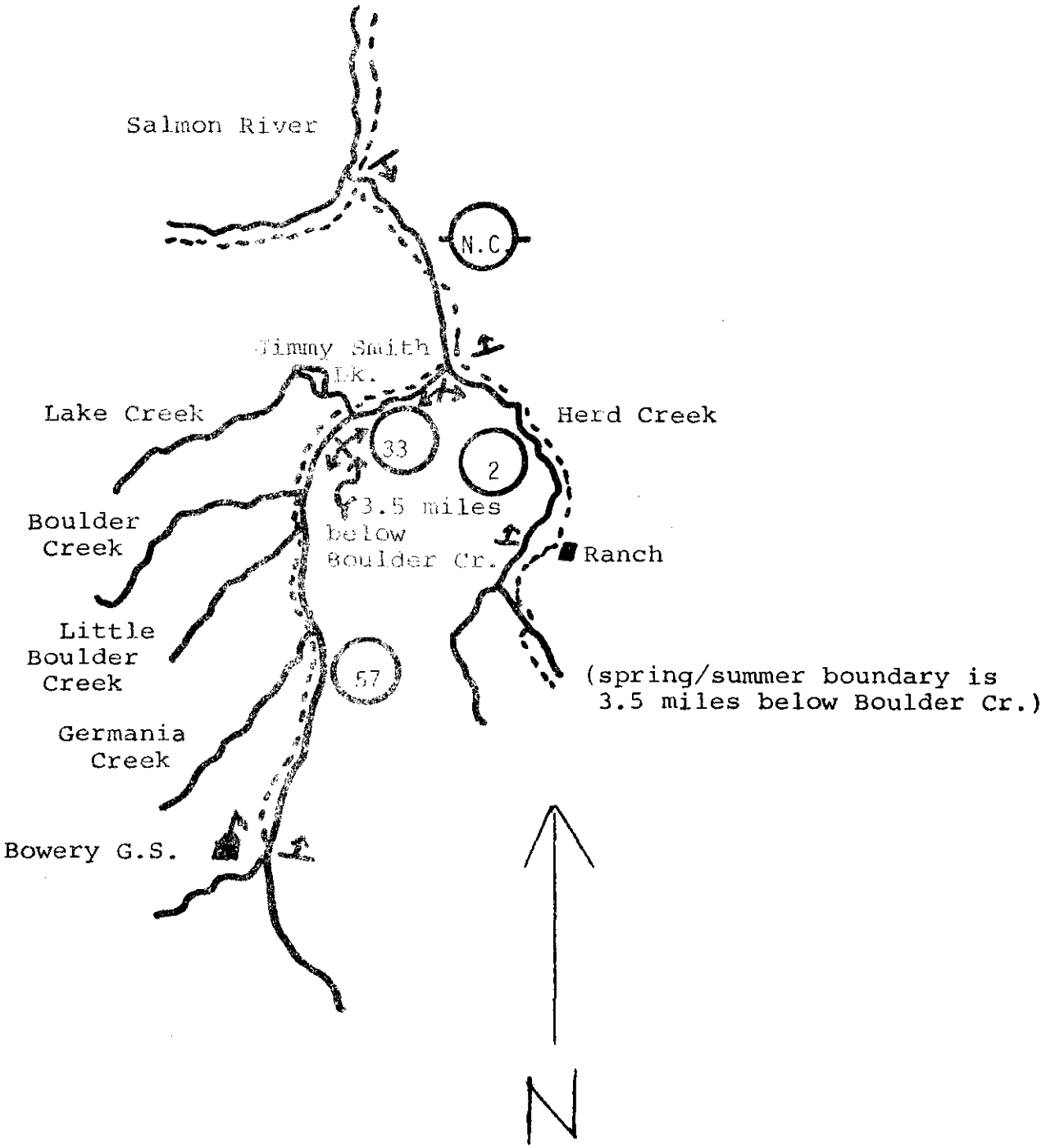
DRAINAGE Salmon River SURVEY DATE Aug. 23; Sept. 3, 1979

STREAM East Fork MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Ball, Reingold, Marshall, Gadwa

TIMING: Early On Time Late (mark one)

REMARKS: Lower section was not flown - no aircraft available



DRAINAGE Salmon River SURVEY DATE Sept. 6, 7, 1979

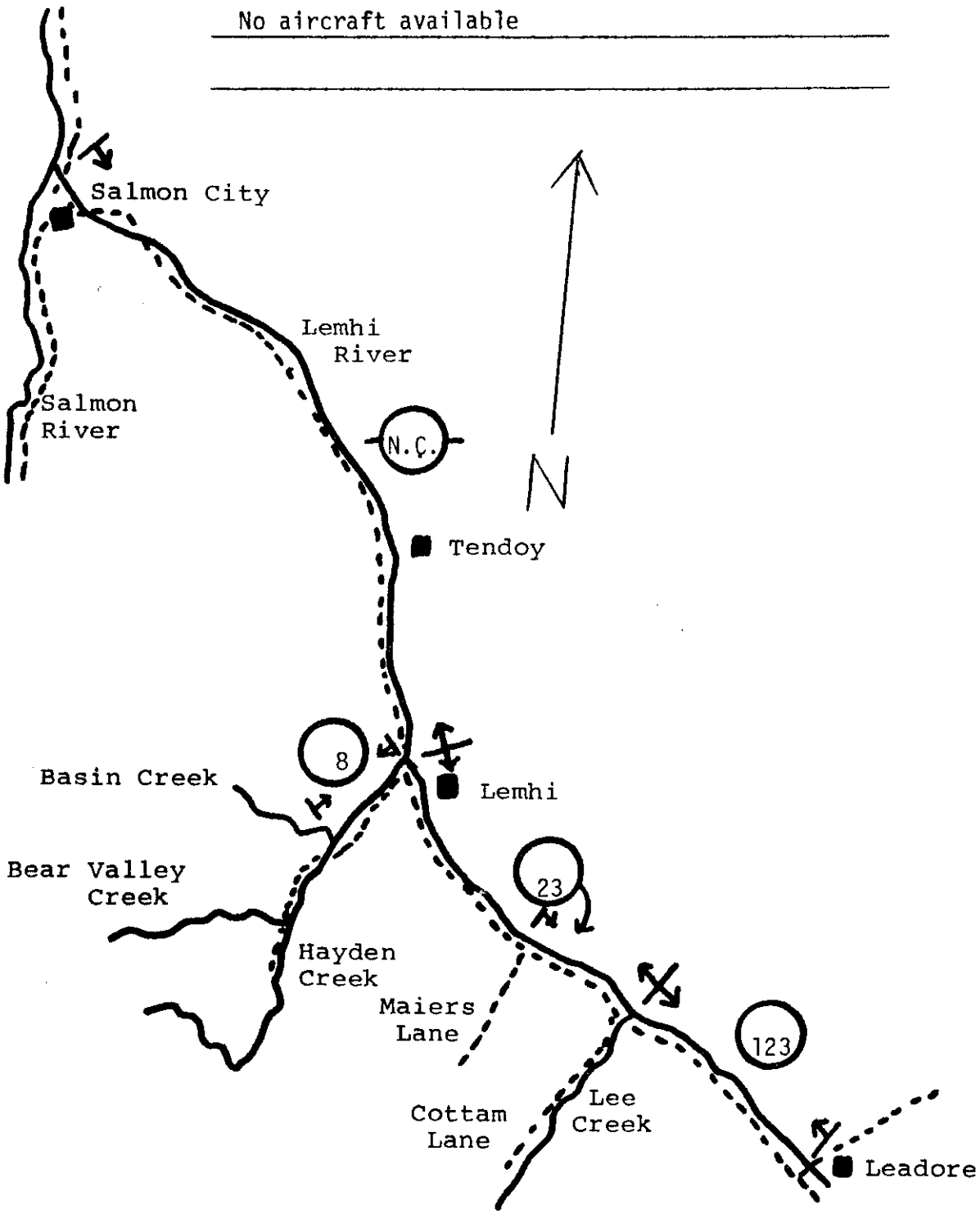
STREAM Lemhi River MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Ball, Jeppson, Marsh, Beers

TIMING: Early On Time Late (mark one)

