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MARINE FISHERIES
P.O. BOX 706, EUREKA, CALIF.

SILVER SALMON

MARK RECOVERY & SPAWNING SURVEY
NORTHERN CALIFORNIA COASTAL STREAMS

FALL 1953

Bill Jong
California Department of Fish & Game
North Coast California Coho Salmon
Investigation
5341 Ericson Way
Arcata, California 95521

By:

Ralph B. McCormick and
Elvn G. Gunderson

Marine Fisheries Branch Lab.
Eureka, California

STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME
INTRAOFFICE CORRESPONDENCE

DATE April 6, 1954

TO: Eldon P. Hughes
Marine Fisheries Branch - Stanford

FROM: Ralph B. McCormick
Marine Fisheries Branch - Eureka Lab.

SUBJECT: Report on Silver Salmon Carcass Recovery - Fall 1953

Attached is the above named report. In scope it is historical rather than analytical; hence the data is essentially basic and only briefly summarized.

There are several aspects to this work that should be considered in regard to future work. I have two basic ideas to suggest but have not had time to give full consideration to expanding and applying them to our circumstances. In the near future I would like to get together with you and kick the ideas around to see what we could do with them.

1. The first idea - Either in cooperation with Inland Fisheries or as a separate effort, give full consideration to the salmon potential of one stream at a time. By nature, the silver salmon recovery this past fall required a great spread in our efforts. Even though the streams are relatively small, the effort was spread too thin. I feel it is more to the point to spend several years evaluating a given watershed and come up with some answers, than to spend the same time superficially examining a number of areas too large to assess a value.

2. The second idea - Pick one or two index streams and make those our main concern for the area. Perhaps in this regard fish counts from existing facilities at Benbow Dam, Sweasey Dam and Klamathon Racks are sufficient.

A small project that I have worked on but not included in this report is that of correlating rainfall, fish counts, and lumber production (logging effects). Perhaps in the future you could look this material over. Perhaps it would not warrant further investigation.

In general, I feel the carcass recovery of silvers was successful as far as stream coverage was concerned. The runs were at a low ebb and low recovery numbers were to be expected.

Sincerely,

Ralph B. McCormick
Junior Aquatic Biologist
Eureka Lab

RBMc:rm

INTRODUCTION

California's silver salmon marking program utilized fingerlings from coastal streams of Del Norte and Humboldt Counties (Hallock, Warner, and Fry; 1952). Subsequent sampling programs have sampled commercial and sport catches for these and other marked populations during the ocean phase of their life. A spawning survey was made during the fall of 1952 to attempt recoveries from a small number of marked silver salmon from the brood year of 1949 (McCormick and Haley; 1953 - unpublished report). The fall of 1953 was the spawning season in which marked silver fingerlings of the 1950 brood year were to return as spawning adults. During the 1953-54 (October 1953 - February 1954) spawning season a program of stream checking was carried on to obtain information on the number of marked fish returning to the streams in which they were released. During this time, other information was gathered, such as: extent of available spawning gravel; utilization of gravel; size of fish; sex ratios and spawning success.

Although the main interest centered on silvers, king salmon data also was obtained. Prior to the post-spawning die-off of silvers, several weeks were spent on the South Fork of the Eel River in an attempt to initiate the use of a skiff in stream checking. During the concentrated silver survey, data also was kept on all king salmon encountered.

The purpose of this report is to present the tabulated survey data and an account of field experiences. It is hoped that this method will provide the statistics with more value and utility.

A total of five men were employed at one time or another. McCormick (biologist in charge) and Gunderson (Fish Hatchery Assistant) were the only permanent employees. Three Seasonal Aids were employed at various times as follows: John Wilson was employed from November to mid-January. Kenneth Gelatt was employed the last two weeks of December. Ralph Cole was employed for a short period during early November. The usual field complement at any given time was three men.

