

1-22-93072X

STOCK COMPOSITION OF
THE 1989 LOWER COLUMBIA RIVER
SPRING CHINOOK FISHERIES

RECEIVED
JUN 22 2 1989
WA STATE LIBRARY

Columbia River Laboratory Progress Report 89-27

Washington Department of Fisheries
Planning, Research and Harvest Management Program
Columbia River Laboratory
16118 N.E. 219th St., P.O. Box 999
Battle Ground, Washington 98604

Cindy LeFleur
Paul Hirose
December 1989

F
830
CC
89-17
1989



Introduction

Stock composition of the 1989 Columbia River spring chinook fisheries using coded wire tag (CWT) analysis has been completed. These fisheries include the commercial gillnet fishery and the recreational sport fishery. The results of this CWT analysis is used along with an independent Genetic Stock Identification estimate to produce the final stock composition for management and allocation use.

Methods

Adult terminal mark rates were used to calculate the contribution of the various stocks (Table 1). The Cowlitz, Kalama and Lewis rivers were combined into one "stock" as Cowlitz is the only group that was marked. Mark rates were derived from the sport, natural spawn and hatchery escapements from all three rivers.

The Willamette River mark rates were obtained from the sport fishery. The Sandy River component which was not marked was assumed to have the same harvest rate as the Willamette River component.

The upriver mark rates were obtained from a combination of Bonneville Dam trap sampling, Corbett test fishing, and treaty ceremonial fishery sampling. Only sampling data prior to April 17th was used, to be representative of the upriver fish caught in the lower river fisheries.

The actual numbers of CWT's recovered in the winter gillnet fishery are listed in Table 2. Table 3 lists the CWT's from the lower river sport fishery. A small number of ventral and pectoral fin clips were recovered in both fisheries. The fin clips were from upriver origin fish and were first subtracted from the total catch before the CWT analysis was done, but are included as part of the total catch of upriver fish. The lost tags and no tags were divided between the actual tags proportionately.

The CWT stock composition analysis of the gillnet season was divided into three periods; Feb. 15-26, Feb. 27-Mar. 6, and Mar. 7-9.

The March and April recreational fishing periods were combined to maximize the CWT recoveries used in the analysis.

The GSI methods are documented in a WDF memorandum (Miller, 1989) for estimating the stock composition of the 1989 winter gillnet fishery. GSI sampling was not conducted for the Lower Columbia sport fishery.

To produce the final stock composition for the winter gillnet fishery, the GSI method is used. For the Lower Columbia

sport fishery, the CWT method is used initially with the results adjusted to reflect the difference in CWT and GSI observed for the winter gillnet fishery.

Results and Discussion

The CWT stock composition of the winter season gillnet fishery, by period, is presented in Table 4. The total catch was 13,868 of which 92% was of lower river origin fish and 8% upriver origin fish.

Table 5 shows the stock composition using results of GSI sampling during the same periods. GSI shows 89% of the catch is of lower river origin and 11% was of upriver origin.

Table 6 shows the CWT stock composition of the lower Columbia River sport fishery. The total catch was 2,996 (1,165 March and 1,831 April catch) which included 86.5% lower river stocks and 13.5% upriver stocks.

Since GSI sampling was not conducted for the lower Columbia River sport fishery due to inadequate sample sizes, an independent estimate could not be made, however CWT estimates for upriver stocks have been consistently lower than GSI estimates. Therefore in order to maintain relativity between commercial and sport estimates, the differential increase observed for the upriver stocks estimated from CWT and GSI methods in the 1989 winter gillnet fishery was applied to the 1989 sport CWT estimate yielding a stock composition adjusted to reflect a GSI method estimate. Table 7 shows that the adjusted upriver portion of the total sport catch is increased from 13.5% to 18.1%.

Conclusion

Table 8 shows the estimated stock composition for both fisheries combined. The total catch of 16,864 spring chinook adults in the 1989 non-treaty mainstem Columbia River fisheries is comprised of an estimated 14,825 (88%) adults of lower river origin and 2,039 (12%) of upriver origin.

