

Ocean Abundance Projections and Prospective Harvest Levels for Klamath River Fall Chinook, 2010 Season

Klamath River Technical Team
19 March 2010

Summary

Predictor performance for 2009 and forecasts for 2010 are:

	Age	2009			2010 Forecast
		Preseason	Postseason	Pre/Post	
Ocean Abundance	3	474,900	368,300	1.29	223,400
	4	25,200	23,000	1.10	106,300
	5	5,600	7,100	0.79	1,800
Proportion Natural	3	0.63	0.70	0.90	0.63
	4	0.60	0.61	0.98	0.70
	5	0.73	0.94	0.77	0.75
Ocean Harvest Rate	4	0.001	0.000	---	---
Ocean Fall Harvest	3	---	0	---	---
	4	---	77	---	---
	5	---	0	---	---

The implications of the 2010 forecast ocean abundances, proportions natural, and the 2009 ocean fall harvest for fisheries management in 2010 were explored with the Klamath Ocean Harvest Model (KOHM) under three hypothetical management scenarios: (A) no additional ocean fisheries (commercial and recreational) from Jan–Aug 2010 between Cape Falcon and Point Sur (77 Klamath River fall Chinook were estimated to be harvested in the ocean during the Sept–Nov 2009 period) and no Klamath River fisheries (tribal and recreational) in 2010, (B) the 2009 ocean fishery seasons and quotas, the 2009 river recreational quota of 30,800 adults, and a tribal allocation of 50% (of total harvest), and (C) the 2007 ocean fishery seasons and quotas, the 2007 river recreational allocation of 26% (of nontribal harvest), and a tribal allocation of 50% (of total harvest). The results are:

Sector	KOHM Forecasts		
	(A) No-fishing in 2009	(B) 2009 Regulations	(C) 2007 Regulations
Adult Spawners			
Natural Areas	86,100	41,800	40,700
Hatcheries	41,300	20,300	20,300
Adult Harvest			
Ocean Commercial	0	0	20,400
Ocean Recreational	100	200	5,600
River Recreational	0	30,800	9,100
Tribal	0	31,000	35,200
Age-4 Ocean Harvest Rate	0.00	0.00	0.15
Spawner Reduction Rate	0.00	0.52	0.53

With no further fishing in 2010 on the current stock, the expected number of natural area adult spawners would be 86,100, with an expected age-4 ocean harvest rate of 0% (less than 100 KRFC were harvested in the

Sept–Nov 2009 period). Applying 2009 fishery regulations resulted in 41,800 natural area adult spawners and an age-4 ocean harvest rate of 0%. Applying 2007 fishery regulations resulted in 40,700 natural area adult spawners and an age-4 ocean harvest rate of 15%. These forecasts are provided for informational purposes only; the Pacific Fishery Management Council (PFMC) will adopt 2010 ocean salmon fishery management regulations in April 2010.

Introduction

The Council's fishery management plan for Klamath River fall Chinook (PFMC 1988; Amendment 9) permits a natural spawner reduction rate via fisheries of no more than 2/3, with a minimum escapement of 35,000 natural area adult spawners (Prager and Mohr 2001). Natural area adult spawners are defined as age-three or older fall Chinook that spawn outside of the hatchery environment, regardless of their origin. The KOHM is used by the PFMC to forecast the impacts of ocean and river fisheries on Klamath River fall Chinook, and to evaluate whether a given management option is expected to meet the fishery management plan's biological goals for Klamath River fall Chinook. The KOHM requires forecasts of Klamath River fall Chinook ocean abundance and proportion of natural spawners by age, along with the estimated harvest of these fish in the previous calendar year's September through December (fall) ocean fisheries. This report presents these forecasts and estimates for the 2010 management year. For informational purposes, KOHM forecasts of harvest and spawner escapement also are presented under three hypothetical management scenarios: (A) no ocean or river fisheries in 2010, (B) the 2009 ocean fishery seasons and quotas, the 2009 river recreational quota of 30,800 adults, and a tribal allocation of 50% (of total harvest), and (C) the 2007 ocean fishery seasons and quotas, the 2007 river recreational allocation of 26% (of nontribal harvest), and a tribal allocation of 50% (of total harvest). Historical records of ocean abundance, harvest, harvest rates, river escapement, and predictor performance are also compiled. These records differ from those presented in KRTAT reports issued prior to 2002 for reasons described in KRTAT (2002) and Goldwasser et al. (2001).

Data and Analytical Methods

The age-composition of the 2009 river run of Klamath River fall Chinook salmon used in this report is from the KRTT (2010).

Ocean Abundance Forecast

The age-specific ocean abundance predictors are based on the use of a sibling regression. The age *a* September 1 ocean abundance estimates for brood years 1979-2005 were regressed against the age *a-1* river run-size estimates of their respective cohorts (Table 1, Figure 1). By convention, September 1 is the date that immature Klamath River fall Chinook remaining in the ocean are incremented one year in age. The regressions were fit using least-squares with the y-intercept constrained to zero, which gives the biologically reasonable expectation that an age *a-1* river run-size of zero predicts an age *a* ocean abundance of zero. This procedure is consistent with recommendations of the PFMC's Salmon Technical Team, and Scientific and Statistical Committee.

Ocean abundance has been forecast preseason since 1985 using methods similar to those described above (Tables 2 and 3). Postseason ocean abundance estimates were calculated using cohort reconstruction methods that accommodate spatial and/or temporal variations in maturity, straying, and fishery impact rates applied separately to the hatchery and natural components of the stock. The postseason estimates for 2008 (age-three) and 2009 (age-three, age-four) are preliminary, as their respective cohorts are incomplete (Table 1).

The 2009 age-three ocean abundance forecast was 1.29 times its postseason estimate (Table 2); the age-three predictor has overestimated abundance in 11 of the 25 previous years. The 2009 age-four ocean abundance forecast was 1.09 times its postseason estimate (Table 2); the age-four predictor has overestimated abundance in 16 of the 25 previous years. The 2009 age-five ocean abundance forecast was 0.79 times its postseason estimate (Table 2); the age-five predictor has underestimated abundance in 15 of the 23 previous years.

Proportion of Natural Spawners Forecast

The age-specific proportion of natural area spawners is also forecast using sibling regression. In this case, the age a observed proportion natural for calendar years 1997-2009 were regressed against the age $a-1$ observed proportion natural of their respective cohorts (Table 4, Figure 2). Data for calendar years prior to 1996 were not used because: (1) at this time the hatcheries did not always have an open-door policy (some fish were denied entry into the hatcheries and presumably spawned in natural areas); and (2) the proportion natural time-series (Figure 2a) indicates a shift-point near 1995-1996. The regressions were fit using ordinary least-squares for age-three and age-four. For age-five, the slope of the relationship was insignificant, and the arithmetic mean was used as the predictor.

The 2009 proportion natural forecast for age-three, -four, and -five fish was 0.63, 0.60, and 0.73, respectively, and the corresponding post-season estimates are 0.70, 0.61, 0.94, respectively (Table 4).

Historical Harvest Levels and Rates

Historical (1986-2009) ocean and river harvest levels and rates of age-three and age-four Klamath River fall Chinook are listed in Table 5. The 2009 age-four ocean harvest rate (preliminary) postseason estimate of zero matches the preseason forecast of less than one tenth of one percent (PFMC 2009).

2008 Ocean Fishery Fall Harvest

Klamath River fall Chinook ocean harvests during the 2009 fall period are estimated postseason through expansion of the coded-wire tags (all release types) recovered in those fisheries. Each coded-wire tag recovery is expanded for sampling and mark-rate, and then to account for the harvest of natural-origin fish, further expanded by the estimated basin-wide escapement (hatchery- plus natural-origin) per hatchery-origin fish observed in the river run just prior to these fall fisheries (same brood and calendar year). In 2009, few fall fisheries were conducted, and 77 Klamath River fall Chinook were estimated to have been harvested.

2010 Forecasts

The 2010 forecasts of ocean stock abundance and proportion natural area spawners are (Figures 1 and 2):

<i>Age</i>	<i>Abundance</i>	<i>Proportion Natural</i>
3	223,400	0.63
4	106,300	0.71
5	1,800	0.75

For the 2009 ocean fall fisheries, the natural production multipliers for the coded-wire tag recoveries are:

<i>Age (a)</i>	<i>Total Escapement (a-1)</i>	<i>Hatchery-origin Escapement (a-1)</i>	<i>Natural-production Multiplier (a)</i>
3	11,938	1,893	6.31
4	78,708	25,877	3.04
5	16,387	8,089	2.03

The fishery-area-month-age-specific estimated harvests are presented in Table 6. Estimated fall landings are accounted for in ocean fisheries harvest allocation in the following calendar year, and the associated harvest impacts are deducted from the September 1 ocean abundance forecasts.

