Ocean Abundance Projections and Prospective Harvest Levels for Klamath River Fall Chinook, 2020 Season

Klamath River Technical Team
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Summary

Predictor performance for 2019 and forecasts for 2020 are:

		2019			
	Age	*Preseason*	*Postseason*	*Pre/Post*	*2020 Forecast*
Ocean Abundance	3	167,500	138,900	1.21	149,600
	4	106,100	17,100	6.21	36,200
	5	600	200	2.67	700
Proportion Natural	3	0.69	0.81	0.86	0.71
	4	0.78	0.71	1.09	0.82
	5	0.82	1.00	0.82	0.83
Ocean Harvest Rate	4	0.16	0.34	0.46	-
Ocean Fall Harvest	3	-	0	-	-
	4	-	26	-	-
	5	-	25	-	-

The implications of the 2020 forecast ocean abundances, proportions natural, and the 2019 ocean fall harvest for fisheries management in 2020 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 2020 between Cape Falcon, OR and Point Sur, CA (51 Klamath River fall Chinook were estimated to have been harvested in the ocean during the Sept-Dec 2019 period) and no Klamath River fisheries (tribal and recreational) in 2020, and (B) the 2019 ocean fishery seasons and quotas, the 2019 river recreational allocation of 23.6 percent (of non-tribal harvest), and a tribal allocation of 50% (of total harvest). The results are:

	KOHM Forecasts	
Sector	*(A) No fishing in 2020*	*(B) 2019 Regulations*
Adult Spawners		
Natural Areas	48,200	24,200
Hatcheries	15,800	8,400
Adult Harvest		
Ocean Commercial	51	11,200
Ocean Recreational	0	1,800
River Recreational	0	4,000
Tribal	0	17,000
Age-4 Ocean Harvest Rate	0.001	0.165
Spawner Reduction Rate	0.001	0.499

With no further fishing in 2020 on the current stock, the expected number of natural area adult spawners would be 48,237, with an expected age-four ocean harvest rate of 0.1% (26 age-four KRFC were harvested in the Sept–Dec 2019 period). Applying 2019 fishery regulations resulted in 24,178 natural area adult spawners and an age-four ocean harvest rate of 16.5%. These forecasts are provided for informational purposes only; the Pacific Fishery Management Council (PFMC) will adopt 2020 ocean salmon fishery management regulations in April 2020.

Introduction

The PFMC's fishery management plan for Klamath River fall Chinook (PFMC 2012; Amendment 16) defines a conservation objective of a natural spawner reduction rate via fisheries of no more than 0.68 and a maximum sustainable yield escapement of 40,700 natural area adult spawners. Annual management is guided by a harvest control rule that reflects this conservation objective but allows for *de minimis* fishing provisions at low abundance. 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 2020 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 2020, and (B) the 2019 ocean fishery seasons and quotas, the 2019 river recreational allocation of 23.6 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 2019 river run of Klamath River fall Chinook salmon used in this report is from KRTT (2020).

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 1979-2015 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 forecasted 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 2018 (age-three) and 2019 (age-three, age-four) are preliminary, as their respective cohorts are incomplete (Table 1).

The 2019 age-three ocean abundance forecast was 1.21 times its postseason estimate (Table 2); the age-three predictor has underestimated abundance in 16 of the 35 previous years. The 2019 age-four ocean abundance forecast was 6.21 times its postseason estimate (Table 2); the age-four predictor has overestimated abundance in 24 of the 35 previous years. The 2019 age-five ocean abundance forecast was 2.67 times its postseason estimate (Table 2); the age-five predictor has overestimated abundance in 15 of the 33 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 1997-2019 were regressed against the age *a-1* observed proportion natural of their respective cohorts (Table 4, Figure 2). Data for calendar years prior to 1997 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 2019 proportion natural forecast for age-three, -four, and -five fish was 0.69, 0.78, and 0.82, respectively, and the corresponding post-season estimates are 0.81, 0.71, and 1.00, respectively (Table 4).

Historical Harvest Levels and Rates

Historical (1986-2019) ocean and river harvest levels and rates of age-three and age-four Klamath River fall Chinook are listed in Table 5. The 2019 age-four ocean harvest rate (preliminary) postseason estimate of 34 percent is greater than the preseason forecast of 16 percent (PFMC 2018).

2019 Ocean Fishery Fall Harvest

Klamath River fall Chinook ocean harvests during the 2019 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, which is assumed to happen just prior to these fall fisheries (same brood and calendar year). In 2019, 51 Klamath River fall Chinook were estimated to have been harvested (Table 6).

2020 Forecasts

The 2020 forecasts of ocean stock abundance and proportion natural area spawners are (Figures 1 and 2):

Age	*Abundance*	*Proportion Natural*
3	149,618	0.71
4	36,241	0.82
5	739	0.83

For the 2019 ocean fall fisheries, the natural production multipliers for the coded-wire tag recoveries are:

Age (a)	*Total Escapement (a-1)*	*Hatchery-origin Escapement (a-1)*	*Natural-production Multiplier (a)*
3	9,991	966	10.34
4	30,304	9,647	3.14
5	6,867	2,378	2.89

The fishery-area-month-age-specific estimated fall ocean 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 2020 between Cape Falcon, OR and Point Sur, CA (51 Klamath River fall Chinook were estimated to have been harvested in the ocean during the Sept–Dec 2019 period) and no Klamath Basin fisheries (tribal and recreational) in 2020, and (B) the 2019 ocean fishery seasons and quotas, the 2019 river recreational allocation of 23.6% (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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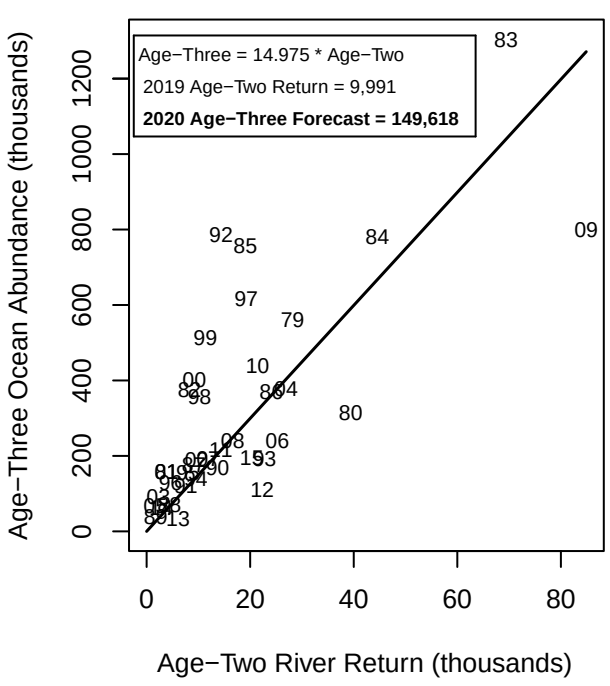

