

Ocean Abundance Projections and Prospective Harvest Levels for Klamath River Fall Chinook, 2014 Season

Klamath River Technical Team
5 March 2014

Summary

Predictor performance for 2013 and forecasts for 2014 are:

	<i>Age</i>	<i>2013</i>			<i>2014 Forecast</i>
		<i>Preseason</i>	<i>Postseason</i>	<i>Pre/Post</i>	
Ocean Abundance	3	390,700	286,400	1.36	219,800
	4	331,200	203,500	1.63	67,400
	5	5,700	4,900	1.16	12,100
Proportion Natural	3	0.66	0.71	0.93	0.65
	4	0.71	0.81	0.88	0.74
	5	0.79	0.96	0.82	0.80
Ocean Harvest Rate	4	0.16	0.20	0.82	-
Ocean Fall Harvest	3	-	0	-	-
	4	-	1,834	-	-
	5	-	628	-	-

The implications of the 2014 forecast ocean abundances, proportions natural, and the 2013 ocean fall harvest for fisheries management in 2014 were explored with the Klamath Ocean Harvest Model (KOHM) under two hypothetical management scenarios: (A) no additional ocean fisheries (commercial and recreational) from Jan–Aug 2014 between Cape Falcon and Point Sur (2462 Klamath River fall Chinook were estimated to have been harvested in the ocean during the Sept-Dec 2013 period) and no Klamath River fisheries (tribal and recreational) in 2014, and (B) the 2013 ocean fishery seasons and quotas, the 2013 river recreational allocation of 35 percent (of non-tribal harvest), and a tribal allocation of 50% (of total harvest). The results are:

<i>Sector</i>	<i>KOHM Forecasts</i>	
	<i>(A) No-fishing in 2014</i>	<i>(B) 2013 Regulations</i>
Adult Spawners		
Natural Areas	75,300	19,200
Hatcheries	32,000	9,200
Adult Harvest		
Ocean Commercial	2,300	24,000
Ocean Recreational	200	3,500
River Recreational	0	14,800
Tribal	0	42,300
Age-4 Ocean Harvest Rate	0.027	0.194
Spawner Reduction Rate	0.022	0.750

With no further fishing in 2014 on the current stock, the expected number of natural area adult spawners would be 75,300, with an expected age-4 ocean harvest rate of 2.7% (1835 age-4 KRFC were harvested in the Sept–Dec 2013 period). Applying 2013 fishery regulations resulted in 19,200 natural area adult spawners and an age-4 ocean harvest rate of 19.4%. These forecasts are provided for informational purposes only; the Pacific Fishery Management Council (PFMC) will adopt 2014 ocean salmon fishery management regulations in April 2014.

Introduction

The PFMC's fishery management plan for Klamath River fall Chinook (PFMC 2012; Amendment 16) allowed a natural spawner reduction rate via fisheries of no more than 0.68, with a minimum escapement of 40,700 natural area adult spawners. 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 alternative 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 2014 management year. For informational purposes, KOHM forecasts of harvest and spawner escapement are also presented under two hypothetical management scenarios: (A) no ocean or river fisheries in 2014, and (B) the 2013 ocean fishery seasons and quotas, the 2013 river recreational allocation of 35 percent (of non-tribal harvest), and a tribal allocation of 50 percent (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 2013 river run of Klamath River fall Chinook salmon used in this report is from KRTT (2014).

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 1979–2009 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 2012 (age-three) and 2013 (age-three, age-four) are preliminary, as their respective cohorts are incomplete (Table 1).

The 2013 age-three ocean abundance forecast was 1.36 times its postseason estimate (Table 2); the age-three predictor has overestimated abundance in 15 of the 29 previous years. The 2013 age-four ocean abundance forecast was 1.63 times its postseason estimate (Table 2); the age-four predictor has overestimated abundance in 19 of the 29 previous years. The 2013 age-five ocean abundance forecast was 1.16 times its postseason estimate (Table 2); the age-five predictor has over estimated abundance in 11 of the 27 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 1997–2013 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 2013 proportion natural forecast for age-three, -four, and -five fish was 0.66, 0.71, and 0.79, respectively, and the corresponding post-season estimates are 0.71, 0.81, and 0.96, respectively (Table 4).

Historical Harvest Levels and Rates

Historical (1986-2013) ocean and river harvest levels and rates of age-three and age-four Klamath River fall Chinook are listed in Table 5. The 2013 age-four ocean harvest rate (preliminary) postseason estimate of 19.6 percent is greater than the preseason forecast of 16.0 percent (PFMC 2013).

2013 Ocean Fishery Fall Harvest

Klamath River fall Chinook ocean harvests during the 2012 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 2012, 3708 Klamath River fall Chinook were estimated to have been harvested.

2014 Forecasts

The 2014 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	219,800	0.65
4	67,400	0.74
5	12,100	0.80

For the 2013 ocean fall fisheries, the natural production multipliers for the coded-wire tag recoveries are:

<i>Age</i> <i>(a)</i>	<i>Total</i> <i>Escapement (a-1)</i>	<i>Hatchery-origin</i> <i>Escapement (a-1)</i>	<i>Natural-production</i> <i>Multiplier (a)</i>
3	14,416	1,796	8.03
4	55,259	18,827	2.94
5	108,799	37,769	2.88

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 two management scenarios: (A) no additional ocean fisheries (commercial and recreational) from Jan–Aug 2014 between Cape Falcon and Point Sur (2462 Klamath River fall Chinook were estimated to be harvested in the ocean during the Sept–Dec 2013 period) and no Klamath River fisheries (tribal and recreational) in 2014, and (B) the 2013 ocean fishery seasons and quotas, the 2013 river recreational allocation of 35% (of non-tribal harvest), and a tribal allocation of 50% (of total harvest); are provided in Appendices A and B respectively.