KOHM principal forecast results under three management scenarios: (A) no additional ocean fisheries (commercial and recreational) from Jan–Aug 2010 between Cape Falcon and Point Sur (77 Klamath River fall Chinook were estimated to be harvested in the ocean during the Sept–Nov 2009 period) and no Klamath River fisheries (tribal and recreational) in 2010, (B) the 2009 ocean fishery seasons and quotas, the 2009 river

recreational quota of 30,800 adults, and a tribal allocation of 50% (of total harvest), and (C) the 2007 ocean fishery seasons and quotas, the 2007 river recreational allocation of 26% (of nontribal harvest), and a tribal allocation of 50% (of total harvest); are provided in Appendices A, B and C, respectively.

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Acknowledgements

The Klamath River Technical Team thanks Jennifer Simon of the California Department of Fish and Game for her expert assistance in producing this report.

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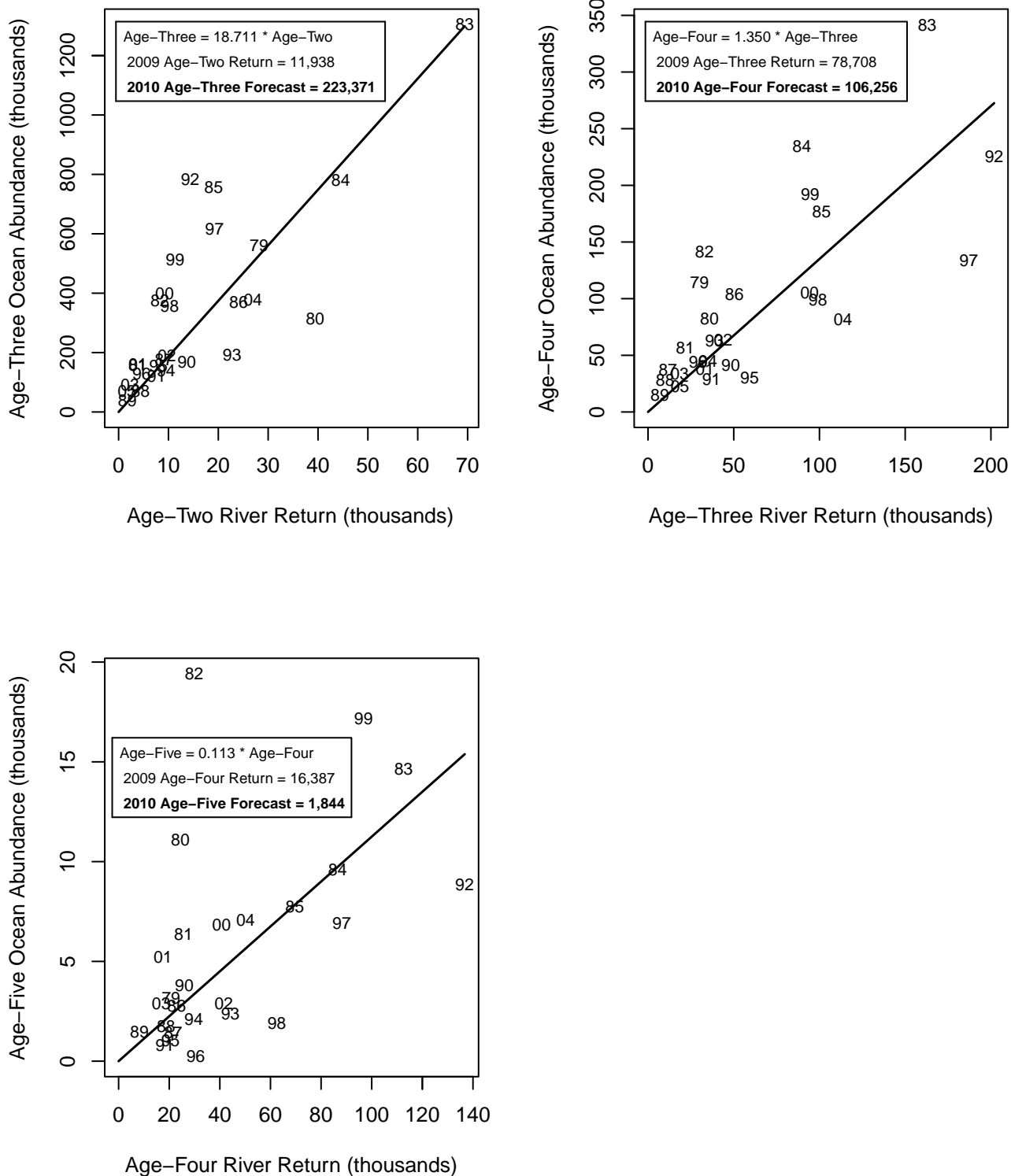


Figure 1. Regression estimators for Klamath River fall chinook ocean abundance (Sept. 1) based on that year's river return of same cohort. Numbers in plots denote brood years.

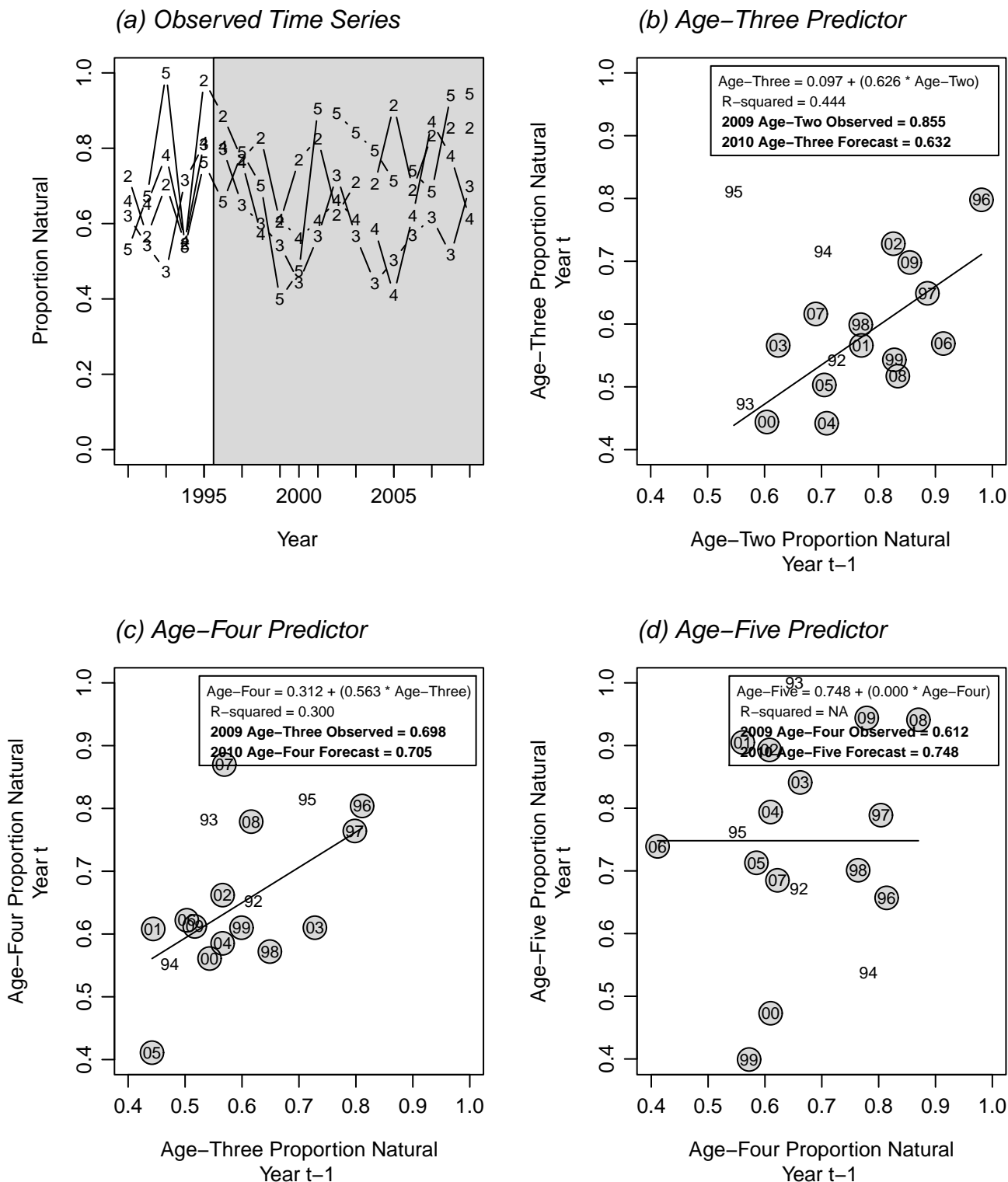


Figure 2. Age-specific proportion of natural area spawners. Panel (a): observed time-series; numbers in plot denote age; shaded area depicts data used for predictor. Panels (b)–(d): age-specific predictor based on previous-year observed proportion for same cohort; numbers in plots denote years 1992–2009; shaded circles indicate years used for predictor; age-three and age-four are regression predictors; age-five predictor is arithmetic mean.

