

AUGMENTED FISH HEALTH MONITORING

Completion Report
(Part Two of Two Volume)

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INTRODUCTION

The Bonneville Power Administration (BPA) initiated the Augmented Fish Health Monitoring project in 1986. This project was a five year interagency project involving fish rearing agencies in the Columbia Basin. Participating agencies included: Washington Department of Fisheries (WDF), Oregon Department of Fish and Wildlife, Idaho Department of Fish and Game, and the U. S. Fish and Wildlife Service (USFWS).

This is the final data report for the Augmented Fish Health Monitoring project. Data collected and sampling results for 1990 and 1991 are presented within this report. An evaluation of this project can be found in "Augmented Fish Health Monitoring, Volume 1, Completion Report." May, 1991.

METHODS AND MATERIALS

Pathogen detection methods remained the same from methods described in "Augmented Fish Health Monitoring, Annual Report 1989", May, 1990 (Table 1).

From January 1, 1990 to June 30, 1991 fish health monitoring sampling was conducted. In 1990 21 returning adult stocks were sampled. Juvenile pre-release exams were completed on 20 yearling releases, and 13 sub-yearling releases in 1990. In 1991 17 yearling releases and 11 sub-yearling releases were examined. Midterm sampling was completed on 19 stocks in 1990.

Organosomatic analysis was performed at release on index station stocks; Cowlitz spring and fall chinook, Lewis River early coho and Lyons Ferry fall chinook.

RESULTS AND DISCUSSION

Results of fish health inspections on adults and juveniles were recorded in two ways. Results listed for virus or parasite are listed as positive (P) or negative (N). Only presence or absence of these pathogens are determined so no prevalence data are possible. Any sampling greater than 60 fish was conducted at WDF's expense. For all other pathogens, results are listed as the number positive.

The following tables are a summary of adult and juvenile sampling completed during the project. Adults are listed by return year, and juveniles are listed by brood year with yearling releases separated from zero releases.

ADULT ANALYSIS

Results of inspections from 1987 through 1990 returning adults are presented in Table 2. Infectious Hematopoietic Necrosis Virus (IHNV) was isolated from only two stocks in 1990, Cowlitz spring chinook and Wells summer chinook. This was a substantial decline from the 6 stocks found positive in 1989. All stocks were negative

Table 1. Pathogen Detection Methods

Disease/ Pathogen	Life Stage	Tissue Sampled	Detection Method ¹
Viral			
IHNV	Juvenile	Kidney/spleen	Tissue culture EPC w/PEG and CHSE-214.
	Adult	Ovarian fluid	Tissue culture EPC w/PEG and CHSE-214.
IPNV	Juvenile & Adult	Kidney/spleen	Tissue culture EPC and CHSE-214.
EIBS	Juvenile & Adult	Blood film	Pinacynol chloride stain, two (2) minutes at 1000x.
Bacterial			
<i>R. salmoninarum</i>	Juvenile	Kidney smear	FAT, 30 fields at 600X.
	Adult	Ovarian fluid	FAT, 30 fields at 600X.
<i>C. psychronhila</i>	Juvenile	Kidney or spleen	Gram stain.
<i>A. salmonicida</i>	Juvenile & Adult	Kidney or spleen	Culture TSA media.
<i>V. ruckeri</i>	Juvenile & Adult	Kidney or spleen	Culture TSA media.
Parasite			
<i>M. cerebralis</i>	Juvenile	Head cartilage	Digest Method confirm by histopathology.
<i>C. shasta</i>	Juvenile & Adult	Hindgut	Light microscopy.
PKX	Juvenile	Posterior kidney	Light microscopy, confirm by histopathology.

CHSE - Chinook salmon embryo 214

EPC - Epithelioma papillosum cyprini

IHNV - Infectious Hematopoietic Necrosis Virus

IPNV - Infectious Pancreatic Necrosis Virus

EIBS - Erythrocytic Inclusion Body Syndrome

PEG - Polyethylene Glycol

FAT - fluorescent antibody test

TSA - Tryptic Soy Agar

PKX - Proliferative Kidney X

¹ Amos, K., 1985. Procedures for the Detection and Identification of Certain Fish Pathogens. American Fisheries Society, Fish Health Section, Bethesda, MD. 119 pages.

Table 2. Inspection Results of Returning Adults 1987, 1988, 1989, and 1990.

Species	Stock	Return Year	IHNV		IPNV		EIBS			BKD		
			# Fish	Result	# Fish	Result	# Fish	Result	Percent Positive	# Fish	Result	Percent Positive
Hatchery: Cowlitz												
spring	Cowlitz	87	778	P	60	N	60	22	37	60	12	20
Spring	Cowlitz	88	2520	P	60	N	60	0	0	60	0	0
Spring	Cowlitz	89	213	P	60	N	60	1	2	60	1	2
Spring	Cowlitz	90	60	P	60	N	60	0	0	60	3	5
Fall	Cowlitz	87	2560	P	60	N	60	0	0	60	12	20
Fall	Cowlitz	88	4778	P	60	N	60	1	2	60	3	5
Fall	Cowlitz	89	390	N	60	N	59	0	0	60	1	2
Fall	Cowlitz	90	60	N	60	N	60	0	0	60	0	0
L. Coho	Cowlitz	87	2619	N	120	N	60	0	0	60	33	55
L. Coho	Cowlitz	88	5156	N	60	N	60	0	0	60	15	25
L. Coho	Cowlitz	89	120	N	60	N	60	1	2	60	9	15
L. Coho	Cowlitz	90	60	N	60	N	60	0	0	60	8	13
Hatchery: Elokomln												
Fall	Elokomin	87	60	N	60	N	60	1	2	60	1	2
Fall	Elokomin	88	994	N	60	N	60	3	5	60	1	2
Fall	Elokomin	89	60	N	60	N	60	0	0	60	0	0
Fall	Elokomin	90	60	N	60	N	60	0	0	60	4	7
L. Coho	Elokomin	87	60	N	60	N	60	3	5	60	8	13
L. Coho	Elokomin	88	699	N	NS	-	NS	-	-	NS	-	-
L. Coho	Elokomin	89	60	N	60	N	60	0	0	60	18	30
L. Coho	Elokomin	90	60	N	60	N	60	0	0	60	1	2
E. Coho	Elokomin	88	402	N	60	N	60	0	0	60	7	12
Hatchery: Grays River												
Fall	Grays River	87	60	N	60	N	60	24	40	60	12	20
Fall	Grays River	88	65	N	60	N	60	0	0	60	4	7
Fall	Grays River	89	103	N	60	N	60	0	0	60	0	0
Fall	Grays River	90	85	N	60	N	60	0	0	64	0	0
E. Coho	Grays River	87	60	N	60	N	60	4	7	60	2	3
E. Coho	Grays River	88	60	N	60	N	60	0	0	60	0	0
E. Coho	Grays River	89	60	N	60	N	60	0	0	60	0	0
E. Coho	Grays River	90	60	N	60	N	60	1	2	60	0	0
Hatchery: Kalama Falls												
Spring	Kalama Falls	87	120	N	60	N	60	31	52	60	2	3
Spring	Kalama Falls	88	223	N	60	N	60	0	0	60	0	0
Spring	Kalama Falls	89	60	N	60	N	60	1	2	59	0	0
Spring	Kalama Falls	90	60	N	60	N	61	0	0	44	1	2
L. Coho	Kalama Falls	87	60	N	60	N	60	1	2	60	0	0
L. Coho	Kalama Falls	88	60	N	60	N	60	4	7	60	0	0
L. Coho	Kalama Falls	89	60	N	60	N	60	1	2	60	37	62
L. Coho	Kalama Falls	90	60	N	60	N	60	0	0	60	4	7

Results: N - negative. P - positive, number - number positive, NS - not sampled, NF - no fish.

Table 2. Inspection Results of Returning Adults 1987, 1968, 1989, and 1990.

species	Stock	Return Year	IHNV		IPNV		EIBS		BKD			
			# Flsh	Result	# Fish	Result	# Fish	Result	Percent Positive	# Fish	Result	Percent Positive
Hatchery: Klickitat												
Spring	Klickitat	87	80	N	60	N	60	30	50	80	9	15
Spring	Klickitat	88	80	N	60	N	60	0	0	60	3	5
Spring	Klickitat	89	60	N	60	N	60	0	0	60	0	0
Spring	Klickitat	90	80	N	60	N	60	0	0	60	48	80
Hatchery: Lewis River												
spring	Lewis River	87	9	N								
L. Coho	Lewis River	87	80	N	80	N	60	2	3	60	15	25
L. Coho	Lewis River	88	1192	N	60	N	60	0	0	60	3	5
L. Coho	Lewis River	89	1604	N	60	N	60	2	3	60	13	22
L. Coho	Lewis River	90	60	N	60	N	60	0	0	60	0	0
Hatchery: Lower Kalama												
Fall	Kalama Falls	87	60	N	60	N	60	41	68	60	10	17
Fall	Kalama Falls	88	60	N	60	N	60	0	0	60	2	3
Fall	Kalama Falls	89	278	N	55	N	60	0	0	60	1	2
Fall	Kalama Falls	90	60	N	60	N	60	0	0	60	3	5
E. Coho	Lower Kalama	87	60	N	60	N	60	5	6	60	0	0
E. Coho	Kalama Falls	88	342	N	60	N	60	0	0	60	6	10
E. Coho	Kalama Falls	89	62	P	60	N	60	1	2	62	0	0
E. Coho	Kalama Falls	90	60	N	60	N	60	0	0	60	21	35
Hatchery: Lyons Ferry												
Spring	Tucannon	87	48	P	63	N	67	21	31	43	12	28
spring	Tucannon	88	100	N	60	N	61	0	0	49	1	2
Spring	Tucannon	89	75	P	62	N	44	0	0	37	2	8
Spring	Tucannon	90	103	N	65	N	69	0	0	44	1	2
Fall	Lyons Ferry	87	1579	N	60	N	59	3	5	80	3	5
Fall	Lyons Ferry	68	60	N	60	N	60	1	2	60	1	2
Fall	Lyons Ferry	89	320	N	60	N	60	0	0	60	1	2
Fall	Lyons Ferry	90	80	N	60	N	60	0	0	60	1	2
Hatchery: Priest Rapids												
Fall	Priest Rapids	87	116	N	60	N	60	0	0	60	0	0
Fall	Priest Rapids	88	2617	N	80	N	60	0	0	60	1	2
Fall	Priest Rapids	89	1745	N	60	N	60	0	0	60	1	2
Fall	Priest Rapids	90	316	N	60	N	60	0	0	60	1	2
Hatchery: Speelyai												
Spring	Lewis River	87	82	N	60	N	60	3	5	61	28	46
Spring	Lewis River	88	60	N	60	N	60	0	0	60	1	2
Spring	Lewis River	89	234	P	60	N	60	1	2	60	1	2
Spring	Lewis River	90	60	N	60	N	60	0	0	60	14	23

Results: N - negative, P - positive. number - number positive. NS - not sampled, NF - no fish.

Table 2. Inspection Results of Returning Adults 1987, 1988, 1989, and 1990.

Species	Stock	Return Year	IHNV		IPNV		EIBS		BKD		Percent Positive	
			# Fish	Result	# Fish	Result	# Fish	Result	# Fish	Result		
Hatchery: Speelyal												
E. Coho	Lewis River	87	80	N	60	N	59	30	51	60	10	17
E. Coho	Lewis River	86	60	N	60	N	60	1	2	60	0	0
E. Coho	Lewis River	89	490	N	60	N	60	0	0	60	0	0
E. Coho	Lewis River	90	60	N	60	N	60	0	0	59	2	3
Sockeye	Wild	67	37	N								
Sockeye	Wild	68	7	N								
Hatchery: Washougal												
Fall	Washougal	87	148	N	60	N	60	26	43	60	12	20
Fall	Washougal	88	NS		60	N	60	0	0	60	3	5
Fall	Washougal	69	1177	N	80	N	60	0	0	60	0	0
Fall	Washougal	90	60	N	60	N	60	0	0	60	5	8
E. Coho	Washougal	87	12	N	37	N	37	5	13	12	5	42
E. Coho	Washougal	68	87	N	60	N	60	0	0	60	0	0
E. Coho	Washougal	69	NF		NF		NF			NF		
L. Coho	Washougal	87	60	N	60	N	60	0	0	60	9	15
L. Coho	Washougal	88	60	N	60	N	60	1	2	60	3	5
L. Coho	Washougal	89	80	N	60	N	60	0	0	60	7	12
L. Coho	Washougal	90	60	N	60	N	60	0	0	60	6	13
Hatchery: Wells												
Summer	Wells	87	456	P	60	N	60	3	5	60	11	18
Summer	Wells	86	60	P	60	N	60	0	0	60	5	8
Summer	Wells	89	689	P	473	N	60	0	0	60	1	2
Summer	Wells	90	90	P	63	N	60	0	0	60	8	13

Results: N = negative. P = positive, number = number positive, NS = not sampled, NF = no fish.

for other replicating agents. Prevalence of EIBS was found to be only **.08%** in all species and stocks sampled in 1990. This is approximately a ten-fold decrease from 1989. These prevalence levels are extremely low and even with this substantial decline from 1989, all levels are insignificantly positive.

Prevalence of BKD in 1990 spawning adults demonstrated again the variable nature of BKD prevalence (Table 3). Spring chinook were 23.9% positive, the majority of which came from one hatchery (Klickitat, **48+/60**), while in the previous year spring chinook had a prevalence of only 1.4% positive. Overall there was an increase in BKD prevalence in adult stocks, only late coho declined in prevalence from previous years. The high prevalence at Klickitat Hatchery may be accounted for by the 1986 brood spring chinook yearlings released from Klickitat Hatchery which had a high prevalence (52%) of BKD at their pre-release exam.

Bacterial kidney disease continues to be a concern of hatchery managers and fish health specialists during the adult holding phase. With vertical and horizontal transmission occurring with BKD, drug therapies and segregation strategies will continue to be pursued and evaluated.

Table 3. Prevalence (%) of Bacterial Kidney Disease in spawning adult salmon species for 1987 through 1990.

SPECIES	1987	n	1988	n	1989	n	1990	n
Spring chinook	22.2	284	1.7	289	1.4	276	23.9	268
Fall chinook	11.9	420	3.6	420	.7	427	3.3	424
Summer chinook	18.3	60	8.3	60	1.7	60	13.3	60
Early coho	8.9	192	4.3	300	0	182	12.8	179
Late coho	21.7	300	8.8	240	28.0	300	7.0	300

Pre-spawning mortality was monitored extensively throughout the adult holding period (1990) by staff fish health specialists. Adult pre-spawning loss was attributed to the following diseases/pathogens and conditions: BKD, Columnaris, fungus (*Saprolegnia*), *Ichthyophthirius*, handling and normal holding (**pre-spawning**) mortality. Causes of loss were very similar to those documented in previous years. Loss is detailed in the Disease Prevalence Summary Report (Appendix A) for 1990.

JUVENILE ANALYSIS

The juvenile analysis will contain data from 1990 and up through June, 1991. Monthly monitoring visits were completed throughout the duration of the project, and will continue after the project. Monitoring visits have assisted in accurately determining cause of loss and in attributing loss to the appropriate cause and/or pathogen.

Monthly loss to specific bacterial pathogens CWD, BKD, ERM and Furunculosis was evaluated for 1987 through 1991. Loss is differentiated by sub-basin (Lower or Upper Columbia).

Juvenile mortality to CWD continued to be the highest level attributable to a specific pathogen throughout the Columbia Basin. Loss to CWD in 1990 for the lower basin followed the pattern seen in the previous three years, with the peak of mortality occurring in May (Figure 1). Total loss to CWD in the lower basin decreased by 18% from 1989 to a total of 469,145 in 1990. A slight change in loss pattern occurred in 1991 (January - June only). In June, 1991 a spike of loss occurred. This may only be a residual accounting factor from loss that began in the month of May, since the loss for May was the lowest seen in the five years of the project. The loss for the first six months of 1991 was substantial at 406,173. From this pattern it appeared that the loss in 1991 would be similar to the level seen in 1990.

Loss to CWD in the Upper Columbia Basin demonstrated a different pattern in 1990 than seen in previous years (Figure 2). Loss peaked in March and declined through the rest of the year. In previous years a bimodal distribution was seen. Loss again increased in 1990 to 175,540. In 1988 and 1989 CWD accounted for 118,101 and 171,904 lost fish respectively. In 1991 loss from January through June was substantially less, with a six month total of only 51,555. This decline was primarily due to the reduced loss at Klickitat Hatchery in the late coho.

Loss to BKD in the Lower Columbia Basin for 1990 was negligible (less than 500). In 1991 loss increased considerable (10,509) due to disease problems at **Cowlitz** Hatchery in the late coho. Annual loss in 1990 (Figure 3) for the Upper Columbia Basin peaked in March with a high of 16,595 due to an epizootic at Lyons Ferry in fall chinook. Loss in the Upper Basin for 1991 was minimal at 9,520 for the period, January through June (Figure 3).

Mortality to ERM during 1990 in the Lower Columbia Basin was elevated over the 1989 level due to significant loss at Lower Kalama Hatchery. Loss increased to 10,500. In 1991 loss again increased dramatically to 22,814. Major loss occurred at a number of facilities, with Toutle Hatchery fall chinook being the most affected. Loss to ERM in the Upper Columbia Basin for both 1990 and 1991 was negligible.

In 1990 loss to Furunculosis was elevated in juveniles with an increase in mortality seen at a number of facilities; Elokomin, Kalama Falls, Lewis River and Lower Kalama.

Pre-Release Exams

Pre-release exam results for yearling stocks are presented in Table 4. Viral exams for **IHNV**, IPNV and other replicating agents were negative for all stocks in 1990 and 1991. Prevalence of BKD in 1990 (88 brood) was 2.4% over all stocks, the lowest level seen during

Juvenile Loss to CWD Upper Columbia

WDF Hatcheries

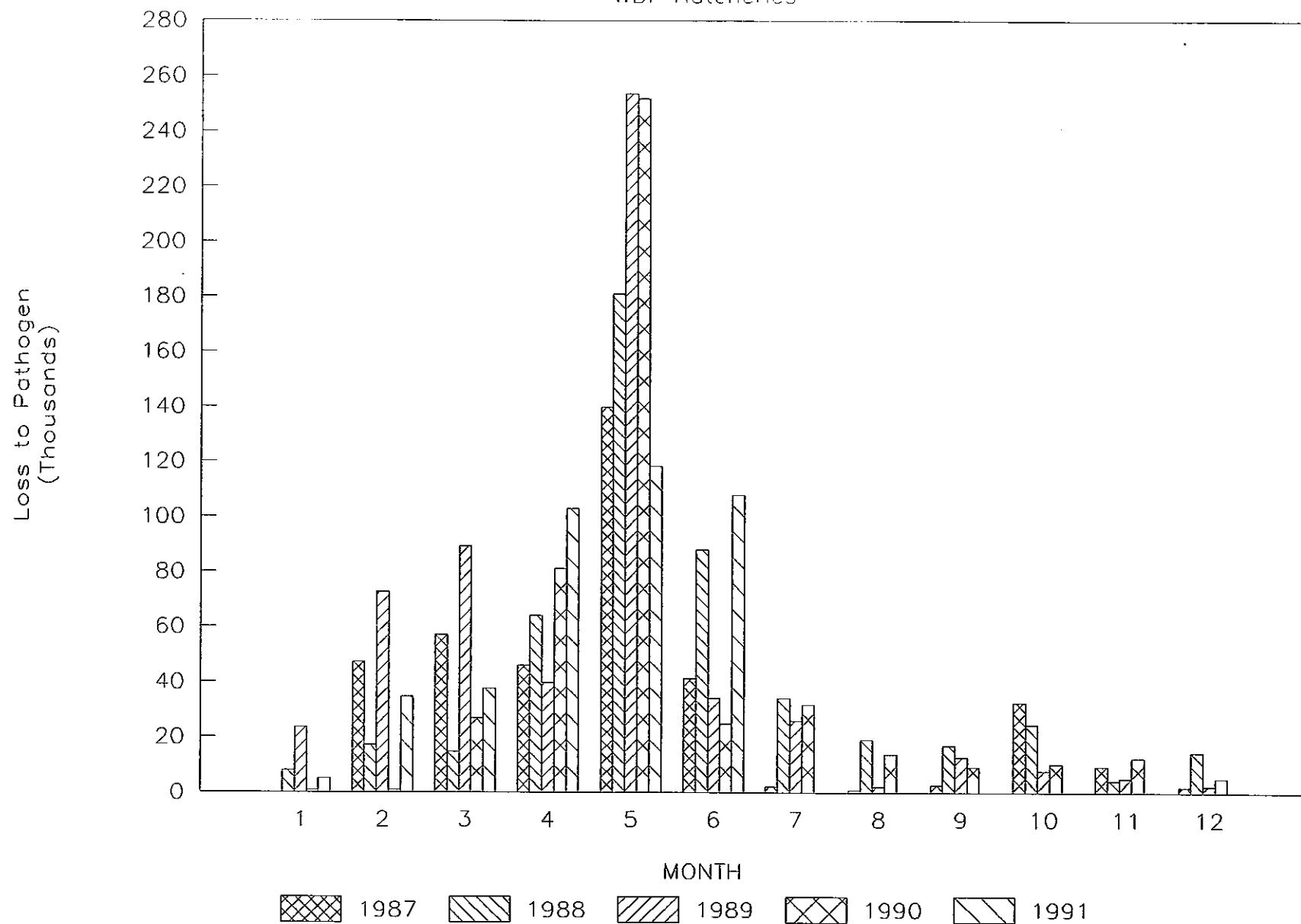


Figure 1. Juvenile loss to Coldwater Disease at WDF Lower Columbia Basin Hatcheries.

Juvenile Loss to CWD Upper Columbia

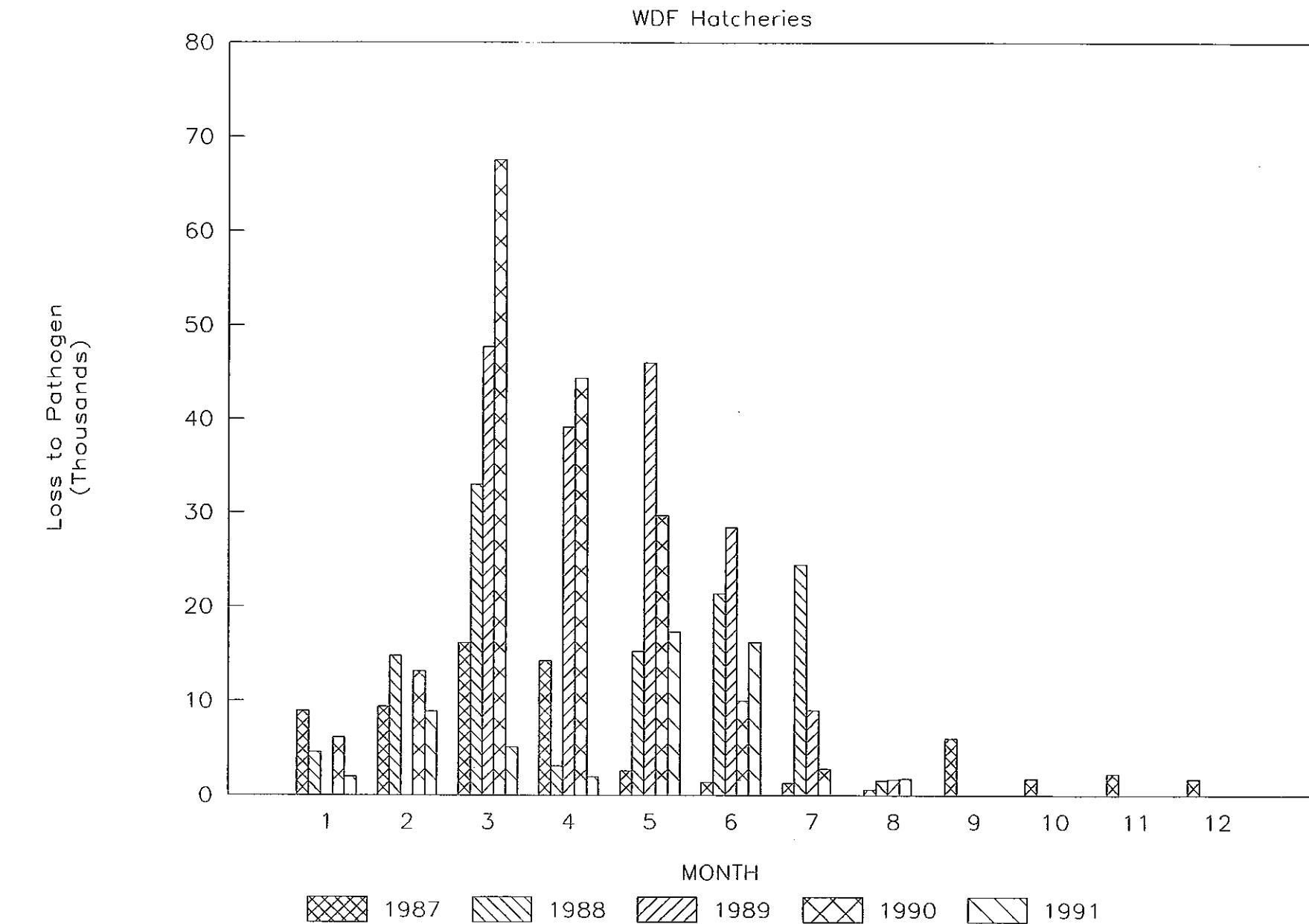


Figure 2. Juvenile loss to Coldwater Disease at WDF Lower Columbia Basin Hatcheries.

Juvenile Loss to CWD Upper Columbia

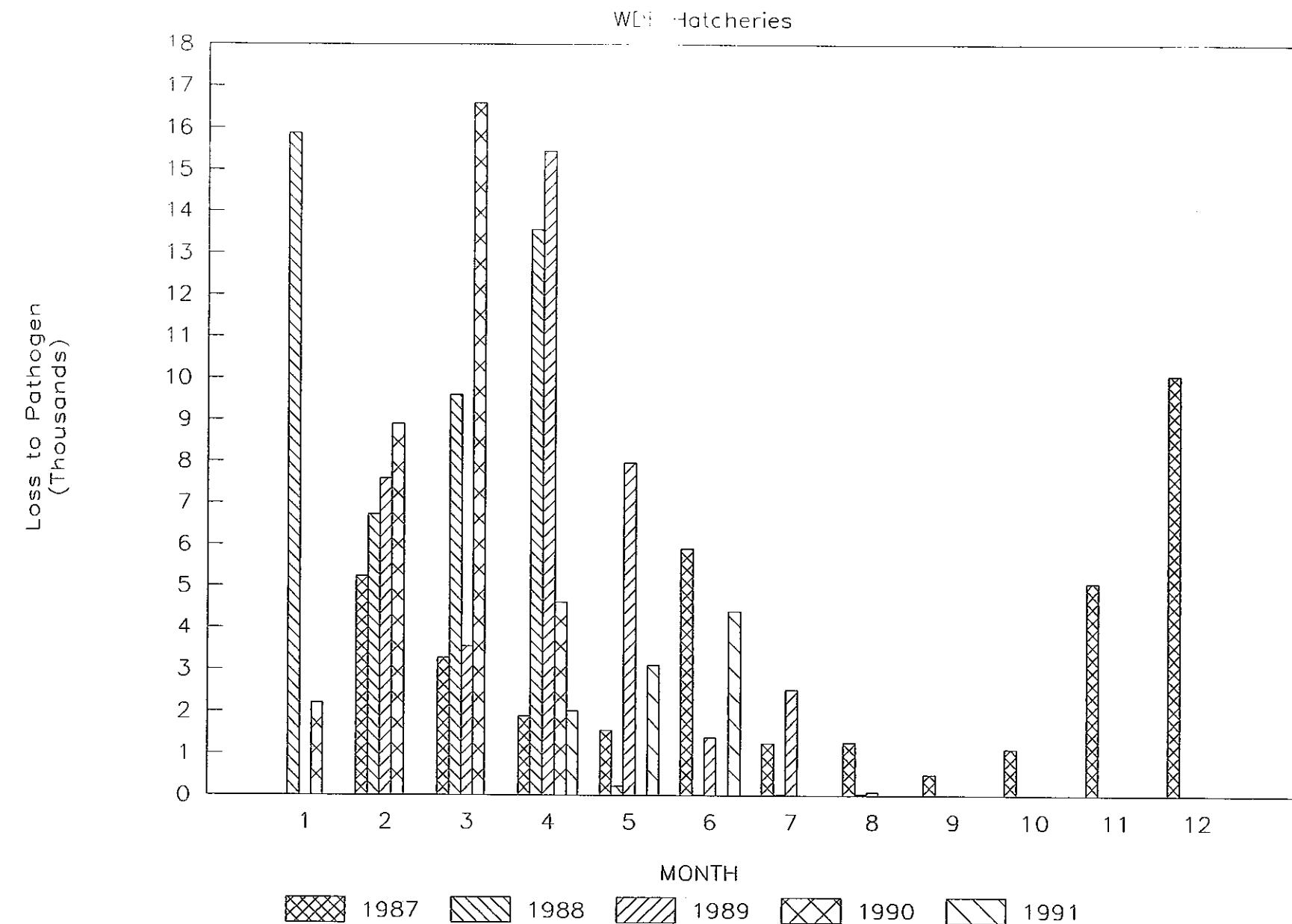


Figure 3. Juvenile loss to Bacterial Kidney Disease at WDF Upper Columbia Basin Hatcheries.

Table 4. Prs-Release Sampling Results - Yearling Age Releases 1967, 1966, 1969, 1990 and 1991.

Species	Stock	Brood	IHNV		IPNV		EIBS		BKD			
			Year	# Flsh	Result	# Flsh	Result	# Fish	Result	Percent Positive	# Fish	Result
Hatchery: Cowlitz												
spring	Cowlitz	85	60	N	60	N	59	56	95	60	44	73
Spring	Cowlitz	66	60	N	60	N	60	1	2	60	16	27
Spring	Cowlitz	67	60	N	60	N	60	2	3	60	3	5
Spring	Cowlitz	86	60	N	60	N	60	0	0	60	1	2
Spring	Cowlitz	69	60	N	60	N	60	0	0	60	5	8
L. Coho	Cowlitz	85	60	N	60	N	60	52	87	60	1	2
L. Coho	Cowlitz	66	60	N	60	N	60	0	0	60	5	8
L. Coho	Cowlitz	67	65	N	65	N	60	13	22	60	3	5
L. Coho	Cowlitz	66	60	N	60	N	60	0	0	60	0	0
L. Coho	Cowlitz	69	60	N	60	N	60	17	28	60	13	22
Hatchery: Elokomin												
L. Coho	Elokomin	86	60	N	60	N	60	7	12	60	16	27
L. Coho	Elokomin	86	60	N	60	N	60	0	0	60	5	8
L. Coho	Elokomln	67	60	N	60	N	60	10	17	60	3	5
L. Coho	Elokomin	66	60	N	60	N	60	2	3	60	0	0
L. Coho	Elokomin	89	60	N	60	N	60	20	33	60	9	15
Hatchery: Grays River												
E. Coho	Grays River	85	60	N	60	N	60	51	65	62	0	0
E. Coho	Grays River	66	60	N	60	N	60	0	0	60	7	12
E.Coho	Grays River	07	60	N	60	N	60	0	0	60	4	7
E.Coho	Grays River	88	60	N	60	N	60	0	0	60	0	0
E.Coho	Grays River	69	60	N	60	N	60	0	0	60	1	2
Hatchery: Kalama Falls												
L. Coho	Kalama Falls	85	60	N	60	N	60	42	70	60	20	33
L. Coho	Kalama Falls	66	60	N	60	N	60	4	7	60	10	17
L.Coho	Kalama Falls	67	69	N	69	N	60	18	30	58	0	0
L.Coho	Kalama Falls	88	60	N	60	N	60	0	0	60	2	3
L.Coho	Kalama Falls	69	60	N	60	N	60	0	0	60	3	5
Spring	Kalama Falls	66	60	N	60	N	60	0	0	60	0	0
Spring	Kalama Falls	67	60	N	60	N	60	0	0	60	9	15
Spring	Kalama Falls	68	60	N	60	N	60	0	0	60	2	3
Spring	Kalama Falls	69	60	N	60	N	60	2	3	60	5	6

Results: N = negative. P = positive, number = number positive, ND = no data.

Table 4. Pre-Release Sampling Results - Yearling Age Releases 1967, 1966, 1969, 1990 and 1991.

Species	Stock	Brood Year	IHNV		IPNV		EIBS		BKD	
			# Fish	Result	# Fish	Result	# Fish	Result	Percent Positive	# Fish
Hatchery: Klickitat										
Spring	Klickitat	85	60	N	60	N	60	49	82	60
Spring	Klickitat	66	60	N	60	N	60	0	0	60
Spring	Klickitat	87	60	N	60	N	60	7	12	60
Spring	Klickitat	88	60	N	60	N	60	0	0	60
Spring	Klickitat	69	60	N	60	N	60	0	0	60
L. Coho	Klickitat	65	60	N	60	N	60	60	100	60
L. Coho	Klickitat	66	60	N	60	N	60	1	2	60
L. Coho	Klickitat	a7	60	N	60	N	60	0	0	60
L. Coho	Klickitat	66	60	N	60	N	60	0	0	60
L. Coho	Klickitat	89	60	N	60	N	60	7	12	60
Hatchery: Lewis River										
Spring	Lewis River	85	60	N	60	N	60	60	100	60
Spring	Lewis River	66	60	P	60	N	60	0	0	60
Spring	Lewis River	87	62	N	62	N	62	20	32	60
Spring	Lewis River	88	60	N	60	N	60	8	13	60
Spring	Lewis River	89	60	N	60	N	60	0	0	60
L. Coho	Lewis River	65	60	N	60	N	60	51	65	60
E&L Coho	Lewis River	66	60	N	60	N	60	20	33	60
E&L Coho	Lewis River	a7	67	N	67	N	60	0	0	60
E&L Coho	Lewis River	88	60	N	60	N	60	9	15	60
E&L Coho	Lewis River	89	60	N	60	N	60	0	0	120
Hatchery: Lower Kalama										
E. Coho	Lower Kalama	65	60	N	60	N	60	45	75	60
E. Coho	Kalama Falls	66	60	N	60	N	60	0	0	60
E. Coho	Lower Kalama	87	60	N	60	N	60	1	2	60
E. Coho	Lower Kalama	88	60	N	60	N	60	0	0	60
E. Coho	Lower Kalama	69	60	N	60	N	60	52	87	60
Hatchery: Lyons Ferry										
Fall	Lyons Ferry	85	60	N	60	N	60	52	67	60
Fall	Lyons Ferry	66	60	N	60	N	60	0	0	60
Fall	Lyons Ferry	87	69	N	69	N	60	0	0	60
Fall	Lyons Ferry	88	60	N	60	N	60	0	0	60
Hatchery: Ringold										
Fall	Ringold	85	60	N	60	N	60	54	90	60
Spring	Ringold	66	60	N	60	N	60	0	0	60
Spring	Ringold	66	60	N	60	N	60	0	0	60
Spring	Ringold	69	60	N	60	N	60	11	16	60
										ND
										ND

Results: R = negative, P = positive, number = number positive, ND = no data.

Table 4. Pre-Release Sampling Results - Yearling Age Releases 1967, 1966, 1969, 1990 and 1991.

Species	Stock	Brood	IHNV		IPNV		EIBS		BKD		
			Year	# Fish	Result	# Fish	Result	# Fish	Result	Percent Positive	
Hatchery: Rocky Reach											
Fall	Priest	85	60	N	60	N	59	37	63	60	0
Fall	Rocky Reach	66	60	N	60	N	60	4	7	60	37
Fall	Rocky Reach	67	60	N	60	N	60	0	0	60	0
Fall	Rocky Reach	88	60	N	60	N	60	0	0	60	0
Fall	Rocky Reach	89	60	N	60	N	60	0	0	60	ND
L. Coho	Rocky Reach	85	60	N	60	N	60	10	17	60	1
E. Coho	Rocky Reach	66	60	N	60	N	60	0	0	60	28
E. Coho	Rocky Reach	07	60	N	60	N	60	0	0	60	0
E. Coho	Rocky Reach	86	60	N	60	N	60	0	0	60	0
E. Coho	Rocky Reach	69	60	N	60	N	60	0	0	60	ND
Hatchery: Speelyai											
Spring	Speelyai	66	60	N	60	N	60	0	0	60	20
Spring	Speelyai	88	60	N	60	N	60	0	0	60	0
Spring	Speelyai	89	60	N	60	N	60	1	2	60	5
Hatchery: Toutle											
E. Coho	Toutle	86	60	N	60	N	60	1	2	60	37
E. Coho	Toutle	a7	62	N	62	N	60	0	0	60	0
E. Coho	Toutle	88	60	N	60	N	60	19	32	60'	0
Hatchery: Tucannon											
Spring	Tucannon	65	30	N	30	N	30	28	93	30	21
Spring	Tucannon	66	60	N	60	N	60	4	7	60	13
Spring	Tucannon	87	63	N	63	N	60	31	52	60	2
Spring	Tucannon	88	60	N	60	N	60	31	52	60	1
Spring	Tucannon	89	60	N	60	N	60	0	0	60	1
Hatchery: WSShOUQSI											
E. Coho	Washougal	85	60	N	60	N	60	33	55	60	0
L. Coho	Washougal	65	60	N	60	N	59	54	92	60	0
L. Coho	WSShOUQSI	86	60	N	60	N	60	0	0	60	0
L. Coho	Washougal	87	60	N	60	N	60	20	33	60	3
L. Coho	WSShOUQSI	68	60	N	60	N	60	0	0	60	0
L. Coho	WSShOUQSI	69	60	N	60	N	60	4	7	60	8
Hatchery: Wells Spawning Channel											
Summer	Wells	65	60	N	60	N	60	16	27	60	1
Summer	Wells	86	60	N	60	N	60	0	0	60	31
Summer	Wells	87	60	N	60	N	60	1	2	60	3
Summer	Wells	68	60	N	60	N	60	0	0	60	5

Results: N = negative, P = positive, number = number positive, ND = no data.

the five years of this project. In 1991 (89 brood) BKD prevalence rose slightly to 8.3% over all stocks. Prevalence of EIBS in 1990 (88 brood) was 5.75% over all stocks, a decline from the level seen in 1989. In 1991 (89 brood) overall prevalence of EIBS was **10.1%**, this increase was mainly attributable to the 87% positive level seen at Lower Kalama Hatchery in their early coho stock.

The results from pre-release exams for the zero age release groups are presented in Table 5. Viral examinations for **IHNV**, **IPNV**, and other replicating agents were negative for all stocks in 1990 and 1991. Again, in 1990 and 1991 prevalence of EIBS in zero age releases was negligible. Prevalence of BKD in 1990 was also very low, .13%. Data on BKD for 1991 are not available due to laboratory contamination.

Hematocrit data collected during the pre-release exams since 1987 are summarized by species with yearling and sub-yearling releases separate. The mean hematocrit and range of means is presented in Table 6. Summary of data by species and location can be found in Appendix C.

Table 6. Mean Hematocrit and Mean Hematocrit Range by Species and release age, 1987 - 1991 sampling.

Species	Age	Mean Hematocrit	Mean Hematocrit	Range
Spring chinook	yearling	36.3	31.1	- 43.4
Fall chinook	yearling	41.0	38.4	- 44.6
Summer chinook	yearling	37.1	34.2	- 43.9
Late coho	yearling	32.9	26.4	- 41.6
Early coho	yearling	33.7	27.1	- 41.1
Fall chinook	zero	36.3	29.2	- 44.7

Midterm Exams

Results of midterm BKD and **Myxobolus cerebralis** exams are presented in Table 7 for 1990. No midterm exams were completed in 1991 due to the completion of the project in June. The 1989 brood had a mid-rearing prevalence of 3.9% for BKD, a continued lower level than that seen in 1988 and 1989. All assays for **M. cerebralis** were negative.

ORGANOSOMATIC ANALYSIS - Index Stocks

The Organosomatic Index analysis (OSI), developed by Ron Goede of the Utah Division of Wildlife Resources, was performed on 60 fish from each of the index stocks listed in Table 8. Summaries of OSI analyses completed in 1990 and 1991 follows, highlighting **similarities** and differences between subsequent year classes. Computer generated summaries and raw data are presented in Appendix E.

Table5 Pm-Release Sampling Results - Zero Age Releases 1967, 1966, 1969, 1990 and 1991.

Species	Stock	Brood	IHNV		IPNV		EIBS			BKD	
			#	Fish	#	Fish	Result	#	Fish	Result	Percent positive
Hatchery: Cowlitz											
Spring	Cowlitz	86	60	N	60	N		60	26	47	60
Spring	Cowlitz	87	60	N	60	N		60	0	0	60
Spring	Cowlitz	88	65	N	65	N		60	0	0	60
Spring	Cowlitz	89	60	N	60	N		60	0	0	60
Spring	Cowlitz	90	60	N	60	N		60	0	0	60
Fall	Cowlitz	66	60	N	60	N		60	18	30	60
Fall	Cowlitz	67	60	N	60	N		60	0	0	60
Fall	Cowlitz	88	60	N	60	N		60	0	0	60
Fall	Cowlitz	89	60	N	60	N		60	0	0	60
Fall	Cowlitz	90	60	N	60	N		60	0	0	60
Fall	Cowlitz - DR	86	60	N	60	N		60	32	53	60
Fall	Cowlitz - DR	67	60	N	60	N		60	15	25	60
Hatchery: Elokomin											
Fall	Elokomin	86	60	N	60	N		60	29	48	60
Fall	Elokomin	67	60	N	60	N		60	0	0	60
Fall	Elokomin	88	60	N	60	N		60	1	2	60
Fall	Elokomin	89	60	N	60	N		60	0	0	60
Fall	Elokomin	90	60	N	60	N	NS	--	--	--	60
Hatchery: Grays River											
Fall	Grays River	86	60	N	60	N		60	24	40	60
Fall	Grays River	87	60	N	60	N		60	0	0	60
Fall	Grays River	88	64	N	64	N		60	0	0	60
Fall	Grays River	89	60	N	60	N		60	0	0	60
Fall	ways River	90	60	N	60	N		60	0	0	60
Fall	Grays R. - DR	86	57	N	57	N		56	37	66	57
No delayed release in 1988 & 1989.											
Hatchery: Katama Falls											
Fall	Katama Falls	86	60	N	60	N		60	25	42	60
Fall	Kalama Falls	07	60	N	60	N		60	0	0	60
Fall	Kalama Falls	88	65	N	65	N		60	0	0	60
Fall	Kalama Falls	89	60	N	60	N		60	0	0	60
Fall	Kalama Falls	90	60	N	60	N		60	0	0	60
Hatchery: Klickitat											
Fall	Priest Rapids	86	60	N	60	N		60	19	32	60
Fall	Priest - DR	86	60	N	60	N		60	32	53	60
Fall	Klickitat	86	60	N	60	N		60	19	32	60
Fall	Klickitat	87	60	N	60	N		60	0	0	60
Fall	Klickitat	88	62	N	62	N		60	0	0	60
Fall	Klickitat	89	60	N	60	N		60	0	0	60
Fall	Klickitat	90	60	N	60	N		60	0	0	60
Spring	Klickitat	87	60	N	60	N		60	1	2	60
Spring	Klickitat	89	60	N	60	N		60	0	0	60

Results: N = negative, P = positive, number = number positive, NS = not sampled, ND = no data. DR = delayed release.

Table 5. Pre-Release Sampling Results - Zero Age Releases 1967, 1966, 1969, 1990 and 1991.

Species	Stock	Brood	IHNV		IPNV		EIBS			BKD		
			Year	# Fish	Result	# Fish	Result	# Flsh	Result	Percent Positive	# Fish	Result
Hatchery: Lower Kalama												
Fall	Lower Kalama	66	60	N	60	N	60	28	46	60	2	3
Fall	Lower Kalama	67	60	N	60	N	60	0	0	60	34	57
Fall	Lower Kalama	88	65	N	65	N	60	0	0	60	1	2
Fall	Lower Kalama	89	60	N	60	N	60	0	0	60	0	0
Fall	Lower Kalama	90	60	N	60	N	60	0	0	60	ND	ND
Hatchery: Lyons Ferry												
Fall	Lyons Ferry	66	60	N	60	N	60	38	63	60	0	0
Fall	Lyons Ferry	07	60	N	60	N	60	0	0	60	22	37
Fall	Lyons Ferry	88	65	N	65	N	60	0	0	60	0	0
Fall	Lyons Fan-y	89	60	N	60	N	60	0	0	60	0	0
Fall	Lyons Ferry	90	60	N	60	N	60	0	0	60	ND	ND
Hatchery: Priest Rapids												
Fall	Priest Rapids	66	60	N	60	N	60	25	42	60	0	0
Fall	Priest Rapids	67	60	N	60	N	60	0	0	60	13	22
Fall	Priest Rapids	88	60	N	60	N	60	0	0	60	0	0
Fall	Priest Rapids	89	60	N	60	N	60	0	0	60	1	2
Fall	Priest Rapids	90	60	N	60	N	60	0	0	60	ND	ND
Hatchery: Rocky Reach												
Fall	Rocky Reach	66	60	N	60	N	60	24	40	60	0	0
No zero release in 1968, 1969 & 1990.												
Hatchery: Toutle												
Fall	Toutle	a7	60	N	60	N	60	0	0	60	10	17
Fall	Toutle	88	60	N	60	N	60	0	0	60	1	2
Fall	Toutle	89	60	N	60	N	60	1	2	60	0	0
Hatchery: Washougal												
Fall	Washougal	66	60	N	60	N	60	24	40	60	20	33
Fall	Washougal	67	60	N	60	N	60	0	0	60	22	37
Fall	Washougal	88	60	N	60	N	60	0	0	60	0	0
Fall	Washougal	69	60	N	60	N	60	0	0	60	0	0
Fall	Washougal	90	60	N	60	N	60	0	0	60	ND	ND
Hatchery: Wells Spawning Channel												
Summer	Wells	66	60	N	60	N	60	51	85	60	0	0
Summer	Wells	87	60	N	60	N	60	20	33	60	12	20
Summer	Wells	66	60	N	60	N	60	0	0	60	3	5
Summer	Wells	89	60	N	60	N	60	0	0	60	0	0
Summer	Wells - DR	86	60	N	60	N	60	36	63	60	1	2
Fall	Wells	90	60	N	60	N	60	0	0	60	ND	ND
No delayed release in 1966, 1969 & 1990.												

Results: N – negative, P – posltve. number ■ number posltive, NS ■ not sampled, ND ■ no data, DR ■ delayed release.

Table 7. Midterm Sampling Results 1967, 1968, 1989 and 1990.

species	Stock	Brood Year	# Fish	BKD		M.c.	
				Result	Percent Positive	# Fish	Result
Hatchery: Cowlitz							
Spring	Cowlitz	86	60	0	0	72	N
Spring	Cowlitz	67	60	6	10	60	N
Spring	Cowlitz	68	60	1	2	NS	
Spring	Cowlitz	69	60	17	28	60	N
L. Coho	Cowlitz	66	60	1	2	--	
L. Coho	Cowlitz	87	60	1	2	--	
L. Coho	Cowlitz	88	60	2	3	--	
L. Coho	Cowlitz	69	60	2	3	--	
Hatchery: Elokomin							
L. Coho	Elokomin	88	60	0	0	--	
L. Coho	Elokomin	87	60	0	0	--	
L. Coho	Elokomin	88	60	2	3	--	
L. Coho	Elokomin	89	60	0	0	--	
E. Coho	Grays River	87	60	0	0	--	
E. Coho	Elokomin	68	60	7	12	--	
E. Coho	Elokomin	69	60	0	0	--	
Fall	Elokomin	88	--			60	N
Hatchery: Grays River							
Fall	Grays River	86	--			57	N
Fall	Grays River	88	--			60	N
E. Coho	Grays River	86	60	0	0	--	-
E. Coho	Grays River	88	60	0	0	--	-
E. Coho	Grays River	89	60	4	7	--	-
Hatchery: Kalama Falls							
spring	Kalama Falls	86	60	0	0	60	N
Spring	Kalama Falls	67	60	2	3	60	N
Spring	Kalama Falls	88	40	0	0	60	N
Spring	Kalama Falls	89	60	0	0	--	-
L. Coho	Kalama Falls	86	60	0	0	--	-
L. Coho	Kalama Falls	87	60	2	3	--	-
L. Coho	Kalama Falls	88	60	2	3	--	-
L. Coho	Kalama Falls	89	60	0	0	--	-
Hatchery: Klickitat							
spring	Klickitat	86	60	0	0	60	N
Spring	Klickitat	67	60	7	12	--	
Spring	Klickitat	88	60	8	13	--	
Spring	Klickitat	99	60	0	0	--	
L. Coho	Klickitat	88	60	0	0	--	
L. Coho	Klickitat	87	60	9	15	--	
L. Coho	Klickitat	86	15	1	7	--	
L. Coho	Klickitat	89	60	1	2	--	

M.c. = *Myxobolus cerebralis* NS = not sampled, Result: N = negative, P = positive, number ■ = number positive.

Table 7. Midterm Sampling Results 1987, 1988, 1989 and 1990.

Species	Stock	Brood Year	# Fish	BKD		M.C.	
				Result	Percent Positive	# Fish	Result
Hatchery: Lewis River							
Spring	Lewis River	86	60	0	0	60	N
Spring	Lewis River	87	60	2	3	60	N
Spring	Lewis River	89	60	4	7	60	N
L. Coho	Lewis River	86	60	0	0	--	
L. Coho	Lewis River	87	60	0	0	--	
L. Coho	Lewis River	88	60	0	0	--	
L. Coho	Lewis River	89	60	6	10	--	
Hatchery: Lower Kalama							
E. Coho	Lower Kalama	86	60	0	0	--	
E. Coho	Lower Kalama	88	60	3	5	--	
E. Coho	Lower Kalama	89	60	0	0	--	
Hatchery: Lyons Ferry							
Fall	Lyons Ferry	86	60	0	0	--	
Fall	Lyons Ferry	87	60	6	10	--	
Fall	Lyons Ferry	88	60	0	0	--	
No yearling production in 1990.							
Hatchery: Priest Rapids							
Fall	Priest Rapids	87	--			60	N
Fall	Priest Rapids	88	--			60	N
Hatchery: Ringold							
Spring	Wind River	86	60	0	0	60	N
Spring	Klickitat	88	31	11	35	NS	-
Spring	Klickitat	89	60	0	0	60	N
Hatchery: Rocky Reach							
Fall	Rocky Reach	86	60	0	0	60	N
Fall	Rocky Reach	87	60	0	0	60	N
Fall	Rocky Reach	88	60	0	0	--	-
Fall	Rocky Reach	89	60	0	0	60	N
E. Coho	Rocky Reach	86	60	0	0	--	-
E. Coho	Rocky Reach	87	60	2	3	--	-
E. Coho	Rocky Reach	89	60	1	2	--	-
L. Coho	Cowlitz	88	60	0	0	--	-
Hatchery: Speelyal							
Spring	Speelyal	86	80	0	0	80	N
Spring	Speelyal	88	60	3	5	NS	
Spring	Speelyal	89	60	0	0	--	
E. Coho	Lewis River	86	60	0	0	--	
E. Coho	Speelyal	87	60	2	3	--	
E. Coho	Speelyal	88	60	1	2	--	
E. Coho	Lewis River	89	60	0	0	--	

M.c. - Myxobolus cerebralis NS = not sampled, Result: N = negative, P = positive, number = number positive.