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Literature Cited

- Goldwasser, L., M. S. Mohr, A. M. Grover, and M. L. Palmer-Zwahlen. 2001. The supporting databases and biological analyses for the revision of the Klamath Ocean Harvest Model. Available from M. S. Mohr, National Marine Fisheries Service, 110 Shaffer Road, Santa Cruz, California, 95060.
- KRTAT (Klamath River Technical Advisory Team). 2002. Ocean abundance projections and prospective harvest levels for Klamath River fall chinook, 2002 season. Available from U.S. Fish and Wildlife Service, 1829 South Oregon Street, Yreka, California, 96097.
- KRTT (Klamath River Technical Team). 2014. Klamath River fall Chinook age-specific escapement, river harvest, and run size estimates, 2013 run. Available from the Pacific Fishery Management Council, 7700 NE Ambassador Place, Suite 101, Portland, OR 97220-1384.
- PFMC (Pacific Fishery Management Council). 2012. Pacific Coast Salmon Fishery Management Plan for Commercial and Recreational Salmon Fisheries off the Coasts of Washington, Oregon, and California as Revised Through Amendment 16. PFMC, Portland, OR. 90 p.
- PFMC (Pacific Fishery Management Council). 2013. Preseason report III: Analysis of council adopted management measures for 2013 ocean salmon fisheries. Pacific Fishery Management Council, 7700 NE Ambassador Place, Suite 101, Portland, Oregon 97220-1384.

