Klamath River Fall Chinook Salmon Age-Specific Escapement, River Harvest, and Run Size Estimates, 2014 Run

Klamath River Technical Team 2 March 2015

Summary

The number of Klamath River fall Chinook salmon returning to the Klamath River Basin (Basin) in 2014 was estimated to be:

	Run Size			
Age	Number	Proportion		
2	22,348	0.12		
3	57,837 0.32			
4	98,710 0.54			
5	3,897	0.02		
Total	182,792	1.00		

Preseason forecasts of the number of fall Chinook salmon adults returning to the Basin and the corresponding post-season estimates are:

 _	Adults				
Sector	Preseason Forecast	Postseason Estimate	Pre / Post		
Run Size	92,800	160,400	0.58		
Fishery Mortality					
Tribal Harvest	27,300	25,900	1.05		
Recreational Harvest	4,100	5,300	0.77		
Drop-off Mortality	2,500	2,400	1.04		
	33,900	33,600	1.01		
Escapement					
Hatchery Spawners	18,200	31,300	0.58		
Natural Area Spawners	40,700	95,300	0.43		
	58,900	126,600	0.47		

Introduction

This report describes the data and methods used by the Klamath River Technical Team (KRTT) to estimate age-specific numbers of fall Chinook salmon returning to the Basin in 2014. The estimates provided in this report are consistent with the Klamath Basin Megatable (CDFG 2015) and with the 2014 forecast of ocean stock abundance (KRTT 2015).

Age-specific escapement estimates for 2014 and previous years, coupled with the coded-wire tag (CWT) recovery data from Basin hatchery stocks, allow for a cohort reconstruction of the hatchery and natural components of Klamath River fall Chinook salmon (Goldwasser et al. 2001, Mohr 2006a, KRTT 2015). Cohort reconstruction enables forecasts to be developed for the current year's ocean stock abundance, ocean fishery contact rates, and percent of spawners expected in natural areas (KRTT 2015). These forecasts are necessary inputs to the Klamath Ocean Harvest Model (Mohr 2006b), the model used by the Pacific Fishery Management Council to forecast the effect of fisheries on Klamath River fall Chinook salmon.

Methods

The KRTT obtained estimates of abundance and age composition separately for each sector of harvest and escapement (Appendix B and C). Random and nonrandom sampling methods of various types were used throughout the Basin (Table 1) to estimate the numbers of fall Chinook salmon in the 2014 run and to obtain the data from which the Klamath Basin Megatable totals and estimates of age composition were derived. The KRTT relied on surrogate data for estimating age composition where the sample of scales was insufficient, or altogether lacking, within a particular sector.

Estimates of age composition were based on random samples of scales (Table 2) whenever possible. Generally, each scale was aged independently by two trained readers. In cases of disagreement, a third read was used to arbitrate. Statistical methods (Cook and Lord 1978, Cook 1983, Kimura and Chikuni 1987) were used to correct the reader-assigned age composition estimates for potential bias based on the known-age vs. read-age validation matrices. The method used to combine the random sample's known ages (for CWT fish) and unknown read ages for estimation of the escapement or harvest age composition is described in Appendix A.

For cases in which scales were believed to be non-representative of the age-2 component, the KRTT relied on analysis of length-frequency histograms. In these cases, all fish less than or equal to a given fork-length "cutoff" were assumed to be age-2, and all fish greater than the cutoff length were assumed to be adults. The cutoff value varied by sector, and was based on location of the length-frequency nadir and, if appropriate, the length-frequency of known-age fish. As before, scales were used to estimate the age composition of adults (Appendix A).

An indirect method was used to estimate age composition for natural spawners in the Trinity River above the Willow Creek Weir (WCW). Age-specific numbers of fall Chinook salmon that immigrated above WCW were estimated by applying the age composition from scales collected at the weir to the estimate of total abundance above the weir. Next, the age composition of returns to Trinity River Hatchery and the harvest above WCW were estimated. The age composition of natural spawners above the weir was then estimated as the age-specific abundances above the WCW, minus the age-specific hatchery and harvest totals.

The specific protocols used to develop estimates of age composition for each sector are provided in Table 3. A summary of the KRTT minutes specific to each sector is given in Appendix B for the Klamath River and Appendix C for the Trinity River.

Results

A total of 11,796 scales from 15 different sectors were aged for this analysis (Table 2). Of these, 941 were from known-age CWT fish. Known-age scales provide a direct check, or "validation", of accuracy of the scale-based age estimates (Tables 4a and 4b, Appendices D and E). Overall, the scale-based ages were generally accurate. Accuracy within the Trinity Basin was 100% for age-2 fish, 98% for age-3 fish, 99% for age-4 fish, and 100% for age-5 fish. Accuracy within the Klamath River Basin was 97% for age-2 fish, 96% for age-3 fish, 92% for age-4 fish, and 71% for age-5 fish. The statistical bias-adjustment methods employed are intended to correct for scale-reading bias, but the methods assume that the known-age versus read-age validation matrices are themselves well estimated (Kimura and Chikuni 1987).

Table 5 presents estimates of age-specific returns to Basin hatcheries and spawning grounds, as well as Basin harvest by tribal and recreational fisheries and the drop-off mortality associated with those fisheries. Table 6 displays the Table 5 estimates as proportions. Calculations underlying the results summarized in Table 5 are presented in Appendix F.

The final estimates of the 2013 Klamath Basin age composition were slightly modified from the preliminary age composition. Final estimates are presented in Appendix G.