Table 7. Midterm Sampling Results 1987, 1988, 1989 and 1990.

species	Stock	Brood Year	# Flsh	BKD		M.c.	
				Result	Percent Positive	# Flsh	Result
Hatchery: Tucannon							
spring	Tucannon	86	60	1	2	60	N
Spring	Tucannon	87	60	29	48	60	N
spring	Tucannon	88	60	1	2	--	-
Spring	Tucannon	89	60	8	13	--	-
spring	Tucannon-wild	87	NS	NS	NS	20	N
Hatchery: Washougal							
L. Coho	Washougal	86	60	0	0	--	-
L. Coho	Washougal	87	80	0	0	--	-
L. Coho	Washougal	88	80	12	20	--	-
L. Coho	Washougal	89	60	1	2	--	-
E. Coho	Kalama Falls	87	80	2	3	--	-
Fall	Washougal	87	--			60	N
Fall	Washougal	88	--			60	N
Hatchery: Wells Spawning Channel							
Summer	Wells	86	60	0	0	60	N
Summer	Wells	87	80	3	5	--	
Summer	Wells	88	60	0	0	--	

M.c. = **Myxobolus cerebralis** NS = not sampled, Result: N = negative, P = positive, number = number positive.

Table 8. Organosomatic Analysis - Index Stocks.

Hatchery	Stock	Year Class
Cowlitz	Spring chinook	Yearling and subyearling.
cowlitz	Fall chinook (Tule)	Subyearling.
Lyons Perry	Fall chinook (URB)	Yearling and subyearling.
Lewis River	Early coho	Yearling.

Cowlitz yearlins snrina chinook 1988 brood

The BY88 Cowlitz yearling spring chinook showed a significant decrease in fish with hemorrhaging in the thymus. BY86 and BY87 had values of 27% and 38% respectively, while BY80 had only 10%. In contrast, there was a significant increase to 19% in abnormal pseudobranchs, and 8% of the fish had pale gills. Blood films were negative for EIBS, and only one of sixty fish was positive for BKD. The cause for the increased number of abnormal pseudobranchs and pale gills is unknown, and may just be an artifact of rearing conditions at Cowlitz Salmon Hatchery.

Cowlitz yearlina snrina chinook 1989 brood

The BY89 Cowlitz yearling spring chinook showed an increase in fish with hemorrhaging in the thymus. Brood year 88 had dropped to 10% from the 38% observed in BY87, but BY89 rose to 30%. Pseudobranch, gill, kidney, and spleen observations were in normal ranges. Blood films were negative for EIBS, but 5 of 60 kidney smears were positive for BKD. A mean fat level of 1.1 was observed. Fish length averaged 203.5 mm with a coefficient of variation of 8%. This group had the largest average size, and the lowest coefficient of variation during the five years of the project.

Cowlitz subyearlina spring chinook 1989 brood

The BY89 Cowlitz subyearling spring chinook had a 12% increase in hemorrhaging in the thymus. Conversely, enlarged spleens dropped from 10% in BY88 to 0% in BY89. All other tissues examined fall within normal levels. Both blood films and kidney smears tested negative for EIBS and BKD respectively. The mean hematocrit was very good at 43.6. Fat levels showed 80% at +1. Overall, this group appears to be healthy with the cause of hemorrhaging in the thymus unknown.

Cowlitz subyearlins spring chinook 1990 brood

The BY90 Cowlitz subyearling spring chinook had 17% with hemorrhaging in the thymus. This high percent is indicative of a stressor within the environment. All other observations of

internal organs were normal. Blood films were negative for EIBS, and the mean hematocrit was a very healthy 43.7. No data on **BKD** is available.

Cowlitz subyearlings fall chinook 1989 brood

The BY89 subyearling fall chinook showed an increase in abnormal pseudobranchs and enlarged spleens, and a significant increase in pale gills. A decrease in hemorrhaged thymus from the prior brood year was observed. It was noted during the exam that 10% of the fish were bleeding from the gills. Both EIBS and **BKD** sampling were negative. The abnormal observed values may be the result of an environmental stressor or pathogen not tested for during this exam. Eighty-eight percent of the fish were at fat level +1, with a mean of 0.9.

Cowlitz subyearling fall chinook 1990 brood

The BY90 Cowlitz subyearling fall chinook appeared to be in good health. Pseudobranchs, gills, kidneys, and spleens showed no abnormalities. Blood films were negative for EIBS, and the mean hematocrit of 43.3 was well within the normal range. Twenty-eight percent of the fish had a fat level of +1, with 77% at 0, for a mean of 0.3.

Lyons Ferry yearling fall chinook 1988 brood

The BY88 Lyons Ferry yearling fall chinook showed a significant decrease in abnormalities from BY87. Hemorrhaging in the thymus was down from 9% to 5%, enlarged spleen fell from 17% to 0% and swollen kidney dropped from 5% to 3%. Only pale gills rose to 5% in the BY88 fish. This group was negative for EIBS, but kidney smears were 15% positive for **BKD**. Ninety-five percent of the fish had a fat level of +1, with a mean level of 1.1. The mean fat level is in the low end of a desirable range for yearling release groups.

Lyons Ferry subyearlings fall chinook 1989 brood

The BY89 Lyons Ferry subyearling fall chinook showed a slight increase in hemorrhaging in the thymus and enlarged spleens from BY88. BY89 was negative for both EIBS and **BKD**. Seventy-three percent of the fish had a fat level of +1 with a mean of 0.8. The mean hematocrit level of 44.5 was the best level seen from the five release groups examined during this project.

Lyons Ferry subyearling fall chinook 1990 brood

The BY90 Lyons Ferry subyearling fall chinook appeared to be healthy fish. A hemorrhaged thymus was observed in only 2% of the fish examined, and other organs showed no gross abnormalities. The stock was negative for EIBS, and no data is available for **BED** due to laboratory contamination. A mean fat level of 0.9 was observed in these fish, with 77% of the examined fish at +1.

Lewis River yearlings coho 1988 brood

The BY88 Lewis River yearling coho showed no significant abnormalities for thymus, pseudobranch, spleen or kidney. However, seven percent did have pale gills. Blood films showed 9 out of 60 fish positive for EIBS, this may account for the increase in pale gills. Seventy-seven percent of the fish had a fat level of +1, with a mean of 1.2.

Lewis River yearlings coho 1989 brood

The BY89 Lewis River yearling coho exhibited a slight increase (2%) in the percentage of swollen kidneys and pseudobranchs from the previous years. Conversely, there was a decrease in the prevalence of pale gills in BY89 (2%) from BY88 (7%). Blood films were negative for EIBS, but five of 60 kidney smears were positive for BKD. This may account for the increase in swollen kidneys and pseudobranchs. Fat levels were improved from the previous brood year, with 57% of the fish at a +2 level and a mean of 1.6.

CONCLUSIONS

Evaluation of the 1990 and 1991 data documented similar trends to the previous years of the project. Adult health and pathogen problems were fairly similar between years, with the most variability due to BKD. Juvenile loss patterns were similar between years, with the major causes of loss remaining the same (Appendix A). Though, severity of diseases may vary significantly between broods. Pre-release exams showed similar results with the most variability due to BKD in zero-age and yearling releases and EIBS prevalence fluctuating in only yearling releases.

The Augmented Fish Health Monitoring Project has allowed WDF to better understand and document fish health concerns within the Columbia Basin. With five years of data collected we have a beginning for evaluating trends and fish health problems within the Basin. Documentation of BKD and EIBS prevalence in adults demonstrated only one of the values of this project. Due to, this project we developed the methods required to efficiently screen adults, for BKD and EIBS, and obtained the information to evaluate the necessity of that screening.

Evaluation of the analyses conducted during the project and an overall evaluation of the project can be found in Volume 1 of the Completion Report.

APPENDIX A

Appendix A contains the Disease Prevalence Summary Report for calendar year 1990 and 1991. Pathogens and causes of loss are categorized by: Bacterial, Other, Parasite and Viral. Loss to each pathogen or cause it totaled per month with Lower Columbia (**LCol**) and Upper Columbia (**UCol**) stations divided.

Abbreviations:

BHS - Bacterial Hemorrhagic Septicemia

EIBS - Erythrocytic Inclusion Body Syndrome

WIF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Bacterial
Agent: Bacterial Gill Disease

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number LOSE	% LOSS
Lower Columbia									
Mnth: September	1990 Lower Kalam	Spring Chinook	Katama Falls	89	27.	1. 653	0. 1181	3520	0. 64
								3520	

Upper Columbia

Mnth: February	1990 Lyon's Ferry	Fall Chinook	Lyon's Ferry	89	630.	0. 253	0. 0549	3168	0. 10
								3168	

Disease Category: Bacterial
Agent: Bacterial Kidney Disease

Basin	Location	Species	Stock	Brood	Size Fish/Lb	FLOW Index	Density Index	Number LOSE	% Loss
Lower Columbia									
Mnth: March	1990 Cowlitz	Spring Chinook	Cowlitz	88	7.	0. 985	0. 1416	260	0. 02
								260	
Mnth: May	1990 Grays River	Fall Chinook	Grays River	69	63.	1. 592	0. 0500	100	0. 01
								100	
Mnth: December	1990 Cowlitz Lewis River	Spring Chinook	Cowlitz	A				65	1. 40
		Spring Chinook	Lewis River	89	13.	0. 997	0. 0997	111	0. 01
								176	

Upper Columbia

Mnth: January	1990 Lyon's Ferry	Fall Chinook	Lyon's Ferry	88	17.	0. 481	0. 0618	2200	0. 47
								2200	

Mnth: February	1990 Lyon's Ferry Wells Spawning	Fall Chinook	Lyon's Ferry	88	13.	0. 559	0. 0745	8508	1. 87
		Summer Chinook	Wells	88	8.	1. 110	0. 2461	393	0. 10
								8901	

Mnth: March	1990 Lyon's Ferry Wells Spawning	Fall Chinook	Lyon's Ferry	88	11.	0. 596	0. 0795	14025	3. 19
		Summer Chinook	Wells	88	8.	1. 045	0. 2317	2570	0. 65
								16595	

Mnth: April	1990 Lyon's Ferry Wells Spawning	Fall Chinook	Lyon's Ferry	88	10.	0. 600	0. 0800	2853	0. 65
		Summer Chinook	Wells	88	7.	1. 214	0. 2691	1760	0. 45
								4613	

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Bacterial

Agent: Columnaris

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
<hr/>									
Lower Columbia									
Mnth: July	1990								
	Lower Kalama	Earl Coho	Kalama Falls	89	72.	0.928	0.1172	100	0.02
	Lower Kalama	Spring Chinook	Kalama Falls	89	76.	0.869	0.1097	320	0.06
	Washougal	Late Coho	Lewis River	89	112.	1.384	0.0633	4415	0.29
	Washougal	Late Coho	Washougal	89	123.	1.389	0.0475	12300	0.66
								17135	
Mnth: August	1990								
	Lower Kalama	Early Coho	Kalama Falls	89	48.	1.206	0.1524	925	0.17
	Lower Kalama	Spring Chinook	Kelam Falls	89	42.	1.407	0.1778	1300	0.24
	Washougal	Late Coho	Lewis River	89	81.	1.945	0.0754	800	0.05
	Washougal	Late Coho	Washougal	89	85.	1.917	0.0567	1500	0.08
								4525	
Upper Columbia									
Mnth: July	1990								
	Rocky Reach	Early Coho	Rocky Reach	89	85.	0.461	0.0488	7030	1.56
								7030	
Mnth: August	1990								
	Rocky Reach	Early Coho	Rocky Reach	89	62.	0.158	0.0371	11500	2.63
								11500	
Mnth: September	1990								
	Rocky Reach	Early Coho	Rocky Reach	89	45.	0.349	0.0718	500	0.11
								500	
Mnth: December	1990								
	Priest Rapids	Fall Chinook	Priest Rapids	A				120	3.74
								120	

Disease Category: Bacterial

Agent: Cold Water Disease

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
<hr/>									
Lower Columbia									
Mnth: January	1990								
	Lewis River	Early Coho	Lewis River	88	28.	1.525	0.0949	268	0.03
	Lewis River	Late Coho	Lewis River	88	30.	1.549	0.0964	616	0.03
	Lewis River	Late Coho	Washougal	88	28.	0.103	0.0064	35	0.05
								919	
Mnth: February	1990								
	Lewis River	Early Coho	Lewis River	88	26.	1.518	0.1012	199	0.02
	Lewis River	Late Coho	Lewis River	88	28.	1.548	0.1032	765	0.03
	Lewis River	Late Coho	Washougal	88	26.	0.102	0.0068	11	0.02
								975	

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Bacterial
Agent: Cold Water Disease

Basin	Location	Species	Stock	Brood	size Fish/Lb	Flow Index	Density Index	Number	% Loss
Lower Columbia									
Mnth: March									
		1990							
Elokomin	Early Coho	Grays River	89	351.	1.292	0.0969		1327	0.27
Elokomin	Early Coho	Lewis River	89	338.	1.406	0.1055		554	0.11
Grays River	Early Coho	Grays River	89	405.	1.747	0.0953		19850	2.47
Lewis River	Early Coho	Lewis River	88	22.	1.584	0.1188		412	0.04
Lewis River	Late Coho	Lewis River	88	23.	1.631	0.1087		571	0.03
Lewis River	Late Coho	Lewis River	89	872.	0.857	0.0760		1340	0.03
Lewis River	Late Coho	Washougal	88	22.	0.107	0.0080		28	0.04
Lower Kalama	Early Coho	Kalama Falls	89	463.	1.089	0.1361		255	0.05
Speelyai	Early Coho	Lewis River	89	242.	2.103	0.0901		2500	0.15
								26837	
Mnth: April									
		1990							
Elokomin	Early Coho	Grays River	89	164.	1.434	0.1056		900	0.18
Elokomin	Late Coho	Elokomin	89	705.	1.395	0.1076		5700	0.33
Grays River	Early Coho	Grays River	89	220.	1.896	0.1417		1750	0.22
Lewis River	Early Coho	Lewis River	88	17.	1.626	0.1265		2303	0.22
Lewis River	Late Coho	Lewis River	88	17.	1.726	0.1343		1723	0.08
Lewis River	Late Coho	Lewis River	89	510.	1.589	0.1192		43998	0.93
Lewis River	Late Coho	Washougal	88	17.	0.109	0.0085		107	0.15
Lower Kalama	Early Coho	Kalama Falls	89	249.	0.541	0.0696		575	0.11
Speelyai	Early Coho	Lewis River	89	166.	1.077	0.0657		5000	0.30
Washougal	Late Coho	Lewis River	89	454.	1.842	0.0695		6360	0.27
Washougal	Late Coho	Washougal	89	489.	2.315	0.0741		12595	0.64
								81011	
Mnth: May									
		1990							
Cowlitz	Late Coho	Cowlitz	89	200.	1.473	0.1625		18084	0.27
Elokomin	Early Coho	Grays River	89	98.	1.192	0.0894		1100	0.23
Elokomin	Late Coho	Elokomin	89	354.	0.825	0.0953		12000	0.71
Grays River	Early Coho	Grays River	89	136.	0.754	0.0485		1550	0.20
Kalama Falls	Late Coho	Kalama Falls	89	326.	1.239	0.1032		7725	1.17
Kalama Falls	Late Coho	Lewis River	89	322.	0.939	0.0861		1120	0.41
Lewis River	Early Coho	Lewis River	88	16.	1.971	0.1314		1245	0.12
Lewis River	Late Coho	Lewis River	88	16.	2.094	0.1396		180	0.00
Lewis River	Late Coho	Lewis River	89	296.	0.903	0.0401		156911	3.45
Lewis River	Late Coho	Washougal	88	16.	0.133	0.0088		45	0.06
Speelyai	Early Coho	Lewis River	89	111.	1.240	0.1168		300	0.02
Washougal	Late Coho	Lewis River	89	214.	2.528	0.0989		33250	1.45
Washougal	Late Coho	Washougal	89	256.	2.244	0.0804		18335	0.94
								251845	
Mnth: June									
		1990							
Cowlitz	Late Coho	Cowlitz	89	139.	1.407	0.1553		16450	0.25
Elokomin	Early Coho	Grays River	89	83.	0.824	0.0613		1000	0.21
Kalama Falls	Late Coho	Kalama Falls	89	265.	0.386	0.0360		1065	0.17
Kalama Falls	Late Coho	Lewis River	89	266.	0.513	0.0481		970	0.36
Lewis River	Late Coho	Lewis River	89	210.	1.126	0.0500		5383	0.12
								24868	
Mnth: July									
		1990							
Cowlitz	Late Coho	Cowlitz	89	89.	0.928	0.1470		19650	0.30
Lewis River	Late Coho	Lewis River	89	129.	1.564	0.0695		12232	0.27
								31882	

VDF PROGRAM PC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Bacterial
Agent: Cold Water Disease

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number LOSS	% Loss
<hr/>									
Lower Columbia									
Mnth: August	1990	Cowlitz trays River	Late Coho	Cowlitz	89	64.	0. 948	0. 1354	10700 0.20
		Early Coho	Grays River	89	36.	1. 353	0. 0486	600 0.08	
		Lewis River	Lewis River	89	al.	2. 131	0. 0947	2509 0.06	
		Lewis River	Spring Chinook	Lewis River	89	42.	0. 532	0. 0517	9 0.00

									13818
Mnth: September	1990	Cowlitz Lewis River	Late Coho	Cowlitz	89	51.	0. 932	0. 1332	4475 0.10
		Late Coho	Lewis River	89	75.	2. 216	0. 0985	4786 0.11	

									9261
Mnth: October	1990	Cowlitz Cowlitz	Late Coho	Cowlitz	89	45.	1. 318	0. 1883	3350 0.07
		Spring Chinook	Cowlitz	89	9.				98 0.00
		Lewis River	Lewis River	89	51.	1. 964	0. 1331	6862 0.15	

									10310
Mnth: November	1990	Cowlitz Cowlitz	Late Coho	Cowlitz	89	31.	1. 668	0. 2383	6720 0.15
		Spring Chinook	Cowlitz	89	7.	1. 013	0. 1448	955 0.08	
		Lewis River	Lewis River	89	46.	2. 020	0. 1369	4698 0.11	

									12373
Mnth: December	1990	Cowlitz Cowlitz	Late Coho	Cowlitz	89	30.	1. 722	0. 2460	3360 0.08
		Spring Chinook	Cowlitz	89	7.				227 0.02
		Lewis River	Lewis River	89	35.	2. 552	0. 1730	1784 0.04	

									5371
Upper Columbia									
Mnth: January	1990	Rocky Reach	Early Coho	Grays River	89	950.	0. 493	0. 0822	4000 1.20
		Rocky Reach	Early Coho	Lewis River	89	950.	0. 271	0. 0451	2160 1.18

									6160
Mnth: February	1990	Rocky Reach	Early Coho	Grays River	89	427.	0. 521	0. 1303	4550 2.65
		Rocky Reach	Early Coho	Lewis River	89	427.	0. 286	0. 0716	4590 2.59

									13140
Mnth: March	1990	Klickitat	Late Coho	Lewis River	89	643.	1. 623	0. 0709	64618 4.08
		Rocky Reach	Early Coho	Grays River	89	312.	0. 319	0. 0796	1920 0.60
		Rocky Reach	Early Coho	Lewis River	89	312.	0. 175	0. 0438	1020 0.58

									67558
Mnth: April	1990	Klickitat	Late Coho	Lewis River	89	270.	2. 859	0. 1250	37270 2.30
		Rocky Reach	Early Coho	Rocky Reach	89	233.	0. 571	0. 1428	7120 1.46

									44390

VDF PROGRAM acoi
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Bacterial
Agent: Cold Water Disease

Basin	Location	Species	Stock	Brood	sire Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
<hr/>									
Upper Columbia									
Mnth: May	1990 Klickitat Rocky Reach	Late Coho Early Coho	Lewis River Rocky Reach	89 89	181. 133.	1.755 0.650	0.0955 0.1624	28900 850	1.82 0.18
								----- 29750	
Mnth: June	1990 Klickitat	Late Coho	Lewis River	89	125.	2.119	0.1153	9978	0.63
								----- 9978	
Mnth: July	1990 Klickitat	Late Coho	Lewis River	89	85.	2.843	0.1547	2800	0.18
								----- 2800	
Mnth: August	1990 Klickitat	Late Coho	Lewis River	89	69.	1.657	0.0599	1764	0.12
								----- 1764	

Disease Category: Bacterial
Agent: Enteric Redmouth Disease

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
<hr/>									
Lower Columbia									
Mnth: March	1990 Speelyai	Spring Chinook	Lewis River	89	160.	1.120	0.0819	300	0.02
								----- 300	
Mnth: April	1990 Grays River Lower Kalama	Fall Chinook Fall Chinook	Grays River Kalama Falls	89 89	126. 185.	1.417 1.328	0.0402 0.0664	1500 6457	0.12 0.32
								----- 7957	
Mnth: May	1990 Grays River	Fall Chinook	Grays River	89	63.	1.592	0.0500	800	0.10
								----- 800	
Mnth: June	1990 Cowlitz	Spring Chinook	Cowlitz	89	30.	0.394	0.0604	1154	0.08
								----- 1154	
Mnth: July	1990 Cowlitz	Spring Chinook	Cowlitz	89	22.	0.440	0.0781	325	0.03
								----- 325	
Upper Columbia									
Mnth: March	1990 Ringold	Spring Chinook	Wind River	89	153.	1.173	0.2527	320	0.03
								----- 320	
Mnth: April	1990 Ringold	Spring Chinook	Wind River	89	94.	0.779	0.2072	130	0.01
								----- 130	

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Bacterial
Agent: Furunculosis

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
Lower Columbia									
Mnth: June	1990 Kalama Falls	Fall Chinook	Kalama Falls	89	121.	0.490	0.0459	1795	1.12

								1795	
Mnth: July	1990 Elokomin Lower Kalam Lower Kalam	Late Coho Early Coho Spring Chinook,	Elokomin Kalama Falls Kalama Falls	89 89 89	163. 72. 76.	0.546 0.928 0.869	0.0304 0.1172 0.1097	8000 180 2780	0.56 0.03 0.50

								10960	
Mnth: August	1990 Lower Kalam	Spring Chinook	Kalama Falls	89	42.	1.407	0.1778	600	0.11

								600	
Mnth: October	1990 Lewis River	Late Coho	Lewis River	89	51.	1.964	0.1331	11256	0.25

								11256	
Mnth: December	1990 Cowlitz Elokomin Kalama Falls Kalama Falls	Spring Chinook Fall Chinook Fall Chinook Spring Chinook	Cowlitz Elokomin Kalama Falls Kalama Falls	A A A A					
								147	3.17
								464	30.90
								100	2.51
								85	7.97

								796	

Disease Category: Other
Agent: Coho Anemia Disease

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
Lower Columbia									
Mnth: January	1990 Lewis River	Early Coho	Lewis River	88	28.	1.525	0.0949	393	0.04
	Lewis River	Late Coho	Lewis River	88	30.	1.549	0.0964	613	0.03

								1006	
Mnth: February	1990 Lewis River	Early Coho	Lewis River	88	26.	1.518	0.1012	22	0.00
	Lewis River	Late Coho	Lewis River	88	28.	1.548	0.1032	132	0.00

								154	
Mnth: March	1990 Lewis River	Early Coho	Lewis River	88	22.	1.584	0.1188	154	0.01
	Lewis River	Late Coho	Lewis River	88	23.	1.631	0.1087	204	0.00

								358	
Mnth: April	1990 Lewis River	Early Coho	Lewis River	88	17.	1.626	0.1265	240	0.02
	Lewis River	Late Coho	Lewis River	88	17.	1.726	0.1343	257	0.01
	Lewis River	Late Coho	Washougal	88	17.	0.109	0.0085	16	0.02

								513	
Mnth: October	1990 Lewis River	Late Coho	Lewis River	89	51.	1.964	0.1331	1753	0.04

								1753	

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other

Agent: Coagulated Yolk

Basin	Location	Species	Stock	Brood	Sire Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
<hr/>									
Lower Columbia									
Mnth: February	1990								
	Lower Kalama	Fall Chinook	Kalama Falls	89	685.	1.119	0.1178	1230	0.06
	Washougal	Fall Chinook	Washougal	89	863.	1.477	0.0659	4000	0.06

								5230	
Mnth: March	1990								
	Lewis River	Late Coho	Lewis River	89	872.	0.857	0.0760	1455	0.03

								1455	
Mnth: April	1990								
	Lewis River	Late Coho	Lewis River	89	510.	1.589	0.1192	1107	0.02

								1107	
Upper Columbia									
Mnth: January	1990								
	Rocky Reach	Early Coho	Grays River	89	950.	0.493	0.0822	1000	0.30
	Rocky Reach	Early Coho	Lewis River	89	950.	0.271	0.0451	540	0.30
	Rocky Reach	Fall Chinook	Wells	89	932.	0.655	0.1091	2200	0.24
	Wells Spawning	Summer Chinook	Wells	89	620.	0.611	0.1280	69495	3.71

								73235	
Mnth: February	1990								
	Klickitat	Fall Chinook	Priest Rapids	89	480.	1.242	0.0446	75195	1.74
	Priest Rapids	Fall Chinook	Priest Rapids	89	678.	1.186	0.0508	101400	2.55
	Rocky Reach	Fall Chinook	Wells	89	532.	0.590	0.1475	2880	0.32
	Wells Spawning	Summer Chinook	Wells	89	338.	0.726	0.1021	15030	0.82

								194505	
Mnth: March	1990								
	Klickitat	Fall Chinook	Priest Rapids	89	216.	1.253	0.0751	21525	0.50
	Priest Rapids	Fall Chinook	Priest Rapids	89	310.	0.956	0.0602	64750	0.98
	Rocky Reach	Fall Chinook	wells	89	350.	0.390	0.0974	700	0.31

								86975	
Mnth: April	1990								
	Klickitat	Fall Chinook	Priest Rapids	89	107.	3.321	0.1192	4840	0.11
	Rocky Reach	Fall Chinook	wells	89	270.	0.461	0.1152	250	0.11
	Wells Spawning	Summer Chinook	Wells	89	97.	1.387	0.1734	700	0.04

								5790	
Mnth: December	1990								
	Wells Spawning	Summer Chinook	Wells	90	975.	0.863	0.0767	3595	0.75

								3595	

VDF PROGRAM Q01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other
Agent: CWD/EIES/FUNGUS

Basin	Location	Species	Stock	Brood	size Fish/Lb	Flow Index	Density Index	Number Loss	% LOSS
Lower Columbia									
Mnth: February	1990 Cowlitz	Late Coho	Cowlitz	88	24.	2.280	0.2757	13120	0.28
								13120	
Mnth: March	1990 Cowlitz	Late Coho	Cowlitz	88	22.	2.324	0.2810	11520	0.24
								11520	

Disease Category: Other
Agent: Dropout

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% LOSS
Lower Columbia									
Mnth: January	1990 Cowlitz	Spring Chinook	Cowlitz	89	202.	1.997	0.0524	10500	0.53
								10500	

Upper Columbia

Mnth: February	1990 Wells	Spawning	Summer Chinook Wells	89	338.	0.726	0.1021	1620	0.09
Mnth: April	1990 Wells	Spawning	Summer Chinook Wells	89	97.	1.387	0.1734	4350	0.24
Mnth: May	1990 Wells	Spawning	Summer Chinook Wells	89	70.	3.770	0.8796	3816	0.21
Mnth: June	1990 Wells	Spawning	Summer Chinook Wells	89	38.	4.707	1.0003	260	0.01
Mnth: July	1990 wells	Spawning	Summer Chinook Wells	89	56.	3.006	0.6388	399	0.03
								399	

Disease Category: Other
Agent: Predation

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% LOSS
Lower Columbia									
Mnth: January	1990 Elokomin	Early Coho	Elokomin	88	27.	1.232	0.1793	600	0.13
	Elokomin	Late Coho	Elokomin	88	27.	1.635	0.0838	1000	0.08
	Kalama Falls	Fall Chinook	Kalama Falls	89	883.	0.946	0.0685	700	0.03
	Kalama Falls	Late Coho	Kalama Falls	88	24.	1.406	0.1483	1130	0.12
	Kalama Falls	Spring Chinook	Kalama Falls	89	708.	0.994	0.0725	705	0.09
								4135	

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other
Agent: Predation

Basin	Location	Species	Stock	Size Brood	Flow Fish/Lb	Density Index	Number	% LOSS
Lower Columbia								
Month: February								
	1990							
El okomin	Early Coho	El okomin	88	25.	1.231	0.1759	400	0.08
El okomin	Early Coho	Grays River	89	647.	1.178	0.0655	300	0.06
El okomin	Early Coho	Lewis River	89	665.	1.201	0.0667	300	0.06
Elokomin	Fall Chinook	El okomin	89	533.	0.824	0.0598	2000	0.05
El okomin	Late Coho	El okomin	88	24.	1.790	0.0950	750	0.06
Kalama Falls	Fall Chinook	Kalama Falls	89	583.	1.120	0.0914	160	0.00
Kalama Falls	Late Coho	Kalama Falls	88	20.	1.583	0.1670	750	0.08
Kalama Falls	Spring Chinook	Kalama Falls	89	499.	0.934	0.0873	40	0.00

							4700	
Month: March								
	1990							
El okomin	Early Coho	El okomin	88	19.	1.452	0.2112	600	0.13
Kalama Falls	Late Coho	Kalama Falls	88	17.	1.741	0.1836	280	0.03
Kalama Falls	Spring Chinook	Kalama Falls	89	302.	1.320	0.1237	90	0.01

							970	
Month: April								
	1990							
Elokomin	Fall Chinook	El okomin	89	144.	1.555	0.1583	1300	0.03
El okomin	Late Coho	El okomin	88	15.	1.540	0.0982	455	0.05
Kalama Falls	Fall Chinook	Kalama Falls	89	166.	1.321	0.1390	780	0.02
Kalama Falls	Late Coho	Kalama Falls	89	601.	0.828	0.0690	75	0.01
Kalama Falls	Late Coho	Lewis River	89	587.	0.691	0.0576	35	0.01

							2645	
Month: May								
	1990							
El okomin	Early Coho	Grays River	89	98.	1.192	0.0894	300	0.06
El okomin	Early Coho	Lewis River	89	104.	1.201	0.0900	300	0.06
El okomin	Fall Chinook	El okomin	89	68.	1.720	0.2559	1300	0.03
El okomin	Late Coho	El okomin	88	13.	1.853	0.0984	500	0.06

							2400	
Month: June								
	1990							
Elokomin	Early Coho	Grays River	89	83.	0.824	0.0613	500	0.10
Elokomin	Early Coho	Lewis River	89	82.	1.007	0.0761	500	0.10
Elokomin	Late Coho	Elokomin	89	227.	1.537	0.1162	800	0.05
Kalama Falls	Spring Chinook	Kalama Falls	89	113.	0.370	0.0347	280	0.24

							2080	
Month: July								
	1990							
El okomin	Early Coho	Grays River	89	72.	0.792	0.0550	300	0.06
Elokomin	Early Coho	Lewis River	89	74.	0.822	0.0571	300	0.06
Elokomin	Late Coho	Elokomin	89	163.	0.546	0.0304	200	0.01

							800	
Month: August								
	1990							
El okomin	Early Coho	Grays River	89	57.	0.922	0.0640	100	0.02
Elokomin	Early Coho	Lewis River	89	54.	1.006	0.0699	100	0.02
Elokomin	Late Coho	Elokomin	89	102.	0.734	0.0409	300	0.02
Kalama Falls	Fall Chinook	Kalama Falls	89	74.	0.536	0.0615	150	0.19
Kalama Falls	Late Coho	Kalama Falls	89	108.	0.568	0.0647	1320	0.22
Kalama Falls	Late Coho	Lewis River	89	107.	0.765	0.0877	450	0.17
Kalama Falls	Spring Chinook	Kalama Falls	89	60.	0.453	0.0519	500	0.44

							2920	

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other
Agent: Predation

Bassin	Location	Species	Stock	Brood	Size	Flow	Density	Number	%
					Fish/Lb	Index	Index	LOSS	Loss
Lower Columbia									
Mnth: September	1990								
	Elokomin	Early Coho	Grays River	89	43.	1. 102	0. 0765	52	0.01
	Elokomin	Early Coho	Lewis River	89	43.	1. 165	0. 0809	80	0.02
	Elokomin	Late Coho	Elokomin	89	66.	0. 993	0. 0553	130	0.00
								262	
Mnth: October	1990								
	Elokomin	Early Coho	Grays River	89	33.	1. 332	0. 0925	75	0.02
	Elokomin	Late Coho	Elokomin	89	40.	1. 384	0. 0772	400	0.03
	Kalama Falls	Late Cdho	Kalama Falls	89	46.	1. 108	0. 1146	2310	0.38
	Kalama Falls	Late Coho	Lewis River	89	50.	1. 404	0. 1462	770	0.29
	Kalama Falls	Spring Chinook	Kalama Falls	89	31.	0. 754	0. 0786	760	0.68
								4315	
Mnth: November	1990								
	Kalama Falls	Late Coho	Kalama Falls	89	36.	1. 297	0. 1342	575	0.10
	Kalama Falls	Late Coho	Lewis River	89	38.	1. 673	0. 1743	190	0.07
	Kalama Falls	Spring Chinook	Kalama Falls	89	21.	0. 961	0. 1001	190	0.17
								955	
Mnth: December	1990								
	Elokomin	Early Coho	Grays River	89	28.	1. 475	0. 1024	285	0.06
	Elokomin	Early Coho	Lewis River	89	28.	1. 300	0. 1772	125	0.02
	Elokomin	Late Coho	Elokomin	89	39.	1. 405	0. 0783	800	0.06
	Grays River	Early Coho	Grays River	89	27.	2. 059	0. 0649	700	0.09
	Kalama Falls	Late Coho	Kalama Falls	89	34.	1. 444	0. 1064	350	0.06
	Kalama Falls	Late Coho	Lewis River	89	34.	1. 286	0. 0948	150	0.06
	Kalama Falls	Spring Chinook	Kalama Falls	89	17.	1. 612	0. 1567	100	0.09
	Kalama Falls	Spring Chinook	Kalama Falls	90	1200.	0. 234	0. 0146	200	0.17
	Lewis River	Late Coho	Lewis River	89	35.	2. 552	0. 1730	85	0.00
	Speelyai	Early Coho	Lewis River	89	38.	1. 824	0. 1260	7840	0.67
	Speelyai	Spring Chinook	Lewis River	89	23.	1. 477	0. 0984	2940	1.39
								13575	
Upper Columbia									
Mnth: January	1990								
	Klickitat	Late Coho	Cowlitz	88	38.	4. 672	0. 1018	465	0.03
	Klickitat	Spring Chinook	Klickitat	88	28.	1. 372	0. 0760	292	0.04
	Klickitat	Spring Chinook	Klickitat	89	424.	1. 464	0. 0870	1051	0.11
	Klickitat	Spring Chinook	Wind River	89	450.	1. 022	0. 0756	1285	0.10
	Ringold	Spring Chinook	Klickitat	88	9.	2. 508	0. 0054	10000	1.12
								13093	
Mnth: February	1990								
	Klickitat	Fall Chinook	Priest Rapids	89	480.	1. 242	0. 0446	2933	0.07
	Klickitat	Late Coho	Cowlitz	88	33.	2. 154	0. 1347	400	0.03
	Klickitat	Spring Chinook	Klickitat	88	16.	1. 511	0. 1001	250	0.03
	Klickitat	Spring Chinook	Klickitat	89	242.	1. 156	0. 0834	379	0.04
	Klickitat	Spring Chinook	Wind River	89	238.	0. 689	0. 0310	544	0.90
	Ringold	Spring Chinook	Klickitat	88	8.	2. 320	0. 0058	10000	1.14
								14506	

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other
Agent: Predation

Basin	Location	Species	Stock	Brood	size Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
<hr/>									
Lower Columbia									
Mnth: September	1990								
	Elokomin	Early Coho	Grays River	89	45.	1.102	0.0765	52	0.01
	Elokomin	Early Coho	Lewis River	89	43.	1.165	0.0809	80	0.02
	Elokomin	Late Coho	Elokomin	89	66.	0.993	0.0553	130	0.00
								262	
Mnth: October	1990								
	Elokomin	Early Coho	Grays River	89	33.	1.332	0.0925	75	0.02
	Elokomin	Late Coho	Elokomin	89	40.	1.384	0.0772	400	0.03
	Kalam Falls	Late Coho	Kalam Falls	89	46.	1.108	0.1146	2310	0.38
	Kalam Falls	Late Coho	Lewis River	89	50.	1.404	0.1462	770	0.29
	Kalam Falls	Spring Chinook	Kalam Falls	89	31.	0.754	0.0786	760	0.68
								4315	
Mnth: November	1990								
	Kalam Falls	Late Coho	Kalam Falls	89	36.	1.297	0.1342	575	0.10
	Kalam Falls	Late Coho	Lewis River	89	38.	1.673	0.1743	190	0.07
	Kalam Falls	Spring Chinook	Kalam Falls	89	21.	0.961	0.1001	190	0.17
								955	
Mnth: December	1990								
	Elokomin	Early Coho	Grays River	89	28.	1.473	0.1024	285	0.06
	Elokomin	Early Coho	Lewis River	89	28.	1.300	0.1772	125	0.02
	Elokomin	Late Coho	Elokomin	89	39.	1.405	0.0783	800	0.06
	Grays River	Early Coho	Grays River	89	27.	2.059	0.0649	700	0.09
	Kalam Falls	Late Coho	Kalam Falls	89	34.	1.444	0.1064	350	0.06
	Kalam Falls	Late Coho	Lewis River	89	34.	1.286	0.0948	150	0.06
	Kalam Falls	Spring Chinook	Kalam Falls	89	17.	1.612	0.1567	100	0.09
	Kalam Falls	Spring Chinook	Kalam Falls	90	1200.	0.234	0.0146	200	0.17
	Lewis River	Late Coho	Lewis River	89	35.	2.552	0.1730	85	0.00
	Speelyai	Early Coho	Lewis River	89	38.	1.824	0.1260	7840	0.67
	Speelyai	Spring Chinook	Lewis River	89	23.	1.477	0.0984	2940	1.39
								13575	
<hr/>									
Upper Columbia									
Mnth: January	1990								
	Klickitat	Late Coho	Cowlitz	88	38.	4.672	0.1018	465	0.03
	Klickitat	Spring Chinook	Klickitat	88	28.	1.372	0.0760	292	0.04
	Klickitat	Spring Chinook	Klickitat	89	424.	1.464	0.0870	1051	0.11
	Klickitat	Spring Chinook	Wind River	89	450.	1.022	0.0756	1285	0.10
	Ringold	Spring Chinook	Klickitat	88	9.	2.508	0.0054	10000	1.12
								13093	
Mnth: February	1990								
	Klickitat	Fall Chinook	Priest Rapids	89	480.	1.242	0.0446	2933	0.07
	Klickitat	Late Coho	Cowlitz	88	33.	2.154	0.1347	400	0.03
	Klickitat	Spring Chinook	Klickitat	88	16.	1.511	0.1001	250	0.03
	Klickitat	Spring Chinook	Klickitat	89	242.	1.156	0.0834	379	0.04
	Klickitat	Spring Chinook	Wind River	89	238.	0.689	0.0310	544	0.90
	Ringold	Spring Chinook	Klickitat	88	a.	2.320	0.0058	10000	1.14
								14506	

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other
Agent: Predation

Basin	Location	Species	Stock	Brood	size Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
<hr/>									
upper Columbia									
Mnth: March	1990								
Klickitat	Fall Chinook	Priest Rapids	89	216.	1. 253	0. 0751		901	0.02
Klickitat	Late Coho	Cowlitz	88	25.	2. 696	0. 1618		420	0.03
Klickitat	Late Coho	Lewis River	89	643.	1. 623	0. 0709		706	0.04
Klickitat	Spring Chinook	Klickitat	88	12.	1. 830	0. 1213		140	0.02
Klickitat	Spring Chinook	Klickitat	89	183.	1. 067	0. 0831		213	0.02
Klickitat	Spring Chinook	Wind River	89	157.	0. 897	0. 0404		6	0.00
Ringold	Spring Chinook	Klickitat	88	7.	2. 402	0. 0060		10000	1.15
Rocky Reach	Late Coho	Cowlitz	88	19.	0. 782	0. 1380		50	0.01
Wells Spawning	Summer Chinook	Wells	89	170.	1. 170	0. 1647		100	0.00
								<hr/>	
								12536	
Mnth: April	1990								
Klickitat	Fall Chinook	Priest Rapids	89	107.	3. 321	0. 1192		628	0.01
Klickitat	Late Coho	Cowlitz	88	20.	3. 013	0. 1883		450	0.03
Klickitat	Late Coho	Lewis River	89	270.	2. 859	0. 1250		1002	0.06
Klickitat	Spring Chinook	Klickitat	88		2. 666	0. 1767		600	0.08
Klickitat	Spring Chinook	Klickitat	89	12::	1. 314	0. 1073		336	0.04
Klickitat	Spring Chinook	Wind River	89	90.	1. 105	0. 0595		46	0.08
Rocky Reach	Fall Chinook	Priest Rapids	88	8.	0. 641	0. 1130		550	0.24
Rocky Reach	Late Coho	Cowlitz	88	16.	0. 881	0. 1555		600	0.13
Wells Spawning	Summer Chinook	Wells	89	97.	1. 387	0. 1734		156	0.00
								<hr/>	
								4368	
Mnth: May	1990								
Klickitat	Fall Chinook	Priest Rapids	89	151.	0. 994	0. 0363		1552	0.12
Klickitat	Late Coho	Cowlitz	88	17.	2. 167	0. 1354		465	0.05
Klickitat	Late Coho	Lewis River	89	181.	1. 755	0. 0955		2305	0.15
Klickitat	Spring Chinook	Klickitat	88	7.	2. 666	0. 1788		20	0.00
Klickitat	Spring Chinook	Klickitat	89	98.	0. 845	0. 0478		560	0.06
Klickitat	Spring Chinook	Wind River	89	84.	1. 155	0. 0622		26	0.04
Ringold	Spring Chinook	Wind River	89	85.	0. 851	0. 2266		929	0.07
Wells Spawning	Summer Chinook	Wells	89	70.	3. 770	0. 8796		124	0.00
								<hr/>	
								5981	
Mnth: June	1990								
Klickitat	Fall Chinook	Priest Rapids	89	74.	1. 599	0. 0578		80	0.00
Klickitat	Late Coho	Cowlitz	88	18.	2. 075	0. 1297		225	0.02
Klickitat	Late Coho	Lewis River	89	125.	2. 119	0. 1153		1189	0.08
Klickitat	Spring Chinook	Klickitat	89	68.	1. 094	0. 0576		157	0.02
Ringold	Spring Chinook	Wind River	89	60.	1. 005	0. 2752		1024	0.08
Wells Spawning	Summer Chinook	Wells	89	38.	4. 707	1. 0003		101	0.00
								<hr/>	
								2776	
Mnth: July	1990								
Klickitat	Late Coho	Lewis River	89	85.	2. 843	0. 1547		379	0.02
Klickitat	Spring Chinook	Klickitat	89	56.	1. 242	0. 0654		195	0.02
Ringold	Spring Chinook	Wind River	89	43.	1. 298	0. 3555		500	0.04
Wells Spawning	Summer Chinook	Wells	89	56.	3. 006	0. 6388		97	0.00
								<hr/>	
								1171	
Mnth: August	1990								
Klickitat	Late Coho	Lewis River	89	69.	1. 657	0. 0599		285	0.02
Klickitat	Spring Chinook	Klickitat	89	47.	0. 814	0. 0654		247	0.03
								<hr/>	
								532	

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other
Agent: Predation

Basin	Location	Species	Stock	Brood	Sire Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
upper Columbia									
Mnth: September	1990 Klickitat Klickitat	Late Coho Spring Chinook	Lewis River Klickitat	89 89	63. 43.	1.753 0.864	0.0634 0.0706	52 48	0.00 0.00
								100	
Mnth: October	1990 Klickitat Klickitat	Late Coho Spring Chinook	Lewis River Klickitat	89 89	51. 31.	1.586 0.884	0.0865 0.0867	44 34	0.00 0.00
								78.	
Mnth: November	1990 Klickitat Klickitat Ringold	Late Coho Spring Chinook Spring Chinook	Lewis River Klickitat Wind River	89 89 89	50. 26. 15.	1.612 0.905 2.502	0.0873 0.0744 0.0054	12 14 10000	0.00 0.00 0.77
								10026	
Mnth: December	1990 Klickitat Klickitat Klickitat Klickitat Ringold	Late Coho Spring Chinook Spring Chinook Spring Chinook	Lewis River Klickitat Klickitat Wind River	89 89 90 90 89	39. 21. 829. 856. 13.	1.493 1.046 1.079 1.182 2.727	0.1027 0.0825 0.0397 0.0473 0.0058	7 2 78 100 10000	0.00 0.00 0.02 0.00 0.78
								10187	

Disease Category: Other
Agent: Eye picking

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number LOSS	% Loss
Upper Columbia									
Mnth: January	1990 Wells Spawning	Summer Chinook Wells		88	9.	1.056	0.2289	1b9	0.04
								1b9	
Mnth: February	1990 Wells Spawning	Summer Chinook Wells		88	8.	1.110	0.2461	119	0.03
								119	
Mnth: March	1990 Rocky Reach Rocky Reach Wells Spawning	Early Coho Early Coho Summer Chinook	Grays River Lewis River Wells	89 89 88	312. 312. 8.	0.319 0.175 1.045	0.0796 0.0438 0.2317	1280 680 40	0.40 0.39 0.01
								2DDD	
Mnth: April	1990 Rocky Reach	Early Coho	Rocky Reach	89	233.	0.571	0.1428	1280	0.26
								1280	
Mnth: May	1990 Rocky Reach	Early Coho	Rocky Reach	89	133.	0.650	0.1624	2550	0.53
								2550	
Mnth: June	1990 Rocky Reach	Early Coho	Rocky Reach	89	104.	0.359	0.0413	5000	1.09
								5000	

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other
Agent: Saprolegnia

Basin	Location	Species	Stock	Brood	size Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
<hr/>									
Lower Columbia									
Mnth: January	1990								
	Lewis River	Early Coho	Lewis River	88	28.	1. 525	0. 0949	28	0. 00
	Lewis River	Late Coho	Lewis River	88	30.	1. 549	0. 0964	105	0. 00
	Lewis River	Spring Chinook	Kalama Falls	88	16.	0. 317	0. 0212	40	0. 03
	Lewis River	Spring Chinook	Lewis River	88	16.	1. 143	0. 0254	176	0. 09

								349	
Mnth: February	1990								
	Lewis River	Late Coho	Lewis River	88	28.	1. 548	0. 1032	43	0. 00
	Lewis River	Spring Chinook	Kalama Falls	88	12.	0. 379	0. 0254	23	0. 02
	Lewis River	Spring Chinook	Lewis River	88	12.	0. 951	0. 0361	30	0. 02

								96	
Mnth: April	1990								
	Kalama Falls	Fall Chinook	Kalama Falls	89	166.	1. 321	0. 1390	150	0. 00
	Lewis River	Spring Chinook	Lewis River	89	133.	1. 307	0. 1144	35	0. 02
	Speelyai	Spring Chinook	Lewis River	89	163.	0. 901	0. 0660	850	0. 07

								1035	
Mnth: May	1990								
	Kalama Falls	Spring Chinook	Kalama Falls	89	131.	0. 336	0. 0315	80	0. 07
	Lewis River	Spring Chinook	Lewis River	89	85.	1. 132	0. 1557	222	0. 12

								302	
Mnth: June	1990								
	Kalama Falls	Fall Chinook	Kalama Falls	89	121.	0. 490	0. 0459	790	0. 49
	Lewis River	Spring Chinook	Lewis River	89	71.	0. 507	0. 0627	210	0. 02

								1000	
Mnth: July	1990								
	Lewis River	Spring Chinook	Lewis River	89	57.	0. 584	0. 0518	1820	0. 18

								1820	
Mnth: August	1990								
	Lewis River	Late Coho	Lewis River	89	81.	2. 131	0. 0947	650	0. 01
	Lewis River	Spring Chinook	Lewis River	89	42.	0. 532	0. 0517	307	0. 03

								957	
Mnth: September	1990								
	Lewis River	Spring Chinook	Lewis River	89	28.	0. 684	0. 0665	939	0. 09

								939	
Mnth: October	1990								
	Lewis River	Late Coho	Lewis River	89	51.	1. 964	0. 1331	1237	0. 03

								1237	
Mnth: November	1990								
	Lewis River	Late Coho	Lewis River	89	46.	2. 020	0. 1369	1008	0. 02

								1008	

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other
Agent: Saprolegnia

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% LOSS
Lower Columbia									
Mnth: December 1990									
Cowlitz	Spring Chinook	Cowlitz		90				211000	6.23
Cowlitz	Spring Chinook	Cowlitz		A				98	2.11
Kalama Falls	Early Coho	Kalama Falls		A				62	2.10
Kalama Falls	Fall Chinook	Kalama Falls	90					24580	0.22
Kalama Falls	Fall Chinook	Kalama Falls	A					81	2.04
Kalama Falls	Late Coho	Kalama Falls	A					60	2.28
Washougal	Late Coho	Washougal	90					2500	0.19
								238381	
Upper Columbia									
Mnth: January 1990									
Wells spawning	Summer Chinook	Wells		88	9.	1.056	0.2289	136	0.03
								136	
Mnth: February 1990									
Wells spawning	Summer Chinook	Wells		88	8.	1.110	0.2461	188	0.05
								188	
Mnth: March 1990									
wells spawning	Summer Chinook	Wells		88	8.	1.045	0.2317	217	0.06
								217	
Mnth: April 1990									
Wells Spawning	Summer Chinook	Wells		88	7.	1.214	0.2691	120	0.03
								120	
Mnth: December 1990									
Priest Rapids	Fall Chinook	Priest Rapids	A					10	0.31
								10	