REMARKS: Lower end was not flown

No aircraft available



DRAINAGE Salmon River

SURVEY DATE _____

STREAM North Fork

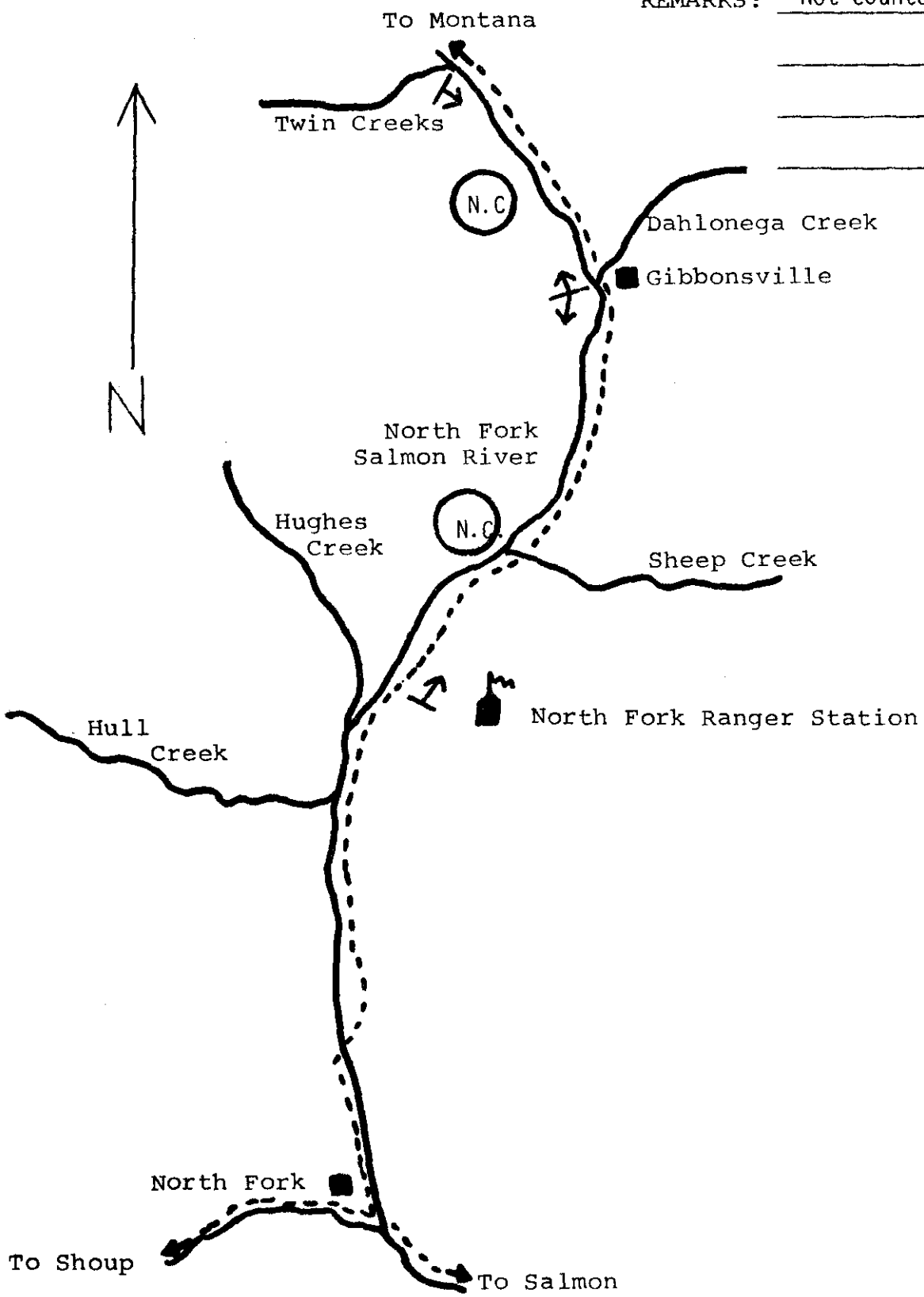
MAP SCALE 1/2" = 1 mile

OBSERVATION CONDITIONS _____

OBSERVER _____

TIMING: Early On Time Late (mark one)

REMARKS: Not counted due to low run size



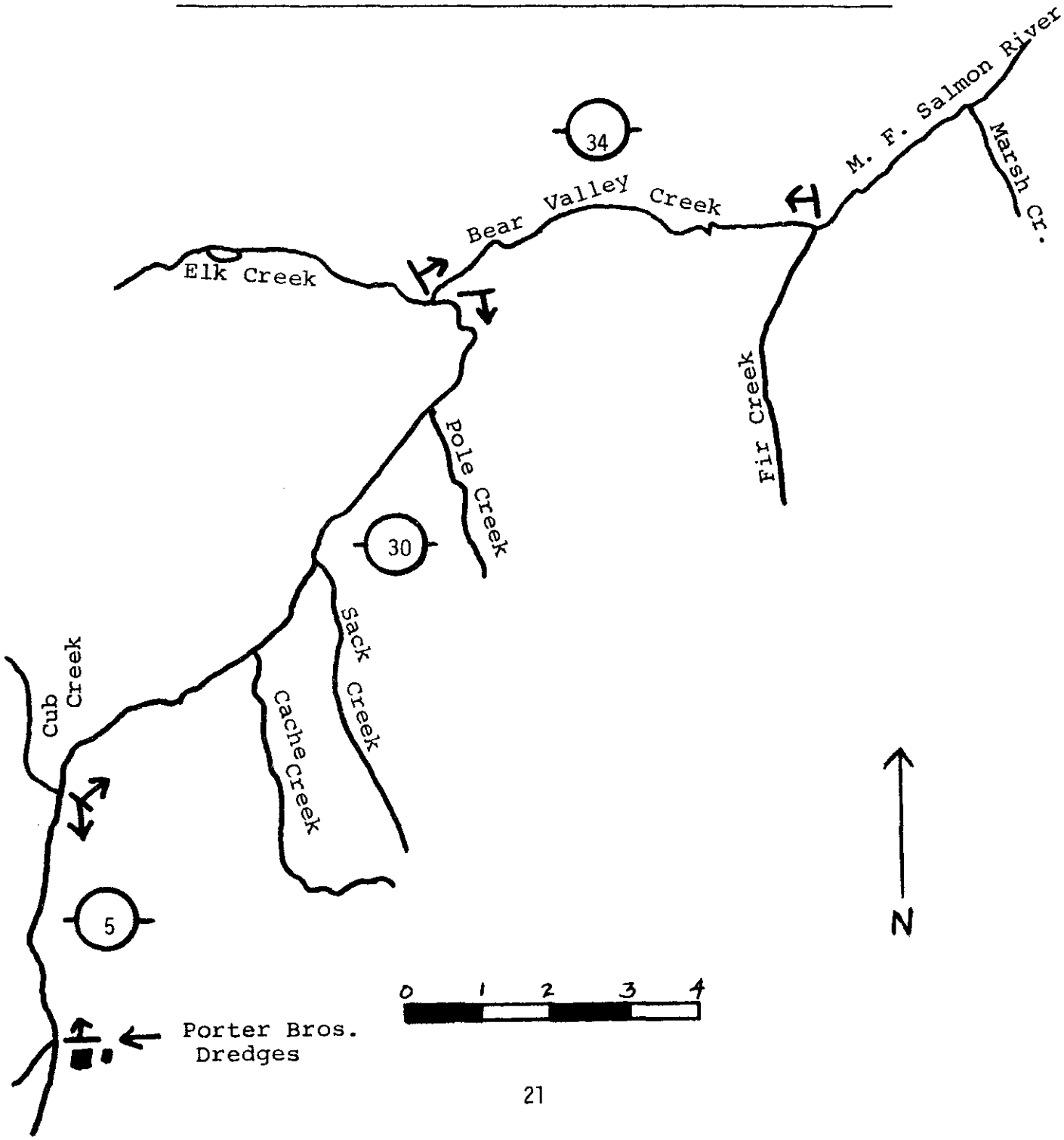
DRAINAGE M. F. Salmon River SURVEY DATE 9/5/79

STREAM Bear Valley Creek MAP SCALE 1" = 2 miles

OBSERVATION CONDITIONS good OBSERVER Reid

TIMING: Early On Time Late (mark one)

REMARKS: Low water and heavy cow use above Cache Creek have caused siltation and algae growth over most redds.