List of Acronyms and Abbreviations

ad-clipped CDFW CWT EST FL HVT IGH	adipose fin removed California Department of Fish and Wildlife coded-wire tag Klamath River estuary fork length Hoopa Valley Tribe Iron Gate Hatchery
KRTAT	Klamath River Technical Advisory Team
KRTT KT	Klamath River Technical Team Karuk Tribe
LRC	Lower Klamath River Creel
MKWC	Mid-Klamath Watershed Council
M&U	Klamath River below Weitchpec: "middle" section (Hwy 101–Surpur Cr.) and "upper" section (Surpur Cr.—Trinity River)
NCRC	Northern California Resource Center
QVIR	Quartz Valley Indian Reservation
SCS	Siskiyou County Schools
SRCD	Siskiyou Resource Conservation District
SRRC	Salmon River Restoration Council
TRH	Trinity River Hatchery
UR TRIBS	Upper Klamath River Tributaries
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WCW YT	Willow Creek Weir Yurok Tribe
YTFP	Yurok Tribal Fisheries Program

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Table 1. Estimation and sampling methods used for the 2014 Klamath River fall Chinook run assessment.

Sampling Location	Estimation and Sampling Methods	Agency
Hatchery Spawners		
Iron Gate Hatchery (IGH)	Direct count. All fish examined for fin-clips, tags, and marks. Bio-data collected from a systematic random sample of 10% of the fish. Additionally, all ad-clipped fish were bio-sampled.	CDFW
Trinity River Hatchery (TRH)	Direct count. All fish examined for fin-clips, tags, and marks. Bio-data collected from a systematic random sample of 20% of the fish.	CDFW, HVT
Natural Spawners		
Salmon River Basin	Carcass mark-recapture survey (Cormack-Jolly-Seber) within the mainstem combined with redd surveys of the lower mainstem and tributaries. Total run based on mark-recapture estimate and expanded redd count (2*total redd count)/(1-proportion of jacks) + live fish observed on last day surveyed. Jacks estimated from scale-age data for this area. Bio-data collected from all carcasses recovered.	CDFW,USFS,YT, KT, SRRC, SCS
Scott River Basin	Video count above weir at river mile 18 and carcass mark-recapture (Cormack-Jolly-Seber) below weir. Total run based on video count through the weir and mark-recapture estimate below the weir. Access was limited in a 0.5 mile section of the mark-recapture area which was surveyed once for a peak redd count. In this 0.5 mile section total was estimated using the following formula: Total run = (2*total redd count)/(1-proportion jacks). Bio-data collected from all carcasses recovered.	CDFW, SCS, QVIR, USFS, KT, NCRC, SRCD
Shasta River Basin	Video count above weir. Bio-data collected from carcasses upstream of video weir site, a temporary trap, and mortalities stranded on weir.	CDFW
Bogus Creek Basin	Video count above weir and twice weekly direct carcass count below weir. Bio-data collected from a systematic random sample (1:4) of all carcasses observed during surveys above and below weir. Additionally, all ad-clipped fish were bio-sampled.	CDFW, SCS
Klamath River mainstem (IGH to Shasta R)	Area under the curve estimate from weekly carcass surveys. Bio-data collected from fresh carcasses.	USFWS, YT
Klamath River mainstem (Ash Cr to Indian Cr)	Weekly redd survey. Total run = (2*total redd count)/(1-proportion jacks). Jacks estimated from the Klamath River mainstem area scale-age data.	USFWS, KT
Klamath Tributaries above Trinity	Periodic redd surveys, the majority of which were performed weekly. Total run = (2*total redd count)/(1- proportion jacks) + live fish observed on last day surveyed. Jacks estimated from Klamath tributary scale-age data. Bio-data collected from all carcasses recovered.	USFS,CDFW, KT, YT, SRRC, MKWC, SCS
Blue Creek	Weekly snorkel surveys. Total estimated as the peak count during surveys. Bio-data collected from all fresh carcasses.	YT
Trinity River (mainstem above WCW)	Mark-recapture (Peterson); marks applied at WCW and recovered at TRH. All fish bio-sampled and scales collected in systematic random sample (1:2). Age composition of total run past WCW based on scale-age data from the weir. Natural spawning escapement estimated by subtracting age specific estimates of hatchery returns and recreational harvest above WCW from the total run.	CDFW, HVT
Trinity River (mainstem below WCW)	Bi-weekly redd survey. Total run = (2*total redd count)/(1-proportion jacks). Jacks estimated from the natural area above WCW. Bio-samples from all recovered carcasses.	HVT, USFWS
Trinity Tributaries (above Reservation; below WCW)	Periodic redd survey. Total run = (2*total redd count)/(1-proportion jacks) + live fish observed on last day surveyed. Jacks estimated from the Trinity tributaries and Hoopa Reservation tributaries combined. Bio-data collected from all recovered carcasses.	USFS
Hoopa Reservation Tributaries	Periodic redd survey. Total run = (2*total redd count)/(1-proportion jacks). Jacks estimated from the Trinity tributaries and Hoopa Reservation tributaries combined. Bio-data collected from all recovered carcasses.	HVT
Recreational Harvest		
Klamath River (below Hwy 101 bridge)	Jack and adult estimates based on access point creel survey during three randomly selected days per statistical week. Bio-data collected during angler interviews.	CDFW
Klamath River (Hwy 101 to Weitchpec)	Jack and adult estimates based on access point creel survey during three randomly selected days per statistical week. Bio-data collected during angler interviews.	CDFW
Klamath River (Weitchpec to IGH)	No survey. Upper Klamath adult harvest estimated using the ratio of lower river to total adult river harvest during the years 1999-2002 (Appendix B). Upper river adult harvest = total adult harvest minus lower river adult harvest. Total harvest = adults/(1-proportion jacks). Jacks estimated from the weighted IGH, Klamath mainstem, Bogus Creek age composition data.	CDFW
Trinity River Basin (above WCW)	Jack and adult harvest estimates based on estimated harvest rates from angler return of reward tags applied at WCW.	CDFW
Trinity River Basin (below WCW)	Roving access creel survey during three randomly selected days per statistical week stratified by weekdays and weekend days (1 weekday and 2 weekend). Bio-data collected during angler interviews.	HVT
Tribal Harvest		
Klamath River (below Hwy 101)	Daily harvest estimates based on effort and catch-per-effort surveys. Bio-data collected during net harvest and buying station interviews.	ΥT
Klamath River (Hwy 101 to Trinity mouth)	Daily harvest estimates based on effort and catch-per-effort surveys. Bio-data collected during net harvest interviews.	ΥT
Trinity River (Hoopa Reservation)	Effort and catch-per-effort surveys during four randomly selected days per statistical week. Bio-data collected during net harvest interviews.	HVT
Fishery Dropoff Mortality		
Recreational Angling Dropoff Mortality 2.04%	Not directly estimated. Assumed rate relative to fishery impacts = $.02$; relative to fishery harvest = $.02/(102)$.	KRTAT
Tribal Net Dropoff Mortality 8.7%	Not directly estimated. Assumed rate relative to fishery impacts = .08; relative to fishery harvest = .08/(108).	KRTAT