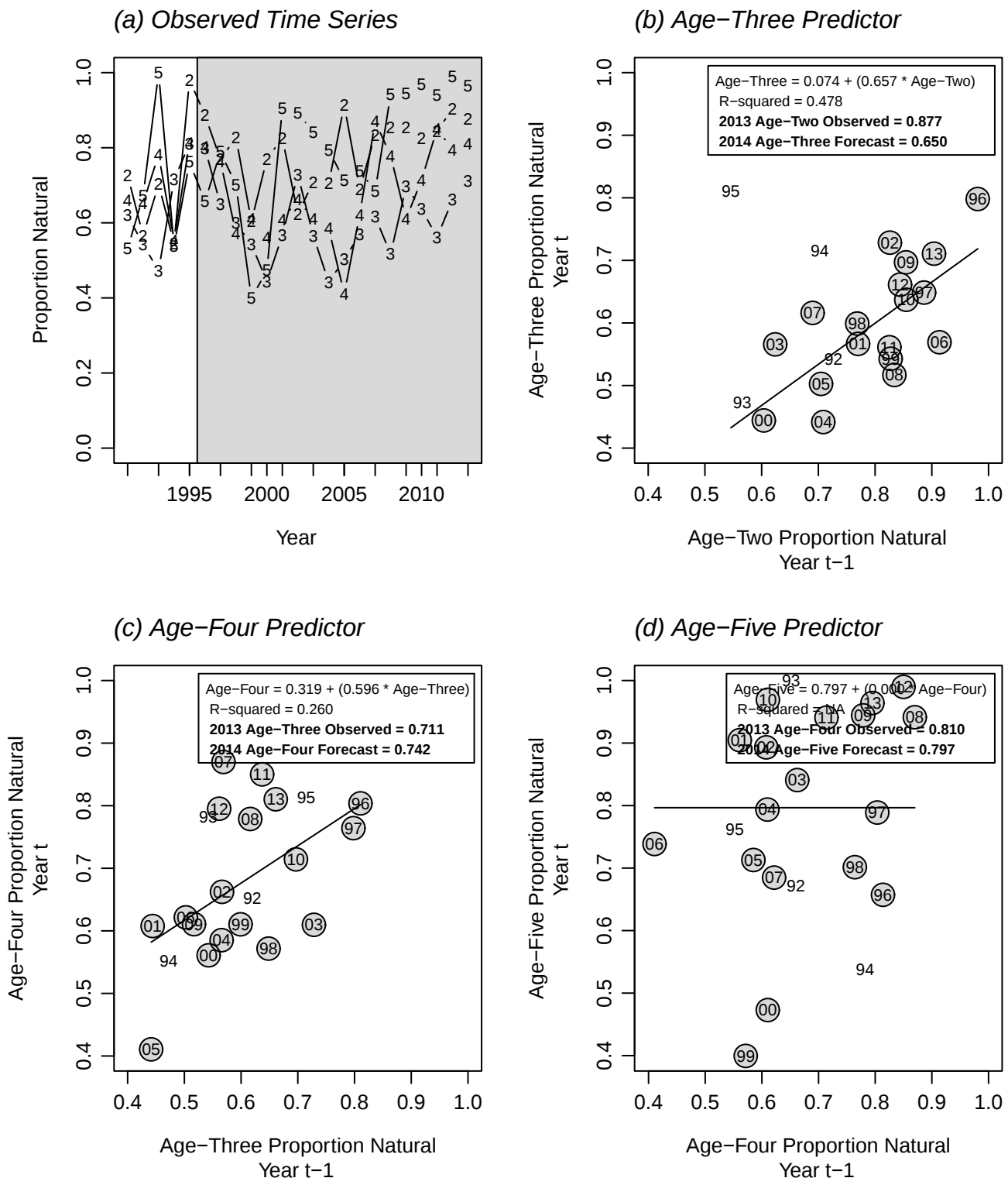


Figure 2. Age-specific proportion of natural area spawners. Panel (a): observed time-series; numbers in plot denote age; shaded area depicts data used for predictor. Panels (b)–(d): age-specific predictor based on previous-year observed proportion for same cohort; numbers in plots denote years 1992–2013; shaded circles indicate years used for predictor; age-three and age-four are regression predictors; age-5 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				Total Adults
	Sept1(t-1)			Sept1(t-1) thru Aug31(t)		River Run (t)				
	Age 3	Age 4	Total	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	313.3	114.2	427.5	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	374.8	56.9	431.7	0.11	0.24	69.4	32.9	25.7	5.8	64.4
1986	1,304.4	140.8	1,445.2	0.18	0.46	44.6	162.9	29.8	2.3	195.0
1987	781.1	341.9	1,123.0	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	617.1	44.2	661.3	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	400.2	192.2	592.4	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	376.8	33.6	410.5	0.06	0.21	1.7	113.7	16.8	1.6	132.1
2008	68.0	81.4	149.4	0.00	0.10	25.2	18.6	50.2	1.7	70.6
2009	240.7	21.1	261.8	0.00	0.00	11.9	78.6	16.4	5.6	100.6
2010	192.8	62.1	254.9	0.01	0.04	16.6	46.1	44.3	0.4	90.9
2011	241.9	64.6	306.5	0.03	0.08	84.9	59.0	41.0	2.0	102.0
2012	810.1 ^{a/}	75.2	885.3	0.03 ^{a/}	0.08	21.1	240.8	49.0	2.1	291.9
2013	286.4 ^{b/}	203.5 ^{a/}	489.8	---- ^{c/}	0.196 ^{a/}	14.4	55.3	108.8	1.1	165.1

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 4).

Year (t)	Preseason Forecast ^{a/}	Postseason Estimate	Pre/Postseason
	Sept 1 (t-1)	Sept 1 (t-1)	
Age-Three			
1985	113,000	276,000	0.41
1986	426,000 ^{b/}	1,304,409	0.33
1987	511,800	781,123	0.66
1988	370,800	756,261	0.49
1989	450,600	369,828	1.22
1990	479,000	176,122	2.72
1991	176,200	69,424	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	784,260	0.34
1996	479,800	192,272	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	617,098	0.57
2001	187,200	356,128	0.53
2002	209,000	513,561	0.41
2003	171,300	400,242	0.43
2004	72,100	159,560	0.45
2005	185,700	189,976	0.98
2006	44,100	90,606	0.49
2007	515,400	376,841	1.37
2008	31,600	68,003	0.46
2009	474,900	240,713	1.97
2010	223,400	192,791	1.16
2011	304,600	241,907	1.26
2012	1,567,600	810,145	1.93
2013 ^{c/}	390,700	286,370	1.36
2014	219,800		

Table 2. Comparisons of preseason forecast and postseason estimates for ocean abundance of adult Klamath River fall Chinook (Page 2 of 4).

Year (t)	Preseason Forecast ^{a/}	Postseason Estimate	Pre/Postseason
	Sept 1 (t-1)	Sept 1 (t-1)	
Age-Four			
1985	56,875	57,500	0.99
1986	66,250	140,823	0.47
1987	206,125	341,875	0.60
1988	186,375	234,751	0.79
1989	215,500	177,245	1.22
1990	50,125	103,951	0.48
1991	44,625	37,171	1.20
1992	44,750	28,169	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	225,521	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	192,156	0.69
2004	134,500	105,051	1.28
2005	48,900	38,079	1.28
2006	63,700	63,383	1.01
2007	26,100	33,615	0.78
2008	157,200	81,366	1.93
2009	25,200	21,124	1.19
2010	106,300	62,092	1.71
2011	61,600	64,586	0.95
2012	79,600	75,179	1.06
2013 ^{c/}	331,200	203,478	1.63
2014	67,400		

Table 2. Comparisons of preseason forecast and postseason estimates for ocean abundance of adult Klamath River fall Chinook (Page 3 of 4).

	Preseason Forecast ^{a/}	Postseason Estimate	
Year (t)	Sept 1 (t-1)	Sept 1 (t-1)	Pre/Postseason
Age-Five			
1985 ^{d/}	--	11,113	--
1986 ^{d/}	--	6,376	--
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	2,911	1.61
2008	1,900	2,900	0.66
2009	5,600	7,059	0.79
2010	1,800	517	3.48
2011	5,000	2,753	1.82
2012	4,600	5,123	0.90
2013 ^{c/}	5,700	4,850	1.18
2014	12,100		

Table 2. Comparisons of preseason forecast and postseason estimates for ocean abundance of adult Klamath River fall Chinook (Page 4 of 4).