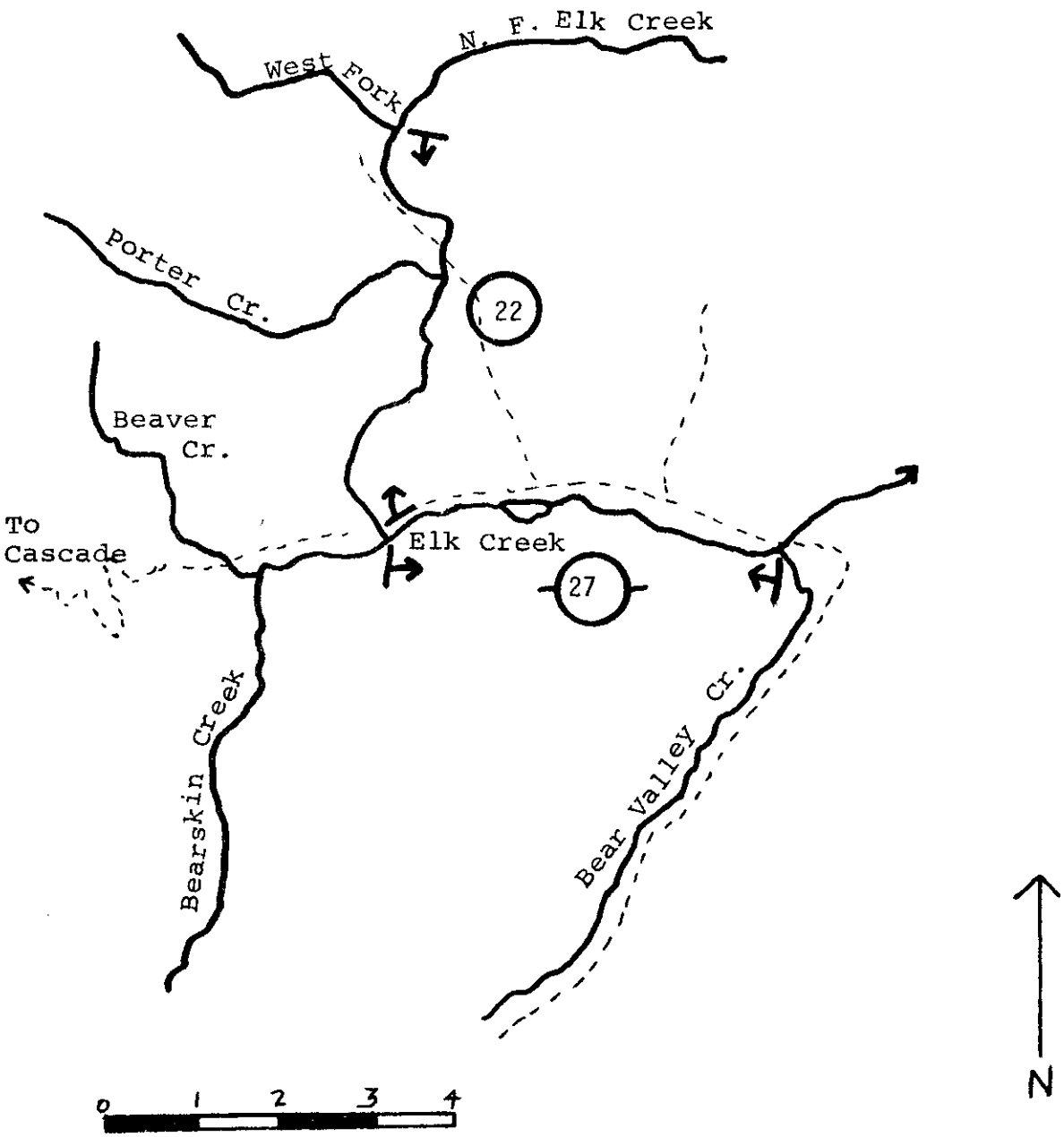
DRAINAGE M. F. Salmon River SURVEY DATE 9/5/79

STREAM Elk Creek MAP SCALE 1" = 2 miles

OBSERVATION CONDITIONS excellent OBSERVER Reid

TIMING: Early On Time Late (mark one)

REMARKS: No live fish. Upper Elk Creek had very little water. Fish were extremely open to predation and poaching.



DRAINAGE M. F. Salmon River

SURVEY DATE August 16, 17, 1980

STREAM Marsh, Beaver, Knapp, Capehorn Creeks

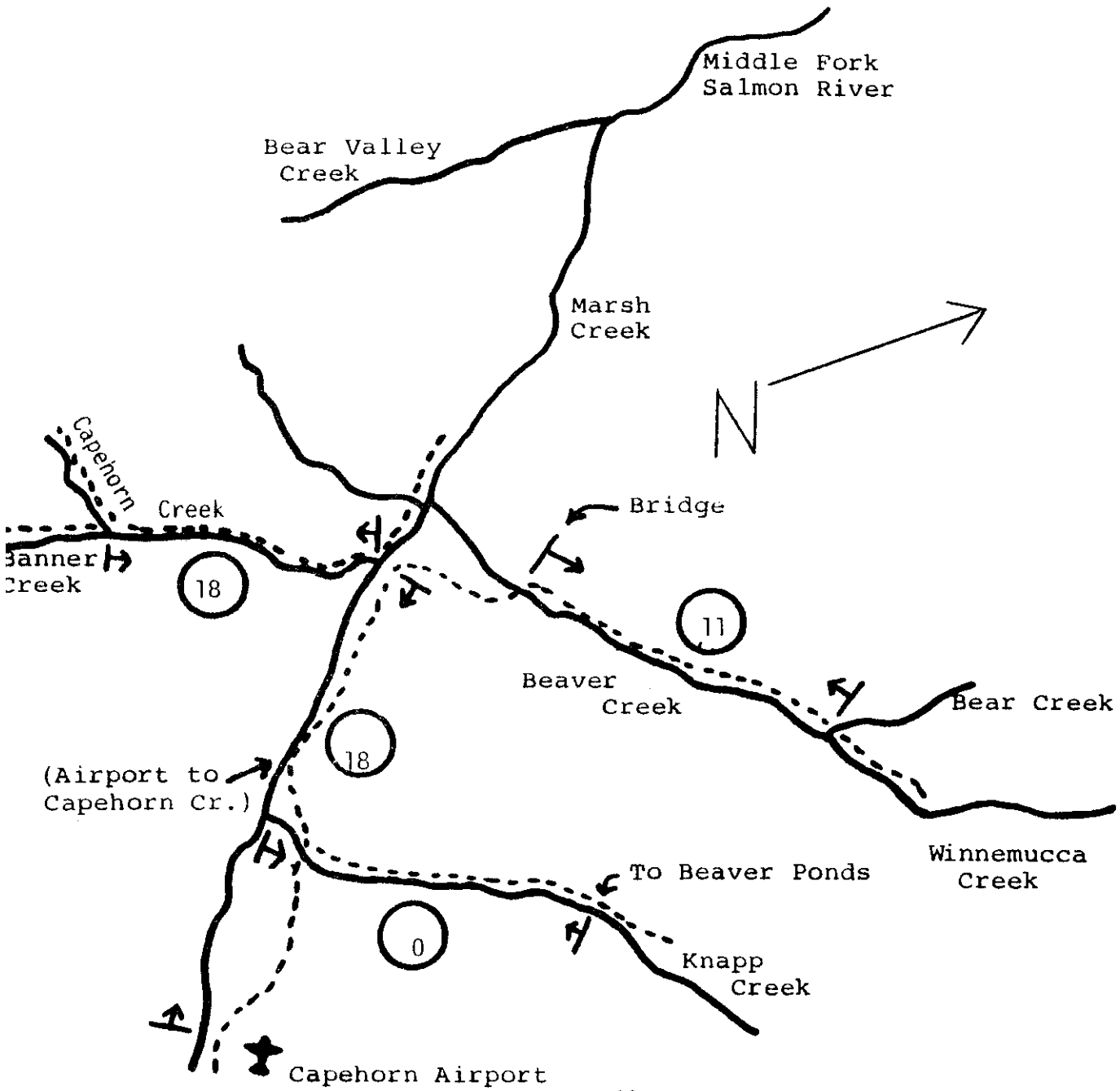
MAP SCALE 2/3" - 1 mile

OBSERVATION CONDITIONS Good

OBSERVER Ball, Reingold, Marshall, Brooks, Pierson

TIMING: Early On Time Late (mark one)

REMARKS: _____



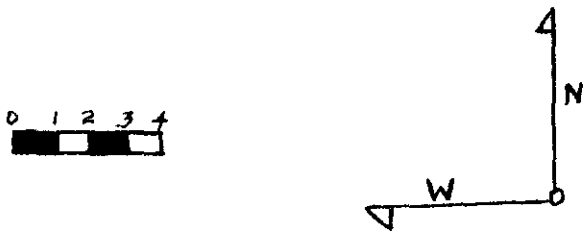
DRAINAGE M. F. Salmon River SURVEY DATE 9/6/79