^a Bio-data generally includes: fork length, scale, sex, tags or marks, and CWT recovery from dead ad-clipped fish.

	Age				
Sampling Location	Unknown-age ^{a/}	Known-age b/	Not aged ^{c/}	Total	Agency
Hatchery Spawners					
Iron Gate Hatchery (IGH)	1,014	95	1,573	2,682	CDFW
Trinity River Hatchery (TRH)	993	301	24	1,318	HVT
Natural Spawners					
Salmon River Carcass Survey	449	0	15	464	CDFW
Scott River Carcass Survey	1,094	1	1,809	2,904	CDFW
Shasta River Carcass	272	12	123	407 ^{d/}	CDFW
Bogus Creek Weir	943	230	1,010	2,183	CDFW
Klamath River mainstem	677	61	20	758	USFWS
Upper Klamath River tributaries	504	0	12	516	USFS
Blue Creek Snorkle	63	0	4	67	ΥT
Willow Creek Weir	518	21	6	545	CDFW, HVT
Lower Trinity River Carcass	21	0	1	22	HVT
Lower Trinity River tributaries	36	0	0	36	HVT, USFS
Recreational Harvest					
Lower Klamath River Creel	1,448	15	73	1,536	CDFW
Lower Trinity River Creel	18	0	0	18	HVT
Tribal Harvest					
Klamath River (below Hwy 101)	1,490	141	336	1,967	ΥT
Klamath River (Hwy 101 to Trinity R)	535	16	29	580	ΥT
Trinity River (Hoopa Reservation)	684	51	15	750	HVT
TOTAL	10,759	944	5,050	16,753	

Table 2. Scale sampling locations and numbers of scales collected for the 2014 Klamath Basin fall Chinook age-composition assessment.

a/ Scales from non-ad-clipped fish and ad-clipped fish without CWTs, mounted and aged.

b/ Scales from all mounted and aged ad-clipped CWT fish; non-random CWT fish used for validation but not age composition.

c/ Scales mounted and not aged or scales not mounted.

d/ Includes 12 scales collected from washbacks at Shasta weir that were aged but not used in scale analysis.

Table 3. Age-composition methods used for the 2014 Klamath Basin fall Chinook run assessment.

Sampling Location	Age Composition Method
Hatchery Spawners	
Iron Gate Hatchery (IGH)	Jack/adult structure from scale-age analysis.
Trinity River Hatchery (TRH)	Jack/adult structure from scale-age analysis.
Natural Spawners	
Salmon River Basin	Jack/adult structure from scale-age analysis.
Scott River Basin	Jack/adult structure from scale-age analysis.
Shasta River Basin	Jack/adult structure from scale-age analysis.
Bogus Creek Basin	Jack/adult structure from scale-age analysis.
Klamath River mainstem (IGH to Shasta R)	Jack/adult structure from scale-age analysis.
Klamath River mainstem (Ash Cr to Indian Cr)	Surrogate: Klamath mainstem (IGH to Shasta R) age-structure.
Klamath tributaries (above Trinity River)	Jack/adult structure from scale-age analysis.
Blue Creek	Jack/adult structure from scale-age analysis.
Trinity River (above WCW)	Jack/adult structure derived from subtracting age specific TRH counts and recreational harvest estimate above WCW from the age specific total run estimate above WCW derived from scale-age analysis.
Trinity River (mainstem below WCW)	Surrogate: Jack/adult structure from Trinity River (above WCW).
Trinity Tributaries (above Reservation to WCW)	Jack/adult structure from scale-age analysis.
Hoopa Reservation Tributaries	Jack/adult structure from scale-age analysis.
Recreational Harvest	
Klamath River (below Hwy 101 bridge)	Jack/adult structure from scale-age analysis.
Klamath River (Hwy 101 to Weitchpec)	Jack/adult structure from scale-age analysis.
Klamath River (Weitchpec to IGH)	Surrogate: IGH, Bogus Creek, and Klamath River mainstem (IGH to Shasta River) weighted age composition.
Trinity River Basin (above WCW)	Jack component based on estimated jack harvest rate and total jack run estimate. Adult Surrogate: adult age composition from Trinity River Basin Recreational Harvest (below WCW).
Trinity River Basin (below WCW)	Jack/adult structure from scale-age analysis.
Tribal Harvest	
Klamath River (below Hwy 101)	Jack/adult structure from scale-age analysis.
Klamath River (Hwy 101 to Trinity mouth)	Jack/adult structure from scale-age analysis.
Trinity River (Hoopa Reservation)	Jack/adult structure from scale-age analysis.