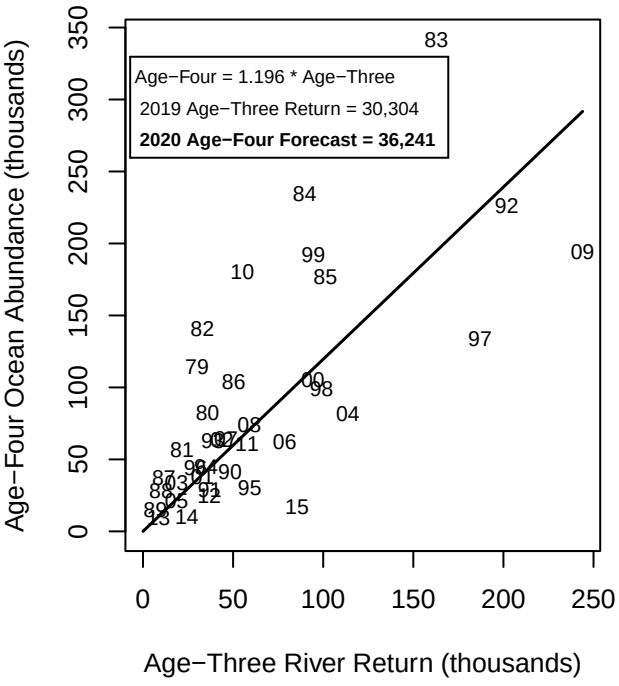

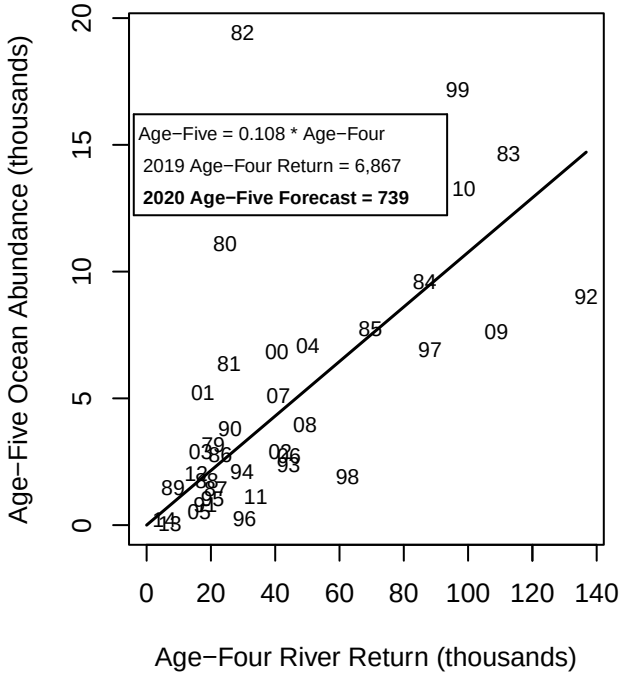

Figure 1. Regression estimators for Klamath River fall Chinook ocean abundance (Sept. 1) based on that year's river return of same cohort. Numbers in plots denote brood years.