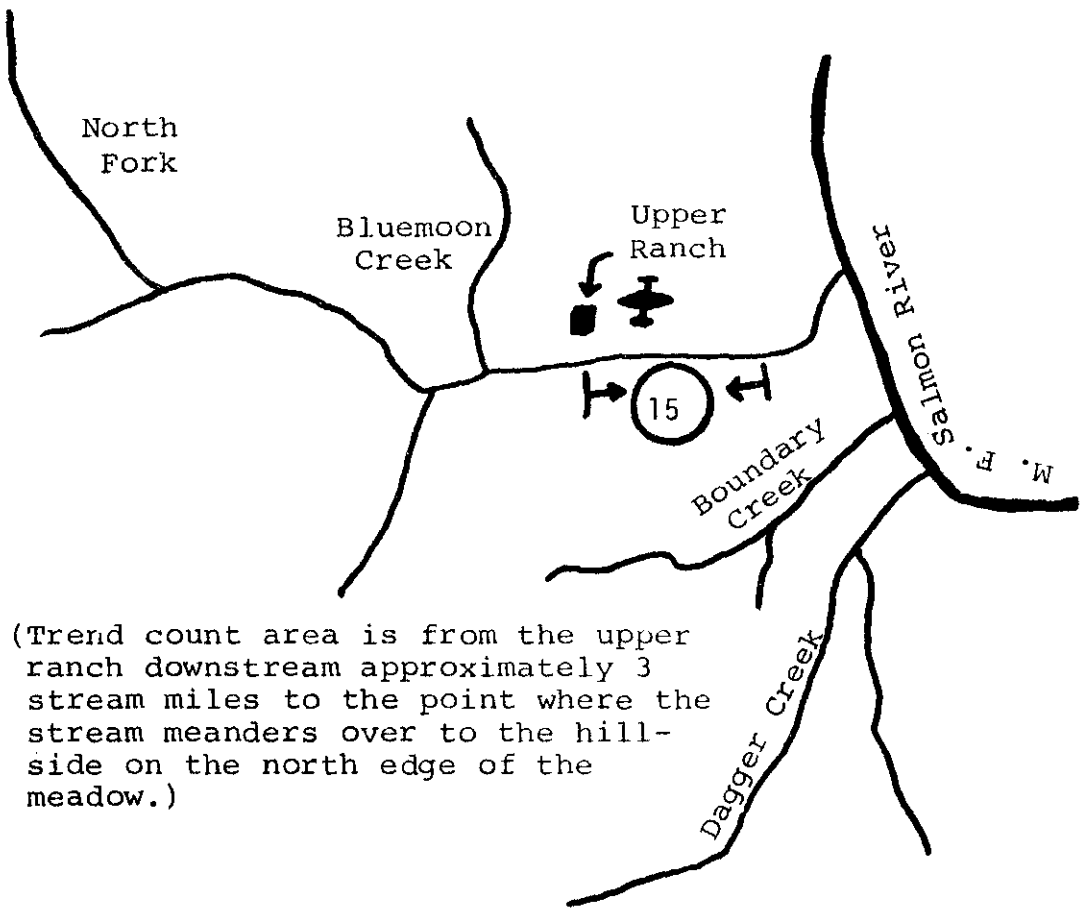
STREAM Sulphur Creek MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS excellent OBSERVER Reid

TIMING: Early On Time Late (mark one)

REMARKS: Almost too late. Some redds were hard to recognize.





(Trend count area is from the upper ranch downstream approximately 3 stream miles to the point where the stream meanders over to the hillside on the north edge of the meadow.)

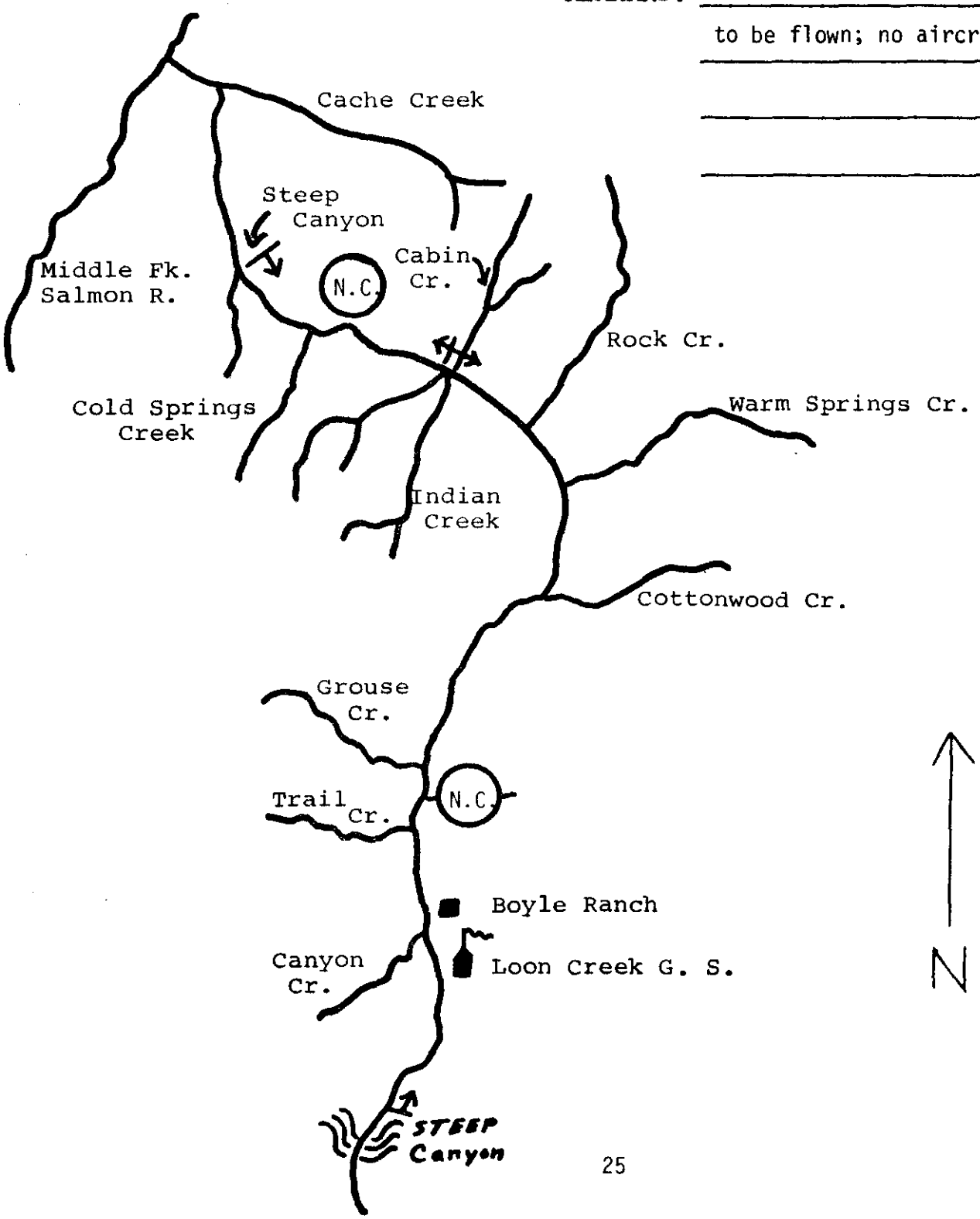
DRAINAGE Middle Fork Salmon River SURVEY DATE _____

STREAM Loon Creek MAP SCALE 1/3" = 1 mile

OBSERVATION CONDITIONS _____ OBSERVER _____

TIMING: Early On Time Late (mark one)

REMARKS: Not counted. Entire stream was to be flown; no aircraft available.