Number		ł	Known Age			
	•	2	3	4	5	
	2	103	5	0	0	
Read	3	3	198	34	0	
Age	4	0	4	381	12	
	5	0	0	1	29	Total
-	Total	106	207	416	41	770
Percent	<u>age</u>	ł	Known Age			
		2	3	4	5	
	2	0.97	0.02	0.00	0.00	
Read	3	0.03	0.96	0.08	0.00	
Age	4	0.00	0.02	0.92	0.29	
	5	0.00	0.00	0.00	0.71	
-	Total	1.00	1.00	1.00	1.00	

Table 4a. 2014 Klamath River Basin scale validation matrices.

Table 4b. 2014 Trinity River Basin scale validation matrices.

Number		Known Age					
		2	3	4	5		
	2	12	0	0	0		
Read	3	0	183	2	0		
Age	4	0	3	172	0		
	5	0	0	0	1	Total	
Т	otal	12	186	174	1	373	
Percenta	age	Kr	iown Age				
		2	3	4	5		
	2	1.00	0.00	0.00	0.00		
Read	3	0.00	0.98	0.01	0.00		
Age	4	0.00	0.02	0.99	0.00		
	5	0.00	0.00	0.00	1.00		
1		1 0 0	1 0 0	4 00	0.00		
Т	otal	1.00	1.00	1.00	0.00		

Table 5. Age composition	of the 2014 Klamath	Basin fall Chinook run.

