

CLACKAMAS SUBBASIN FISH MANAGEMENT PLAN

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Table 7. Monthly sport catch^a of steelhead in the Clackamas River, 1956-65. (Modified from Howell et al. 1985).

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1956	232	249	461	693	154	186	55	29	12	20	52	322	2,465
1957	103	159	301	210	60	39	4	18	4	12	27	56	993
1958	302	181	221	178	103	47	6	31	3	--	31	171	1,274
1959	362	239	222	145	64	4	4	21	51	102	38	371	1,623
1960	263	348	185	224	85	6	--	3	6	10	29	202	1,361
1961	251	143	283	208	43	4	25	29	10	22	56	626	1,700
1962	729	351	511	1,115	85	37	14	31	27	37	41	440	3,418
1963	100	291	191	446	116	16	--	--	--	23	113	423	1,719
1964	565	565	464	474	57	14	24	10	10	20	57	504	2,764
1965	526	649	457	372	84	12	4	27	31	15	61	200	2,438
Average	343	318	330	407	85	37	15	22	17	26	51	332	1,976
Percent	17.3%	16.0%	16.6%	20.5%	4.3%	1.8%	0.8%	1.1%	0.9%	1.3%	2.5%	16.7%	

^a Estimated from salmon steelhead angler catch records. Not corrected for non-response bias.

production releases below the North Fork Dam. The Big Creek stock of winter steelhead is believed to return to the subbasin at a somewhat earlier date than the native stock. The shift in temporal distribution is believed to reflect an increase in the number of adults returning from the production releases and a general decline in the number of naturally produced adults.

The best index of run size for the wild stock of winter steelhead are counts made at a fish ladder located at the North Fork Dam. A photographic counter is used to record each fish passing through the ladder. Winter steelhead passing the dam are interpreted to be primarily of natural origin while the harvest estimates and hatchery returns include a greater proportion of hatchery fish. From 1964 to 1973, an average of approximately 2,000 naturally produced winter steelhead passed the North Fork Dam annually. From 1977 to 1988, an average of approximately 1,600 adult winter steelhead (primarily native stock, but some Big Creek stock) passed the North Fork Dam annually. A linear regression of run year on dam counts shows passage declined about 15 fish per year from 1964 to 1988.

Hutchinson and Aney (1964) reported that winter steelhead spawn in May for those tributaries entering the Willamette River from the west side. Kelts are primarily observed at the North Fork Dam prior to June, which indicates that spawning is probably completed by this time (Howell et al. 1985). A general range for time of spawning is presented in Figure 5.

Table 8. Counts of adult winter steelhead passing North Fork Dam (PGE and ODFW).

Run Year	Month								Total Run
	N	D	J	F	M	A	M	J	
1957-58	11	5	3	4	0	399	1,192	34	1,648
1958-59	0	10	1	0	0	137	376	32	556
1959-60	0	0	2	0	0	75	890	181	1,148
1960-61	0	0	0	0	1	343	1,788	72	2,204
1961-62	0	0	0	0	2	1,506	2,502	351	4,361
1962-63	1	0	0	2	11	94	2,069	60	2,237
1963-64	1	0	0	0	0	218	1,554	109	1,882
1964-65	3	0	0	5	0	196	1,312	36	1,552
1965-66	3	0	1	0	0	2	1,158	126	1,290
1966-67	0	0	1	3	2	28	608	40	682
1967-68	3	3	2	10	5	35	721	11	790
1968-69	16	17	4	2	32	341	1,787	117	2,316
1969-70	10	13	2	30	81	946	1,692	35	2,809
1970-71	14	6	86	133	202	1,212	2,514	182	4,349
1971-72	4	20	18	64	62	559	1,784	123	2,634
1972-73	21	8	2	3	47	979	834	3	1,897
1973-74	1	2	9	7	11	132	451	58	671
1974-75	31	9	33	10	12	384	1,047	0	1,526
1975-76	5	55	26	11	60	350	675	0	1,182
1976-77	8	0	0	109	215	724	432	39	1,527
1977-78	0	139	75	177	515	738	329	14	1,987
1978-79	0	231	2	151	177	458	474	18	1,511
1979-80	0	0	120	116	136	853	840	0	2,065
1980-81	0	233	125	250	291	632	1,161	5	2,697
1981-82	60	132	25	8	68	445	692	16	1,446
1982-83	0	0	13	21	34	368	638	25	1,099
1983-84	26	34	35	50	106	176	785	26	1,238
1984-85	4	41	1	26	126	268	736	23	1,225
1985-86	0	0	72	40	126	381	783	30	1,432
1986-87	1	1	21	70	86	541	562	36	1,318
1987-88	5	35	10	19	278	799	627	0	1,773
1988-89	0	0	53	19	216	160	785	18	1,251
1989-90	0	22	23	69	420	603	347	3	1,487
1990-91	13	8	10	247	77	271	210	1	837

(continued)

Table 9. Counts of juvenile wild steelhead passing North Fork Dam, Clackamas River.