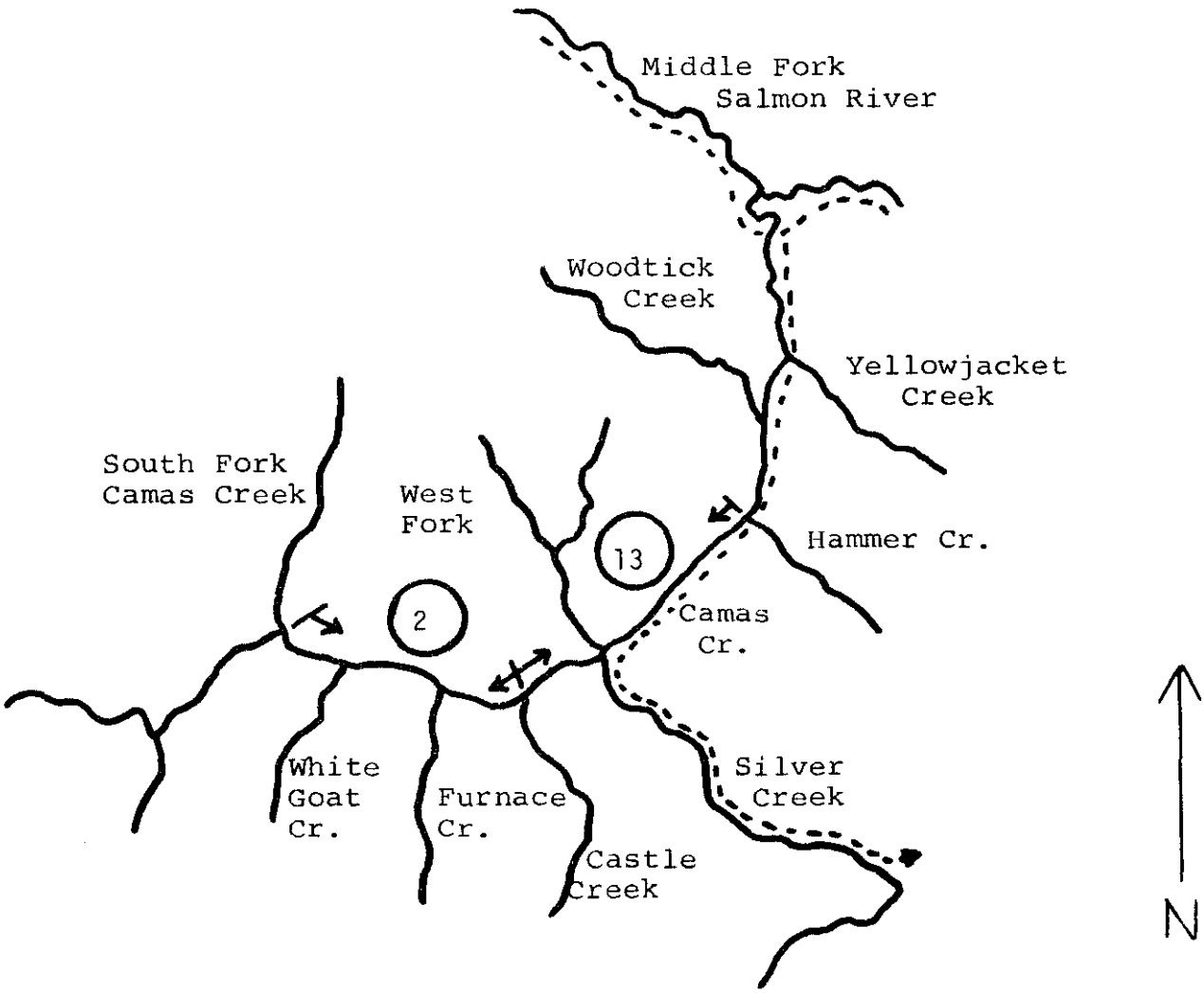
DRAINAGE M. F. Salmon River SURVEY DATE Aug. 26 & 30, 1979

STREAM Camas Creek MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Reingold, Ball

TIMING: Early On Time Late (mark one)

REMARKS: _____



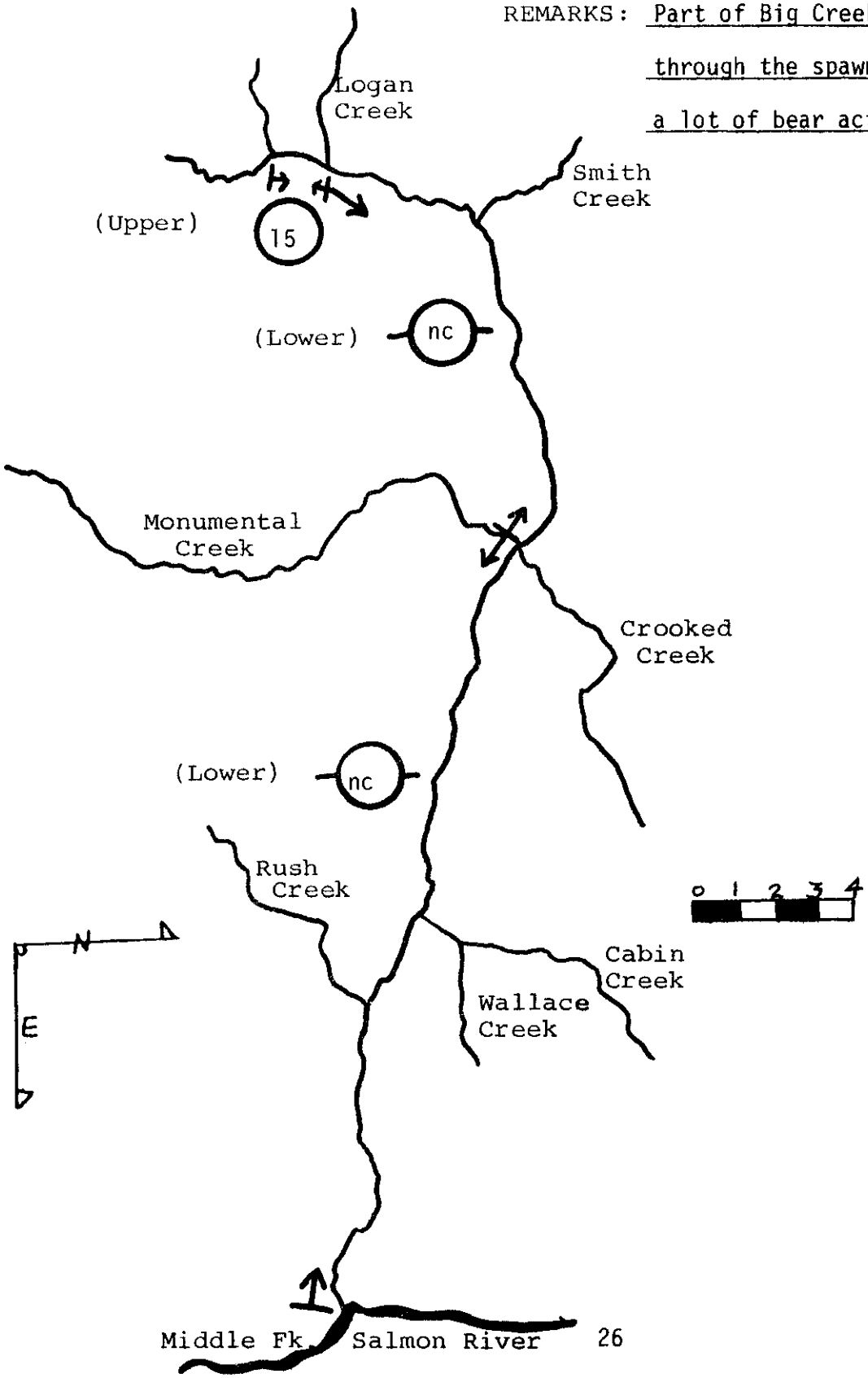
DRAINAGE M. F. Salmon River SURVEY DATE 9/2/79

STREAM Big Creek MAP SCALE 1" = 4 miles

OBSERVATION CONDITIONS _____ OBSERVER Reid

TIMING: Early On Time Late (mark one)

REMARKS: Part of Big Creek ran intermittent through the spawning period. Saw a lot of bear activity in the stream.



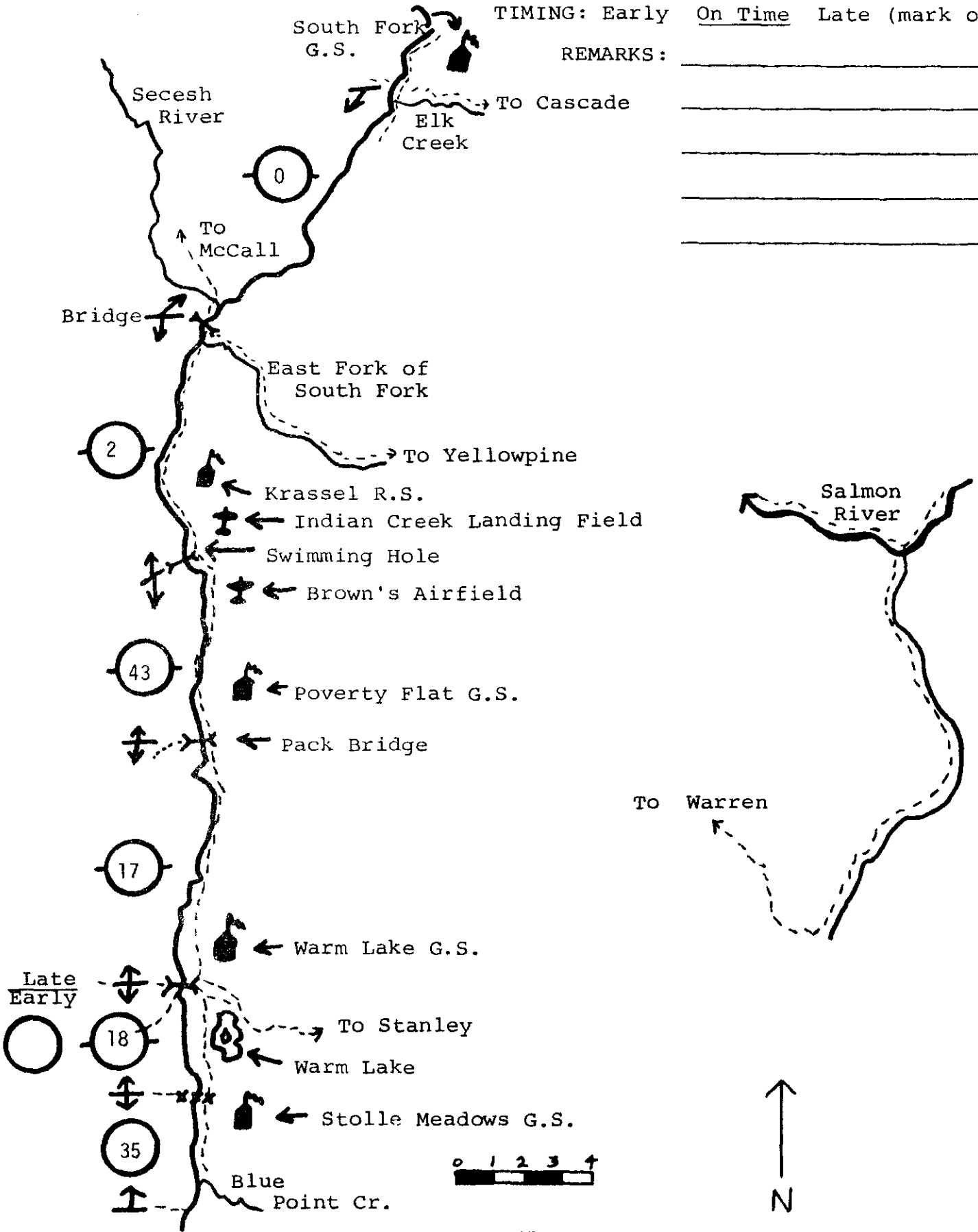
DRAINAGE Salmon River SURVEY DATE 9/12/79