			AGE		Total	Total
Escapement & Harvest	2	3	4	5	Adults	Run
Hatabary Snawnara						
Hatchery Spawners Iron Gate Hatchery (IGH)	1 020	12,864	11,276	160	24,300	25 220
Trinity River Hatchery (TRH)	1,039 221	3,653	3,271	160 51	24,300 6,975	25,339
Hatchery Spawner subtotal	1,260	<u> </u>	14,547	211	31,275	7,196 32,535
natchery opawner subtotai	1,200	10,517	14,547	211	51,275	52,555
Natural Spawners						
Salmon River Basin	527	865	1,674	167	2,706	3,233
Scott River Basin	2,051	2,977	7,159	283	10,419	12,470
Shasta River Basin	3,945	4,064	10,265	83	14,412	18,357
Bogus Creek Basin	323	6,119	6,448	40	12,607	12,930
Klamath River mainstem (IGH to Shasta R)	1269	6491	8847	114	15,451	16,720
Klamath River mainstem (Shasta R to Indian Cr)	575	2932	4010	50	6,992	7,567
Klamath Tributaries (above Trinity River)	1,498	1,649	4,987	241	6,877	8,375
Blue Creek	332	105	<u>1,108</u>	32	<u>1,245</u>	<u>1,577</u>
Klamath Basin subtotal	10,520	25,202	44,498	1,010	70,709	81,229
	. 0,020	_0,_0_	,	.,	,	0.,0
Trinity River (mainstem above WCW)	6,576	10,261	12,011	1,004	23,276	29,852
Trinity River (mainstem below WCW)	74	115	135	11	262	336
Trinity Tributaries (above Reservation; below WCW)	47	123	361	31	515	562
Hoopa Reservation tributaries	<u>52</u>	<u>135</u>	<u>398</u>	<u>34</u>	<u>568</u>	<u>620</u>
Trinity Basin subtotal	6,749	10,634	12,905	1,080	24,621	31,370
Natural Spawners subtotal	17,269	35,836	57,403	2,091	95,330	112,599
	,	,	- ,			
Total Spawner Escapement	18,529	52,353	71,950	2,302	126,605	145,134
		-				145,134
Total Spawner Escapement		-				145,134
Total Spawner Escapement Recreational Harvest	18,529	52,353	71,950	2,302	126,605	
Total Spawner Escapement <u>Recreational Harvest</u> Klamath River (below Hwy 101 bridge)	18,529 268	52,353 249	71,950 775	2,302 69	126,605 1,093	1,361
Total Spawner Escapement <u>Recreational Harvest</u> Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec)	18,529 268 2,847	52,353 249 365	71,950 775 1,438	2,302 69 71	126,605 1,093 1,875	1,361 4,722
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH)	18,529 268 2,847 75	52,353 249 365 728	71,950 775 1,438 759	2,302 69 71 9	126,605 1,093 1,875 1,496	1,361 4,722 1,571
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW)	18,529 268 2,847 75 168	52,353 249 365 728 358	71,950 775 1,438 759 355	2,302 69 71 9 45	126,605 1,093 1,875 1,496 758	1,361 4,722 1,571 926
Total Spawner Escapement <u>Recreational Harvest</u> Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW) Trinity River Basin (below WCW)	268 2,847 75 168 3	52,353 249 365 728 358 26	71,950 775 1,438 759 355 26	2,302 69 71 9 45 3	126,605 1,093 1,875 1,496 758 55	1,361 4,722 1,571 926 58
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW)	18,529 268 2,847 75 168	52,353 249 365 728 358	71,950 775 1,438 759 355	2,302 69 71 9 45	126,605 1,093 1,875 1,496 758	1,361 4,722 1,571 926
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW) Trinity River Basin (below WCW) Subtotals	268 2,847 75 168 3	52,353 249 365 728 358 26	71,950 775 1,438 759 355 26	2,302 69 71 9 45 3	126,605 1,093 1,875 1,496 758 55	1,361 4,722 1,571 926 58
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW) Trinity River Basin (below WCW) Subtotals	268 2,847 75 168 3	52,353 249 365 728 358 26 1,726	71,950 775 1,438 759 355 26 3,353	2,302 69 71 9 45 3 198	126,605 1,093 1,875 1,496 758 55 55 5,277	1,361 4,722 1,571 926 58 8,638
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW) Trinity River Basin (below WCW) Subtotals Tribal Harvest Klamath River (below Hwy 101)	18,529 268 2,847 75 168 3 3,361 153	52,353 249 365 728 358 26	71,950 775 1,438 759 355 26 3,353 16,668	2,302 69 71 9 45 3 198 1,108	126,605 1,093 1,875 1,496 758 55 5,277 20,039	1,361 4,722 1,571 926 58
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW) Trinity River Basin (below WCW) Subtotals	18,529 268 2,847 75 168 3 3,361 153 130	52,353 249 365 728 358 26 1,726 2,262 593	71,950 775 1,438 759 355 26 3,353 16,668 2,785	2,302 69 71 9 45 3 198 1,108 56	126,605 1,093 1,875 1,496 758 55 5,277 20,039 3,434	1,361 4,722 1,571 926 58 8,638 20,192 3,564
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW) Trinity River Basin (below WCW) Subtotals Tribal Harvest Klamath River (below Hwy 101) Klamath River (Hwy 101 to Trinity mouth)	18,529 268 2,847 75 168 3 3,361 153	52,353 249 365 728 358 26 1,726 2,262	71,950 775 1,438 759 355 26 3,353 16,668	2,302 69 71 9 45 3 198 1,108	126,605 1,093 1,875 1,496 758 55 5,277 20,039	1,361 4,722 1,571 926 <u>58</u> 8,638 20,192
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW) Subtotals Tribal Harvest Klamath River (below Hwy 101) Klamath River (below Hwy 101) Klamath River (Hwy 101 to Trinity mouth) Trinity River (Hoopa Reservation) Subtotals	268 2,847 75 168 3 3,361 153 130 65 348	52,353 249 365 728 358 26 1,726 2,262 593 524 3,379	71,950 775 1,438 759 355 26 3,353 16,668 2,785 1,804 21,257	2,302 69 71 9 45 3 198 1,108 56 111 1,277	126,605 1,093 1,875 1,496 758 55 5,277 20,039 3,434 2,439 25,913	1,361 4,722 1,571 926 58 8,638 20,192 3,564 2,504 26,260
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW) Trinity River Basin (below WCW) Subtotals Tribal Harvest Klamath River (below Hwy 101) Klamath River (Hoopa Reservation)	18,529 268 2,847 75 168 3 3,361 153 130 65	52,353 249 365 728 358 26 1,726 2,262 593 524	71,950 775 1,438 759 355 26 3,353 16,668 2,785 1,804	2,302 69 71 9 45 3 198 1,108 56 111	126,605 1,093 1,875 1,496 758 55 5,277 20,039 3,434 2,439	1,361 4,722 1,571 926 58 8,638 20,192 3,564 2,504
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW) Trinity River Basin (below WCW) Subtotals Tribal Harvest Klamath River (below Hwy 101) Klamath River (Hwy 101 to Trinity mouth) Trinity River (Hoopa Reservation) Subtotals Total Harvest Total Harvest	268 2,847 75 168 3 3,361 153 130 65 348	52,353 249 365 728 358 26 1,726 2,262 593 524 3,379	71,950 775 1,438 759 355 26 3,353 16,668 2,785 1,804 21,257	2,302 69 71 9 45 3 198 1,108 56 111 1,277	126,605 1,093 1,875 1,496 758 55 5,277 20,039 3,434 2,439 25,913 31,190	1,361 4,722 1,571 926 58 8,638 20,192 3,564 2,504 26,260
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW) Trinity River Basin (below WCW) Subtotals Tribal Harvest Klamath River (below Hwy 101) Klamath River (Hoopa Reservation) Subtotals	268 2,847 75 168 3 3,361 153 130 65 348	52,353 249 365 728 358 26 1,726 2,262 593 524 3,379	71,950 775 1,438 759 355 26 3,353 16,668 2,785 1,804 21,257	2,302 69 71 9 45 3 198 1,108 56 111 1,277	126,605 1,093 1,875 1,496 758 55 5,277 20,039 3,434 2,439 25,913	1,361 4,722 1,571 926 58 8,638 20,192 3,564 2,504 26,260 34,898
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW) Subtotals Tribal Harvest Klamath River (below Hwy 101) Klamath River (Hwy 101 to Trinity mouth) Trinity River (Hoopa Reservation) Subtotals Total Harvest Total Harvest	18,529 268 2,847 75 168 3 3,361 153 130 65 348 3,709	52,353 249 365 728 358 26 1,726 2,262 593 524 3,379 5,105	71,950 775 1,438 759 355 26 3,353 16,668 2,785 1,804 21,257 24,610	2,302 69 71 9 45 3 198 1,108 56 111 1,277 1,475	126,605 1,093 1,875 1,496 758 55 5,277 20,039 3,434 2,439 25,913 31,190	1,361 4,722 1,571 926 58 8,638 20,192 3,564 2,504 26,260 34,898 180032
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW) Subtotals Tribal Harvest Klamath River (below Hwy 101) Klamath River (below Hwy 101) Klamath River (Hwy 101 to Trinity mouth) Trinity River (Hoopa Reservation) Subtotals Total Harvest Total Harvest Harvest and Escapement	18,529 268 2,847 75 168 3 3,361 153 130 65 348 3,709 22238	52,353 249 365 728 358 26 1,726 2,262 593 524 3,379 5,105	71,950 775 1,438 759 355 26 3,353 16,668 2,785 1,804 21,257 24,610 96560	2,302 69 71 9 45 3 198 1,108 56 111 1,277 1,475	126,605 1,093 1,875 1,496 758 55 5,277 20,039 3,434 2,439 25,913 31,190	1,361 4,722 1,571 926 58 8,638 20,192 3,564 26,260 34,898 180032 177
Total Spawner Escapement Recreational Harvest Klamath River (below Hwy 101 bridge) Klamath River (Hwy 101 to Weitchpec) Klamath River (Weitchpec to IGH) Trinity River Basin (above WCW) Subtotals Tribal Harvest Klamath River (below Hwy 101) Klamath River (below Hwy 101) Klamath River (Hwy 101 to Trinity mouth) Trinity River (Hoopa Reservation) Subtotals Total Harvest Marvest and Escapement Recreational Angling Dropoff Mortality 2.04%	18,529 268 2,847 75 168 3 3,361 153 130 65 348 3,709 22238 69	52,353 249 365 728 358 26 1,726 2,262 593 524 3,379 5,105 57458 35	71,950 775 1,438 759 355 26 3,353 16,668 2,785 1,804 21,257 24,610 96560 68	2,302 69 71 9 45 3 198 1,108 56 111 1,277 1,475 3777 5	126,605 1,093 1,875 1,496 758 55 5,277 20,039 3,434 2,439 25,913 31,190 157,794 108	1,361 4,722 1,571 926 58 8,638 20,192 3,564 2,504 26,260