	Preseason Forecast ^{a/}	Postseason Estimate	
Year (t)	Sept 1 (t-1)	Sept 1 (t-1)	Pre/Postseason
Total Adults			
1985 ^{d/}	169,875	344,613	0.49
1986 ^{d/}	492,250	1,451,608	0.34
1987	723,175	1,142,412	0.63
1988	570,425	1,005,644	0.57
1989	676,225	556,685	1.21
1990	536,750	287,840	1.86
1991	222,325	109,369	2.03
1992	96,000	69,115	1.39
1993	334,650	185,269	1.81
1994	224,625	163,117	1.38
1995	318,000	816,790	0.39
1996	749,425	418,580	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	662,325	0.59
2001	435,450	490,187	0.89
2002	362,500	619,421	0.59
2003	310,200	594,313	0.52
2004	216,300	281,781	0.77
2005	239,800	234,912	1.02
2006	110,000	159,225	0.69
2007	546,200	413,367	1.32
2008	190,700	152,269	1.25
2009	505,700	268,896	1.88
2010	331,500	255,400	1.30
2011	371,200	309,246	1.20
2012	1,651,800	890,447	1.86
2013 ^{c/}	727,600	494,698	1.47
2014	299,300	--	--

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)		Forecast ^{b/}		Rate Estimate ^{c/}		Forecast		Estimate	
	Age-3	Age-4	Age-3	Age-4	Ocean	River	Ocean	River	Ocean	River	Ocean	River
1986	426,000	66,250	1,304,409	140,823	0.28	0.50	0.46	0.67	72,000	37,700	301,999	46,154
1987	511,800	206,125	781,123	341,875	0.28	0.53	0.43	0.44	121,200	78,200	277,203	73,265
1988	370,800	186,375	756,261	234,751	0.31	0.53	0.39	0.52	114,100	65,400	253,888	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	176,122	103,951	0.30	0.49	0.55	0.36	85,100	31,200	114,780	11,459
1991	176,200	44,625	69,424	37,171	0.13	0.28	0.18	0.45	16,700	12,800	9,871	13,581
1992	50,000	44,750	39,502	28,169	0.06	0.15	0.07	0.27	4,200	4,200	3,142	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	784,260	28,725	0.07	0.32	0.14	0.19	13,500	18,500	32,233	21,637
1996	479,800	268,500	192,272	225,521	0.17	0.66	0.16	0.39	88,400	129,100	45,155	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	617,098	44,176	0.11	0.53	0.10	0.25	24,000	32,400	42,050	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	513,561	98,927	0.13	0.57	0.15	0.26	30,000	70,900	28,895	35,069
2003	171,300	132,400	400,242	192,156	0.16	0.50	0.21	0.28	30,600	52,200	70,684	39,715
2004	72,100	134,500	159,560	105,051	0.15	0.38	0.34	0.48	26,500	35,800	63,885	29,807
2005	185,700	48,900	189,976	38,079	0.08	0.16	0.20	0.19	7,100	9,600	12,826	10,001
2006	44,100	63,700	90,606	63,383	0.11	0.23	0.10	0.18	10,000	10,000	10,401	10,345
2007	515,400	26,100	376,841	33,615	0.16	0.63	0.21	0.56	30,200	51,400	30,244	33,884
2008	31,600	157,200	68,003	81,366	0.02	0.43	0.10	0.38	4,500	49,500	8,679	24,180
2009	474,900	25,200	240,713	21,124	0.00	0.57	0.00	0.40	100	61,700	51	34,040
2010	223,400	106,300	192,791	62,092	0.12	0.49	0.04	0.40	22,600	46,600	4,497	32,920
2011	304,600	61,600	241,907	64,586	0.16	0.54	0.08	0.34	26,900	42,700	12,117	30,502
2012	1,567,600	79,600	810,145	75,179	0.16	0.77	0.08	0.51	92,400	227,600	35,555	109,312
2013 ^{d/}	390,700	331,200	286,370	203,478	0.16	0.62	0.20	0.51	74,800	154,800	63,082	82,499

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 (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-area 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	8,090	36,417	5,691	2,303	44,411	0.85	0.70	0.61	0.94	0.69
2010	2,501	10,866	7,179	7	18,052	11,806	19,067	17,937	221	37,225	0.83	0.64	0.71	0.97	0.67
2011	11,424	18,381	3,874	82	22,337	61,849	23,517	21,945	1,303	46,765	0.84	0.56	0.85	0.94	0.68
2012	1,629	51,450	4,486	2	55,938	15,312	100,431	17,419	197	118,047	0.90	0.66	0.80	0.99	0.68
2013	1,458	7,775	9,352	21	17,148	10,367	19,107	39,945	566	59,618	0.88	0.71	0.81	0.96	0.78

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).