STREAM S. F. Salmon River MAP SCALE 1/4" - 1 mile

OBSERVATION CONDITIONS excellent OBSERVER Reid

TIMING: Early On Time Late (mark one)

REMARKS:



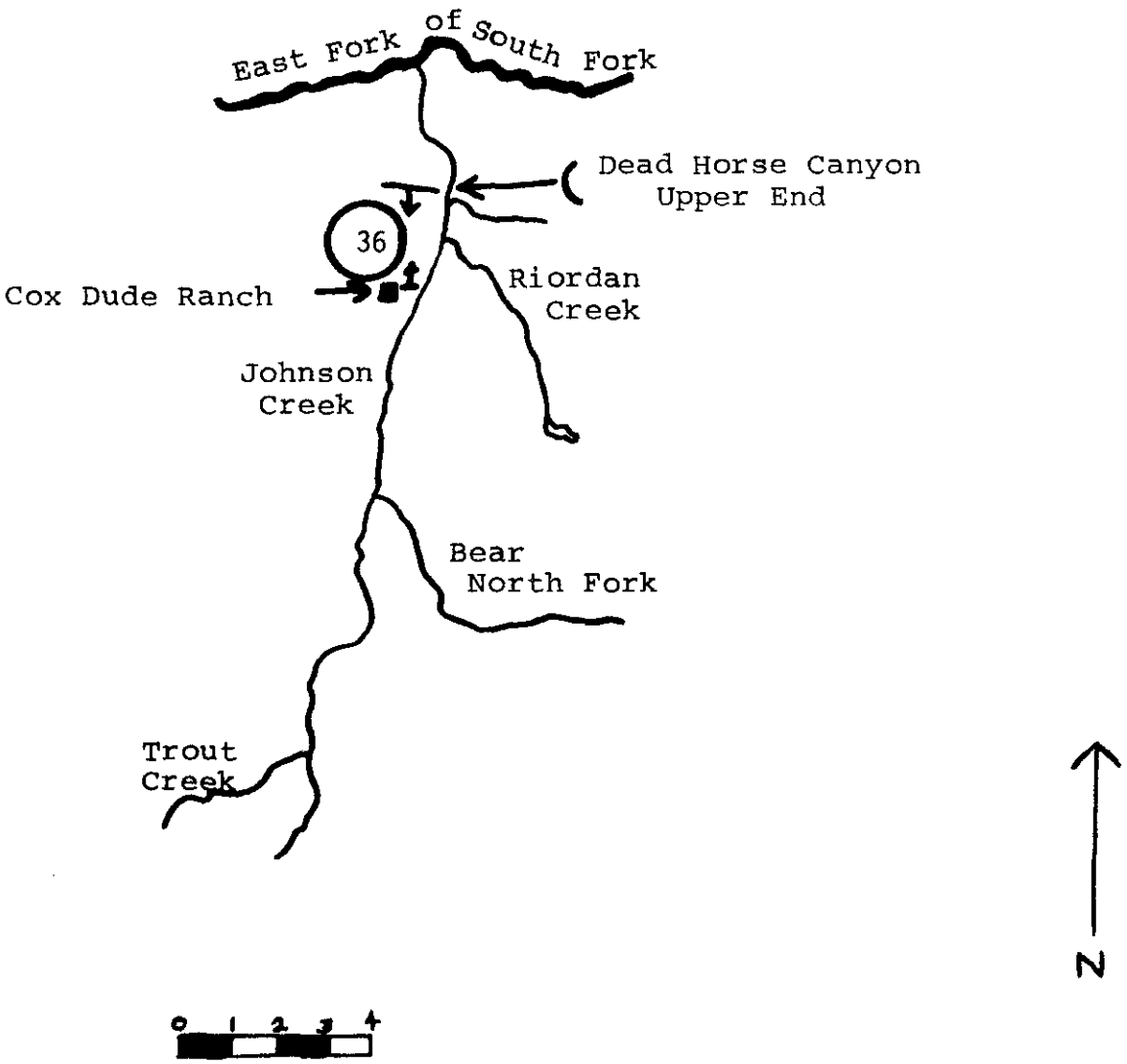
DRAINAGE E. F. of South Fork SURVEY DATE 9/2/79

STREAM Johnson Creek MAP SCALE 1" = 4 miles

OBSERVATION CONDITIONS fair OBSERVER Reid

TIMING: Early On Time Late (mark one)

REMARKS: Overcast and windy - very poor light



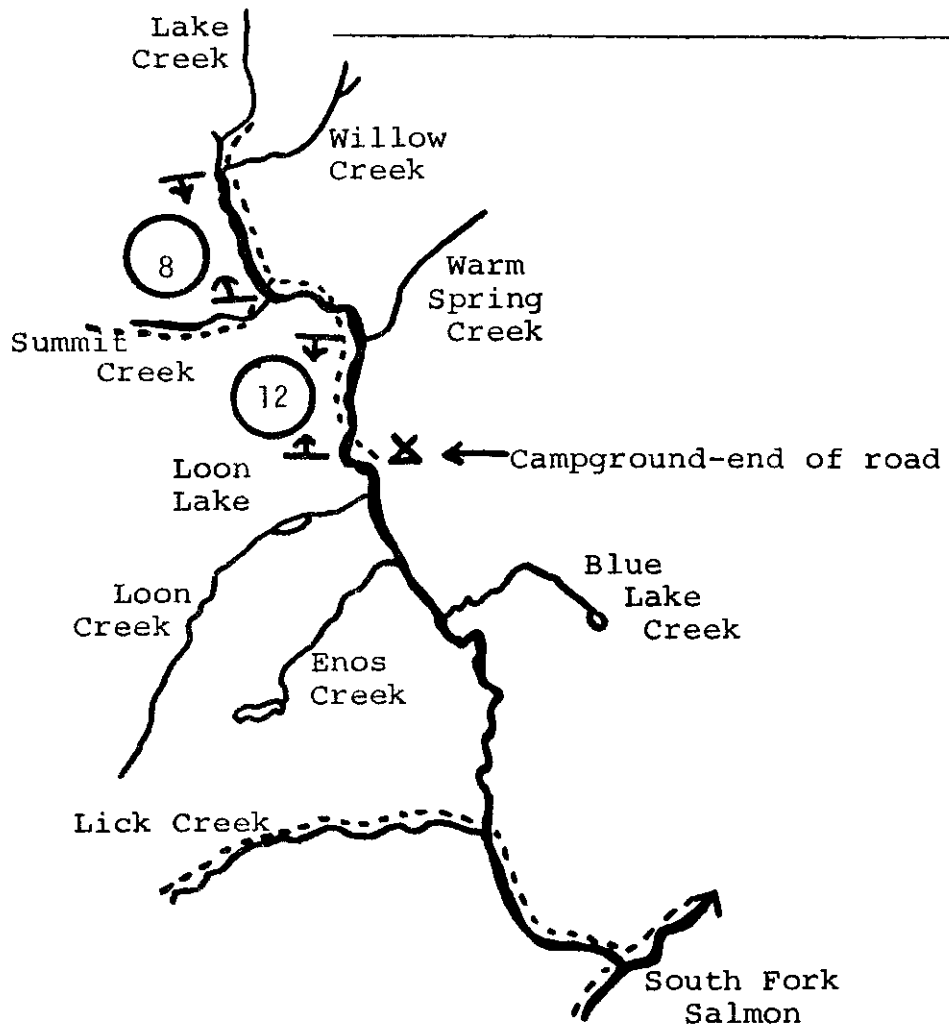
DRAINAGE S. F. Salmon River SURVEY DATE 8/28/79