Year	Month												Annual Total
	J	F	M	A	M	J	J	A	S	O	N	D	
1959	0	0	193	5,151	30,293	682	9	0	0	0	8	0	36,336
1960	0	0	14	3,556	32,927	2,390	1	0	0	0	0	0	38,888
1961	0	0	0	3,427	13,177	1,090	0	0	0	0	0	0	17,694
1962	0	0	0	2,985	16,923	2,555	9	0	0	11	14	34	22,531
1963	3	2	87	2,914	20,603	1,058	4	0	0	0	110	27	24,808
1964	22	27	10	1,071	26,535	2,891	47	90	0	0	7	27	30,727
1965	0	0	2	2,358	11,001	496	1	0	0	0	0	0	13,858
1966	0	0	60	1,770	8,698	505	2	0	0	0	0	0	11,035
1967	0	0	23	1,848	25,562	3,973	0	0	0	0	0	0	31,406
1968	0	0	221	5,683	28,490	1,360	4	0	0	0	0	0	35,758
1969	0	0		2,544	21,952	4,681	10	0	0	0	0	0	29,187
1970	0	0	74	2,975	27,069	1,337	2	0	0	0	0	0	31,457
1971	0	0	50	1,834	15,144	2,072	11	0	0	0	0	0	19,111
1972	0	0	191	2,305	11,503	1,475	2	0	0	0	0	0	15,476
1973	0	0	12	3,660	16,875	856	0	0	0	0	0	0	21,403
1974	3	0	87	2,024	21,973	3,213	3	2	1	0	0	0	27,306
1975	0	0	15	698	23,111	4,167	27	1	1	0	0	4	28,024
1976 ^a	1	13	64	6,332	86,110	12,881	132	16	8	14	6	20	105,597
1977	9	4	18	3,324	27,180	3,094	25	0	0	12	94	32	33,792
1978	3	12	205	19,167	56,303	1,681	132	136	11	0	0	178	77,828
1979	2	33	52	1,751	35,851	3,239	25	1	0	97	224	59	41,334
1980	7	1	56	7,457	36,540	4,165	5	0	0	0	0	0	48,231
1981	0	53	526	14,195	28,030	746	8	0	0	0	0	0	43,558
1982			489	3,870	38,213	1,968	4	0	0	0	0	0	44,544
1983	0	4	260	7,518	23,191	628	6	2	4	2	0	0	31,615
1984	16	2	109	4,062	32,674	3,404	366	1	1	12	0	0	40,647
1985	0	0	13	4,203	26,805	3,973	19	2	6	42	65	24	35,152
1986	5	56	734	22,628	26,237	695			6	33	19	27	50,440
1987	0	8	360	16,408	30,086	685	2	24	21	8	10	112	47,724
1988	13	4	105	5,901	29,983	1,782	12	0	16	12	60	90	37,978
1989	4	8	26	5,297	31,476	3,427	2	0	36	42	16	38	40,372
1990	14	8	172	11,535	22,721	1,527	18	0	4	13	131	255	36,398
1991	86	11	70	5,877	35,022	3,536	14	0	1	57	116	48	44,838
AVERAGES:													
63-67	5	6	36	1,992	18,480	1,785	11	18	0	0	23	11	22,367
68-72	0	0	107	3,068	20,832	2,185	6	0	0	0	0	0	26,198
73-77	3	3	39	3,208	35,050	4,842	37	4	2	5	20	11	43,224
78-82	2	20	266	9,288	38,987	2,360	35	27	2	19	45	47	51,099

(continued)

Table 11. Counts of adult and juvenile winter and summer steelhead (StW and StS) at North Fork Dam, Clackamas River Oregon (modified from D. Cramer, PGE).