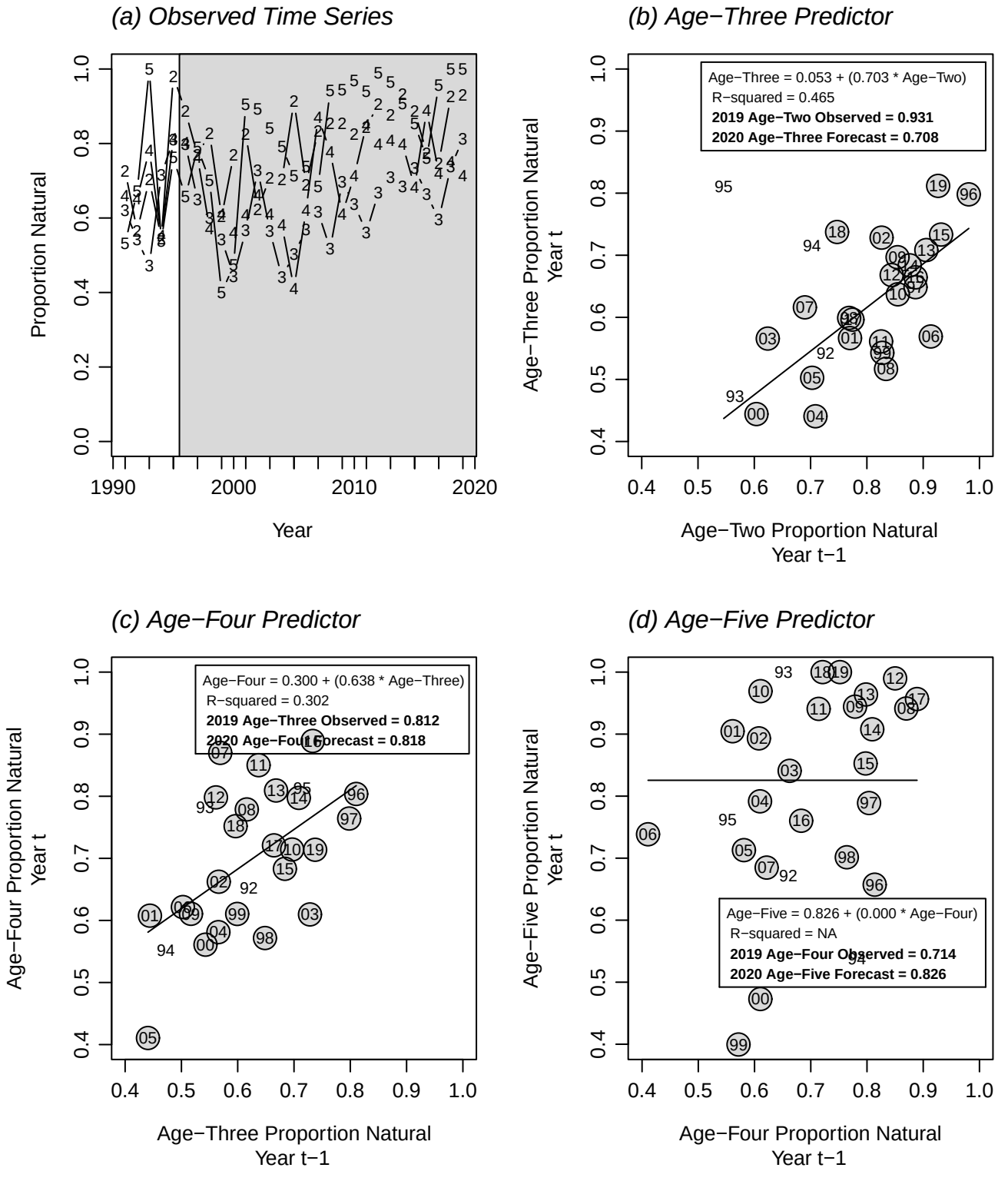

Figure 2. Age−specific proportion of natural area spawners. Panel (a): observed time series; numbers in plot denote age; shaded area depicts data used for predictor. Panels (b)−(d): age−specific predictor based on previous−year observed proportion for same cohort; numbers in plots denote years 1992−2019; 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 Sept1(t-1) Age 3	Ocean Abundance Sept1(t-1) Age 4	Ocean Abundance Sept1(t-1) Total	Annual Ocean Harvest Rate Sept1(t-1) thru Aug31(t) Age 3	Annual Ocean Harvest Rate Sept1(t-1) thru Aug31(t) Age 4	Klamath Basin River Run (t) Age 2	Klamath Basin River Run (t) Age 3	Klamath Basin River Run (t) Age 4	Klamath Basin River Run (t) Age 5	Total Adults
1981	493.2	57.0	550.2	0.21	0.53	28.180	64.100	14.400	1.800	80.300
1982	561.1	133.4	694.5	0.30	0.52	39.436	30.052	33.900	2.600	66.552
1983	313.3	114.2	427.5	0.19	0.60	3.849	35.873	20.744	0.900	57.517
1984	157.3	82.8	240.1	0.08	0.38	8.297	21.721	24.437	1.086	47.244
1985	374.8	56.9	431.7	0.11	0.24	69.424	32.938	25.657	5.807	64.402
1986	1,304.4	140.8	1,445.2	0.18	0.46	44.566	162.873	29.843	2.276	194.992
1987	781.1	341.9	1,123.0	0.16	0.43	19.075	89.718	112.614	6.775	209.107
1988	756.3	234.8	991.0	0.20	0.39	24.090	101.210	86.519	3.877	191.606
1989	369.8	177.2	547.1	0.15	0.36	9.119	50.407	69.604	4.309	124.320
1990	176.1	104.0	280.1	0.30	0.55	4.396	11.615	22.944	1.304	35.863
1991	69.4	37.2	106.6	0.03	0.18	1.755	9.993	21.567	1.110	32.670
1992	39.5	28.2	67.7	0.02	0.07	13.693	6.936	18.761	1.000	26.697
1993	168.5	15.0	183.5	0.05	0.16	7.598	48.301	8.248	0.663	57.212
1994	119.9	41.7	161.7	0.03	0.09	14.371	37.017	25.977	0.989	63.983
1995	787.3	28.7	816.0	0.04	0.14	22.774	201.896	18.276	2.596	222.768
1996	192.3	226.3	418.6	0.05	0.16	9.532	38.766	136.745	0.262	175.773
1997	140.2	62.8	203.0	0.01	0.06	7.993	34.973	44.184	4.579	83.736
1998	154.8	44.7	199.5	0.00	0.09	4.639	59.244	29.696	1.707	90.647
1999	129.1	30.5	159.5	0.02	0.09	19.248	29.171	20.534	1.343	51.048
2000	617.1	44.2	661.3	0.06	0.10	10.246	187.088	30.486	0.503	218.077
2001	356.1	133.8	489.9	0.03	0.09	11.343	99.097	88.172	0.065	187.334
2002	513.6	98.9	612.5	0.02	0.15	9.226	94.576	62.525	3.686	160.787
2003	401.1	192.2	593.3	0.08	0.21	3.845	94.287	96.798	0.864	191.949
2004	159.4	105.2	264.7	0.12	0.35	9.646	33.105	40.527	5.311	78.943
2005	190.0	38.1	228.1	0.02	0.20	2.296	43.811	17.515	3.901	65.227
2006	90.7	63.4	154.1	0.01	0.10	26.935	18.505	41.597	1.272	61.374
2007	376.9	33.7	410.6	0.06	0.21	1.684	113.685	16.846	1.600	132.131
2008	68.0	81.4	149.4	0.00	0.10	25.247	18.644	50.173	1.737	70.554
2009	240.8	21.1	261.9	0.00	0.00	11.914	78.620	16.377	5.647	100.644
2010	192.8	62.1	254.8	0.01	0.04	16.640	46.129	44.349	0.382	90.860
2011	240.2	64.6	304.8	0.03	0.08	84.895	59.023	40.997	1.957	101.977
2012	799.4	74.3	873.7	0.03	0.08	21.433	243.938	49.292	2.092	295.322
2013	438.4	194.4	632.9	0.04	0.20	14.356	55.152	108.805	1.068	165.025
2014	216.5	180.7	397.2	0.03	0.17	22.321	57.792	98.707	3.896	160.395
2015	110.5	61.0	171.5	0.02	0.22	6.094	36.742	33.951	7.128	77.821
2016	32.7	24.8	57.4	0.01	0.09	2.787	8.619	15.453	0.510	24.582
2017	63.3	9.8	73.1	0.02	0.04	20.318	24.397	7.272	1.563	33.232
2018	196.1 [a/]	10.5	206.6	0.05 [a/]	0.24	10.872	85.496	5.555	0.009	91.060
2019	138.9 [b/]	17.1 [a/]	156.0	---- [c/]	0.34 [a/]	9.991	30.304	6.867	0.099	37.270

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/] Sept 1 (t-1)	Postseason Estimate Sept 1 (t-1)	Pre/Postseason
	Age-Three		
1985	113,000	374,822	0.30
1986	426,000 [b/]	1,304,409	0.33
1987	511,800	781,122	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	119,915	1.15
1995	269,000	787,309	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	617,097	0.57
2001	187,200	356,128	0.53
2002	209,000	513,604	0.41
2003	171,300	401,112	0.43
2004	72,100	159,446	0.45
2005	185,700	189,977	0.98
2006	44,100	90,666	0.49
2007	515,400	376,940	1.37
2008	31,600	68,015	0.46
2009	474,900	240,787	1.97
2010	223,400	192,750	1.16
2011	304,600	240,222	1.27
2012	1,567,600	799,446	1.96
2013	390,700	438,443	0.89
2014	219,800	216,493	1.02
2015	342,200	110,506	3.10
2016	93,400	32,670	2.86
2017	42,000	63,253	0.66
2018	330,000	196,070	1.68
2019 [c/]	167,500	138,941	1.21
2020	149,600	--	--