Disease Category: Other
Agent: Gas Bubble Disease

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% LOSS
Lower Columbia									
Mnth: January 1990									
Lower Kalama	Fall Chinook	Kalama Falls	89	953.	0.802	0.0859		4932	0.32
								4932	

**WDF PROGRAM QCOL
DISEASE PREVALENCE SUMMARY
1990**

Disease Category: Other
Agent: Handling mortality

Basin	Location	species	Stock	Brood	size	Flow	Density	Number	%	
					Fish/Lb	Index	Index	LOSS	LOSS	
Lower Columbia										
Mnth: January	1990	Lewis River	Spring Chinook Lewis River	88	16.	1. 143	0. 0254	29	0. 02	
								29		
Mnth: March	1990	Lewis River	Late Coho Lewis River	89	872.	0. 857	0. 0760	100	0. 00	
		Lewis River	Spring Chinook Lewis River	89	-200.	0. 198	0. 0178	38	0. 03	
								138		
Mnth: April	1990	Kalama Falls	Fall Chinook Kalama Falls	89	166.	1. 321	0. 1390	400	0. 01	
		Lewis River	Spring Chinook Lewis River	89	133.	1. 307	0. 1144	33	0. 02	
								433		
Mnth: May	1990	Lewis River	Late Coho Lewis River	89	296.	0. 903	0. 0401	809	0. 02	
								809		
Mnth: June	1990	Lewis River	Spring Chinook Lewis River	89	71.	0. 507	0. 0627	1360	0. 14	
								1360		
Mnth: August	1990	Lewis River	Spring Chinook Lewis River	89	42.	0. 532	0. 0517	32	0. 00	
					3			32		
Mnth: September	1990	Lewis River	Late Coho Lewis River	89	75.	2. 216	0. 0985	771	0. 02	
								771		
Mnth: December	1990	Elokomin Kalama Falls	Early Coho Fall Chinook	Lewis River Kalama Falls	89 A	28.	1. 300	0. 1772	200 600	0. 04 15. 10
								800		
Upper Columbia										
Mnth: January	1990	Lyon's Ferry	Fall Chinook Lyon's Ferry	88	17.	0. 481	0. 0618	700	0. 15	
		Lyon's Ferry	Fall Chinook Lyon's Ferry	89	1011.	0. 249	0. 0499	1781	0. 11	
		Rocky Reach	Early Coho Grays River	89	950.	0. 493	0. 0822	7000	2. 11	
		Rocky Reach	Early Coho Lewis River	89	950.	0. 271	0. 0451	6000	3. 29	
		Rocky Reach	Fall Chinook Wells	89	932.	0. 655	0. 1091	21000	2. 30	
								36481		
Mnth: March	1990	Rocky Reach	Fall Chinook Wells	89	350.	0. 390	0. 0974	200	0. 09	
								200		

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other
Agent: Handling mortality

Basin	Location	Species	Stock	Brood	size Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS	
<hr/>										
upper Columbia										
Mnth: April	1990	Lyon's Ferry Wells spawning	Fall Chinook Summer Chinook	Lyon's Ferry Wells	89 89	133. 97.	0.474 1.387	0.1389 0.1734	548 1311	0.02 0.07
									1859	
Mnth: May	1990	Wells Spawning	Summer Chinook	Wells	89	70.	3.770	0.8796	414	0.02
									414	
Mnth: June	1990	Rocky Reach Wells Spawning	Early Coho Summer Chinook	Rocky Reach Wells	89 89	104. 38.	0.359 4.707	0.0413 1.0003	400 551	0.09 0.03
									951	
Mnth: July	1990	Rocky Reach Wells Spawning	Early Coho Summer Chinook	Rocky Reach Wells	89 89	85. 56.	0.461 3.006	0.0488 0.6388	370 457	0.08 0.03
									827	
Mnth: September	1990	Ringold	Spring Chinook	Wind River	89	25.	1.852	0.0040	2500	0.19
									2500	
Mnth: November	1990	Lyon's Ferry Rocky Reach	Spring Chinook Fall Chinook	Tucannon Wells	89 89	15. 22.	0.501 0.456	0.1440 0.0563	104 1000	0.10 0.45
									1104	
Mnth: December	1990	Priest Rapids	Fall Chinook	Priest Rapids	A				14	0.44
									14	

Disease Category: Other
Agent: Fish Kill

Basin	Location	species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS	
<hr/>										
Lower Columbia										
Mnth: April	1990	Cowlitz	Late Coho	Cowlitz	88	18.	2.744	0.3340	7200	0.15
									7200	
Mnth: August	1990	Lewis River	Swing. Chinook	Lewis River	89	42.	0.532	0.0517	3644	0.37
									3644	
Upper Columbia										
Mnth: July	1990	Wells Spawning	Summer Chinook	Wells	89	56.	3.006	0.6388	309469	20.30
									309469	

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other
Agent: Precocious males

Basin	Location	species	Stock	Brood	Sire Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
<hr/>									
Lower Columbia									
Mnth: January	1990	Lewis River	Spring Chinook	Kalama Falls	88	16.	0.317	0.0212	88 0.06
		Lewis River	Spring Chinook	Lewis River	88	16.	1.143	0.0254	362 0.19
								-----	450
Mnth: February	1990	Lewis River	Spring Chinook	Kalama Falls	88	12.	0.379	0.0254	96 0.07
		Lewis River	Spring Chinook	Lewis River	88	12.	0.951	0.0361	82 0.04
								-----	178
Mnth: March	1990	Lewis River	Spring Chinook	Kalama Falls	88	11.	0.376	0.0252	179 0.13
		Lewis River	Spring Chinook	Lewis River	88	11.	0.909	0.0345	32 0.02
								-----	211
Mnth: April	1990	Lewis River	Spring Chinook	Kalama Falls	88	12.	0.338	0.0227	63 0.05
		Lewis River	Spring Chinook	Lewis River	88	9.	1.488	0.0331	404 0.21
								-----	467
Mnth: October	1990	Lewis River	Spring Chinook	Lewis River	89	17.	1.512	0.1470	2047 0.21
								-----	2047
Mnth: November	1990	Lewis River	Spring Chinook	Lewis River	89	16.	1.178	0.1145	1704 0.17
								-----	1704
Mnth: December	1990	Lewis River	Spring Chinook	Lewis River	89	13.	0.997	0.0997	534 0.05
								-----	534
<hr/>									
Upper Columbia									
Mnth: January	1990	Wells Spawning	Summer Chinook	Wells	88	9.	1.056	0.2289	486 0.12
								-----	486
Mnth: February	1990	Wells Spawning	Summer Chinook	Wells	88	8.	1.110	0.2461	611 0.15
								-----	611
Mnth: March	1990	Wells Spawning	Summer Chinook	Wells	88	8.	1.045	0.2317	778 0.20
								-----	778
Mnth: April	1990	Wells Spawning	Summer Chinook	Wells	88	7.	1.214	0.2691	550 0.14
								-----	550

**VDF PROGRAM PC01
DISEASE PREVALENCE SUMMARY
1990**

Disease Category: Other
Agent: Marking mortality

Disease Category: Other
Agent: Normal

Basin	Location	Species	Stock	Brood	size Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
Lower Columbia									
Mnth: January	1990								
Cowlitz	Late Coho	Cowlitz	88	27.	2. 123	0. 2584	18200	0. 38	
Cowlitz	Spring Chinook	Cowlitz	88	9.	0. 845	0. 1215	6900	0. 64	
Elokomin	Early Coho	Elokomin	88	27.	1. 232	0. 1793	400	0. 08	
Elokomin	Early Coho	Grays River	88	30.	0. 349	0. 0252	1000	0. 23	
Elokomin	Early Coho	Grays River	89	1288.	0. 974	0. 0557	1500	0. 30	
Elokomin	Early Coho	Lewis River	89	1282.	1. 025	0. 0586	1500	0. 29	
Elokomin	Fall Chinook	Elokomin	89	1200.	2. 425	0. 1347	9760	0. 37	
Elokomin	Late Coho	Elokomin	88	27.	1. 635	0. 0838	1200	0. 10	
Grays River	Early Coho	Grays River	88	21.	2. 283	0. 0571	300	0. 08	
Kalam Falls	Fall Chinook	Kalam Falls	89	883.	0. 946	0. 0685	345	0. 01	
Kalam Falls	Late Coho	Kalam Falls	88	24.	1. 406	0. 1483	280	0. 03	
Kalam Falls	Spring Chinook	Kalam Falls	89	708.	0. 994	0. 0725	320	0. 04	
Lewis River	Early Coho	Lewis River	88	28.	1. 525	0. 0949	84	0. 00	
Lewis River	Late Coho	Lewis River	88	30.	1. 549	0. 0964	260	0. 01	
Lewis River	Late Coho	Washougal	88	28.	0. 103	0. 0064	25	0. 03	
Lewis River	Spring Chinook	Kalam Falls	88	16.	0. 317	0. 0212	36	0. 03	
Lewis River	Spring Chinook	Lewis River	88	16.	1. 143	0. 0254	260	0. 14	
Lower Kalam	Early Coho	Kalam Falls	88	18.	1. 986	0. 1192	300	0. 05	
Lower Kalam	Fall Chinook	Kalam Falls	89	953.	0. 802	0. 0859	548	0. 04	
Lower Kalam	Spring Chinook	Kalam Falls	88	15.	2. 150	0. 1173	300	0. 06	
Speelvai	Early Coho	Lewis River	88	29.	1. 729	0. 1482	100	0. 08	

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other
Agent: Normal

Basin	Location	species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% LOSS
Lower Columbia									
Mnth: January 1990									
Speelyai Early Coho Lewis River 89 1057. 1.077 0.0317 1600 0.10									
Speelyai Spring Chinook Lewis River 88 18. 1.025 0.1367 100 0.05									
Speelyai Spring Chinook Lewis River 89 399. 1.025 0.0586 1800 0.14									
Toutle Late Coho Elokomin 88 26. 1.748 0.0424 500 0.06									
Washougal Fall Chinook Washougal 89 940. 1.398 0.0624 900 0.09									
Washougal Late Coho Washougal .88 28. 4.082 0.0517 289 0.00									
48807									
Mnth: February 1990									
Cowlitz Fall Chinook Cowlitz 89 585. 1.934 0.1682 16400 0.22									
Cowlitz Late Coho Cowlitz 88 24. 2.280 0.2757 3280 0.07									
Cowlitz Spring Chinook Cowlitz 88 9. 0.989 0.1451 6800 0.63									
Cowlitz Spring Chinook Cowlitz 89 145. 0.410 0.0696 4300 0.22									
Elokomin Early Coho Elokomin 88 25. 1.231 0.1759 600 0.13									
Elokomin Early Coho Grays River 89 647. 1.178 0.0655 1500 0.30									
Elokomin Early Coho Lewis River 89 665. 1.201 0.0667 1500 0.29									
Elokomin Fall Chinook Elokomin 89 533. 0.824 0.0598 5200 0.12									
Elokomin Late Coho Elokomin 88 24. 1.790 0.0950 850 0.07									
Grays River Early Coho Grays River 88 19. 2.653 0.0227 300 0.08									
Grays River Early Coho Grays River 89 830. 1.632 0.0918 1200 0.06									
Grays River Fall Chinook Grays River 89 579. 0.586 0.0103 1900 0.13									
Grays River Fall Chinook Washougal 89 558. 1.092 0.0840 300 0.01									
Kalama Falls Fall Chinook Kalama Falls 89 583. 1.120 0.0914 9770 0.27									
Kalama Falls Late Coho Kalama Falls 88 20. 1.583 0.1670 470 0.05									
Kalama Falls Spring Chinook Kalama Falls 89 499. 0.934 0.0875 2485 0.31									
Lewis River Early Coho Lewis River 88 26. 1.518 0.1012 85 0.00									
Lewis River Late Coho Lewis River 88 28. 1.548 0.1032 238 0.01									
Lewis River Late Coho Washougal 88 26. 0.102 0.0068 14 0.02									
Lewis River Spring Chinook Kalama Falls 88 12. 0.379 0.0254 48 0.03									
Lewis River Spring Chinook Lewis River 88 12. 0.951 0.0361 92 0.05									
Lower Kalama Early Coho Kalama Falls 88 18. 2.364 0.1182 280 0.05									
Lower Kalama Early Coho Kalama Falls 89 806. 0.934 0.0934 1480 0.27									
Lower Kalama Fall Chinook Kalama Falls 89 685. 1.119 0.1178 820 0.04									
Lower Kalama Spring Chinook Kalama Falls 88 12. 4.149 0.1358 280 0.05									
Speelyai Early Coho Lewis River 88 24. 2.337 0.1669 100 0.08									
Speelyai Early Coho Lewis River 89 593. 1.731 0.0502 2200 0.13									
Speelyai Late Coho Lewis River 89 1000. 1.608 0.0230 700 0.30									
Speelyai Spring Chinook Lewis River 88 16. 1.025 0.1366 100 0.05									
Speelyai Spring Chinook Lewis River 89 267. 1.112 0.0794 2000 0.16									
Toutle Fall Chinook Kalama Falls 89 475. 0.200 0.0068 900 0.07									
Toutle Fall Chinook Washougal 89 475. 0.326 0.0110 1500 0.07									
Toutle Late Coho Elokomin 88 23. 0.955 0.0463 300 0.04									
Washougal Fall Chinook Washougal 89 863. 1.477 0.0659 11411 0.18									
Usshougal Late Coho Washougal 88 23. 4.832 0.0611 221 0.00									
79624									
Mnth: March 1990									
Cowlitz Fall Chinook Cowlitz 89 306. 0.917 0.1251 29900 0.44									
Cowlitz Late Coho Cowlitz 88 22. 2.324 0.2810 2880 0.06									
Cowlitz Spring Chinook Cowlitz 88 7. 0.985 0.1416 4940 0.46									
Cowlitz Spring Chinook Cowlitz 89 85. 0.580 0.0985 9200 0.47									
Elokomin Early Coho Elokomin 88 19. 1.452 0.2112 200 0.04									
Elokomin Early Coho Grays River 89 351. 1.292 0.0969 749 0.15									
Elokomin Early Coho Lewis River 89 338. 1.406 0.1055 1464 0.28									
Elokomin Fall Chinook Elokomin 89 304. 1.041 0.1060 2495 0.05									
Elokomin Late Coho Elokomin 88 18. 1.697 0.1081 565 0.05									
Elokomin Late Coho Elokomin 89 1081. 0.933 0.0700 285 0.04									
Grays River Early Coho Grays River 88 15. 3.032 0.0259 650 0.18									

VDF PRDGRAN QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other

Agent: Normal

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% LOSS
<hr/>									
Lower Columbia									
Mnth: March	1990								
Grays River	Early Coho	Grays River	89	405.	1.747	0.0953		200	0.02
Grays River	Fall Chinook	Grays River	89	246.	1.105	0.0163		8150	0.66
Grays River	Fall Chinook	Washaugal	89	201.	0.624	0.0412		750	0.67
Kalam Falls	Fall Chinook	Kalam Falls	89	323.	1.580	0.1372		4690	0.13
Kalam Falls	Late Coho	Kalam Falls	88	17.	1.741	0.1836		1005	0.11
Kalam Falls	Spring Chinook	Kalam Falls	89	302.	1.320	0.1237		1280	0.16
Lewis River	Early Coho	Lewis River	88	22.	1.584	0.1188		175	0.02
Lewis River	Late Coho	Lewis River	88	23.	1.631	0.1087		231	0.01
Lewis River	Late Coho	Lewis River	89	872.	0.857	0.0760		91	0.00
Lewis River	Late Coho	Washougal	88	22.	0.107	0.0080		9	0.01
Lewis River	Spring Chinook	Kalam Falls	88	11.	0.376	0.0252		139	0.10
Lewis River	Spring Chinook	Lewis River	88	11.	0.909	0.0345		21	0.01
Lower Kalam	Early Coho	Kalam Falls	88	16.	2.321	0.1160		465	0.08
Lower Kalam	Early Coho	Kalam Falls	89	463.	1.089	0.1361		310	0.06
Lower Kalam	Spring Chinook	Kalam Falls	88	11.	2.052	0.1306		465	0.09
Speelyai	Early Coho	Lewis River	88	18.	2.144	0.0715		100	0.08
Speelyai	Early Coho	Lewis River	89	242.	2.103	0.0901		900	0.05
Speelyai	Spring Chinook	Lewis River	88	12.	1.118	0.1490		100	0.05
Speelyai	Spring Chinook	Lewis River	89	160.	1.120	0.0819		1100	0.08
Toutle	Early Coho	Grays River	88	19.	1.173	0.0521		300	0.04
Toutle	Early Coho	Grays River	89	449.	2.799	0.0131		800	0.07
Toutle	Fall Chinook	Kalam Falls	89	226.	0.361	0.0112		800	0.06
Toutle	Fall Chinook	Washougal	89	226.	0.588	0.0182		1300	0.06
Washougal	Fall Chinook	Washougal	89	444.	0.820	0.0244		12127	0.20
Washougal	Late Coho	Lewis River	89	854.	1.745	0.0645		8099	0.31
Washougal	Late Coho	Washougal	88	20.	2.473	0.0616		95	0.00
Washougal	Late Coho	Washougal	89	997.	1.462	0.0468		4573	0.23
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101603									
Mnth: April	1990								
Cowlitz	Fall Chinook	Cowlitz	89	152.	1.119	0.1772		16600	0.25
Cowlitz	Late Coho	Cowlitz	88	18.	2.744	0.3340		8300	0.18
Cowlitz	Spring Chinook	Cowlitz	89	58.	0.330	0.0471		11277	0.58
Elokomin	Early Coho	Elokomin	88	18.	1.614	0.2347		400	0.08
Elokomin	Early Coho	Grays River	89	164.	1.434	0.1056		1447	0.30
Elokomin	Early Coho	Lewis River	89	168.	2.111	0.1583		964	0.19
Elokomin	Fall Chinook	Elokomin	89	144.	1.555	0.1583		2699	0.06
Elokomin	Late Coho	Elokomin	88	15.	1.540	0.0982		780	0.09
Elokomin	Late Coho	Elokomin	89	705.	1.395	0.1076		3700	0.22
Grays River	Early Coho	Grays River	88	13.	3.358	0.0289		600	0.17
Grays River	Early Coho	Grays River	89	220.	1.896	0.1417		4050	0.51
Grays River	Fall Chinook	Grays River	89	126.	1.417	0.0402		5700	0.46
Grays River	Fall Chinook	Washougal	89	124.	0.748	0.0565		1300	1.17
Kalam Falls	Fall Chinook	Kalam Falls	89	166.	1.321	0.1390		4870	0.14
Kalam Falls	Late Coho	Kalam Falls	88	15.	1.879	0.1981		895	0.09
Kalam Falls	Late Coho	Kalam Falls	89	601.	0.828	0.0690		725	0.11
Kalam Falls	Late Coho	Lewis River	89	587.	0.691	0.0576		365	0.13
Kalam Falls	Spring Chinook	Kalam Falls	89	177.	1.538	0.1763		900	0.11
Lewis River	Early Coho	Lewis River	88	17.	1.626	0.1265		204	0.02
Lewis River	Late Coho	Lewis River	88	17.	1.726	0.1343		176	0.00
Lewis River	Late Coho	Lewis River	89	510.	1.589	0.1192		345	0.00
Lewis River	Late Coho	Washougal	88	17.	0.109	0.0085		10	0.01
Lewis River	Spring Chinook	Kalam Falls	88	12.	0.338	0.0227		II	0.00
Lewis River	Spring Chinook	Lewis River	88	9.	1.488	0.0331		57	0.03
Lewis River	Spring Chinook	Lewis River	89	133.	1.307	0.1144		136	0.08
Lower Kalam	Early Coho	Kalam Falls	88	13.	2.799	0.1399		300	0.05
Lower Kalam	Early Coho	Kalam Falls	89	249.	0.541	0.0696		1120	0.21
Lower Kalam	Fall Chinook	Kalam Falls	89	185.	1.328	0.0664		1200	0.06
Lower Kalam	Spring Chinook	Kalam Falls	88	9.	2.355	0.1499		150	0.03

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other

Agent: Normal

Basin	Location	Species	Stock	sire	Flow	Density	Number	%
				Brood	Fish/Lb	Index	LOSS	LOSS
Lower Columbia								
Mnth: April								
	1990							
Speelyai	Early Coho	Lewis River	88	16.	24.800	0.8265	100	0.08
Speelyai	Early Caho	Lewis River	89	166.	1.077	0.0657	800	0.05
Speelyai	Spring Chinook	Lewis River	89	163.	0.901	0.0660	850	0.07
Toutle	Early Coho	Grays River	88	14.	1.447	0.0643	400	0.05
Toutle	Early Coho	Grays River	89	206.	2.937	0.0221	400	0.04
Toutle	Fall Chinook	Kalama Falls	89	134.	0.508	0.0158	500	0.04
Toutle	Fall Chinook	Washougal	89	134.	0.840	0.0261	900	0.04
Washougal	Fall Chinook	Washougal	89	210.	1.083	0.0253	2950	0.05
Washougal	Lste Coho	Lewis River	89	454.	1.842	0.0695	1590	0.07
Washougal	Late Caho	Washougal	89	459.	2.315	0.0741	3149	0.16
							80920	
Mnth: May								
	1990							
Cowlitz	Late Coho	Cowlitz	88	17.	0.542	0.0660	26600	2.96
Cowlitz	Late Caho	Cowlitz	89	200.	1.473	0.1625	33976	0.51
Cowlitz	Spring Chinook	Cowlitz	89	39.	0.385	0.0588	2598	0.15
Elokomin	Early Coho	Grays River	89	98.	1.192	0.0894	985	0.20
Elokomin	Early Caho	Lewis River	89	104.	1.201	0.0900	1439	0.28
Elokomin	Fall Chinook	Elokmin	89	68.	1.720	0.2559	1881	0.04
Elokomin	Late Coho	Elokmin	88	13.	1.853	0.0984	205	0.02
Elokomin	Late Caho	Elokmin	89	354.	0.825	0.0953	5797	0.34
Grays River	Early Coho	Grays River	89	136.	0.754	0.0485	1550	0.20
Grays River	Fall Chinook	Grays River	89	63.	1.592	0.0500	500	0.06
Kalama Falls	Fall Chinook	Kalama Falls	89	96.	1.004	0.1089	8200	0.29
Kalama Falls	Late Coho	Kalama Falls	88	14.	2.012	0.2117	80	0.02
Kalama Falls	Late Caho	Kalama Falls	89	326.	1.239	0.1032	4950	0.75
Kalama Falls	Late Coho	Lewis River	89	322.	0.939	0.0861	950	0.35
Kalama Falls	Spring Chinook	Kalama Falls	89	131.	0.336	0.0315	1195	1.02
Lewis River	Early Coho	Lewis River	88	16.	1.971	0.1314	25	0.00
Lewis River	Late Caho	Washougal	88	16.	0.133	0.0688	1	0.00
Lewis River	Spring Chinook	Lewis River	89	85.	1.132	0.1557	165	0.09
Lower Kalama	Early Coho	Kalama Falls	89	118.	0.668	0.0844	550	0.10
Lower Kalams	Fall Chinook	Kalama Falls	89	77.	1.913	0.0729	1620	0.08
Lower Kalama	Spring Chinook	Kalama Falls	89	123.	0.633	0.0800	500	0.09
Speelyai	Early Coho	Lewis River	89	111.	1.240	0.1168	1600	0.10
Speelyai	Spring Chinook	Lewis River	89	93.	1.365	0.0949	700	0.06
Toutle	Early Coho	Grays River	88	13.	1.460	0.0678	100	0.01
Toutle	Fall Chinook	Kalama Falls	89	73.	0.729	0.0236	200	0.02
Toutle	Fall Chinook	Washougal	89	73.	1.188	0.0385	300	0.01
Washougal	Fall Chinook	Washougal	89	99.	2.613	0.0441	600	0.00
Washougal	Late Coho	Lewis River	89	214.	2.528	0.0989	1750	0.08
Washougal	Late Caho	Washougal	89	256.	2.244	0.0804	965	0.05
							99982	
Mnth: June								
	1990							
Cowlitz	Late Coho	Cowlitz	89	139.	1.407	0.1553	49350	0.75
Cowlitz	Spring Chinook	Cowlitz	89	30.	0.394	0.0604	3462	0.23
Elokamin	Early Caho	Grays River	89	83.	8.824	0.0613	219	0.05
Elokomin	Early Coho	Lewis River	89	82.	1.007	0.0761	1580	0.31
Elokmin	Fall Chinook	Elokmin	89	52.	2.062	0.3223	1202	0.03
Elokmin	Late Caho	Elokmin	89	227.	1.537	0.1162	3008	0.20
Grays River	Early Coho	Grays River	89	81.	0.778	0.0279	1400	0.18
Kalama Falls	Fall Chinook	Kalama Falls	89	121.	0.490	0.0459	2960	1.85
Kalama Falls	Late Coho	Kalama Falls	89	265.	0.386	0.0360	1470	0.24
Kalama Falls	Late Caho	Lewis River	89	266.	0.513	0.0481	660	0.24
Kalama Falls	Spring Chinook	Kalama Falls	89	113.	0.370	0.0347	870	0.75
Lewis River	Late Coho	Lewis River	89	210.	1.126	0.0500	1176	0.03
Lewis River	Spring Chinook	Lewis River	89	71.	0.507	0.0627	615	0.06

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other

Agent: Normal

Basin	Location		Size	Flow	Density	Number	%
			Brood	Index	Index	Loss	Loss
Lower Columbia							
Mnth: June 1990							
Lower Kalama	Early Coho	Kalama Falls	89	87.	0.848	0.1071	420 0.08
Lower Kalama	Fall Chinook	Kalama Falls	89	70.	2.204	0.0840	330 0.02
Lower Kalama	Spring Chinook	Kalama Falls	89	98.	0.816	0.1031	420 0.08
Speelyai	Early Coho	Lewis River	89	77.	1.502	0.1029	100 0.00
Speelyai	Spring Chinook	Lewis River	89	86.	0.860	0.0584	200 0.09
Washougal	Fall Chinook	Washougal	89	57.	1.300	0.0629	220 0.04
Washougal	Late Coho	Lewis River	89	134.	1.926	0.0712	1160 0.07
Washougal	Late Coho	Washougal	89	137.	1.827	0.0617	1645 0.08

						72467	
Mnth: July 1990							
Cowlitz	Late Coho	Cowlitz	89	89.	0.928	0.1470	6550 0.10
Cowlitz	Spring Chinook	Cowlitz	89	22.	0.440	0.0781	976 0.08
Elokomin	Early Coho	Grays River	89	72	0.792	0.0550	485 0.10
Elokomin	Early Coho	Lewis River	89	74:	0.822	0.0571	303 0.06
Elokomin	Late Coho	Elokomin	89	163.	0.546	0.0304	562 0.04
Grays River	Early Coho	Grays River	89	57.	0.996	0.0357	2500 0.33
Kalama Falls	Fall Chinook	Kalama Falls	89	103.	0.483	0.0504	685 0.86
Kalama Falls	Late Coho	Kalama Falls	89	156.	0.548	0.0510	865 0.14
Kalama Falls	Late Coho	Lewis River	89	162.	0.714	0.0669	350 0.13
Kalama Falls	Spring Chinook	Kalama Falls	89	89.	0.425	0.0398	345 0.30
Lewis River	Late Coho	Lewis River	89	129.	1.564	0.0695	2103 0.05
Lewis River	Spring Chinook	Lewis River	89	57.	0.584	0.0518	726 0.07
Lower Kalama	Early Coho	Kalama Falls	89	72	0.928	0.1172	268 0.05
Lower Kalama	Spring Chinook	Kalama Falls	89	76.	0.869	0.1097	688 0.12
Speelyai	Early Coho	Lewis River	89	99.	1.044	0.0721	1728 0.14
Speelyai	Spring Chinook	Lewis River	89	64.	1.047	0.0765	200 0.09
Washougal	Fall Chinook	Washougal	89	40.	1.634	0.0729	480 0.10
Washougal	Late Coho	Lewis River	89	112.	1.384	0.0633	3185 0.21
Washougal	Late Coho	Washougal	89	123.	1.389	0.0475	5800 0.31

						28799	
Mnth: August 1990							
Cowlitz	Late Coho	Cowlitz	89	64.	0.948	0.1354	10700 0.20
Cowlitz	Spring Chinook	Cowlitz	89	14.	0.598	0.1062	1354 0.11
Elokomin	Early Coho	Grays River	89	57.	0.922	0.0640	504 0.10
Elokomin	Early Coho	Lewis River	89	54.	1.006	0.0699	389 0.08
Elokomin	Late Coho	Elokomin	89	102.	0.734	0.0409	1010 0.07
Grays River	Early Coho	Grays River	89	36.	1.353	0.0486	1800 0.24
Kalama Falls	Fall Chinook	Kalama Falls	89	74.	0.536	0.0615	350 0.45
Kalama Falls	Late Coho	Kalama Falls	89	108.	0.568	0.0647	1085 0.18
Kalama Falls	Late Coho	Lewis River	89	107.	0.765	0.0877	515 0.19
Kalama Falls	Spring Chinook	Kalama Falls	89	60.	0.453	0.0519	470 0.42
Lewis River	Late Coho	Lewis River	89	81.	2.131	0.0947	1202 0.03
Lewis River	Spring Chinook	Lewis River	89	42.	0.532	0.0517	794 0.08
Lower Kalama	Early Coho	Kalama Falls	89	48.	1.206	0.1524	325 0.06
Lower Kalama	Spring Chinook	Kalama Falls	89	42.	1.407	0.1778	418 0.08
Speelyai	Early Coho	Lewis River	89	73.	1.282	0.0886	2300 0.19
Speelyai	Spring Chinook	Lewis River	89	50.	0.902	0.6013	400 0.19
Washougal	Late Coho	Lewis River	89	81.	1.945	0.0754	3230 0.21
Washougal	Late Coho	Washougal	89	85.	1.917	0.0567	3553 0.19

						30399	
Mnth: September 1990							
Cowlitz	Late Coho	Cowlitz	89	51.	0.932	0.1332	13425 0.30
Cowlitz	Spring Chinook	Cowlitz	89	10.	0.742	0.1318	985 0.08
Elokomin	Early Coho	Grays River	89	43.	1.102	0.0765	300 0.06

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other
Agent: Normal

Basin	Location	Species	Stock	Brood	Sire Fish/Lb	Flow Index	Density Index	Number	% Loss	% LOSS
Lower Columbia										
Mnth: September 1990										
	Elokomin	Early Coho	Lewis River	89	43.	1.165	0.0809	200	0.04	
	Elokomin	Late Coho	Elokomin	89	66.	0.993	0.0553	1000	0.07	
	Grays River	Early Coho	Grays River	89	28.	1.592	0.0570	2300	0.30	
	Kalam Falls	Late Coho	Kalam Falls	89	64.	0.890	0.0921	690	0.11	
	Kalam Falls	Late Coho	Lewis River	89	69.	1.126	0.1173	255	0.09	
	Kalam Falls	Spring Chinook	Kalam Falls	89	39.	0.655	0.0682	315	0.28	
	Lewis River	Late Coho	Lewis River	89	75.	2.216	0.0985	2867	0.06	
	Lewis River	Spring Chinook	Lewis River	89	28.	0.624	0.0665	1600	0.16	
	Lower Kalam	Early Coho	Kalam Falls	89	37.	1.286	0.1241	296	0.05	
	Lower Kalsma	Spring Chinook	Kalam Falls	89	27.	1.653	0.1181	292	0.05	
	Speelyai	Early Coho	Lewis River	89	67.	1.363	0.0942	1600	0.13	
	Speelyai	Spring Chinook	Lewis River	89	43.	0.980	0.6533	200	0.09	
	Washougal	Late Coho	Lewis River	89	80.	1.940	0.0752	2340	0.15	
	Washougal	Late Coho	Washougal	89	82.	1.981	0.0584	2640	0.14	

	31305									
Mnth: October 1990										
	Cowlitz	Late Coho	Cowlitz	89	45.	1.318	0.1883	3350	0.07	
	Cowlitz	Spring Chinook	Cowlitz	89	9.			880	0.07	
	Elokomin	Early Coho	Grays River	89	33	1.332	0.0925	56	0.01	
	Elokomin	Early Coho	Lewis River	89	34.	1.255	0.0872	96	0.02	
	Elokomin	Late Coho	Elokomin	89	40.	1.384	0.0772	1060	0.07	
	Grays River	Early Coho	Grays River	89	27.	1.618	0.0579	2300	0.31	
	Kalam Falls	Late Coho	Kalam Falls	89	46.	1.108	0.1146	495	0.08	
	Kalam Falls	Late Coho	Lewis River	89	50.	1.404	0.1462	185	0.07	
	Kalam Falls	Spring Chinook	Kalam Falls	89	31.	0.754	0.0786	235	0.21	
	Lewis River	Late Coho	Lewis River	89	51.	1.964	0.1331	3138	0.07	
	Lewis River	Spring Chinook	Lewis River	89	17.	1.512	0.1470	2672	0.27	
	Lower Kalam	Early Coho	Kalam Falls	89	30.	1.475	0.1374	372	0.07	
	Lower Kalam	Spring Chinook	Kalam Falls	89	21.	1.220	0.1394	620	0.11	
	Speelyai	Early Coho	Lewis River	89	58.	1.488	0.1028	1600	0.13	
	Speelyai	Spring Chinook	Lewis River	89	30.	1.579	1.0529	100	0.05	
	Washougal	Late Coho	Lewis River	89	48.	1.137	0.0190	713	0.05	
	Washougal	Late Coho	Washougal	89	49.	0.976	0.0187	300	0.02	

	18172									
Mnth: November 1990										
	Cowlitz	Late Coho	Cowlitz	89	31.	1.668	0.2383	4480	0.10	
	Cowlitz	Spring Chinook	Cowlitz	89	7.	1.013	0.1448	409	0.03	
	Elokomin	Early Coho	Grays River	89	29.	1.438	0.0999	109	0.02	
	Elokomin	Early Coho	Lewis River	89	29.	1.520	0.1056	101	0.02	
	Elokomin	Lets Coho	Elokomin	89	37.	1.454	0.0811	200	0.01	
	Grays River	Early Coho	Grays River	89	27.	1.612	0.0577	2300	0.31	
	Kalsma Falls	Late Coho	Kalam Falls	89	36.	1.297	0.1342	150	0.02	
	Kalam Falls	Late Coho	Lewis River	89	38.	1.673	0.1743	55	0.02	
	Kalam Falls	Spring Chinook	Kalam Falls	89	21.	0.961	0.1001	a5	0.08	
	Lewis River	Late Coho	Lewis River	89	46.	2.020	0.1369	2834	0.06	
	Lewis River	Spring Chinook	Lewis River	89	16.	1.178	0.1145	964	0.10	
	Lower Kalam	Early Coho	Kalam Falls	89	30.	1.474	0.1373	360	0.07	
	Lower Kalam	Spring Chinook	Kalam Falls	89	14.	0.905	0.1810	300	0.05	
	Speelyai	Early Coho	Lewis River	89	42.	1.773	0.1225	1100	0.09	
	Speelyai	Spring Chinook	Lewis River	89	29.	1.493	0.0595	100	0.05	
	Washougal	Late Coho	Lewis River	89	45.	1.175	0.0196	2670	0.18	
	Washougal	Late Coho	Washougal	89	46.	1.057	0.0202	6465	0.37	

	22682									

VDF PROGRAMQC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other
Agent: Normal

Basin	Location	Species	Stock	Size	Flow	Density	Number	%
				Brood Fish/Lb	Index	Index	Loss	Loss
Lower Columbia								
Mnth: December 1990								
Cowlitz	Late Coho	Cowlitz	89	30.	1. 722	0. 2460	2240	0. 05
Cowlitz	Spring Chinook	Cowlitz	89	7.			681	0. 05
Cowlitz	Spring Chinook	Cowlitz	90	500.	0. 948	0. 0379	9500	0. 39
Elokomin	Early Coho	Grays River	89	28.	1. 475	0. 1024	200	0. 04
Elokomin	Early Coho	Lewis River	89	28.	1. 300	0. 1772	100	0. 02
Elokomin	Fall Chinook	Elokomin	A				120	8. 00
Elokomin	Late Coho	Elokomin	89	39.	1. 405	0. 0783	300	0. 02
Grays River	Early Coho	Grays River	89	27.	2. 059	0. 0649	2800	0. 37
Kalama Falls	Early Coho	Kalama Falls	90				14600	3. 50
Kalama Falls	Early Coho	Kalama Falls	A				62	2. 10
Kalama Falls	Fall Chinook	Kalama Falls	90				467020	4. 13
Kalama Falls	Late Coho	Kalama Falls	89	34.	1. 444	0. 1064	105	0. 02
Kalama Falls	Late Coho	Kalama Falls	90				178400	14. 30
Kalama Falls	Late Coho	Lewis River	89	34.	1. 2%	0. 0948	35	0. 01
Kalama Falls	Spring Chinook	Kalama Falls	89	17.	1. 612	0. 1567	45	0. 04
Kalama Falls	Spring Chinook	Kalama Falls	90				35700	10. 70
Kalama Falls	Spring Chinook	Kalama Falls	90	1200.	0. 234	0. 0146	100	0. 08
Lewis River	Late Coho	Lewis River	89	35.	2. 552	0. 1730	1222	0. 03
Lewis River	Spring Chinook	Lewis River	89	13.	0. 997	0. 0997	626	0. 06
Lower Kalama	Early Coho	Kalama Falls	89	30.	1. 260	0. 0770	420	0. 08
Lower Kalama	Spring Chinook	Kalama Falls	89	14.	1. 000	0. 2000	310	0. 06
Speelyai	Early Coho	Lewis River	89	38.	1. 824	0. 1260	160	0. 01
Speelyai	Spring Chinook	Lewis River	89	23.	1. 477	0. 0984	60	0. 03
Speelyai	Spring Chinook	Lewis River	90	940.	1. 157	0. 0343	4400	0. 34
Washougal	Fall Chinook	Washougal	90				537400	6. 88
Washougal	Late Coho	Lewis River	89	35.	1. 523	0. 0254	2930	0. 20
Washougal	Late Coho	Washougal	89	36.	1. 714	0. 0240	6465	0. 38
Washougal	Late Coho	Washougal	90				95800	7. 34
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Upper Columbia								
Mnth: January 1990								
Klickitat	Late Coho	Cowlitz	88	38.	4. 672	0. 1018	594	0. 04
Klickitat	Spring Chinook	Klickitat	88	28.	1. 372	0. 0760	437	0. 06
Klickitat	Spring Chinook	Klickitat	89	424.	1. 464	0. 0870	2373	0. 25
Klickitat	Spring Chinook	Wind River	89	450.	1. 022	0. 0756	2420	0. 19
Lyon's Ferry	Fall Chinook	Lyon's Ferry	88	17.	0. 481	0. 0618	1259	0. 27
Lyon's Ferry	Fall Chinook	Lyon's Ferry	89	1011.	0. 249	0. 0499	1956	0. 12
Lyon's Ferry	Spring Chinook	Tucannon	88	12.	1. 010	0. 2714	561	0. 37
Lyon's Ferry	Spring Chinook	Tucannon	89	436.	0. 105	0. 0210	384	0. 37
Rocky Reach	Fall Chinook	Priest Rapids	88	13.	0. 705	0. 0829	100	0. 04
Rocky Reach	Late Coho	Cowlitz	88	23.	1. 055	0. 1241	100	0. 02
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Mnth: February 1990								
Klickitat	Fall Chinook	Priest Rapids	89	480.	1. 242	0. 0446	3600	0. 08
Klickitat	Late Coho	Cowlitz	88	33.	2. 154	0. 1347	460	0. 03
Klickitat	Spring Chinook	Klickitat	88	16.	1. 511	0. 1001	400	0. 05
Klickitat	Spring Chinook	Klickitat	89	242.	1. 156	0. 0834	984	0. 10
Klickitat	Spring Chinook	Wind River	89	238.	0. 689	0. 0310	544	0. 90
Lyon's Ferry	Fall Chinook	Lyon's Ferry	88	13.	0. 559	0. 0745	1130	0. 25
Lyon's Ferry	Fall Chinook	Lyon's Ferry	89	630.	0. 253	0. 0549	6138	0. 19
Lyon's Ferry	Fall Chinook	Lyon's Ferry	89	630.	0. 253	0. 0549	11338	0. 35
Lyon's Ferry	Spring Chinook	Tucannon	88	11.	1. 069	0. 2874	160	0. 11
Lyon's Ferry	Spring Chinook	Tucannon	89	197.	0. 172	0. 0373	70	0. 07
Priest Rapids	Fall Chinook	Priest Rapids	89	678.	1. 186	0. 0508	4225	0. 11
Ringold	Spring Chinook	Wind River	89	290.	0. 763	1. 2574	1995	0. 16

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other

Agent: Normal

Basin	Location	species	Stock	Brood	Sire Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
upper Columbia									
Month: February									
1990									
	Rocky Reach	Early Coho	Grays River	89	427.	0.521	0.1303	950	0.29
	Rocky Reach	Early Caho	Lewis River	89	427.	0.286	0.0716	510	0.29
	Rocky Reach	Fall Chinook	Priest Rapids	88		0.485	0.0855	100	0.04
	Rocky Reach	Fall Chinook	Wells	89	5:::	0.590	0.1475	320	0.04
	Rocky Reach	Late Coho	Cowlitz	88	21.	0.735	0.1297	100	0.02

33024									
Month: March									
1990									
	Klickitat	Fall Chinook	Priest Rapids	89	216.	1.253	0.0731	594	0.01
	Klickitat	Late Coho	Cowlitz	88	25.	2.696	0.1618	420	0.03
	Klickitat	Late Coho	Lewis River	89	643.	1.623	0.0709	7273	0.46
	Klickitat	Spring Chinook	Klickitat	88	12.	1.830	0.1213	560	0.07
	Klickitat	Spring Chinook	Klickitat	89	183.	1.067	0.0831	782	0.08
	Klickitat	Spring Chinook	Wind River	89	157.	0.897	0.0404	22	0.04
	Lyon's Ferry	Fall Chinook	Lyon's Ferry	88	11.	0.596	0.0795	1239	0.28
	Lyon's Ferry	Fall Chinook	Lyon's Ferry	89	238.	0.555	0.1202	10439	0.33
	Lyon's Ferry	Spring Chinook	Tucannon	88	11.	1.101	0.2958	95	0.07
	Lyon's Ferry	Spring Chinook	Tucannon	89	114.	0.248	0.0536	44	0.04
	Priest Rapids	Fall Chinook	Priest Rapids	89	310.	0.956	0.0602	1325	0.02
	Ringold	Fall Chinook	Washougal	89	534.	0.394	0.0812	261	0.21
	Rocky Reach	Fall Chinook	Priest Rapids	88	ID.	0.565	0.0996	100	0.04
	Rocky Reach	Late Coho	Cowlitz	88	19.	0.782	0.1380	50	0.01

23204									
Month: April									
1990									
	Klickitat	Fall Chinook	Priest Rapids	89	107.	3.321	0.1192	266	0.00
	Klickitat	Late Coho	Cowlitz	88	20.	3.013	0.1883	450	0.03
	Klickitat	Late Coho	Lewis River	89	270.	2.859	0.1250	221	0.01
	Klickitat	Spring Chinook	Klickitat	88		2.666	0.1767	150	0.02
	Klickitat	Spring Chinook	Klickitat	89	12::	1.314	0.1073	339	0.04
	Klickitat	Spring Chinook	Wind River	89	90.	1.105	0.0595	42	0.07
	Lyon's Ferry	Fall Chinook	Lyon's Ferry	88	10.	0.600	0.0800	318	0.07
	Lyon's Ferry	Fall Chinook	Lyon's Ferry	89	133.	0.474	0.1389	4702	0.17
	Lyon's Ferry	Spring Chinook	Tucannon	88	11.	1.098	0.2950	38	0.03
	Lyon's Ferry	Spring Chinook	Tucannon	89	79.	0.321	0.0696	104	0.10
	Priest Rapids	Fall Chinook	Priest Rapids	89	127.	0.539	0.1078	8700	0.13
	Ringold	Fall Chinook	Washougal	89	75.	1.187	0.0003	168	0.13
	Ringold	Spring Chinook	Wind River	89	94.	0.779	0.2072	1393	0.11
	Rocky Reach	Fall Chinook	Priest Rapids	88	8.	0.641	0.1130	150	0.07
	Rocky Reach	Fall Chinook	Wells	89	270.	0.461	0.1152	150	0.07

17191									
Month: May									
1990									
	Klickitat	Fall Chinook	Priest Rapids	89	151.	0.994	0.0363	5454	0.43
	Klickitat	Late Coho	Cowlitz	88	17.	2.167	0.1354	465	0.05
	Klickitat	Late Coho	Lewis River	89	181.	1.755	0.0955	841	0.05
	Klickitat	Spring Chinook	Klickitat	88	7.	2.666	0.1788	5	0.00
	Klickitat	Spring Chinook	Klickitat	89	98.	0.845	0.0478	479	0.05
	Klickitat	Spring Chinook	Wind River	89	84.	1.155	0.0622	22	0.04
	Lyon's Ferry	Fall Chinook	Lyon's Ferry	89	82.	0.662	0.1941	4490	0.14
	Lyon's Ferry	Spring Chinook	Tucannon	89	72.	0.225	0.0488	262	0.26
	Priest Rapids	Fall Chinook	Priest Rapids	89	67.	0.731	0.1463	1723	0.03
	Ringold	Fall Chinook	Washougal	89	55.	1.435	0.3800	81	0.07
	Ringold	Spring Chinook	Wind River	89	85.	0.851	0.2266	800	0.06
	Rocky Reach	Fall Chinook	Wells	89	143.	0.700	0.1750	245	0.11

14867									

**WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990**

Disease Category: Other

Agent: Normal

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other

Agent: Normal

Basin	Location	Species	Stock	Brood	Size	Flow	Density	Number	%
					Fish/Lb	Index	Index	Loss	Loss
Upper Columbia									
Mnth: December	1990	Klickitat	Fall Chinook	Lyon's Ferry	90			28600	1.45
		Klickitat	Fall Chinook	Priest Rapids	90			529000	20.40
		Klickitat	Late Coho	Lewis River	89	39.	1.493 0.1027	183	0.01
		Klickitat	Spring Chinook	Klickitat	89	21.	1.046 0.0825	109	0.01
		Klickitat	Spring Chinook	Klickitat	90	829.	1.079 0.0397	b34	0.18
		Klickitat	Spring Chinook	Klickitat	90			16100	4.31
		Klickitat	Spring Chinook	Wind River	90	856.	1.182 0.0473	6959	0.55
		Klickitat	Spring Chinook	Wind River	90			25400	2.06
		Lyon's Ferry	Spring Chinook	Tuconnon	89	15	0.501 0.1439	45	0.05
		Lyon's Ferry	Spring Chinook	Tucaonnon	90	1359:	0.015 0.0032	1202	1.36
		Priest Rapids	Fall Chinook	Priest Rapids	90			823500	15.40
		Rocky Reach	Early Coho	Rocky Reach	89	21.	0.738 0.1193	105	0.02
		Rocky Reach	Fall Chinook	Wells	90	975. 18.	0.521 0.0644	45	0.02
		Wells Spawning	Summer Chinook	Wells			0.863 0.0767	45090	9.46

									1476972

Disease Category: Other

Agent: Pinhead

Basin	Location	Species	Stock	Brood	Sire	FLOW	Density	Number	%
					Fish/Lb	'Index	Index	Loss	Loss
Lower Columbia									
Mnth: January	1990	Lewis River	Early Coho	Lewis River	88	28.	1.525 0.0949	224	0.02
		Lewis River	Late Coho	Lewis River	88	30.	1.549 0.0964	427	0.02
		Lewis River	Late Coho	Washougal	88	28.	0.103 0.0064	15	0.02
									666
Mnth: February	1990	Lewis River	Early Coho	Lewis River	88	26.	1.518 0.1012	172	0.02
		Lewis River	Late Coho	Lewis River	88	28.	1.548 0.1032	406	0.02
		Lewis River	Late Coho	Washougal	88	26.	0.102 0.0068	9	0.01
		Lewis River	Spring Chinook	Lewis River	88	12.	0.951 0.0361	5	0.00
									592
Mnth: March	1990	Lewis River	Early Coho	Lewis River	88	22.	1.584 0.1188	288	0.03
		Lewis River	Late Coho	Lewis River	88	23.	1.631 0.1087	381	0.02
		Lewis River	Late Coho	Lewis River	89	872.	0.857 0.0760	882	0.02
		Lewis River	Late Coho	Washougal	88	22.	0.107 0.0080	1b	0.02
		Lewis River	Spring Chinook	Kalama Falls	88	11.	0.376 0.0252	30	0.02
		Lewis River	Spring Chinook	Lewis River	88	11.	0.909 0.0345	2	0.00
									1599
Mnth: April	1990	Lewis River	Early Coho	Lewis River	88		I. 626 0.1265	342	0.03
		Lewis River	Late Coho	Lewis River	88	1::	I. 726 0.1343	387	0.02
		Lewis River	Late Coho	Lewis River	89	510.	1.589 0.1192	8767	0.19
		Lewis River	Late Coho	Washougal	88	17.	0.109 0.0085	25	0.04
		Lewis River	Spring Chinook	Kalama Falls	88	12.	0.338 0.0227	4	0.00
		Lewis River	Spring Chinook	Lewis River	89	133.	1.307 0.1144	124	0.07
									9649

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other

Agent: Pinhead

Basin	Location	Species	Stock	Brood	size Fish/Lb	Flow Index	Density Index	Number Loss	% LOSS
<hr/>									
Lower Columbia									
Month: May	1990	Lewis River	Early Coho	Lewis River	88	16.	1.971	0.1314	30 0.00
		Lewis River	Late Coho	Lewis River	88	16.	2.094	0.1396	20 0.00
		Lewis River	Late Coho	Lewis River	89	296.	0.903	0.0401	7676 0.17
		Lewis River	Spring Chinook	Lewis River	89	85.	1.132	0.1557	134 0.07