			AGE	
Escapement & Harvest	2	3	4	5
Hatchery Spawners				
Iron Gate Hatchery (IGH)	0.04	0.51	0.45	0.01
Trinity River Hatchery (TRH)	0.03	0.51	0.45	0.01
Hatchery Spawner subtotal	0.04	0.51	0.45	0.01
Natural Spawners				
Salmon River Basin	0.16	0.27	0.52	0.05
Scott River Basin	0.16	0.24	0.57	0.02
Shasta River Basin	0.21	0.22	0.56	0.00
Bogus Creek Basin	0.02	0.47	0.50	0.00
Klamath River mainstem (IGH to Shasta R)	0.08	0.39	0.53	0.01
Klamath River mainstem (Shasta R to Indian Cr)	0.08	0.39	0.53	0.01
Klamath tributaries (above Reservation)	0.18	0.20	0.60	0.03
Yurok Reservation tributaries	<u>0.21</u>	<u>0.07</u>	<u>0.70</u>	<u>0.02</u>
Klamath Basin subtotal	0.13	0.31	0.55	0.01
	0.00	0.04	0.40	0.00
Trinity River (mainstem above WCW)	0.22	0.34	0.40	0.03
Trinity River (mainstem below WCW)	0.22	0.34	0.40	0.03
Trinity tributaries (above Reservation)	0.08	0.22	0.64	0.06
Hoopa Reservation tributaries	<u>0.08</u>	<u>0.22</u>	<u>0.64</u>	<u>0.06</u>
Trinity Basin subtotal	0.22	0.34	0.41	0.03
Natural Spawners subtotal	0.15	0.32	0.51	0.02
Total Spawner Escapement	0.13	0.36	0.50	0.02
· ·				
Recreational Harvest				
Klamath River (below Hwy 101 bridge)	0.20	0.18	0.57	0.05
Klamath River (Hwy 101 to Weitchpec)	0.60	0.08	0.30	0.02
Klamath River (Weitchpec to IGH)	0.05	0.46	0.48	0.01
Trinity River Basin (above WCW)	0.18	0.39	0.38	0.05
Trinity River Basin (below WCW)	<u>0.06</u>	<u>0.45</u>	<u>0.44</u>	<u>0.06</u>
Subtotals	0.39	0.20	0.39	0.02
Tribal Harvest	0.01	o <i>i i</i>	0.00	o o -
Klamath River (below Hwy 101)	0.01	0.11	0.83	0.05
Klamath River (Hwy 101 to Trinity mouth)	0.04	0.17	0.78	0.02
Trinity River (Hoopa Reservation)	<u>0.03</u>	<u>0.21</u>	<u>0.72</u>	<u>0.04</u>
Subtotals	0.01	0.13	0.81	0.05
Total Harvest	0.11	0.15	0.71	0.04
Totals				
	0.12	0.32	0.54	0 00
Harvest and Escapement Recreational Angling Dropoff Mortality 2.04%	0.12	0.32	0.54 0.38	0.02 0.03
Tribal Net Dropoff Mortality 8.7%	0.39 0.01	0.20	0.38 0.81	0.03
	0.01	0.13	0.01	0.05
Total River Run	0.12	0.32	0.54	0.02

Table 6. Age proportion of the 2014 Klamath Basin fall Chinook run.

Appendix A: Estimation of escapement age-composition from a random sample containing known-age (CWT) and unknown read-age fish.

Denote the escapement at age as { N_a , a = 2,3,4,5}, $N = \sum N_a$, and for the random sample of size (n + m) fish, denote the following quantities:

- known-age fish: number at age $\{n_a, a = 2, 3, 4, 5\}$, $n = \sum n_a$, $p_a = n_a / n$.
- unknown read-age fish: number at age $\{m_a, a = 2, 3, 4, 5\}$, $m = \sum m_a$, $r_a = m_a / m$.
- bias-corrected unknown read-age proportions: $\{r_a, a = 2, 3, 4, 5\}, r_a = r_3 + r_4 + r_5$.
- age-2 proportion as estimated by size-frequency: s₂.
- 1. Age 2–5 escapement by scales. Estimate N_a as the sample of known-age *a* fish plus the unknown age portion of the escapement times the estimated age *a* proportion (bias-corrected):

$$N_a = np_a + (N - n)r_a^*, \ a = 2, 3, 4, 5.$$

2. Age-2 escapement by size-frequency; age 3–5 escapement by scales. Estimate N_2 as the total escapement times the size-frequency based estimated age-2 proportion. Estimate N_a for a = 3, 4, 5 as the sample known-age *a* fish plus the unknown age portion of the adult escapement times the age *a* proportion among adults (bias-corrected):

$$N_{a} = \begin{cases} Ns_{2}, & a = 2\\ np_{a} + [N(1 - s_{2}) - n(1 - p_{2})](r_{a}^{*} / r_{A}^{*}), & a = 3, 4, 5 \end{cases}$$

Appendix B. Klamath River – 2014 details.

Iron Gate Hatchery (IGH)

A systematic random bio-sample^a was obtained from every tenth Chinook salmon returning to IGH in 2014. A total of 1,109 scale samples were aged, of which 95 were from known-age, CWT fish. 143 non-random scales were collected from known-age CWT fish <50 cm to assist in validation. Scale-based age compositions were used to apportion all age classes.