Year(t)	Ocean Fisheries (Sept 1(t-1) through Aug 31(t))						River Fisheries (t)			
	KMZ			North of	South of	Ocean	River Fisheries (t)			
	Troll	Sport	Subtotal	KMZ	KMZ	Subtotal	Total	Net	Sport	Total
HARVEST (numbers of fish)										
Age-Three										
1986	35,632	4,876	40,508	73,777	122,913	196,690	237,198	8,100	18,100	26,200
1987	17,237	5,082	22,319	43,432	56,368	99,800	122,119	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	36,575	11,004	47,579	52,017	1,300	1,400	2,700
1991	0	1,022	1,022	344	810	1,154	2,176	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	12,213	14,810	27,023	28,022	11,840	5,536	17,376
1996	0	0	0	0	9,314	9,314	9,314	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	8,604	25,203	33,807	37,493	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	784	1,004	1,501	9,915	11,416	12,420	11,734	6,258	17,992
2003	173	679	852	1,885	27,309	29,194	30,046	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	8,099	8,869	4,193	9,365	13,558	22,427	17,543	5,734	23,277
2008	0	0	0	0	0	0	0	3,225	608	3,833
2009	0	51	51	0	0	0	51	19,820	4,715	24,535
2010	112	28	140	0	1,665	1,665	1,805	13,132	1,884	15,016
2011	337	1,152	1,489	35	4,913	4,948	6,437	13,286	2,630	15,916
2012 ^{a/}	1,150	11,647	12,797	951	13,433	14,384	27,181	70,409	12,157	82,566
2013 ^{a/}	421	6,012	6,433	939	12,906	13,845	20,278	18,924	7,651	26,575
Age-Four										
1986	7,745	1,113	8,858	23,486	31,913	55,399	64,257	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	11,868	3,595	15,463	26,376	50,287	76,663	92,126	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	4,134	5,647	6,648	7,593	2,016	9,609
1992	171	55	226	1,783	12	1,795	2,021	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	10,337	20,741	31,078	35,315	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	834	918	1,752	7,855	30,007	37,862	39,614	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	6,376	1,105	7,481	546	113	659	8,140	17,891	1,260	19,151
2009	0	0	0	0	0	0	0	5,831	706	6,537
2010	42	112	154	886	1,482	2,368	2,522	16,630	1,134	17,764
2011	417	176	593	1,043	3,781	4,824	5,417	12,587	1,466	14,053
2012	343	2,131	2,474	776	3,020	3,796	6,270	23,285	1,714	24,999
2013 ^{a/}	4,409	6,441	10,850	4,175	24,817	28,992	39,842	43,480	11,996	55,476

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

Year(t)	Ocean Fisheries (Sept 1(t-1) through Aug 31(t))						Ocean Total	River Fisheries (t)		
	KMZ			North of	South of	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.03	0.21
2009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.06	0.31
2010	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.28	0.04	0.33
2011	0.00	0.00	0.01	0.00	0.02	0.02	0.03	0.23	0.04	0.27
2012 ^{a/}	0.00	0.01	0.02	0.00	0.02	0.02	0.03	0.29	0.05	0.34
2013 ^{a/}	0.00	0.02	0.02	0.00	0.05	0.05	0.07	0.34	0.14	0.48
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	0.08	0.01	0.09	0.01	0.00	0.01	0.10	0.36	0.03	0.38
2009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.04	0.40
2010	0.00	0.00	0.00	0.01	0.02	0.04	0.04	0.37	0.03	0.40
2011	0.01	0.00	0.01	0.02	0.06	0.07	0.08	0.31	0.04	0.34
2012	0.00	0.03	0.03	0.01	0.04	0.05	0.08	0.48	0.04	0.51
2013 ^{a/}	0.02	0.03	0.05	0.02	0.12	0.14	0.20	0.40	0.11	0.51

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 2013 (September - November) ocean landings of Klamath River fall Chinook by fishery, age, and KOHM area.

COMMERCIAL FISHERY										
KOHM area ^{a/}	Age 3			Age 4			Age 5			Total
	Sept	Oct	Nov	Sept	Oct	Nov	Sept	Oct	Nov	
NO	--	--	--	--	--	--	--	--	--	0
CO	--	--	--	1,164	488	--	509	91	--	2,252
KO	--	--	--	--	--	--	--	--	--	0
KC	--	--	--	--	--	--	--	--	--	0
FB	--	--	--	--	--	--	--	--	--	0
SF	--	--	--	--	--	--	--	--	--	0
MO	--	--	--	--	--	--	--	--	--	0
Total	0	0	0	1,164	488	0	509	91	0	2,252

SPORT FISHERY										
KOHM area ^{a/}	Age 3			Age 4			Age 5			Total
	Sept	Oct	Nov	Sept	Oct	Nov	Sept	Oct	Nov	
NO	--	--	--	--	--	--	--	--	--	0
CO	--	--	--	155	--	--	--	--	--	155
KO	--	--	--	28	--	--	27	--	--	54
KC	--	--	--	--	--	--	--	--	--	0
FB	--	--	--	--	--	--	--	--	--	0
SF	--	--	--	--	--	--	--	--	--	0
MO	--	--	--	--	--	--	--	--	--	0
Total	0	0	0	182	0	0	27	0	0	209

a/ 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.

Appendix A: KOHM: Summary Output. Thu Feb 20 14:41:40 2014
2014 Stock Projections; no 2014 fishing.