Table 1. Klamath River fall chinook ocean abundance (thousands), ocean harvest rate, and river-run size estimates (thousands) by age.

Calendar Year(t)	Ocean Abundance			Annual Ocean Harvest Rate		Klamath Basin River Run (t)				Total Adults
	Age 3	Age 4	Total	Sept1(t-1) thru Aug31(t) Age 3	Age 4	Age 2	Age 3	Age 4	Age 5	
1981	493.2	57.0	550.2	0.21	0.53	28.2	64.1	14.4	1.8	80.3
1982	561.1	133.4	694.5	0.30	0.52	39.4	30.1	33.9	2.6	66.6
1983	313.4	114.2	427.6	0.19	0.60	3.8	35.9	20.7	0.9	57.5
1984	157.3	82.8	240.1	0.08	0.38	8.3	21.7	24.4	1.1	47.2
1985	376.4	56.9	433.3	0.11	0.24	69.4	32.9	25.7	5.8	64.4
1986	1,304.4	141.7	1,446.1	0.18	0.46	44.6	162.9	29.8	2.3	195.0
1987	781.4	341.9	1,123.2	0.16	0.43	19.1	89.7	112.6	6.8	209.1
1988	756.3	234.8	991.0	0.20	0.39	24.1	101.2	86.5	3.9	191.6
1989	369.8	177.2	547.1	0.15	0.36	9.1	50.4	69.6	4.3	124.3
1990	176.1	104.0	280.1	0.30	0.55	4.4	11.6	22.9	1.3	35.9
1991	69.4	37.2	106.6	0.03	0.18	1.8	10.0	21.6	1.1	32.7
1992	39.5	28.2	67.7	0.02	0.07	13.7	6.9	18.8	1.0	26.7
1993	168.5	15.0	183.5	0.05	0.16	7.6	48.3	8.2	0.7	57.2
1994	119.9	41.7	161.6	0.03	0.09	14.4	37.0	26.0	1.0	64.0
1995	784.3	28.7	813.0	0.04	0.14	22.8	201.9	18.3	2.6	222.8
1996	192.3	225.5	417.8	0.05	0.16	9.5	38.8	136.7	0.3	175.8
1997	140.2	62.8	203.0	0.01	0.06	8.0	35.0	44.2	4.6	83.7
1998	154.8	44.7	199.5	0.00	0.09	4.6	59.2	29.7	1.7	90.6
1999	129.1	30.5	159.5	0.02	0.09	19.2	29.2	20.5	1.3	51.0
2000	617.2	44.2	661.4	0.06	0.10	10.2	187.1	30.5	0.5	218.1
2001	356.1	133.8	489.9	0.03	0.09	11.3	99.1	88.2	0.2	187.4
2002	513.6	98.9	612.5	0.02	0.15	9.2	94.6	62.5	3.7	160.8
2003	400.3	192.2	592.5	0.08	0.21	3.8	94.3	96.8	0.9	191.9
2004	159.6	105.1	264.6	0.12	0.34	9.7	33.2	40.7	5.3	79.2
2005	190.0	38.1	228.1	0.02	0.20	2.3	43.8	17.5	3.9	65.2
2006	90.6	63.4	154.0	0.01	0.10	26.9	18.5	41.6	1.3	61.4
2007	377.0	33.6	410.6	0.06	0.21	1.7	113.7	16.8	1.6	132.1
2008	71.3 ^{a/}	81.4	152.7	0.00 ^{a/}	0.10	25.2	18.6	50.2	1.7	70.6
2009	368.3 ^{b/}	23.0 ^{a/}	391.3	---- ^{c/}	0.00 ^{a/}	11.9	78.7	16.4	5.7	100.7

a/ Preliminary: incomplete cohort data (age-5 data unavailable).

b/ Preliminary: incomplete cohort data (age-4 and age-5 data unavailable).

c/ Not estimated: incomplete cohort data (age-4 and age-5 data unavailable).

Table 2. Comparisons of preseason forecast and postseason estimates for ocean abundance of adult Klamath River fall chinook (Page 1 of 2).

Year (t)	Preseason Forecast ^{a/} Sept 1 (t-1)	Postseason Estimate Sept 1 (t-1)	Pre/Postseason
Age-Three			
1985	113,000	276,000	0.41
1986	426,000 ^{b/}	1,304,419	0.33
1987	511,800	781,350	0.66
1988	370,800	756,261	0.49
1989	450,600	369,828	1.22
1990	479,000	176,133	2.72
1991	176,200	69,442	2.54
1992	50,000	39,502	1.27
1993	294,400	168,473	1.75
1994	138,000	119,913	1.15
1995	269,000	784,279	0.34
1996	479,800	192,271	2.50
1997	224,600	140,153	1.60
1998	176,000	154,799	1.14
1999	84,800	129,066	0.66
2000	349,600	617,189	0.57
2001	187,200	356,128	0.53
2002	209,000	513,583	0.41
2003	171,300	400,304	0.43
2004	72,100	159,566	0.45
2005	185,700	189,978	0.98
2006	44,100	90,605	0.49
2007	515,400	377,029	1.37
2008	31,600	71,259	0.44
2009 ^{c/}	474,900	368,252	1.29
Age-Four			
1985	56,875	57,500	0.99
1986	66,250	141,692	0.47
1987	206,125	341,875	0.60
1988	186,375	234,779	0.79
1989	215,500	177,245	1.22
1990	50,125	103,951	0.48
1991	44,625	37,172	1.20
1992	44,750	28,181	1.59
1993	39,125	15,037	2.60
1994	86,125	41,736	2.06
1995	47,000	28,725	1.64
1996	268,500	225,526	1.19
1997	53,875	62,820	0.86
1998	46,000	44,733	1.03
1999	78,750	30,456	2.59
2000	38,875	44,176	0.88
2001	247,000	133,801	1.85
2002	143,800	98,927	1.45
2003	132,400	192,173	0.69
2004	134,500	105,051	1.28
2005	48,900	38,079	1.28
2006	63,700	63,381	1.01
2007	26,100	33,614	0.78
2008	157,200	81,410	1.93
2009 ^{c/}	25,200	23,029	1.09

Table 2. Comparisons of preseason forecast and postseason estimates for ocean abundance of adult Klamath River fall chinook (Page 2 of 2).