The sport fishery harvested an estimated 542 upriver stock or 0.66 percent of the run and the lower river commercial fishery harvested an estimated 1,497 upriver stock or 1.83 percent of the run. The combined impact was estimated at 2.49 percent of the run.

The total lower river fishery impact on upriver stocks was about 1.9 percent below the 1983-85 average impact of 4.4 percent (preliminary GSI method estimate).

The 1983-85 average impact by GSI method was calculated by TAC and reported in a March 27, 1989 Issue Paper titled "Harvest Rate on the Columbia River Upriver Spring Chinook Run in the Lower Columbia River Fisheries, 1983-85". TAC will review the methodology again prior to 1990 fisheries.

REFERENCES

Miller, M. 1989. 1989 Columbia River winter gillnet GSI estimates - post season. Wash. Dept. of Fish. Memorandum. March 22, 1989. 3pp.

Table 1. Terminal mark rates for stock component analysis of winter gillnet and lower Columbia recreational fisheries, 1989.

Stock Component	Sample Type	Sampling Period	AD-MARK RATES	
			4-year olds	5-6-year olds
Willamette	Sport	Thru 4/9	3/94 = .032	10/298 = .034
Upriver	Bonn. Trap	Thru 4/16	27/116 = .233	5/63 = .079
	Corbett Test	Thru 4/14	7/112 = .063	2/42 = .048
	Ceremonial	Thru 4/12	18/288 = .063	14/159 = .088
		Subtotal	52/516 = .101	21/264 = .080
WA Tribs.	Escp/Sport	All	.0628	.0727

Table 2. Actual numbers of spring chinook coded wire tags (CWT's) recovered in the 1989 lower Columbia River gillnet fishery.

Stock	Age			Total
	4's	5's	6's	
<u>Lower Columbia</u>				
Cowlitz	2	35	1	38
Willamette	18	186	2	206
Total Lower Columbia	20	221	3	244
<u>Upper Columbia</u>				
Snake River	1	18	2	21
Upper Columbia	9	13	1	23
Total Upper Columbia	10	31	3	44
Total Lost Tags	0	1	0	1
Total No Tags	1	18	0	19
Season total	31	271	6	308

Table 3. Actual numbers of spring chinook coded wire tags (CWT's) and other fin marks recovered in the 1989 lower Columbia River sport fishery.

Stock	AGE								
	4-yr olds			5-yr olds			Total Adults		
	March	April	Total	March	April	Total	March	April	Total
<u>Lower River</u>									
Cowlitz	0	0	0	0	3	3	0	3	3
Willamette	3	1	4	3	2	5	6	3	9
Subtotal	3	1	4	3	5	8	6	6	12
<u>Upriver</u>									
Snake	0	1	1	0	1	1	0	2	2
Upper Columbia	1	1	2	0	0	0	1	1	2
Subtotal	1	2	3	0	1	1	1	3	4
No Tags	1	1	2	0	0	0	1	1	2
Total CWT's	5	4	9	3	6	9	8	10	18
Other Fin Marks	1	9	10	0	0	0	1	9	10

Table 4. Stock composition of the 1989 lower Columbia winter gillnet fishery, based on coded wire tag (CWT) analysis.

<u>February 15 - 26</u>		<u>Catch</u>			
<u>Stock</u>	<u>4's</u>	<u>5's</u>	<u>6's</u>	<u>Total</u>	<u>Percent</u>
Cowlitz, Kalama, Lewis	0	155	43	198	6.3
Willamette	9	2,741	95	2,845	90.9
Sandy	0	83	3	86	2.8
Upriver	0	0	0	0	0
Total	9	2,979	141	3,129	100

<u>February 27 - March 6</u>		<u>Catch</u>			
<u>Stock</u>	<u>4's</u>	<u>5's</u>	<u>6's</u>	<u>Total</u>	<u>Percent</u>
Cowlitz, Kalama, Lewis	21	529	0	550	7.6
Willamette	368	5,386	0	5,754	79.2
Sandy	11	163	0	174	2.4
Upriver	72	446	269	787	10.8
Total	472	6,524	269	7,265	100