Klamath Escapement

Absent fishing: 109480
Hatcheries: 32529
Natural areas: 76952

With fishing
Mature adults: 107684
Strays: 449
Klamath Basin: 107235
Spawners: 107235
Hatcheries: 31979
Natural areas: 75256
Reduction rate: 0.022

Klamath Harvest

Total: 2462
River: 0
Ocean: 2462

Tribal: 0 0.000 (objective: 0.000)

Non-tribal: 2462
River: 0 0.000 (objective: 0)
Ocean troll: 2252
CA / OR: 0.000 / 1.000
Ocean sport: 210
KMZ: 55 0.022
Age-four o.harv.rate: 0.027 (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	0	0	0	0	0	0	NA
CO	1673	579	0	0	0	0	0	0	0	0	0	0	2252	NA
KO	0	0	0	0	0	0	0	0	0	0	0	0	0	NA
KC	0	0	0	0	0	0	0	0	0	0	0	0	0	NaN
FB	0	0	0	0	0	0	0	0	0	0	0	0	0	NaN
SF	0	0	0	0	0	0	0	0	0	0	0	0	0	NaN
MO	0	0	0	0	0	0	0	0	0	0	0	0	0	NaN
Total	1673	579	0	0	0	0	0	0	0	0	0	0	2252	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	0	0	0	NA	NA
CO	155	0	0	0	0	0	0	0	0	0	0	0	155	NA	NA
KO	55	0	0	0	0	0	0	0	0	0	0	0	55	NA	NA
KC	0	0	0	0	0	0	0	0	0	0	0	0	0	NaN	NaN
FB	0	0	0	0	0	0	0	0	0	0	0	0	0	NaN	NaN
SF	0	0	0	0	0	0	0	0	0	0	0	0	0	NaN	NaN
MO	0	0	0	0	0	0	0	0	0	0	0	0	0	NaN	NaN
Total	210	0	0	0	0	0	0	0	0	0	0	0	210	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	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, 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	24	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KO	24	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KC	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FB	20	20	20	NA	NA	NA	NA	NA	NA	NA	NA	NA
SF	20	20	20	NA	NA	NA	NA	NA	NA	NA	NA	NA
MO	24	24	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	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 0.00

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

Appendix B. KOHM: Summary Output. Thu Feb 20 16:23:30 2014
2014 Stock Projections; 2013 Regulations.

Klamath Escapement

Absent fishing: 109480
Hatcheries: 32529
Natural areas: 76952

With fishing
Mature adults: 89947
Strays: 379
Klamath Basin: 89568
Spawners: 28424
Hatcheries: 9206
Natural areas: 19218
Reduction rate: 0.750

Klamath Harvest

Total: 84682
River: 57160
Ocean: 27522

Tribal: 42341 0.500 (objective: 0.500)

Non-tribal: 42341
River: 14819 0.350 (objective: 0.350)
Ocean troll: 24028
CA / OR: 0.653 / 0.347
Ocean sport: 3493
KMZ: 2189 0.080
Age-four o.harv.rate: 0.194 (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	116	234	84	108	418	959	NA
CO	1673	579	0	0	0	0	0	291	394	314	656	1973	5880	NA
KO	0	0	0	0	0	0	0	0	32	445	569	445	1491	NA
KC	0	0	0	0	0	0	0	0	903	835	394	474	2605	14.3
FB	0	0	0	0	0	0	0	0	422	3098	3907	2126	9553	52.3
SF	0	0	0	0	0	0	0	0	603	1077	1194	314	3188	17.5
MO	0	0	0	0	0	0	0	0	171	82	95	3	352	1.9
Total	1673	579	0	0	0	0	0	407	2758	5936	6924	5752	24028	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	27	6	33	NA	NA
CO	155	0	0	0	0	0	0	0	5	14	69	37	279	NA	NA
KO	55	0	0	0	0	0	0	0	7	67	157	332	619	NA	NA
KC	0	0	0	0	0	0	0	0	304	431	395	441	1570	8.6	61.3
FB	0	0	0	0	0	0	0	7	68	166	214	52	508	2.8	19.8
SF	0	0	0	0	0	0	0	63	42	123	139	6	374	2.0	14.6
MO	0	0	0	0	0	0	0	49	10	14	33	4	109	0.6	4.3
Total	210	0	0	0	0	0	0	119	437	815	1034	879	3493	NA	NA

Chinook Harvest (All Stocks): Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	4600	800	NA	NA	NA	NA	0	13147	12815	6989	4400	6723	49476
CO	23700	7600	900	NA	NA	NA	0	6615	12217	6079	6314	13742	77168
KO	100	200	NA	NA	NA	NA	NaN	NaN	537	4000	3000	2000	9837
KC	200	NA	NA	NA	NA	NA	NA	NA	3000	3000	2000	1500	9700
FB	4300	NA	NA	NA	NA	NA	NA	0	3656	18766	31789	38883	97393
SF	6300	900	NA	NA	NA	NA	NA	NaN	13366	19823	22742	14262	77393
MO	100	NA	NA	NA	NA	NA	NA	NaN	17011	6346	3339	2681	29477
Total	39300	9500	900	NA	NA	NA	0	19763	62603	65004	73583	79791	350443

Chinook Harvest (All Stocks): Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	1100	800	NA	NA	NA	NA	NaN	NaN	168	27	1024	416	3534
CO	700	10	NA	NA	NA	NA	NaN	NaN	167	378	1848	1719	4822
KO	100	800	NA	NA	NA	NA	NA	NA	612	1825	1464	1755	6556
KC	400	NA	NA	NA	NA	NA	NA	NA	2802	3765	4497	3202	14667
FB	300	10	0	NA	NA	NaN	NaN	1027	3247	4608	4275	2227	15694
SF	1700	1300	100	NA	NA	0	0	4757	6156	4305	13063	3939	35321
MO	20	0	NA	NA	NA	NaN	0	14559	7076	8513	9757	2451	42376
Total	4320	2920	100	NA	NA	0	0	20343	20229	23421	35927	15709	122970