Year (t)	Preseason Forecast ^{a/} Sept 1 (t-1)	Postseason Estimate Sept 1 (t-1)	Pre/Postseason
Age-Five			
1985 ^{d/}	--	11,113	--
1986 ^{d/}	--	6,367	--
1987	5,250	19,414	0.27
1988	13,250	14,632	0.91
1989	10,125	9,612	1.05
1990	7,625	7,767	0.98
1991	1,500	2,774	0.54
1992	1,250	1,444	0.87
1993	1,125	1,759	0.64
1994	500	1,468	0.34
1995	2,000	3,805	0.53
1996	1,125	787	1.43
1997	7,875	8,859	0.89
1998	3,250	2,382	1.36
1999	2,000	2,106	0.95
2000	1,375	1,051	1.31
2001	1,250	258	4.84
2002	9,700	6,933	1.40
2003	6,500	1,915	3.39
2004	9,700	17,170	0.56
2005	5,200	6,857	0.76
2006	2,200	5,236	0.42
2007	4,700	2,909	1.62
2008	1,900	2,900	0.66
2009	5,600	7,066	0.79
Total Adults			
1985 ^{d/}	169,875	344,613	0.49
1986 ^{d/}	492,250	1,452,478	0.34
1987	723,175	1,142,639	0.63
1988	570,425	1,005,672	0.57
1989	676,225	556,685	1.21
1990	536,750	287,851	1.86
1991	222,325	109,388	2.03
1992	96,000	69,127	1.39
1993	334,650	185,269	1.81
1994	224,625	163,117	1.38
1995	318,000	816,809	0.39
1996	749,425	418,584	1.79
1997	286,350	211,832	1.35
1998	225,250	201,914	1.12
1999	165,550	161,628	1.02
2000	389,850	662,416	0.59
2001	435,450	490,187	0.89
2002	362,500	619,443	0.59
2003	310,200	594,392	0.52
2004	216,300	281,787	0.77
2005	239,800	234,914	1.02
2006	110,000	159,222	0.69
2007	546,200	413,552	1.32
2008	190,700	155,569	1.23
2009 ^{c/}	505,700	398,347	1.27

a/ Original preseason forecasts for years 1985-2001 were for May 1(t); converted to Sept 1(t-1) forecasts by dividing the May 1(t) number by the Sept 1(t-1) through May 1(t) survival rate presumed by modelers in those years: 0.5 age-three, 0.8 age-four, 0.8 age-5.

b/ A scalar of 0.75 was applied to the jack count because 1) most jacks returned to the Trinity River and 2) the jack count was outside the database range.

c/ Preliminary.

d/ Age-5 preseason ocean abundance forecast unavailable.

Table 3. Summary of management objectives and predictor performance for Klamath River fall chinook.

Year (t)	Preseason Ocean Abundance Forecast ^{a/}		Postseason Ocean Abundance Estimate		Preseason Age-4 Harvest Rate Forecast ^{b/}		Postseason Age-4 Harvest Rate Estimate ^{c/}		Preseason Adult Harvest Forecast		Postseason Adult Harvest Estimate	
	Sept 1 (t-1)		Sept 1 (t-1)		Ocean	River	Ocean	River	Ocean	River	Ocean	River
	Age-3	Age-4	Age-3	Age-4								
1986	426,000	66,250	1,304,419	141,692	0.28	0.50	0.46	0.67	72,000	37,700	302,309	46,154
1987	511,800	206,125	781,350	341,875	0.28	0.53	0.43	0.44	121,200	78,200	277,193	73,265
1988	370,800	186,375	756,261	234,779	0.31	0.53	0.39	0.52	114,100	65,400	253,905	73,854
1989	450,600	215,500	369,828	177,245	0.30	0.49	0.36	0.70	128,100	67,600	125,117	54,340
1990	479,000	50,125	176,133	103,951	0.30	0.49	0.55	0.36	85,100	31,200	114,786	11,459
1991	176,200	44,625	69,442	37,172	0.13	0.28	0.18	0.45	16,700	12,800	9,871	13,581
1992	50,000	44,750	39,502	28,181	0.06	0.15	0.07	0.27	4,200	4,200	3,140	6,787
1993	294,400	39,125	168,473	15,037	0.12	0.43	0.16	0.49	20,100	22,500	11,355	12,808
1994	138,000	86,125	119,913	41,736	0.07	0.20	0.09	0.29	10,400	14,300	7,961	13,524
1995	269,000	47,000	784,279	28,725	0.07	0.32	0.14	0.19	13,500	18,500	32,230	21,637
1996	479,800	268,500	192,271	225,526	0.17	0.66	0.16	0.39	88,400	129,100	45,147	69,241
1997	224,600	53,875	140,153	62,820	0.10	0.43	0.06	0.26	17,600	26,500	8,656	17,764
1998	176,000	46,000	154,799	44,733	0.07	0.29	0.09	0.30	10,200	14,800	4,891	17,897
1999	84,800	78,750	129,066	30,456	0.10	0.28	0.09	0.45	12,300	18,100	5,116	16,942
2000	349,600	38,875	617,189	44,176	0.11	0.53	0.10	0.25	24,000	32,400	42,048	35,066
2001	187,200	247,000	356,128	133,801	0.14	0.61	0.09	0.29	45,600	105,300	21,747	50,780
2002	209,000	143,800	513,583	98,927	0.13	0.57	0.15	0.26	30,000	70,900	28,891	35,069
2003	171,300	132,400	400,304	192,173	0.16	0.50	0.21	0.28	30,600	52,200	70,670	39,715
2004	72,100	134,500	159,566	105,051	0.15	0.38	0.34	0.48	26,500	35,800	63,885	29,807
2005	185,700	48,900	189,978	38,079	0.08	0.16	0.20	0.19	7,100	9,600	12,825	10,001
2006	44,100	63,700	90,605	63,381	0.11	0.23	0.10	0.18	10,000	10,000	10,400	10,345
2007	515,400	26,100	377,029	33,614	0.16	0.63	0.21	0.56	30,200	51,400	30,238	33,884
2008	31,600	157,200	71,259	81,410	0.02	0.43	0.10	0.38	4,500	49,500	8,681	24,180
2009 ^{d/}	474,900	25,200	368,252	23,029	0.00	0.57	0.00	0.40	100	61,700	64	33,963

a/ Original preseason forecast for years 1986-2001 were for May 1(t); converted to Sept 1 (t-1) forecasts by dividing the May 1(t) number by the Sept 1(t-1) through May 1(t) survival rate presumed by modelers in those years: 0.5 age-three, 0.8 age-four, 0.8 age-five.

b/ Ocean harvest rate forecast is the fraction of the predicted ocean abundance expected to be harvested Sept 1 (t-1) through Aug 31 (t). River harvest rate forecast is the fraction of the predicted river run expected to be harvested in river fisheries. Original ocean harvest rate forecasts for year(t), 1986-2001, were based on a May 1(t) ocean abundance denominator; converted to Sept 1(t-1) abundance denominator by multiplying former values by 0.8 (the age-four survival rate between Sept 1 (t-1) and May 1(t) presumed by modelers in those years).

c/ Ocean harvest rate is the fraction of the postseason ocean abundance harvested Sept 1(t-1) through Aug 31(t). River harvest rate is the fraction of the river run harvested by river fisheries.

d/ Preliminary.

Table 4. Numbers of hatchery and natural adult fall chinook spawners in the Klamath Basin by age.^{a/}

Year	Hatchery Spawners					Natural Area Spawners					Proportion Natural				
	Age 2	Age 3	Age 4	Age 5	Adults	Age 2	Age 3	Age 4	Age 5	Adults	Age 2	Age 3	Age 4	Age 5	Adults
1985					22,500					25,700					0.53
1986					32,900					113,400					0.78
1987					29,100					101,700					0.78
1988					33,500					79,400					0.70
1989					22,000					43,900					0.67
1990					8,100					15,600					0.66
1991	270	2,426	3,827	232	6,485	718	3,956	7,430	263	11,649	0.73	0.62	0.66	0.53	0.64
1992	3,948	2,576	4,627	157	7,360	5,143	3,051	8,657	321	12,029	0.57	0.54	0.65	0.67	0.62
1993	1,619	20,797	846	0	21,643	3,825	18,629	3,039	190	21,858	0.70	0.47	0.78	1.00	0.50
1994	5,200	8,864	8,016	192	17,072	6,245	22,230	9,879	224	32,333	0.55	0.71	0.55	0.54	0.65
1995	335	34,737	2,716	406	37,859	17,324	148,639	11,856	1,298	161,793	0.98	0.81	0.81	0.76	0.81
1996	792	4,360	15,649	24	20,033	6,174	17,232	64,048	46	81,326	0.89	0.80	0.80	0.66	0.80
1997	1,272	10,484	7,560	618	18,662	4,225	19,343	24,493	2,308	46,144	0.77	0.65	0.76	0.79	0.71
1998	595	20,411	8,588	220	29,219	2,855	30,509	11,462	517	42,488	0.83	0.60	0.57	0.70	0.59
1999	6,857	10,046	4,081	200	14,327	10,447	11,927	6,396	133	18,456	0.60	0.54	0.61	0.40	0.56
2000	1,909	87,643	9,833	136	97,612	6,394	70,042	12,565	122	82,729	0.77	0.44	0.56	0.47	0.46
2001	1,631	31,306	23,802	4	55,112	7,747	40,908	36,889	38	77,835	0.83	0.57	0.61	0.90	0.59
2002	2,331	15,867	11,177	137	27,181	3,867	42,557	21,932	1,146	65,635	0.62	0.73	0.66	0.89	0.71
2003	864	35,403	26,295	84	61,782	2,102	46,116	41,084	444	87,644	0.71	0.57	0.61	0.84	0.59
2004	1,981	14,505	8,205	271	22,981	4,730	11,469	11,567	1,043	24,079	0.70	0.44	0.59	0.79	0.51
2005	101	18,583	8,187	929	27,699	1,068	18,778	5,705	2,307	26,790	0.91	0.50	0.41	0.71	0.49
2006	6,462	6,791	12,495	235	19,521	14,382	8,969	20,528	664	30,161	0.69	0.57	0.62	0.74	0.61
2007	213	34,073	854	122	35,049	1,071	54,693	5,712	265	60,670	0.83	0.62	0.87	0.68	0.63
2008	2,931	7,015	6,512	26	13,553	17,223	7,504	22,928	417	30,849	0.85	0.52	0.78	0.94	0.69
2009	1,372	15,849	3,628	136	19,613	8,113	36,566	5,711	2,314	44,591	0.86	0.70	0.61	0.94	0.69

a/ Age structure of hatchery and natural area spawners not available prior to 1991.