								7862	
Month: June	1990	Lewis River	Late Coho	Lewis River	89	210.	1.126	0.0500	1953 0.04
		Lewis River	Spring Chinook	Lewis River	89	71.	0.507	0.0627	335 0.03

								2288	
Month: July	1990	Lewis River	Late Coho	Lewis River	89	129.	1.564	0.0695	2681 0.06
		Lewis River	Spring Chinook	Lewis River	89	57.	0.584	0.0518	402 0.04

								3083	
Month: August	1990	Lewis River	Late Coho	Lewis River	89	81.	2.131	0.0947	1180 0.03
		Lewis River	Spring Chinook	Lewis River	89	42.	0.532	0.0517	309 0.03

								1489	
Month: September	1990	Lewis River	Late Coho	Lewis River	89	75.	2.216	0.0985	1714 0.04
		Lewis River	Spring Chinook	Lewis River	89	28.	0.684	0.0665	999 0.10

								2713	
Month: October	1990	Lewis River	Late Coho	Lewis River	89	51.	1.964	0.1331	3597 0.08
		Lewis River	Spring Chinook	Lewis River	89	17.	1.512	0.1470	1156 0.12

								4733	
Month: November	1990	Lewis River	Late Coho	Lewis River	89	46 lb	2.020 1.178	0.1369 0.1145	2382 341 0.04 0.05
		Lewis River	Spring Chinook	Lewis River	89				-----
								2723	
Month: December	1990	Lewis River	Late Coho	Lewis River	89	35.	2.552	0.1730	1304 0.03
		Lewis River	Spring Chinook	Lewis River	89	13.	0.997	0.0997	245 0.03

								1549	
<hr/>									
Upper Columbia									
Month: January	1990	Klickitat	Late Coho	Cowlitz	88	38.	4.672	0.1018	30 0.00

								30	
Month: March	1990	Ringold	Spring Chinook	Wind River	89	153.	1.173	0.2527	2244 0.18

								2244	

**VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990**

Disease Category: Other
Agent: Pinhead

Disease Category: Other
Agent: Pre-spawning loss

Upper Columbia

Mnth: December **1990**
Lyon's Ferry **Spring Chinook Tucannon** **A** **51 40.50**

51

Disease Category: Other
Agent: Tail Rot

Agent:	Fall	Net	Basin	Location	species	Stock	Brood	Sire	FLOW	Density	Number	%	
								Fish/Lb	Index	Index	LOSS	LOSS	
Lower	Columbia												
Mnth:	May	1990											
		Grays	River	Fall	Chinook	Grays	River	89	63.	1.592	0.0500	200	0.02

Upper Columbia

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Other

Agent: Tail Rot

Basin	Location	Species	Stock	Size Brood Fish/Lb	FLOW Index	Density Index	Number Loss	% Loss
Lower Columbia								
Mnth: June	1990	Wells Spawning	Summer Chinook Wells	89	38.	4.707	1.0003	11 0.00
							11	
Mnth: December	1990	Rocky Reach Rocky Reach	Early Fall Caho Chinook	Rocky Wells	Reach 89 89	21. 18.	0.738 0.521	0.1193 0.0644
							500 400	0.11 0.18
							900	

Disease Category: Other

Agent: Unknown

Basin	Location	Species	Stock	sire Brood Fish/Lb	FLOW Index	Density Index	Number Loss	% Loss
Lower Columbia								
Mnth: September	1990	Lewis River	Spring Chinook Lewis River	89	28.	0.684	0.0665	3518 0.36
							3518	
Mnth: October	1990	Lewis River	Spring Chinook Lewis River	89	17.	1.512	0.1470	4655 0.48
							4655	
Mnth: November	1990	Lewis River	Spring Chinook Lewis River	89	1b.	1.178	0.1145	648 0.07
							648	
Upper Columbia								
Mnth: January	1990	Lyon's Ferry Wells spawning	Fall Chinook Summer Chinook Wells	Lyon's Ferry Wells	88 88	17. 9.	0.481 1.056	0.0618 0.2289
							6832 174	1.46 0.04
							7006	
Mnth: February	1990	Lyon's Ferry Wells Spawning	Fall Chinook Summer Chinook Wells	Lyon's Ferry Wells	88 88	13. 8.	0.559 1.110	0.0745 0.2461
							4527 69	0.00 0.02
							4596	

Disease Category: Parasite

Agent: Costia

Basin	Location	Species	Stock	Sire Brood Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
Lower Columbia								
Mnth: April	1990	Elokomin Lewis River Lower Kalama	Early Coho Late Coho Early Coho	Grays River Lewis River Kalama Falls	89 89 89	164. 510. 249.	1.434 1.589 0.541	0.1056 0.1192 0.0696
							300 4247 1800	0.06 0.09 0.33
							6347	

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Parasite

Agent: Costia

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
Lower Columbia									
Mnth: May	1990								
	Cowlitz	Late Coho	Cowlitz		89	200.	1.473	0.1625	2740 0.04

									2740

Disease Category: Parasite

Agent: Ichthyophthirius

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
Lower Columbia									
Mnth: July	1990								
	Kalama Falls	Spring Chinook	Kalama Falls		89	89.	0.425	0.0398	1570 1.38

									1570
Mnth: September	1990								
	Lewis River	Spring Chinook	Lewis River		89	28.	0.684	0.0665	976 0.10

									976
Mnth: December	1990								
	Kalama Falls	Spring chinook	Kalama Falls A						400 37.50

									400

Disease Category: Parasite

Agent: Nematode

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
Lower Columbia									
Mnth: August	1990								
	Elokomin	Late Coho	Elokomin		89	102.	0.734	0.0409	2300 0.16

									2300

Disease Category: Parasite

Agent: Philonema

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
Lower Columbia									
Mnth: October	1990								
	Elokomin	Late Coho	Elokomin		89	40.	1.384	0.0772	230 0.02

									230
Mnth: November	1990								
	Elokomin	Late Coho	Elokomin		89	37.	1.454	0.0811	150 0.01

									150
Mnth: December	1990								
	Elokomin	Late Coho	Elokomin		89	39.	1.405	0.0783	100 0.00

									100

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Parasite

Agent: *Plistophora*

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
Lower Columbia									
Mnth: March									
	1990	Lewis River	Spring Chinook	Kalama Falls	88	11.	0.376	0.0252	132 0.09
		Lewis River	Spring Chinook	Lewis River	88	11.	0.909	0.0345	19 0.00
									151
Mnth: April									
	1990	Lewis River	Spring Chinook	Kalama Falls	88	12.	0.338	0.0227	19 0.01
		Lewis River	Spring Chinook	Lewis River	88	9.	1.488	0.0331	39 0.02
									58

Disease Category: Parasite

Agent: *Sauviniocola*

Basin	Location	species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
Lower Columbia									
Mnth: April									
	1990	Lewis River	Spring Chinook	Kalama Falls	88	12.	0.338	0.0227	3 0.00
									3
Mnth: October									
	1990	Lewis River	Spring Chinook	Lewis River	89	17.	1.512	0.1470	788 0.08
									788
Mnth: November									
	1990	Lewis River	Spring Chinook	Lewis River	89	16.	1.178	0.1145	221 0.02
									221

Disease Category: Viral

Agent: EIBS

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% LOSS
Lower Columbia									
Mnth: February									
	1990	Lewis River	Early Coho	Lewis River	88	26.	1.518	0.1012	21 0.00
		Lewis River	Late Coho	Lewis River	88	28.	1.548	0.1032	114 0.00
									135
Mnth: March									
	1990	Lewis River	Late Coho	Lewis River	88	23.	1.631	0.1087	82 0.00
									82
Mnth: April									
	1990	Lewis River	Early Coho	Lewis River	88	17.	1.626	0.1265	143 0.01
		Lewis River	Late Coho	Lewis River	88	17.	1.726	0.1343	147 0.00
		Lewis River	Late Coho	Washougal	88	17.	0.109	0.0085	4 0.00
									294

VDF PROGRAMQC01
DISEASE PREVALENCE SUMMARY
1990

Disease Category: Viral
Agent: EIBS

Basin	Location	species	Stock	Brood	size Fish/Lb	Flow Index	Density Index	Number LOSS	% Loss
<hr/>									
Lower Columbia									
Mnth: December	1990 Cowlitz	Spring Chinook Cowlitz	89	7.				454	0.04
								454	
<hr/>									
Upper Columbia									
Mnth: January	1990 Lyon's Ferry	Spring Chinook Tucannon	88	12.	1.010	0.2714		778	0.52
								778	
Mnth: February	1990 Lyon's Ferry	Spring Chinook Tucannon	88	11.	1.069	0.2874		1296	0.87
								1296	
Mnth: March	1990 Lyon's Ferry	Spring Chinook Tucannon	88	11.	1.101	0.2958		3732	2.56
								3732	
Mnth: April	1990 Lyon's Ferry	Spring Chinook Tucannon	88	11.	1.098	0.2950		348	0.24
								348	

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Bacterial

Agent: Bacterial Gill Disease

Basin	Location	species	Stock	Brood	Sire Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
Upper Columbia									
Mnth: June	1991 Wells Spawning Summer	Chinook Wells		90	93.	2. 580	0. 6435	7717	0. 60
								7717	

Disease Category: Bacterial

Agent: BHS

Basin	Location	Species	Stock	Brood	Sire Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
Upper Columbia									
Mnth: May	1991 Wells Spawning Fall Chinook Wells			90	57.	1. 107	0. 1845	9	0. 00
								9	

Disease Category: Bacterial

Agent: Bacterial Kidney Disease

Basin	Location	Species	Stock	Brood	size Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
Lower Columbia									
Mnth: January	1991 Lewis River	Early Coho	Lewis River	89	35.	1. 241	0. 0827	124	0. 01
	Lewis River	Spring Chinook	Lewis River	89	9.	1. 292	0. 1292	152	0. 02
								276	
Mnth: February	1991 Lewis River	Early Coho	Lewis River	89	27.	1. 325	0. 0987	24	0. 00
	Lewis River	Spring Chinook	Lewis River	89	8.	1. 706	0. 1410	297	0. 03
								321	
Mnth: March	1991 Lewis River	Early Coho	Lewis River	89	21.	1. 497	0. 1310	567	0. 05
	Lewis River	Late Coho	Lewis River	89	21.	2. 050	0. 1656	625	0. 01
								1192	
Mnth: April	1991 Cowlitz	Late Coho	Cowlitz	89	18.	2. 374	0. 3391	6233	0. 19
	Lewis River	Early Coho	Lewis River	89	17.	1. 715	0. 1501	487	0. 05
	Washougal	Late Coho	Washougal	89	19.	2. 323	0. 0743	500	0. 10
								9220	

Upper Columbia

Mnth: April	1991 Ringold	Spring Chinook	Wind River	90	83.	0. 760	0. 2081	2006	0. 16
								2006	
Mnth: May	1991 Klickitat	Late Coho	Lewis River	89	15.	0. 716	0. 0425	350	0. 12
	Klickitat	Spring Chinook	Klickitat	90	87.	0. 571	0. 0901	700	0. 20
	Ringold	Spring Chinook	Wind River	90	54.	1. 009	0. 2763	2063	0. 17
								3113	

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Bacterial
Agent: Bacterial Kidney Disease

Basin	Location	Species	Stock	Brood	Sire	Flow	Density	Number	%
					Fish/Lb	Index	Index	LOSS	Loss
Upper Columbia									
Month: June	1991								
	Klickitat	Spring Chinook	Klickitat	90	69.	0.733	0.1070	2500	0.73
	Ringold	Spring Chinook	Wind River	90	50.	1.018	0.2789	1901	0.16
								4401	

Disease Category: Bacterial
Agent: Cold Water Disease

Basin	Location	Species	Stock	Brood	Size	Flow	Density	Number	%
					Fish/Lb	Index	Index	LOSS	Loss

Lower Columbia

Month: January	1991								
	Cowlitz	Late Coho	Cowlitz	89	28.	1.776	0.2537	4240	0.10
	Cowlitz	Spring Chinook	Cowlitz	89	5.8	1.295	0.1850	145	0.01
	Lewis River	Early Coho	Lewis River	89	35.	1.241	0.0827	42	0.00
	Lewis River	Late Coho	Lewis River	89	33.	1.761	0.1187	764	0.02
	Toutle	Early Coho	Grays River	89	24.	1.746	0.0393	100	0.01
								5291	

Month: February	1991								
	Cowlitz	Late Coho	Cowlitz	89	22.	2.089	0.2984	5240	0.12
	Grays River	Early Coho	Grays River	90	788.	1.523	0.0831	23200	2.15
	Grays River	Early Coho	Toutle	90	946.	1.069	0.0601	3850	0.30
	Lewis River	Early Coho	Lewis River	89	27.	1.325	0.0987	194	0.02
	Lewis River	Late Coho	Lewis River	89	28.	1.752	0.1324	1579	0.04
	Toutle	Early Coho	Grays River	89	21.	1.809	0.0452	211	0.03
	Washougal	Late Coho	Lewis River	89	25:	1.402	0.0303	100	0.00
	Washougal	Late Coho	Washougal	89	25.	1.618	0.0350	200	0.01
								34574	

Mnth: March	1991								
	Cowlitz	Late Coho	Cowlitz	89	20.	2.216	0.3166	7040	0.16
	Elokomin	Early Coho	Kalama Falls	90	460.	1.197	0.0898	500	0.09
	Elokomin	Late Coho	Elokomin	90	865.	0.94D	0.0705	4000	0.40
	Grays River	Early Coho	Grays River	90	526.	1..903	0.1142	10260	0.96
	Grays River	Early Coho	Toutle	90	860.	1.013	0.0524	3000	0.73
	Lewis River	Early Coho	Lewis River	89	21.	1.497	0.1310	447	0.04
	Lewis River	Early Coho	Toutle	90	502.	1..434	0.1075	105	0.03
	Lewis River	Late Coho	Lewis River	89	21.	2..050	0.1656	1120	0.03
	Speelyai	Early Coho	Lewis River	90	512.	1..359	0.0777	10000	0.68
	Toutle	Early Coho	Grays River	90	482.	1..484	0.0742	1000	0.10
	Washougal	Late Coho	Lewis River	89	20.			225	0.02
	Washougal	Late Coho	Washougal	89	20.	1..733	0.0375	900	0.05
								38597	

Mnth: April	1991								
	Cowlitz	Late Coho	Cowlitz	89	18.	2.374	0.3391	8234	0.19
	Elokomin	Early Coho	Kalama Falls	90	301.	1.670	0.1253	3800	0.67
	Elokomin	Early Coho	Toutle	90	511.	1.116	0.0837	2250	0.41
	Elokomin	Late Coho	Elokomin	90	517.	1.318	0.1067	3000	0.31
	Grays River	Early Coho	Grays River	90	240.	1.320	0.0754	4000	0.92
	Grays River	Early Coho	Toutle	90	262.	1.147	0.0656	3100	0.78
	Kalama Falls	Late Coho	Kalama Falls	90	693.	0.933	0.0972	6000	0.57
	Lewis River	Early Coho	Lewis River	89		1.715	0.1501	1064	0.10
	Lewis River	Early Coho	Toutle	90	333.	1.868	0.1401	1575	0.41

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Bacterial
Agent: Cold Water Disease

Bassin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
Lower Columbia									
Mnth: April									
		1991							
	Lewis River	Late Coho	Lewis River	89	18.	2. 187	0. 2187	4524	0. 12
	Lewis River	Late Coho	Lewis River	90	857.	1. 129	0. 8464	412	0. 00
	Lower Kalama	Early Coho	Kalama Falls	90	280.	0. 795	0. 0681	1030	0. 18
	Speelyai	Early Coho	Lewis River	90	401.	0. 450	0. 0308	15000	0. 97
	Toutle	Early Coho	Grays River	90	275.	2. 081	0. 1041	12000	1. 21
	Washougal	Late Coho	Lewis River	90	576.	2. 152	0. 0746	14800	0. 50
	Washougal	Late Coho	Washougal	90	686.	1. 448	0. 0504	22000	1. 64
								102789	
Mnth: May									
		1991							
	Elokomin	Late Caho	Elokomin	90	242.	0. 531	0. 0259	8000	0. 85
	Elokomin	Late Coho	Lewis River	90	288.	1. 181	0. 0885	6800	1. 16
	Grays River	Early Coho	Grays River	90	142.	1. 088	0. 0190	2043	0. 47
	Grays River	Early Coho	Toutle	90	161.	1. 129	0. 0635	1262	0. 29
	Kalama Falls	Late Coho	Kalama Falls	90	450.	1. 035	0. 0887	31500	3. 11
	Lewis River	Early Coho	Toutle	90	187.	0. 356	0. 0400	2424	0. 66
	Lewis River	Late Coho	Lewis River	89	16.	2. 387	0. 2387	972	0. 03
	Lewis River	Late Coho	Lewis River	90	425.	0. 907	0. 0513	62396	1. 43
	Lewis River	Spring Chinook	Lewis River	90	98.	1. 076	0. 0463	592	0. 06
	Lower Kalama	Early Coho	Kalama Falls	90	158.	0. 806	0. 0764	105	0. 02
	Speelyai	Early Caho	Lewis River	90	150.	0. 287	0. 0185	2100	0. 46
								118194	
Mnth: June									
		1991							
	Elokomin	Late Coho	Lewis River	90	176.	2. 196	0. 1647	8000	1. 06
	Grays River	Early Coho	Grays River	90	106.	1. 005	0. 0226	100	0. 02
	Grays River	Early Coho	Toutle	90	114.	0. 557	0. 0316	200	0. 05
	Lewis River	Early Coho	Toutle	90	106.	0. 725	0. 0544	2023	0. 56
	Lewis River	Late Coho	Lewis River	90	235.	0. 897	0. 0448	60830	1. 40
	Washougal	Late Coho	Lewis River	90	149.	1. 841	0. 0629	22500	0. 86
	Washougal	Late Coho	Washougal	90	166.	1. 566	0. 0535	14200	1. 13
								107853	
Upper Columbia									
Mnth: January									
		1991							
	Rocky Reach	Early Caho	Lower Kalama	90	1000.	0. 673	0. 1261	1700	0. 29
	Rocky Reach	Early Coho	Rocky Reach	89	19.	0. 784	0. 1269	300	0. 07
								2000	
Mnth: February									
		1991							
	Rocky Reach	Early Coho	Lover Kalama	90	660.	0. 928	0. 1741	8870	1. 53
								8870	
Mnth: March									
		1991							
	Priest Rapids	Fall Chinook	Priest Rapids	90	540.	0. 930	0. 3066	3405	0. 07
	Rocky Reach	Early Coho	Lower Kalama	90	450.	0. 693	0. 2166	1730	0. 30
								5135	
Mnth: April									
		1991							
	Rocky Reach	Early Coho	Lower Kalama	90	340.	0. 421	0. 1315	2000	0. 35
								2000	

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Bacterial

Agent: Cold Water Disease

Basin	Location	Species	Stock	Brood	Flow Fish/Lb	Density Index	Number Loss	% Loss
Upper Columbia								
Mnth: May	1991	Klickitat	Late Coho	Lewis River	89 15.	0.716	0.0425	350 0.12
		Klickitat	Late Coho	Lewis River	90 296.	1.209	0.1184	10000 0.56
		Rocky Reach	Early Coho	Lower Kalama	90 175.	0.640	0.2001	7000 1.24
								17350
Mnth: June	1991	Klickitat	Late Coho	Lewis River	90 170.	1.389	0.1014	14000 0.79
		Rocky Reach	Early Coho	Lower Kalama	90 100.	0.328	0.0526	2200 0.39
								16200

Disease Category: Bacterial

Agent: Enteric Redmouth Disease

Basin	Location	Species	Stock	Brood	Size Fish/lb	Flow Index	Density Index	Number Loss	% Loss
Lower Columbia									
Mnth: March	1991	Elokomin	Fall Chinook	Elokomin	90 451.	0.959	0.0982	750 0.02	
		Elokomin	Fall Chinook	Kalama Falls	90 531.	1.076	0.0815	660 0.06	
		Grays River	Fall Chinook	Cowlitz	90 202.	0.526	0.0298	100 0.12	
		Grays River	Fall Chinook	Kalama Falls	90 313.	0.887	0.0507	200 0.05	
		Speelyai	Spring Chinook	Lewis River	90 216.	1.033	0.0760	1525 0.12	
									3235
Mnth: April	1991	Grays River	Fall Chinook	Grays River	90 111.	0.732	0.0425	300 0.03	
		Speelyai	Spring Chinook	Lewis River	90 190.	0.506	0.0343	1000 0.30	
		Toutle	Fall Chinook	Kalama Falls	90 120.	1.425	0.0498	5000 0.22	
									6300
Mnth: May	1991	Elodomin	Fall Chinook	Toutle	90 154.	1.751	0.1313	300 0.08	
		Toutle	Fall Chinook	Toutle	90 84.	1.265	0.0327	3504 0.32	
									8804
Mnth: June	1991	Toutle	Fall Chinook	Toutle	90 66.	1.419	0.0432	4475 0.17	
									4475
Upper Columbia									
Mnth: January	1991	Rocky Reach	Fall Chinook	Wells	89 16.	0.558	0.0689	2000 0.90	
									2000
Mnth: February	1991	Rocky Reach	Fall Chinook	Wells	89 15.	0.582	0.0719	500 0.23	
									500

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other
Agent: Coagulated Yolk

Basin	Location	species	Stock	Brood	sire Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
<hr/>									
Lower Columbia									
Mnth: January	1991								
	Grays River	Fall Chinook	Grays River	90	670.	1.039	0.0552	1180	0.12
	Grays River	Fall Chinook	Kalama Falls	90	636.	1.192	0.1006	44350	2.50
	Kalama Falls	Spring Chinook	Kalama Falls	90	800.	0.752	0.0470	150	0.05
								45680	
Mnth: February	1991								
	Grays River	Fall Chinook	Cowlitz	90	689.	0.651	0.0355	2000	0.44
	Grays River	Fall Chinook	Grays River	90	346.	1.519	0.0807	26050	2.79
	Grays River	Fall Chinook	Kalama Falls	90	549.	1.781	0.1018	13100	0.63
	Kalama Falls	Fall Chinook	Kalama Falls	90	688.	0.871	0.0725	150	0.00
	Lower Kalama	Fall Chinook	Kalama Falls	90	853.	0.602	0.0623	485	0.02
								41785	
Mnth: March	1991								
	Lewis River	Late Coho	Lewis River	90	1250.	1.242	0.0466	9	0.00
								9	
Mnth: April	1991								
	Lewis River	Late Coho	Lewis River	90	857.	1.129	0.8466	10	0.00
								10	
Upper Columbia									
Mnth: January	1991								
	Wells Spawning	Fall Chinook	Wells	90	730.	0.305	0.0508	6540	4.37
	Wells Spawning	Summer Chinook	Wells	90	534.	0.423	0.0706	15670	2.27
								22210	
Mnth: February	1991								
	Klickitat	Fall Chinook	Lyon's Ferry	90	824.	1.803	0.0782	2080	0.12
	Klickitat	Fall Chinook	Priest Rapids	90	651.	1.860	0.0946	10000	0.40
	Klickitat	Fall Chinook	Wells	90	580.	1.841	0.0829	500	0.17
	Wells Spawning	Fall Chinook	Wells	90	184.	0.765	0.1275	55	0.04
	Wells Spawning	Summer Chinook	Wells	90	180.	1.041	0.0425	2475	0.36
								15110	
Mnth: March	1991								
	Priest Rapids	Fall Chinook	Priest Rapids	90	540.	0.930	0.3066	6460	0.12
								6460	
Mnth: April	1991								
	Klickitat	Late Coho	Lewis River	90	777.	1.885	0.0628	5500	0.31
	Priest Rapids	Fall Chinook	Priest Rapids	90	206.	0.828	0.6252	2793	0.05
								8293	

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other
Agent: Dropout

Basin	Location	Species	Stock	Brood	Sire Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
Lower Columbia									
Month: May									
	1991								
	Grays River	Fall Chinook	Grays River	90	80.	0.718	0.0238	250	0.04
	Washougal	Late Caho	Lewis River	90	270.	1.670	0.0559	900	0.03
	Washougal	Late Caho	Washougal	90	270.	1.910	0.0677	4000	0.30

								5150	
Month: June									
	1991								
	Grays River	Fall Chinook	Grays River	90	49.	1.009	0.0334	200	0.04

								200	
Upper Columbia									
Month: January									
	1991								
	Rocky Reach	Fall Chinook	Wells	90	1100.	0.117	0.0160	500	1.25
	Wells Spawning	Fall Chinook	Wells	90	730.	0.305	0.0508	1430	0.96
	Wells Spawning	Summer Chinook	Wells	90	534.	0.423	0.0706	3355	0.49
								5285	
Month: February									
	1991								
	Wells Spawning	Summer Chinook	Wells	90	180.	1.041	0.0425	320	0.05
								320	
Month: March									
	1991								
	Wells Spawning	Fall Chinook	Wells	90	154.	0.855	0.1425	50	0.03
	Wells Spawning	Spring Chinook	Leavenworth	90	50.	1.145	0.2713	25	0.00
	Wells Spawning	Summer Chinook	Wells	90	101.	1.500	0.0705	395	0.06
								470	
Month: April									
	1991								
	Wells Spawning	Fall Chinook	Wells	90	103.	1.118	0.1863	46	0.03
	Wells Spawning	Spring Chinook	Leavenworth	90	50.	1.144	0.2710	17	0.00
	Wells Spawning	Summer Chinook	Wells	90	112.	1.525	0.0943	563	0.05
								626	
Month: May									
	1991								
	Rocky Reach	Fall Chinook	Priest Rapids	90	720.	0.741	0.1177	700	0.32
	Wells spawning	Fall Chinook	Wells	90	57.	1.107	0.1845	55	0.05
	Wells Spawning	Summer Chinook	Wells	90	89.	0.765	0.1025	455	0.04
Month: June									
	1991								
	Rocky Reach	Fall Chinook	Priest Rapids	90	350.	0.325	0.0913	1300	0.60
	Wells Spawning	Fall Chinook	Wells	90	40.			51	0.05
	Wells Spawning	Summer Chinook	Wells	90	93.	2.580	0.6435	231	0.02

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other

Agent: Predation

Basin	Location	species	Stock	Brood	size Fish/Lb	Flow Index	Density Index	Number Loss	% LOSS
Lower Columbia									
Mnth: January									
	1991								
El okomin	Early Coho	Grays River	89	25.	1. 644	0. 1142		213	0. 05
El okomin	Early Coho	Lewis River	89	28.	1. 353	0. 1846		53	0. 01
El okomin	Late Coho	El okomin	89	39.	1. 304	0. 0727		500	0. 04
Kalama Falls	Spring Chinook	Kalama Falls	90	800.	0. 752	0. 0470		165	0. 06
Lewis River	Early Coho	Lewis River	89	35:	1. 241	0. 0827		660	0. 06
Speelyai	Spring Chinook	Lewis River	89	16.	2. 152	0. 1435		100	0. 05
								1691	
Mnth: February									
	1991								
El okomin	Early Coho	Lewis River	89	21.	1. 644	0. 2242		125	0. 02
El okomin	Late Coho	El okomin	89	25.	1. 736	0. 0979		150	0. 01
Grays River	Early Coho	Grays River	89	21.	3. 187	0. 0616		720	0. 19
Lewis River	Early Coho	Lewis River	89	27.	1. 325	0. 0987		495	0. 05
Lewis River	Late Coho	Lewis River	89	28.	1. 752	0. 1324		419	0. 00
								1909	
Mnth: March									
	1991								
El okomin	Early Coho	Kalama Falls	90	460.	1. 197	0. 0898		560	0. 10
El okomin	Early Coho	Toutle	90	771.	0. 858	0. 0643		400	0. 07
El okomin	Fall Chinook	El okomin	90	451.	0. 959	0. 0982		180	0. 00
El okomin	Fall Chinook	Kalama Falls	90	531.	1. 076	0. 0815		560	0. 05
El okomin	Fall Chinook	Toutle	90	600.	1. 386	0. 1040		100	0. 03
El okomin	Late Coho	Lewis River	90	1061.	1. 175	0. 0881		300	0. 06
Grays River	Earl. Coho	Grays River	89	17.	3. 537	0. 0684		455	0. 12
Kalama Falls	Fall Chinook	Kalama Falls	90	363.	1. 192	0. 1123		8055	0. 22
Kalama Falls	Late Coho	Kalama Falls	89	1.	1. 613	0. 1698		325	0. 05
Kalama Falls	Late Coho	Lewis River	89	1::	1. 417	0. 1491		185	0. 07
Kalama Falls	Spring Chinook	Kalama Falls	89	13.	1. 897	0. 1845		70	0. 06
Kalama Falls	Spring Chinook	Kalama Falls	90	355.	0. 869	0. 0815		700	0. 24
								11890	
Mnth: April									
	1991								
El okomin	Early Coho	Lewis River	89	17.	1. 877	0. 2560		100	0. 02
El okomin	Fall Chinook	El okomin	90	236.	1. 504	0. 1579		7550	0. 23
El okomin	Fall Chinook	Kalama Falls	90	298.	1. 041	0. 0752		50	0. 00
El okomin	Fall Chinook	Toutle	90	362.	0. 946	0. 0709		200	0. 05
El okomin	Late Coho	El okomin	89	16.	2. 357	0. 1314		400	0. 03
El okomin	Late Coho	Lewis River	90	659.	1. 749	0. 1312		34	0. 00
Kalama Falls	Fall Chinook	Kalama Falls	90	180.	1. 446	0. 1816		450	0. 01
Kalama Falls	Spring Chinook	Kalama Falls	90	169.	1. 442	0. 1352		70	0. 02
Lewis River	Early Coho	Lewis River	89	17.	1. 715	0. 1501		3543	0. 33
Lewis River	Late Coho	Lewis River	89	18.	2. 187	0. 2187		2000	0. 05
								14397	
Mnth: May									
	1991								
El okomin	Early Coho	Toutle	90	254.	1. 196	0. 0969		700	0. 13
El okomin	Fall Chinook	El okomin	90	101.	2. 667	0. 2732		1100	0. 03
El okomin	Fall Chinook	Kalama Falls	90	123.	1. 236	0. 1404		200	0. 02
El okomin	Fall Chinook	Toutle	90	154.	1. 751	0. 1313		100	0. 03
El okomin	Late Coho	El okomin	89	16.	2. 355	0. 1313		200	0. 02
El okomin	Late Coho	El okomin	90	242.	0. 531	0. 0259		400	0. 04
El okomin	Late Coho	Lewis River	90	288.	1. 181	0. 0885		200	0. 03
Grays River	Fall Chinook	Grays River	90	80.	0. 718	0. 0238		400	0. 07
								3300	

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other
Agent: Predation

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
Lower Columbia									
Mnth: June	1991	Elokomin	Early Coho	Kalama Falls	90	101.	0. 711	0. 0533	100 0. 02
		Elokomin	Early Coho	Toutle	90	154.	1. 294	0. 0971	50 0. 00
		Elokomin	Fall Chinook	Elokomin	90	70.	3. 171	0. 3329	200 0. 00
		Elokomin	Fall Chinook	Kalama Falls	90	182.	1. 508	0. 1714	100 0. 00
		Elokomin	Late Coho	Elokomin			0. 586	0. 0275	200 0. 03
		Elokomin	Late Coho	Lewis River	90	176.	2. 196	0. 1647	100 0. 01

									750
Upper Columbia									
Mnth: January	1991	Ringold	Spring Chinook	Wind River	89	ID.	4. 459	0. 0068	20000 1. 58
		Rocky Reach	Early Coho	Lower Kalama	90	1000.	0. 673	0. 1261	500 0. 09
		Rocky Reach	Fall Chinook	Wells	90	1100.	0. 117	0. 0160	6000 15. 00

									26500
Mnth: February	1991	Ringold	Spring Chinook	Wind River	89	7.	3. 866	0. 0089	20000 1. 61
		Wells spawning	Summer Chinook	Wells	90	180.	1. 041	0. 0425	218 0. 03

									20218
Mnth: March	1991	Klickitat	Fall Chinook	Lyon's Ferry	90	370.	1. 050	0. 0722	15724 0. 85
		Klickitat	Late Coho	Lewis River	89	26.	2. 386	0. 1417	2751 0. 20
		Klickitat	Spring Chinook	Klickitat	89	11.	1. 279	0. 1042	4069 0. 60
		Klickitat	Spring Chinook	Klickitat	90	127.	0. 708	0. 0710	700 0. 19
		Ringold	Spring Chinook	Wind River	89	7.	3. 624	0. 0083	20000 1. 67
		Wells spawning	Fall Chinook	Wells	90	154.	0. 855	0. 1425	224 0. 15
		Wells Spawning	Spring Chinook	Leavenworth	90	50.	1. 145	0. 2713	46 0. 02
		Wells Spawning	Summer Chinook	Wells	90	101.	1. 500	0. 0705	77 0. 01

									43591
Mnth: April	1991	Klickitat	Fall Chinook	Lyon's Ferry	90	181.	1. 348	0. 1488	7600 0. 45
		Klickitat	Late Coho	Lewis River	89	20.	2. 789	0. 1656	2733 0. 20
		Klickitat	Late Coho	Lewis River	90	777.	1. 885	0. 0628	16500 0. 92
		Klickitat	Spring Chinook	Klickitat	89	9.	1. 187	0. 0967	2600 0. 48
		Klickitat	Spring Chinook	Klickitat	90	94.	0. 872	0. 0874	1000 0. 27
		Ringold	Spring Chinook	Wind River	90	83.	0. 760	0. 2081	1605 0. 13

									32038
Mnth: May	1991	Klickitat	Fall Chinook	Lyon's Ferry	90	102.	0. 956	0. 4005	8900 0. 53
		Klickitat	Fall Chinook	Priest Rapids	90	75.	1. 820	0. 1164	7400 0. 28
		Klickitat	Late Coho	Lewis River	89	15.	0. 716	0. 0425	2900 0. 99
		Klickitat	Late Coho	Lewis River	90	296.	1. 209	0. 1184	800 0. 04
		Klickitat	Spring Chinook	Klickitat	90	87.	0. 571	0. 0901	500 0. 14
		Ringold	Spring Chinook	Wind River	90	54.	1. 009	0. 2763	1650 0. 14
		Wells Spawning	Summer Chinook	Wells	90	89.	0. 765	0. 1025	42 0. 00

									22192

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other
Agent: Predation

Basin	Location	Species	Stock	Brood	Sire Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
<hr/>									
Upper Columbia									
Mnth: June	1991	Klickitat Fall Chinook	Lyon's Ferry	90	79.	0.132	0.5209	8000	0.47
		Klickitat Late Coho	Lewis River	89	15.	0.670	0.0398	2300	0.87
		Klickitat Late Coho	Lewis River	90	170.	1.389	0.1014	7000	0.40
		Priest Rapids Fall Chinook	Priest Rapids	90	50.	1.018	0.2789	1800	0.15
		Ringold Spring Chinook	Wind River	90					
		Wells Spawning Summer Chinook	Wells	90	93.	2.580	0.6435	256	0.02
									72356

Disease Category: Other
Agent: Eye picking

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
<hr/>									
Upper Columbia									
Mnth: May	1991	Rocky Reach Early Coho	Lower Kalama	90	175.	0.640	0.2001	2900	0.51
									2900
Mnth: June	1991	Rocky Reach Early Coho	Lover Kalama	90	100.	0.328	0.0526	2500	0.45
									2500

Disease Category: Other
Agent: Saprolegnia

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number	%
								Index	LOSS
									LOSS
Lower Columbia	Cowlitz	Spring Chinook	Cowlitz	89	5.8	1.295	0.1850	434	0.03
Mnth: January	1991								434

Disease Category: Other
Agent: Handling mortality

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number	%
								LOSS	
								LOSS	
<hr/>									
Lower Columbia									
Mnth: January	1991	Elkomin Early Coho	Grays River	89	25	1.644	0.1142	1000	0.21
		Lewis River Early Coho	Lewis River	89	35	1.241	0.0827	146	0.01
		Lewis River Late Coho	Lewis River	89	33.	1.761	0.1187	575	0.01
									1721
Mnth: February	1991	Lewis River Late Coho	Lewis River	89	28.	1.752	0.1324	202	0.00
									202

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other
Agent: Handling Mortality

Basin	Month:	Year	Location	Stock	Sample Size	Size		Flow Index	Density Index	Number Loss	% Loss									
						Brood	Fish/Lb													
Lower Columbia																				
Month: March																				
		1991	Lewis River	Early Coho	Toutle	90	502.	1.434	0.1075	1696	0.44									
										1696										
Month: April																				
		1991	Lewis River	Spring Chinook	Lewis River	90	157.	0.384	0.0302	563	0.05									
										563										
Month: May																				
		1991	Grays River	Fall Chinook	Grays River	90	80.	0.718	0.0238	400	0.07									
										400										
Month: June																				
		1991	Lewis River	Late Coho	Lewis River	90	235.	0.897	0.0448	858	0.02									
										858										
Upper Columbia																				
Month: January																				
		1991	Lyon's Ferry	Fall Chinook	Lyon's Ferry	90	915.	0.137	0.0297	1015	0.15									
										1015										
Month: February																				
		1991	Lyon's Ferry	Fall Chinook	Lyon's Ferry	90	585.	0.194	0.0420	852	0.08									
			Uells Spawning	Summer Chinook	Wells	90	180.	1.041	0.0425	15	0.00									
										867										
Month: March																				
		1991	Priest Rapids	Fall Chinook	Priest Rapids	90	540.	0.930	0.3066	4000	0.08									
			Ringold	Spring Chinook	Wind River	90	110.	0.632	0.1730	3892	0.32									
			Uells Spawning	Summer Chinook	Uells	90	101.	1.500	0.0705	928	0.14									
										8820										
Month: April																				
		1991	Lyon's Ferry	Fall Chinook	Lyon's Ferry	90	166.	0.201	0.0436	200	0.05									
			Lyon's Ferry	Spring Chinook	Tucannon	90	94.	0.098	0.0213	361	0.42									
			Priest Rapids	Fall Chinook	Priest Rapids	90	206.	0.828	0.6252	532	0.01									
			Priest Rapids	Fall Chinook	Wells	90	132.	0.449	0.0831	37	0.04									
			Rocky Reach	Early Coho	Lower Kalama	90	340.	0.421	0.1315	600	0.10									
			Wells spawning	Fall Chinook	Wells	90	103.	1.118	0.1863	255	0.17									
			Uells Spawning	Spring Chinook	Leavenworth	90	50.	1.144	0.2710	249	0.09									
			Uells Spawning	Summer Chinook	Wells	90	112.	1.525	0.0943	688	0.06									
										2922										
Month: May																				
		1991	Lyon's Ferry	Fall Chinook	Lyon's Ferry	90	147.	0.474	0.1027	168	0.02									
			Priest Rapids	Fall Chinook	Priest Rapids	90	66.	0.894	1.3317	120	0.00									
			Wells Spawning	Summer Chinook	Wells	90	89.	0.765	0.1025	424	0.03									
										712										
Month: June																				
		1991	Wells Spawning	Fall Chinook	Wells	90	40.			101	0.10									
			Wells Spawning	Summer Chinook	Wells	90	93.	2.580	0.6435	103	0.00									
										204										

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other
Agent: Kidney Fungus

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
Lower Columbia									
Month: February	1991 Cowlitz	Spring Chinook Cowlitz		89	6.	1. 047	0. 1859	419	0. 03
								419	
Month: March	1991 Cowlitz	Spring Chinook Cowlitz		89	6.	1. 146	0. 1637	267	0. 02
								267	

Disease Category: Other
Agent: Fish Kill

Basin	Location	Species	Stock	Brood	size Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
Lower Columbia									
Month: June	1991 Kalama Falls	Fall Chinook	Kalama Falls	90	70.	1. 570	0. 1635	6000	0. 17
								6000	

Disease Category: Other
Agent: Precocious males

Basin	Location	Species	Stock	Brood	Sire Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
Lower Columbia									
Month: January	1991 Lewis River	Spring Chinook	Lewis River	89	9.	1. 292	0. 1292	284	0. 03
								284	
Month: February	1991 Lewis River	Spring Chinook	Lewis River	89	8.	1. 706	0. 1410	406	0. 04
								406	
Month: March	1991 Lewis River	Spring Chinook	Lewis River	89	9.	0. 702	0. 0595	54	0. 01
								54	

Disease Category: Other
Agent: Marking mortality

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
Upper Columbia									
Month: April	1991 Wells spawning	Fall Chinook	Wells	90	103.	1. 118	0. 1863	106	0. 07
	Wells spawning	Summer Chinook	Wells	90	112.	1. 525	0. 0943	556	0. 05
								662	
Month: May	1991 Wells Spawning	Fall Chinook	Wells	90	57.	1. 107	0. 1845	54	0. 05
	Wells Spawning	Summer Chinook	Wells	90	89.	0. 765	0. 1025	50	0. 00
								104	

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other

Agent: Normal

Basin	Location	Species	Stock	Size	Flow	Density	Number	%			
				Brood	Fish/Lb	Index	Index	Loss			
Lower Columbia											
Mnth: January											
	1991										
Cowlitz	Late Coho	Cowlitz	89	28.	1. 776	0. 2537	2120	0. 05			
Cowlitz	Spring Chinook	Cowlitz	89	5.8	1. 295	0. 1850	433	0. 03			
Cowlitz	Spring Chinook	Cowlitz	90	300.	0.668	0. 0356	11000	0. 46			
Elokomin	Early Coho	Lewis River	89	28.	1. 353	0. 1846	200	0. 04			
Elokomin	Late Coho	Elokomin	89	39.	1. 304	0. 0727	201	0. 02			
Grays River	Fall Chinook	Cowlitz	90	782.	0.802	0. 0694	4700	1. 03			
Grays River	Fall Chinook	Grays River	90	670.	I. 039	0. 0552	2950	0. 30			
Grays River	Fall Chinook	Kalama Falls	90	636.	1. 192	0. 1006	17740	1. 00			
Kalama Falls	Late Coho	Kalama Falls	89	28.	1. 145	0. 1205	35	0. 00			
Kalama Falls	Late Coho	Lewis River	89	29.	0. 993	0. 1045	15	0. 00			
Kalama Falls	Spring Chinook	Kalama Falls	89	17.	1. 612	0. 1567	30	0. 03			
Kalama Falls	Spring Chinook	Kalama Falls	90	800.	0. 752	0. 0470	185	0. 06			
Lewis River	Early Coho	Lewis River	89	35.	1. 241	0. 0827	93	0. 00			
Lewis River	Late Coho	Lewis River	89	33.	1. 761	0. 1187	1129	0. 03			
Lewis River	Spring Chinook	Lewis River	89	9.	I. 292	0. 1292	530	0. 05			
Lower Kalama	Early Coho	Kalama Falls	89	21.	1. 742	0. 0950	310	0. 06			
Lover Kalama	Spring Chinook	Kalama Falls	89	11.	1. 346	0. 2346	310	0. 06			
Speelyai	Early Coho	Lewis River	89	38.	1. 902	0. 1378	100	0. 07			
Speelyai	Spring Chinook	Lewis River	89	16.	2. 152	0. 1435	200	0. 09			
Speelyai	Spring Chinook	Lewis River	90	500.	1. 835	0. 0544	1400	0. 11			
Toutle	Early Coho	Grays River	89	24.	I. 746	0. 0393	110	0. 01			
Washougal	Late Coho	Lewis River	89	29.	1. 556	0. 0259	1300	0. 09			
Washougal	Late Coho	Washougal	89	28.	1. 312	0. 0305	4500	0. 27			
							49591				
Mnth: February											
	1991										
Cowlitz	Late Coho	Cowlitz	89	22.	2.089	0. 2984	2620	0. 06			
Cowlitz	Spring Chinook	Cowlitz	89	6.	1. 047	0. 1859	977	0. 08			
Cowlitz	Spring Chinook	Cowlitz	90	160.	0. 727	0. 0873	6200	0. 26			
Elokomin	Early Coho	Kalama Falls	90	664.	0.889	0. 0667	440	0. 08			
Elokomin	Early Coho	Lewis River	89	21.	1. 644	0. 2242	80	0. 02			
Elokomin	Fall Chinook	Elokomin	90	641.	0. 136	0. 0102	720	0. 04			
Elokomin	Fall Chinook	Kalama Falls	90	740.	1. 239	0. 0896	1240	0. 05			
Elokomin	Fall Chinook	Toutle	90	907.	1. 060	0. 0780	800	0. 21			
Elokomin	Late Coho	Elokomin	89	25.	1. 756	0. 0979	110	0. 00			
Grays River	Early Coho	Grays River	89	21.	3. 187	0. 0616	80	0. 02			
Grays River	Early Coho	Grays River	90	788.	1. 523	0. 0831	15700	I. 46			
Grays River	Early Coho	Toutle	90	946.	1. 069	0. 0601	10100	0. 78			
Grays River	Fall Chinook	Cowlitz	90	689.	0. 651	0. 0355	4200	0. 92			
Grays River	Fall Chinook	Grays River	90	346.	1. 519	0. 0807	16000	1. 72			
Grays River	Fall Chinook	Kalama Falls	90	549.	1. 781	0. 1018	9100	0. 44			
Kalama Falls	Fall Chinook	Kalama Falls	90	688.	0. 871	0. 0725	1750	0. 04			
Kalama Falls	Late Coho	Kalama Falls	89	22.	1. 344	0. 1415	60	0. 00			
Kalama Falls	Late Coho	Lewis River	89	21.	1. 245	0. 1310	20	0. 00			
Kalama Falls	Spring Chinook	Kalama Falls	89	11.	2. 154	0. 2094	45	0. 04			
Kalama Falls	Spring Chinook	Kalama Falls	90	469.	0.961	0. 0801	200	0. 07			
Lewis River	Early Coho	Lewis River	89	27.	1. 325	0. 0987	117	0. 01			
Lewis River	Late Coho	Lewis River	89	28.	1. 752	0. 1324	519	0. 01			
Lewis River	Spring Chinook	Lewis River	89	a.	1. 706	0. 1410	640	0. 07			
Lower Kalama	Early Coho	Kalama Falls	89	21.	1. 741	0. 0950	280	0. 05			
Lower Kalama	Early Coho	Kalama Falls	90	1034.	0. 767	0. 0640	190	0. 02			
Lower Kalama	Fall Chinook	Kalama Falls	90	853.	0. 602	0. 0623	280	0. 01			
Lower Kalama	Spring Chinook	Kalama Falls	89	10.	1. 921	0. 2579	280	0. 05			
Speelyai	Early Coho	Lewis River	89	33.	2. 087	0. 1512	50	0. 03			
Speelyai	Early Coho	Lewis River	90	873.	2. 012	0. 0575	600	0. 04			
Speelyai	Spring Chinook	Lewis River	89	9.	1. 554	0. 2072	100	0. 05			
Speelyai	Spring Chinook	Lewis River	90	329.	1. 229	0. 0702	925	0. 07			
Toutle	Early Coho	Grays River	89	21.	1. 809	0. 0452	166	0. 02			

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other
Agent: Normal

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number	% Loss
Lower Columbia									
Mnth: February 1991									
Toutle	Fall Chinook	Cowlitz	90	415.	0.721	0.0180		1452	0.07
Washougal	Fall Chinook	Washougal	90	900.	1.431	0.0588		4900	0.08
Washougal	Late Coho	Lewis River	89	25.	1.402	0.0303		1300	0.09
Washougal	Late Coho	Washougal	89	25.	1.618	0.0350		3000	0.18

85241									
Mnth: March 1991									
Cowlitz	Late Coho	Cowlitz	89	20.	2.216	0.3166		3520	0.08
Cowlitz	Spring Chinook	Cowlitz	89	6.	1.146	0.1637		624	0.05
Cowlitz	Spring Chinook	Cowlitz	90	130.	0.553	0.0888		35200	1.49
Elokomin	Early Coho	Lewis River	89	20.	1.698	0.2316		400	0.08
Elokomin	Early Coho	Toutle	90	771.	0.858	0.0643		1400	0.26
Elokomin	Fall Chinook	Elokomin	90	451.	0.959	0.0982		4250	0.13
Elokomin	Fall Chinook	Kalam Falls	90	531.	1.076	0.0815		2240	0.21
Elokomin	Fall Chinook	Toutle	90	600.	1.386	0.1040		700	0.18
Elokomin	Late Coho	Elokomin	89	22.	1.914	0.1067		400	0.03
Elokomin	Late Coho	Elokomin	90	865.	0.940	0.0705		600	0.06
Elokomin	Late Coho	Lewis River	90	1061.	1.175	0.0881		1000	0.22
Grays River	Early Coho	Grays River	90	526.	1.903	0.1142		128	0.01
Grays River	Early Coho	Toutle	90	860.	1.013	0.0524		740	0.18
Grays River	Fall Chinook	Cowlitz	90	202.	0.526	0.0298		420	0.51
Grays River	Fall Chinook	Grays River	90	208.	1.545	0.0846		3840	0.41
Grays River	Fall Chinook	Kalam Falls	90	313.	0.887	0.0507		2000	0.54
Kalam Falls	Fall Chinook	Kalam Falls	90	363.	1.192	0.1123		6345	0.17
Kalam Falls	Late Coho	Kalam Falls	89	17.	1.613	0.1698		85	0.01
Kalam Falls	Late Coho	Lewis River	89	17.	1.417	0.1491		50	0.02
Kalam Falls	Spring Chinook	Kalam Falls	89	13.	1.897	0.1845		115	0.10
Kalam Falls	Spring Chinook	Kalam Falls	90	355.	0.869	0.0815		560	0.19
Lewis River	Early Coho	Lewis River	89	21.	1.497	0.1310		133	0.01
Lewis River	Early Coho	Toutle	90	502.	1.434	0.1075		469	0.12
Lewis River	Late Coho	Lewis River	89	21.	2.050	0.1656		1309	0.03
Lewis River	Spring Chinook	Lewis River	89	9.	0.702	0.0595		365	0.08
Lower Kalam	Early Coho	Kalam Falls	89	21.	1.740	0.0949		310	0.06
Lower Kalam	Early Coho	Kalam Falls	90	495.	1.211	0.1009		415	0.05
Lower Kalam	Fall Chinook	Kalam Falls	90	456.	1.308	0.1090		1515	0.05
Lower Kalam	Spring Chinook	Kalam Falls	89	10.	2.282	0.2282		310	0.06
Speelyai	Early Coho	Lewis River	89	32.	2.132	0.1545		50	0.03
Speelyai	Early Coho	Lewis River	90	512.	1.359	0.0777		4100	0.28
Speelyai	Late Coho	Lewis River	90	645.	1.516	0.0439		300	0.10
Speelyai	Spring Chinook	Lewis River	90	216.	1.033	0.0760		1425	0.11
Toutle	Early Coho	Grays River	89	17.	1.837	0.0517		364	0.05
Toutle	Early Coho	Grays River	90	482.	1.484	0.0742		700	0.07
Toutle	Fall Chinook	Kalam Falls	90	240.	0.893	0.0251		2500	0.12
Washougal	Fall Chinook	Washougal	90	490.	1.232	0.0244		8000	0.12
Washougal	Late Coho	Lewis River	89	20.				673	0.05
Washougal	Late Coho	Lewis River	90	1000.	1.592	0.0552		2900	0.09
Washougal	Late Coho	Washougal	89	20.	1.733	0.0375		2600	0.15
Washougal	Late Coho	Washougal	90	1100.	1.411	0.0451		700	0.05