Klamath Contribution Rates: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0.000	0.000	NA	NA	NA	NA	0.064	0.009	0.018	0.012	0.025	0.062
CO	0.071	0.076	0	NA	NA	NA	0.044	0.044	0.032	0.052	0.104	0.144
KO	0.000	0.000	NA	NA	NA	NA	0.000	0.000	0.059	0.111	0.190	0.223
KC	0.000	NA	NA	NA	NA	NA	NA	NA	0.301	0.278	0.197	0.316
FB	0.000	NA	NA	NA	NA	NA	NA	0.063	0.115	0.165	0.123	0.055
SF	0.000	0.000	NA	NA	NA	NA	NA	0.000	0.045	0.054	0.053	0.022
MO	0.000	NA	NA	NA	NA	NA	NA	0.000	0.010	0.013	0.029	0.001

Klamath Contribution Rates: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0.000	0	NA	NA	NA	NA	0.000	0.000	0.001	0.001	0.027	0.014
CO	0.221	0	NA	NA	NA	NA	0.000	0.000	0.029	0.037	0.037	0.021
KO	0.550	0	NA	NA	NA	NA	NA	NA	0.012	0.037	0.107	0.189
KC	0.000	NA	NA	NA	NA	NA	NA	NA	0.108	0.114	0.088	0.138
FB	0.000	0	NaN	NA	NA	0.000	0.000	0.007	0.021	0.036	0.050	0.024
SF	0.000	0	0	NA	NA	0.001	0.003	0.013	0.007	0.029	0.011	0.002
MO	0.000	NaN	NA	NA	NA	0.000	0.003	0.003	0.001	0.002	0.003	0.002

Total Effort: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	0	436	899	700	533	648	3217
CO	NA	NA	NA	NA	0	0	0	492	702	642	456	778	3069
KO	NA	NA	NA	NA	0	0	0	10	34	191	202	145	584
KC	NA	NA	NA	NA	0	0	0	0	261	237	264	185	947
FB	NA	NA	NA	NA	0	0	0	0	294	827	1220	1440	3782

Mgt.Input.Files/ocean.dat

	fishery	area	start.date	end.date	Q	ret	sl	coho
1	10	NO	apr-01-2014	aug-29-2014	NA	1	28	0
2	10	NO	sep-04-2014	oct-31-2014	NA	1	28	0
3	10	CO	apr-01-2014	aug-29-2014	NA	1	28	0
4	10	CO	sep-04-2014	oct-31-2014	NA	1	28	0
5	10	KO	apr-01-2014	may-31-2014	NA	1	28	0
6	10	KO	jun-01-2014	jun-30-2014	4000	1	28	0
7	10	KO	jul-01-2014	jul-31-2014	3000	1	28	0
8	10	KO	aug-01-2014	aug-29-2014	2000	1	28	0
9	10	KO	sep-16-2014	sep-27-2014	1000	1	28	0
10	10	KC	may-01-2014	may-31-2014	3000	1	27	0
11	10	KC	jun-01-2014	jun-30-2014	3000	1	27	0
12	10	KC	jul-15-2014	jul-31-2014	2000	1	27	0
13	10	KC	aug-01-2014	aug-29-2014	1500	1	27	0
14	10	KC	sep-16-2014	sep-30-2014	6000	1	27	0
15	10	FB	may-22-2014	may-31-2014	NA	1	27	0
16	10	FB	jun-01-2014	jun-08-2014	NA	1	27	0
17	10	FB	jun-21-2014	jun-30-2014	NA	1	27	0
18	10	FB	jul-15-2014	jul-31-2014	NA	1	27	0
19	10	FB	aug-01-2014	aug-29-2014	NA	1	27	0
20	10	FB	sep-01-2014	sep-30-2014	NA	1	27	0
21	10	SF	may-01-2014	may-31-2014	NA	1	27	0
22	10	SF	jun-01-2014	jun-08-2014	NA	1	27	0
23	10	SF	jun-21-2014	jun-30-2014	NA	1	27	0
24	10	SF	jul-15-2014	jul-31-2014	NA	1	27	0
25	10	SF	aug-01-2014	aug-29-2014	NA	1	27	0
26	10	SF	sep-01-2014	sep-30-2014	NA	1	26	0
27	10	SF	oct-01-2014	oct-04-2014	NA	1	26	0
28	10	SF	oct-07-2014	oct-11-2014	NA	1	26	0
29	10	SF	oct-14-2014	oct-15-2014	NA	1	26	0
30	10	MO	may-01-2014	may-31-2014	NA	1	27	0
31	10	MO	jun-01-2014	jun-08-2014	NA	1	27	0
32	10	MO	jun-21-2014	jun-30-2014	NA	1	27	0
33	10	MO	jul-15-2014	jul-31-2014	NA	1	27	0
34	10	MO	aug-01-2014	aug-29-2014	NA	1	27	0
35	10	MO	sep-01-2014	sep-30-2014	NA	1	26	0
36	40	NO	mar-15-2014	jun-30-2014	NA	1	24	0
37	40	NO	jul-01-2014	jul-31-2014	NA	1	24	1
38	40	NO	aug-01-2014	aug-31-2014	NA	1	24	0
39	40	NO	sep-01-2014	sep-02-2014	NA	1	24	1
40	40	NO	sep-03-2014	sep-04-2014	NA	1	24	0
41	40	NO	sep-05-2014	sep-07-2014	NA	1	24	1
42	40	NO	sep-08-2014	sep-11-2014	NA	1	24	0
43	40	NO	sep-12-2014	sep-14-2014	NA	1	24	1
44	40	NO	sep-15-2014	sep-18-2014	NA	1	24	0
45	40	NO	sep-19-2014	sep-21-2014	NA	1	24	1
46	40	NO	sep-22-2014	sep-25-2014	NA	1	24	0
47	40	NO	sep-26-2014	sep-28-2014	NA	1	24	1
48	40	NO	sep-29-2014	oct-31-2014	NA	1	24	0
49	40	CO	mar-15-2014	jun-30-2014	NA	1	24	0
50	40	CO	jul-01-2014	jul-31-2014	NA	1	24	1
51	40	CO	aug-01-2014	aug-31-2014	NA	1	24	0
52	40	CO	sep-01-2014	sep-02-2014	NA	1	24	1
53	40	CO	sep-03-2014	sep-04-2014	NA	1	24	0
54	40	CO	sep-05-2014	sep-07-2014	NA	1	24	1
55	40	CO	sep-08-2014	sep-11-2014	NA	1	24	0
56	40	CO	sep-12-2014	sep-14-2014	NA	1	24	1