Run Year	StW				StS & StW Smolts			
	Adult StW AOC	Adult StS 391	Smolts/ Adult	Sm to Ad Survival	Year	Wild	Hatchery ^a	W & H
1960 ^b	1,148	0	--	--	1960	38,888	0	38,888
1961	2,204	0	--	--	1961	17,694	0	17,694
1962	4,360	0	--	--	1962	22,531	6,780	29,311
1963	2,237	0	--	--	1963	24,808	2,963	27,771
1964	1,883	0	16.6	--	1964	30,727	8,054	38,781
1965	1,552	0	23.0	--	1965	13,858	0	13,858
1966	1,290	0	22.6	--	1966	11,035	0	11,035
1967	682	0	45.9	4.9%	1967	31,406	0	31,406
1968	790	0	24.1	7.2%	1968	35,758	0	35,758
1969	2,316	0	6.7	7.4%	1969	29,187	0	29,187
1970	2,809	0	7.6	7.9%	1970	31,457	6,085	37,542
1971	4,349	0	6.3	14.9%	1971	19,111	2	19,113
1972	2,634	202	--	8.4%	1972	15,476	25,091	40,567
1973	1,897	97	--	9.9%	1973	21,403	45,519	66,922
1974	671	810	--	--	1974	27,306	41,587	68,893
1975	1,526	2,269	--	--	1975	28,024	82,654	110,678
1976	1,182	1,507	--	--	1976	--	--	105,561
1977	1,527	3,430	--	--	1977	33,692	116,680	150,372
1978	1,987	4,120	--	--	1978	77,728	154,871	232,599
1979	1,511	4,358	--	--	1979	41,334	63,987	105,321
1980	2,065	5,803	--	--	1980	48,611	91,328	139,939
1981	2,697	4,714	--	--	1981	43,558	93,229	136,787
1982	1,446	4,138	--	--	1982	44,544	142,399	186,943
1983	1,099	1,948	--	--	1983	31,613	35,977	67,590
1984	1,238	11,062	--	--	1984	40,647	92,646	133,293
1985	1,225	5,549	--	--	1985	35,152	48,526	83,678
1986	1,432	7,422	--	--	1986	50,440	97,425	147,865
1987	1,318	4,444	--	--	1987	47,724	86,147	133,871
1988	1,749	7,750	--	--	1988	37,978	115,636	153,614
1989	1,251	3,951	--	--	1989	40,372	146,686	187,058
1990	1,487	4,284	--	--	1990	36,398	111,101	147,499
1991	837	2,222	--	--	1991	44,838	87,737	132,575
MEAN:	1,762	4,004	19.1	8.7%	1977-91	43,642	98,958	142,600
AVERAGES:								
1965-69	1,326	--	--	--		24,249	--	--
1970-74	2,472	--	--	--		22,951	23,657	46,607
1975-79	1,547	3,137	--	--		45,195	83,638	140,906
1980-84	1,709	5,533	--	--		41,795	91,116	132,910
1985-89	1,395	5,823	--	--		42,333	98,884	141,217

^a The 1962-64 releases were winter steelhead (Eagle Creek stock) and the 1970-91 releases were summer steelhead (Skamania/Foster stock).

^b Winter steelhead runs are listed in the year they terminate.

Table 19. Subbasin harvest, run size and escapement of winter steelhead by run year in the Clackamas River and its tributaries.

Stream	Run Year											Average		
	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90		1990-91	1980-91
<u>Lower Clackamas River Harvest</u>														
Clackamas River (28)	6,467	5,489	4,724	3,328	4,740	6,930	4,520	4,330	5,527	3,961	4,700	2,926	4,804	4,704
Deep Creek (57)	42	36	37	17	57	26	35	77	49	28	39	16	38	41
Eagle Creek (67)	1,549	1,231	1,502	1,301	2,077	1,870	1,115	590	788	1,066	1,156	1,033	1,273	1,212
Clear Creek (33)	73	70	109	99	95	49	42	44	64	57	63	55	68	59
<u>Upper Clackamas River Harvest</u>														
Clackamas River (20)					129	298	172	108	86	57	70	43	120	120
Collawash River (30)	30	9	0	68	3	28	0	0	0	0	0	0	12	4
Hot Springs Fork (37)	7	0	0	7	3	8	0	0	0	0	0	0	2	1
Subbasin Harvest	8,168	6,835	6,372	4,820	7,104	9,209	5,884	5,149	6,514	5,169	6,028	4,073	6,277	6,141
North Fork Dam Count (101)	2,065	2,697	1,446	1,099	1,238	1,225	1,432	1,318	1,773	1,251	1,487	837	1,489	1,320
ECNFH returns (223)	568	367	705 (416)	636	1,431	1,288	502	555 (567)	667	587 (401)	519 (417)	448	689	750
Lower Clackamas Catch	8,131	6,826	6,372	4,745	6,969	8,875	5,712	5,041	6,428	5,112	5,958	4,030	6,183	6,016
Estimated run b	10,764	9,890	8,523	6,480	9,638	11,388	7,646	6,914	8,954	6,950	7,964	5,315	8,361	8,086
Estimated escapement c	2,596	3,055	2,151	1,660	2,534	2,179	1,762	1,765	2,440	1,838	1,936	1,242	2,044	1,945