9337									
Mnth: April 1991									
Cowlitz	Fall Chinook	Cowlitz	90	239.	0.662	0.0945		42000	0.61
Cowlitz	Spring Chinook	Cowlitz	90	70.	0.282			3609	0.16
Elokomin	Early Coho	Kalam Falls	90	301.	1.670	0.1253		300	0.05
Elokomin	Early Coho	Lewis River	89	17.	1.877	0.2560		300	0.06
Elokomin	Early Coho	Toutle	90	511.	1.116	0.0837		550	0.10
Elokomin	Fall Chinook	Elokomin	90	236.	1.504	0.1579		6840	0.20

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other
Agent: Normal

Basin	Location	Species	Stock	Size Brood Fish/Lb	Flow Index	Density Index	Number	% Loss	% Loss
Lower Columbia									
Month: April									
	1991								
Elokomin	Fall Chinook	Kalama Falls	90	298.	1.041	0.0752	550	0.05	
Elokomin	Fall Chinook	Toutle	90	362.	0.946	0.0709	1500	0.40	
Elokomin	Late Coho	Elokomin	89	16.	2.357	0.1314	1000	0.08	
Elokomin	Late Coho	Elokomin	90	517.	1.318	0.1067	666	0.07	
Elokomin	Late Coho	Lewis River	90	659.	1.749	0.1312	900	0.17	
Grays River	Early Coho	Grays River	89	15.	3.765	0.0732	2200	0.59	
Grays River	Early Coho	Grays River	90	240.	1.320	0.0754	3200	0.74	
Grays River	Early Coho	Toutle	90	262.	1.147	0.0656	800	0.20	
Grays River	Fall Chinook	Cowlitz	90	201.	0.555	0.0314	200	0.23	
Grays River	Fall Chinook	Grays River	90	111.	0.732	0.0425	3200	0.30	
Kalama Falls	Fall Chinook	Kalama Falls	90	180.	1.446	0.1816	3090	0.08	
Kalama Falls	Late Coho	Kalama Falls	89	16.	1.666	0.1735	100	0.02	
Kalama Falls	Late Coho	Kalama Falls	90	693.	0.933	0.0972	1600	0.15	
Kalama Falls	Late Coho	Lewis River	89	16.	1.483	0.1561	100	0.04	
Kalama Falls	Spring Chinook	Kalama Falls	89	12.	2.043	0.1986	5	0.00	
Kalama Falls	Spring Chinook	Kalama Falls	90	169.	1.442	0.1352	430	0.15	
Lewis River	Early Coho	Lewis River	89	17.	1.715	0.1501	376	0.04	
Lewis River	Early Coho	Toutle	90	333.	1.868	0.1401	96	0.03	
Lewis River	Late Coho	Lewis River	89	18.	2.187	0.2187	2036	0.06	
Lewis River	Late Coho	Lewis River	90	857.	1.129	0.8466	627	0.01	
Lewis River	Spring Chinook	Lewis River	90	157.	0.384	0.0302	440	0.04	
Lower Kalama	Early Coho	Kalama Falls	89	13.	2.325	0.1268	290	0.05	
Lower Kalama	Early Coho	Kalama Falls	90	280.	0.795	0.0681	305	0.05	
Lower Kalama	Fall Chinook	Kalama Falls	90	240.	0.786	0.0850	1200	0.05	
Lower Kalama	Spring Chinook	Kalama Falls	89	8.	2.639	0.2639	140	0.03	
Speelyai	Early Coho	Lewis River	89	29.	2.431	0.1673	40	0.03	
Speelyai	Early Coho	Lewis River	90	401.	0.450	0.0308	600	0.04	
Speelyai	Late Coho	Lewis River	90	517.	0.821	0.0565	200	0.06	
Speelyai	Spring Chinook	Lewis River	90	190.	0.506	0.0343	300	0.09	
Toutle	Early Coho	Grays River	89	15.	1.817	0.0649	1000	0.14	
Toutle	Early Coho	Grays River	90	275.	2.081	0.1041	3000	0.30	
Toutle	Fall Chinook	Kalama Falls	90	120.	1.425	0.0498	1000	0.04	
Washougal	Fall Chinook	Washougal	90	227.	0.158	0.0271	7200	0.11	
Washougal	Late Coho	Lewis River	90	576.	2.152	0.0746	2000	0.07	
Washougal	Late Coho	Washougal	89	19.	2.323	0.0743	3000	0.58	
Washougal	Late Coho	Washougal	90	686.	1.448	0.0504	2500	0.19	

99490									
Month: May									
	1991								
Cowlitz	Fall Chinook	Cowlitz	90	100.	1.214	0.1734	37900	0.54	
Cowlitz	Spring Chinook	Cowlitz	90	43.	0.314	0.0599	3784	0.22	
Elokomin	Early Coho	Kalama Falls	90	147.	0.609	0.0462	1400	0.25	
Elokomin	Early Coho	Toutle	90	254.	1.196	0.0969	2000	0.37	
Elokomin	Fall Chinook	Elokomin	90	101.	2.667	0.2732	5000	0.15	
Elokomin	Fall Chinook	Kalama Falls	90	123.	1.236	0.1404	1200	0.11	
Elokomin	Fall Chinook	Toutle	90	154.	1.751	0.1313	700	0.18	
Elokomin	Late Coho	Elokomin	89	16.	2.355	0.1313	600	0.05	
Elokomin	Late Coho	Elokomin	90	242.	0.531	0.0259	2000	0.21	
Elokomin	Late Coho	Lewis River	90	288.	1.181	0.0885	300	0.05	
Grays River	Early Coho	Grays River	89	17.	3.831	0.0352	110	0.07	
Grays River	Early Coho	Grays River	90	142.	1.088	0.0190	2042	0.47	
Grays River	Early Coho	Toutle	90	161.	1.129	0.0635	1253	0.29	
Grays River	Fall Chinook	Grays River	90	80.	0.718	0.0238	750	0.13	
Grays River	Fall Chinook	Kalama Falls	90	75.	1.249	0.0229	108	0.04	
Kalama Falls	Fall Chinook	Kalama Falls	90	80.	1.475	0.1339	6200	0.17	
Kalama Falls	Spring Chinook	Kalama Falls	90	125.	1.672	0.1742	1200	0.42	
Lewis River	Early Coho	Toutle	90	187.	0.356	0.0400	223	0.06	
Lewis River	Late Coho	Lewis River	90	425.	0.907	0.0513	1161	0.03	

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other

Agent: Normal

Basin	Location	Species	Stock	Brood	Sire Fish/lb	Flow Index	Density Index	Number Loss	% Loss
Lower Columbia									
Mnth: May									
		1991							
Lewis River	Spring Chinook	Lewis River	90	98.	1.076	0.0463		616	0.06
Lower Kalama	Early Coho	Kalama Falls	90	158.	0.806	0.0764		415	0.07
Lower Kalama	Fall Chinook	Kalama Falls	90	90.	1.189	0.0925		750	0.03
Lower Kalama	Spring Chinook	Kalama Falls	90	137.	0.449	0.0426		78	0.03
Speelyai	Earl, ' Coho	Lewis River	89	24.	2.713	0.1868		100	0.07
Speelyai	Early Coho	Lewis River	90	150.	0.287	0.0185		2100	0.46
Speelyai	Spring Chinook	Lewis River	90	126.	0.644	0.0443		900	0.27
Toutle	Early Coho	Grays River	89	15.	1.298	0.0640		100	0.01
Toutle	Fall Chinook	Toutle	90	84.	1.265	0.0327		448	0.02
Washougal	Fall Chinook	Washougal	90	105.	1.836	0.0424		4800	0.07
Washougal	Late Coho	Lewis River	90	270.	1.670	0.0559		5000	0.17
Washougal	Late Coho	Washougal	89	17.	2.458	0.0787		1400	0.27
Washougal	Late Coho	Washougal	90	270.	1.910	0.0677		10200	0.77
									94838
Mnth: June									
		1991							
Cowlitz	Fall Chinook	Cowlitz	90	68.	1.479	0.1849		15100	0.21
El okomin	Early Coho	Kalama Falls	90	101.	0.711	0.0533		300	0.05
El okomin	Early Coho	Toutle	90	154.	1.294	0.0971		250	0.05
El okomin	Fall Chinook	El okomin	90	70.	3.171	0.3329		600	0.02
El okomin	Fall Chinook	Kalama Falls	90	82.	1.508	0.1714		500	0.05
El okomin	Lste Coho	El okomin	90	174.	0.586	0.0275		700	0.09
Wokomin	Late Coho	Lewis River	90	176.	2.196	0.1647		1000	0.13
Grays River	Earl, ' Coho	Grays River	90	106.	1.005	0.0226		1800	0.42
Grays River	Early Coho	Toutle	90	114.	0.557	0.0316		6100	1.57
Grays River	Fall Chinook	Grays River	90	49.	1.009	0.0334		1200	0.21
Grays River	Fall Chinook	Kalama Falls	90	60.	1.349	0.0248		100	0.03
Kalama Falls	Fall Chinook	Kalama Falls	90	70.	1.570	0.1635		3100	0.09
Lewis River	Early Coho	Toutle	90	106.	0.725	0.0544		187	0.05
Lewis River	Lste Coho	Lewis River	90	235.	0.897	0.0448		1886	0.04
Lower Kalama	Early Coho	Kalama Falls	90	129.	0.863	0.0818		735	0.13
Lower Kalama	Fall Chinook	Kalama Falls	90	64.	1.338	0.1040		390	0.02
Lower Kalama	Spring Chinook	Kalama Falls	90	92.	0.525	0.0497		622	0.22
Toutle	Fall Chinook	Toutle	90	66.	1.419	0.0432		2238	0.08
Washougal	Fall Chinook	Washougal	90	64.	1.334	0.0544		3800	0.75
Washougal	Lets Coho	Lewis River	90	149.	1.841	0.0629		33700	1.29
Washougal	Late Coho	Washougal	90	166.	1.566	0.0535		6000	0.48
									80308
Upper Columbia									
Mnth: January									
		1991							
Klickitat	Late Coho	Lewis River	89	38.	1.605	0.1103		266	0.02
Klickitat	Spring Chinook	Klickitat	89	17.	1.145	0.0903		135	0.02
Klickitat	Spring Chinook	Klickitat	90	373.	0.883	0.0477		614	0.17
Klickitat	Spring Chinook	Wind River	90	630.	1.591	0.0597		2024	0.20
Lyon's Ferry	Fall Chinook	Lyon's Ferry	90	915.	0.137	0.0297		1781	0.26
Lyon's Ferry	Spring Chinook	Tucannon	89	13.	0.624	0.1794		94	0.09
Lyon's Ferry	Spring Chinook	Tucannon	90	401.	0.036	0.0077		656	0.75
Ringold	Spring Chinook	Wind River	90	388.	0.958	0.1829		7095	0.50
Rocky Reach	Early Coho	Rocky Reach	89	19.	0.784	0.1269		100	0.02
									13565
Mnth: February									
		1991							
Klickitat	Fall Chinook	Lyon's Ferry	90	824.	1.803	0.0782		6250	0.36
Klickitat	Fall Chinook	Priest Rapids	90	651.	1.860	0.0946		2573	0.10

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other
Agent: Normal

Basin	Location	Species	Stock	Brood	Sire	Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
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Upper Columbia										
Mnth: February	1991									
Klickitat	Fall Chinook	Wells	90	580.	1.841	0.0829			1589	0.55
Klickitat	Late Coho	Lewis River	89	33.	1.760	0.1210			847	0.06
Klickitat	Spring Chinook	Klickitat	89	12.	1.437	0.1133			110	0.01
Klickitat	Spring Chinook	Klickitat	90	218.	1.270	0.0686			187	0.05
Lyon's Ferry	Fall Chinook	Lyon's Ferry	90	585.	0.194	0.0420			8488	0.77
Lyon's Ferry	Spring Chinook	Tucannon	89	11.	0.610	0.1755			68	0.07
Lyon's Ferry	Spring Chinook	Tucannon	90	280.	0.047	0.0102			154	0.18
Ringold	Spring Chinook	Wind River	90	181.	0.965	0.2533			6204	0.44
Rocky Reach	Early Coho	Rocky Reach	89	18.	0.810	0.1310			100	0.02
Rocky Reach	Fall Chinook	Wells	90	715.	0.177	0.0221			200	0.50
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										26770
Mnth: March	1991									
Klickitat	Fall Chinook	Lyon's Ferry	90	370.	1.050	0.0722			16569	0.89
Klickitat	Fall Chinook	Priest Rapids	90	309.	0.888	0.0461			5600	0.21
Klickitat	Late Coho	Lewis River	89	26.	2.386	0.1417			849	0.06
Klickitat	Spring Chinook	Klickitat	89	11.	1.279	0.1042			131	0.02
Klickitat	Spring Chinook	Klickitat	90	127.	0.708	0.0710			400	0.11
Lyon's Ferry	Fall Chinook	Lyon's Ferry	90	339.	0.205	0.0444			2958	0.31
Lyon's Ferry	Spring Chinook	Tucannon	89	9.	0.760	0.2184			41	0.04
Lyon's Ferry	Spring Chinook	Tucamon	90	143.	0.077	0.0167			73	0.08
Priest Rapids	Fall Chinook	Priest Rapids	90	540.	0.930	0.3066			4947	0.10
Ringold	Spring Chinook	Wind River	90	110.	0.632	0.1730			973	0.08
Rocky Reach	Early Coho	Rocky Reach	89	17.	0.815	0.1377			100	0.02
Rocky Reach	Fall Chinook	wells	89	14.	0.682	0.0750			200	0.09
Rocky Reach	Fall Chinook	Wells	90	450.	0.208	0.0286			100	0.25
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										32941
Mnth: April	1991									
Klickitat	Fall Chinook	Lyon's Ferry	90	181.	1.348	0.1488			2000	0.12
Klickitat	Fall Chinook	Priest Rapids	90	116.	1.679	0.0873			5000	0.19
Klickitat	Late Coho	Lewis River	89	20.	2.789	0.1656			267	0.02
Klickitat	Late Coho	Lewis River	90	777.	1.885	0.0628			10000	0.56
Klickitat	Spring Chinook	Klickitat	89	9.	1.187	0.0967			600	0.11
Klickitat	Spring Chinook	Klickitat	90	94.	0.872	0.0874			600	0.16
Lyon's Ferry	Fall Chinook	Lyon's Ferry	90	166.	0.201	0.0436			789	0.18
Lyon's Ferry	Spring Chinook	Tucannon	90	94.	0.098	0.0213			117	0.14
Priest Rapids	Fall Chinook	Priest Rapids	90	206.	0.828	0.6252			5366	0.10
Priest Rapids	Fall Chinook	Wells	90	132.	0.449	0.0831			152	0.16
Ringold	Spring Chinook	Wind River	90	83.	0.760	0.2081			402	0.03
Rocky Reach	Early Coho	Rocky Reach	89	13.	0.817	0.1635			100	0.02
Rocky Reach	Fall Chinook	Wells	89	11.	0.796	0.0876			100	0.05
Rocky Reach	Fall Chinook	Wells	90	440.	0.216	0.0296			100	0.22
Wells Spawning	Fall Chinook	Wells	90	103.	1.118	0.1863			12	0.00
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										25605
Mnth: May	1991									
Klickitat	Fall Chinook	Lyon's Ferry	90	102.	0.956	0.4005			2500	0.15
Klickitat	Fall Chinook	Priest Rapids	90	75.	1.820	0.1164			2000	0.08
Klickitat	Late Coho	Lewis River	89	15.	0.716	0.0425			1500	0.51
Lyon's Ferry	Fall Chinook	Lyon's Ferry	90	147.	0.474	0.1027			1198	0.13
Lyon's Ferry	Spring Chinook	Tucannon	90	84.	0.110	0.0275			30	0.03
Priest Rapids	Fall Chinook	Priest Rapids	90	66.	0.894	1.3317			2287	0.04
Priest Rapids	Fall Chinook	Wells	51.	0.849	0.1570				102	0.11
Ringold	Spring Chinook	Wind River	90	54.	1.009	0.2763			413	0.03
Rocky Reach	Early Coho	Rocky Reach	89	13.	0.823	0.1645			100	0.02

WIF Program QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other

Agent: Normal

Basin	Location	Species	Stock	Size Brood	Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
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Upper Columbia									
Month: May									
	1991								
	Rocky Reach	Fall Chinook	Priest Rapids	90	720.	0.741	0.1177	500	0.23
	Rocky Reach	Fall Chinook	Wells	89	10.	0.836	0.0920	100	0.05

								10730	
Month: June									
	1991								
	Klickitat	Fall Chinook	Lyon's Ferry	90	79.	0.132	0.5209	800	0.05
	Klickitat	Late Coho	Lewis River	89	15.	0.670	0.0398	2000	0.76
	Klickitat	Late Coho	Lewis River	90	170.	1.389	0.1014	300	0.02
	Klickitat	Spring Chinook	Klickitat	90	69.	0.733	0.1070	700	0.20
	Priest Rapids	Fall Chinook	Priest Rapids	90	46.	1.076	1.6743	1732	0.03
	Priest Rapids	Fall Chinook	Wells	90	37.	1.056	0.0195	11	0.01

								5543	

Disease Category: Other

Agent: *Phoma herbarum*

Basin	Location	Species	Stock	Size Brood	Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
<hr/>									
Lower Columbia									
Month: January									
	1991								
	Speelyai	Spring Chinook	Lewis River	90	500.	1.835	0.0544	600	0.05

								600	
Month: February									
	1991								
	Speelyai	Spring Chinook	Lewis River	90	329.	1.229	0.0702	375	0.03

								375	
Month: March									
	1991								
	Speelyai	Spring Chinook	Lewis River	90	216.	1.033	0.0760	150	0.01

								150	
Month: April									
	1991								
	Kalama Falls	Fall Chinook	Kalama Falls	90	180.	1.446	0.1816	2060	0.06
	Washougal	Fall Chinook	Washougal	90	227.	0.158	0.0271	2800	0.04

								4860	
Month: May									
	1991								
	Lewis River	Spring Chinook	Lewis River	90	98.	1.076	0.0463	77	0.00

								77	

Disease Category: Other

Agent: *Pinehead*

Basin	Location	species	Stock	Size Brood	Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
<hr/>									
Lower Columbia									
Month: January									
	1991								
	Lewis River	Early Coho	Lewis River	89	35.	1.241	0.0827	54	0.00
	Lewis River	Late Coho	Lewis River	89	33.	1.761	0.1187	770	0.02
	Lewis River	Spring Chinook	Lewis River	89	9.	1.292	0.1292	148	0.02
	Toutle	Early Coho	Grays River	89	24.	1.746	0.0393	31	0.00

								1003	

WDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other
Agent: Pinhead

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number Loss	% LOSS
Lower Columbia									
Mnth: February									
1991									
Lewis River	Early Coho	Lewis River	89	27.	1. 325	0. 0987		86	0. 00
Lewis River	Late Coho	Lewis River	89	28.	1. 752	0. 1324		744	0. 02
Lewis River	Spring Chinook	Lewis River	89	8.	1. 706	0. 1410		84	0. 00
Toutle	Early Coho	Grays River	89	21.	1. 809	0. 0452		22	0. 00
Toutle	Fall Chinook	Cowlitz	90	415.	0. 721	0. 0180		148	0. 00

1084									
Mnth: March									
1991									
Grays River	Early Coho	Grays River	90	526.	1. 903	0. 1142		2437	0. 23
Grays River	Early Coho	Toutle	90	860.	1. 013	0. 0524		1500	0. 36
Lewis River	Early Coho	Lewis River	89	21.	1. 497	0. 1310		219	0. 02
Lewis River	Early Coho	Toutle	90	502.	1. 434	0. 1075		20	0. 00
Lewis River	Late Coho	Lewis River	89	21.	2. 050	0. 1656		476	0. 01
Lewis River	Spring Chinook	Lewis River	89	9.	0. 702	0. 0595		81	0. 02

4733									
Mnth: April									
1991									
Lewis River	Early Coho	Lewis River	89	17.	1. 715	0. 1501		430	0. 04
Lewis River	Early Coho	Toutle	90	333.	1. 868	0. 1401		186	0. 05
Lewis River	Late Coho	Lewis River	89	18.	2. 187	0. 2187		1489	0. 04
Lewis River	Late Coho	Lewis River	90	857.	1. 129	0. 8466		64	0. 00
Lewis River	Spring Chinook	Lewis River	90	157.	0. 384	0. 0302		449	0. 04

2618									
Mnth: May									
1991									
Lewis River	Early Coho	Toutle	90	187.	0. 356	0. 0400		377	0. 10
Lewis River	Late Coho	Lewis River	89	16.	2. 387	0. 2387		228	0. 00
Lewis River	Late Coho	Lewis River	90	425.	0. 907	0. 0513		6039	0. 14
Lewis River	Spring Chinook	Lewis River	90	98.	1. 076	0. 0463		241	0. 02

6885									
Mnth: June									
1991									
Grays River	Early Coho	Toutle	90	114.	0. 557	0. 0316		200	0. 05
Lewis River	Early Coho	Toutle	90	106.	0. 725	0. 0544		90	0. 02
Lewis River	Late Coho	Lewis River	90	235.	0. 897	0. 0448		1727	0. 04
Toutle	Fall Chinook	Toutle	90	66.	1. 419	0. 0432		2237	0. 08

4254									
Upper Columbia									
Mnth: April									
1991									
Lyon's Ferry	Fall Chinook	Lyon's Ferry	90	166.	0. 201	0. 0436		121	0. 03
Lyon's Ferry	Spring Chinook	Tucannon	90	94.	0. 098	0. 0213		232	0. 27
Priest Rapids	Fall Chinook	Wells	90	132.	0. 449	0. 0831		40	0. 04

393									
Mnth: May									
1991									
Lyon's Ferry	Fall Chinook	Lyon's Ferry	90	147.	0. 474	0. 1027		1831	0. 20
Priest Rapids	Fall Chinook	Wells	90	51.	0. 849	0. 1570		47	0. 05

1878									

VDF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Other
Agent: Tail Rot

Basin	Location	Species	Stock	Brood	size Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
<hr/>									
Lower Columbia									
Mnth: February									
	1991								
	Grays River	Fall Chinook	Grays River	90	346.	1.579	0.0807	10050	1.08
	Grays River	Fall Chinook	Kalama Falls	90	549.	1.781	0.1018	4000	0.19
								14050	
Mnth: March									
	1991								
	Grays River	Fall Chinook	Grays River	90	208.	1.545	0.0846	2070	0.22
	Washougal	Fall Chinook	Washougal	90	490.	1.232	0.0244	3000	0.05
								5070	
Upper Columbia									
Mnth: January									
	1991								
	Rocky Reach	Fall Chinook	Wells	89	16.	0.558	0.0689	200	0.09
								200	

Disease Category: Other
Agent: unknown

Basin	Location	Species	Stock	Brood	size Fish/Lb	Flow Index	Density Index	Number Loss	% Loss
<hr/>									
Lower Columbia									
Mnth: January									
	1991								
	Grays River	Fall Chinook	Grays River	90	670.	1.039	0.0552	1770	0.18
	Grays River	Fall Chinook	Kalama Falls	90	636.	1.192	0.1006	26610	1.50
								28380	
Mnth: February									
	1991								
	Lewis River	Spring Chinook	Lewis River	89	8.	1.706	0.1410	107	0.01
								107	
Upper Columbia									
Mnth: February									
	1991								
	Wells spawning	Fall Chinook	Wells	90	184.	0.765	0.1273	19	0.01
	Wells Spawning	Summer Chinook	Wells	90	180.	1.041	0.0425	187	0.03
								206	
Mnth: March									
	1991								
	Wells Spawning	Fall Chinook	Wells	90	154.	0.855	0.1425	37	0.02
	Wells Spawning	Spring Chinook	Leavenworth	90	50.	1.145	0.2713	11	0.00
	Wells Spawning	Summer Chinook	Uells	90	101.	1.500	0.0705	228	0.03
								276	
Mnth: April									
	1991								
	Uells Spawning	Fall Chinook	Wells	90	103.	1.118	0.1863	12	0.00
	Uells Spawning	Spring Chinook	Leavenworth	90	50.	1.144	0.2710	24	0.00
	Uells Spawning	Summer Chinook	Uells	90	112.	1.525	0.0943	108	0.01
								144	
Mnth: May									
	1991								
	Wells Spawning	Fall Chinook	Wells	90	57.	1.107	0.1845	11	0.01
	Wells Spawning	Summer Chinook	Uells	90	89.	0.765	0.1025	116	0.00
								127	

VMF PROGRAM QC01
DISEASE PREVALENCE SUMMARY
1991

Disease Category: Parasite

Agent: Nematode

Basin	Location	Species	Stock	Brood	Size Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
Upper Columbia									
Month: June	1991 Wells Spawning	Summer Chinook	Wells	90	93.	2. 580	a. 6435	2000	0.16
								2127	

Disease Category: Viral

Agent: EIBS

Basin	Location	species	Stock	Brood	sire Fish/Lb	Flow Index	Density Index	Number LOSS	% LOSS
Lower Columbia									
Month: January	1991 Cowlitz	Late Coho	Cowlitz	89	28.	1. 776	0. 2537	4240	0.10
	Cowlitz	Spring Chinook	Cowlitz	09	5.8	1. 295	0. 1850	434	0.03
								4674	
Month: February	1991 Cowlitz	Late Coho	Cowlitz	89	22.	2. 089	0. 2984	5240	0.12
								5240	
Month: March	1991 Cowlitz	Late Coho	Cowlitz	89	20.	2. 216	0. 3166	7040	0.16
								7040	
Month: April	1991 Cowlitz	Late Coho	Cowlitz	89	18.	2. 374	0. 3391	8233	0.19
								8233	

APPENDIX B

Appendix B contains the Hatchery Rearing Parameters and Mortality Summary Report. Data are presented by location; sorted by species, stock and brood. Data are from January 1, 1990 to June 30, 1991.

Abbreviations:

Brood = A - adults returning in 1990.

Brood = 90 in December of 1990 = eggs taken in 1990.

VMF PROGRAM QC02
Hatchery Rearing Parameters and Mortality Summary Report
1990 - 1991

Location: Cowlitz

SPECIES	STOCK	PWNO'S			AVERAGE SIZE FISH/LB	POND VOLUME CU FEET	WATER INFLOW GPH	LBS PER GPH	FLOW INDEX	DENSITY INDEX	FOOD CONV	MONTHLY MORTLTY
		BROOD	DATE	* OF FISH ON HAND								
Fall	Cowlitz	89	Feb 1990	12487	585.	46000	4000	3.12	1.9	0.17		16400
Fall	Cowlitz	89	Mar 1990	22104	306.	88000	12000	1.84	0.9	0.13	1.6	29900
Fall	Cowlitz	89	Apr 1990	44390	152.	101000	16000	2.77	1.1	0.18	1.3	16600
Fall	Cowlitz	90	Apr 1991	28655	239.	140000	20000	1.43	0.7	0.09		42000
Fall	Cowlitz	90	May 1991	70733	100.	140000	20000	3.54		0.17	0.0	37900
Fall	Cowlitz	90	Jun 1991	103797	68.	176000	22000	4.72	1::	0.18	1.2	15100
Late	Cowlitz	88	Jan 1990	176270	27.	152000	18500	9.53	2.1	0.26	1.3	18200
Late	Cowlitz	88	Feb 1990	197620	24.	153000	185DD	10.70	2.3	0.28	1.7	16400
Late	Cowlitz	88	Mar 1990	214931	22.	153000	18500	11.60	2.3	0.28	3.2	14400
Late	Cowlitz	88	Apr 1990	261833	48.	152000	18500	14.20	2.7	0.33	1.2	15500
Late	Cowlitz	88	May 1990	52935	17.	152000	18500	2.86	0.5	0.07	0.0	26600
Late	Cowlitz	89	May 1990	33398	200.	116000	12800	2.61	1.5	0.16	0.0	54800
Late	Cowlitz	89	Jun 1990	47509	139.	116000	12800	3.71	1.4	0.16	1.5	65800
Late	Cowlitz	89	Jul 1990	73106	89.	164000	26000	2.81	D.9	0.15	1.4	26200
Late	Cowlitz	89	Aug 1990	83440	64.	182000	26000	3.21	0.9	0.14	0.0	21400
Late	Cowlitz	89	Sep 1990	88749	51.	182000	26000	3.41	0.9	0.13	0.0	17900
Late	Cowlitz	89	Oct 1990	99651	45.	140000	20000	4.98	1.3	0.19	3.9	6700
Late	Cowlitz	89	Nov 1990	144493	31.	140000	20000	7.22	1.7	0.24	0.0	11200
Late	Cowlitz	89	Dec 1990	149123	30.	140000	20000	7.46	1.7	0.25	7.7	5600
Late	Cowlitz	89	Jan 1991	159396	28.	140000	20000	7.97	1.8	0.25	4.2	10600
Late	Cowlitz	89	Feb 1991	202272	22.	140000	20000	10.10	2.1	0.30	1.0	13100
Late	Cowlitz	89	Mar 1991	221620	20.	140000	20000	11.10	2.2	0.32	2.6	17600
Late	Cowlitz	89	Apr 1991	244872	18.	140000	20000	12.20	2.4	0.34	2.3	24700
Spring	Cowlitz	88	Jan 1990	120722	9.	153000	22000	5.49	0.8	0.12	3.5	6900
Spring	Cowlitz	88	Feb 1990	119966	9.	150000	22000	5.45	0.0	0.15	0.0	6800
Spring	Cowlitz	88	Mar 1990	153500	7.	153000	22000	6.98	0.0	0.14	1.2	5200
Spring	Cowlitz	89	Jan 1990	9742	202.	80000	2100	4.64	2.0	0.05	1.0	10500
Spring	Cowlitz	89	Feb 1990	13542	145.	76000	12906	1.05	0.4	0.07	1.8	4300
Spring	Cowlitz	89	Mar 1990	22994	85.	76000	12906	1.78	0.6	0.10	1.1	9200
Spring	Cowlitz	89	Apr 1990	33503	58.	203000	29000	1.16	0.3	0.05	1.8	11277
Spring	Cowlitz	89	May 1990	44453	39.	190000	29000	1.53	0.4	0.06	0.0	2598
Spring	Cowlitz	89	Jun 1990	49895	30.	189000	29000	1.72	0.4	0.06	0.0	4616
Spring	Cowlitz	89	Jul 1990	57484	22.	152000	27000	2.13	0.4	0.08	0.0	1301
Spring	Cowlitz	89	Aug 1990	90236	14.	152000	27000	3.34	0.6	0.11	1.0	1354
Spring	Cowlitz	89	Sep 1990	126232	10.	152000	27000	4.68	0.7	0.13	0.0	985
Spring	Cowlitz	89	Oct 1990	140149	9.						2.4	978
Spring	Cowlitz	89	Nov 1990	179997	7.	168000	24000	7.50	1.0	0.14	0.0	1364
Spring	Cowlitz	89	Dec 1990	179672	7.						0.0	2276
Spring	Cowlitz	89	Jan 1991	216597	5.8	168000	24000	9.02	1.3	0.19	1.1	1446
Spring	Cowlitz	89	Feb 1991	209144	6.	152000	27000	7.75	1.0	0.19	0.0	1396
Spring	Cowlitz	89	Mar 1991	208996	6.	168000	24000	8.71	1.1	0.16	0.0	891
Spring	Cowlitz	90	Dec 1990									211000
Spring	Cowlitz	90	Dec 1990	4817	500.	75000	3000	1.61	0.9	0.04		9500
Spring	Cowlitz	90	Jan 1991	7991	300.	75000	4000	2.00	0.7	0.04	1.6	11000
Spring	Cowlitz	90	Feb 1991	14945	160.	75000	9000	1.66	0.7	0.09	0.9	6200
Spring	Cowlitz	90	Mar 1991	18123	130.	81000	13000	1.39	0.6	0.09	2.9	35200
Spring	Cowlitz	90	Apr 1991	31355	70.		34000	0.92	0.3		1.1	3609
Spring	Cowlitz	90	May 1991	39961	43.	173000	33000	1.21	0.3	0.06	0.0	3704
Spring	Cowlitz	A	Dec 1990									326

WDF PROGRAM QC02
Hatchery Rearing Parameters and Mortality Summary Report
1990 - 1991

Location: Elokomin

SPECIES	STOCK	BROOD	* DATE	* OF FISH	POUNDS	AVERAGE SIZE FISH/LB	PDND VOLUME CU FEET	WATER INFLOW GPM	LBS PER GPM	FLOW INDEX	DENSITY INDEX	FOOD	MNTHLY
												INDEX	CONV
Early	Elokomin	88	Jan 1990	17700	27.	22000	3200	5.53	1.2	0.18	1.2		1000
Early	Elokomin	88	Feb 1990	19076	25.	22399	3200	5.96	0.18	1.7			1000
Early	Elokomin	88	Mar 1990	25057	19.	22000	3200	7.83	1.1	0.21	0.8		800
Early	Elokomin	88	Apr 1990	26427	18.	22000	3200	8.26	1.6	0.23	3.0		400
Early	Grays River	88	Jan 1990	14786	30.	36000	2600	5.69	0.3	0.03	0.0		1000
Early	Grays River	89	Jan 1990	383	1288.	7000	400	0.96	0.0	0.06			1500
Early	Grays River	89	Feb 1990	760	647.	7199	400	1.90	1.2	0.07	0.1		1800
Early	Grays River	89	Mar 1990	1401	351.	7199	540	2.59	1.3	0.10	0.3		2076
Early	Grays River	89	Apr 1990	2971	164.	11000	810	3.67	1.4	0.11	0.7		2647
Early	Grays River	89	May 1990	4940	98.	18000	4350	3.66	1.2	0.09	0.9		2385
Early	Grays River	89	Jun 1990	5813	83.	29000	2160	2.69	0.8	0.06	2.0		1719
Early	Grays River	89	Jul 1990	6700	72.	36000	2500	2.68	0.8	0.05	2.2		786
Early	Grays River	89	Aug 1990	8435	57.	36000	2500	3.37	0.9	0.06	1.3		604
Early	Grays River	89	Sep 1990	11173	43.	36000	2500	4.47	1.1	0.08	0.9		352
Early	Grays River	89	Oct 1990	14554	33.	36000	2500	5.82	1.3	0.09	0.0		131
Early	Grays River	89	Nov 1990	16558	29.	36000	2500	6.62	1.4	0.10	0.0		109
Early	Grays River	89	Dec 1990	17132	28.	36000	2500	6.85	1.5	0.10	3.2		485
Early	Grays River	89	Jan 1991	18772	25.	36000	2500	7.51	1.6	0.11	1.2		1213
Early	Kalama Falls	90	Feb 1991	812	664.	71w	540	1.50	0.9	0.07			440
Early	Kalama Falls	90	Mar 1991	1170	460.	7199	540	2.17	1.2	0.09	1.2		1060
Early	Kalama Falls	90	Apr 1991	1991	301.	7199	540	3.48	1.7	0.13	0.0		4100
Early	Kalama Falls	90	May 1991	3844	147.	32000	2430	1.58	0.6	0.05	0.7		1400
Early	Kalama Falls	90	Jun 1991	5591	101.	36000	2700	2.07	0.7	0.05	1.2		400
Early	Lewis River	89	Jan 1990	403	1282.	7000	400	1.01	1.0	0.06			1500
Early	Lewis River	89	Feb 1990	775	665.	71w	400	1.94	1.2	0.07	0.2		1800
Early	Lewis River	89	Mar 1990	1524	338.	7199	540	2.82	1.4	0.11	0.2		2018
Early	Lewis River	89	Apr 1990	3051	168.	7199	540	5.65	2.1	0.16	0.7		964
Early	Lewis River	89	May 1990	4913	104.	18000	1350	3.64	1.2	0.09	0.9		1739
Early	Lewis River	89	Jun 1990	6218	82.	25000	1890	3.29	1.0	0.08	1.4		2080
Early	Lewis River	89	Jul 1990	6873	74.	36000	2500	2.75	0.8	0.06	3.0		603
Early	Lewis River	89	Aug 1990	9409	54.	36000	2500	3.76	1.0	0.07	1.0		489
Early	Lewis River	89	Sep 1990	11810	43.	36000	2500	4.72	1.2	0.08	1.1		280
Early	Lewis River	89	Oct 1990	13589	34.	36000	2500	5.44	1.3	0.09	1.9		96
Early	Lewis River	89	Nov 1990	17505	29.	36000	2500	7.00	1.5	0.11	0.0		101
Early	Lewis River	89	Dec 1990	18115	28.	22000	3000	6.04	1.3	0.18	2.8		425
Early	Lewis River	89	Jan 1991	18063	28.	22000	3000	6.02	1.4	0.18	0.0		253
Early	Lewis River	89	Feb 1991	24074	21.	22000	3000	8.02	1.6	0.22	0.5		205
Early	Lewis River	89	Mar 1991	25275	20.	22000	3000	8.43	1.7	0.23	3.1		400
Early	Lewis River	89	Apr 1991	29711	17.	22000	3000	9.90	1.9	0.26	0.7		400
Early	Toutle	90	Mar 1991	711	771.	7199	540	1.32	0.9	0.06			1800
Early	Toutle	90	Apr 1991	1067	511.	7199	540	1.98	1.1	0.08	1.2		2800
Early	Toutle	90	May 1991	2136	254.	10000	810	2.64	1.2	0.10	0.9		2700
Early	Toutle	90	Jun 1991	3522	154.	14399	1080	3.26	1.3	0.10	0.8		300
Fall	Elokomin	89	Jan 1990	2195	1200.	1800	1000	2.19	2.4	0.13	0.0		9760
Fall	Elokomin	89	Feb 1990	7908	533.	73000	5300	1.49	0.8	0.06	0.0		7200
Fall	Elokomin	89	Mar 1990	15531	304.	73000	7430	2.09	1.0	0.11	0.0		2495
Fall	Elokomin	89	Apr 1990	32760	144.	73000	7430	4.41	1.6	0.16	1.0		3999
Fall	Elokomin	89	May 1990	69323	68.	74000	11010	6.30	1.7	0.26	0.7		3181
Fall	Elokomin	89	Jun 1990	85858	52.	67000	10470	8.20	2.1	0.32	0.9		1202

VDF PROGRAM QC02
Hatchery Rearing Parameters and Mortality Summary Report
1990 - 1991

Location: Elokomin

SPECIES	STOCK	BROOD	* DATE	* MTH	PWNOS	AVERAGE	POND	WATER	LBS	FLOW	DENSITY	FOOD	MONTHLY
			YEAR	ON RAND	SIZE	FISH/LB	VOLUME	INFLOW	PER GPH	INDEX	INDEX	CONV	MORTLTY
							CU FEET	GPM					
Fall	El okmin	90	Feb	1991	2773	641.	10800	810	3.42	0.1	0.01		720
Fall	El okmin	90	Mar	1991	7450	451.	41000	4200	1.77	0.0	0.10	0.0	5180
Fall	El okmin	90	Apr	1991	14177	236.	40000	4200	3.38	1.5	0.16	0.0	14390
Fall	El okmin	90	May	1991	33075	101.	41000	4200	7.88	2.7	0.27	0.8	6100
Fall	El okmin	90	Jun	1991	47711	70.	40000	4200	11.40	3.2	0.33	0.7	800
Fall	Elokomin	A	Dec	1990			22000	5000					584
Fall	Kalama Falls	90	Feb	1991	3336	740.	22000	1590	2.10	1.2	0.09		1240
Fall	Kalama Falls	90	Mar	1991	1975	531.	14000	1060	1.86	1.1	0.08	0.0	3460
Fall	Kalama Falls	90	Apr	1991	3518	298.	22000	1590	2.21	1.0	0.08	1.1	600
Fall	Kalama Falls	90	May	1991	8513	123.	22000	2500	3.41	1.2	0.14	0.9	1400
Fall	Kalama Falls	90	Jun	1991	12764	82.	22000	2500	5.11	1.5	0.17	0.0	600
Fall	Toutle	90	Feb	1991	420	907.	3599	265	1.58	1.1	0.08	0.0	800
Fall	Toutle	90	Mar	1991	633	600.	35 w	270	2.34	1.4	0.10	1.0	800
Fall	Toutle	90	Apr	1991	1045	362.	71 w	540	1.94	0.9	0.07	1.1	1700
Fall	Toutle	90	May	1991	2457	154.	7199	540	4.55	1.8	0.13	0.6	1100
Late	Elokmin	88	Jan	1990	44022	27.	117000	6000	7.34	1.6	0.08	1.0	2200
Late	Elokmin	88	Feb	1990	49458	24.	113000	6000	8.24	1.8	0.10	0.0	1600
Late	Elokmin	88	Mar	1990	65911	18.	113000	7200	9.15		0.11	0.7	565
Late	Elokmin	88	Apr	1990	60697	15.	113000	7200	8.43	1::	0.10	0.0	1235
Late	Elokmin	88	May	1990	66983	13.	113000	6000	11.20	1.9	0.10	0.7	705
Late	Elokmin	89	Mar	1990	694	1081.	7199	540	1.29	0.9	0.07		285
Late	Elokmin	89	Apr	1990	2431	705.	14000	1080	2.25	1.4	0.11	0.0	9400
Late	Elokmin	89	May	1990	4786	354.	25000	2890	1.66	0.8	0.10	0.9	17797
Late	Elokmin	89	Jun	1990	6747	227.	25000	1890	3.57	1.5	0.12	1.6	3808
Late	Elokmin	89	Jul	1990	8798	163.	113000	6300	1.40	0.5	0.03	1.9	8762
Late	Elokmin	89	Aug	1990	14024	102.	113000	6300	2.23	0.7	0.04	1.1	3610
Late	Elokmin	89	Sep	1990	21663	6.5.	113000	6300	3.44	0.0	0.06	1.1	1130
Late	Elokmin	89	Oct	1990	35702	40.	113000	6300	5.67	1.4	0.08	0.6	1690
Late	Elokmin	89	Nov	1990	38588	37.	113000	6300	6.13	1.5	0.08	1.8	350
Late	Elokmin	89	Dec	1990	36578	39.	113000	6300	5.81	1.4	0.08	0.0	1200
Late	Elokmin	89	Jan	1991	32677	39.	113000	6300	5.19	1.3	0.07	0.0	701
Late	Elokmin	89	Feb	1991	50966	25.	113000	6300	8.09	1.8	0.10	0.5	260
Late	Elokmin	89	Mar	1991	57904	22.	113000	6300	9.19	1.9	0.11	1.8	400
Late	Elokmin	89	Apr	1991	79518	16.	113000	6300	12.60	2.4	0.13	0.6	1400
Late	Elokmin	89	May	1991	79450	16.	113000	6300	12.60	2.4	0.13	0.0	800
Late	Elokmin	90	Mar	1991	1169	865.	10800	810	1.44	0.9	0.07		4600
Late	Elokmin	90	Apr	1991	1849	517.	10000	810	2.28	1.3	0.11	1.1	3666
Late	Elokmin	90	May	1991	3899	242.	67000	3270	1.19	0.5	0.03	0.8	10400
Late	Elokmin	90	Jun	1991	4291	174.	64000	3000	1.43	0.6	0.03	0.0	900
Late	Lewis River	90	Mar	1991	437	1061.	35 w	270	1.62	1.2	0.09		1300
Late	Lewis River	90	Apr	1991	780	659.	3599	270	2.89	1.7	0.13	0.0	934
Late	Lewis River	90	May	1991	2032	288.	10800	810	2.51	1.2	0.09	0.0	7300
Late	Lewis River	90	Jun	1991	4271	176.	10800	810	5.27	2.2	0.16	0.0	9100

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Location: Grays River

SPECIES	STOCK	BROOD	* DATE MTH	OF FISH YEAR	POUNDS ON HAND	AVERAGE SIZE FISH/LB	POND VOLUME CU FEET	WATER INFLOW GPM	LBS PER GPM	FLOW INDEX	DENSITY INDEX	FOOD CONV	MONTHLY MORTLTY
										INDEX	INDEX	INDEX	INDEX
Early	Grays River	88	Jan 1990	16852	21.	60000	1500	11.20	2.3	0.06	0.0	0.0	300
Early	Grays River	88	Feb 1990	18610	19.	158000	1350	13.80	2.7	0.02	0.0	0.0	300
Early	Grays River	88	Mar 1990	23530	15.	158000	1350	17.40	3.0	0.03	0.8	0.0	650
Early	Grays River	88	Apr 1990	27126	13.	157000	1350	20.10	3.4	0.03	0.0	0.0	600
Early	Grays River	89	Feb 1990	2312	830.	16000	900	2.57	1.6	0.09	0.0	0.0	1200
Early	Grays River	89	Mar 1990	1980	405.	11000	600	3.30	1.7	0.10	0.0	0.0	20050
Early	Grays River	89	Apr 1990	3620	220.	11000	822	4.40	1.9	0.14	0.9	0.0	5800
Early	Grays River	89	May 1990	5613	136.	42000	2700	2.08	0.8	0.05	1.0	0.0	3100
Early	Grays River	89	Jun 1990	9419	81.	102000	3660	2.57	0.8	0.03	0.7	0.0	1400
Early	Grays River	89	Jul 1990	13342	57.	102000	3660	3.65	0.0	0.04	1.2	0.0	2500
Early	Grays River	89	Aug 1990	21058	36.	102000	3660	5.75	1.4	0.05	0.9	0.0	2400
Early	Grays River	89	Sep 1990	26992	28.	102000	3650	7.40	1.6	0.06	0.0	0.0	2300
Early	Grays River	89	Oct 1990	27907	27.	102000	3650	7.65	1.6	0.06	3.8	0.0	2300
Early	Grays River	89	Nov 1990	27792	27.	102000	3650	7.61	1.6	0.06	0.0	0.0	2300
Early	Grays River	89	Dec 1990	28211	27.	92000	2900	9.73	2.1	0.06	0.0	0.0	3500
Early	Grays River	89	Feb 1991	18047	21.	60000	1160	15.60	3.2	0.06	0.0	0.0	800
Early	Grays River	89	Mar 1991	22294	17.	60000	1160	19.20	3.5	0.07	0.0	0.0	455
Early	Grays River	89	Apr 1991	25066	15.	60000	1160	21.60	3.8	0.07	0.8	0.0	2200
Early	Grays River	89	May 1991	9435	17.	49000	450	21.00	3.8	0.04	0.0	0.0	110
Early	Grays River	90	Feb 1991	1366	788.	11000	600	2.28	1.5	0.08	0.0	0.0	38900
Early	Grays River	90	Mar 1991	2023	526.	10000	600	3.37	1.9	0.11	1.3	0.0	12825
Early	Grays River	90	Apr 1991	1808	240.	10500	600	3.01	1.3	0.08	0.0	0.0	7200
Early	Grays River	90	May 1991	3057	142.	60000	1050	2.91	1.1	0.02	0.0	0.0	4085
Early	Grays River	90	Jun 1991	4061	106.	60000	1350	3.01	1.0	0.02	1.4	0.0	1900
Early	Toutle	90	Feb 1991	1363	946.	16000	900	1.51	1.1	0.06	0.0	0.0	13950
Early	Toutle	90	Mar 1991	478	860.	5800	300	1.59	1.0	0.05	0.0	0.0	5240
Early	Toutle	90	Apr 1991	1517	262.	10500	600	2.53	1.1	0.07	0.6	0.0	3900
Early	Toutle	90	May 1991	2719	161.	16000	900	3.02	1.1	0.06	0.0	0.0	2515
Early	Toutle	90	Jun 1991	3409	114.	37000	2100	1.62	0.6	0.03	0.0	0.0	6500
Fall	Cowlitz	90	Jan 1991	582	782.	5199	450	1.29	0.8	0.07	0.0	0.0	4700
Fall	Cowlitz	90	Feb 1991	660	689.	11000	600	1.10	0.6	0.04	0.0	0.0	6200
Fall	Cowlitz	90	Mar 1991	403	202.	5300	300	1.34	0.5	0.03	0.0	0.0	520
Fall	Cowlitz	90	Apr 1991	425	201.	5300	300	1.42	0.6	0.03	D.0	0.0	200
Fall	Grays River	89	Feb 1990	2437	579.	134000	2350	1.04	0.6	0.01	0.0	0.0	1900
Fall	Grays River	89	Mar 1990	5043	246.	129000	1900	2.65	1.1	0.02	0.0	0.0	8150
Fall	Grays River	89	Apr 1990	9751	126.	81000	2300	4.24	1.4	0.04	1.1	0.0	7200
Fall	Grays River	89	May 1990	13098	63.	70000	2200	5.95	1.6	0.05	0.0	0.0	1600
Fall	Grays River	90	Jan 1991	1460	670.	16000	850	1.72	1.0	0.06	0.0	0.0	5900
Fall	Grays River	90	Feb 1991	2694	346.	16000	850	3.17	1.5	0.08	0.0	0.0	52100
Fall	Grays River	90	Mar 1991	4477	208.	21000	1150	3.89	1.5	0.08	1.9	0.0	5910
Fall	Grays River	90	Apr 1991	9646	111.	37000	2150	4.50	0.7	0.04	0.0	0.0	3500
Fall	Grays River	90	May 1991	7170	80.	86000	2850	2.52	0.7	0.02	0.0	0.0	1800
Fall	Grays River	90	Jun 1991	11657	49.	86000	2850	4.09	1.0	0.03	1.2	0.0	1400
Fall	Kalama Falls	90	Jan 1991	2788	636.	16000	1350	2.07	1.2	0.10	0.0	0.0	88700
Fall	Kalama Falls	90	Feb 1991	3787	549.	21000	1200	3.16	1.8	0.10	0.0	0.0	26200
Fall	Kalama Falls	90	Mar 1991	1172	313.	10500	600	1.95	0.9	0.05	0.0	0.0	2200
Fall	Kalama Falls	90	Apr 1991	369	211.	5300	300	1.23	0.5	0.03	0.0	0.0	0
Fall	Kalama Falls	90	May 1991	3940	75.	49000	900	4.38	1.2	0.02	0.0	0.0	108
Fall	Kalama Falls	90	Jun 1991	4923	60.	49000	900	5.47	1.3	0.02	0.8	0.0	100
Fall	Washougal	89	Feb 1990	3868	558.	26000	2000	1.93	I.1	0.08	0.0	0.0	300
Fall	Washougal	89	Mar 1990	558	201.	5300	350	1.59	0.6	0.04	0.0	0.0	750
Fall	Washougal	89	Apr 1990	895	124.	5300	400	2.24	0.7	0.06	1.3	0.0	1300