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/] Sept 1 (t-1)	Postseason Estimate Sept 1 (t-1)	Pre/Postseason
	Age-Four		
1985	56,900	56,908	1.00
1986	66,300	140,823	0.47
1987	206,100	341,875	0.60
1988	186,400	234,751	0.79
1989	215,500	177,245	1.22
1990	50,100	103,951	0.48
1991	44,600	37,171	1.20
1992	44,800	28,169	1.59
1993	39,100	15,037	2.60
1994	86,100	41,736	2.06
1995	47,000	28,726	1.64
1996	268,500	226,282	1.19
1997	53,900	62,820	0.86
1998	46,000	44,733	1.03
1999	78,800	30,456	2.59
2000	38,900	44,176	0.88
2001	247,000	133,801	1.85
2002	143,800	98,927	1.45
2003	132,400	192,180	0.69
2004	134,500	105,246	1.28
2005	48,900	38,079	1.28
2006	63,700	63,384	1.00
2007	26,100	33,650	0.78
2008	157,200	81,411	1.93
2009	25,200	21,131	1.19
2010	106,300	62,089	1.71
2011	61,600	64,570	0.95
2012	79,600	74,300	1.07
2013	331,200	194,407	1.70
2014	67,400	180,669	0.37
2015	71,100	60,979	1.17
2016	45,100	24,777	1.82
2017	10,600	9,821	1.08
2018	28,400	10,541	2.69
2019 [c/]	106,100	17,078	6.21
2020	36,200	--	--

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

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/]	--	6,376	--
1987	5,300	19,414	0.27
1988	13,300	14,632	0.91
1989	10,100	9,612	1.05
1990	7,600	7,767	0.98
1991	1,500	2,774	0.54
1992	1,300	1,444	0.90
1993	1,100	1,759	0.63
1994	500	1,468	0.34
1995	2,000	3,805	0.53
1996	1,100	788	1.40
1997	7,900	9,004	0.88
1998	3,300	2,382	1.39
1999	2,000	2,106	0.95
2000	1,400	1,051	1.33
2001	1,300	258	5.04
2002	9,700	6,933	1.40
2003	6,500	1,915	3.39
2004	9,700	17,184	0.56
2005	5,200	6,859	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	5,110	0.90
2013	5,700	3,945	1.44
2014	12,100	7,625	1.59
2015	10,400	13,283	0.78
2016	3,700	1,142	3.24
2017	1,700	2,024	0.84
2018	800	50	16.00
2019 [c/]	600	225	2.67
2020	700	--	--

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

Year (t)	Preseason Forecast [a/] Sept 1 (t-1)	Postseason Estimate Sept 1 (t-1)	Pre/Postseason
	Total Adults		
1985 [d/]	169,900	442,843	0.38
1986 [d/]	492,300	1,451,608	0.34
1987	723,200	1,142,411	0.63
1988	570,500	1,005,644	0.57
1989	676,200	556,685	1.21
1990	536,700	287,840	1.86
1991	222,300	109,369	2.03
1992	96,100	69,115	1.39
1993	334,600	185,269	1.81
1994	224,600	163,119	1.38
1995	318,000	819,840	0.39
1996	749,400	419,342	1.79
1997	286,400	211,977	1.35
1998	225,300	201,914	1.12
1999	165,600	161,628	1.02
2000	389,900	662,324	0.59
2001	435,500	490,187	0.89
2002	362,500	619,464	0.59
2003	310,200	595,207	0.52
2004	216,300	281,876	0.77
2005	239,800	234,915	1.02
2006	110,000	159,286	0.69
2007	546,200	413,501	1.32
2008	190,700	152,326	1.25
2009	505,700	268,977	1.88
2010	331,500	255,356	1.30
2011	371,100	307,545	1.21
2012	1,651,800	878,856	1.88
2013	727,700	636,795	1.14
2014	299,300	404,787	0.74
2015	423,800	184,768	2.29
2016	142,200	58,589	2.43
2017	54,200	75,098	0.72
2018	359,200	206,661	1.74
2019 [c/]	274,200	156,244	1.75
2020	186,600	--	--

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.

	Preseason Ocean Abundance Forecast[a/] Sept 1 (t-1)		Postseason Ocean Abundance Estimate Sept 1 (t-1)		Preseason Age-4 Harvest Rate Forecast[b/]		Postseason Age-4 Harvest Rate Estimate[c/]		Preseason Adult Harvest Forecast		Postseason Adult Harvest Estimate	
Year (t)	Age-3	Age-4	Age-3	Age-4	Ocean	River	Ocean	River	Ocean	River	Ocean	River
1986	426,000	66,300	1,304,409	140,823	0.28	0.50	0.46	0.67	72,000	37,700	301,999	46,154
1987	511,800	206,100	781,122	341,875	0.28	0.53	0.43	0.44	121,200	78,200	277,203	73,265
1988	370,800	186,400	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	125,118	54,340
1990	479,000	50,100	176,122	103,951	0.30	0.49	0.55	0.36	85,100	31,200	114,780	11,459
1991	176,200	44,600	69,424	37,171	0.13	0.28	0.18	0.45	16,700	12,800	9,871	13,581
1992	50,000	44,800	39,502	28,169	0.06	0.15	0.07	0.27	4,200	4,200	3,142	6,787
1993	294,400	39,100	168,473	15,037	0.12	0.43	0.16	0.49	20,100	22,500	11,355	12,808
1994	138,000	86,100	119,915	41,736	0.07	0.20	0.09	0.29	10,400	14,300	7,961	13,524
1995	269,000	47,000	787,309	28,726	0.07	0.32	0.14	0.19	13,500	18,500	33,146	21,637
1996	479,800	268,500	192,272	226,282	0.17	0.66	0.16	0.39	88,400	129,100	45,637	69,241
1997	224,600	53,900	140,153	62,820	0.10	0.43	0.06	0.26	17,600	26,500	8,987	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	78,800	129,066	30,456	0.10	0.28	0.09	0.45	12,300	18,100	5,116	16,942
2000	349,600	38,900	617,097	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	513,604	98,927	0.13	0.57	0.15	0.26	30,000	70,900	28,896	35,069
2003	171,300	132,400	401,112	192,180	0.16	0.50	0.21	0.28	30,600	52,200	70,995	39,715
2004	72,100	134,500	159,446	105,246	0.15	0.38	0.35	0.48	26,500	35,800	64,226	29,807
2005	185,700	48,900	189,977	38,079	0.08	0.16	0.20	0.19	7,100	9,600	12,807	10,001
2006	44,100	63,700	90,666	63,384	0.11	0.23	0.10	0.18	10,000	10,000	10,401	10,345
2007	515,400	26,100	376,940	33,650	0.16	0.63	0.21	0.56	30,200	51,400	30,275	33,884
2008	31,600	157,200	68,015	81,411	0.02	0.43	0.10	0.38	4,500	49,500	8,716	24,180
2009	474,900	25,200	240,787	21,131	0.00	0.57	0.00	0.40	100	61,700	53	34,040
2010	223,400	106,300	192,750	62,089	0.12	0.49	0.04	0.40	22,600	46,600	4,489	32,920
2011	304,600	61,600	240,222	64,570	0.16	0.54	0.08	0.34	26,900	42,700	12,011	30,502
2012	1,567,600	79,600	799,446	74,300	0.16	0.77	0.08	0.51	92,400	227,600	34,719	109,263
2013	390,700	331,200	438,443	194,407	0.16	0.62	0.20	0.51	74,800	154,800	59,511	82,835
2014	219,800	67,400	216,493	180,669	0.16	0.40	0.17	0.25	23,200	31,400	40,158	31,353
2015	342,200	71,100	110,506	60,979	0.16	0.59	0.22	0.47	29,400	57,700	20,019	35,890
2016	93,400	45,100	32,670	24,777	0.08	0.19	0.09	0.31	6,300	8,500	3,025	6,470
2017	42,000	10,600	63,253	9,821	0.03	0.06	0.04	0.08	700	900	1,783	1,951
2018[d/]	330,000	28,400	196,070	10,541	0.12	0.34	0.24	0.36	14,600	21,600	13,312	18,879
2019[e/]	167,500	106,100	138,941	17,078	0.16	0.47	0.34	0.38	24,800	40,000	9,203	11,339