a The mainstem was listed under one stream code prior to 1984. Run size estimates prior to 1984 include some fish which were counted twice, once at the dam and once in the harvest. This may amount to several hundred fish based on harvest data from 1984 on.

b Estimated run is ECNFH returns + North Fork Dam count + lower river harvest. It does not include escapement to lower river tributaries.

c Estimated escapement is ECNFH returns + North Fork Dam count - upper river harvest. It does not include escapement to lower river tributaries.

Table 21. Subbasin harvest, run size and escapement of summer steelhead by run year in the Clackamas River and its tributaries.

Stream	Run Year											Average		
	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90		1990-91	1979-91
<u>Lower Clackamas River Harvest</u>														
Clackamas River ⁽²⁷⁾	3,382	5,001	3,986	4,300	2,011	2,585	1,330	2,049	2,050	4,035	2,121	1,444	2,858	2,231
Deep Creek ⁽⁵⁸⁾	0	3	0	4	0	0	0	0	0	0	0	0	1	0
Eagle Creek ⁽⁶⁶⁾	42	39	0	81	0	0	4	0	0	0	0	0	0	14
<u>Upper Clackamas River Harvest</u>														
Clackamas River ⁽²⁹⁾						7,185	3,784	4,846	4,060	4,437	2,681	1,640	--	4,090
Collawash River ⁽³⁴⁾	266	466	561	417	45	508	206	0	0	0	0	0	206	102
Hot Springs Fork ⁽³⁶⁾	26	69	47	112	17	116	73	0	0	0	0	0	38	27
Subbasin Harvest	3,716	5,578	4,594	4,914	2,073	10,394	5,397	6,895	6,110	8,472	4,802	3,084	5,502	6,450
North Fork Dam Count ⁽³⁷⁾	4,358	5,803	4,714	4,138	1,948	11,062	5,549	7,422	4,444	7,750	3,951	4,284	5,280	6,352
Lower Clackamas Catch						2,585	1,334	2,049	2,050	4,035	2,121	1,444	NA	2,231
Estimated run b						13,647	6,883	9,471	6,494	11,785	6,072	5,728	NA	8,583
Estimated escapement c						3,253	1,486	2,576	384	313	1,270	2,644	NA	2,133
Assoc. smolt release d	188,911	194,557	182,022	156,934	153,686	129,749	153,288	170,354	164,544	152,899	158,932	161,708	163,965	155,925
Smolt to adult						10.5%	4.5%	6.5%	4.0%	7.7%	3.8%	2.3%	NA	5.5%

a The mainstem was listed under one stream code prior to 1984. Run size estimates are not possible for those years.

b Estimated run is North Fork Dam count + lower river harvest. It does not include escapement to lower river tributaries.

c Estimated escapement is estimated run - subbasin harvest. It does not include escapement to lower river tributaries.

d Associated smolt release is that from two years prior to the run. For example the smolt releases for the 1975-76 harvest year occurred in 1973.