Bogus Creek

Escapement was estimated by summing carcasses encountered below the video weir and videography counts (since 2002) above the weir. Bio-samples were obtained using a 1:4 systematic random sample. Additionally, biological data, but no scale samples, were obtained from every (i.e., non-random) adclipped fish encountered. A total of 1,173 scale samples were aged, of which 230 were from known-age, CWT fish. Scale-based age compositions were used to apportion all age classes.

Shasta River

Escapement was estimated by videography (since 1998) while bio-samples were collected from all recovered carcasses during surveys in the lower seven river miles on public and private lands where access is granted. Bio-samples were also obtained from systematically sampled (1:10) carcasses that washed back onto the counting weir. Additionally, all ad-clipped fish not falling within the systematic sample were bio-sampled. A total of 284 scale samples were aged (258 from spawning ground surveys, 14 from a live trap and 12 from weir "wash-backs'). The 12 'wash-back' samples were from known-age, CWT fish. Scale-based age compositions were used to apportion all age classes.

Scott River

Independent estimates from above and below the weir were combined to produce total escapement. Escapement above the weir was estimated using videography (since 2008). Escapement below the weir was calculated using the Cormack-Jolly-Seber estimator with data from twice weekly mark-recapture carcass surveys, with one exception. In a 0.5 mile reach, where access was granted for a single pass survey, a redd survey was conducted. Bio-samples were obtained from all non-deteriorated carcasses recovered above and below the weir. A total of 1,095 scale samples were aged of which one was of known-age. Scale-based age compositions were used to apportion all age classes.

Salmon River

Total escapement was estimated by combining the Cormack-Jolly-Seber estimate from the carcass survey within the main stem, upstream of Nordheimer campground, and a redd count expansion (redds X 2) from tributaries and the lowest three reaches of the main stem. Biological samples and scales were obtained from all recovered carcasses. A total of 449 scale samples were aged, none of which were from known-age CWT fish. Scale-based age compositions were used to apportion all age classes.

Klamath River Tributaries

Adult escapement was estimated by expanding the total redd count (redds X 2) and adding the number of live fish observed during the final survey in each tributary. A total of 504 scale samples were aged, none of which were from known-age CWT fish. Total escapement (including jacks) was estimated by expanding the adult estimate by the scale-based age-2 proportion. Scale-based age compositions were used to apportion all age classes.

Klamath River Mainstem

For the upper reach (IGH to Shasta River), weekly counts without removal were used to calculate an area-under-the-curve escapement estimate. Observation efficiency was derived from recapture histories of marked carcasses. Carcass 'life' (residence time) was derived from recapture histories and a 5-point

^a Biological samples ("bio-samples") of live fish or carcasses generally included: sex, fork length, tags or marks, a scale sample, and CWT recovery codes from adipose fin-clipped fish.

scale for appraisal of carcass condition. A total of 738 scales were aged, of which 61 were from knownage CWT fish. Scale-based age proportions were used to assign all age classes.

For the lower reach (Ash Creek to Indian Creek), adult escapement was estimated by expanding the total redd count (redds X 2). Total escapement was estimated by expanding the adult estimate by the scale-based age-2 proportion from the upper reach. Scale-based age proportions from the upper reach were used as surrogate to assign all age classes from total estimate.

Lower Klamath River Creel

Total harvest was estimated by combining creel census estimates from the two sub-areas (above the Highway 101 Bridge to Weitchpec and below the Highway 101 Bridge to the mouth). A total of 1,463 scale samples were aged, of which 15 were taken from known-age CWT fish. Scale-based age proportions for each sub-area were used to apportion all age classes in their respective sub-area.

Upper Klamath River Recreational Fishery

A creel census in this sub-area was not conducted in 2014. Creel census data were available for the lower and upper river fisheries in 1999 through 2002. The ratio of average adult harvest in the entire Klamath main stem to the average harvest in the lower Klamath River Creel area from these years was applied to the 2014 lower Klamath River Creel harvest estimate to estimate the total adult harvest in the Klamath River main stem. Adult harvest for the upper Klamath River recreational fishery was then estimated by subtracting the estimated lower Klamath River Creel estimate from the Klamath main stem total harvest. Finally, the combined adult and jack harvest was obtained by dividing the adult harvest by the proportion of adults from the weighted average scale age composition of the Upper Klamath River main stem (IGH to Shasta River), Bogus Creek, and Iron Gate Hatchery. These weighted scale-based age compositions were used to apportion all age classes in this fishery.

Yurok Tribal Estuary Fishery (Klamath mouth to Hwy 101)

Yurok harvest in the estuary was estimated by hourly stratified effort and catch-per-effort methods. The fishery was largely subsistence and ceremonial with a four-day commercial fishery. A total of 1,631 scales were aged, of which 141 were from known-age CWT fish. Scale-based age compositions were used to apportion all age classes.

Yurok Tribal Fishery Above 101

Yurok harvest in this sub-area was estimated by daily effort and catch-per-effort analyses. A total of 551 scale samples were aged, of which 16 came from known-age, CWT fish. Scale-based age compositions were used to apportion all age classes.

Blue Creek

The peak dive count of live fish was used as the estimate of escapement. A total of 63 scale samples were aged. Bio-samples were obtained from all carcasses recovered. Scale-based age compositions were used to apportion all age classes.

Appendix C. Trinity River – 2014 details.

Trinity River Hatchery (TRH)

Sampling for scales was conducted in a systematic (1:5) random manner including ad-clipped and nonad-clipped fish (no non-random ad-clipped fish scales were collected). A total of 1,294 scales were aged, of which 301 scales came from known-age CWT fish. Scale samples were used to apportion the hatchery return into age classes.

