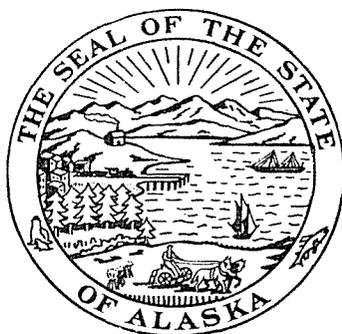


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STATE OF ALASKA

William A. Egan, Governor



ANNUAL REPORT OF PROGRESS, 1969 - 1970

FEDERAL AID IN FISH RESTORATION PROJECT F-9-2

SPORT FISH INVESTIGATIONS OF ALASKA

ALASKA DEPARTMENT OF FISH AND GAME

Wallace H. Noerenberg, Commissioner

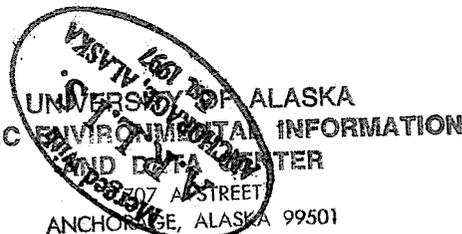
*Alaska* DIVISION OF SPORT FISH

Rupert E. Andrews, Director

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## INTRODUCTION

This report of progress consists of Job Segment Reports from the State of Alaska, Federal Aid In Fish Restoration, Project F-9-2, "Sport Fish Investigations of Alaska".

The studies reported herein are investigations evaluating the sport fish resources of the state. Recreational and other impacts on the fishery resources necessitates a continuous endeavor of ascertaining facts and knowledge of the fisheries. The 24 jobs reported on are of a continuing nature. The investigations are composed of 11 projects involved with the inventory and cataloging of the sport fish waters of the state, sport fishery creel censuses, and access. Fish species that received special investigational effort include: Dolly Varden, anadromous fish, grayling, sheefish, whitefish, pike, char, and salmon. The information gathered from the combined studies provides necessary background data for a better understanding of management problems and constitutes a basis for necessary future investigations.

The subject matter contained in these reports is incomplete, and the findings and interpretations subject to re-evaluation as work progresses.



5. To evaluate current regulations on the sport fishery and to provide recommendations for future management and research.

## TECHNIQUES USED

The Russian River creel census was a modification of the method described by Neuhold and Lu (1957). Sampling procedures were identical to those outlined by Engel (1965) except that fisherman counts were increased to include four of the five weekdays.

Escapements were enumerated at a temporary weir located approximately 100 yards downstream from Lower Russian Lake. The weir was constructed, in part, of 1 1/8-inch conduit pipe placed side by side in a wooden spacer. The structure was anchored in position by weighted tripods.

A Floy tag applicator utilizing red FD-67F internal anchor tags was used in the tagging experiment. All tags were inserted in the left-hand side musculature immediately below the dorsal fin. The T-bar of the 2 1/2-inch tag was positioned beyond the interneural bones of the dorsal fin. The adipose fin was removed from each tagged salmon.

## FINDINGS

The development of the Russian River red salmon fishery has been presented in Alaska Department of Fish and Game, Federal Aid In Fish Restoration, Annual Progress Reports by Lawler (1963, 1964) and Engel (1965 through 1969). The stream's management program has been strongly influenced by public expression regarding the unethical aspects of snagging, a common angling practice since the beginning of the fishery. A single-hook restriction in 1965 and a fly-only regulation in 1966 were initial attempts to eliminate snagging. In 1967 the fly-only requirement was supplemented with a foul-hook regulation which required that any fish hooked elsewhere than in the head, mouth, or gills be immediately released. Past regulations for the Russian River have been discussed in detail by Engel (1968).

### Creel Census

In accordance with the anti-snagging philosophy, both the fly-only and foul-hook provisions remained mandatory during the 1969 red salmon migration. To evaluate these regulations, the creel census initiated in 1962 was continued during this report segment. The census was active from June 7 through August 15 and sampled nearly the entire fishing effort on red salmon. Projected fisherman counts yielded estimates of 13,970 man-days of effort, or a total of 69,460 angler-hours. Based on interviews with 5,946 fishermen who had caught 2,715 salmon, the harvest was estimated to be 6,530 red salmon. The mean rate of success was 0.09 red salmon per hour, the lowest recorded. Table 1 summarizes fishing effort, harvest, and rate of success since 1962.