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

d/ Postseason estimates are preliminary for age-3.

e/ Postseason estimates are preliminary for age-3 and age-4.

Table 4. Numbers of hatchery and natural-area adult fall Chinook spawners in the Klamath Basin by age.[a/]

	Hatchery Spawners					Natural Area Spawners					Proportion Natural				
Year	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	4,685	11,421	11,380	1,030	23,831	0.70	0.44	0.58	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	15,658	103,605	17,743	197	121,545	0.91	0.67	0.80	0.99	0.68
2013	1,458	7,775	9,352	21	17,148	10,310	18,897	39,696	562	59,155	0.88	0.71	0.81	0.96	0.78
2014	1,260	16,517	14,547	211	31,275	17,239	35,730	57,293	2,081	95,104	0.93	0.68	0.80	0.91	0.75
2015	444	5,489	5,331	265	11,085	3,472	15,086	11,492	1,534	28,112	0.89	0.73	0.68	0.85	0.72
2016	552	2,405	1,127	46	3,578	1,894	4,761	9,030	146	13,937	0.77	0.66	0.89	0.76	0.80
2017	5,056	9,287	1,864	62	11,213	14,937	13,717	4,817	1,370	19,904	0.75	0.60	0.72	0.96	0.64
2018	606	17,723	844	0	18,567	7,663	49,785	2,558	9	52,352	0.93	0.74	0.75	1.00	0.74
2019	454	4,007	1,171	0	5,178	6,167	17,276	2,921	48	20,245	0.93	0.81	0.71	1.00	0.80

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).

	Ocean Fisheries (Sept 1 (t-1) through Aug 31 (t))							River Fisheries (t)		
	KMZ			North of	South of		Ocean			
Year (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	13,126	14,808	27,934	28,933	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	9,916	11,417	12,421	11,734	6,258	17,992
2003	176	669	845	1,921	27,586	29,507	30,352	6,996	5,061	12,057
2004	402	970	1,372	9,710	7,324	17,034	18,406	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	478	478	32	341	373	851	2,388	13	2,401
2007	770	8,101	8,871	4,194	9,366	13,560	22,431	17,543	5,734	23,277
2008	0	0	0	0	0	0	0	3,225	608	3,833
2009	0	53	53	0	0	0	53	19,820	4,715	24,535
2010	106	28	134	0	1,664	1,664	1,798	13,132	1,884	15,016
2011	334	1,119	1,453	48	4,829	4,877	6,330	13,286	2,630	15,916
2012	1,116	11,350	12,466	928	13,089	14,017	26,483	70,409	12,104	82,513
2013	390	5,574	5,964	868	12,053	12,921	18,885	18,996	7,675	26,671
2014	0	566	566	4,144	1,550	5,694	6,260	3,386	1,778	5,164
2015	48	293	341	652	1,597	2,249	2,590	10,604	4,509	15,113
2016	0	0	0	14	308	322	322	918	430	1,348
2017	0	0	0	115	1,264	1,379	1,379	1,261	23	1,284
2018 [a/]	1,523	1,640	3,163	3,991	3,604	7,595	10,758	12,954	3,931	16,885
2019 [a/]	160	401	561	195	2,562	2,757	3,318	4,060	4,619	8,679
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	1,772	3,651	3,893	2,957	480	3,437
1996	866	3,457	4,323	10,776	20,698	31,474	35,797	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	919	1,753	7,856	30,011	37,867	39,620	22,754	4,592	27,346
2004	1,429	1,234	2,663	11,645	22,132	33,777	36,440	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	2,019	2,472	4,491	7,097	8,987	502	9,489
2008	6,378	1,105	7,483	581	113	694	8,177	17,891	1,260	19,151
2009	0	0	0	0	0	0	0	5,831	706	6,537
2010	36	113	149	889	1,482	2,371	2,520	16,630	1,134	17,764
2011	417	175	592	1,045	3,780	4,825	5,417	12,587	1,466	14,053
2012	334	2,085	2,419	759	2,960	3,719	6,138	23,285	1,718	25,003
2013	4,277	6,236	10,513	4,054	23,994	28,048	38,561	43,671	12,043	55,714
2014	1,292	1,434	2,726	19,822	8,977	28,799	31,525	21,303	3,404	24,707
2015	273	197	470	5,763	7,127	12,890	13,360	13,160	2,692	15,852
2016	0	56	56	633	1,571	2,204	2,260	3,966	870	4,836
2017	0	124	124	98	183	281	405	503	43	546
2018	638	91	729	928	853	1,781	2,510	1,815	179	1,994
2019 [a/]	705	49	754	1,131	3,993	5,124	5,878	1,872	741	2,613

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

	Ocean Fisheries (Sept 1 (t-1) through Aug 31 (t))							River Fisheries (t)		
	KMZ			North of	South of		Ocean			
Year (t)	Troll	Sport	Subtotal	KMZ	KMZ	Subtotal	Total	Net	Sport	Total
					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	0.04	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	0.00	0.01	0.02	0.00	0.02	0.02	0.03	0.29	0.05	0.34
2013	0.00	0.01	0.01	0.00	0.03	0.03	0.04	0.34	0.14	0.48
2014	0.00	0.00	0.00	0.02	0.01	0.03	0.03	0.06	0.03	0.09
2015	0.00	0.00	0.00	0.01	0.01	0.02	0.02	0.29	0.12	0.41
2016	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.11	0.05	0.16
2017	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.05	0.00	0.05
2018 [a/]	0.01	0.01	0.02	0.02	0.02	0.04	0.05	0.15	0.05	0.20
2019 [a/]	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.13	0.15	0.29
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	0.35	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	0.47	0.03	0.51
2013	0.02	0.03	0.05	0.02	0.12	0.14	0.20	0.40	0.11	0.51
2014	0.01	0.01	0.02	0.11	0.05	0.16	0.17	0.22	0.03	0.25
2015	0.00	0.00	0.01	0.09	0.12	0.21	0.22	0.39	0.08	0.47
2016	0.00	0.00	0.00	0.03	0.06	0.09	0.09	0.26	0.06	0.31
2017	0.00	0.01	0.01	0.01	0.02	0.03	0.04	0.07	0.01	0.08
2018	0.06	0.01	0.07	0.09	0.08	0.17	0.24	0.33	0.03	0.36
2019 [a/]	0.04	0.00	0.04	0.07	0.23	0.30	0.34	0.27	0.11	0.38