Table 5. Harvest levels and rates of age-three and age-four Klamath River fall Chinook. (Page 1 of 2) 13

Year(t)	Ocean Fisheries (Sept 1(t-1) through Aug 31(t))						Ocean Total	River Fisheries (t)		
	KMZ			North of	South of	Subtotal		Net	Sport	Total
	Troll	Sport	Subtotal	KMZ	KMZ					
HARVEST (numbers of fish)										
Age-Three										
1986	35,632	4,876	40,508	73,776	122,911	196,687	237,195	8,100	18,100	26,200
1987	17,235	5,082	22,317	43,429	56,363	99,792	122,109	11,400	11,400	22,800
1988	15,999	5,165	21,164	24,317	107,971	132,288	153,452	12,500	15,600	28,100
1989	6,456	11,783	18,239	15,315	23,729	39,044	57,283	2,700	900	3,600
1990	81	4,357	4,438	36,578	11,006	47,584	52,022	1,300	1,400	2,700
1991	0	1,022	1,022	343	810	1,153	2,175	2,123	1,277	3,400
1992	0	0	0	972	0	972	972	970	251	1,221
1993	0	822	822	833	6,424	7,257	8,079	5,426	2,917	8,343
1994	42	604	646	0	3,387	3,387	4,033	4,543	965	5,508
1995	0	999	999	12,211	14,808	27,019	28,018	11,840	5,536	17,376
1996	0	0	0	0	9,311	9,311	9,311	12,363	3,661	16,024
1997	0	232	232	620	1,215	1,835	2,067	2,166	2,736	4,902
1998	0	6	6	298	466	764	770	2,231	5,781	8,012
1999	63	180	243	1,262	433	1,695	1,938	4,981	1,748	6,729
2000	404	3,282	3,686	8,603	25,202	33,805	37,491	22,458	4,893	27,351
2001	113	105	218	2,749	6,082	8,831	9,049	17,885	7,294	25,179
2002	220	783	1,003	1,500	9,912	11,412	12,415	11,734	6,258	17,992
2003	173	679	852	1,885	27,310	29,195	30,047	6,996	5,061	12,057
2004	402	971	1,373	9,719	7,331	17,050	18,423	4,679	2,051	6,730
2005	0	568	568	619	2,381	3,000	3,568	4,394	1,641	6,035
2006	0	477	477	32	341	373	850	2,388	13	2,401
2007	770	8,097	8,867	4,192	9,362	13,554	22,421	17,543	5,734	23,277
2008 ^{av}	0	0	0	0	0	0	0	3,225	608	3,833
2009 ^{av}	0	64	64	0	0	0	64	19,820	4,655	24,475
Age-Four										
1986	7,793	1,120	8,913	23,549	32,112	55,661	64,574	17,000	2,900	19,900
1987	21,736	4,427	26,163	70,645	48,832	119,477	145,640	41,000	8,500	49,500
1988	11,870	3,596	15,466	26,381	50,296	76,677	92,143	38,600	6,200	44,800
1989	6,064	9,735	15,799	32,116	16,608	48,724	64,523	41,000	7,700	48,700
1990	3,997	2,919	6,916	39,627	10,624	50,251	57,167	6,000	2,200	8,200
1991	0	1,001	1,001	1,513	4,135	5,648	6,649	7,593	2,016	9,609
1992	171	55	226	1,781	12	1,793	2,019	4,360	723	5,083
1993	0	0	0	849	1,616	2,465	2,465	3,786	243	4,029
1994	0	1,124	1,124	1,168	1,499	2,667	3,791	6,666	818	7,484
1995	0	242	242	1,879	1,771	3,650	3,892	2,957	480	3,437
1996	773	3,464	4,237	10,336	20,738	31,074	35,311	43,959	9,080	53,039
1997	3	172	175	463	2,994	3,457	3,632	8,734	2,586	11,320
1998	0	105	105	3,942	0	3,942	4,047	7,164	1,822	8,986
1999	15	381	396	1,657	696	2,353	2,749	8,789	494	9,283
2000	117	895	1,012	2,327	1,076	3,403	4,415	6,733	756	7,489
2001	1,312	1,604	2,916	5,819	3,926	9,745	12,661	20,759	4,819	25,578
2002	1,938	827	2,765	2,811	9,416	12,227	14,992	11,929	4,063	15,992
2003	833	918	1,751	7,852	29,995	37,847	39,598	22,754	4,592	27,346
2004	1,421	1,215	2,636	11,504	21,949	33,453	36,089	17,623	1,751	19,374
2005	247	317	564	5,243	1,909	7,152	7,716	3,048	304	3,352
2006	196	725	921	4,192	985	5,177	6,098	7,569	42	7,611
2007	270	2,336	2,606	1,991	2,472	4,463	7,069	8,987	502	9,489
2008 ^{av}	6,378	1,105	7,483	546	113	659	8,142	17,891	1,260	19,151
2009 ^{av}	0	0	0	0	0	0	0	5,831	696	6,527

Table 5. Harvest levels and rates of age-three and age-four Klamath River fall Chinook. (Page 2 of 2) 14