During the census an estimated 634 Dolly Varden, Salvelinus malma; 140 rainbow trout, Salmo gairdneri; 55 silver salmon, Oncorhynchus kisutch; 10 round whitefish, Prosopium cylindraceum; 2 Arctic grayling, Thymallus arcticus; and 2 pink salmon, O. gorbuscha, were caught incidental to red salmon. Approximately 34 king salmon, O. tshawytscha, were reported landed and released because of the closed season on this species.

The reduced red salmon catch can be attributed to two factors: (1) An intense forest fire restricted public access to the Russian River during the peak of the early red salmon migration. (2) A small late run resulted in an emergency closure to prevent excessive harvest. The forest fire, coupled with the closure of a U. S. Forest Service campground and sporadic operation of a privately operated ferry, noticeably curtailed

fishing from June 14 through June 19. Fire "mop-up" activities also were a deterrent to fishing for several days after the blaze was declared under control.

**TABLE 1** Red Salmon Sport Harvest, Effort, and Rate of Success on the Russian River, 1962-69.

<u>Year</u>	<u>Sport Harvest</u>	<u>Effort (man-days)</u>	<u>Catch Per Hour</u>	<u>Census Period</u>
1962	4,700	6,595	0.22	6/15 - 8/12
1963	5,060	7,880	0.19	6/ 8 - 8/15
1964	6,855	4,940*	0.31	6/20 - 8/16
1965	10,700	8,320	0.25	6/15 - 8/15
1966	21,820	17,890	0.21	6/15 - 8/15
1967	12,140	16,470	0.13	6/10 - 8/15
1968	12,730	17,300	0.13	6/10 - 8/15
1969	6,530	13,970	0.09	6/ 7 - 8/15

\*Damage to the Seward Highway by the March 27 earthquake resulted in reduced effort.

The emergency closure was in effect during the peak of the late red salmon run and extended from July 27 through August 8. The restriction was imposed by the department because of inadequate escapement.

Differences between weekday and weekend fishing pressures and success rates were similar to past information collected at the Russian River. Thirty-one weekday and 34 weekend and holiday counts averaged 53.6 and 87.5 anglers, respectively. Anglers fished an average of 4.9 hours on weekdays and 5.1 hours on weekend days. The catch per hour averaged higher on weekdays (0.11) than on weekends (0.07). This is attributed to the greater weekend congestion on the stream. A comparison of catch statistics for recent years is presented in Table 2.

#### Red Salmon Escapements

Escapement of late-run red salmon consisted of 28,900 fish through the weir and approximately 1,100 spawners downstream from the weir. The sport harvest from this run was estimated to be 1,110 or 3.6% of the red salmon available to the sport fishery.

Red salmon escapement estimates have been obtained from a counting tower operated by the Commercial Fisheries Division of the Alaska Department of Fish and Game at the outlet of Lower Russian Lake. The tower provided a gross assessment of the runs after they had been harvested by the Cook Inlet commercial and Russian River sport fisheries. Since 1960, escapements past the tower have ranged from 26,470 to 65,500 with a mean of 51,990 red salmon.

**TABLE 2** Differences Between Weekday and Weekend Day Fishing Pressures and Rates of Success at the Russian River, 1964-69.

	Fisherman Counts		Catch Per Hour		Hours Fished	
	Weekdays	Weekend days	Weekdays	Weekend days	Weekdays	Weekend days
1964	12.1	26.7	0.46	0.25	3.3	4.8
1965	19.6	64.3	0.32	0.22	4.3	5.4
1966	56.2	112.7	0.30	0.17	4.8	5.5
1967	56.8	87.9	0.17	0.09	5.3	5.6
1968	58.7	101.5	0.16	0.10	5.3	5.8
1969	53.6	87.5	0.11	0.07	4.9	5.1

In 1969 a weir was erected by the Commercial Fisheries Division at the former tower site. Although the weir was operational on June 21, the spacing of the pipe unknowingly permitted the majority of the early red salmon run to pass undetected through the structure. The spacing problem was corrected on July 4, and from that date on the weir was a barrier to salmon.