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 2019 (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	--	--	--	26	--	--	25	--	--	51
CO	--	--	--	--	--	--	--	--	--	0
KO	--	--	--	--	--	--	--	--	--	0
KC	--	--	--	--	--	--	--	--	--	0
FB	--	--	--	--	--	--	--	--	--	0
SF	--	--	--	--	--	--	--	--	--	0
MO	--	--	--	--	--	--	--	--	--	0
Total	0	0	0	26	0	0	25	0	0	51

SPORT FISHERY

KOHM area[a/]	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

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: No 2020 Fishing. KOHM: Summary Output. Mon Feb 24 12:26:18 2020

Klamath Escapement

```
   Absent fishing:           64066
      Hatcheries:            15792
      Natural areas:         48274

   With fishing
      Mature adults:         64334
         Strays:               313
         Klamath Basin:      64021
      Spawners:              64021
         Hatcheries:         15784
         Natural areas:      48237
            Reduction rate:  0.001
```

Klamath Harvest

```
   Total:                       51
      River:                     0
      Ocean:                    51

   Tribal:                       0   0.000   (objective: 0.000)

   Non-tribal:                  51
      River:                     0   0.000   (objective:       0)
      Ocean troll:              51
         CA / OR:          0.000 / 1.000
      Ocean sport:               0
         KMZ:                    0   0.000
      Age-four o.harv.rate:  0.001           (objective: <= 0.16)
```

Klamath Harvest: ocean troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total	%CA
NO	51	0	0	0	0	0	0	0	0	0	0	0	51	NA
CO	0	0	0	0	0	0	0	0	0	0	0	0	0	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	51	0	0	0	0	0	0	0	0	0	0	0	51	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	0	0	0	0	0	0	0	0	0	0	0	0	0	NA	NA
KO	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	NA	NA

Chinook Harvest (All Stocks): Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	600	100	NA	NA	NA	NA	0	0	0	0	0	0	700
CO	100	800	NA	NA	NA	NA	0	0	0	0	0	0	900
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	6100	800	NA	NA	NA	NA	NA	NaN	0	0	0	0	6900
MO	NA	NA	NA	NA	NA	NA	NA	NaN	0	0	0	0	0
Total	6800	1700	NA	NA	NA	NA	0	0	0	0	0	0	8500

Chinook Harvest (All Stocks): Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	400	300	NA	NA	NA	NA	NaN	NaN	0	0	0	0	700
CO	300	0	NA	NA	NA	NA	NA	NaN	0	0	0	0	300
KO	10	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	10
KC	100	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	100
FB	100	0	NA	NA	NA	NaN	NaN	0	0	0	0	0	100
SF	3600	500	NA	NA	NA	0	0	0	0	0	0	0	4100
MO	NA	NA	NA	NA	NA	NaN	0	0	0	0	0	0	0
Total	4510	800	NA	NA	NA	0	0	0	0	0	0	0	5310

Klamath Contribution Rates: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0.084	0	NA	NA	NA	NA	0.063	0.008	0.014	0.009	0.023	0.064
CO	0.000	0	NA	NA	NA	NA	0.043	0.036	0.024	0.035	0.102	0.134
KO	NA	NA	NA	NA	NA	NA	0.000	0.000	0.068	0.087	0.138	0.189
KC	NA	NA	NA	NA	NA	NA	NA	NA	0.284	0.196	0.132	0.251
FB	NA	NA	NA	NA	NA	NA	NA	0.020	0.083	0.104	0.086	0.041
SF	0.000	0	NA	NA	NA	NA	NA	0.000	0.036	0.042	0.037	0.019
MO	NA	NA	NA	NA	NA	NA	NA	0.000	0.008	0.010	0.020	0.001

Klamath Contribution Rates: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0	0	NA	NA	NA	NA	0.000	0.000	0.001	0.001	0.025	0.019
CO	0	NaN	NA	NA	NA	NA	NA	0.000	0.022	0.027	0.032	0.025
KO	0	NA	NA	NA	NA	NA	NA	NA	0.016	0.064	0.075	0.146
KC	0	NA	NA	NA	NA	NA	NA	NA	0.102	0.102	0.072	0.100
FB	0	NaN	NA	NA	NA	0.000	0.000	0.004	0.019	0.027	0.034	0.017
SF	0	0	NA	NA	NA	0.001	0.003	0.009	0.006	0.021	0.009	0.002
MO	NA	NA	NA	NA	NA	0.000	0.002	0.002	0.001	0.001	0.001	0.001

Total Effort: Troll

	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

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
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

Total 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

Season Effort: Troll

	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

Season 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

Quota Effort: Troll

	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

Quota 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

Retention Effort: Troll

	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

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

Non-retention Effort: Troll

	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

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
[1] fishery   area   start.date end.date   Q   ret   sl
[8] coho
<0 rows> (or 0-length row.names)

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	28	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	27	27	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	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	NA	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	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SF	20	20	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	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: 2019 regulations. KOHM: Summary Output. Mon Feb 24 12:27:29 2020

Klamath Escapement

Absent fishing:	64066		
Hatcheries:	15792		
Natural areas:	48274		
With fishing			
Mature adults:	55384		
Strays:	274		
Klamath Basin:	55110		
Spawners:	32627		
Hatcheries:	8448		
Natural areas:	24178		
Reduction rate:	0.499		

Klamath Harvest

Total:	33873		
River:	20929		
Ocean:	12945		
Tribal:	16937	0.500	(objective: 0.500)
Non-tribal:	16937		
River:	3992	0.236	(objective: 0.236)
Ocean troll:	11184		
CA / OR:	0.699 / 0.301		
Ocean sport:	1761		
KMZ:	1017	0.079	
Age-four o.harv.rate:	0.165		(objective: <= 0.16)