Year(t)	Ocean Fisheries (Sept 1(t-1) through Aug 31(t))						River Fisheries (t)			
	KMZ			North of	South of	Ocean	Net	Sport	Total	
	Troll	Sport	Subtotal	KMZ	KMZ					Subtotal
HARVEST RATE^{b/}										
Age-Three										
1986	0.03	0.00	0.03	0.06	0.09	0.15	0.18	0.05	0.11	0.16
1987	0.02	0.01	0.03	0.06	0.07	0.13	0.16	0.13	0.13	0.25
1988	0.02	0.01	0.03	0.03	0.14	0.17	0.20	0.12	0.15	0.28
1989	0.02	0.03	0.05	0.04	0.06	0.11	0.15	0.05	0.02	0.07
1990	0.00	0.02	0.03	0.21	0.06	0.27	0.30	0.11	0.12	0.23
1991	0.00	0.01	0.01	0.00	0.01	0.02	0.03	0.21	0.13	0.34
1992	0.00	0.00	0.00	0.02	0.00	0.02	0.02	0.14	0.04	0.18
1993	0.00	0.00	0.00	0.00	0.04	0.04	0.05	0.11	0.06	0.17
1994	0.00	0.01	0.01	0.00	0.03	0.03	0.03	0.12	0.03	0.15
1995	0.00	0.00	0.00	0.02	0.02	0.03	0.04	0.06	0.03	0.09
1996	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.32	0.09	0.41
1997	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.06	0.08	0.14
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.10	0.14
1999	0.00	0.00	0.00	0.01	0.00	0.01	0.02	0.17	0.06	0.23
2000	0.00	0.01	0.01	0.01	0.04	0.05	0.06	0.12	0.03	0.15
2001	0.00	0.00	0.00	0.01	0.02	0.02	0.03	0.18	0.07	0.25
2002	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.12	0.07	0.19
2003	0.00	0.00	0.00	0.00	0.07	0.07	0.08	0.07	0.05	0.13
2004	0.00	0.01	0.01	0.06	0.05	0.11	0.12	0.14	0.06	0.20
2005	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.10	0.04	0.14
2006	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.13	0.00	0.13
2007	0.00	0.02	0.02	0.01	0.02	0.04	0.06	0.15	0.05	0.20
2008 ^{a/}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.03	0.21
2009 ^{a/}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.06	0.31
Age-Four										
1986	0.05	0.01	0.06	0.17	0.23	0.39	0.46	0.57	0.10	0.67
1987	0.06	0.01	0.08	0.21	0.14	0.35	0.43	0.36	0.08	0.44
1988	0.05	0.02	0.07	0.11	0.21	0.33	0.39	0.45	0.07	0.52
1989	0.03	0.05	0.09	0.18	0.09	0.27	0.36	0.59	0.11	0.70
1990	0.04	0.03	0.07	0.38	0.10	0.48	0.55	0.26	0.10	0.36
1991	0.00	0.03	0.03	0.04	0.11	0.15	0.18	0.35	0.09	0.45
1992	0.01	0.00	0.01	0.06	0.00	0.06	0.07	0.23	0.04	0.27
1993	0.00	0.00	0.00	0.06	0.11	0.16	0.16	0.46	0.03	0.49
1994	0.00	0.03	0.03	0.03	0.04	0.06	0.09	0.26	0.03	0.29
1995	0.00	0.01	0.01	0.07	0.06	0.13	0.14	0.16	0.03	0.19
1996	0.00	0.02	0.02	0.05	0.09	0.14	0.16	0.32	0.07	0.39
1997	0.00	0.00	0.00	0.01	0.05	0.06	0.06	0.20	0.06	0.26
1998	0.00	0.00	0.00	0.09	0.00	0.09	0.09	0.24	0.06	0.30
1999	0.00	0.01	0.01	0.05	0.02	0.08	0.09	0.43	0.02	0.45
2000	0.00	0.02	0.02	0.05	0.02	0.08	0.10	0.22	0.02	0.25
2001	0.01	0.01	0.02	0.04	0.03	0.07	0.09	0.24	0.05	0.29
2002	0.02	0.01	0.03	0.03	0.10	0.12	0.15	0.19	0.06	0.26
2003	0.00	0.00	0.01	0.04	0.16	0.20	0.21	0.24	0.05	0.28
2004	0.01	0.01	0.03	0.11	0.21	0.32	0.34	0.43	0.04	0.48
2005	0.01	0.01	0.01	0.14	0.05	0.19	0.20	0.17	0.02	0.19
2006	0.00	0.01	0.01	0.07	0.02	0.08	0.10	0.18	0.00	0.18
2007	0.01	0.07	0.08	0.06	0.07	0.13	0.21	0.53	0.03	0.56
2008 ^{a/}	0.08	0.01	0.09	0.01	0.00	0.01	0.10	0.36	0.03	0.38
2009 ^{a/}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.04	0.40

a/ Preliminary data (incomplete cohort).

b/ Ocean harvest rates are the fraction of Sept 1(t-1) ocean abundance harvested in these fisheries. River harvest rates are the fraction of the river run (t) harvested in these fisheries.

Table 6. Fall 2009 (September - November) ocean landings of Klamath River fall Chinook by fishery, age, and KOHM area.^{a1}

COMMERCIAL FISHERY										
KOHM area	Age 3			Age 4			Age 5			Total
	Sept	Oct	Nov	Sept	Oct	Nov	Sept	Oct	Nov	
NO	--	--	--	--	--	--	--	--	--	0
CO	--	--	--	--	--	--	--	--	--	0
KO	--	--	--	--	--	--	--	--	--	0
KC	--	--	--	--	--	--	--	--	--	0
FB	--	--	--	--	--	--	--	--	--	0
SF	--	--	--	--	--	--	--	--	--	0
MO	--	--	--	--	--	--	--	--	--	0
Total	0	0	0	0	0	0	0	0	0	0

SPORT FISHERY										
KOHM area	Age 3			Age 4			Age 5			Total
	Sept	Oct	Nov	Sept	Oct	Nov	Sept	Oct	Nov	
NO	--	--	--	--	--	--	--	--	--	0
CO	--	--	--	--	--	--	--	--	--	0
KO	--	--	--	29	--	--	--	--	--	29
KC	--	--	--	49	--	--	--	--	--	49
FB	--	--	--	--	--	--	--	--	--	0
SF	--	--	--	--	--	--	--	--	--	0
MO	--	--	--	--	--	--	--	--	--	0
Total	0	0	0	77	0	0	0	0	0	77

a¹ KOHM areas are as follows: NO=Newport & Tillamook; CO=Coos Bay; KO=Klamath Management Zone in Oregon; KC=Klamath Management Zone in California; FB=Fort Bragg; SF=San Francisco; and MO=Monterey.

MO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	77	0	0	0	0	0	0	0	0	0	0	0	0	77	NA	NA

Chinook Harvest (All Stocks): Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	100	40	NA	NA	NA	NA	0	0	0	0	0	0	140
CO	NA	300	NA	NA	NA	NA	0	0	0	0	0	0	300
KO	NA	NA	NA	NA	NA	NA	NaN	NaN	0	0	0	0	0
KC	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0
FB	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0	0
SF	NA	NA	NA	NA	NA	NA	NA	NaN	0	0	0	0	0
MO	NA	NA	NA	NA	NA	NA	NA	NaN	0	0	0	0	0
Total	100	340	NA	NA	NA	NA	0	0	0	0	0	0	440

Chinook Harvest (All Stocks): Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	90	200	NA	NA	NA	NA	NA	NaN	0	0	0	0	290
CO	NA	0	0	NA	NA	NA	NA	NaN	0	0	0	0	0
KO	200	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	200
KC	400	NA	NA	NA	NA	NA	NA	NaN	0	0	0	0	400
FB	NA	NA	NA	NA	NA	NaN	NaN	0	0	0	0	0	0
SF	NA	NA	NA	NA	NA	0	0	0	0	0	0	0	0
MO	NA	NA	NA	NA	NA	NaN	0	0	0	0	0	0	0
Total	690	200	0	NA	NA	0	0	0	0	0	0	0	890

Klamath Contribution Rates: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0	0	NA	NA	NA	NA	0.142	0.025	0.050	0.027	0.070	0.132
CO	NA	0	NA	NA	NA	NA	0.105	0.073	0.066	0.096	0.184	0.254
KO	NA	NA	NA	NA	NA	NA	0.000	0.000	0.128	0.215	0.297	0.290
KC	NA	NA	NA	NA	NA	NA	NA	NA	0.647	0.459	0.434	0.449
FB	NA	NA	NA	NA	NA	NA	NA	0.098	0.260	0.362	0.298	0.130
SF	NA	NA	NA	NA	NA	NA	NA	0.000	0.107	0.154	0.137	0.062
MO	NA	NA	NA	NA	NA	NA	NA	0.000	0.031	0.040	0.078	0.003

Klamath Contribution Rates: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0.000	0	NA	NA	NA	NA	NA	0.000	0.004	0.003	0.045	0.032
CO	NA	NaN	NaN	NA	NA	NA	NA	0.000	0.064	0.074	0.081	0.043
KO	0.144	NA	NA	NA	NA	NA	NA	NA	0.029	0.078	0.189	0.327
KC	0.122	NA	NA	NA	NA	NA	NA	0.000	0.195	0.231	0.181	0.257
FB	NA	NA	NA	NA	NA	0.000	0.000	0.027	0.060	0.090	0.124	0.057
SF	NA	NA	NA	NA	NA	0.004	0.007	0.036	0.017	0.041	0.026	0.005
MO	NA	NA	NA	NA	NA	0.000	0.006	0.011	0.005	0.005	0.007	0.007

Total Effort: Troll

SF	NA	NA	NA	NA	0	0	0	0	0	0	0	0
MO	NA	NA	NA	NA	0	0	0	0	0	0	0	0

Quotas: recreational, non-retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Mgt.Input.Files/river.dat

	parameter	value
1	pi.t	0.00
2	pi.r	NA
3	H.r.tot	0.00
4	CR.r	0.00
5	c.r	0.07
6	s.r	0.10
7	E.nat.tot	NA

MO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	77	0	0	0	0	0	0	0	0	0	0	0	128	206	NA	NA

Chinook Harvest (All Stocks): Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	100	40	NA	NA	NA	NA	0	0	0	0	0	0	140
CO	NA	300	NA	NA	NA	NA	0	0	0	0	0	0	300
KO	NA	NA	NA	NA	NA	NA	NaN	NaN	0	0	0	0	0
KC	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0
FB	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0	0
SF	NA	NA	NA	NA	NA	NA	NA	NaN	0	0	0	0	0
MO	NA	NA	NA	NA	NA	NA	NA	NaN	0	0	0	0	0
Total	100	340	NA	NA	NA	NA	0	0	0	0	0	0	440