Inland Fisheries Branch has continued the Mad River study during this spawning season. Mr. Floyd Anders turned over to the Marine Fisheries Lab a summary of all Mad River salmon carcass checking data. It has been previously agreed upon that in return for this information, Marine Fisheries personnel would be responsible for checking the Lindsey Creek watershed. At the end of the survey, a copy of the salmon data from the Lindsey Creek system was turned over to Mr. Anders.

MATERIALS AND THEIR USE

Field Office

1. House Trailer - sleeping accommodations and use as a field office.
2. Transportation Vehicles - Ford Ranch Wagon; 3/4-ton Dodge truck.
3. Metal Notebooks, 8½" x 11" - to hold field office data sheets.
4. Paper, 8½" x 11", Mimeographed, Cumulative Data Sheets - to accumulate daily records.
5. Skiff, 14-foot Plywood, and Trailer - for use on larger streams and rivers.

Individual Field Equipment

1. White Plastic Data Sheets, $3\frac{1}{2}$ " x 6" Semi-rough, and Soft #2 Pencils - for recording data.
2. Metal Tape in Metric Graduations - for length measurements.
3. Machette - for chopping carcasses.
4. File, 8" - to sharpen machette.
5. Gaff with 8-foot Calcutta Handles - for picking up carcasses.
6. Chest-high Waders and Rain Gear (Neoprene Coat and Hat).
7. Detachable Metal Soles with Calks - for waders.

Field Methods

Field methods closely paralleled those reported for the previous year (McCormick and Haley; 1953 - unpublished report). Several aspects of this year's work were different and are described in the following paragraphs.

Light-weight rubber waders were used this year and proved to be an indispensable aid in the field. This is contradictory to the prophecy in the 1953 report.

In conjunction with the waders, two pairs of detachable "boot calks" were used. These calks were found to be of considerable assistance on streams where there were large log jams or on streams having a hard clay or shale bed to traverse. Care must be taken not to puncture the waders with these calks.

A State-owned house trailer was used this season as a field headquarters. It proved to be an indispensable item. Without the trailer, it would have been financially impossible for the crew to have spent two consecutive months in the field as was done.

The carcass checking routine was slightly different this year due to the desirability of obtaining random lengths of the spawned-out carcasses. The usual carcass checking procedure this year is outlined as follows: When a carcass was encountered, the first step was to determine species. Then all fins were carefully checked to see if the fish had been fin-marked. Measurement of the caudal fork length to the nearest even-numbered centimeter was the next step. Then, using the gaff, the carcass was held off the ground head up and cut in half with the machette. The sex and condition of the gonads were noted and all of the data was recorded. If the fish were fin-marked, the mark combination, species, size, sex and condition were recorded separately from the non-marked fish. All of this recording was done on the $3\frac{1}{2}$ " x 6" plastic field sheet.

STREAM COVERAGE

General

Actual coverage of spawning areas is seldom easy. In this North Coast area the weather, rugged terrain, and log jams are major deterrents to extensive or periodic inspection of spawning streams. Another factor is the tendency of silver salmon to disperse into the small coastal streams and into the tributaries of the larger rivers. This makes it necessary to cover large areas in order to obtain a significant number of carcasses. Also in this regard, these smaller tributaries are less likely to have passable roads or trails in close proximity.

Due to heavy rains, the fluctuating water level of the streams usually does not leave dead fish in shallow water. Even though the carcasses may remain in shallow areas, heavily silted flood waters often

keep even these obliterated. Under ordinary circumstances there is enough turbidity to prevent recovery in water more than four or five feet deep.

Maintenance of good roads in this area is virtually impossible. During the winter storms, even major highways may be impassable for extended periods. Most streams have a network of dirt roads in the watershed but ranchers and lumber firms may not allow trespass during the winter, the reason being that if these dirt roads become rutted during the winter, they will not drain and dry out in the summer as will the unbroken roads.