Table 22. Counts of adult summer steelhead passing through the North Fork fish ladder.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1972	0	0	0	0	0	4	86	88	19	0	0	0	202
1973	0	0	0	0	0	10	15	27	26	13	6	0	97
1974	0	0	0	0	0	66	408	282	44	10	0	0	810
1975	0	0	0	10	54	1,063	867	206	30	30	9	0	2,269
1976	0	0	0	0	21	484	651	254	88	9	0	0	1,507
1977	0	0	0	16	417	1,242	982	295	196	137	145	0	3,430
1978	0	0	0	84	440	1,626	984	348	533	94	11	0	4,120
1979	0	0	0	0	574	1,192	1,459	340	330	401	62	0	4,358
1980	0	0	0	0	207	506	3,082	1,314	364	137	193	0	5,803
1981	0	0	0	0	285	1,727	2,310	223	98	71	0	0	4,714
1982	0	0	0	11	482	1,751	1,426	325	95	45	3	0	4,138
1983	0	0	0	4	35	300	725	483	201	53	147	0	1,948
1984	0	0	0	15	218	1,991	5,004	950	1,676	338	870	0	11,062
1985	0	0	0	6	269	2,439	1,673	621	302	168	71	0	5,549
1986	0	0	0	36	473	3,291	2,570	638	231	44	139	0	7,422
1987	0	0	0	10	130	1,448	1,833	744	101	80	21	77	4,444
1988	11	0	0	35	443	3,321	2,833	489	219	52	303	44	7,750
1989	0	0	0	11	114	1,797	1,508	357	37	35	48	44	3,951
1990	0	0	0	137	604	1,835	1,276	223	108	70	31	0	4,284
1991	1	2	0	28	109	643	1,002	277	141	10	12	0	2,225
1979-90													
Average	1	0	0	22	303	1,711	2,054	537	300	116	146	13	5,204
Percent	0	0	0	0	6	33	39	10	6	2	3	0	100

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Table 25. Catch, escapement and run size of spring chinook in the Clackamas River Subbasin, 1958-91.

Year	Catch ^{a,b}	Escapement						Run Size ^b	Will. R. Catch & Escapement ^b
		Hatchery Returns		North Fork			Total ^b		
		Eagle Cr.	Clackamas	Dam Counts	Jacks ^c	Other ^d			
1958	--	0	--	475	88	--	2,100	--	60,700
1959	400	0	--	567	278	--	3,000	--	50,400
1960	400	510	--	287	106	1,003	1,800	2,200	22,400
1961	600	1,072	--	370	147	758	2,200	2,800	25,300
1962	1,400	2,821	--	666	96	487	4,000	5,400	35,100
1963	--	2,448	--	616	81	936	4,000	--	43,900
1964	500	1,303	--	448	103	1,749	3,500	4,000	54,900
1965	600	331	--	511	204	2,158	3,000	3,600	38,100
1966	800	948	--	277	59	1,775	3,000	3,800	41,000
1967	600	749	--	147	18	2,104	3,000	3,600	71,400
1968	600	352	--	501	93	1,147	2,000	2,600	45,000
1969	500	591	--	984	75	925	2,500	3,000	50,000
1970	800	253	--	652	76	595	1,500	2,300	52,100
1971	1,000	1,254	--	381	48	365	2,000	3,000	64,600
1972	1,300	790	--	303	113	907	2,000	3,300	44,700
1973	300	861	--	514	58	625	2,000	2,300	52,000
1974	1,100	1,083	--	504	54	413	2,000	3,100	69,500
1975	700	283	--	401	39	316	1,000	1,700	31,500
1976	600	1,152	--	461	28	387	2,000	2,600	38,400
1977	2,000	1,591	--	504	69	905	3,000	5,000	54,000
1978	1,300	1,446	--	739	323	805	3,000	4,300	67,300
1979	2,100	2,810	--	838	246	152	3,800	5,900	39,500
1980	4,200	1,353	1,024	2,172	50	713	5,300	9,500	36,000
1981	3,400	812	1,065	3,169	182	654	5,700	9,100	40,600
1982	3,500	905	573	3,119	209	203	4,800	8,300	65,100
1983	4,600	522	1,923	2,685	87	1,770	6,900	11,500	44,400
1984	4,900	1,032	2,521	2,835	102	512	6,900	11,800	62,900
1985	2,400	726	946	1,834	140	594	4,100	6,500	50,000
1986	2,900	661	785	1,960	163	694	4,100	7,000	54,200
1987	3,800	1,800	1,005	2,292	133	1,300	6,400	10,200	73,600
1988	2,863	1,373	1,253	3,140	51	300	6,100	9,000	95,000
1989	3,068	1,321	865	2,938	85	600	5,700	8,800	93,400
1990	8,824	869	1,921	3,444	56	500	6,700	15,500	94,300
1991	5,848	88	2,776	4,659	75	500	8,000	13,900	83,000
Averages:									
1970-79	1,100	1,152	--	530	105	547	2,200	3,400	51,400
1980-91	4,192	955	1,388	2,854	111	695	5,900	10,000	72,045

- ^a Estimated from returns of salmon-steelhead angling tags corrected for non-response bias.
- ^b Rounded to the nearest 100 fish.
- ^c Jacks are included in total.
- ^d Other escapement includes estimates of spawning fish below River Mill Dam and between River Mill and North Fork Dams.