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Location: Kalama Falls

SPECIES	STOCK	BROOD	MTH	YEAR	* DATE	* OF FISH	POUNDS	AVERAGE SIZE FISH/LB	POND VOLUME CU FEET	WATER INFLOW GPW	LBS PER GPM	FLOW INDEX	DENSITY INDEX	FOOD CONY	MONTHLY MORTLTY
Early	Kalama Falls	90	Dec	1990											14600
Early	Kalama Falls	A	Dec	1990											124
Fall	Kalama Falls	89	Jan	1990	3049	883.	29000	2100	1.45	0.9	0.07	0.0	1045		
Fall	Kalama Falls	89	Feb	1990	6150	583.	38000	3100	1.98	1.1	0.09	0.0	9930		
Fall	Kalama Falls	89	Mar	1990	11084	323.	38000	3300	3.36	1.6	0.14	1.1	5160		
Fall	Kalama Falls	89	Apr	1990	21530	166.	57000	6000	3.59	1.3	0.14	1.1	6200		
Fall	Kalama Falls	89	May	1990	29190	96.	82000	8900	3.28	1.0	0.11	0.0	8200		
Fall	Kalama Falls	89	Jun	1990	1319	121.	9600	900	1.47	0.5	0.05	0.0	5545		
Fall	Kalama Falls	89	Jul	1990	770	103.	4800	500	1.54	0.5	0.05	0.0	685		
Fall	Kalama Falls	89	Aug	1990	1056	74.	4800	550	1.92	0.5	0.06	1.6	500		
Fall	Kalama Falls	90	Dec	1990										491600	
Fall	Kalama Falls	90	Jan	1991	2587	991.	33000	2100	1.23	0.8	0.05	0.0	0		
Fall	Kalama Falls	90	Feb	1991	5895	683.	48000	4000	1.47	0.9	0.07	0.0	1900		
Fall	Kalama Falls	90	Mar	1991	10074	363.	43000	4050	2.49	1.2	0.11	1.2	14400		
Fall	Kalama Falls	90	Apr	1991	20286	180.	43000	5400	3.76	1.4	0.18	0.8	5600		
Fall	Kalama Falls	90	May	1991	45541	80.	108000	9800	4.65	1.5	0.13	0.8	6200		
Fall	Kalama Falls	90	Jun	1991	51917	70.	96000	10000	5.19	1.6	0.16	2.0	9100		
Fall	Kalama Falls	A	Dec	1990											781
Late	Kalama Falls	88	Jan	1990	39820	24.	55000	5800	6.87	1.4	0.15	1.3	1410		
Late	Kalama Falls	88	Feb	1990	47725	20.	55000	5800	8.23	1.6	0.17	0.0	1220		
Late	Kalama Falls	88	Mar	1990	56070	17.	55000	5800	9.67	1.7	0.18	1.8	1285		
Late	Kalama Falls	88	Apr	1990	63486	15.	55000	5800	10.90	1.9	0.20	1.6	895		
Late	Kalama Falls	88	May	1990	23600	14.	19000	2000	11.80	2.0	0.21	0.0	80		
Late	Kalama Falls	89	Mar	1990	220	1300.	4800	200	1.10	0.8	0.04	0.0			
Late	Kalama Falls	89	Apr	1990	1121	601.	9600	800	1.40	0.8	0.07	0.0	800		
Late	Kalama Falls	89	May	1990	2029	326.	9600	800	2.54	1.2	0.10	0.8	12675		
Late	Kalama Falls	89	Jun	1990	2300	265.	29000	2700	0.85	0.4	0.04	3.1	2535		
Late	Kalama Falls	89	Jul	1990	3901	156.	29000	2700	1.44	0.5	0.05	0.9	865		
Late	Kalama Falls	89	Aug	1990	5612	108.	29000	3300	1.70	0.6	0.06	1.8	2405		
Late	Kalama Falls	89	Sep	1990	9460	64.	29000	3000	3.15	0.9	0.09	1.3	690		
Late	Kalama Falls	89	Oct	1990	13084	46.	29000	3000	4.36	1.1	0.11	1.3	2805		
Late	Kalama Falls	89	Nov	1990	16700	36.	29000	3000	5.57	1.3	0.13	1.3	725		
Late	Kalama Falls	89	Dec	1990	17647	34.	38000	2800	6.31	1.4	0.11	3.9	455		
Late	Kalama Falls	89	Jan	1991	21453	28.	38000	4000	5.36	1.1	0.12	0.0	35		
Late	Kalama Falls	89	Feb	1991	27304	22.	38000	4000	6.83	1.3	0.14	0.0	60		
Late	Kalama Falls	89	Mar	1991	35311	17.	38000	4000	8.83	1.6	0.17	1.0	410		
Late	Kalama Falls	89	Apr	1991	37512	16.	38400	4000	9.38	1.7	0.17	3.4	100		
Late	Kalama Falls	90	Dec	1990										0.0	178400
Late	Kalama Falls	90	Mar	1991	763	1159.	9600	600	1.27	0.0	0.06	0.0	0		
Late	Kalama Falls	90	Apr	1991	1505	693.	9600	1000	1.50	0.9	0.10	0.0	7600		
Late	Kalama Falls	90	May	1991	2248	450.	14000	1200	1.87	1.0	0.09	1.1	31500		
Late	Kalama Falls	A	Dec	1990					12000	700					60
Late	Lewis River	89	Mar	1990	211	1300.	4800	200	1.05	0.8	0.03	0.0			
Late	Lewis River	89	Apr	1990	467	587.	4800	400	1.17	0.7	0.06	0.6	400		
Late	Lewis River	89	May	1990	846	322.	4800	440	1.92	0.9	0.09	0.7	2070		

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Location: Kalama Falls

SPECIES	STOCK	BROOD	MTH	YEAR	* GATE	POUNDS	AVERAGE	POND	WATER	LBS	FLOW	DENSITY	FOOD	MONTHLY
					ON HAND	FISH/LB	SIZE	VOLUME	INFLOW	PER				
Late	Lewis	River	89	Jun 1990	1018	266.	9600	900	1.13	0.5	0.05	2.0	1630	
Late	Lewis	River	89	Jul 1990	1669	162.	9600	900	1.85	0.7	0.07	0.0	350	
Late	Lewis	River	89	Aug 1990	2518	107.	9600	1100	2.29	0.8	0.09	1.7	965	
Late	Lewis	River	89	Sep 1990	3901	69.	9600	1000	3.90	1.1	0.12	1.6	255	
Late	Lewis	River	89	Oct 1990	5360	50.	9600	1000	5.36	1.4	0.15	1.4	955	
Late	Lewis	River	89	Nov 1990	7047	38.	9600	1000	7.05	1.7	0.17	1.3	245	
Late	Lewis	River	89	Dec 1990	7870	34.	19000	1400	5.62	1.3	0.09	2.1	185	
Late	Lewis	River	89	Jan 1991	9227'	29.	19000	2000	4.61	0.0	0.10	0.0	15	
Late	Lewis	River	89	Feb 1991	12742	21.	19000	2000	6.37	1.2	0.13	0.0	20	
Late	Lewis	River	89	Mar 1991	15729	17.	19000	2000	7.86	1.4	0.15	1.3	235	
Late	Lewis	River	89	Apr 1991	16700	16.	19000	2000	8.35	1.5	0.16	3.4	100	
Spring	Kalama Falls	89	Jan 1990	1122	708.	9600	- 700	1.60	0.0	0.07	0.0	1025		
Spring	Kalama Falls	89	Feb 1990	1587	499.	9600	900	1.76	0.9	0.09	0.0	2525		
Spring	Kalama Falls	89	Mar 1990	2618	302.	9600	900	2.91	1.3	0.12	0.9	1370		
Spring	Kalama Falls	89	Apr 1990	4463	177.	9600	1100	4.06	1.5	0.18	0.8	900		
Spring	Kalama Falls	89	May 1990	891	131.	9600	900	0.99	0.3	0.03	0.0	1275		
Spring	Kalama Falls	89	Jun 1990	1023	113.	9600	900	1.14	0.4	0.03	3.2	1150		
Spring	Kalama Falls	89	Jul 1990	1278	89.	9600	900	1.42	0.4	0.04	2.5	1915		
Spring	Kalama Falls	89	Aug 1990	1881	60.	9600	1100	1.71	0.5	0.05	2.0	970		
Spring	Kalama Falls	89	Sep 1990	2887	39.	9600	1000	2.89	0.7	0.07	1.9	315		
Spring	Kalama Falls	89	Oct 1990	3593	31.	9600	1000	3.59	0.8	0.08	2.3	995		
Spring	Kalama Falls	89	Nov 1990	5295	21.	9600	1000	5.30	0.0	0.10	1.1	275		
Spring	Kalama Falls	89	Dec 1990	6529	17.	71 w	700	9.33	1.6	0.16	1.3	145		
Spring	Kalama Falls	89	Jan 1991	6329	17.	7199	700	9.33	1.6	0.16	0.0	30		
Spring	Kalama Falls	89	Feb 1991	10090	11.	7199	700	14.40	2.2	0.21	0.0	45		
Spring	Kalama Falls	89	Mar 1991	8523	13.	7199	700	12.20	1.9	0.18	0.0	185		
Spring	Kalama Falls	89	Apr 1991	9233	12.	7199	700	13.20	2.0	0.20	0.0	5		
Spring	Kalama Falls A		Dec 1990				12000	500				485		
													300	
													35700	
Spring	Kalama Falls	90	Dec 1990	99	1200.	4800	300	0.33	0.2	0.01			500	
Spring	Kalama Falls	90	Dec 1990										200	
Spring	Kalama Falls	90	Jan 1991	364	800.	4800	300	1.21	0.8	0.05	0.0		500	
Spring	Kalama Falls	90	Feb 1991	620	469.	4800	400	1.55	0.0	0.08	0.7		200	
Spring	Kalama Falls	90	Mar 1991	816	355.	4800	450	1.81	0.9	0.08	1.8		1260	
Spring	Kalama Falls	90	Apr 1991	1711	169.	4800	450	3.80	1.4	0.14	0.6		500	
Spring	Kalama Falls	90	May 1991	2304	125.	4800	500	4.61	1.7	0.17	0.9		1200	

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Location: Klickitat

SPECIES	STOCK	BROOD	* DATE	* OF FISH	PWNS	AVERAGE	POND	WATER	LGS	FLOW	DENSITY	FOOD	MONTHLY	
					MTH	YEAR	ON HAND	SIZE	VOLUME	INFLOW	PER	INDEX	INDEX	CONV
<hr/>														
Fall	Lyon's Ferry	90	Dec 1990											28600
Fall	Lyon's Ferry	90	Feb 1991	2093	824.		17000	737	2.84	1.8	0.08			8330
Fall	Lyon's Ferry	90	Mar 1991	5028	370.		34000	2340	2.15	1.0	0.07	0.0		32293
Fall	Lyon's Ferry	90	Apr 1991	9419	181.		24000	2649	3.56	1.3	0.15	0.7		9600
Fall	Lyon's Ferry	90	May 1991	16603	102.		13000	5446	3.05	0.0	0.40	0.0		11400
Fall	Lyon's Ferry	90	Jun 1991	21326	79.		13000	51196	0.42	0.1	0.52	0.3		8800
Fall	Priest	89	Feb 1990	9013	480.		107000	3840	2.35	1.2	0.04	0.0		81728
Fall	Priest	89	Mar 1990	19923	216.		107000	6412	3.11	1.3	0.08	0.5		23020
Fall	Priest	89	Apr 1990	40164	107.		107000	3840	10.50	3.3	0.12	0.9		5734
Fall	Priest	89	May 1990	8331	151.		82000	3000	2.78	0.0	0.04	0.0		7006
Fall	Priest	89	Jun 1990	16998	74.		83000	3000	5.67	1.6	0.06	0.3		240
Fall	Priest	90	Dec 1990											529000
Fall	Priest	90	Feb 1991	3843	651.		24000	1221	3.15	1.9	0.09			12573
Fall	Priest	90	Mar 1991	8590	309.		86000	4470	1.92	0.9	0.05	0.0		5600
Fall	Priest	90	Apr 1991	22753	116.		86000	4470	5.09	1.7	0.09	0.9		5000
Fall	Priest	90	May 1991	35066	75.		86000	5500	6.38	1.8	0.12	1.3		9400
Fall	Wells	90	Dec 1990											0
Fall	Wells	90	Feb 1991	499	580.		3400	153	3.26	1.8	0.08			2089
Late	Cowlitz	88	Jan 1990	41273	38.		101000	2200	18.80	4.7	0.10			1089
Late	Cowlitz	88	Feb 1990	47500	33.		80000	5000	9.50	2.2	0.13	1.9		860
Late	Cowlitz	88	Mar 1990	62666	25.		80000	4800	13.10	2.7	0.16	1.1		840
Late	Cowlitz	88	Apr 1990	78288	20.		80000	5000	15.70	3.0	0.19	1.4		900
Late	Cowlitz	88	May 1990	59280	17.		80000	5000	11.90	2.2	0.14	0.0		930
Late	Cowlitz	88	Jun 1990	55962	18.		80000	5000	11.20	2.1	0.13	0.0		450
Late	Lewis River	89	Mar 1990	2463	643.		21000	918	2.68	1.6	0.07	0.0		72597
Late	Lewis River	89	Apr 1990	5992	270.		21000	918	6.53	2.9	0.12	0.0		38493
Late	Lewis River	89	May 1990	8762	181.		37000	2013	4.35	1.8	0.10	1.0		32046
Late	Lewis River	89	Jun 1990	12595	125.		37000	2013	6.26	2.1	0.12	1.1		11528
Late	Lewis River	89	Jul 1990	18472	85.		37000	2013	9.18	2.8	0.15	0.9		3880
Late	Lewis River	89	Aug 1990	21344	69.		104000	3760	5.68	1.7	0.06	1.5		2410
Late	Lewis River	89	Sep 1990	23360	63.		104000	3760	6.21	1.8	0.06	2.6		1088
Late	Lewis River	89	Oct 1990	27457	51.		84000	4580	5.99	1.6	0.09	1.4		567
Late	Lewis River	89	Nov 1990	28003	50.		84000	4550	6.15	1.6	0.09			171
Late	Lewis River	89	Dec 1990	35894	39.		80000	5500	6.53	1.5	0.10	0.8		190
Late	Lewis River	89	Jan 1991	36831	38.		80000	5500	6.70	1.6	0.11	9.9		266
Late	Lewis River	89	Feb 1991	42303	33.		80000	5500	7.69	1.8	0.12	2.0		847
Late	Lewis River	89	Mar 1991	53553	26.		80000	4750	11.30	2.4	0.14			3600
Late	Lewis River	89	Apr 1991	68320	20.		80000	4750	14.40	2.8	0.17	1::		3000
Late	Lewis River	89	May 1991	19560	15.		80000	4750	4.12	0.7	0.04	0.0		5100
Late	Lewis River	89	Jun 1991	17540	15.		80000	4750	3.69	0.7	0.04	0.0		4300
Late	Lewis River	90	Apr 1991	2315	777.		24000	800	2.89	1.9	0.06			32000
Late	Lewis River	90	May 1991	6041	296.		24000	2350	2.57	1.2	0.12	0.7		10800
Late	Lewis River	90	Jun 1991	10393	170.		42000	3065	3.39	1.4	0.10	0.9		21300
Spring	Klickitat	88	Jan 1990	28070	28.		83000	4600	6.10	1.4	0.08	4.3		729
Spring	Klickitat	88	Feb 1990	49082	16.		83000	5500	8.92	1.5	0.10	0.5		650
Spring	Klickitat	88	Mar 1990	65389	12.		83000	5500	11.90	1.8	0.12	1.0		700
Spring	Klickitat	88	Apr 1990	111988	7.		83000	5500	20.40	2.7	0.18	0.3		750
Spring	Klickitat	88	May 1990	111985	7.		82000	5500	20.40	2.7	0.18			25

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Location: Klickitat

SPECIES	STOCK	POUNDS			AVERAGE SIZE FISH/LB	POND VOLUME CU FEET	WATER INFLOW GPH	LGS PER GPM	FLOW INDEX	DENSITY INDEX	FOOD CONY	MONTHLY MORTLTY
		BROOD	MTH	YEAR								
Spring	Klickitat	89	Jan	1990	2205	424.	14000	832 2.65	1.5	0.09	0.7	3424
Spring	Klickitat	89	Feb	1990	4138	242.	21000	1516 2.73		0.08	0.0	1363
Spring	Klickitat	89	Mar	1990	5184	183.	24000	1870 2.77	1::	0.08	1.6	995
Spring	Klickitat	89	Apr	1990	7708	123.	24000	1960 3.93	1.3	0.11	0.0	675
Spring	Klickitat	89	May	1990	9713	98.	63000	3560 2.73	0.8	0.05	0.0	1039
Spring	Klickitat	89	Jun	1990	12015	68.	57000	3000 4.01	1.1	0.06	0.0	558
Spring	Klickitat	89	Jul	1990	14519	56.	57000	3000 4.84	1.2	0.07	2.0	362
Spring	Klickitat	89	Aug	1990	17314	47.	64000	5146 3.36	0.8	0.07	0.0	489
Spring	Klickitat	89	sep	1990	18909	43.	63000	5146 3.67	0.9	0.07	2.8	649
Spring	Klickitat	89	Oct	1990	26219	31.	64000	6280 4.18	0.9	0.09	0.9	322
Spring	Klickitat	89	Nov	1990	31235	26.	84000	6900 4.53	0.9	0.07	1.6	778
Spring	Klickitat	89	Dec	1990	38690	21.	87000	6860 5.64	1.0	0.08	0.0	111
Spring	Klickitat	89	Jan	1991	46524	17.	89000	7020 6.63	1.1	0.09	1.5	135
Spring	Klickitat	89	Feb	1991	65525	12.	89000	7020 9.33	1.4	0.11	0.8	110
Spring	Klickitat	89	Mar	1991	62072	11.	89000	7250 8.56	1.3	0.10	0.0	4200
Spring	Klickitat	89	Apr	1991	60622	9.	89000	7250 8.36	1.2	0.10	0.0	3200
Spring	Klickitat	90	Dec	1990								16100
Spring	Klickitat	90	Dec	1990	424	829.	6800	250 1.70	1.1	0.04	0.0	712
Spring	Klickitat	90	Jan	1991	994	373.	10000	540 1.84	0.9	0.05	0.0	614
Spring	Klickitat	90	feb	1991	1700	218.	10000	540 3.15	1.3	0.07	0.0	187
Spring	Klickitat	90	Mar	1991	2910	127.	13699	1374 2.12	0.7	0.07	0.7	1100
Spring	Klickitat	90	Apr	1991	3914	94.	13699	1374 2.85	0.9	0.09	1.1	1600
Spring	Klickitat	90	May	1991	3966	87.	13000	2050 1.93	0.6	0.09		1200
Spring	Klickitat	90	Jun	1991	4955	69.	14000	2045 2.42	0.7	0.11	1.4	3200
Spring	Wind River	89	Jan	1990	2811	450.	21000	1553 1.81	1.0	0.08	0.8	3705
Spring	Wind River	89	Feb	1990	253	238.	3400	153 1.65	0.7	0.03	0.0	1088
Spring	Wind River	89	Mar	1990	383	157.	3400	153 2.50	0.9	0.04	1.3	28
Spring	Wind River	89	Apr	1990	668	90.	3400	183 3.65	1.1	0.06	1.3	88
Spring	Wind River	89	May	1990	715	84.	3400	183 3.91	1.2	0.06	1.6	48
Spring	Wind River	90	Dec	1990	1488	856.	20000	800 1.86	1.2	0.05	0.0	7059
Spring	Wind River	90	Dec	1990								25400
Spring	Wind River	90	Jan	1991	2255	630.	24000	900 2.51	1.6	0.06	0.0	2824

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1990 - 1991

Location: Lewis River

SPECIES	STOCK	BROOD	* DATE MTH	* OF FISH YEAR	POUNDS ON HAND	AVERAGE SIZE FISH/LB	POND VOLUME CU FEET	WATER INFLOW GPH	LBS PER GPM	FLOW INDEX	DENSITY INDEX	FOOD CONV	MONTHLY MORTLTY
Early	Lewis River	88	Jan	1990	37985	28.	90000	5600	6.78	1.5	0.09	0.8	997
Early	Lewis River	88	Feb	1990	40888	26.	90000	6000	6.81	1.5	0.10	2.3	4 w
Early	Lewis River	88	Mar	1990	48277	22.	80000	6000	8.05	1.6	0.12	1.3	1029
Early	Lewis River	88	Apr	1990	62288	17.	90000	7000	8.90	1.6	0.13	0.0	3232
Early	Lewis River	88	May	1990	66100	16.	90000	6000	11.00	2.0	0.13	1.6	1300
Early	Lewis River	89	Jan	1991	30768	35.	90000	6000	5.13	1.2	0.08		1119
Early	Lewis River	89	Feb	1991	39851	27.	90000	6700	5.95	1.3	0.10	1.0	916
Early	Lewis River	89	Mar	1991	51171	21.	80000	7000	7.31	1.5	0.13	1.1	1366
Early	Lewis River	89	Apr	1991	62864	17.	80000	7000	8.98	1.7	0.15	0.8	5900
Early	Toutle	90	Mar	1991	761	502.	4000	300	2.54	1.4	0.11		2290
Early	Toutle	90	Apr	1991	1147	333.	4000	300	3.82	1.9	0.14	1.2	1857
Early	Toutle	90	May	1991	1953	187.	20000	2250	0.87	0.4	0.04	0.9	3024
Early	Toutle	90	Jun	1991	3424	106.	20000	1500	2.28	0.7	0.05	0.8	2300
Late	Lewis River	88	Jan	1990	75136	30.	180000	11200	6.71	1.5	0.10	1.1	2021
Late	Lewis River	88	Feb	1990	80442	28.	180000	12000	6.70	1.5	0.10	2.7	1698
Late	Lewis River	88	Mar	1990	97865	23.	180000	12000	8.16	1.6	0.11	1.2	1469
Late	Lewis River	88	Apr	1990	132247	17.	180000	14000	9.45	1.7	0.13	0.8	2690
Late	Lewis River	88	May	1990	140500	16:	180000	12000	11.70	2.1	0.14	1.7	200
Late	Lewis River	89	Mar	1990	5002	872.	44000	3900	1.28	0.9	0.08		3868
Late	Lewis River	89	Apr	1990	9291	510.	44000	3300	2.82	1.6	0.12	0.0	58735
Late	Lewis River	89	May	1990	15351	296.	180000	8000	1.92	0.9	0.04	0.0	165400
Late	Lewis River	89	Jun	1990	21623	210.	180000	8000	2.70	1.1	0.05	1.4	8512
Late	Lewis River	89	Jul	1990	34979	129.	180000	8000	4.37	1.6	0.07	1.1	17100
Late	Lewis River	89	Aug	1990	55713	81.	180000	8000	6.96	2.1	0.09	0.0	5541
Late	Lewis River	89	Sep	1990	60034	75.	180000	8000	7.50	2.2	0.10	5.0	10138
Late	Lewis River	89	Oct	1990	87739	51.	180000	12200	7.19	2.0	0.13	1.2	27843
Late	Lewis River	89	Nov	1990	97039	46.	180000	12200	7.95	2.0	0.14	2.9	10922
Late	Lewis River	89	Dec	1990	127485	35.	180000	12200	10.40	2.6	0.17	0.9	4395
Late	Lewis River	89	Jan	1991	135036	33.	270000	18200	7.42	1.8	0.12	3.4	3238
Late	Lewis River	89	Feb	1991	159028	28.	270000	20400	7.80	1.8	0.13	1.1	3463
Late	Lewis River	89	Mar	1991	211871	21.	260000	21000	10.10	2.1	0.17	0.6	3530
Late	Lewis River	89	Apr	1991	204561	18.	180000	18000	11.40	2.2	0.22	0.0	10049
Late	Lewis River	89	May	1991	230056	16.	180000	18000	12.80	2.4	0.24	1.2	1200
Late	Lewis River	90	Mar	1991	483	1250.	8000	300	1.61	1.2	0.05	0.0	9
Late	Lewis River	90	Apr	1991	5572	857.	4400	3300	1.69	1.1	0.85	0.0	1113
Late	Lewis River	90	May	1991	10279	425.	106000	6000	1.71	0.9	0.05	1.1	69596
Late	Lewis River	90	Jun	1991	18428	235.	180000	9000	2.05	0.9	0.04	1.7	65301
Late	Washougal	88	Jan	1990	2554	28.	90000	5600	0.46	0.1	0.00	1.5	75
Late	Washougal	88	Feb	1990	2750	26.	90000	6000	0.46	0.1	0.00	2.3	34
Late	Washougal	88	Mar	1990	3245	22.	80000	6000	0.54	0.1	0.00	1.3	53
Late	Washougal	88	Apr	1990	4188	17.	90000	7000	0.60	0.1	0.00	0.0	162
Late	Washougal	88	May	1990	4450	16.	90000	6000	0.74	0.1	0.00	0.0	46
Spring	Kalama Falls	88	Jan	1990	8787	16.	79000	5300	1.66	0.3	0.02	5.2	164
Spring	Kalama Falls	88	Feb	1990	11700	12.	79000	5300	2.21	0.4	0.03	0.8	167
Spring	Kalama Falls	88	Mar	1990	12718	11.	79000	5300	2.40	0.4	0.03	3.2	480
Spring	Kalama Falls	88	Apr	1990	11650	12.	79000	5300	2.20	0.3	0.02	-1	100

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Location: Lewis River

SPECIES	STOCK	BROOD	* DATE	* OF FISH	POUNDS	AVERAGE	POND	WATER	LBS	FLOW	DENSITY	FOOD	MONTHLY	
					ON HAND	SIZE	VOLUME	INFLOW	PER					
					FISH/LB	CU FEET	GPM	CPM						
Spring	Lewis River	88	Jan 1990	11975	16.	90000	2000	5.99	1.1	0.03	4.3		827	
Spring	Lewis River	88	Feb 1990	15950	12.	79000	3000	5.32	0.0	0.04	0.7		209	
Spring	Lewis River	88	Mar 1990	17390	11.	79000	3000	5.80	0.9	0.03	3.2		74	
Spring	Lewis River	88	Apr 1990	21200	9.	90000	2000	10.60	1.5	0.03	0.2		500	
Spring	Lewis River	89	Mar 1990	590	200.	4000	360	1.64	0.2	0.02			38	
Spring	Lewis River	89	Apr 1990	1351	133.	4000	350	3.86	1.3	0.11	0.0		328	
Spring	Lewis River	89	May 1990	2108	85.	4000	550	3.83	1.1	0.16	0.9		521	
Spring	Lewis River	89	Jun 1990	14159	71.	63000	7800	1.82	0.5	0.06	0.0		2684	
Spring	Lewis River	89	Jul 1990	17584	57.	88000	7800	2.25	0.6	0.05	2.1		2948	
Spring	Lewis River	89	Aug 1990	23742	42.	408000	10500	2.26	0.5	0.05	1.3		5095	
Spring	Lewis River	89	Sep 1990	35335	28.	108000	10500	3.37	0.7	0.07			8032	
Spring	Lewis River	89	Oct 1990	57517	17.	108000	10500	5.48	1.5	0.15	1.1		11318	
Spring	Lewis River	89	Nov 1990	60868	16.	108000	10500	5.80	1.2	0.11	0.0		3878	
Spring	Lewis River	89	Dec 1990	74800	13.	127000	12700	5.89	0.0	0.10	0.6		1516	
Spring	Lewis River	89	Jan 1991	107922	9.	127000	12700	8.50	1.3	0.13	0.6		1114	
Spring	Lewis River	89	Feb 1991	121287	8.	127000	10500	11.60	1.7	0.14	1.5		1534	
Spring	Lewis River	89	Mar 1991	52200	9.	128000	10850	4.81	0.7	0.06	0.0		500	
Spring	Lewis River	90	Apr 1991	6668	157.	80000	6300	1.06	0.4	0.03			1452	
Spring	Lewis River	90	May 1991	10656	98.	79000	3400	3.13	1.1	0.05	1.1		1526	
Spring	Lewis River	90	Jun 1991	11315	83.	108000	11087	1.02	0.3	0.03	0.0		3100	

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1990 - 1991

Location: Lower Kalama

SPECIES	STOCK	HATCH	MOOD	MTH	YEAR	PWNOS	AVERAGE	POND	WATER	LBS	FLOW	DENSITY	FOOD	MONTHLY
						* DATE	* OF FISH	SIZE	VOLUME	INFLOW	PER	INDEX	INDEX	CONV
						FISH/LB	CU FEET	GPM	GPH					
Early	Kalama Falls	88	Jan	1990	30495	18.	50000	3000	10.20	2.0	0.12	-1	300	
Early	Kalama Falls	88	Feb	1990	30480	18.	50000	2500	12.20	2.4	0.12	0.0	280	
Early	Kalama Falls	88	Mar	1990	34261	16.	50000	2500	13.70	2.3	0.12	1.1	465	
Early	Kalama Falls	88	Apr	1990	42144	13.	50000	2500	16.90	2.8	0.14	1.7	300	
Early	Kalama Falls	89	Feb	1990	680	806.	5000	500	1.36	0.9	0.09		1480	
Early	Kalsns Falls	89	Mar	1990	1183	463.	4800	600	1.97	1.1	0.14	1.4	565	
Early	Kalama Falls	89	Apr	1990	2186	249.	14000	1800	1.21	0.5	0.07	1.2	3495	
Early	Kalama Falls	89	May	1990	4609	118.	19000	2400	1.92	0.7	0.08	0.8	550	
Early	Kalama Falls	89	Jun	1990	6247	87.	19000	2400	2.60	0.8	0.11	1.9	420	
Early	Kalama Falls	89	Jul	1990	7540	72.	19000	2400	3.14	0.9	0.12	2.7	548	
Early	Kalama Falls	89	Aug	1990	11285	48.	19000	2400	4.70	1.2	0.15	1.3	1250	
Early	Kalama Falls	89	Sep	1990	14632	37.	28000	2700	5.42	1.3	0.12	1.4	296	
Early	Kalama Falls	89	Oct	1990	18034	30.	29000	2700	6.68	1.5	0.14	1.0	372	
Early	Kalama Falls	89	Nov	1990	18024	30.	29000	2700	6.68	1.5	0.14		360	
Early	Kalama Falls	89	Dec	1990	18009	30.	54000	3300	5.46	1.3	0.08		420	
Early	Kalama Falls	89	Jan	1991	25713	21.	55000	3000	8.57	1.7	0.09	0.5	310	
Early	Kalama Falls	89	Feb	1991	25700	21.	55000	3000	8.57		0.09		280	
Early	Kalama Falls	89	Mar	1991	25685	21.	55000	3000	8.56	1::	0.09		310	
Early	Kalama Falls	89	Apr	1991	41469	13.	55000	3000	13.80	2.3	0.13	0.3	290	
Early	Kalama Falls	90	Feb	1991	821	1034.	9600	800	1.03	0.8	0.06		190	
Early	Kalama Falls	90	Mar	1991	1715	495.	9600	800	2.14	1.2	0.10	0.7	415	
Early	Kalama Falls	90	Apr	1991	2065	280.	14000	1200	1.72	0.8	0.07	0.0	1335	
Early	Kalama Falls	90	May	1991	3 5 w	158.	19000	1800	2.00	0.8	0.08	0.9	520	
Early	Kalama Falls	90	Jun	1991	4403	129.	19000	1800	2.45	0.9	0.08	I. 7	735	
Fall	Kalama Falls	89	Jan	1990	1610	953.	14000	1500	1.07	0.8	0.09		5480	
Fall	Kalama Falls	89	Feb	1990	2996	685.	19000	2000	1.50	1.1	0.12	0.0	2050	
Fall	Kalama Falls	89	Mar	1990	5666	362.	19000	2400	2.36	1.1	0.14	0.0	1240	
Fall	Kalama Falls	89	Apr	1990	11046	185.	64000	3200	3.45	1.3	0.07	1.2	7657	
Fall	Kalama Falls	89	May	1990	26508	77.	105000	4000	6.63	1.9	0.07	1.0	1620	
Fall	Kalsns Falls	89	Jun	1990	29154	70.	105000	4000	7.29	2.2	0.08	1.5	330	
Fall	Kalama Falls	90	Feb	1991	2632	853.	29000	3000	0.88	0.6	0.06		765	
Fall	Kalama Falls	90	Mar	1991	6054	456.	28799	2400	2.52	1.3	0.11	0.0	1515	
Fall	Kalama Falls	90	Apr	1991	9344	240.	49000	5300	1.76	0.8	0.08	0.0	1200	
Fall	Kalama Falls	90	May	1991	24909	90.	90000	7000	3.56	1.2	0.09	1.1	750	
Fall	Kalama Falls	90	Jun	1991	35023	64.	90000	7000	5.00	1.3	0.10	0.8	390	
Spring	Kalama Falls	88	Jan	1990	35303	15.	55000	3000	11.80	2.2	0.12	-4	300	
Spring	Kalama Falls	88	Feb	1990	44106	12.	55000	1800	24.50	4.1	0.14	0.0	280	
Spring	Kalsns Falls	88	Mar	1990	48073	11.	55000	3500	13.70	2.1	0.13	3.2	465	
Spring	Kalama Falls	88	Apr	1990	58740	9.	55000	3500	16.80	2.4	0.15	0.8	150	
Spring	Kalama Falls	89	May	1990	4548	123.	19000	2400	1.89	0.6	0.08	0.0	500	
Spring	Kalama Falls	89	Jun	1990	5704	98.	19000	2400	2.38	0.8	0.10	2.1	420	
Spring	Kalama Falls	89	Jul	1990	7306	76.	19000	2400	3.04	0.9	0.11	1.6	3788	
Spring	Kalsns Falls	89	Aug	1990	13166	42.	19000	2400	5.49	1.4	0.18	1.1	2318	
Spring	Kalsns Falls	89	Sep	1990	20339	27.	35000	2500	8.14	1.7	0.12	0.8	3812	
Spring	Kalama Falls	89	Oct	1990	26121	21.	35000	4000	6.53	1.2	0.14	1.1	620	
Spring	Kalama Falls	89	Nov	1990	39160	14.	35000	7000	5.59	0.9	0.18	0.6	300	
Spring	Kalama Falls	89	Dec	1990	39138	14.	35000	7000	5.59	1.0	0.20	0.0	310	
Spring	Kalama Falls	89	Jan	1991	49783	11.	35000	6100	8.16	1.3	0.23	0.0	310	
Spring	Kalama Falls	89	Feb	1991	54734	10.	35000	4700	11.60	1.9	0.26	1.8	280	
Spring	Kalama Falls	89	Mar	1991	54703	10.	35000	3500	15.60	2.3	0.23		310	
Spring	Kalama Falls	89	Apr	1991	68361	8.	35000	3500	19.50	2.6	0.26	0.5	140	
Spring	Kalama Falls	90	May	1991	2101	137.	19000	1800	1.17	0.4	0.04		78	
Spring	Kalama Falls	90	Jun	1991	3122	92.	19000	1800	1.73	0.5	0.05	1.9	622	

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Location: Lyon's Ferry

SPECIES	STOCK	POUNDS			AVERAGE SIZE FISH/LB	POND VOLUME CU FEET	WATER INFLOW GPM	LBS PER CPM	FLOW INDEX	DENSITY INDEX	FOD CON"	MONTHLY MDRTLTY
		BROOD	DATE	OF FISH								
Fall	Lyon's Ferry	88	Jan 1990	27593	17.	84000	10600	2.55	0.5	0.06	1.3	10991
Fall	Lyon's Ferry	88	Feb 1990	34994	13.	84000	11200	3.12	0.6	0.07	1.1	14165
Fall	Lyon's Ferry	88	Mar 1990	39969	11.	84000	11200	3.57	0.6	0.08	2.2	15264
Fall	Lyon's Ferry	88	Apr 1990	43635	10.	84000	11200	3.90	0.6	0.08	1.7	3171
Fall	Lyon's Ferry	89	Jan 1990	1601	1011.	24000	4800	0.33	0.2	0.05		3737
Fall	Lyon's Ferry	89	Feb 1990	5080	630.	48000	10400	0.49	0.3	0.05	0.0	20644
Fall	Lyon's Ferry	89	Mar 1990	13405	238.	48000	10400	1.29	0.6	0.12	0.9	10439
Fall	Lyon's Ferry	89	Apr 1990	20967	133.	54000	15240	1.32	0.5	0.14	0.0	54 w
Fall	Lyon's Ferry	89	May 1990	37898	82.	57000	16720	2.27	0.7	0.19	0.0	13254
Fall	Lyon's Ferry	89	Jun 1990	12619	76.	66000	19360	0.65	0.2	0.06	0.0	18642
Fall	Lyon's Ferry	89	Jul 1990	9763	78.	10000	3520	2.77	0.8	0.30	0.0	17362
Fall	Lyon's Ferry	90	Jan 1991	756	915.	18000	3900	0.19	0.1	0.03		2796
Fall	Lyon's Ferry	90	Feb 1991	1874	585.	27000	5850	0.32	0.2	0.04	0.0	9340
Fall	Lyon's Ferry	90	Mar 1991	2786	339.	27000	5850	0.48	0.2	0.04	0.0	2958
Fall	Lyon's Ferry	90	Apr 1991	2595	166.	24000	5200	0.50	0.2	0.04	0.0	1110
Fall	Lyon's Ferry	90	May 1991	6308	147.	24000	5200	1.21	0.5	0.10	0.0	3197
Spring	Tucannon	88	Jan 1990	12567	12.	8000	2150	5.85	1.0	0.27	0.7	1339
Spring	Tucannon	88	Feb 1990	13578	11.	8000	2150	6.32	1.1	0.29	1.0	1456
Spring	Tucannon	88	Mar 1990	13230	11.	8000	2150	6.15	1.1	0.30	0.0	3827
Spring	Tucannon	88	Apr 1990	13195	11.	8000	2150	6.14	1.1	0.30	0.0	386
Spring	Tucannon	89	Jan 1990	228	456.	6000	1200	0.19	0.1	0.02	0.9	384
Spring	Tucannon	89	Feb 1990	528	197.	6000	1300	0.41	0.2	0.04	0.7	70
Spring	Tucannon	89	Mar 1990	912	114.	6000	1300	0.70	0.2	0.05	1.1	44
Spring	Tucannon	89	Apr 1990	1315	79.	6000	1300	1.01	0.3	0.07	1.0	104
Spring	Tucannon	89	May 1990	1384	72.	9000	1950	0.71	0.2	0.05	4.9	262
Spring	Tucannon	89	Jun 1990	1953	51.	9000	1950	1.00	0.2	0.04	0.0	44
Spring	Tucannon	89	Jul 1990	2552	39.	15000	3900	0.65	0.2	0.04	1.2	56
Spring	Tucannon	89	Aug 1990	3430	29.	15000	3900	0.88	0.2	0.05	1.0	57
Spring	Tucannon	89	Sep 1990	4324	23.	15000	3900	1.11	0.2	0.06	1.3	29
Spring	Tucannon	89	Oct 1990	5849	17.	15000	3900	1.50	0.3	0.07	1.2	30
Spring	Tucannon	89	Nov 1990	6620	15.	8000	2300	2.88	0.5	0.14	1.9	128
Spring	Tucannon	89	Dec 1990	6617	15.	8000	2300	2.88	0.5	0.14		45
Spring	Tucannon	89	Jan 1991	7628	13.	8000	2300	3.32	0.6	0.18	1.2	94
Spring	Tucannon	89	Feb 1991	9008	11.	8000	2300	3.92	0.6	0.18	0.7	68
Spring	Tucannon	89	Mar 1991	11006	9.	8000	2300	4.79	0.8	0.22	0.6	41
Spring	Tucannon	90	Dec 1990	64	1359.	15000	3250	0.02	-2	0.00		1202
Spring	Tucannon	90	Jan 1991	218	401.	15000	3250	0.07	-2	0.00	0.7	656
Spring	Tucannon	90	Feb 1991	312	280.	15000	3250	0.10	-2	0.01	1.7	154
Spring	Tucannon	90	Mar 1991	611	143.	15000	3250	0.19	-2	0.02	0.9	73
Spring	Tucannon	90	Apr 1991	918	94.	15000	3250	0.28	-2	0.02	1.1	710
Spring	Tucannon	90	May 1991	027	84.	13000	3250	0.32	0.1	0.03	2.6	30
Spring	Tucannon	A	Dec 1990									51

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Location: Priest Rapids

SPECIES	STOCK	PONDS			AVERAGE SIZE FISH/LB	POND VOLUME CU FEET	WATER INFLOW GPM	LBS PER GPM	FLOW INDEX	DENSITY INDEX	FOOD CON"	MONTHLY MORTLTY
		* BROOD	* DATE	* OF FISH YEAR ON HAND								
Fall	Priest	89	Feb 1990	5855	678.	77000	3300	1.77	1.2	0.05		105625
Fall	Priest	89	Mar 1990						0.0		0.0	66075
Fall	Priest	89	Apr 1990	21906	320.	180000	36000	1.88	0.5	0.06	0.0	8700
Fall	Priest	89	May 1990	98474	67.	180000	36000	2.74	0.7	0.15	0.0	1911
Fall	Priest	90	Dec 1990								0.0	823500
Fall	Priest	90	Mar 1991	9632	540.	19000	6267	1.54	0.9	0.31		18812
Fall	Priest	90	Apr 1991	25698	206.	18000	13588	1.89	0.8	0.63	0.0	8700
Fall	Priest	90	May 1991	80218	66.	18000	26500	2.99	0.9	1.33	0.0	2407
Fall	Priest	90	Jun 1991	113906	46.	18000	28000	4.07	1.1	1.67	1.4	54732
Fall	Priest	A	Dec 1990								0.0	144
Fall	Wells	90	Apr 1991	712	132.	3200	592	1.20	0.4	0.08	0.0	229
Fall	Wells	90	May 1991	1839	51.	3200	592	3.11	0.8	0.16	0.8	149
Fall	Wells	90	Jun 1991	2535	37.	32000	592	4.28	1.1	0.02	0.0	11

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Location: Ringold

SPECIES	STOCK	BROOD	MTH	* DATE	* OF FISH	PONDS	AVERAGE	POND	WATER	LBS	FLOW	DENSITY	FOOD	MONTHLY	
						ON	NAND	FISH/LB	VOLUME	INFLOW	PER	INDEX	INDEX	CONV	MORTLTY
									CU FEET	GPM	GPM				
Fall	Washougal	89	Mar	1990	233	534.			1700	350	0.67	0.4	0.08	261	
Fall	Washougal	89	Apr	1990	1660	75.			1660000	450	3.69	1.2	0.00	0.7	168
Fall	Washougal	89	May	1990	2263	55.			1700	450	5.03	1.4	0.38	1.4	81
Spring	Klickitat	88	Jan	1990	98888	9.			2940000	6300	15.70	2.5	0.00	1.2	10000
Spring	Klickitat	88	Feb	1990	110000	8.			2940000	7300	15.10	2.3	0.00	0.8	10000
Spring	Klickitat	88	Mar	1990	124285	7.			2940000	7300	17.00	2.4	0.00	1.1	10000
Spring	Wind River	89	Feb	1990	4376	290.			1700	2800	1.56	0.8	1.26		1995
Spring	Wind River	89	Mar	1990	8278	153.			13000	2800	2.96	1.2	0.25	0.9	2564
Spring	Wind River	89	Apr	1990	13457	94.			22000	5850	2.30	0.8	0.21	0.8	1523
Spring	Wind River	89	May	1990	15505	85.			22000	5860	2.65	0.9	0.23	0.0	1729
Spring	Wind River	89	Jun	1990	21932	60.			23000	6300	3.48	1.0	0.28	1.3	2024
Spring	Wind River	89	Jul	1990	30579	43.			23000	6300	4.85	1.3	0.36	1.2	1045
Spring	Wind River	89	Aug	1990	42393	31.			23000	6300	6.73	1.6	0.44	1.1	732
Spring	Wind River	89	Sep	1990	52360	25.			2940000	6300	8.31	1.9	0.00	0.9	5188
Spring	Wind River	89	Oct	1990	59272	22.			2940000	4725	12.50	2.7	0.00	2.3	5000
Spring	Wind River	89	Nov	1990	86266	15.			2940000	6300	13.70	2.5	0.00	3.0	10000
Spring	Wind River	89	Dec	1990	98769	13.			2940000	6300	15.70	2.7	0.00	1.3	10000
Spring	Wind River	89	Jan	1991	126400	10.			2940000	4500	28.10	4.5	0.00	0.4	20000
Spring	Wind River	89	Feb	1991	177714	7.			2940000	6750	26.30	3.9	0.00	0.3	20000
Spring	Wind River	89	Mar	1991	171428	7.			2940000	6750	25.40	3.6	0.00	0.0	20000
Spring	Wind River	90	Jan	1991	3644	388.			11000	2100	1.74	0.0	0.18	0.0	7095
Spring	Wind River	90	Feb	1991	7777	181.			12000	3150	2.47	0.0	0.25	0.0	6204
Spring	Wind River	90	Mar	1991	11125	110.			23000	6300	1.77	0.6	0.17	0.0	4865
Spring	Wind River	90	Apr	1991	14697	83.			23000	6300	2.33	0.8	0.21	1.7	4013
Spring	Wind River	90	May	1991	22513	54.			23000	6300	3.57	1.0	0.28	0.9	4126
Spring	Wind River	90	Jun	1991	24240	50.			23000	6300	3.85	1.0	0.28	3.9	3701

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Location: Rocky Reach

SPECIES	STOCK	BROOD	* DATE * MTH YEAR	PCUNDS OF FISH ON HAND	AVERAGE SIZE FISH/LB	POND VOLUME CU FEET	WATER INFLOW GPM	LBS PER GPM	FLOW INDEX	DENSITY INDEX	FOOD CONV	MONTHLY MORTLTY
Early	Grays River	89	Jan 1990	349	950.	3000	500	0.70	0.5	0.08	0.0	12000
Early	Grays River	89	Feb 1990	755	427.	3200	800	0.94	0.5	0.13	0.7	9500
Early	Grays River	89	Mar 1990	1023	312.	6400	1600	0.64	0.3	0.08	1.3	3200
Early	Lewis River	89	Jan 1990	191	950.	3000	500	0.38	0.3	0.04	0.0	8700
Early	Lewis River	89	Feb 1990	414	427.	3200	800	0.52	0.3	0.07	0.7	5100
Early	Lewis River	89	Mar 1990	562	312.	6400	1600	0.35	0.2	0.04	1.3	1700
Early	Lower Kalama	90	Jan 1991	587	1000.	3200	600	0.98	0.7	0.13	0.0	2200
Early	Lower Kalama	90	Feb 1991	877	660.	3200	600	1.46	0.9	0.17	0.9	a870
Early	Lower Kalama	90	Mar 1991	1282	450.	3200	1000	1.28	0.7	0.22	0.9	1730
Early	Lower Kalama	90	Apr 1991	1690	340.	6400	2000	0.85	0.4	0.13	1.4	2600
Early	Lower Kalama	90	May 1991	3226	175.	6400	2000	1.61	0.6	0.20	0.7	9900
Early	Lower Kalama	90	Jun 1991	5600	100.	35599	5700	0.98	0.3	0.05	0.8	4700
Early	Rocky Reach	89	Apr 1990	2087	233.	6400	1600	1.30	0.6	0.14		8400
Early	Rocky Reach	89	May 1990	3631	133.	8000	2000	1.82	0.6	0.16	0.6	3400
Early	Rocky Reach	89	Jun 1990	4400	104.	35599	4100	1.07	0.4	0.04	1.5	5400
Early	Rocky Reach	89	Jul 1990	5296	85.	34000	3600	1.47	0.5	0.05	2.0	7400
Early	Rocky Reach	89	Aug 1990	7054	62.	34000	8000	0.88	0.2	0.04		12800
Early	Rocky Reach	89	Sep 1990	9706	45.	34000	7000	1.39	0.3	0.07	1:	600
Early	Rocky Reach	89	Oct 1990	13648	32.	34000	7000	1.95	0.4	0.09	1.0	50
Early	Rocky Reach	89	Nov 1990	17464	25.	34000	5500	3.18	0.7	0.11	1.3	145
Early	Rocky Reach	89	Dec 1990	20761	21.	34000	5500	3.77	0.7	0.12	1.3	605
Early	Rocky Reach	89	Jan 1991	22926	19.	34000	5500	4.17	0.8	0.13	1.0	400
Early	Rocky Reach	89	Feb 1991	24194	18.	34000	5500	4.40	0.8	0.13	0.0	100
Early	Rocky Reach	89	Mar 1991	25611	17.	34000	5740	4.46	0.8	0.14	2.4	100
Early	Rocky Reach	89	Apr 1991	33484	13.	34000	6800	4.92	0.8	0.16	1.1	100
Early	Rocky Reach	89	May 1991	33476	13.	34000	6800	4.92	0.8	0.16		100
Fall	Priest	88	Jan 1990	17761	13.	34000	4000	4.44	0.7	0.08	1.0	100
Fall	Priest	88	Feb 1990	19233	12.	34000	6000	3.21	0.5	0.09	1.6	100
Fall	Priest	88	Mar 1990	23070	10.	34000	6000	3.85	0.6	0.10	0.9	100
Fall	Priest	88	Apr 1990	28750	8.	34000	6000	4.79	0.6	0.11	0.0	700
Fall	Priest	90	May 1991	303	720.	1600	254	1.19	0.7	0.12		1200
Fall	Priest	90	Jun 1991	621	350.	3200	900	0.69	0.3	0.09	0.9	1300
Fall	Wells	89	Jan 1990	979	932.	6000	1000	0.98	0.7	0.11	0.0	23200
Fall	Wells	89	Feb 1990	1709	532.	6400	1600	1.07	0.6	0.15	0.6	3200
Fall	Wells	89	Mr 1990	650	350.	3200	800	0.81	0.4	0.10	0.0	900
Fall	Wells	89	Apr 1990	841	270.	3200	800	1.05	0.5	0.12	2.2	400
Fall	Wells	89	May 1990	1587	143.	3200	800	1.98	0.7	0.17	0.7	245
Fall	Wells	89	Jun 1990	2266	100.	3200	1000	2.27	0.7	0.22	0.9	355
Fall	Wells	89	Jul 1990	2756	82.	11000	2800	0.98	0.3	0.07	1.8	600
Fall	Wells	89	Aug 1990	3700	61.	11000	2800	1.32	0.2	0.06	1.4	270
Fall	Wells	89	Sep 1990	5011	45.	11000	2800	1.79	0.4	0.1,	1.3	230
Fall	Wells	89	Oct 1990	7763	29.	11000	2800	2.77	0.6	0.15	0.0	350
Fall	Wells	89	Nov 1990	10179	22.	34000	4200	2.42	0.5	0.06	1.3	1205
Fall	Wells	89	Dec 1990	12416	18.	34000	4200	2.96	0.5	0.06	1.3	445
Fall	Wells	89	Jan 1991	13831	16.	34000	4200	3.29	0.6	0.07	1.4	2200
Fall	Wells	89	Feb 1991	14720	15.	34000	4200	3.50	0.6	0.07	1.9	500
Fall	Wells	89	Mar 1991	15757	14.	34000	3740	4.21	0.7	0.07	2.9	200
Fall	Wells	89	Apr 1991	20045	11.	34000	3740	5.36	0.8	0.09	1.6	100
Fall	Wells	89	May 1991	22040	10.	34000	3740	5.89	0.8	0.09	1.4	100
Fall	Wells	90	Jan 1991	36	1100.	1600	220	0.16	0.1	0.02	0.0	6500
Fall	Wells	90	Feb 1991	55	715.	1600	200	0.28	0.2	0.02	1.5	200
Fall	Wells	90	Mar 1991	88	450.	1600	220	0.40	0.2	0.03	1.4	100
Fall	Wells	90	Apr 1991	104	440.	1600	220	0.47	0.2	0.03	0.0	100
Late	Cowlitz	88	Jan 1990	20604	23.	34000	4000	5.15	1.1	0.12	2.2	100
Late	Cowlitz	88	Feb 1990	22561	21.	34000	6000	3.76	0.7	0.13	1.3	100
Late	Cowlitz	88	Mar 1990	24931	19.	34000	6000	4.16	0.8	0.14	1.2	100
Late	Cowlitz	88	Apr 1990	29562	16.	34000	6000	4.93	0.9	0.16	0.9	600