Most all streams contain numerous log jams. The main stem of major rivers is the only exception. These jams usually slow down stream coverage considerably. Climbing over log jams is not an advised procedure and is not done unless circumvention is impossible. It is fatiguing and dangerous work to climb over these masses of slippery logs. A slip could mean anything from a bruise to drowning. Boot calks were an asset. Great care was used in traversing jams but nonetheless bruises and punctured waders were acquired.

Besides the log jams, many streams have wide, deep holes which force a person to climb out of the river bed and force his way along the bank until he is past the deep water and can work down into the river bed and continue onward. All stream coverage was done by staying in the stream bed and wading until forced to detour. This circumvention of deep holes and jams was often difficult.

The banks of North Coast streams are usually a near impenetrable jungle of logging debris, windfalls, alders and ferns. Interlaced

in this maze is a heavy growth of salmon berry brush, which bristles with thorns. Pushing one's way through this riparian growth is a slow painful process. Rubber waders suffer numerous small thorn pricks, all of which allow water to seep in around one's feet.

All stream checking was done on foot. Stream coverage with three men was planned so as to eliminate back tracking wherever possible. In some cases, due to lack of access roads or to trespass refusal, back tracking could not be avoided.

As near as can be figured from our daily records and map computations, 150 miles of stream bed were covered on foot in quest of salmon carcasses. This figure does not include any back tracking. This is a "one-way" mileage.

Specific Areas Covered

The following paragraphs give a brief account of the areas covered on each creek.

In general, the spawning gravel was underutilized. Spawning redds were usually well distributed over the available area but were few and far between.

Attempts were made, where possible, to estimate the percent of spawning run that was checked. In most cases, due to high and turbid waters or to lack of periodic checking, an estimate of the run could not be made. In some areas, number of carcasses cut exceeded the number of live fish seen.

1. Bull Creek - Was checked from the mouth to Cuneo Creek. Most of Cuneo Creek and lower Mill Creek were checked.
No estimation of the run could be made.

2. Elk River - The north fork was the only section of the creek covered. The area from 2 miles above the old Carson Co. logging camp to 2 miles below this point was covered. The upper 2 miles was the only area containing spawning silvers.
An estimated 30 percent of the fish in this area were checked.
3. Freshwater Creek - Cloney Creek and a 1-mile stretch above the County park on Freshwater were checked.
About 75 percent of the fish on Cloney Creek were checked.
4. Jacoby Creek - Spotty coverage from Bayside to $\frac{1}{2}$ mile above Sound Lumber Company entrance road.
No size estimation on size of run.
5. Lindsey Creek - East Fork, Grassey Creek and Squaw Creek each were given coverage from mouth to $\frac{1}{2}$ mile above the road. Upper areas of Lindsey covered above and below the railroad trestle. West Fork was also checked. Most of the main creek was covered from the West Fork down but no spawning areas found.
An estimated 75 percent of the total run was checked.
6. Noisey Creek - Covered from the mouth to $\frac{1}{2}$ mile above the Highway 299.
No estimation of the total run.
7. Redwood Creek - Spot checks above and below Highway 299 bridge; the lower 1 mile of Captain Creek was also covered.
No estimation of the run.

8. Prairie Creek - Boyes Creek and Godwood Creek were covered.
Prairie Creek from the old swimming hole to 1 mile below Mae Creek was covered.
An estimated 30 percent of the total run was checked.
9. High Prairie Creek - Coverage of this entire creek was made from above the Yurok Forest Headquarters down to the marsh below Highway 101.
No estimation of the run.
10. Wilson Creek - The lower 4 miles covered.
No estimation of the run.
11. Mill Creek - From the forks, the west fork upstream was covered for 3 miles, and the east fork upstream was covered for 3 miles. The main stream was covered from the confluence of the forks down to the Smith River.
More silver carcasses were examined than live fish seen.

CARCASS RECOVERY

King Salmon Recovery

Work was begun on the South Fork of the Eel River on November 10. The main purpose was to initiate the use of a large skiff in conducting carcass checking activities for king salmon. This system has been used so successfully on the Sacramento River that it was hoped the method could be adapted to the larger rivers on the North Coast. After twenty-five days, this year's attempt ended with a resounding "flop"!