57	40	CO	sep-15-2014	sep-18-2014	NA	1	24	0
58	40	CO	sep-19-2014	sep-21-2014	NA	1	24	1
59	40	CO	sep-22-2014	sep-25-2014	NA	1	24	0
60	40	CO	sep-26-2014	sep-28-2014	NA	1	24	1
61	40	CO	sep-29-2014	oct-31-2014	NA	1	24	0
62	40	KO	may-01-2014	jun-30-2014	NA	1	24	0
63	40	KO	jul-01-2014	jul-31-2014	NA	1	24	1
64	40	KO	aug-01-2014	sep-08-2014	NA	1	24	0
65	40	KC	may-01-2014	sep-08-2014	NA	1	20	0
66	40	FB	apr-06-2014	nov-10-2014	NA	1	20	0
67	40	SF	apr-06-2014	may-31-2014	NA	1	24	0
68	40	SF	jun-01-2014	jun-02-2014	NA	1	24	0
69	40	SF	jun-05-2014	jun-09-2014	NA	1	24	0
70	40	SF	jun-12-2014	jun-16-2014	NA	1	24	0
71	40	SF	jun-19-2014	jun-23-2014	NA	1	24	0
72	40	SF	jun-26-2014	jun-30-2014	NA	1	24	0
73	40	SF	jul-03-2014	jul-07-2014	NA	1	24	0
74	40	SF	jul-10-2014	jul-31-2014	NA	1	24	0
75	40	SF	aug-01-2014	nov-10-2014	NA	1	20	0
76	40	MO	apr-06-2014	may-31-2014	NA	1	24	0
77	40	MO	jun-01-2014	jun-02-2014	NA	1	24	0
78	40	MO	jun-05-2014	jun-09-2014	NA	1	24	0
79	40	MO	jun-12-2014	jun-16-2014	NA	1	24	0
80	40	MO	jun-19-2014	jun-23-2014	NA	1	24	0
81	40	MO	jun-26-2014	jun-30-2014	NA	1	24	0
82	40	MO	jul-03-2014	jul-07-2014	NA	1	24	0
83	40	MO	jul-10-2014	jul-31-2014	NA	1	24	0
84	40	MO	aug-01-2014	oct-06-2014	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	30	31	30	31	29
CO	NA	NA	NA	NA	0	0	0	30	31	30	31	29
KO	NA	NA	NA	NA	0	0	0	30	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	10	18	17	29
SF	NA	NA	NA	NA	0	0	0	0	31	18	17	29
MO	NA	NA	NA	NA	0	0	0	0	31	18	17	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	1000	NA	NA	NA	NA	NA	NA	NA	NA	4000	3000	2000
KC	6000	NA	NA	NA	NA	NA	NA	NA	3000	3000	2000	1500
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	28	28	28	28	28
CO	28	28	26	NA	NA	NA	NA	28	28	28	28	28
KO	28	28	NA	NA	NA	NA	NA	28	28	28	28	28
KC	27	NA	NA	NA	NA	NA	NA	NA	27	27	27	27
FB	27	NA	NA	NA	NA	NA	NA	NA	27	27	27	27
SF	26	26	NA	NA	NA	NA	NA	NA	27	27	27	27
MO	26	NA	NA	NA	NA	NA	NA	NA	27	27	27	27

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	31	30	31	31
KC	NA	NA	NA	NA	0	0	0	0	31	30	31	31
FB	NA	NA	NA	NA	0	0	0	25	31	30	31	31
SF	NA	NA	NA	NA	0	0	0	25	31	22	27	31
MO	NA	NA	NA	NA	0	0	0	25	31	22	27	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	24	24	NA	NA	NA	NA	24	24	24	24	24	24
KO	24	24	NA	NA	NA	NA	NA	NA	24	24	24	24
KC	20	NA	NA	NA	NA	NA	NA	NA	20	20	20	20
FB	20	20	20	NA	NA	NA	NA	20	20	20	20	20
SF	20	20	20	NA	NA	NA	NA	24	24	24	24	20
MO	24	24	NA	NA	NA	NA	NA	24	24	24	24	24

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	0.35
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