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Location: Speelyai

SPECIES	STOCK	BROOD	MTH	YEAR	* DATE	* OF FISH	PWNS	AVERAGE	POND	WATER	LBS	FLOW	DENSITY	FOOD	MONTHLY
								SIZE	VOLUME	INFLOW	PER				
							FISH/LB	CU FEET	GPH	PER GPM					
Early	Lewis	River	88	Jan	1990	4534	29.	7000	600	7.56	1.7	0.15	1.0	100	
Early	Lewis	River	88	Feb	1990	5473	24.	7000	500	10.90	2.3	0.17	1.0	100	
Early	Lewis	River	88	Mar	1990	7294	18.	18000	600	12.20	2.1	0.07	0.7	100	
Early	Lewis	River	88	Apr	1990	8200	16.	18000	600	13.70	25.0	0.83	2.9	100	
Early	Lewis	River	88	May	1990	14577	9.	1799	1200	12.10	1.8	1.20	0.0	0	
Early	Lewis	River	89	Jan	1990	1569	1057.	34000	1000	1.57	1.1	0.03		1600	
Early	Lewis	River	89	Feb	1990	2793	593.	34500	1000	2.79	1.7	0.05	0.7	2200	
Early	Lewis	River	89	Mar	1990	6831	242.	35000	1500	4.55	2.1	0.09	0.6	3400	
Early	Lewis	River	89	Apr	1990	9924	166.	59000	3600	2.76	1.1	0.07	1.2	5800	
Early	Lewis	River	89	May	1990	14825	111.	43000	4050	3.64	1.2	0.12	0.0	1900	
Early	Lewis	River	89	Jun	1990	21588	77.	73000	5000	4.32	1.5	0.10	0.0	100	
Early	Lewis	River	89	Jul	1990	12184	99.	55000	3800	3.21	1.0	0.07	0.0	1728	
Early	Lewis	River	89	Aug	1990	16493	73.	55000	3800	4.34	1.3	0.09	0.8	2300	
Early	Lewis	River	89	Sep	1990	17946	67.	55000	3800	4.72	1.4	0.09	2.2	1600	
Early	Lewis	River	89	Oct	1990	20703	58.	55000	3800	5.45	1.5	0.10	2.0	1600	
Early	Lewis	River	89	Nov	1990	27847	42.	55000	3800	7.33	1.8	0.12	0.8	1100	
Early	Lewis	River	89	Dec	1990	30568	38.	55000	3800	8.04	1.8	0.13	2.2	8000	
Early	Lewis	River	89	Jan	1991	3818	38.	6900	500	7.64	1.9	0.14	0.0	100	
Early	Lewis	River	89	Feb	1991	4395	33.	6900	500	8.79	2.1	0.15	1.0	50	
Early	Lewis	River	89	Mar	1991	4532	32.	6900	500	9.06	2.1	0.15	4.4	50	
Early	Lewis	River	89	Apr	1991	5000	29.	6900	475	10.50	2.4	0.17	2.1	40	
Early	Lewis	River	89	May	1991	6037	24.	6900	475	12.70	2.7	0.19	0.0	100	
Early	Lewis	River	90	Feb	1991	1710	873.	21000	600	2.85	2.0	0.06		600	
Early	Lewis	River	90	Mar	1991	2889	512.	21000	1200	2.41	1.4	0.08	1.0	14100	
Early	Lewis	River	90	Apr	1991	3843	401.	66000	4525	0.85	0.4	0.03	0.0	15600	
Early	Lewis	River	90	May	1991	3031	150.	66000	4252	0.71	0.3	0.02	0.0	4200	
Late	Lewis	River	89	Feb	1990	234	1000.	7000	100	2.34	1.6	0.02	0.0	700	
Late	Lewis	River	90	Feb	1991	243	1300.	1600	200	1.22	0.9	0.12		0	
Late	Lewis	River	90	Mar	1991	489	645.	6900	200	2.44	1.5	0.04	0.9	300	
Late	Lewis	River	90	Apr	1991	660	517.	6900	475	1.39	0.8	0.06	0.0	200	
Spring	Lewis	River	88	Jan	1990	11622	18.	18000	2400	4.84	1.0	0.14	2.8	100	
Spring	Lewis	River	88	Feb	1990	13068	16.	18000	2400	5.45	1.0	0.14	2.1	100	
Spring	Lewis	River	88	Mar	1990	17425	12.	18000	2400	7.26	1.1	0.15	0.0	100	
Spring	Lewis	River	89	Jan	1990	3228	399.	28000	1600	2.02	1.0	0.06		1800	
Spring	Lewis	River	89	Feb	1990	4816	267.	28000	2000	2.41	1.1	0.08	1.1	2000	
Spring	Lewis	River	89	Mar	1990	8331	160.	41000	3000	2.78	1.1	0.08	0.0	1400	
Spring	Lewis	River	89	Apr	1990	7345	163.	41000	3000	2.45	0.9	0.07	0.0	1700	
Spring	Lewis	River	89	Mar	1990	12866	93.	41000	2850	4.51	1.4	0.09	0.7	700	
Spring	Lewis	River	89	Jun	1990	2509	86.	14000	950	2.64	0.9	0.06	0.0	200	
Spring	Lewis	River	89	Jul	1990	3368	64.	13000	950	3.55	1.0	0.08	1.8	200	
Spring	Lewis	River	89	Aug	1990	4304	50.	1799	1200	3.59	0.9	0.60	1.3	400	
Spring	Lewis	River	89	Sep	1990	5000	43.	1799	1200	4.17	0.0	0.65	1.7	200	
Spring	Lewis	River	89	Oct	1990	7163	30.	1799	1200	5.97	1.6	1.05	1.2	100	
Spring	Lewis	River	89	Nov	1990	7406	29.	18000	1200	6.17		0.10	8.3	100	
Spring	Lewis	River	89	Dec	1990	9208	23.	18000	1200	7.67	1::	0.10	1.3	3000	
Spring	Lewis	River	89	Jan	1991	13218	16.	18000	1200	11.00	2.2	0.14	0.6	300	
Spring	Lewis	River	89	Feb	1991	23488	9.	18000	2400	9.79	1.6	0.21	0.4	100	
Spring	Lewis	River	90	Dec	1990	1385	940.	27000	800	1.73	1.2	0.03		4400	
Spring	Lewis	River	90	Jan	1991	2600	500.	27000	800	3.25	1.8	0.05	2.1	2000	
Spring	Lewis	River	90	Feb	1991	3948	329.	28000	1600	2.47	1.2	0.07	0.9	1300	
Spring	Lewis	River	90	Mar	1991	5999	216.	34000	2500	2.40	1.0	0.08	0.9	3100	
Spring	Lewis	River	90	Apr	1991	1730	190.	21000	1425	1.21	0.5	0.03	0.0	1300	
Spring	Lewis	River	90	May	1991	2601	126.	20700	1425	1.83	0.6	0.04	1.1	900	

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Location: Toutle

SPECIES	STOCK	BROOD	MTH	YEAR	PCUNDS ON HAND	AVERAGE SIZE FISH/LB	POND VOLUME CU FEET	WATER INFLOW GPH	LGS PER GPH	FLOW INDEX	DENSITY INDEX	FOOD CDNV	MONTHLY MORTLTY
Early	Grays River	88	Mar	1990	41900	19.	157000	6978	6.00	1.2	0.05		300
Early	Grays River	88	Apr	1990	56835	14.	157000	6978	8.14	1.4	0.06	0.8	400
Early	Grays River	88	May	1990	61200	13.	157000	7291	8.39	1.5	0.07	0.0	100
Early	Grays River	89	Mar	1990	2410	449.	104000	486	4.96	2.8	0.01		800
Early	Grays River	89	Apr	1990	5251	206.	104000	783	6.71	2.9	0.02	0.0	400
Early	Grays River	89	Jan	1991	30925	24.	160000	3600	8.59	1.7	0.04		241
Early	Grays River	89	Feb	1991	35323	21.	160000	4000	8.83	1.8	0.05	1.3	399
Early	Grays River	89	Mar	1991	43611		160000	4500	9.69	1.8	0.05	0.8	364
Early	Grays River	89	Apr	1991	49360	1::	140000	5000	9.87	1.8	0.06	0.3	1000
Early	Grays River	89	May	1991	49353	15;	140000	6900	7.15	1.3	0.06		100
Early	Grays River	90	Mar	1991	2102	482.	16000	800	2.63	1.5	0.07		1700
Early	Grays River	90	Apr	1991	3605	275.	16000	800	4.51	2.1	0.10	0.0	15000
Fall	Cowlitz	90	Feb	1991	5221	415.	160000	4000	1.31	0.7	0.02		1600
Fall	Kalama Falls	89	Feb	1990	2640	475.	225000	7612	0.35	0.2	0.00		900
Fall	Kalama Falls	89	Mar	1990	5546	226.	225000	6978	0.79	0.4	0.01	0.0	800
Fall	Kalama Falls	a9	Apr	1990	9350	134.	225000	6978	1.34	0.5	0.02	1.1	500
Fall	Kalama Falls	89	May	1990	17161	73.	225000	7291	2.35	0.7	0.02	0.0	200
Fall	Kalama Falls	89	Jun	1990	18981	66.	225000	6978	2.72	0.8	0.03	0.0	0
Fall	Kalama Falls	90	Mar	1991	9018	240.	160000	4500	2.00	0.9	0.03		2500
Fall	Kalama Falls	90	Apr	1991	19349	120.	143000	5000	3.87	1.4	0.05	0.0	6000
Fall	Toutle	90	May	1991	31704	84.	286000	7400	4.28	1.3	0.03	0.0	8952
Fall	Toutle	90	Jun	1991	40828	66.	286000	8700	4.69	1.4	0.04	0.0	8950
Fall	Washougal	89	Feb	1990	4303	475.	225000	7612	0.57	0.3	0.01		1500
Fall	Washougal	89	Mar	1990	9038	226.	225000	6978	1.30	0.6	0.02	0.0	1300
Fall	Washougal	89	Apr	1990	15238	134.	225000	6978	2.18	0.8	0.03	1.1	900
Fall	Washougal	89	May	1990	27967	73.	225000	7291	3.84	1.2	0.04	0.0	300
Fall	Washougal	89	Jun	1990	30933	66.	225000	6978	4.43	1.3	0.04	0.0	0
Late	Elokomin	88	Jan	1990	30642	26.	157000	3806	8.05	1.7	0.04		500
Late	Elokomin	88	Feb	1990	34626	23.	157000	7612	4.55	0.0	0.05	1.1	300

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Location: Uashougal

SPECIES	STOCK	BROOD	* DATE	* OF FISH	PWNS	AVERAGE	POND	WATER	LBS	FLOW	DENSITY	FOOD	MONTHLY
					BRD MTH	YEAR	ON HAND	SIZE	VOLUME				
CU FEET	GPM	GPM	INDEX	INDEX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fall	Washougal	89	Jan 1990	1117	940.	13000	580	1. 93	1. 4	0. 06	0. 0	900	
Fall	Washougal	89	Feb 1990	7283	863.	78000	3480	2. 09	1.5	0. 07	0. 0	15411	
Fall	Washougal	89	Mar 1990	13893	444.	289000	8610	1. 61	0.8	0. 02	0. 8	12127	
Fall	Washougal	89	Apr 1990	29317	210.	459000	10740	2. 73	1.1	0. 03	0. 5	2950	
Fall	Washougal	89	May 1990	62096	99.	459000	7740	8. 02	2.6	0. 04	1. 1	600	
Fall	Washougal	89	Jun 1990	8729	57.	36000	1740	5. 02	1.3	0. 06	0. 0	220	
Fall	Washougal	89	Jul 1990	12425	40.	39000	1740	7. 14	1. 6	0. 07	0. 8	480	
Fall	Washougal	90	Dec 1990									0. 0	537400
Fall	Washougal	90	Feb 1991	6406	900.	71000	2915	2. 20	1.4	0. 06	0. 0	4900	
Fall	Washougal	90	Mar 1991	13155	490.	285000	5650	2. 33	1.2	0. 02	0. 0	11000	
Fall	Washougal	90	Apr 1991	28353	227.	459000	78590	0. 36	0.2	0. 03	0. 9	10000	
Fall	Washougal	90	May 1991	61251	105.	459000	10590	5. 78	1.8	0. 04	0. 0	4800	
Fall	Washougal	90	Jun 1991	7931	64.	39000	1590	4. 99	1.3	0. 05	0. 0	3800	
Fall	Washougal	A	Dec 1990				6000					0. 0	185
Late	Lewis River	89	Mar 1990	3101	854.	33000	1220	2. 54	1.7	0. 06	0. 0	8099	
Late	Lewis River	89	Apr 1990	5146	454.	40000	1510	3. 41	1.8	0. 07	0. 0	7950	
Late	Lewis River	89	Hay 1990	10749	214.	46000	1800	5. 97	2.5	0. 10	0. 9	35000	
Late	Lewis River	89	Jun 1990	12954	134.	66000	2440	5. 31	1.9	0. 07	0. 0	1160	
Late	Lewis River	89	Jul 1990	13811	112.	78000	3570	3. 87	1.4	0. 06	0. 0	7600	
Late	Lewis River	89	Aug 1990	18995	81.	78000	3025	6. 28	1.9	0. 08	1. 2	4030	
Late	Lewis River	89	Sep 1990	19173	80.	78000	3025	6. 34	1.9	0. 08	2340		
Late	Lewis River	89	Oct 1990	30712	48.	420000	7000	4. 39	1.1	0. 02	0. 6	713	
Late	Lewis River	89	Nov 1990	32700	45.	420000	7000	4. 67	1.2	0. 02	4.4	2670	
Late	Lewis River	89	Dec 1990	41960	35.	420000	7000	5. 99	1.5	0. 03	0. 0	2930	
Late	Lewis River	89	Jan 1991	50596	29.	420000	7000	7. 23	1.6	0. 03	1. 3	1300	
Late	Lewis River	89	Feb 1991	58 636	25.	427000	9240	6. 35	1.4	0. 03	1.4	1400	
Late	Lewis River	89	Mar 1991	73250	20.	427000	9240	7. 93		1.0	900		
Late	Lewis River	89	Apr 1991	73250	20.	427000	9240	7. 93		0.0	0		
Late	Lewis River	90	Mar 1991	3362	1000.	43000	1490	2. 26	1.6	0. 06	0. 0	2900	
Late	Lewis River	90	Apr 1991	5175	576.	43000	1490	3. 47	2.2	0. 07	0. 0	16800	
Late	Lewis River	90	May 1991	10776	270.	89000	2980	3. 62	1.7	0. 06	1.0	5900	
Late	Lewis River	90	Jun 1991	17575	149.	106000	3620	4. 85	1.8	0. 06	1.3	56200	
Late	Washougal	88	Jan 1990	113600	28.	490000	6200	18. 30	4.1	0. 05	1. 4	289	
Late	Washougal	88	Feb 1990	138000	23.	490000	6200	22. 30	4.8	0. 06	1. 1	221	
Late	Washougal	88	Mar 1990	157975	20.	490000	12200	12. 90	2.5	0. 06	1. 7	95	
Late	Washougal	88	Apr 1990	27300	19.	70000	6200	4. 40	0.8	0. 07	0. 0	93	
Late	Washougal	89	Mar 1990	1989	997.	30000	960	2. 07	1.5	0. 05	0. 0	4573	
Late	Washougal	89	Apr 1990	4024	489.	30000	960	4. 19	2.3	0. 07	0. 3	15744	
Late	Washougal	89	Hay 1990	7618	256.	43000	1540	4. 95	2.2	0. 08	0. 9	19300	
Late	Washougal	89	Jun 1990	15586	137.	93000	3140	4. 96	1.8	0. 06	0. 0	1645	
Late	Washougal	89	Jul 1990	15134	123.	119000	4070	3. 72	1.4	0. 05	0. 0	18100	
Late	Washougal	89	Aug 1990	21781	85.	119000	3520	6. 19	1.9	0. 06	1.4	5053	
Late	Washougal	89	Sep 1990	22512	82.	119000	3520	6. 40	2.0	0. 06	15.0	2640	
Late	Washougal	89	Oct 1990	35983	49.	500000	9560	3. 76	0.0	0. 02	0.7	300	
Late	Washougal	89	Nov 1990	38189	46.	500000	9560	3. 99	1.1	0. 02	6.8	6465	
Late	Washougal	89	Dec 1990	47230	36.	500000	7000	6. 75	1.7	0. 02	1.0	6465	
Late	Washougal	89	Jan 1991	60564	28.	427000	9940	6. 09	1.3	0. 03	1.0	4500	
Late	Washougal	89	Feb 1991	67704	25.	427000	9240	7. 33	1.6	0. 04	1.9	3200	
Late	Washougal	89	Mar 1991	84455	20.	427000	9240	9. 14	1.7	0. 04	1.1	3500	
Late	Washougal	89	Apr 1991	27036	19.	70000	2240	12. 10	2.3	0. 07	0. 0	3500	
Late	Washougal	89	May 1991	30135	17.	70000	2240	13. 50	2.5	0. 08	1.6	1400	
Late	Washougal	90	Dec 1990									98300	
Late	Uashougal	90	Mar 1991	1244	1100.	20000	640	1. 94	1.4	0. 05	0. 0	700	
Late	Washougal	90	Apr 1991	1959	686.	26000	905	2. 16	1.4	0. 05	1.2	24500	
Late	Washougal	90	May 1991	4925	270.	33000	1170	4. 21	1.9	0. 07	0. 8	14200	
Late	Uashougal	90	Jun 1991	7589	166.	53000	1810	4. 19	1.6	0. 05	1.4	20200	
Late	Washougal	A	Dec 1990							0. 0	79		

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Location: Wells Spawning

SPECIES	STOCK	BROOD MTH	YEAR	PWNS	AVERAGE	POND	WATER	LBS	FLOW	DENSITY	FOOD	MONTHLY
				* DATE	* OF FISH	SIZE	VOLUME	INFLOW				
				FISH/LB	CU FEET	GPM	GPM					
Fall	Wells	90	Jan 1991	205	730.	2700	450	0.46	0.3	0.05	0.0	7970
Fall	Wells	90	Feb 1991	813	184.	2700	450	1.81	0.8	0.13	0.7	74
Fall	Wells	90	Mar 1991	969	154.	2700	450	2.15	0.9	0.14	3.7	311
Fall	Wells	90	Apr 1991	1445	103.	2700	450	3.21	1.1	0.19	1.1	431
Fall	Wells	90	May 1991	1765	57.	2700	450	3.92	1.1	0.18	0.0	129
Fall	Wells	90	Jun 1991	2511	40.							152
Spring	Leavenworth	90	Mar 1991	5722	50.	5699	1350	4.24	1.1	0.27		82
Spring	Leavenworth	90	Apr 1991	5715	50.	5699	1350	4.23	1.1	0.27		290
Summer	Wells	88	Jan 1990	44332	9.	30000	6500	6.82	1.1	0.23	1.6	965
Summer	Wells	88	Feb 1990	49702	8.	30000	6649	7.48	1.1	0.25	0.9	1380
Summer	Wells	88	Mar 1990	49251	8.	30000	6649	7.41	1.0	0.23		3605
Summer	Wells	88	Apr 1990	55939	7.	30000	6649	8.41	1.2	0.27	0.3	2430
Summer	Wells	89	Jan 1990	3024	620.	15000	3143	0.96	0.6	0.13	0.0	69495
Summer	Wells	89	Feb 1990	5427	338.	27000	3800	1.43	0.7	0.10	1.1	16650
Summer	Wells	89	Mar 1990	10852	170.	27000	3800	2.86	1.2	0.16	0.0	5638
Summer	Wells	89	Apr 1990	18940	97.	37000	4625	4.10	1.4	0.17	1.4	7620
Summer	Wells	89	May 1990	26181	70.	9000	2100	12.50	3.8	0.88	2.1	4564
Summer	Wells	89	Jun 1990	48204	38.	12000	2550	18.90	4.7	1.00	0.0	923
Summer	Wells	89	Jul 1990	27163	56.	12000	2550	10.70	3.0	0.64	0.0	310422
Summer	Wells	90	Dec 1990	489	975.	4500	400	1.22	0.9	0.08		49680
Summer	Wells	90	Jan 1991	1290	534.	10800	1800	0.72	0.4	0.07	0.0	19025
Summer	Wells	90	Feb 1991	3810	180.	38000	1550	2.46	1.0	0.04	0.9	3215
Summer	Wells	90	Mar 1991	6774	101.	33000	1550	4.37	1.5	0.07	1.3	1628
Summer	Wells	90	Apr 1991	9485	112.	36000	2225	4.26	1.5	0.09	0.0	1915
Summer	Wells	90	May 1991	14602	89.	47000	6300	2.32	0.8	0.10	0.0	1087
Summer	Wells	90	Jun 1991	13863	93.	7199	1796	7.72	2.6	0.64	0.0	10307

APPENDIX C

Appendix C contains the Hematocrit Summary Data by age at release and by species for 1987 - 1991.

Appendix C. Hematocrit Summary

Yearling Chinook Lots: 1987-88-89-90-91
 (Brood Years 1985-86-87-88-89)

Spring Chinook

		Mean	Max	Min
Cowlitz	BY85	36.2	44	23
	BY86	35.3	47	5
	BY87	32.0	39	26
	BY88	37.4	45	20
Kalama	BY85	NA	NA	NA
	BY86	32.9	39	26
	BY87	33.1	39	23
	(L. Kalama)	37.1	54	22
	(L. Kalama)	37.3	43	27
Klickitat	BY85	41.0	54	30
	BY86	36.6	46	24
	BY87	31.1	39	18
	BY88	38.1	47	31
	BY89	37.3	45	28
Lewis River	BY85	35.9	47	26
	BY86	35.7	47	24
	BY87	31.1	40	17
	BY88	33.0	42	13
	BY89	38.3	49	20
Ringold	BY86	43.4	57	31
	BY88	39.2	48	29
	BY89	39.5	49	26
Speelyai	BY86	35.1	43	26
	BY89	32.5	41	14
Tucannon	BY85	40.2	51	33
	BY86	39.0	57	31
	BY87	36.7	44	13
	BY88	31.5	43	9

Mean Hematocrit (by brood year)

BY85	38.3
BY86	36.9
BY87	32.8
BY88	36.4
BY89	37.0

Mean Hematocrit: 36.3
 (all lots)

Appendix C. Hematocrit Summary.

Yearling Chinook Lots: 1987-88-83-90-91
(Brood Years 1985-86-87-88-89)

Summer Chinook

		Mean	Max	Min
Wells	BY85	34.8	44	30
	BY86	34.2	42	4
	BY87	36.4	44	30
	BY88	36.4	45	24
	BY89	43.9	51	39

Mean Hematocrit: 37.1
(all lots)

Yearling Chinook Lots: 1987-88-89-90
(Brood Years 1985-86-87-88)

Fall Chinook

		Mean	Max	Min
Lyons Ferry	BY85	43.7	52	35
	BY86	42.3	50	33
	BY87	38.9	48	29
	BY88	39.5	49	13
Ringold	BY85	41.4	51	28
Rocky Reach	BY85	41.5	50	27
	BY86	38.4	47	22
	BY87	38.7	47	30
	BY88	44.6	51	31

Mean Hematocrit (by brood year):

BY85	42.2
BY86	40.4
BY87	38.9
BY88	42.1

Mean Hematocrit: 41.0
(all lot)

Appendix C. Hematocrit Summary.

Subyearling Chinook Lots: 1987-88-89-90-91
 (Brood Years 1986-87-88-89-90).

Fall Chinook

		Mean	Max	Min	
Cowlitz	BY86	31.9	41	22	delayed release
	BY86	34.6	47	21	
	BY87	35.3	45	28	
	BY87	34.5	43	26	
	BY88	40.3	50	20	
	BY89	40.3	50	20	
Elokomin	BY86	35.2	42	27	
	BY87	29.2	40	23	
	BY88	33.1	40	22	
	BY89	35.3	43	24	
	BY90	38.0	46	32	
Grays River	BY86	34.0	43	25	
	BY86	33.9	44	20	
	BY87	37.0	43	30	
	BY88	33.0	42	23	
	BY89	NA	NA	NA	
	BY90	41.7	52	28	
Kalama	BY86	40.2	50	17	
	BY86	39.4	47	31	
	BY86	34.5	42	28	
	BY87	33.9	41	26	
	BY88	36.1	47	29	
	BY89	36.2	41	29	
	BY90	44.7	56	33	
Klickitat	BY86	40.2	50	17	
	BY86	39.4	47	31	Priest Stock
	BY86	34.5	42	28	Priest (delayed)
	BY87	33.9	41	26	
	BY88	36.1	47	29	
	BY89	36.2	41	29	
	BY90	43.4	49	30	
L. Kalama	BY86	34.3	41	27	
	BY88	35.4	43	28	
	BY89	41.1	49	29	
	BY90	33.4	49	31	

Appendix C. Hematocrit Summary.

Subyearling Chinook Lots: 1987-88-89-90-91
(Brood Years 1986-87-88-89-90).

Fall Chinook (continued)

		Mean	Max	Min
Lyons Ferry	BY86	41.6	51	31
	BY87	37.5	46	23
	BY88	36.4	49	26
	BY89	44.5	53	35
Priest Rapids	BY86	42.6	52	35
	BY87	34.8	47	27
	BY88	39.8	49	30
	BY89	38.8	51	28
	BY90	39.4	47	31
Rocky Reach	BY86	37.5	39	36
Toutle	BY87	31.5	39	22
	BY88	36.9	47	29
	BY89	40.2	51	32
Washougal	BY86	34.3	41	26
	BY87	30.1	26	23
	BY88	34.1	45	25
	BY89	36.8	47	2
	BY90	42.2	51	33

Mean Hematocrit (by brood year):

BY86 36.3
BY87 34.1
BY88 35.7
BY89 34.8
BY90 40.4

Mean Hematocrit: 36.3
(all lots)

Appendix C. Hematocrit Summary.

Yearling Coho Lots: 1987-88-89-90-91
 (Brood Years 1985-86-87-88-89)

Early Coho

		Mean	Max	Min
Grays River	BY85	29.1	40	3
	BY86	37.9	48	29
	BY87	31.0	37	26
	BY88	34.9	42	28
	BY89	41.1	54	29
Kalama (L. Kalama)	BY85	37.9	53	28
	BY86	27.1	38	10
	BY87	29.1	34	23
	BY88	38.5	47	23
	BY89	32.1	45	20
Lewis River	BY86	32.9	44	24
	BY87	32.4	43	27
	BY88	35.2	45	22
Rocky Reach	BY87	39.6	49	29
	BY88	36.7	44	28
	BY89	36.5	47	30
Toutle	BY86	32.2	38	19
	BY87	29.7	38	22
	BY88	28.4	37	13
Washougal	BY85	29.4	39	19

Mean Hematocrit (by brood year):

BY85	32.1
BY86	32.5
BY87	32.4
BY88	34.7
BY89	36.7

Mean Hematocrit: 33.7
 (all lots)

***Note: Lewis River BY87 and BY88 Coho lots consisted of mixed early and late stocks.

Appendix C. Hematocrit Summary

Yearling Coho Lots: 1987-88-89-90-91
 (Brood Years 1985-86-87-88-89).

Late Coho

		Mean	Max	Min
Cowlitz	BY85	36.2	43	30
	BY86	31.8	39	20
	BY87	30.8	38	25
	BY88	32.6	41	21
	BY89	27.2	39	9
Elokomin	BY85	39.6	49	29
	BY86	36.7	44	27
	BY87	31.4	39	20
	BY88	31.5	39	20
	BY89	26.4	40	10
Kalama	BY85	33.5	41	25
	BY86	31.1	41	19
	BY87	31.4	39	20
Klickitat	BY85	40.6	48	27
	BY86	32.7	42	23
	BY87	33.8	45	27
	BY88	35.5	49	15
	BY89	30.4	39	15
Lewis River	BY85	35.3	45	27
	BY87	32.4	43	27
	BY88	35.2	45	22
Rocky Reach	BY85	41.6	52	28
	BY86	37.9	46	30
Washougal	BY85	29.8	42	21
	BY86	35.5	51	18
	BY87	27.4	33	18
	BY88	31.2	40	15
	BY89	33.1	41	25

Mean Hematocrit (by brood year):

BY85	36.7
BY86	34.3
BY87	31.4
BY88	34.0
BY89	28.0

Mean Hematocrit:
 (all lots) 32.9

APPENDIX D

Appendix D contains the Yearly Medication report. Medication usage is listed by type of medication for each pathogen for 1990 - 1991.

Dosage:

Formalin = parts per million (ppm)

Diquat = ppm

Romet = % body weight fed

TM50 = % body weight fed

Gallimycin = % body weight fed

Sulmet = % body weight fed

Malachite = number of treatments per month

Epsom salts = % of feed by weight

Erythromycin = number of injections per month

Terramycin = number of injections per month

Amount:

Formalin = gallons

Diquat = gallons

Romet = pounds

TM50 = pounds

Gallimycin = pounds

Sulmet = pounds

Malachite = gallons

Epsom salts = pounds

Erythromycin & Terramycin = none

WF PROGRAM MEDREP
Yearly Medication Report
 1990 - 1991

Agent: Bacterial Gill Disease

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size	
Di quat	BPPM 12PPM	2.46 3. 66	Lower Lower	Kalama Kalama	Spring Spring	Kalama Kalama	89 89	27. 27.

Agent: Bacterial Kidney Disease

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size
Gallimycin							
	2%	1600	Cowlitz	Spring	Cowlitz	90	70.
	2%	2150	Cowlitz	Spring	Cowlitz	89	58.
	2%	4860	Cowlitz	Spring	Cowlitz	90	43.
	1%	21760	Cowlitz	Spring	Cowlitz	89	456.
	2%	276	Kalama Falls	Spring	Kalama	90	355.
	1%	100	Klickitat	Late	Cowlitz	88	38.
	2%	54	Klickitat	Spring	Klickitat	90	373.
	1%	1512	Klickitat	Spring	Klickitat	89	424.
	2%	405	Klickitat	Spring	Klickitat	90	218.
	2%	1171	Klickitat	Spring	Klickitat	89	242.
	1%	1016	Klickitat	Spring	Klickitat	89	242.
	2%	60	Klickitat	Spring	Wind River	89	238.
	2%	18	Klickitat	Spring	Wind River	89	157.
	1%	783	Klickitat	Spring	Klickitat	90	69.
	1.5	1517	Lewis River	Spring	Lewis River	90	157.
	1%	296	Lyon's Ferry	Fall	Lyon's	90	339.
	2%	1000	Lyon's Ferry	Fall	Lyon's	89	133.
	2%	75	Lyon's Ferry	Fall	Lyon's	88	172.
	2%	75	Lyon's Ferry	Spring	Tucannon	90	280.
	1%	50	Lyon's Ferry	Spring	Tucannon	90	143.
	2%	1509	Ringold	Spring	Wind River	90	181.
	2%	1090	Ringold	Spring	Wind River	89	290.
	2%	1652	Ringold	Spring	Wind River	90	110.
	1%	5020	Ringold	Spring	Wind River	90	50.
	1.3%	1286	Rocky Reach	Fall	Wells	89	29.
	1.25%	360	Speelyai	Spring	Lewis River	90	190.
	2%	422	Wells	Summer	Wells	90	89.

VDF PROGRAM MEDREP
Yearly Medication Report
 1990 - 1991

Agent: Columnaris

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size
Di quat	16.8PPM	1.1G	Washougal	Late	Washougal	89	123.
TM50							
2%	1655		Lower Kalama	Early	Kalama	89	48.
2%	1580		Lower Kalama	Spring	Kalama	89	42.
2%	490		Rocky Reach	Early			85.
2%	1400		Rocky Reach	Early	Rocky Reach	89	62.
2%	1405		Rocky Reach	Early	Rocky Reach	89	45.
2%	1068		Washougal	Late	Washougal	89	123.
2%	1536		Washougal	Late	Lewis River	89	112.
2%	1096		Washougal	Late	Washougal	89	85.
2%	999		Washougal	Late	Lewis River	89	81.

Agent: CWD/EIRS/FUNGUS

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size
TM50							
2%	17475		Cowlitz	Late	Cowlitz	88	24.
2%	24450		Cowlitz	Late	Cowlitz	88	22.

Agent: Costia

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size
Formalin							
167	1126		Cowlitz	Fall	Cowlitz	89	152.
167	48G		Cowlitz	Fall	Cowlitz	90	68.
143	30G		Cowlitz	Late	Cowlitz	89	200.
167	12G		Elokomin	Early	Grays River	89	164.
167	18G		Lower Kalama	Early	Kalama	89	249.
83			Lower Kalama	Spring	Kalama	88	12.
167	3G		Speelyai	Early	Lewis River	89	166.
167	3G		Speelyai	Early	Lewis River	90	401.

WDF PROGRAM MEDREP
Yearly Medication Report
 1990 - 1991

Agent: Cold Water Disease

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size
Oxolinic Acid							
	10MG/KG	.43#	Klickitat	Late	Lewis River	89	181.
	10MG/KG	.01#	Klickitat	Late	Lewis River	89	125.
	20MG/KG	.66#	Lewis River	Late	Lewis River	89	296.
	10MG/KG	1.2#	Lewis River	Late	Lewis River	89	296.
Ronet							
	1. 7%	1484	Cowlitz	Late	Cowlitz	89	139.
	1%	204	Klickitat	Late	Lewis River	89	270.
	1%	264	Lewis River	Late	Lewis River	89	296.
	1%	6	Rocky Reach	Early	Lewis River	89	950.
	1%	10	Rocky Reach	Early	Grays River	89	950.
	1. 7%	18	Rocky Reach	Early	Grays River	89	427.
	1. 7%	29	Rocky Reach	Early	Lewis River	89	427.
	1. 5%	132	Speelyai	Early	Lewis River	89	166.
TM100							
	2%	3350	Cowlitz	Late	Cowlitz	89	28.
	2%	21640	Cowlitz	Late	Cowlitz	89	20.
	2%	31600	Cowlitz	Late	Cowlitz	89	18.
	1%	501	El okomin	Early	Kalama	90	460.
	2%	2311	El okomin	Early	Toutle	90	511.
	2%	587	El okomin	Early	Kalama	90	301.
	2%	304	El okomin	Late	El okomin	90	517.
	1%	304	El okomin	Late	El okomin	90	242.
	1%	54	El okomin	Late	Lewis River	90	288.
	2%	194	Grays River	Early	Grays River	90	526.
	2%	124	Grays River	Early	Grays River	90	240.
	2%	387	Grays River	Early	Toutle	90	262.
	1%	71	Kalam Falls	Late	Kalama	90	693.
	1%	589	Kalam Falls	Late	Kalama	90	450.
	1%	236	Klickitat	Late	Lewis River	90	296.
	1%	707	Klickitat	Late	Lewis River	90	170.
	2%	182	Lewis River	Early	Toutle	90	333.
	1%	1138	Lewis River	Late	Lewis River	90	425.
	1.5%	3133	Lewis River	Late	Lewis River	90	235.
	2%	376	Lower Kalama	Early	Kalama	90	280.
	1%	61	Rocky Reach	Early	Lower	90	450.
	1%	283	Rocky Reach	Early	Lower	90	340.
	1.5%	320	Rocky Reach	Early	Lower	90	175.
	2%	21640	Rocky Reach	Early	Rocky Reach	89	133.
	1.5	692	Rocky Reach	Early	Lower	90	100.
	2%	626	Speelyai	Early	Lewis River	89	166.
	2%	626	Speelyai	Early	Lewis River	90	401.
	2%	480	Speelyai	Early	Lewis River	90	150.
	1%	374	Washougal	Fall	Washougal	90	64.

VDF PROGRAM MEDREP
Yearly Medication Report
 1990 - 1991

Agent: Cold Water Disease

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size
TM100	2%	115	Washougal	Late	Washougal	90	686.
	1%	409	Washougal	Late	Lewis River	90	149.
	1%	374	Washougal	Late	Washougal	90	166.
TM50							
	2%	9159	Cowlitz	Late	Cowlitz	89	200.
	2%	5725	Cowlitz	Late	Cowlitz	89	64.
	2%	2150	Cowlitz	Late.	Cowlitz	89	51.
	2%	8325	Cowlitz	Late	Cowlitz	89	45.
	2%	10510	Cowlitz	Late	Cowlitz	89	31.
	2%	5200	Cowlitz	Late	Cowlitz	89	30.
	1%	25115	Cowlitz	Spring	Cowlitz	88	135.
	2%	2000	Cowlitz	Spring	Cowlitz	89	9.
	2%	29230	Cowlitz	Spring	Cowlitz	89	7.
	2%	237	El okomin	Early	Lewis River	89	338.
	2%	212	El okomin	Early	Grays River	89	351.
	1%	201	El okomin	Early	Grays River	89	83.
	2%	230	El okomin	Late	El okomin	89	705.
	2%	677	El okomin	Late	El okomin	89	354.
	2%	715	Grays River	Early	Grays River	89	405.
	2%	91	Grays River	Early	Toutle	90	860.
	2%	130	Kalama Falls	Late	Lewis River	89	322.
	1%	301	Kalama Falls	Late	Kalama	89	326.
	2%	117	Kalama Falls	Late	Lewis River	89	266.
	2%	282	Kalama Falls	Late	Kalama	89	265.
	1%	239.6	Klickitat	Late	Lewis River	89	643.
	1%	290	Klickitat	Late	Lewis River	89	270.
	1.5%	125	Lewis River	Late	Lewis River	89	872.
	2%	1806	Lewis River	Late	Lewis River	89	510.
	2%	2640	Lewis River	Late	Lewis River	89	296.
	2%	108	Lower Kalama	Early	Kalama	90	158.
	2%	140	Rocky Reach	Early	Lower	90	660.
	2%	92	Rocky Reach	Early	Lewis River	89	427.
	2%	172	Rocky Reach	Early	Grays River	89	427.
	2%	297	Rocky Reach	Early	Rocky Reach	89	233.
	2%	187	Rocky Reach	Early	Rocky Reach	89	133.
	2%	1516	Speelyai	Early	Lewis River	89	242.
	2%	118	Speelyai	Early	Lewis River	90	512.
	3%	392	Speelyai	Early	Lewis River	89	166.
	2%	61	Washougal	Late	Lewis River	89	454.
	2%	49	Washougal	Late	Washougal	89	489.
	2%	1349	Washougal	Late	Washougal	89	256.
	2%	1892	Washougal	Late	Lewis River	89	214.

VDF PROGRAM MEDREP
Yearly Medication Report
 1990 - 1991

Agent: Epistylis

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size
Formalin							
	167	10G	Kalam Falls	Spring	Kalam	89	499.
	100	120G	Washougal	Late	Washougal	89	25.
	100	100G	Washougal	Late	Lewis River	89	25.
	167	37G	Washougal	Late	Washougal	89	25.

Agent: Enteric Redmouth Disease

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size
Romet							
	1. 7%	430	Cowlitz	Spring	Cowlitz	89	30.
	1%	220 792	Grays River	Fall	Grays River	89	63.
	1%	220 792	Lower Kalam	Fall	Kalam	89	185.
	1. 5%	75	Ringold	Spring	Wind River	89	153.
	1. 25%	13	Ringold	Spring	Wind River	89	94.
	1%	100	Rocky Reach	Fall	Wells	89	932.
	1%	100	Rocky Reach	Fall	Wells	89	532.
	1%	900 176	Speelyai	Spring	Lewis River	89	160.
	1%	900 176	Speelyai	Spring	Lewis River	90	190.
	1%	329 1400	Toutle	Fall	Toutle	90	84.
TM100							
	1%	130	Speelyai	Spring	Lewis River	90	216.
TM50							
	1%	5272	Cowlitz	Spring	Cowlitz	89	58.
	2%	6106	Cowlitz	Spring	Cowlitz	89	30.
	2%	3778	Cowlitz	Spring	Cowlitz	89	22.
	1. 7%	91	Grays River	Fall	Grays River	89	126.

Agent: Saprolegnia

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size
Formalin							
	1667	48G	Cowlitz	Spring	Cowlitz	90	
	200	18206	Cowlitz	Spring	Cowlitz	A	
	2000	5146	Elokomin	Fall	Elokomin	A	
	1667	12G	Kalam Falls	Early	Kalam	90	
	167	1806	Kalam Falls	Early	Kalam	A	
	1667	4836	Kalam Falls	Fall	Kalam	90	
	167	14236	Kalam Falls	Fall	Kalam	A	
	167	2976	Kalam Falls	Late	Kalam	A	

WDF PROGRAM MEDREP
Yearly Medication Report
 1990 - 1991

Agent: Saprolegnia

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size
Formalin							
1667	71G	Kalam Falls	Late	Kalam	90		
1667	26G	Kalam Falls	Spring	Kalam	90	1200.	
1667	92G	Klickitat	Fall	Priest	90		
1667	58G	Klickitat	Spring	Wind River	90	856.	
1667	13G	Klickitat	Spring	Klickitat	90	829.	
167	30G	Lyon's Ferry	Spring	Tucannon	A		
1667	2756	Priest Rapids	Fall	Priest	90	"	
167	15956	Priest Rapids	Fall	Priest	A		
1667	58G	Ringold	Spring	Wind River	90	54.	
1667	3046	Washougal	Fall	Washougal	90		
1667	40G	Washougal	Late	Washougal	90		

Agent: Furunculosis

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size
Ronet							
1%	528	Kalam Falls	Fall	Kalam	89	121.	
1%	94	Kalam Falls	Spring	Kalam	89	89.	
1%	528	Klickitat	Late	Cowlitz	, 88	200.	
1%	375	Lower Kalam	Spring	Kalam	89	76.	
Terramycin							
2		Elokomin	Fall	Elokomin	A		
3		Kalam Falls	Fall	Kalam	A		
1		Kalam Falls	Spring	Kalam	A		
TM50							
2%	956	Elokomin	Late	Elokomin	89	163.	
1.5%	16000	Lewis River	Late	Lewis River	89	51.	

VDF PROGRAM MEDREP
Yearly Medication Report
 1990 - 1991

Agent: Ichthyophthirius

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size
Formalin							
	167	44G	Kalam Falls	Spring	Kalam	89	89.
	167	12G	Kalam Falls	Spring	Kalam	89	60.
	167	4466	Kalam Falls	Spring	Kalam	A	
	167	5506	Lewis River	Spring	Lewis River	89	28.
	167	3206	Lower Kalam	Spring	Kalam	89	42.
	167	4486	Ringold	Spring	Wind River	89	43.
	167	2526	Ringold	Spring	Wind River	89	31.
	167	70G	Ringold	Spring	Wind River	89	25.
	25PPM	15406	Ringold	Spring	Wind River	89	22.
	25PPM	10456	Ringold	Spring	Wind River	89	15.

Agent: Prophylactic

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size
Erythronycin							
	3		Cowlitz	Spring	Cowlitz	A	
	2		Kalam Falls	Spring	Kalam	A	
Gallimycin							
	2%	3695	Cowlitz	Spring	Cowlitz	89	39.
	1%	17430	Cowlitz	Spring	Cowlitz	89	14.
	1%	200	Kalam Falls	Spring	Kalam	89	113.
	1%	5435	Klickitat	Late	Lewis River	89	51.
	1%	195	Klickitat	Late	Lewis River	89	50.
	1%	65	Klickitat	Late	Lewis River	89	
	1%	246	Klickitat	Spring	Klickitat	90	87.
	1%	3330	Klickitat	Spring	Klickitat	89	31.
	1%	21	Klickitat	Spring	Klickitat	89	26.
	1.5%	2150	Lewis River	Spring	Lewis River	90	98.
	1%	5650	Lewis River	Spring	Lewis River	89	57.
	1.5%	9832	Lewis River	Spring	Lewis River	89	17.
	1.5%	5118	Lewis River	Spring	Lewis River	89	16.
	1%	1050	Lower Kalam	Spring	Kalam	89	98.
	1%	4000	Lower Kalam	Spring	Kalam	89	21.
	2%	627	Lyon's Ferry	Spring	Tucannon	89	51.
	2%	586	Ringold	Spring	Wind River	89	153.
	2%	5650	Ringold	Spring	Wind River	89	60.
	2%	308	Rocky Reach	Fall	Wells	89	270.
	1%	504	Rocky Reach	Fall	Wells	89	45.
	1.5%	2550	Speelyai	Spring	Lewis River	89	163.
	1.5%	290	Speelyai	Spring	Lewis River	90	126.
	1%	1350	Speelyai	Spring	Lewis River	89	64.
	1.5%	1475	Speelyai	Spring	Lewis River	89	30.

VDF PROGRAM MEDREP
Yearly Medication Report
 1990 - 1991

Agent: Prophylactic

Medication	Dosage	Amount	Location	Species	Stock	Brood	Fish Size
<hr/>							
Gallimycin	1.5% 2%	1025 339	Speelyai Wells	Spring Summer	Lewis Wells	River	89 89
<hr/>							
Terranycin	2		Priest Rapids	Fall	Priest		A
TM100	2%	3387	Cowlitz	Spring	Cowlitz	90	70.
TM50	2% 2%	695 1345	Rocky Reach Reach	Early	Rocky Reach Reach	89 89	32. 25.

APPENDIX E

Appendix E contains the Organosomatic Analysis Summary of Fish Autopsy reports and the raw data.