<u>March 7 - 9</u>		<u>Catch</u>			
<u>Stock</u>	<u>4's</u>	<u>5's</u>	<u>6's</u>	<u>Total</u>	<u>Percent</u>
Cowlitz, Kalama, Lewis	22	222	0	244	7.0
Willamette	300	2,480	14	2,794	80.4
Sandy	9	77	24	110	3.2
Upriver	72	254	0	326	9.4
Total	403	3,033	38	3,474	100

<u>Season Total</u>		<u>Catch</u>			
<u>Stock</u>	<u>4's</u>	<u>5's</u>	<u>6's</u>	<u>Total</u>	<u>Percent</u>
Cowlitz, Kalama, Lewis	43	906	43	992	7.1
Willamette	677	10,607	109	11,393	82.2
Sandy	20	323	27	370	2.7
Upriver	144	700	269	1,113	8.0
Total	884	12,536	448	13,868	100

Table 5. Stock composition of the 1989 lower Columbia winter gillnet fishery based on GSI analysis. 1/

Stock	ESTIMATED CATCH AND PERCENTAGE BY FISHING PERIOD							
	FEB 15-26		FEB 27-MAR 6		MAR 7-9		TOTAL	
	Catch	%	Catch	%	Catch	%	Catch	%
<u>Lower River</u>								
Non Willamette 2/	282	9	872	12	313	9	1,467	11
Willamette 3/	2,597	83	5,667	78	2,640	76	10,904	78
Subtotal	2,879	92	6,539	90	2,953	85	12,371	89
<u>Upriver</u>								
Upper Columbia	219	7	290	4	417	12	926	7
Snake	31	1	436	6	104	3	571	4
Subtotal	250	8	726	10	521	15	1,497	11
Total Harvest	3,129		7,265		3,474		13,868	

1/ These estimated catches are based on GSI results reported by WDF (MAR 22, 1989).

2/ Washington tributaries; Cowlitz, Lewis, and Kalama Rivers.

3/ Includes Willamette stock fish that comprise the run in the Sandy River.

Table 6. Stock composition of the 1989 lower Columbia sport fishery based on coded wire tag (CWT) analysis.

Stock	Catch			Percent
	4's	5's	Total	
Cowlitz, Kalama, Lewis	0	410	410	13.7
Willamette	856	1,263	2,119	70.7
Sandy 1/	26	38	64	2.1
Upriver 2/	296	107	403	13.5
Total	1,178	1,818	2,996	100

1/ Estimate based on harvest rate analysis of Willamette run.

2/ Includes estimates from ventral fin clipped fish of upriver origin.

Table 7. Adjusted stock composition of the 1989 lower Columbia sport fishery using observed differences in stock composition of the 1989 winter gillnet fishery using CWT and GSI methods.

Stock Component	CATCH			
	CWT	%	Adjusted	%
Cowlitz, Kalama, Lewis	410	13.7	388	13.0
Willamette	2,119	70.7	2,005	66.9
Sandy	64	2.1	61	2.0
Upriver	403	13.5	542	18.1
Total	2,996	100.0	2,996	100.0

1/ Adjusted for the differences in CWT and GSI estimates calculated for 1989 winter gillnet fishery.

Table 8. Estimated stock composition of the 1989 lower Columbia River sport and winter gillnet fisheries.

Stock Component	Lower Columbia Sport		Winter Gillnet		Nontreaty Total	
	Catch	%	Catch	%	Catch	%
Cowlitz, Kalama, Lewis	388	13%	1,467	11%		
Willamette	2,005	67%	10,904	78%		
Sandy 1/	61	2%	NA			
Subtotal	2,454	82%	12,371	89%	14,825	88%
Upper Columbia Snake	NA	2/	926	7%		
	NA	2/	571	4%		
Subtotal	542	18%	1,497	11%	2,039	12%
Grand Total	2,996		13,868		16,864	

1/ A separate estimate is not made for the Sandy River in the winter gillnet fishery since the run is composed of Willamette stock and is not genetically separable. The sport catch estimate of Sandy stock is made by assuming the same harvest rate as Willamette stock.

2/ Terminal mark rates used for deriving the upriver component were not stock specific.