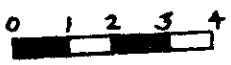
STREAM Secesh and Lake Creek MAP SCALE 1" = 4 miles

OBSERVATION CONDITIONS excellent OBSERVER Anderson

TIMING: Early On Time Late (mark one)

REMARKS:





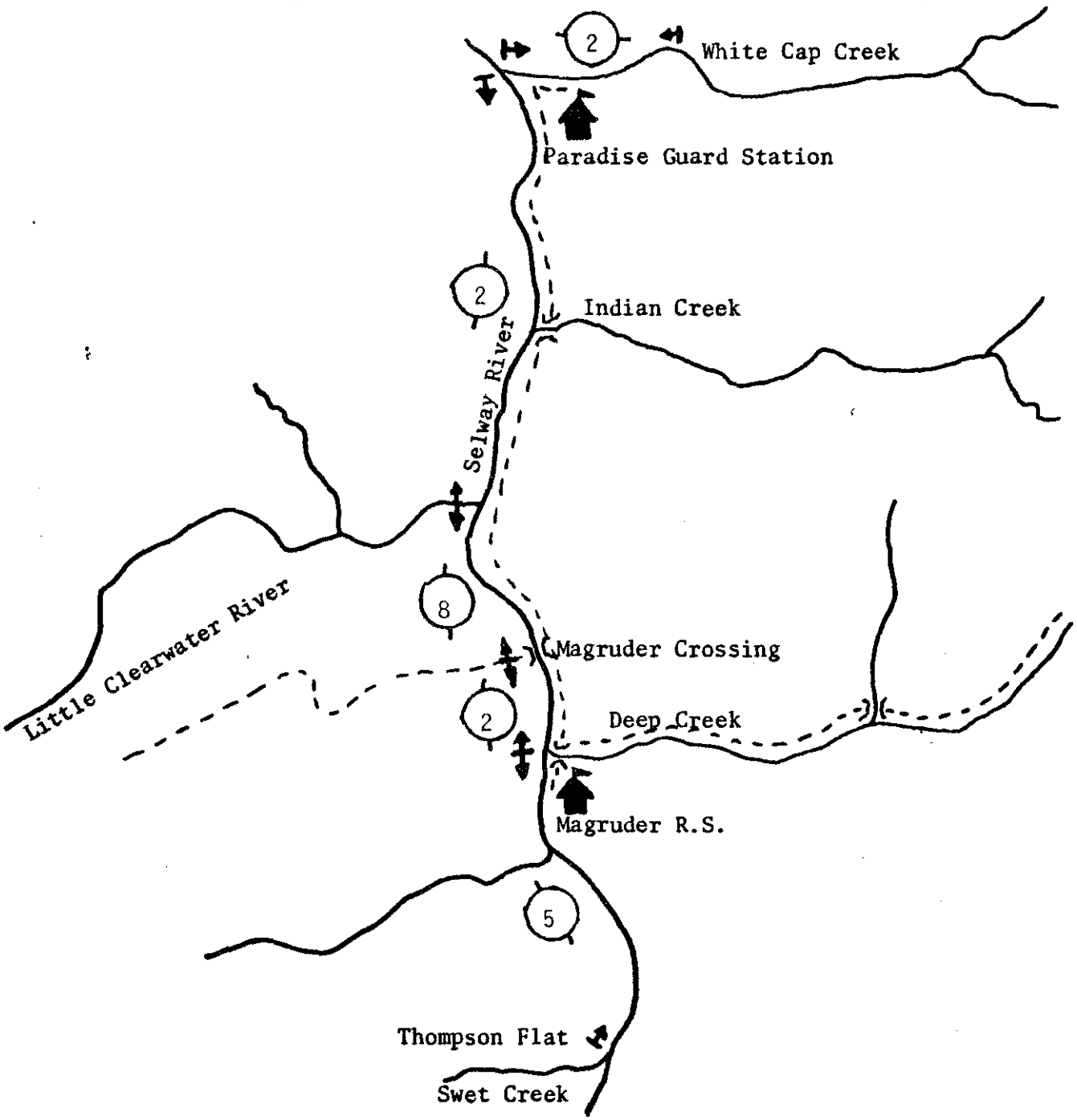
DRAINAGE Clearwater River SURVEY DATE September 7, 1979

STREAM Selway River & tributaries MAP SCALE 1/8" = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Lindland

TIMING: Early On Time Late (mark one)

REMARKS: Sunny weather and low flows made observation conditions very good.



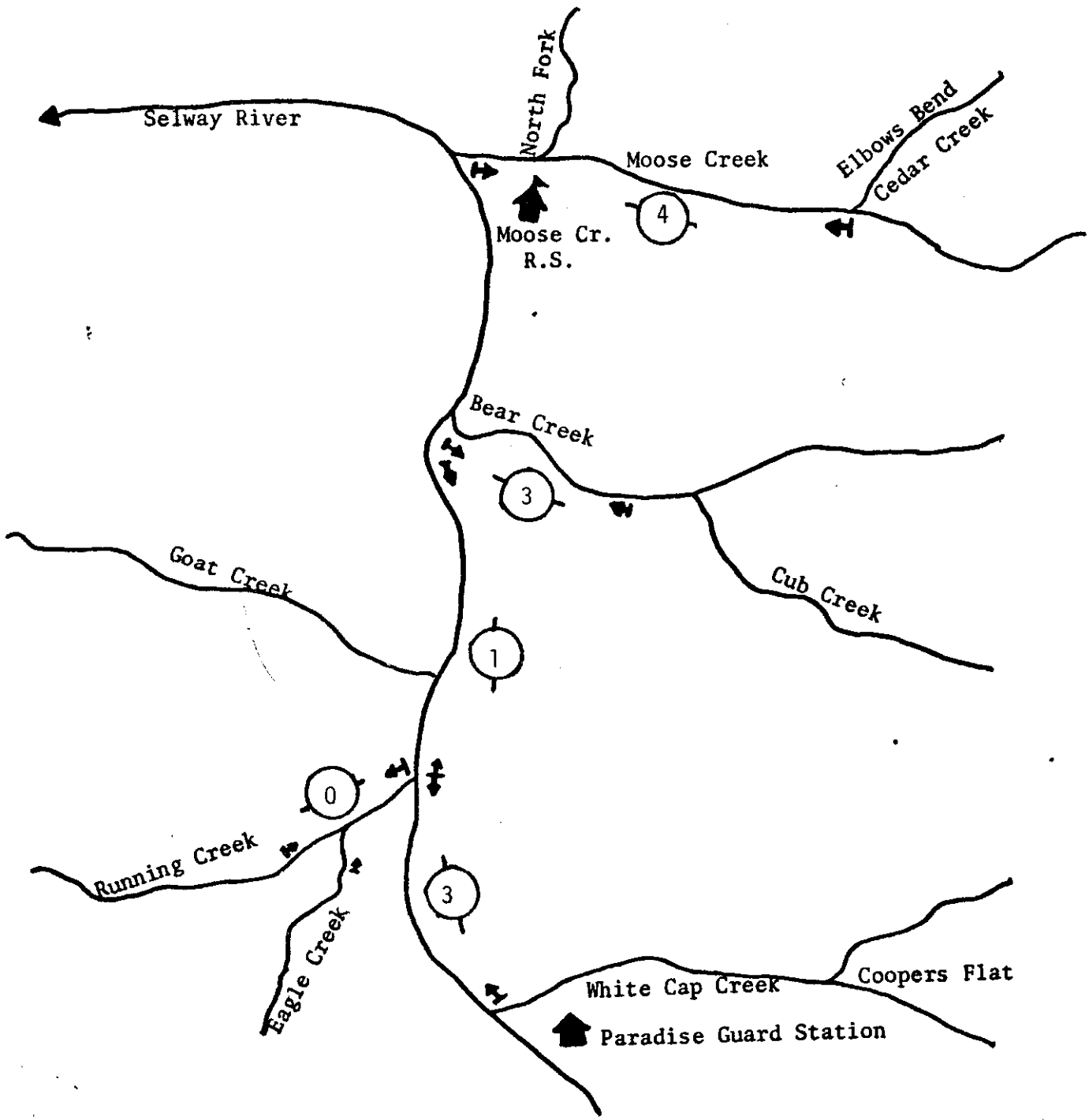
DRAINAGE Clearwater River SURVEY DATE September 7, 1979

STREAM Selway River & tributaries MAP SCALE 1/8" = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Lindland

TIMING: Early (On Time) Late (mark one)

REMARKS: Sunny weather and low flows made observation conditions very good.