Klamath Harvest: ocean troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total	%CA
NO	51	0	0	0	0	0	0	19	78	41	88	347	624	NA
CO	0	0	0	0	0	0	0	57	139	200	353	1104	1852	NA
KO	0	0	0	0	0	0	0	0	35	278	345	227	885	NA
KC	0	0	0	0	0	0	0	0	0	490	329	501	1320	14.4
FB	0	0	0	0	0	0	0	0	0	1193	2053	623	3869	42.2
SF	0	0	0	0	0	0	0	0	187	689	778	655	2309	25.2
MO	0	0	0	0	0	0	0	0	164	88	73	0	325	3.5
Total	51	0	0	0	0	0	0	76	603	2980	4018	3457	11184	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	17	24	41	NA	NA
CO	0	0	0	0	0	0	0	0	2	17	34	36	89	NA	NA
KO	0	0	0	0	0	0	0	0	1	40	82	164	288	NA	NA
KC	0	0	0	0	0	0	0	0	40	251	213	226	730	8.0	54.3
FB	0	0	0	0	0	0	0	4	17	85	133	31	271	3.0	20.1
SF	0	0	0	0	0	0	0	23	12	110	130	9	284	3.1	21.1
MO	0	0	0	0	0	0	0	24	5	9	20	2	60	0.7	4.4
Total	0	0	0	0	0	0	0	51	77	512	628	493	1761	NA	NA

Chinook Harvest (All Stocks): Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	600	100	NA	NA	NA	NA	0	2439	5534	4676	3918	5438	22705
CO	100	800	NA	NA	NA	NA	0	1568	5773	5676	3447	8230	25594
KO	NA	NA	NA	NA	NA	NA	NaN	NaN	516	3200	2500	1200	7416
KC	NA	NA	NA	NA	NA	NA	NA	NA	0	2500	2500	2000	7000
FB	NA	NA	NA	NA	NA	NA	NA	0	0	11508	23870	15132	50510
SF	6100	800	NA	NA	NA	NA	NA	NaN	5187	16477	21177	35036	84777
MO	NA	NA	NA	NA	NA	NA	NA	NaN	20660	9028	3543	0	33232
Total	6800	1700	NA	NA	NA	NA	0	4007	37671	53065	60955	67036	231234

Chinook Harvest (All Stocks): Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	400	300	NA	NA	NA	NA	NaN	NaN	98	106	651	1260	2815
CO	300	0	NA	NA	NA	NA	NA	NaN	104	617	1064	1466	3551
KO	10	NA	NA	NA	NA	NA	NA	NA	60	628	1092	1130	2919
KC	100	NA	NA	NA	NA	NA	NA	NA	393	2465	2934	2259	8151
FB	100	0	NA	NA	NA	NaN	NaN	919	860	3102	3884	1840	10705
SF	3600	500	NA	NA	NA	0	0	2429	2021	5333	14981	4210	33074
MO	NA	NA	NA	NA	NA	NaN	0	10813	4774	7819	16510	2155	42070
Total	4510	800	NA	NA	NA	0	0	14160	8310	20069	41115	14320	103284

Klamath Contribution Rates: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0.084	0	NA	NA	NA	NA	0.063	0.008	0.014	0.009	0.023	0.064
CO	0.000	0	NA	NA	NA	NA	0.043	0.036	0.024	0.035	0.102	0.134
KO	NA	NA	NA	NA	NA	NA	0.000	0.000	0.068	0.087	0.138	0.189
KC	NA	NA	NA	NA	NA	NA	NA	NA	0.284	0.196	0.132	0.251
FB	NA	NA	NA	NA	NA	NA	NA	0.020	0.083	0.104	0.086	0.041
SF	0.000	0	NA	NA	NA	NA	NA	0.000	0.036	0.042	0.037	0.019
MO	NA	NA	NA	NA	NA	NA	NA	0.000	0.008	0.010	0.020	0.001

Klamath Contribution Rates: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0	0	NA	NA	NA	NA	0.000	0.000	0.001	0.001	0.025	0.019
CO	0	NaN	NA	NA	NA	NA	NA	0.000	0.022	0.027	0.032	0.025
KO	0	NA	NA	NA	NA	NA	NA	NA	0.016	0.064	0.075	0.146
KC	0	NA	NA	NA	NA	NA	NA	NA	0.102	0.102	0.072	0.100
FB	0	NaN	NA	NA	NA	0.000	0.000	0.004	0.019	0.027	0.034	0.017
SF	0	0	NA	NA	NA	0.001	0.003	0.009	0.006	0.021	0.009	0.002
MO	NA	NA	NA	NA	NA	0.000	0.002	0.002	0.001	0.001	0.001	0.001

Total Effort: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	0	180	668	635	564	703	2750
CO	NA	NA	NA	NA	0	0	0	185	516	623	404	694	2422
KO	NA	NA	NA	NA	0	0	0	4	59	226	209	113	612
KC	NA	NA	NA	NA	0	0	0	0	0	242	348	305	896
FB	NA	NA	NA	NA	0	0	0	0	0	1171	1412	742	3325
SF	NA	NA	NA	NA	0	0	0	0	907	1415	1080	1934	5337

MO	NA	NA	NA	NA	0	0	0	0	2307	1008	575	0	3890
Total	NA	NA	NA	NA	0	0	0	369	4457	5321	4592	4492	19231

Total Effort: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	69	103	696	3759	14518	14883	34029
CO	NA	NA	NA	NA	0	0	21	54	422	3100	8789	7834	20221
KO	NA	NA	NA	NA	0	0	0	0	346	1859	3307	4769	10281
KC	NA	NA	NA	NA	0	0	0	0	997	4717	6016	5738	17468
FB	NA	NA	NA	NA	0	0	0	611	876	4016	7060	3750	16313
SF	NA	NA	NA	NA	0	0	0	3495	3159	9782	19434	14029	49898
MO	NA	NA	NA	NA	0	0	0	12531	6413	5485	6364	1723	32517
Total	NA	NA	NA	NA	0	0	91	16795	12909	32719	65489	52725	180727

Season Effort: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	0	180	668	635	564	703	2750
CO	NA	NA	NA	NA	0	0	0	185	516	623	404	694	2422
KO	NA	NA	NA	NA	0	0	0	4	59	0	0	0	63
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	0	1171	1412	742	3325
SF	NA	NA	NA	NA	0	0	0	0	907	1415	1080	1934	5337
MO	NA	NA	NA	NA	0	0	0	0	2307	1008	575	0	3890
Total	NA	NA	NA	NA	0	0	0	369	4457	4852	4034	4074	17787

Season Effort: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	69	103	696	3759	14518	14883	34029
CO	NA	NA	NA	NA	0	0	21	54	422	3100	8789	7834	20221
KO	NA	NA	NA	NA	0	0	0	0	346	1859	3307	4769	10281
KC	NA	NA	NA	NA	0	0	0	0	997	4717	6016	5738	17468
FB	NA	NA	NA	NA	0	0	0	611	876	4016	7060	3750	16313
SF	NA	NA	NA	NA	0	0	0	3495	3159	9782	19434	14029	49898
MO	NA	NA	NA	NA	0	0	0	12531	6413	5485	6364	1723	32517
Total	NA	NA	NA	NA	0	0	91	16795	12909	32719	65489	52725	180727