On the 10th of November, men and material were assembled at Garberville; it was raining. The following day the river was too

muddy to warrant using a skiff. During this day and the following twenty-two days, limited coverage on foot and spot checks by car were conducted while awaiting favorable water conditions for skiff use. Rains continued to fall during every one of those twenty-two days. At one time the flow over Rainbow Dam rose eight and one-half feet. Various tributaries and stretches of the main river were checked periodically. Due to logging activities in all of this area all flows remained heavily silted. At times a bright object could not be seen four inches below the surface.

Contact was kept with local wardens on water conditions of the main Eel River in hopes that activities could be shifted to that stream. It was anticipated that the river between Fort Seward and Dyerville could be checked by using the skiff. Water conditions never warranted this check. At times, no access roads were passable in the area.

On December 14th, men, material, and effort was shifted northward to Klamath to concentrate on the coastal streams containing releases of marked silver salmon. Weather and water conditions were far from favorable. Early in December much of the work was done in pouring rain which often turned to sleet and hail. Streams were high, cold and swift. However, due to the press of time, field work was carried on in spite of the adverse conditions.

Silver Salmon Recovery

1. Marked Fish Streams -

In the spring of 1951, silver fingerlings for marking were seined from thirty-one coastal streams. These fish, after being fin-marked at Prairie Creek Hatchery, were released in ten of the larger coastal streams. Table 4 gives a condensed summary of the

fingerling releases and subsequent carcass recoveries three years later. With weather, terrain and size of field crew considered, coverage of silver streams was as good as could be expected. Personnel stayed in the field seven days a week during December to take full advantage of any favorable conditions to obtain a maximum number of carcass recoveries. Generally speaking, field time was allotted to a stream in direct proportion to the number of marked fish released therein. It was a physical impossibility to cover all streams completely.

The following streams were given coverage:

- | | |
|------------------------|----------------------|
| (1) Mill Creek | (6) Lindsey Creek |
| (2) High Prairie Creek | (7) Jacoby Creek |
| (3) Prairie Creek | (8) Freshwater Creek |
| (4) Lost Man Creek | (9) Elk River |
| (5) Redwood Creek | |

Little River was not given any coverage at all.

2. Non-Marked Fish Streams -

It was desirable to cover streams in which no marked fish had been released to obtain information on the "straying" of returning adults from their brood stream. Proper coverage on mark release streams required nearly full use of available time and men. Bull, Noisey and Wilson Creeks were the only "non-mark" creeks given extensive coverage; few carcasses were obtained. However, some evidence of homing tendency is shown in the composite data from Mad River and is summarized in Table 5.

Table 1

DISTRIBUTION OF SILVER SALMON SPAWNING RUNS
MAD RIVER AND SOUTH FORK OF EEL RIVER
HUMBOLDT COUNTY, CALIFORNIA

October 1953 to February 1954

Weekly Interval	Benbow Dam		Sweasey Dam	
	No. Fish	% of Run	No. Fish	% of Run
Oct. 12 - 18 1953	0	0.0	0	0.0
Oct. 19 - 24	0	0.0	7	7.6
Oct. 25 - 31	0	0.0	0	0.0
Nov. 1 - 7	0	0.0	0	0.0
Nov. 8 - 14	43	1.4	1	1.1
Nov. 15 - 21	284	9.3	10	10.9
Nov. 22 - 28	978	32.0	6	6.5
Nov. 29 - Dec. 5	456	14.9	21	22.8
Dec. 6 - 12	561	18.4	5	5.4
Dec. 13 - 19	391	12.8	23	25.0
Dec. 20 - 26	162	5.5	2	2.2
Dec. 27 - Jan. 2	4	0.1	5	5.4
Jan. 3 - 9 1954	106	3.5	7	7.6
Jan. 10 - 16	59	2.0	5	5.4
Jan. 17 - 23	7	0.2	0	0.0
Jan. 24 - 30	0	0.0	0	0.0
TOTALS	3,051	100.1 %	92	99.9 %