DRAINAGE Lochsa River

SURVEY DATE Aerial - August 30, 1979
Ground - August 24, 1979

STREAM As noted

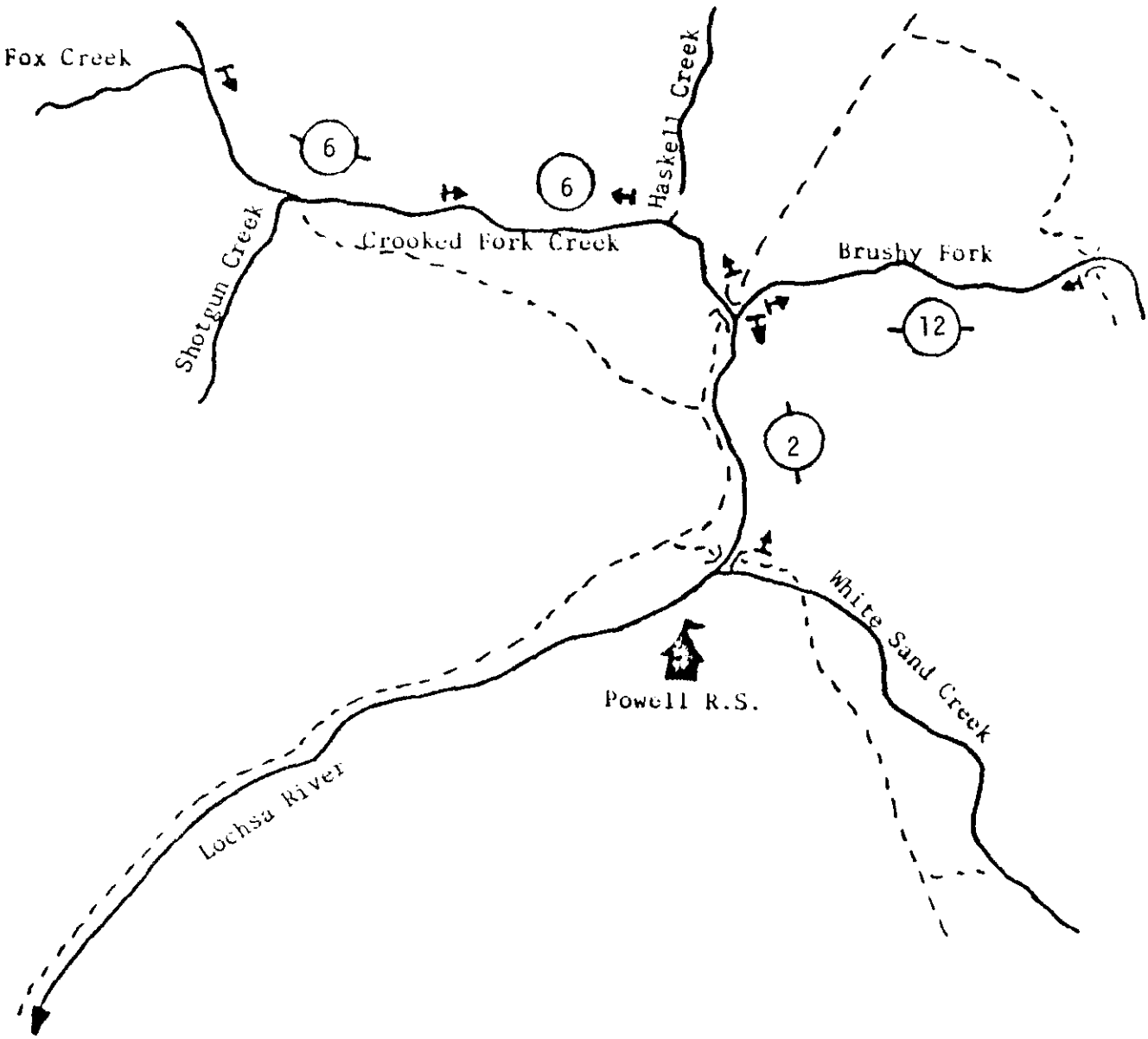
MAP SCALE ¼ inch = 1 mile

OBSERVATION CONDITIONS Good

OBSERVER Lindland

TIMING: Early (On Time) Late (mark one)

REMARKS: Both aerial and ground counts were done during sunny weather and low flows.



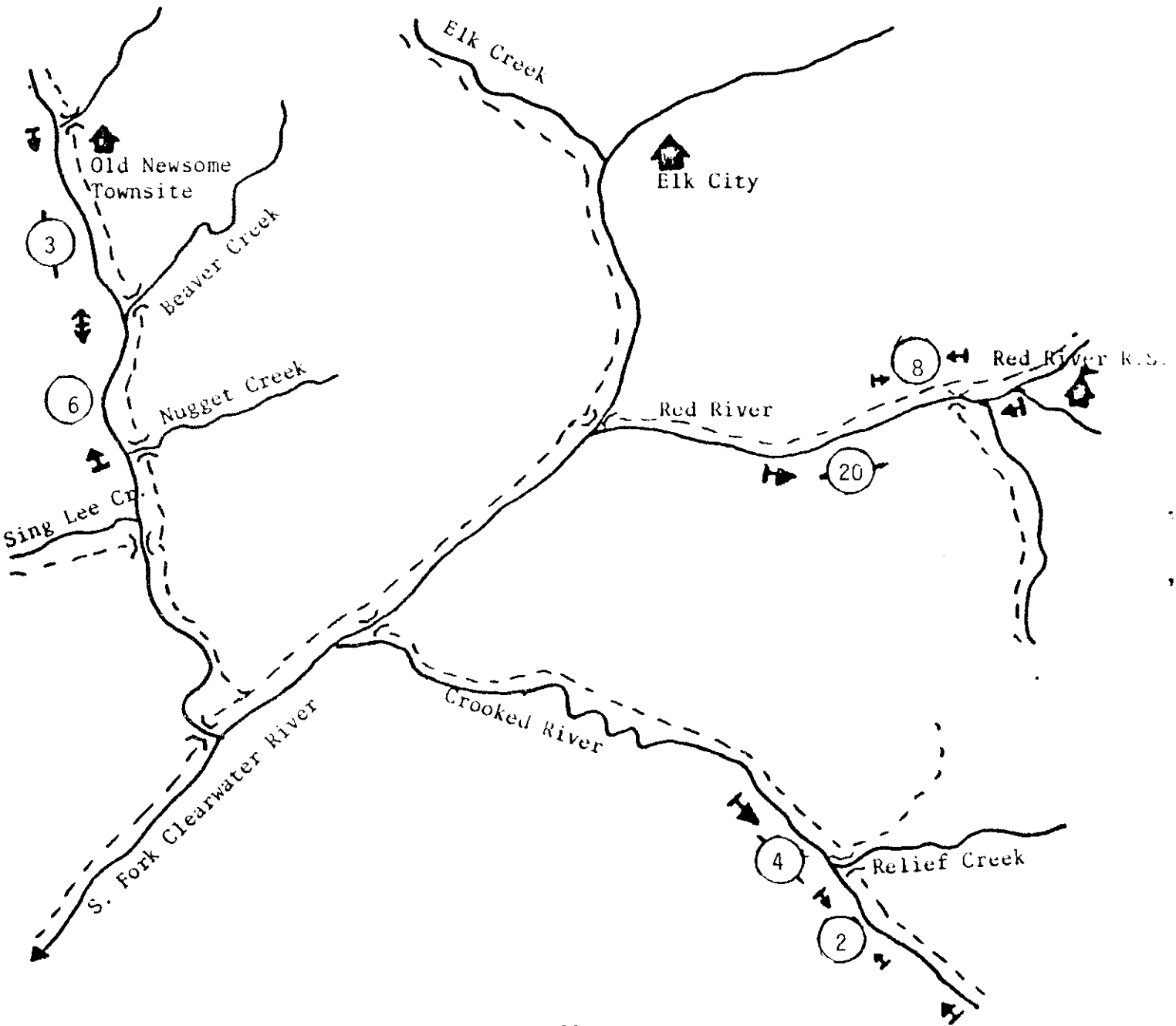
DRAINAGE S. Fork Clearwater R. SURVEY DATE Aerial - September 24, 1979 Ground - September 13, 1979

STREAM As noted MAP SCALE ¼ inch = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Lindland (Ground) Cannon (Aerial)

TIMING: Early On Time Late (mark one)

REMARKS: Sunny weather and low water for both ground and aerial counts. The aerial count was about a week late.



Submitted by:

Ronald L. Lindland, Regional Fishery Biologist
Kent W. Ball, Regional Fishery Biologist Will W. Reid, Regional Fishery Manager

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

Robert L. Salter, Acting Director

Stacy Gebhards, Chief
Bureau of Fisheries

Jerry Mallet
Fishery Research Supervisor
Bureau of Fisheries