Quota Effort: Troll

	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	226	209	113	549
KC	NA	NA	NA	NA	0	0	0	0	0	242	348	305	896
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	468	558	418	1444

Quota 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

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
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

Retention Effort: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	0	180	668	635	564	703	2750
CO	NA	NA	NA	NA	0	0	0	185	516	623	404	694	2422
KO	NA	NA	NA	NA	0	0	0	4	59	226	209	113	612
KC	NA	NA	NA	NA	0	0	0	0	0	242	348	305	896
FB	NA	NA	NA	NA	0	0	0	0	0	1171	1412	742	3325
SF	NA	NA	NA	NA	0	0	0	0	907	1415	1080	1934	5337
MO	NA	NA	NA	NA	0	0	0	0	2307	1008	575	0	3890
Total	NA	NA	NA	NA	0	0	0	369	4457	5321	4592	4492	19231

Retention Effort: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	69	103	696	3759	14518	14883	34029
CO	NA	NA	NA	NA	0	0	21	54	422	3100	8789	7834	20221
KO	NA	NA	NA	NA	0	0	0	0	346	1859	3307	4769	10281
KC	NA	NA	NA	NA	0	0	0	0	997	4717	6016	5738	17468
FB	NA	NA	NA	NA	0	0	0	611	876	4016	7060	3750	16313
SF	NA	NA	NA	NA	0	0	0	3495	3159	9782	19434	14029	49898
MO	NA	NA	NA	NA	0	0	0	12531	6413	5485	6364	1723	32517
Total	NA	NA	NA	NA	0	0	91	16795	12909	32719	65489	52725	180727

Non-retention Effort: Troll

	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

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-20-2020	apr-30-2020	NA	1	28	0
2	10	NO	may-06-2020	may-30-2020	NA	1	28	0
3	10	NO	jun-01-2020	aug-29-2020	NA	1	28	0
4	10	NO	sep-01-2020	oct-31-2020	NA	1	28	0
5	10	CO	apr-20-2020	apr-30-2020	NA	1	28	0
6	10	CO	may-06-2020	may-30-2020	NA	1	28	0
7	10	CO	jun-01-2020	aug-29-2020	NA	1	28	0
8	10	CO	sep-01-2020	oct-31-2020	NA	1	28	0
9	10	KO	apr-20-2020	apr-30-2020	NA	1	28	0
10	10	KO	may-06-2020	may-30-2020	NA	1	28	0
11	10	KO	jun-01-2020	jun-30-2020	3200	1	28	0
12	10	KO	jul-01-2020	jul-31-2020	2500	1	28	0
13	10	KO	aug-01-2020	aug-29-2020	1200	1	28	0
14	10	KC	jun-01-2020	jun-30-2020	2500	1	27	0
15	10	KC	jul-01-2020	jul-30-2020	2500	1	27	0
16	10	KC	aug-02-2020	aug-31-2020	2000	1	27	0
17	10	FB	jun-04-2020	jun-30-2020	NA	1	27	0
18	10	FB	jul-11-2020	aug-28-2020	NA	1	27	0
19	10	SF	may-16-2020	may-31-2020	NA	1	27	0
20	10	SF	jun-04-2020	jun-30-2020	NA	1	27	0
21	10	SF	jul-11-2020	aug-28-2020	NA	1	27	0
22	10	SF	sep-01-2020	sep-30-2020	NA	1	27	0
23	10	SF	oct-01-2020	oct-04-2020	NA	1	27	0
24	10	SF	oct-07-2020	oct-11-2020	NA	1	27	0
25	10	SF	oct-14-2020	oct-15-2020	NA	1	27	0
26	10	MO	may-01-2020	may-31-2020	NA	1	27	0
27	10	MO	jun-04-2020	jun-30-2020	NA	1	27	0
28	10	MO	jul-11-2020	jul-31-2020	NA	1	27	0
29	40	NO	mar-15-2020	jun-21-2020	NA	1	24	0
30	40	NO	jun-22-2020	aug-25-2020	NA	1	24	1
31	40	NO	aug-26-2020	aug-30-2020	NA	1	24	0
32	40	NO	aug-31-2020	sep-30-2020	NA	1	24	1
33	40	NO	oct-01-2020	oct-31-2020	NA	1	24	0
34	40	CO	mar-15-2020	jun-21-2020	NA	1	24	0
35	40	CO	jun-22-2020	aug-25-2020	NA	1	24	1
36	40	CO	aug-26-2020	aug-30-2020	NA	1	24	0
37	40	CO	aug-31-2020	sep-30-2020	NA	1	24	1
38	40	CO	oct-01-2020	oct-31-2020	NA	1	24	0
39	40	KO	may-25-2020	jun-21-2020	NA	1	24	0
40	40	KO	jun-22-2020	aug-25-2020	NA	1	24	1
41	40	KO	aug-26-2020	sep-02-2020	NA	1	24	0
42	40	KC	may-25-2020	sep-02-2020	NA	1	20	0
43	40	FB	apr-13-2020	apr-30-2020	NA	1	20	0
44	40	FB	may-18-2020	oct-31-2020	NA	1	20	0
45	40	SF	apr-13-2020	apr-30-2020	NA	1	24	0
46	40	SF	may-18-2020	oct-31-2020	NA	1	20	0
47	40	MO	apr-06-2020	aug-28-2020	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	11	25	30	31	29
CO	NA	NA	NA	NA	0	0	0	11	25	30	31	29
KO	NA	NA	NA	NA	0	0	0	11	25	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	27	21	28

SF	NA	NA	NA	NA	0	0	0	0	16	27	21	28
MO	NA	NA	NA	NA	0	0	0	0	31	27	21	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	3200	2500	1200
KC	NA	NA	NA	NA	NA	NA	NA	NA	NA	2500	2500	2000
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	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	27	27	27
FB	NA	NA	NA	NA	NA	NA	NA	NA	NA	27	27	27
SF	27	27	NA	NA	NA	NA	NA	NA	27	27	27	27
MO	NA	NA	NA	NA	NA	NA	NA	NA	27	27	27	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	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	7	30	31	31
KC	NA	NA	NA	NA	0	0	0	0	7	30	31	31
FB	NA	NA	NA	NA	0	0	0	18	14	30	31	31
SF	NA	NA	NA	NA	0	0	0	18	14	30	31	31
MO	NA	NA	NA	NA	0	0	0	25	31	30	31	28

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  NA  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  NA  NA  NA  NA  NA  20  20  20  20  20
SF  20  20  NA  NA  NA  NA  NA  24  20  20  20  20
MO  NA  NA  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 0.500000
2      pi.r 0.235705
3   H.r.tot       NA
4      CR.r 0.000000
5       c.r 0.070000
6       s.r 0.100000
7 E.nat.tot       NA

--------------------------------------------------------------------------------
```