A foot survey on July 23 of Upper Russian Creek, a tributary to Upper Russian Lake, confirmed that approximately 5,000 early red salmon had passed uncounted through the permeable weir. This escapement should be viewed with some caution, however, since only one foot survey was conducted and the spawning grounds for the early red salmon run may not be confined entirely to Upper Russian Creek.

The total escapement into the Upper Russian River drainage, including the early-run estimate and the late-run weir count, was approximately 34,000 red salmon. This escapement was substantially below the nine-year tower average of 51,990 red salmon. Seventy silver and 119 king salmon were also passed through the weir.

The importance of the early run, which in recent years has contributed from 65 - 75% of the seasonal harvest, was again evident. In 1969 approximately 83% of the sport catch came from the early migration. The increased percentage contribution of the early run resulted from the ten-day closure during the late run. The estimated early-run catch and escapement of 5,420 and 5,000 red salmon, respectively, were among the lowest observed at the Russian River. Based on limited escapement data, the rate of harvest (52% of the run) was the highest recorded.

It should be noted that the red salmon catch and escapement figures presented in Table 3 differ from those depicted in the 1968-1969 Annual Progress Report, F-9-1, (Vol. 10). The present changes in estimated catch and escapement figures for years 1960-1968 reflect errors located and corrections made in enumeration techniques. The figures shown in Table 3 are the corrected totals.

Approximately 36.2% of the salmon landed in 1969 were reported to have been released because they were foul-hooked. This was comparable to 1967 and 1968 when snagged salmon comprised 40.5 and 37.9% of the respective catches. The anti-snagging regulation, because it substantially affects the fishery, has been a subject of controversy since it was adopted. A 1967 survey developed to determine general acceptance

of the regulation, indicated the following attitudes: 50.6% of the anglers favored the anti-snagging measure, 41.4% opposed the rule, and 8% were indifferent (Engel, 1968). Those opposed to the regulation frequently expressed concern over possible mortality factors associated with the regulation.

**TABLE 3** Russian River Red Salmon Catch Distribution and Escapement Estimates, 1960-69.

<u>Year</u>	<u>Total Escapement</u>	<u>Early Run* Escapement</u>	<u>Est. Early Run Catch</u>	<u>Total Early Run</u>	<u>% of Early Run Caught</u>
1960	43,970	9,120	---	---	---
1961	26,470	7,790	---	---	---
1962	56,670	33,300	3,410	36,710	9.3
1963	65,500	14,380	3,670	18,050	20.3
1964	59,630	12,700	4,970	17,670	28.1
1965	43,330	21,510	7,760	29,270	26.5
1966	51,090	16,660	16,360	33,020	49.5
1967	63,190	13,710	8,500	22,210	38.3
1968	58,080	9,200	8,250	17,450	47.3
1969	34,000	5,000**	5,430	10,430	52.1

\*July 15 was used as the termination date for the early run.

\*\*Escapement determined by foot survey of Upper Russian Creek.

### Tag-and-Recovery Experiment

A tag-and-recovery experiment was initiated in 1969 to determine the existence of mortality factors connected with hooking and releasing red salmon. Internal anchor tags were applied to salmon that were snagged, landed, and released by anglers. In addition, the adipose fin was removed from each tagged fish to measure tag loss.

From June 10 through July 4, one hundred eleven red salmon were tagged at the confluence of the Kenai and Russian rivers. Fourteen of these fish were recovered at the Russian River weir. Twelve of the weir recoveries occurred within ten days after the structure became a barrier to fish. Creel census observations revealed that 11 tagged salmon were recaptured and retained by fishermen. Extrapolation of creel census recoveries yielded an estimated catch of 26 tagged red salmon. Tag retention appeared favorable since no salmon without tags were observed.

Conclusions regarding possible mortalities associated with the anti-snagging regulation cannot be made in view of the weir failure. However, the creel census recoveries (approximately 23.6% of those tagged) suggested that a substantial number of foul-hooked fish are vulnerable to recapture by conventional methods. No data is available concerning tagged salmon snagged and released a second time.

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