Chinook Harvest (All Stocks): Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	90	200	NA	NA	NA	NA	NA	NaN	0	0	0	0	290
CO	NA	0	0	NA	NA	NA	NA	NaN	0	0	0	0	0
KO	200	NA	NA	NA	NA	NA	NA	NA	0	0	0	182	382
KC	400	NA	NA	NA	NA	NA	NA	NaN	0	0	0	267	667
FB	NA	NA	NA	NA	NA	NaN	NaN	0	0	0	0	0	0
SF	NA	NA	NA	NA	NA	0	0	0	0	0	0	0	0
MO	NA	NA	NA	NA	NA	NaN	0	0	0	0	0	0	0
Total	690	200	0	NA	NA	0	0	0	0	0	0	449	1339

Klamath Contribution Rates: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0	0	NA	NA	NA	NA	0.142	0.025	0.050	0.027	0.070	0.132
CO	NA	0	NA	NA	NA	NA	0.105	0.073	0.066	0.096	0.184	0.254
KO	NA	NA	NA	NA	NA	NA	0.000	0.000	0.128	0.215	0.297	0.290
KC	NA	NA	NA	NA	NA	NA	NA	NA	0.647	0.459	0.434	0.449
FB	NA	NA	NA	NA	NA	NA	NA	0.098	0.260	0.362	0.298	0.130
SF	NA	NA	NA	NA	NA	NA	NA	0.000	0.107	0.154	0.137	0.062
MO	NA	NA	NA	NA	NA	NA	NA	0.000	0.031	0.040	0.078	0.003

Klamath Contribution Rates: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0.000	0	NA	NA	NA	NA	NA	0.000	0.004	0.003	0.045	0.032
CO	NA	NaN	NaN	NA	NA	NA	NA	0.000	0.064	0.074	0.081	0.043
KO	0.144	NA	NA	NA	NA	NA	NA	NA	0.029	0.078	0.189	0.327
KC	0.122	NA	NA	NA	NA	NA	NA	0.000	0.195	0.231	0.181	0.257
FB	NA	NA	NA	NA	NA	0.000	0.000	0.027	0.060	0.090	0.124	0.057
SF	NA	NA	NA	NA	NA	0.004	0.007	0.036	0.017	0.041	0.026	0.005
MO	NA	NA	NA	NA	NA	0.000	0.006	0.011	0.005	0.005	0.007	0.007

Total Effort: Troll

Non-retention Effort: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	0	0	0	4322	18565	19901	42788
CO	NA	NA	NA	NA	0	0	0	0	0	3507	14139	11328	28975
KO	NA	NA	NA	NA	0	0	0	0	0	1543	8666	6932	17140
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
SF	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
MO	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
Total	NA	NA	NA	NA	0	0	0	0	0	9372	41369	38162	88903

Mgt.Input.Files/ocean.dat

	fishery	area	start.date	end.date	Q	ret	sl	coho
1	40	NO	jun-20-2010	aug-31-2010	NA	0	NA	1
2	40	CO	jun-20-2010	aug-31-2010	NA	0	NA	1
3	40	KO	jun-20-2010	aug-28-2010	NA	0	NA	1
4	40	KO	aug-29-2010	aug-31-2010	NA	1	24	1
5	40	KC	aug-29-2010	aug-31-2010	NA	1	24	0

Days open: commercial, retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
CO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
KO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	0	0	0	0
SF	NA	NA	NA	NA	0	0	0	0	0	0	0	0
MO	NA	NA	NA	NA	0	0	0	0	0	0	0	0

Quotas: commercial, retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Size-limits: commercial, retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	28	28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CO	NA	28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Days open: commercial, non-retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
CO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
KO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	0	0	0	0
SF	NA	NA	NA	NA	0	0	0	0	0	0	0	0
MO	NA	NA	NA	NA	0	0	0	0	0	0	0	0

Quotas: commercial, non-retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Days open: recreational, retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
CO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
KO	NA	NA	NA	NA	0	0	0	0	0	0	0	3
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	3
FB	NA	NA	NA	NA	0	0	0	0	0	0	0	0
SF	NA	NA	NA	NA	0	0	0	0	0	0	0	0
MO	NA	NA	NA	NA	0	0	0	0	0	0	0	0

Quotas: recreational, retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Size-limits: recreational, retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	24	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CO	NA	20	20	NA	NA	NA	NA	NA	NA	NA	NA	NA
KO	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
KC	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
FB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Days open: recreational, non-retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	0	0	0	0	0	11	31	31
CO	NA	NA	NA	NA	0	0	0	0	0	11	31	31

KO	NA	NA	NA	NA	0	0	0	0	0	0	11	31	28
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
SF	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
MO	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0

Quotas: recreational, non-retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Mgt.Input.Files/river.dat

	parameter	value
1	pi.t	0.50
2	pi.r	NA
3	H.r.tot	30773.00
4	CR.r	0.00
5	c.r	0.07
6	s.r	0.10
7	E.nat.tot	NA

Appendix C. KOHM: Summary Output. Thu Feb 18 17:37:31 2010
2010 Stock Projections; 2007 regulations.

Klamath Escapement

Absent fishing: 127482
Hatcheries: 41296
Natural areas: 86186

With fishing
Mature adults: 109018
 Strays: 452
 Klamath Basin: 108565
Spawners: 61027
 Hatcheries: 20289
 Natural areas: 40739
 Reduction rate: 0.527

Klamath Harvest

Total: 70309
River: 44295
Ocean: 26014

Tribal: 35154 0.500 (objective: 0.500)

Non-tribal: 35154
River: 9140 0.260 (objective: 0.260)
Ocean troll: 20407
 CA / OR: 0.614 / 0.386
Ocean sport: 5607
 KMZ: 3725 0.143
Age-four o.harv.rate: 0.147 (objective: <= 0.16)

Klamath Harvest: ocean troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total	%CA
NO	0	0	0	0	0	0	0	138	417	178	258	863	1854	NA
CO	0	0	0	0	0	0	0	262	452	469	1170	2271	4624	NA
KO	0	0	0	0	0	0	0	0	66	344	475	521	1405	NA
KC	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
FB	0	0	0	0	0	0	0	197	0	0	0	2796	2992	18.0
SF	0	0	0	0	0	0	0	0	1602	0	5351	428	7381	44.3
MO	0	0	0	0	0	0	0	0	849	0	1287	14	2151	12.9
Total	0	0	0	0	0	0	0	598	3386	991	8541	6892	20407	NA

Klamath Harvest: ocean sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total	%CA	%CA.rec
NO	0	0	0	0	0	0	0	0	0	0	39	42	81	NA	NA
CO	0	0	0	0	0	0	0	0	5	37	112	72	226	NA	NA
KO	29	0	0	0	0	0	0	0	15	146	414	551	1154	NA	NA
KC	49	0	0	0	0	0	0	0	359	678	851	633	2571	15.4	62.0
FB	0	0	0	0	0	0	0	11	92	270	352	73	797	4.8	19.2
SF	0	0	0	0	0	0	0	95	54	201	233	10	592	3.6	14.3

MO	0	0	0	0	0	0	0	0	61	16	31	68	9	185	1.1	4.5
Total	77	0	0	0	0	0	0	0	167	541	1363	2069	1389	5607	NA	NA

Chinook Harvest (All Stocks): Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	100	40	NA	NA	NA	NA	0	5577	8320	6550	3701	6524	30811
CO	NA	300	NA	NA	NA	NA	0	3579	6826	4877	6361	8939	30882
KO	NA	NA	NA	NA	NA	NA	NaN	NaN	512	1600	1600	1800	5512
KC	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0
FB	NA	NA	NA	NA	NA	NA	NA	2000	0	0	0	21558	23558
SF	NA	NA	NA	NA	NA	NA	NA	NaN	14907	0	39140	6851	60898
MO	NA	NA	NA	NA	NA	NA	NA	NaN	27304	0	16473	4134	47911
Total	100	340	NA	NA	NA	NA	0	11156	57868	13027	67274	49806	199572