SUMMARY OF FISH AUTOPSY

LOCATION: Lyons Ferry

QUAL. CONTROL INSPECT. NO.: 904

Species: Chinook	Autopsy Date: 03-01-90	Sample Size: 60
Strain: Fall	Age: BY88	Tissue Collection No.: NA
Mark/Lot: NA		Disease Survey No.: NA
Unit: NA	Water Temp.: NA	Case History No.: 904
Fish Source: Lyons Ferry	Water Hardness: NA ppm	Custody No.: NA
Egg Source: Lyons Ferry	Investigator: PM-LW-KP	
Hatching Date: NA	Reason for Autopsy: Pre-Lib Exam	
Remarks: Fish 31-60 barged		

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
Length	149.500 mm	19.97 mm	13%
Weight	31.480 gr	10.7 gr	34%
Ktl*	0.940	0.07	7%
Ctl**	3.396		
Hematocrit	39.450	7.03	18%
Leucocrit	0.690	0.84	122%
Serum Protein	4.190	0.65	16%

*Expressed as Ktl times 10 to the fifth power

**Converted from Ktl; expressed as Ctl times 10 to the fourth power

VALUES AS PERCENT OF TOTAL SAMPLE

EYES	GILLS	PSEUDO-BRANCHS	THYMUS	MESEN.	FAT	SPLEEN	HIND GUT	KIDNEY	LIVER	BILE
N 98%	N 95%	N 95%	0 95%	0 0%	B 0%	0 100%	N 95%	A 0%	O 28%	
B1 0%	F 0%	S 3%	1 5%	1 95%	R 97%	1 0%	S 3%	B 98%	1 86%	
B2 0%	C 0%	L 0%	2 0%	2 5%	G 3%	2 0%	M 2%	C 0%	2 6%	
E1 0%	M 0%	S&L 2%	x 0.1	3 0%	NO 0%	x 0.0	G 0%	D 0%	3 0%	
E2 0%	P 5%	I 0%		4 0%	E 0%		U 0%	E 0%		x 1.0
H1 2%	OT 0%	OT 0%		x 1.1	OT 0%		OT 0%	F 2%		
H2 0%							OT 0%	OT 0%		
M1 0%										
M2 0%										
OT 0%										

Summary of Normals

98%	95%	95%	95%	100%	100%	95%	98%
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Summary of Means

	0.1	1.1		0.0			1.0
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SEX: M: 50% F: 50% U: 0%

GENERAL REMARKS

FINS Eroded caudal fin-40

SKIN NA

GONADS NA

OTHER Kidney lesions-1,9,23,36,39. Pseudobranch tumor-8. Deformed gill

Qual.Qual. Control N904

SN	LGH	WGT	Ktl	EYE	GILL	PSBR	THY	FAT	GUT	KID	LIV	BILE	SEX	HEM	LEU	SPR.
1	150	27.5	0.8	N	N	N	N	0	O	M	B		19	0.0	4..	
2	115	14.8	1.0	N	N	N	N	1	2	M	B		39	0.0	5..	
3	125	25.2	1.0	N	N	N	N	2	1	N	B		42	0.0	4..	
4	110	13.3	0.9	N	N	N	N	0	0	N	B		38	0.5	3..	
5	152	35.3	0.9	N	N	N	N	1	0	N	B		15	0.5	4..	
6	157	33.8	0.9	N	N	N	N	1	0	N	B		35	0.5	3..	
7	158	36.1	0.9	N	N	N	N	1	0	N	B		41	0.5	4..	
8	154	33.8	0.9	N	N	N	N	1	0	N	B		44	0.5	4..	
9	152	31.7	0.9	N	N	N	N	1	0	N	B		42	0.5	4..	
10	156	34	0.9	N	N	N	N	1	0	N	B		33	0.5	4..	
11	170	42.4	0.9	N	N	N	N	1	0	N	B		40	0.5	4..	
12	142	24.6	0.9	N	N	N	N	1	0	N	B		38	0.5	4..	
13	157	37.2	0.9	N	N	N	N	1	0	N	B		39	0.5	4..	
14	122	15.6	0.9	N	N	N	N	1	0	N	B		47	0.5	4..	
15	162	41.6	0.9	N	N	N	N	1	0	N	B		41	0.5	4..	
16	158	36.2	0.9	N	N	N	N	1	0	N	B		45	0.5	4..	
17	172	42.5	0.9	N	N	N	N	1	0	N	B		49	0.5	4..	
18	165	40.4	0.9	N	N	N	N	1	0	N	B		40	0.5	4..	
19	162	39.1	0.9	N	N	N	N	1	0	N	B		37	0.5	4..	
20	158	34.4	0.9	N	N	N	N	1	0	N	B		40	0.5	4..	
21	150	30.3	0.9	N	N	N	N	1	0	N	B		38	0.5	4..	
22	147	27.8	0.9	N	N	N	N	1	0	N	B		44	0.5	4..	
23	131	20.1	0.9	N	N	N	N	1	0	N	B		43	0.5	4..	
24	173	46	0.8	N	N	N	N	1	0	N	B		41	0.5	4..	
25	149	31.5	0.8	N	N	N	N	1	0	N	B		41	0.5	4..	
26	147	14	0.8	N	N	N	N	1	0	N	B		45	0.5	4..	
27	119	7	0.8	N	N	N	N	1	0	N	B		44	0.5	4..	
28	128	19.9	0.8	N	N	N	N	1	0	N	B		44	0.5	4..	
29	166	42.1	0.8	N	N	N	N	1	0	N	B		45	0.5	4..	
30	132	33.4	0.8	N	N	N	N	1	0	N	B		41	0.5	4..	
31	159	37.9	0.8	N	N	N	N	1	0	N	B		45	0.5	4..	
32	162	35.9	0.8	N	N	N	N	1	0	N	B		41	0.5	4..	
33	170	42.1	0.8	N	N	N	N	1	0	N	B		45	0.5	4..	
34	168	40.8	0.8	N	N	N	N	1	0	N	B		41	0.5	4..	
35	176	50.4	0.8	N	N	N	N	1	0	N	B		45	0.5	4..	
36	153	28.4	0.8	N	N	N	N	1	0	N	B		41	0.5	4..	
37	143	29.5	0.7	N	N	N	N	1	0	N	B		45	0.5	4..	
38	131	20.7	0.7	N	N	N	N	1	0	N	B		41	0.5	4..	
39	183	55.3	0.6	N	N	N	N	1	0	N	B		45	0.5	4..	
40	175	46.6	0.6	N	N	N	N	1	0	N	B		41	0.5	4..	
41	156	33.1	0.6	N	N	N	N	1	0	N	B		45	0.5	4..	
42	158	35.3	0.6	N	N	N	N	1	0	N	B		41	0.5	4..	
43	167	40.4	0.6	N	N	N	N	1	0	N	B		45	0.5	4..	
44	115	13.8	0.6	N	N	N	N	1	0	N	B		41	0.5	4..	
45	142	26.1	0.6	N	N	N	N	1	0	N	B		45	0.5	4..	
46	126	18.7	0.6	N	N	N	N	1	0	N	B		41	0.5	4..	
47	110	11.8	0.6	N	N	N	N	1	0	N	B		45	0.5	4..	
48	180	50.7	0.6	N	N	N	N	1	0	N	B		41	0.5	4..	
49	141	28.4	0.6	N	N	N	N	1	0	N	B		45	0.5	4..	
50	145	27.4	0.6	N	N	N	N	1	0	N	B		41	0.5	4..	
51	148	30.4	0.6	N	N	N	N	1	0	N	B		45	0.5	4..	
52	112	13.1	0.6	N	N	N	N	1	0	N	B		41	0.5	4..	
53	165	37.9	0.6	N	N	N	N	1	0	N	B		43	0.5	4..	
54	172	43.1	0.6	N	N	N	N	1	0	N	B		39	0.5	4..	
55	144	25.9	0.6	N	N	N	N	1	0	N	B		41	0.5	4..	
56	159	33.9	0.6	N	N	N	N	1	0	N	B		41	0.5	4..	
57	136	23.8	0.9	N	N	N	N	1	0	N	B		41	0.5	4..	

SUMMARY OF FISH AUTOPSY

LOCATION: Lyons Ferry

QUAL. CONTROL INSPECT. NO.: 931

Species: Chinook Autopsy Date: 05-15-90 Sample Size: 60
 Strain: Fall Age: BY89 Tissue Collection No.: NA
 Mark/Lot: NA Disease Survey No.: NA
 Unit: Pds. 23,24,27,28. Water Temp.: NA NA Case History No.: 931
 Fish Source: NA Water Hardness: NA ppm Custody No.: NA
 Egg Source: NA Investigator: LW-KP
 Hatching Date: NA Reason for Autopsy: Pre-Lib Exam
 Remarks: Fish 1-30(pds. 23,24) barged; fish 31-60(pds. 27,28) on station.

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
Length	79.420 mm	8.22 mm	10%
Weight	4.860 gr	1.24 gr	26%
Ktl*	0.970	0.08	8%
Ctl**	3.504		
Hematocrit	44.450	3.7	8%
Leucocrit	0.130	0.25	194%
Serum Protein	4.010	0.63	16%

*Expressed as Ktl times 10 to the fifth power

**Converted from Ktl; expressed as Ctl times 10 to the fourth power

VALUES AS PERCENT OF TOTAL SAMPLE

EYES	GILLS	PSEUDO-BRANCHS	THYMUS	MESEN.		HIND GUT		KIDNEY	LIVER	BILE
				FAT	SPLEEN	G	OT			
N	100%	N	100%	0	93%	B	10%	0	100%	A 13% 0 5%
B1	0%	F	0%	1	5%	R	82%	1	0%	B 87% 1 92%
B2	0%	C	0%	2	2%	G	7%	2	0%	C 0% 2 3%
E1	0%	M	0%	S&L	0%	NO	0%	x 0.0	G 0%	D 0% 3 0%
E2	0%	P	0%	I	0%	E	2%		U 0%	E 0% x 1.0
H1	0%	OT	0%	OT	0%			OT	0%	F 0% OT 0%
H2	0%									
M1	0%									
M2	0%									
OT	0%									

Summary of Normals

100%	100%	100%	93%	98%	100%	100%	100%
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Summary of Means

		0.1	0.8		0.0			1.0
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SEX: M: 53% F: 42% U: 5%

GENERAL REMARKS

FINS NA

SKIN NA

GONADS NA

OTHER Air bladder constricted-5, dark blotches on spleen-56,58.

Qual. Control No. 931

SN	LGH	WGT	Kt1	EYE	GILL	PSBR	THY	FAT	GUT	KID	BILE	SEX	HEM	LEU	SPR
1	88	5.4	0.8	N	N	N	N	0	0	N	1	F	48	0.0	4.3
2	80	5.2	1.0	N	N	N	N	0	0	N	1	F	47	0.0	5.0
3	89	4.9	0.8	N	N	N	N	0	0	N	1	F	41	0.0	4.1
4	78	3.5	1.0	N	N	N	N	0	0	N	2	M	42	0.0	4.0
5	70	4.4	0.9	N	N	N	N	0	0	N	1	F	43	0.0	4.3
6	79	5.3	1.0	N	N	N	N	0	0	N	1	F	41	0.0	4.7
7	86	4.4	0.9	N	N	N	N	0	0	N	1	M	38	0.0	3.2
8	74	5.3	1.0	N	N	N	N	0	0	N	1	F	45	0.0	4.4
9	84	4.4	0.9	N	N	N	N	0	0	N	1	M	40	0.0	4.0
10	78	5.4	1.0	N	N	N	N	0	0	N	1	F	43	0.0	3.7
11	72	5.3	0.9	N	N	N	N	0	0	N	1	M	39	0.0	4.2
12	84	4.4	1.0	N	N	N	N	0	0	N	1	F	44	0.0	4.4
13	79	5.3	0.9	N	N	N	N	0	0	N	1	M	41	0.0	4.0
14	70	5.4	1.0	N	N	N	N	0	0	N	1	F	35	0.0	3.9
15	81	5.1	0.9	N	N	N	N	0	0	N	1	M	43	0.0	4.0
16	77	4.5	1.0	N	N	N	N	0	0	N	1	F	47	0.0	4.6
17	67	6.3	0.9	N	N	N	N	0	0	N	1	M	41	0.0	4.5
18	87	6.7	1.0	N	N	N	N	0	0	N	1	F	46	0.0	4.5
19	92	4.7	1.0	N	N	N	N	0	0	N	1	M	39	0.0	4.0
20	77	4.5	0.8	N	N	N	N	0	0	N	1	F	44	0.0	4.4
21	84	5.5	1.0	N	N	N	N	0	0	N	1	M	40	0.0	4.0
22	67	2.5	0.8	N	N	N	N	0	0	N	1	F	48	0.0	5.0
23	72	6.3	1.0	N	N	N	N	0	0	N	1	M	42	0.0	4.2
24	87	6.7	0.8	N	N	N	N	0	0	N	1	F	45	0.0	4.5
25	92	4.5	1.0	N	N	N	N	0	0	N	1	M	47	0.0	4.3
26	77	4.5	0.8	N	N	N	N	0	0	N	1	F	44	0.0	4.3
27	84	5.5	1.0	N	N	N	N	0	0	N	1	M	46	0.0	4.6
28	67	2.5	0.8	N	N	N	N	0	0	N	1	F	39	0.0	3.5
29	70	5.5	1.0	N	N	N	N	0	0	N	1	M	43	0.0	3.0
30	81	5.1	0.9	N	N	N	N	0	0	N	1	F	40	0.0	3.1
31	77	4.5	1.0	N	N	N	N	0	0	N	1	M	33	0.0	3.0
32	84	5.5	0.9	N	N	N	N	0	0	N	1	F	33	0.0	3.6
33	51	4.6	1.0	N	N	N	N	0	0	N	1	M	45	0.0	4.8
34	62	3.5	0.9	N	N	N	N	0	0	N	1	F	33	0.0	3.2
35	94	6.6	0.8	N	N	N	N	0	0	N	1	M	45	0.0	4.8
36	90	5.7	1.0	N	N	N	N	0	0	N	1	F	48	0.0	5.9
37	84	4.4	0.8	N	N	N	N	0	0	N	1	M	42	0.0	4.2
38	77	4.2	1.0	N	N	N	N	0	0	N	1	F	47	0.0	4.7
39	73	6.6	0.8	N	N	N	N	0	0	N	1	M	44	0.0	4.8
40	85	6.9	1.0	N	N	N	N	0	0	N	1	F	46	0.0	5.2
41	87	4.4	0.8	N	N	N	N	0	0	N	1	M	37	0.0	3.1
42	75	6.3	1.0	N	N	N	N	0	0	N	1	F	45	0.0	4.5
43	87	6.7	0.8	N	N	N	N	0	0	N	1	M	39	0.0	3.7
44	79	3.4	1.0	N	N	N	N	0	0	N	1	F	43	0.0	4.3
45	72	6.7	0.8	N	N	N	N	0	0	N	1	M	41	0.0	4.7
46	83	6.3	1.0	N	N	N	N	0	0	N	1	F	38	0.0	3.2
47	86	5.5	0.9	N	N	N	N	0	0	N	1	M	40	0.0	4.0
48	65	4.9	1.0	N	N	N	N	0	0	N	1	F	48	0.0	4.8
49	79	5.7	0.9	N	N	N	N	0	0	N	1	M	40	0.0	4.0
50	85	5.5	0.9	N	N	N	N	0	0	N	1	F	46	0.0	4.6
51	86	4.8	1.0	N	N	N	N	0	0	N	1	M	43	0.0	4.3
52	80	5.5	0.9	N	N	N	N	0	0	N	1	F	49	0.0	4.9
53	91	5.6	0.9	N	N	N	N	0	0	N	1	M	40	0.0	4.0
54	86	5.5	0.9	N	N	N	N	0	0	N	1	F	46	0.0	4.6
55	83	5.7	0.9	N	N	N	N	0	0	N	1	M	43	0.0	4.3
56	85	5.5	0.9	N	N	N	N	0	0	N	1	F	48	0.0	4.8
57	81	5.6	0.9	N	N	N	N	0	0	N	1	F	42	0.0	4.2
58	83	5.5	0.9	N	N	N	N	0	0	N	1	F	45	0.0	4.5
59	81	5.5	0.9	N	N	N	N	0	0	N	1	F	48	0.0	4.6
60														0.0	0.0

SUMMARY OF FISH AUTOPSY

LOCATION: LYONS FERRY

QUAL. CONTROL INSPECT. NO.: 7023

Species: CHINOOK Autopsy Date: 05-09-91 Sample Size: 60
 Strain: FALLS Age: BY90 Tissue Collection No.: NA
 Mark/Lot: NA Disease Survey No.: NA
 Unit: NA Water Temp.: NA NA Case History No.: 7023
 Fish Source: LYONS FERRY Water Hardness: NA ppm Custody No.: NA
 Egg Source: LYONS FERRY Investigator: PM/JH
 Hatching Date: NA Reason for Autopsy: PRE-RELEASE ZEROS
 Remarks: MA

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
Length	89.870 mm	7.4 mm	8%
Weight	6.280 gr	1.59 gr	25%
Ktl*	0.870	0.08	9%
Ctl**	3.143		
Hematocrit	40.100	3.01	7%
Leucocrit	0.620	0.52	83%
Serum Protein	4.150	0.5	12%

*Expressed as Ktl times 10 to the fifth power

**Converted from Ktl; expressed as Ctl times 10 to the fourth power

VALUES AS PERCENT OF TOTAL SAMPLE

EYES	GILLS	PSEUDO-BRANCHS	THYMUS	MESEN. FAT	SPLEEN	HIND GUT	KIDNEY	LIVER	BILE
N 100%	N 100%	N 100%	O 98%	O 15%	B 0%	O 100%	N 100%	A 47%	O 78%
B1 0%	F 0%	S 0%	I 2%	I 77%	R 100%	I 0%	S 0%	B 50%	I 42%
B2 0%	C 0%	L 0%	2 0%	2 8%	G 0%	2 0%	M 0%	C 0%	2 0%
E1 0%	M 0%	S&L 0%	x 0.0	3 0%	NO 0%	x 0.0	G 0%	D 0%	3 0%
E2 0%	P 0%	I 0%		4 0%	E 0%		U 0%	E 0%	x 0.4
H1 0%	OT 0%	OT 0%		x 0.9	OT 0%		OT 0%	F 3%	
H2 0%							OT 0%	OT 0%	
M1 0%									
M2 0%									
OT 0%									

Summary of Normals

100%	100%	100%	98%	100%	100%	100%	97%
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Summary of Means

		0.0	0.9		0.0			0.4
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SEX: M: 50% F: 33% U: 17%

GENERAL REMARKS

FINS NA

SKIN NA

GONADS NA

OTHER NA

Qual.Qual. Control N7023 86-{

SN	LGH	WGT	Ktl	EYE	GILL	PSBR	THY	FAT	SPL	KID	LIV	BILE	SEX	HEM	LEU	SPR
1	83	5	0.9	N	N	N	0	0	R	N	B	0	39	1.0	4.0	
2	94	7	0.8	N	N	N	0	0	R	N	B	42	0.0	3.8		
3	86	6	0.9	N	N	N	0	0	R	N	B	43	0.0	3.7		
4	88	6	0.9	N	N	N	0	0	R	N	B	42	0.0	4.0		
5	92	6	0.9	N	N	N	0	0	R	N	B	36	0.0	3.8		
6	88	5	0.9	N	N	N	0	0	R	N	B	45	0.5	4.1		
7	93	7	0.8	N	N	N	0	0	R	N	B	37	1.0	4.8		
8	87	5	0.8	N	N	N	0	0	R	N	B	42	0.0	4.4		
9	95	7	0.7	N	N	N	0	0	R	N	B	39	0.0	4.5		
10	87	5	0.8	N	N	N	0	0	R	N	B	43	0.0	4.1		
11	96	7	0.7	N	N	N	0	0	R	N	B	37	0.5	4.8		
12	83	5	0.8	N	N	N	0	0	R	N	B	42	0.0	4.2		
13	93	7	0.7	N	N	N	0	0	R	N	B	39	0.5	4.3		
14	84	5	0.8	N	N	N	0	0	R	N	B	43	0.0	4.4		
15	97	7	0.8	N	N	N	0	0	R	N	B	38	0.5	4.8		
16	88	5	0.7	N	N	N	0	0	R	N	B	42	0.0	4.6		
17	96	7	0.9	N	N	N	0	0	R	N	B	39	0.5	3.8		
18	87	5	0.8	N	N	N	0	0	R	N	B	43	0.0	2.2		
19	95	7	0.7	N	N	N	0	0	R	N	B	38	0.8	4.8		
20	87	5	0.8	N	N	N	0	0	R	N	B	42	0.0	2.5		
21	92	7	0.9	N	N	N	0	0	R	N	B	41	0.5	4.1		
22	83	5	0.8	N	N	N	0	0	R	N	B	37	1.0	4.2		
23	90	7	0.7	N	N	N	0	0	R	N	B	45	0.0	3.4		
24	100	11	0.8	N	N	N	0	0	R	N	B	41	0.0	3.0		
25	98	16	0.8	N	N	N	0	0	R	N	B	37	0.0	3.3		
26	94	8	0.7	N	N	N	0	0	R	N	B	44	1.0	4.8		
27	97	8	0.8	N	N	N	0	0	R	N	B	37	0.0	3.8		
28	63	1	0.9	N	N	N	0	0	R	N	B	43	0.0	2.2		
29	88	8	0.8	N	N	N	0	0	R	N	B	38	0.0	3.8		
30	93	1	0.9	N	N	N	0	0	R	N	B	42	0.0	2.5		
31	97	102	0.7	N	N	N	0	0	R	N	B	41	0.0	4.1		
32	87	93	0.7	N	N	N	0	0	R	N	B	37	0.0	3.4		
33	96	7	0.8	N	N	N	0	0	R	N	B	45	0.5	4.4		
34	88	8	0.9	N	N	N	0	0	R	N	B	44	0.0	4.8		
35	88	8	0.8	N	N	N	0	0	R	N	B	36	0.5	4.6		
36	93	7	0.7	N	N	N	0	0	R	N	B	40	0.0	3.8		
37	97	7	0.8	N	N	N	0	0	R	N	B	36	0.5	2.2		
38	88	8	0.9	N	N	N	0	0	R	N	B	43	0.0	3.8		
39	91	7	0.8	N	N	N	0	0	R	N	B	39	0.5	2.5		
40	81	7	0.9	N	N	N	0	0	R	N	B	43	0.0	4.1		
41	90	7	0.8	N	N	N	0	0	R	N	B	37	0.0	3.8		
42	95	7	0.7	N	N	N	0	0	R	N	B	42	0.0	2.5		
43	71	103	0.8	N	N	N	0	0	R	N	B	41	0.0	4.1		
44	88	8	0.9	N	N	N	0	0	R	N	B	38	0.5	4.2		
45	92	90	0.8	N	N	N	0	0	R	N	B	44	0.0	3.4		
46	90	97	0.8	N	N	N	0	0	R	N	B	36	0.5	2.2		
47	94	8	0.8	N	N	N	0	0	R	N	B	43	0.0	3.8		
48	91	94	0.8	N	N	N	0	0	R	N	B	38	0.5	2.5		
49	93	91	0.8	N	N	N	0	0	R	N	B	41	0.0	4.1		
50	90	98	0.8	N	N	N	0	0	R	N	B	39	0.5	4.4		
51	94	93	0.8	N	N	N	0	0	R	N	B	43	0.0	3.4		
52	90	90	0.9	N	N	N	0	0	R	N	B	38	0.5	2.8		
53	92	94	0.8	N	N	N	0	0	R	N	B	41	0.0	4.2		
54	92	91	0.8	N	N	N	0	0	R	N	B	39	0.5	3.8		
55	90	94	0.8	N	N	N	0	0	R	N	B	42	0.0	2.5		
56	92	94	0.8	N	N	N	0	0	R	N	B	41	0.0	4.1		
57	94	92	0.9	N	N	N	0	0	R	N	B	38	0.5	3.8		
58	92	94	0.8	N	N	N	0	0	R	N	B	42	0.0	2.4		
59	95	92	0.9	N	N	N	0	0	R	N	B	41	0.0	3.5		
60	95	8	0.9	N	N	N	0	0	R	N	B	37	0.0	3.5		

SUMMARY OF FISH AUTOPSY

LOCATION: Lewis River

QUAL. CONTROL INSPECT. NO.: 906

Species: Coho Autopsy Date: 03-05-90 Sample Size: 60
 Strain: Early and late Age: BY88 Tissue Collection No.: NA
 Mark/Lot: NA Disease Survey No.: NA
 Unit: NA Water Temp.: NA NA Case History No.: NA
 Fish Source: Lewis River Water Hardness: NA ppm Custody No.: NA
 Egg Source: Lewis River Investigator: PM-LW-KP
 Hatching Date: NA Reason for Autopsy: Pre-Lib Exam
 Remarks: NA

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
Length	124.320 mm	9.71 mm	8%
Weight	16.430 gr	3.81 gr	23%
Ktl*	0.860	0.03	4%
Ctl**	3.107		
Hematocrit	35.200	4.07	12%
Leucocrit	1.020	0.58	57%
Serum Protein	3.950	1.04	26%

*Expressed as Kt₁ times 10 to the fifth power
**Converted from Kt₁; expressed as Ctl times 10 to the fourth power

VALUES AS PERCENT OF TOTAL SAMPLE

Summary of Normals

98% | 93% | 100% | 100% | 100% | 100% | 100% | 100% | 100%

Summary of Means

0.0 1.2 0.0 1.2

SEX: M: 53% F: 47% U: 0%

GENERAL REMARKS

FINS Eroded pectorals-49

SKIN NA

GONADS NA

OTHER Short gill arch-3, cataracts-47

Qual.Qual. Control N906 86-8

SN	LGH	WGT	Ktl	EYE	GILL	PSBR	THY	FAT	SPL	GUT	KID	LIV	BILE	SEX	HEM	LEU	SPR
1	130	13.4	18	0.8	N	N	N	0	R	0	N	B	1	M	40	4.5	
2	118	13.4	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	42	5.2	
3	123	15.9	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	45	4.0	
4	114	12.4	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.1	
5	128	24.8	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	43	3.6	
6	142	19.3	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	47	4.7	
7	132	17.1	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	50	5.0	
8	130	17.1	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
9	129	17.1	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
10	118	13.1	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
11	127	17.1	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
12	130	18.2	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
13	109	11.5	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
14	128	16.3	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
15	125	18.3	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
16	130	18.3	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
17	132	20.7	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
18	134	19.7	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
19	121	15.9	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
20	115	13.1	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
21	114	21.2	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
22	136	11.6	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
23	114	11.6	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
24	138	21.7	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
25	118	14.3	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
26	122	15.6	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
27	111	11.9	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
28	138	19.9	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
29	120	15.1	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
30	131	12.2	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
31	114	17.3	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
32	130	13.2	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
33	114	12.2	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
34	125	17.3	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
35	131	17.6	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
36	148	25.6	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
37	118	13.7	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
38	125	17.2	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
39	135	19.9	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
40	137	21.8	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
41	138	21.1	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
42	109	14.8	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
43	116	9.9	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
44	110	14.8	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
45	121	9.6	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
46	105	10.7	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
47	108	12.3	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
48	115	23.3	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
49	139	17.9	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
50	124	15.2	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
51	129	17.9	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
52	130	13.1	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
53	117	14.8	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
54	120	16.9	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
55	125	18.4	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
56	131	18.4	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
57	108	10.0	0.8	0.8	NN	NN	NN	1	RR	0	NN	BBBB	1	M	44	4.4	
58					O	N	N	0	R	0	NN	BBBB	1	M	44	4.4	
59					T	N	N	0	R	0	NN	BBBB	1	M	44	4.4	
60					N	N	N	0	R	0	NN	BBBB	1	M	44	4.4	

SUMMARY OF FISH AUTOPSY

LOCATION: LEWIS RIVER

QUAL. CONTROL INSPECT. NO.: 7008

Species: COHO
 Strain: EARLY & LATE
 Mark/Lot: NA
 Unit: PONDS 13-15
 Fish Source: LEWIS
 Egg Source: LEWIS
 Hatching Date: NA
 Remarks: NA

Autopsy Date: 03-13-91 Sample Size: 60
 Age: BY89 Tissue Collection No.: NA
 Water Temp.: NA F Disease Survey No.: NA
 Water Hardness: NA ppm Case History No.: 7008
 Investigator: PM/BR/JL Custody No.: NA
 Reason for Autopsy: PRE-RELEASE YEARLINGS

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
Length	111.080 mm	14.36 mm	13%
Weight	12.500 gr	4.57 gr	37%
Ktl*	0.910	0.07	8%
Ctl**	3.288		
Hematocrit	38.470	7.79	20%
Leucocrit	1.170	0.73	63%
Serum Protein	3.600	1.4	39%

*Expressed as Ktl times 10 to the fifth power
 **Converted from Ktl; expressed as Ctl times 10 to the fourth power

VALUES AS PERCENT OF TOTAL SAMPLE

EYES	GILLS	PSEUDO-BRANCHS	THYMUS	MESEN.	FAT	SPLEEN	HIND GUT	KIDNEY	LIVER	BILE
N 98%	N 98%	N 98%	O 0%	O 5%	B 0%	O 100%	N 98%	A 73%	O 48%	
B1 2%	F 2%	S 2%	I 0%	1 33%	R 100%	1 0%	S 0%	B 27%	1 64%	
B2 0%	C 0%	L 0%	2 0%	2 57%	G 0%	2 0%	M 2%	C 0%	2 4%	
E1 0%	M 0%	S&L 0%	x 0.0	3 5%	NO 0%	x 0.0	G 0%	D 0%	3 4%	
E2 0%	P 0%	I 0%		4 0%	E 0%		U 0%	E 0%	x 0.8	
H1 0%	OT 0%	OT 0%		x 1.6	OT 0%		OT 0%	F 0%		
H2 0%							OT 0%	OT 0%		
M1 0%										
M2 0%										
OT 0%										

Summary of Normals

98%	98%	98%	0%	100%	100%	98%	100%
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Summary of Means

	0.0	1.6		0.0			0.8
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SEX: M: 43% F: 57% U: 0%

GENERAL REMARKS

FINS 3 ADIPOSE CLIP

SKIN NA

GONADS NA

OTHER 2 CRINKLE BACK

Qual. Qual. Control N7008 8

SUMMARY OF FISH AUTOPSY

LOCATION: Cowlitz

QUAL. CONTROL INSPECT. NO.: 902

Species: Chinook Autopsy Date: 02-26-90 Sample Size: 60
 Strain: Spring Age: BY88 Tissue Collection No.: NA
 Mark/Lot: NA Water Temp.: 42 F Disease Survey No.: NA
 Unit: Pds. 17,19-24,36 Water Hardness: NA ppm Case History No.: 902
 Fish Source: Cowlitz Investigator: PM-BR-LW Custody No.: NA
 Egg Source: Cowlitz Reason for Autopsy: Pre-Lib Exam
 Hatching Date: NA
 Remarks:

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
Length	171.080 mm	27.51 mm	16%
Weight	166.610 gr	899.07 gr	540%
Ktl*	3.330	11.72	352%
Ctl**	12.031		
Hematocrit	37.420	4.65	12%
Leucocrit	0.480	0.51	107%
Serum Protein	4.670	0.7	15%

*Expressed as Ktl times 10 to the fifth power

**Converted from Ktl; expressed as Ctl times 10 to the fourth power

VALUES AS PERCENT OF TOTAL SAMPLE

EYES	GILLS	PSEUDO-BRANCHS	THYMUS	MESEN.	HIND GUT	KIDNEY	LIVER	BILE
N 97%	N 92%	N 82%	O 90%	O 8%	B 0%	O 100%	N 100%	A 30% 0 26%
B1 2%	F 0%	S 5%	I 10%	1 62%	R 98%	1 0%	S 0%	B 70% 1 94%
B2 0%	C 0%	L 7%	2 0%	2 30%	G 2%	2 0%	M 0%	C 0% 2 0%
E1 0%	M 0%	S&L 7%	x 0.1	3 0%	NO 0%	x 0.0	G 0%	D 0% 3 0%
E2 0%	P 7%	I 0%		4 0%	E 0%		U 0%	E 0% x 0.9
H1 2%	OT 2%	OT 0%		x 1.2	OT 0%		OT 0%	F 0% OT 0%
H2 0%								
M1 0%								
M2 0%								
OT 0%								

Summary of Normals

97%	92%	82%	90%	100%	100%	100%	100%
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Summary of Means

			0.1	1.2	0.0			0.9
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SEX: M: 42% F: 58% U: 0%

GENERAL REMARKS

FINS Thick, frayed fins-44

SKIN NA

GONADS NA

OTHER Miscellaneous abnormalities observed; see original sampling forms

Qual.Qual. Control N902 86-8

SN	LGH	WGT	Kt1	EYE	GILL	PSBR	THY	FAT	SPL	GUT	KID	LIV	BILE	SEX	HEM	LEU	SPR
1	108	11.8	0.9	N	N	N	N	0	R	0	N	B	0	F	42	0.0	3.8
2	118	14.8	0.9	N	N	N	N	0	R	0	N	B	0	F	42	0.0	3.5
3	178	50.8	0.8	N	N	N	N	0	R	0	N	B	0	F	43	0.0	5.1
4	195	63	0.9	N	N	N	N	0	R	0	N	B	0	F	44	0.0	4.2
5	179	50.3	0.9	N	N	N	N	0	R	0	N	B	0	F	38	0.0	4.4
6	136	22.1	0.9	N	N	N	N	0	R	0	N	B	0	F	39	0.0	5.0
7	127	17.5	0.9	N	N	N	N	0	R	0	N	B	0	F	37	0.0	5.2
8	168	42.8	0.9	N	N	N	N	0	R	0	N	B	0	F	40	0.0	5.1
9	180	54.9	0.9	N	N	N	N	0	R	0	N	B	0	F	40	0.0	4.8
10	158	35	0.9	N	N	N	N	0	R	0	N	B	0	F	40	0.0	5.0
11	188	61	0.9	N	N	N	N	0	R	0	N	B	0	F	36	0.0	4.9
12	204	76.7	0.9	N	N	N	N	0	R	0	N	B	0	F	37	0.0	5.0
13	159	37.2	0.9	N	N	N	N	0	R	0	N	B	0	F	36	0.0	4.8
14	187	58.2	0.9	N	N	N	N	0	R	0	N	B	0	F	37	0.0	5.1
15	163	40.1	0.9	N	N	N	N	0	R	0	N	B	0	F	37	0.0	5.0
16	193	63.8	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	5.2
17	185	62	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	5.5
18	151	32.1	0.9	N	N	N	N	0	R	0	N	B	0	F	37	0.0	5.5
19	201	73.8	0.9	N	N	N	N	0	R	0	N	B	0	F	41	0.0	5.6
20	133	22	0.9	N	N	N	N	0	R	0	N	B	0	F	37	0.0	5.7
21	169	44.9	0.9	N	N	N	N	0	R	0	N	B	0	F	42	0.0	5.0
22	175	50.9	0.9	N	N	N	N	0	R	0	N	B	0	F	36	0.0	4.3
23	192	64.5	0.9	N	N	N	N	0	R	0	N	B	0	F	40	0.0	4.6
24	180	51.8	0.9	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.6
25	179	52.3	0.9	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.7
26	182	74.6	0.9	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.7
27	172	58.8	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
28	170	46.1	0.9	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
29	192	43.7	0.9	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
30	211	95.8	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
31	205	86.6	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
32	172	51	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
33	146	28.9	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
34	139	24.5	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
35	148	31.9	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
36	183	56.9	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
37	185	60.8	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
38	187	60.8	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
39	214	11.5	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
40	109	35.1	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
41	154	75.1	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
42	203	46.5	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
43	175	46.5	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
44	208	81.4	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
45	131	19.9	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
46	140	25.3	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
47	203	76.9	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
48	189	61.7	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
49	192	66.6	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
50	122	17.4	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
51	170	46.9	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
52	182	57	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
53	205	83.8	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
54	159	39.7	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
55	142	26.4	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
56	176	54.3	1.0	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
57	197	7070	92.5	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
58	185	58.1	0.9	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
59	112	12.7	0.9	N	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8
60				B1	N	N	N	0	R	0	N	B	0	F	37	0.0	4.8

SUMMARY OF FISH AUTOPSY

LOCATION: COWLITZ RIVER

QUAL. CONTROL INSPECT. NO.: 7007

Species: CHINOOK

Autopsy Date: 03-12-91 Sample Size: 60

Strain: SPRING

Age: BY89 Tissue Collection No.: NA

Mark/Lot: NA

Disease Survey No.: NA

Unit: NA

Water Temp.: NA NA Case History No.: 7007

Fish Source: COWLITZ

Water Hardness: NA ppm Custody No.: NA

Egg Source: COWLITZ

Investigator: PM/BR

Hatching Date: NA

Reason for Autopsy: PRE-RELEASE YEARLINGS

Remarks: NA

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
Length	203.480 mm	15.44 mm	8%
Weight	85.120 gr	20.96 gr	25%
Ktl*	1.010	0.14	13%
Ctl**	3.649		
Hematocrit	41.220	5.26	13%
Leucocrit	0.930	0.55	59%
Serum Protein	5.560	i.2	22%

*Expressed as Ktl times 10 to the fifth power

**Converted from Ktl; expressed as Ctl times 10 to the fourth power

VALUES AS PERCENT OF TOTAL SAMPLE

EYES	GILLS	PSEUDO-BRANCHS	THYMUS	MESEN. FAT	SPLEEN	HIND GUT	KIDNEY	LIVER	BILE
N 100%	N 98%	N 100%	O 70%	O 2%	B 0%	O 100%	N 100%	A 92%	O 82%
B1 0%	F 0%	S 0%	I 27%	I 85%	R 98%	I 0%	S 0%	B 8%	I 38%
B2 0%	C 0%	L 0%	2 3%	2 13%	G 2%	2 0%	M 0%	C 0%	2 0%
E1 0%	M 0%	S&L 0%	x 0.3	3 0%	NO 0%	x 0.0	G 0%	D 0%	3 0%
E2 0%	P 2%	I 0%		4 0%	E 0%		U 0%	E 0%	x 0.4
H1 0%	OT 0%	OT 0%		x 1.1	OT 0%		OT 0%	F 0%	
H2 0%							OT 0%	OT 0%	
M1 0%									
M2 0%									
OT 0%									

Summary of Normals

100%	98%	100%	70%	100%	100%	100%	100%
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Summary of Means

		0.3	1.1		0.0			0.4
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SEX: M: 53% F: 47% U: 0%

GENERAL REMARKS

FINS 14 AD CLIPS, 2 FUNGUSED/FRAYED TAILS, 1 ERODED TAIL

SKIN NA

GONADS NA

OTHER 1 SWOLLEN THYMUS, 1 ANEURISM IN FAT CAP, 1 PALE BLOOD, 1 PALE GIL

Qual.Qual. Control N7007 86

SN	LGH	WGT	Kt1	EYE	GILL	PSBR	THY	FAT	GUT	KID	LIV	BILE	SEX	HEM	LEU	SPR
1	190	63.6	0.9	N	N	N	N	0	0	N	B	0	M	41	1.0	5.1
2	170	52.2	1.1	N	N	N	N	1	1	N	A	0	M	43	1.0	6.9
3	205	89.1	1.0	N	N	N	N	1	1	N	A	0	M	39	1.0	5.9
4	192	71	0.9	N	N	N	N	1	1	N	A	0	M	41	1.0	6.8
5	180	55.6	1.0	N	N	N	N	1	1	N	A	0	M	33	1.0	4.8
6	218	104	0.9	N	N	N	N	1	1	N	A	0	M	40	1.0	4.3
7	231	128	1.0	N	N	N	N	1	1	N	A	0	M	38	1.0	3.8
8	166	39.9	0.9	N	N	N	N	1	1	N	A	0	M	47	1.0	3.8
9	203	83	1.1	N	N	N	N	1	1	N	A	0	M	42	1.0	3.8
10	220	109	0.9	N	N	N	N	1	1	N	A	0	M	44	1.0	3.8
11	193	67.1	1.1	N	N	N	N	1	1	N	A	0	M	46	1.0	3.8
12	206	93.2	1.1	N	N	N	N	1	1	N	A	0	M	38	1.0	3.8
13	223	104	1.1	N	N	N	N	1	1	N	A	0	M	47	1.0	3.8
14	218	106	1.1	N	N	N	N	1	1	N	A	0	M	35	1.0	3.8
15	213	106	1.1	N	N	N	N	1	1	N	A	0	M	37	1.0	3.8
16	221	119	0.9	N	N	N	N	1	1	N	A	0	M	39	1.0	3.8
17	186	82	0.6	N	N	N	N	1	1	N	A	0	M	42	1.0	3.8
18	208	82	0.8	N	N	N	N	1	1	N	A	0	M	46	1.0	3.8
19	190	68	0.2	N	N	N	N	1	1	N	A	0	M	48	1.0	3.8
20	209	91	1.0	N	N	N	N	1	1	N	A	0	M	48	1.0	3.8
21	210	93.7	1.0	N	N	N	N	1	1	N	A	0	M	46	1.0	3.8
22	242	143	1.0	N	N	N	N	1	1	N	A	0	M	47	1.0	3.8
23	188	66.1	1.0	N	N	N	N	1	1	N	A	0	M	37	1.0	3.8
24	224	120	1.1	N	N	N	N	1	1	N	A	0	M	39	1.0	3.8
25	194	72.4	1.0	N	N	N	N	1	1	N	A	0	M	42	1.0	3.8
26	220	101	0.9	N	N	N	N	1	1	N	A	0	M	43	1.0	3.8
27	184	59.8	1.0	N	N	N	N	1	1	N	A	0	M	43	1.0	3.8
28	230	122	0.8	N	N	N	N	1	1	N	A	0	M	37	1.0	3.8
29	206	80.7	0.8	N	N	N	N	1	1	N	A	0	M	35	1.0	3.8
30	214	103	0.8	N	N	N	N	1	1	N	A	0	M	39	1.0	3.8
31	198	74.9	1.0	N	N	N	N	1	1	N	A	0	M	41	1.0	3.8
32	208	90.6	1.0	N	N	N	N	1	1	N	A	0	M	43	1.0	3.8
33	192	63.4	0.7	N	N	N	N	1	1	N	A	0	M	37	1.0	3.8
34	188	83.7	0.8	N	N	N	N	1	1	N	A	0	M	39	1.0	3.8
35	208	63.4	0.8	N	N	N	N	1	1	N	A	0	M	41	1.0	3.8
36	201	83.7	0.8	N	N	N	N	1	1	N	A	0	M	43	1.0	3.8
37	213	76.1	0.6	N	N	N	N	1	1	N	A	0	M	37	1.0	3.8
38	179	92.1	0.7	N	N	N	N	1	1	N	A	0	M	41	1.0	3.8
39	198	52.7	0.7	N	N	N	N	1	1	N	A	0	M	43	1.0	3.8
40	215	71.7	1.0	N	N	N	N	1	1	N	A	0	M	45	1.0	3.8
41	215	96.7	1.0	N	N	N	N	1	1	N	A	0	M	47	1.0	3.8
42	215	96.7	1.0	N	N	N	N	1	1	N	A	0	M	48	1.0	3.8
43	190	67.9	0.9	N	N	N	N	1	1	N	A	0	M	45	1.0	3.8
44	208	87.4	1.0	N	N	N	N	1	1	N	A	0	M	47	1.0	3.8
45	197	72.5	1.0	N	N	N	N	1	1	N	A	0	M	48	1.0	3.8
46	210	97.9	1.0	N	N	N	N	1	1	N	A	0	M	45	1.0	3.8
47	217	104	1.1	N	N	N	N	1	1	N	A	0	M	47	1.0	3.8
48	225	121	1.0	N	N	N	N	1	1	N	A	0	M	48	1.0	3.8
49	206	81.7	1.0	N	N	N	N	1	1	N	A	0	M	45	1.0	3.8
50	186	64.1	1.0	N	N	N	N	1	1	N	A	0	M	47	1.0	3.8
51	190	80.8	1.0	N	N	N	N	1	1	N	A	0	M	48	1.0	3.8
52	199	77.1	1.0	N	N	N	N	1	1	N	A	0	M	45	1.0	3.8
53	221	109	1.0	N	N	N	N	1	1	N	A	0	M	47	1.0	3.8
54	205	87.4	1.0	N	N	N	N	1	1	N	A	0	M	48	1.0	3.8
55	184	62.9	1.0	N	N	N	N	1	1	N	A	0	M	45	1.0	3.8
56	213	93.5	1.0	N	N	N	N	1	1	N	A	0	M	47	1.0	3.8
57	197	74.9	1.0	N	N	N	N	1	1	N	A	0	M	48	1.0	3.8
58	198	76.7	1.0	N	N	N	N	1	1	N	A	0	M	45	1.0	3.8
59																
60																

SUMMARY OF FISH AUTOPSY

LOCATION: Cowlitz

QUAL. CONTROL INSPECT. NO.: 924

Species: Chinook Autopsy Date: 04-18-90 Sample Size: 60
 Strain: Spring Age: BY89 Tissue Collection No.: NA
 Mark/Lot: NA Disease Survey No.: NA
 Unit: Pds. 6,30,34 Water Temp.: NA NA Case History No.: 924
 Fish Source: Cowlitz Water Hardness: NA ppm Custody No.: NA
 Egg Source: Cowlitz Investigator: PM-LW-KP
 Hatching Date: NA Reason for Autopsy: Pre-Lib Exam
 Remarks: NA

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
Length	92.430 mm	7.72 mm	8%
Weight	7.320 gr	1.83 gr	25%
Ktl*	0.930	0.06	6%
Ctl**	3.360		
Hematocrit	43.630	5.1	12%
Leucocrit	0.430	0.47	110%
Serum Protein	5.830	1.54	26%

*Expressed as K_{tl} times 10^3 to the fifth power
**Converted from K_{tl} ; expressed as K_{tl} times 1

**Converted from Ktl; expressed as Ctl times 10 to the fourth power

VALUES AS PERCENT OF TOTAL SAMPLE

Summary of Normals

100% 98% 98% 88% 100% 100% 100% 100%

Summary of Means

0.1 1.1 0.0 0.1

SEX: M: 67% F: 33% U: 0%

GENERAL REMARKS

FINS **NA**

SKIN NA

GONADS NA

OTHER Approx. 10% fish hemorrhag. from gills, short operculum-43,51,52.

Qual. Control No. 924

SUMMARY OF FISH AUTOPSY

LOCATION: COWLITZ RIVER

QUAL. CONTROL INSPECT. NO.: 7018

Species: CHINOOK Autopsy Date: 04-16-91 Sample Size: 60
Strain: SPRING Age: BY90 Tissue Collection No.: NA
Mark/Lot: NA Disease Survey No.: NA
Unit: NA Water Temp.: NA NA Case History No.: 7018
Fish Source: COWLITZ Water Hardness: NA ppm Custody No.: NA
Egg Source: COWLITZ Investigator: PM/JL/SE
Hatching Date: NA Reason for Autopsy: PRE-RELEASE ZEROS
Remarks: NA

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
Length	82.220 mm	7.62 mm	9%
Weight	5.060 gr	1.41 gr	28%
Ktl*	0.910	0.05	6%
Ctl**	3.288		
Hematocrit	43.710	4.39	10%
Leucocrit	0.770	0.32	42%
Serum Protein	5.860	0.86	15%

*Expressed as Ktl times 10 to the fifth power
**Converted from Ktl; expressed as Ctl times 10 to the fourth power

VALUES AS PERCENT OF TOTAL SAMPLE

Summary of Normals

100% 100% 100% 83% 100% 100% 100% 100%

Summary of Means

0.2 0.4 0.0 0.2

SEX: M: 37% F: 25% U: 38%

GENERAL REMARKS

FINS 16 ADIPOSE CLIP

SKTN NA

GONADS NA

OTHER 1 SHORTENED OPERCLE

Qual. Qual. Control N7018 86-8

SUMMARY OF FISH AUTOPSY

LOCATION: Cowlitz

QUAL. CONTROL INSPECT. NO.: 927

Species: Chinook Autopsy Date: 05-07-90 Sample Size: 60
 Strain: Fall Age: BY89 Tissue Collection No.: NA
 Mark/Lot: NA Disease Survey No.: NA
 Unit: Pds. 2,3,5,14,29,31. Water Temp.: NA NA Case History No.: 927
 Fish Source: NA Water Hardness: NA ppm Custody No.: NA
 Egg Source: NA Investigator: PM-BR-LW
 Hatching Date: NA Reason for Autopsy: Pre-Lib Exam
 Remarks: Spleen absent and pseudobranch hyperplastic on fish 24.

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
Length	75.350 mm	9.97 mm	13%
Weight	3.980 gr	1.7 gr	43%
Ktl*	0.930	0.07	7%
Ctl**	3.360		
Hematocrit	40.280	5.11	13%
Leucocrit	0.420	0.4	95%
Serum Protein	5.170	0.94	18%

*Expressed as Ktl times 10 to the fifth power

**Converted from Ktl; expressed as Ctl times 10 to the fourth power

VALUES AS PERCENT OF TOTAL SAMPLE

EYES	GILLS	PSEUDO-BRANCHS	THYMUS	MESEN. FAT	SPLEEN	HIND GUT	KIDNEY	LIVER	BILE
N 100%	N 92%	N 97%	O 97%	O 12%	B 2%	O 100%	N 100%	A 63%	O 110%
B1 0%	F 0%	S 2%	I 3%	I 88%	R 93%	I 0%	S 0%	B 30%	I 10%
B2 0%	C 0%	L 0%	2 0%	2 0%	G 0%	2 0%	M 0%	C 0%	2 0%
E1 0%	M 0%	S&L 0%	x 0.0	3 0%	NO 0%	x 0.0	G 0%	D 0%	3 0%
E2 0%	P 8%	I 0%		4 0%	E 3%		U 0%	E 0%	x 0.1
H1 0%	OT 0%	OT 2%		x 0.9	OT 2%		OT 0%	F 2%	
H2 0%							OT	5%	
M1 0%									
M2 0%									
OT 0%									

Summary of Normals

100%	92%	97%	97%	95%	100%	100%	93%
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Summary of Means

		0.0	0.9		0.0			0.1
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SEX: M: 55% F: 38% U: 7%

GENERAL REMARKS

FINS NA

SKIN NA

GONADS NA

OTHER Short operculum-20,29,34,42,45,52. White growths on liver-22,38.

Qual. Control No. 927

SUMMARY OF FISH AUTOPSY

LOCATION: COWLITZ RIVER

QUAL. CONTROL INSPECT. NO.: 7026

Species: CHINOOK Autopsy Date: 05-28-91 Sample Size: 60
 Strain: FALLS Age: BY90 Tissue Collection No.: NA
 Mark/Lot: NA Water Temp.: NA NA Disease Survey No.: NA
 Unit: NA Water Hardness: NA ppm Case History No.: 7026
 Fish Source: COWLITZ RIV Water Hardness: NA ppm Custody No.: NA
 Egg Source: COWLITZ RIV Investigator: PM/JL/JH
 Hatching Date: NA Reason for Autopsy: PRE-RELEASE ZEROS
 Remarks: NA

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
Length	69.620 mm	7.61 mm	11%
Weight	2.970 gr	1.01 gr	34%
Ktl*	0.880	0.06	7%
Ctl**	3.179		
Hematocrit	43.330	3.8	9%
Leucocrit	0.560	0.56	99%
Serum Protein	5.740	1.34	23%

*Expressed as Ktl times 10 to the fifth power

**Converted from Ktl; expressed as Ctl times 10 to the fourth power

VALUES AS PERCENT OF TOTAL SAMPLE

EYES	GILLS	PSEUDO-BRANCHS	THYMUS	MESEN. FAT	HIND GUT	KIDNEY	LIVER	BILE
N 100%	N 100%	N 100%	0 98%	0 72%	B 0%	0 100%	N 100%	A 47% 0 90%
B1 0%	F 0%	S 0%	1 2%	1 28%	R 100%	1 0%	S 0%	B 53% 1 30%
B2 0%	C 0%	L 0%	2 0%	2 0%	G 0%	2 0%	M 0%	C 0% 2 0%
E1 0%	M 0%	S&L 0%	x 0.0	3 0%	NO 0%	x 0.0	G 0%	D 0% 3 0%
E2 0%	P 0%	I 0%		4 0%	E 0%		U 0%	E 0% x 0.3
H1 0%	OT 0%	OT 0%		x 0.3	OT 0%		OT 0%	F 0% OT 0%
H2 0%								
M1 0%								
M2 0%								
OT 0%								

Summary of Normals

100%	100%	100%	98%	100%	100%	100%	100%
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Summary of Means

	0.0	0.3		0.0				0.3
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SEX: M: 43% F: 30% U: 27%

GENERAL REMARKS

FINS NA

SKIN NA

GONADS NA

OTHER NA

Qual. Qual. Control N7026