Table 2

SILVER SALMON
CARCASS RECOVERIES
NORTH COAST CALIFORNIA FALL 1953
Marine Fisheries

	Bull Creek	Elk River	Fresh- water Creek	Jacoby Creek	Lindsey Creek	Noisey Creek	Redwood Creek	Prairie Creek	High Prairie Creek	Wilson Creek	Mill Creek	TOTAL
Male - Large*												
Spent	1	15	2	2	15	1	1	15	1	1	19	73
Part Spent	0	2	0	0	1	0	0	2	0	0	0	5
Ripe	0	1	0	0	0	0	0	1	0	0	0	2
Total	1	18	2	2	16	1	1	18	1	1	19	80
Small*												
Spent	0	1	0	1	0	0	0	0	0	0	1	3
Part Spent	0	1	3	0	0	0	0	0	0	0	0	4
Ripe	0	1	0	0	0	0	0	0	0	0	0	1
Total	0	3	3	1	0	0	0	0	0	0	1	8
TOTAL MALES	1	21	5	3	16	1	1	18	1	1	20	88
Females - Large												
Spent	0	13	3	4	30	2	3	15	0	0	17	87
Part Spent	0	0	0	0	0	0	1	0	0	0	0	1
Ripe	0	1	0	0	0	0	0	0	0	0	0	1
Total	0	14	3	4	30	2	4	15	0	0	17	89
Small												
Spent	0	0	0	0	0	0	0	0	0	0	1	1
Part Spent	0	0	0	0	0	0	0	0	0	0	0	0
Ripe	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	1	1
TOTAL FEMALES	0	14	3	4	30	2	4	15	0	0	18	90
Sex Doubtful	0	0	0	0	1	0	0	1	0	0	3	5
TOTAL Fish Fin- checked Skeletons	1	35	8	7	47	3	5	34	1	1	41	183
	1	3	3	0	5	0	1	1	2	0	0	16
OVER-ALL TOTAL	2	38	11	7	52	3	6	35	3	1	41	199

* Refers to over or under commercial size limit. (22 7/8 inches CFL - 25 inches TL).

NORTH COAST CALIFORNIA FALL 1953

Inland Fisheries

	Mad R. below Sweasy	N. R. Mouth to Falls	Mad. to Canyon Creek	TOTAL	Marine Fisheries- Inland Fisheries GRAND TOTAL
Male - Large*					
Spent	2	7	3	12	85
Part Spent:	0	0	0	0	5
Ripe	0	0	0	0	2
Total	<u>2</u>	<u>7</u>	<u>3</u>	<u>12</u>	<u>92</u>
Small*					
Spent	0	4	0	4	7
Part Spent:	0	0	0	0	4
Ripe	0	0	0	0	1
Total	<u>0</u>	<u>4</u>	<u>0</u>	<u>4</u>	<u>12</u>
TOTAL MALES	2	11	3	16	104
Female - Large					
Spent	0	4	3	7	94
Part Spent:	0	0	0	0	1
Ripe	0	0	0	0	1
Total	<u>0</u>	<u>4</u>	<u>3</u>	<u>7</u>	<u>96</u>
Small					
Spent	0	0	0	0	1
Part Spent:	0	0	0	0	0
Ripe	0	0	0	0	0
Total	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>
TOTAL FEMALES	0	4	3	7	97
Sex Doubtful	0	0	0	0	5
TOTAL Fish Fin- checked Skeletons	2	15	6	23	206
OVERALL TOTAL	<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>16</u>
	2	15	6	23	222

* Refers to over or under commercial size limit. (22 7/8 in. CFI - 25 in. TL.)