Table 26. Counts of upstream migrant spring chinook at River Mill (1952-55) and North Fork (1958-91) fish ladders, Clackamas River, Oregon.

Year	Month							Total
	May	Jun	Jul	Aug	Sep	Oct	Nov	
1952	9	72	214	161	30	10	0	496
1953	0	38	292	252	81	5	1	669
1954	0	37	289	170	30	9	0	535
1955	0	0	183	138	56	30	0	407
1956-7	Count data incomplete -- -- -- -- --							--
1958	11	33	129	45	212	40	5	475
1959	14	10	40	8	174	321	0	567
1960	0	25	73	23	115	49	0	285
1961	0	141	96	2	106	25	0	370
1962	0	134	149	106	232	45	0	666
1963	6	166	55	22	221	142	4	616
1964	0	21	125	93	165	44	0	448
1965	2	183	239	59	24	4	0	511
1966	1	5	113	41	80	37	0	277
1967	1	11	54	12	34	35	0	147
1968	0	3	253	144	80	21	0	501
1969	0	500	193	86	160	44	1	984
1970	4	263	231	57	67	30	0	652
1971	0	61	201	55	53	11	0	381
1972	0	5	76	83	94	45	0	303
1973	5	191	91	40	136	50	0	513
1974	0	1	186	99	162	56	0	504
1975	0	14	112	159	74	42	0	401
1976	6	81	150	64	117	42	0	460
1977	22	93	59	71	143	112	1	501
1978	0	95	108	110	298	125	2	738
1979	0	231	184	57	206	158	2	838
1980	4	209	438	429	763	281	4	2,128
1981	44	498	512	509	1,123	483	0	3,169
1982	20	242	632	458	1,506	263	0	3,121
1983	0	342	157	330	1,669	185	2	2,685
1984	5	212	809	125	1,406	278	0	2,835
1985	5	217	553	254	663	141	1	1,834
1986	6	789	459	117	548	39	0	1,958
1987	15	1,004	528	192	533	143	10	2,425
1988	7	904	763	342	971	152	1	3,140
1989	18	889	627	399	824	181	0	2,938
1990	55	545	923	678	1,038	205	0	3,444
1991	15	271	1136	885	2,072	280	0	4,659
AVERAGES:	<u>1950-59</u>							
Number	10	48	181	100	79	53	3	461
% of Run	2.1%	10.4%	39.3%	21.7%	17.2%	11.5%	0.7%	100.0%
	<u>1960-69</u>							
Number	3	119	135	59	122	45	3	481
% of Run	0.5%	24.7%	28.1%	12.2%	25.3%	9.3%	0.5%	100.0%
	<u>1980-90</u>							
Number	16	532	582	349	1,004	214	2	2,699
% of Run	0.6%	19.7%	21.6%	12.9%	37.2%	7.9%	0.1%	100.0%

Table 33. Comparison of Clackamas River spring chinook angling effort and catch, 1979-1991 (modified from Bennett 1991).^a

Year	Angler Days (Thousands)			Catch (Thousands)			Catch/ Angler Day		Days/Fish	
	Boat	Bank	Total	Boat	Bank	Total	Boat	Bank	Boat	Bank
1979	5.6	2.7	8.3	0.8	0.5	1.3	0.14	0.19	7.0	5.4
1980	9.1	5.0	14.1	2.3	0.9	3.2	0.25	0.18	4.0	5.6
1981	10.2	4.9	15.1	1.6	0.7	2.3	0.16	0.14	6.4	7.0
1982	8.6	7.8	16.4	1.3	1.1	2.4	0.15	0.14	6.6	7.1
1983	10.6	8.5	19.1	2.6	2.0	4.6	0.25	0.24	4.1	4.3
1984	13.5	10.6	24.1	2.6	1.6	4.2	0.19	0.15	5.2	6.6
1985	13.6	9.4	23.0	1.6	0.9	2.5	0.12	0.10	8.5	10.4
1986	13.5	8.3	21.8	2.5	1.4	3.9	0.19	0.17	5.4	5.9
1987	9.8	3.0	12.8	2.6	0.6	3.2	0.27	0.20	3.8	5.0
1988	10.5	9.0	19.5	2.2	0.5	2.7	0.21	0.06	4.8	18.0
1989	11.3	7.3	18.6	2.2	0.8	3.0	0.19	0.11	5.1	9.1
1990	13.2	8.9	22.1	3.2	1.5	4.7	0.24	0.17	4.1	5.9
1991	12.1	13.6	25.7	2.9	1.0	3.9	0.24	0.07	4.2	13.6
1979-91 Avg.	10.9	7.6	18.5	2.2	1.0	3.2	0.20	0.15	5.3	8.0