Chinook Harvest (All Stocks): Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	90	200	NA	NA	NA	NA	NA	NaN	69	66	862	1286	2572
CO	NA	0	0	NA	NA	NA	NA	NaN	81	502	1377	1666	3626
KO	200	NA	NA	NA	NA	NA	NA	NA	506	1877	2190	1686	6459
KC	400	NA	NA	NA	NA	NA	NA	NaN	1839	2940	4695	2462	12336
FB	NA	NA	NA	NA	NA	NaN	NaN	413	1538	2995	2832	1275	9053
SF	NA	NA	NA	NA	NA	0	0	2624	3139	4944	8923	2006	21636
MO	NA	NA	NA	NA	NA	NaN	0	5677	3504	6090	10305	1233	26809
Total	690	200	0	NA	NA	0	0	8715	10675	19412	31185	11615	82491

Klamath Contribution Rates: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0	0	NA	NA	NA	NA	0.142	0.025	0.050	0.027	0.070	0.132
CO	NA	0	NA	NA	NA	NA	0.105	0.073	0.066	0.096	0.184	0.254
KO	NA	NA	NA	NA	NA	NA	0.000	0.000	0.128	0.215	0.297	0.290
KC	NA	NA	NA	NA	NA	NA	NA	NA	0.647	0.459	0.434	0.449
FB	NA	NA	NA	NA	NA	NA	NA	0.098	0.260	0.362	0.298	0.130
SF	NA	NA	NA	NA	NA	NA	NA	0.000	0.107	0.154	0.137	0.062
MO	NA	NA	NA	NA	NA	NA	NA	0.000	0.031	0.040	0.078	0.003

Klamath Contribution Rates: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0.000	0	NA	NA	NA	NA	NA	0.000	0.004	0.003	0.045	0.032
CO	NA	NaN	NaN	NA	NA	NA	NA	0.000	0.064	0.074	0.081	0.043
KO	0.144	NA	NA	NA	NA	NA	NA	NA	0.029	0.078	0.189	0.327
KC	0.122	NA	NA	NA	NA	NA	NA	0.000	0.195	0.231	0.181	0.257
FB	NA	NA	NA	NA	NA	0.000	0.000	0.027	0.060	0.090	0.124	0.057
SF	NA	NA	NA	NA	NA	0.004	0.007	0.036	0.017	0.041	0.026	0.005
MO	NA	NA	NA	NA	NA	0.000	0.006	0.011	0.005	0.005	0.007	0.007

Total Effort: Troll

Non-retention Effort: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
CO	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
KO	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
SF	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
MO	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
Total	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0

Mgt.Input.Files/ocean.dat

	fishery	area	start.date	end.date	Q	ret	sl	coho
1	10	NO	apr-10-2010	apr-29-2010	NA	1	28	0
2	10	NO	may-01-2010	jun-30-2010	NA	1	28	0
3	10	NO	jul-11-2010	jul-30-2010	NA	1	28	0
4	10	NO	aug-04-2010	aug-14-2010	NA	1	28	0
5	10	NO	aug-15-2010	aug-20-2010	NA	1	28	1
6	10	NO	aug-21-2010	aug-24-2010	NA	1	28	0
7	10	NO	aug-25-2010	aug-28-2010	NA	1	28	1
8	10	CO	apr-10-2010	apr-29-2010	NA	1	28	0
9	10	CO	may-01-2010	jun-30-2010	NA	1	28	0
10	10	CO	jul-11-2010	jul-30-2010	NA	1	28	0
11	10	CO	aug-04-2010	aug-14-2010	NA	1	28	0
12	10	CO	aug-15-2010	aug-20-2010	NA	1	28	1
13	10	CO	aug-21-2010	aug-24-2010	NA	1	28	0
14	10	CO	aug-25-2010	aug-28-2010	NA	1	28	1
15	10	KO	apr-10-2010	apr-29-2010	NA	1	28	0
16	10	KO	may-01-2010	may-31-2010	NA	1	28	0
17	10	KO	jun-01-2010	jun-30-2010	1600	1	28	0
18	10	KO	jul-11-2010	jul-31-2010	1600	1	28	0
19	10	KO	aug-01-2010	aug-14-2010	1800	1	28	0
20	10	FB	apr-09-2010	apr-27-2010	2000	1	27	0
21	10	FB	aug-01-2010	aug-29-2010	NA	1	28	0
22	10	SF	may-09-2010	may-31-2010	NA	1	27	0
23	10	SF	jul-01-2010	aug-29-2010	NA	1	28	0
24	10	MO	may-01-2010	may-31-2010	NA	1	27	0
25	10	MO	jul-01-2010	aug-29-2010	NA	1	28	0
26	40	NO	mar-15-2010	jun-22-2010	NA	1	24	0
27	40	NO	jun-23-2010	aug-31-2010	NA	1	24	1
28	40	CO	mar-15-2010	jun-22-2010	NA	1	24	0
29	40	CO	jun-23-2010	aug-31-2010	NA	1	24	1
30	40	KO	may-05-2010	jun-22-2010	NA	1	24	0
31	40	KO	jun-23-2010	aug-31-2010	NA	1	24	1
32	40	KC	may-05-2010	aug-31-2010	NA	1	24	0
33	40	FB	feb-17-2010	aug-31-2010	NA	1	20	0
34	40	SF	apr-07-2010	aug-31-2010	NA	1	20	0
35	40	MO	apr-07-2010	aug-31-2010	NA	1	20	0

Days open: commercial, retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	0	0	0	20	31	30	20	25

CO	NA	NA	NA	NA	0	0	0	20	31	30	20	25
KO	NA	NA	NA	NA	0	0	0	20	31	0	0	0
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	0	0	0	29
SF	NA	NA	NA	NA	0	0	0	0	23	0	31	29
MO	NA	NA	NA	NA	0	0	0	0	31	0	31	29

Quotas: commercial, retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KO	NA	NA	NA	NA	NA	NA	NA	NA	NA	1600	1600	1800
KC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FB	NA	NA	NA	NA	NA	NA	NA	2000	NA	NA	NA	NA
SF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Size-limits: commercial, retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	28	28	NA	NA	NA	NA	NA	28	28	28	28	28
CO	NA	28	NA	NA	NA	NA	NA	28	28	28	28	28
KO	NA	NA	NA	NA	NA	NA	NA	28	28	28	28	28
KC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FB	NA	NA	NA	NA	NA	NA	NA	27	NA	NA	NA	28
SF	NA	NA	NA	NA	NA	NA	NA	NA	27	NA	28	28
MO	NA	NA	NA	NA	NA	NA	NA	NA	27	NA	28	28

Days open: commercial, non-retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
CO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
KO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	0	0	0	0
SF	NA	NA	NA	NA	0	0	0	0	0	0	0	0
MO	NA	NA	NA	NA	0	0	0	0	0	0	0	0

Quotas: commercial, non-retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Days open: recreational, retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	0	0	17	30	31	30	31	31
CO	NA	NA	NA	NA	0	0	17	30	31	30	31	31
KO	NA	NA	NA	NA	0	0	0	0	27	30	31	31
KC	NA	NA	NA	NA	0	0	0	0	27	30	31	31

FB	NA	NA	NA	NA	0	12	31	30	31	30	31	31
SF	NA	NA	NA	NA	0	0	0	24	31	30	31	31
MO	NA	NA	NA	NA	0	0	0	24	31	30	31	31

Quotas: recreational, retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Size-limits: recreational, retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	24	24	NA	NA	NA	NA	24	24	24	24	24	24
CO	NA	20	20	NA	NA	NA	24	24	24	24	24	24
KO	24	NA	NA	NA	NA	NA	NA	NA	24	24	24	24
KC	24	NA	NA	NA	NA	NA	NA	NA	24	24	24	24
FB	NA	NA	NA	NA	NA	20	20	20	20	20	20	20
SF	NA	NA	NA	NA	NA	NA	NA	20	20	20	20	20
MO	NA	NA	NA	NA	NA	NA	NA	20	20	20	20	20

Days open: recreational, non-retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
CO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
KO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	0	0	0	0
SF	NA	NA	NA	NA	0	0	0	0	0	0	0	0
MO	NA	NA	NA	NA	0	0	0	0	0	0	0	0

Quotas: recreational, non-retention

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Mgt.Input.Files/river.dat

	parameter	value
1	pi.t	0.50
2	pi.r	0.26
3	H.r.tot	NA
4	CR.r	0.00
5	c.r	0.07
6	s.r	0.10
7	E.nat.tot	NA