Table
SILVER SALMON
CARCASS RANDOM LENGTHS
NORTH COAST
NOVEMBER 1953 - FEBRUARY 1954

	Mill Creek : : (Smith R.) :	Prairie : Creek :	Lindsey : Creek :	Elk : River :	Freshwater : Creek :	Redwood : Creek :	Jacoby : Creek :								
Cm.	: Dec. 9, 10, : Dec. 14, 15, 22 : Dec. 12, 17, : Dec. 23														
F.L.	: 29, 30, Feb. 5 : 29, 31, Feb. 4 : 25, Jan. 11 : Jan. 1														
	: ♂	: ♀	: ♂	: ♀	: ♂	: ♀	: ♂	: ♀	: TOTAL						
30															
32															
34															
36															
38															
40															
42															
44															
46															
48															
50															
52															
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70															
72															
74															
76															
78															
80															
82															
84															
86															
88															
90															
	18	17	18	15	13	23	18	14	5	2	6	3	5	79	80

* Nolsey Creek carcasses, Dec. 21 and Jan. 11.

** High Prairie and Wilson Creek carcasses, Dec. 29.

Table 4

SILVER SALMON MARK RECOVERY
Wild Fish from
Coastal Streams of Northern California
Fall 1953

Stream	County	Marked Silvers Released in 1951 (1950 Brood Year) Ad RV	No. Carcasses Examined 1953	No. Marks Recovered Ad RV
Mill Creek	Del Norte	68,790	41	11
Elk River	Humboldt	8,591	35	2
Jacoby Creek	Humboldt	13,021	7	1
Lindsey Creek	Humboldt	16,518	47	5
Prairie Creek	Humboldt	30,786	34	10
		137,706	164	29
All Other Creeks (9 in Number)	Del Norte & Humboldt	26,717	42*	0
Silver Count over Sweasy Dam on the Mad River. Each fish trapped and checked for fin marks.	Humboldt		92 fish	0

* Includes Inland Fisheries recoveries on the Mad River, North Fork of Mad River and Canyon Creek.

Table 5

RECOVERY OF MARKED SILVER SALMON (1950 BROOD YEAR)
IN THE MAD RIVER SYSTEM DURING THE 1953 SPAWNING SEASON

	Lindsey Creek, a Tributary to Mad River	Mad River and Other Tributaries
No. Marks Released (1951)	16,518	none
No. Carcasses Examined	47	115
No. Marks Recovered	5	none

Table 6

SPAWNING SUCCESS OF FEMALE NORTH COAST SALMON

November 1953 to February 1954

Condition of Ovaries*	King Salmon		Silver Salmon	
	Number	Percent	Number	Percent
Spent	532	95.7	88	97.8
Part Spent	12	2.2	1	1.1
Ripe	<u>12</u>	<u>2.2</u>	<u>1</u>	<u>1.1</u>
TOTAL	556	100.1 %	90	100.0 %

* Spent - 70-100 % of her eggs had been released before death.

Part Spent - 30-70 % of her eggs had been released before death.

Ripe - 0-30 % of her eggs had been released before death.

Table 7

SIZE OF FISH

Silver and King Salmon
Carcass Lengths in Relation to
The Commercial Size Limit*

Species	OVER Number	UNDER Number	UNDER Percent
KING			
Male	336	61	15.4
Female	<u>556</u>	<u>0</u>	<u>0.0</u>
Total	892	61	6.8
SILVER			
Male	80	8	9.1
Female	<u>89</u>	<u>1</u>	<u>1.1</u>
Total	169	9	5.1

* King salmon minimum size limit - 26 inches (total length).

Silver salmon minimum size limit - 25 inches (total length).