^a The first years that angler days were estimated for boat and bank fisheries was 1979.

Management Considerations

Clackamas Hatchery is currently operating at full production capacity. A number of diseases have been detected in spring chinook at Clackamas Hatchery. Those of greatest concern are infectious hematopoietic necrosis (IHN), viral erythropoietic necrosis (VEN), furunculosis, and ichthyophthirius ("Ich"). IHN was detected in all ponds rearing 1986 brood juveniles scheduled for release in 1987 and 1988. Smolt losses at the hatchery from IHN have been about 5% for previous broods. Additional mortality of infected fish after release is unknown. VEN has been detected just at the time of release in the fall, so subsequent mortality from this disease is unknown. VEN may become more of a problem in overwintering fish released in the spring. Both IHN and VEN are viral diseases, for which there is no treatment. Losses from Ich primarily during July and August have been about 10% to 12%. Furunculosis has caused about 7% mortality (personal communication, T. Kreps, ODFW, Clackamas, Oregon).

Infectious diseases of hatchery fish, particularly IHN, are a concern not only in terms of the effect on survival, but also as a possible source of disease transmission to other wild salmonid populations present in the subbasin. Hatchery adults that do not enter the hatchery may carry the disease above North Fork Dam. To minimize the impact on native stocks of anadromous salmonids and trout, the release of infected fish is restricted to sites below the dams. Because Clackamas Hatchery derives its water supply from the mainstem, disease organisms can be transmitted to

Table 34. Clackamas River fall chinook redd counts from the mouth to River Mill Dam (1967-1991), sport catch in the lower and upper Clackamas, and Eagle Creek (1971-1991); and estimated run size (modified from Smith et al. 1988 and ODFW 1989).

Year	Redd Count	Redds per mile	Sport Catch				Est. Run Size ^d
			Lower	Upper	Eagle	Total	
1967	367	15.5	--	--	--	--	1,635
1968	206	8.7	--	--	--	--	918
1969	89	3.8	--	--	--	--	396
1970	59	2.5	--	--	--	--	263
1971	89	3.8	497	--	--	497	893
1972	110	4.6	234	--	247	481	971
1973	426	18.0	53	--	149	202	2,100
1974	554	23.4	200	--	--	200	2,668
1975	436	18.4	54	--	--	54	1,996
1976	274	11.6	153	--	--	153	1,374
1977	180	7.6	8	--	53	61	863
1978	(a)	--	57	--	171	228	228
1979	196	8.3	114	--	114	228	1,101
1980	224	9.4	194	--	172	366	1,364
1981	229	9.7	135	--	3	138	1,158
1982	371	15.6	188	--	172	360	2,013
1983	221	9.3	126	(b)	3	129	1,114
1984	85	3.6	19	3	83	102	481
1985	63	2.7	81	4	145	226	507
1986	158	6.7	49	15	166	215	919
1987 ^c	147	6.2	82	--	87	169	830
1988	125	5.3	66	0	171	236	799
1989	114	3.0	112	0	97	209	722
1990	50	1.32	48	0	9	57	282
1991	59	1.50	107	0	49	156	422
1977-91	159	6.4	92	6	100	192	854

^a No count made.

^b The main stem was listed under one stream code prior to 1984. Estimated upper Clackamas fall chinook harvest not included in total. No fall chinook were observed passing North Fork Dam.

^c Catch estimate not complete.

^d Run size was estimated using an average fish/redd from the Willamette River above Willamette Falls (4.5 fish/redd) and adding sport harvest.