Table 8

SEX RATIOS OF KING AND SILVER SALMON
CARCASS CHECK

Species	Males	Females	Ratio Male:Female
KING	397	556	1:1.4
SILVER	88	90	1:1.0

KING SALMON

CARCASS RECOVERIES

NORTH COAST CALIFORNIA FALL 1953

		MARINE FISHERIES										INLAND FISHERIES									
		S. Fork	Lindsey	Mill Cr.								Mad R.	N.Fk.Mad:								
		Eel and	Cr. and	(Smith	Prairie	Elk						below	(Mouth	Canyon							
		Bull Cr.	Tribs.	River)	Creek	River	TOTAL	Sweasey	to Falls)	Creek	TOTAL										
Male -	Large*																				
	Spent	77	15	190	35	2	319	53	96	87	236										
	Part Spent	4	1	5	2	1	13	1	14	7	22										
	Ripe	4	0	0	0	0	4	0	3	1	4										
	Total	85	16	195	37	3	336	54	113	95	262										
Small*	Spent	9	0	43	6	0	58	0	16	10	26										
	Part Spent	1	0	1	1	0	3	0	1	0	1										
	Ripe	0	0	0	0	0	0	0	0	0	0										
	Total	10	0	44	7	0	61	0	17	10	27										
TOTAL MALES		95	16	239	44	3	397	54	130	105	289										
Female -	Large																				
	Spent	179	7	317	26	3	532	59	194	122	375										
	Part Spent	11	1	0	0	0	12	2	12	8	22										
	Ripe	8	2	1	1	0	12	2	3	1	6										
	Total	198	10	318	27	3	556	63	209	131	403										
Small	Spent	0	0	0	0	0	0	0	0	0	0										
	Part Spent	0	0	0	0	0	0	0	0	0	0										
	Ripe	0	0	0	0	0	0	0	0	0	0										
	Total	0	0	0	0	0	0	0	0	0	0										
TOTAL FEMALES		198	10	318	27	3	556	63	209	131	403										
Sex Doubtful		0	0	4	2	0	6	0	1	5	6										
TOTAL Fish Fin-	checked	293	26	561	73	6	959	117	340	241	698										
	Skeletons	39	3	126	12	1	181	7	1	6	14										
	OVER-ALL TOTAL	332	29	687	85	7	1140	124	341	247	712										

* Refers to over or under commercial size limit. (22-7/8 inches TL - 25 inches TL).

Table

Elk River-S.Fork: Mill Cr. (Smith R.) : Prairie Creek : Lindsey Creek : Elk River										
Nov. 11 & 17		Dec. 9 & 29		Dec. 11, 14, 15, 22		Dec. 12, 17, 25		Dec. 23		TOTAL
♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	
40										1
2	1									2
4										2
6										4
8										2
50	1									3
2										2
4										2
6										4
8										1
60										3
2										1
4										3
6										2
8										4
70										2
2										5
4										6
6										2
8										1
80										2
2										6
4										2
6										1
8										2
90										6
2										11
4										20
6										26
8										23
100										17
2										21
4										17
6										13
8										8
110										5
12										4
14										1
16										4
18										2
120										1

Table 11

SALMON SPAWNING CHECK
NORTH COAST AREA
November 1953 to February 1954

		KING	SILVER
Male -	Large*		
	Spent	319	73
	Part Spent	13	5
	Ripe	<u>4</u>	<u>2</u>
	Total	336	80
Male -	Small*		
	Spent	58	3
	Part Spent	3	4
	Ripe	<u>0</u>	<u>1</u>
	Total	61	8
TOTAL MALES		397	88
Female -	Large*		
	Spent	532	87
	Part Spent	12	1
	Ripe	<u>12</u>	<u>1</u>
	Total	556	89
Female -	Small*		
	Spent	0	1
	Part Spent	0	0
	Ripe	<u>0</u>	<u>0</u>
	Total	0	1
TOTAL FEMALES		556	90
Sex Doubtful -		6	5
Total Fish Fin Checked -		959	183
Skeletons -		181	16
OVERALL TOTAL		1,140	199

* Note: "Large" or "Small" refers to over or under the commercial minimum size limit.

Kings - 26" total length (23 7/8" F.L. or 60.5 cm.)

Silvers - 25" total length (22 7/8" F.L. or 58.0 cm.)

CARCASS RANDOM LENGTHS - NORTH COAST NOVEMBER 1953 - FEBRUARY 1954