Upper Trinity River Recreational Harvest

The method for estimating the upper Trinity recreational harvest depends on the application of reward and non-reward program tags at the Willow Creek Weir (WCW) and subsequent returns by anglers. In 2014, only reward tags were used to estimate harvest. CDFW estimated a 2.44% harvest rate on adult Chinook salmon based on the return of program reward tags (14 of 573) applied at WCW. The jack harvest rate of 2.42% was based on return of program reward tags (3 of 124 applied), yielding an estimated harvest of 168 age-2 Chinook. There were no scales recovered from this fishery as no creel survey was implemented in 2014. The age-2 recreational harvest was determined by multiplying the jack harvest rate by the age-2 run size estimated from scales aged at WCW. The adult age proportions estimated for the Lower Trinity River Creel were used to apportion the adult component.

Lower Trinity River Creel

A roving creel survey was implemented in Trinity River below the location of the WCW. A total of 18 scales were aged, of which none were from known-age, CWT fish. Total harvest was apportioned by age using the scale age proportions.

Upper Trinity River Natural Escapement

Total run was estimated using a non-stratified Petersen mark-recapture estimator. The methods used for estimating age structure within the Trinity River run above WCW were similar to those used in the population estimate, apportioned to three general recovery areas: Trinity River Hatchery, Trinity upper basin natural spawning escapement, and recreational harvest. At WCW a systematic random sample (1:2) of all Chinook examined produces a collection of scales for program-marked fish, some of which are ad-clipped (Trinity River Hatchery origin). Validation of WCW scales is accomplished with known-age fish recovered throughout all sectors of the Trinity River. A total of 539 scales were aged of which 21 were from known-age, CWT fish subsequently recovered at TRH.

The age structure for fish passing above WCW was estimated using scales collected at WCW minus those from known-age fish later recovered at TRH. Next, specific age structures were estimated for fish returning to TRH and the recreational fishery. These proportions were applied to the total hatchery escapement and estimated fishery harvest, respectively, providing totals by age within area. These totals were then deducted from the WCW run apportioned by age resulting in an age structure for the natural escapement in the upper Trinity River.

Lower Trinity River Natural Escapement:

The lower Trinity River natural escapement estimate included total spawners estimated in both main stem and tributary sub-areas (redds X 2). In the tributaries, a total of 36 scales were aged, none of which were from known-age fish. In the main stem, a total of 21 scales were aged, none of which were from knownage fish. Scale based age proportions were used to apportion all age classes in tributaries while the upper Trinity River natural age structure was used to apportion all age classes in the main stem below WCW.

Hoopa Valley Tribal Harvest

Hoopa Valley Tribal harvest is a composite of the gillnet and hook-and-line fisheries prosecuted by Tribal members. A total of 735 scales were aged, of which 51 were from known-age fish. The total harvest was apportioned by age using these scale age proportions.

Appendix D. 2014 Klamath age analysis.

Unknown scales age composition as read								
	AGE 2	AGE 3	AGE 4	AGE 5	TOTAL			
BOGUS	32	463	437	3	935			
IGH	50	516	441	5	1,012			
SALMON	74	136	222	17	449			
SCOTT	181	306	587	19	1,093			
SHASTA	48	59	116	1	224			
MAINSTEM	56	280	333	4	673			
UR TRIBS	90	122	281	11	504			
LRC EST	74	85	203	14	376			
LRC UP	633	123	304	12	1,072			
YTFP EST	15	259	1,155	61	1,490			
YTFP M&U	21	120	387	7	535			
BLUE CRK	13	8	41	1	63			
-	1287	2477	4507	155	8426			

Unknown scales corrected age proportions (Kimura method)

			-		
	AGE 2	AGE 3	AGE 4	AGE 5	TOTAL
BOGUS	0.0234	0.4743	0.4994	0.0028	1.0
IGH	0.0386	0.4923	0.4637	0.0054	1.0
SALMON	0.1630	0.2676	0.5177	0.0518	1.0
SCOTT	0.1645	0.2388	0.5741	0.0226	1.0
SHASTA	0.2150	0.2212	0.5594	0.0044	1.0
MAINSTEM	0.0760	0.3874	0.5300	0.0066	1.0
UR TRIBS	0.1789	0.1969	0.5954	0.0288	1.0
LRC EST	0.1980	0.1818	0.5694	0.0507	1.0
LRC UP	0.6058	0.0761	0.3033	0.0148	1.0
YTFP EST	0.0076	0.1109	0.8264	0.0551	1.0
YTFP M&U	0.0363	0.1667	0.7812	0.0158	1.0
BLUE CRK	0.2107	0.0665	0.7028	0.0201	1.0
					-
Known CWT ages	/a				
i de la compage	AGE 2	AGE 3	AGE 4	AGE 5	TOTAL
BOGUS	34	263	283	5	585
IGH	224	2478	1493	46	4241
SALMON	0	0	0	0	0
SCOTT	0	0	0	1	1
SHASTA	0	6	4	2	12
MAINSTEM	7	60	50	4	121
UR TRIBS	0	0	0	0	0
LRC	15	14	29	3	61
YTFP EST	1	41	113	5	160
YTFP M&U	1	2	13	0	16
BLUE CRK	0	0	0	0	0
DECE ONIX	282	2864	1985	66	5197
Breakout within strata	202	2004	1000	00	0107
Bogus1	14	92	114	1	221
Bogus2	20	171	169	4	364
LRC - lo	20	5	109	1	18
LRC - mid	13	9	10	2	43
YTFP MID-UP	1	9 2	13	0	43
	I	2	15	0	10

^{/a} Table includes known-age fish whose scales were not mounted / read.

Appendix E. 2014 Trinity age analysis.

	v Ck. Weir			Cwt Age		_		LOWTRINREC = Lowe				Cwt Age		_	
	Scale unreadable	no cwt age	2	3	4	5	Total 6	Soolo upro		no cwt age	2	3	4	5	Total 0
	Scale unreadable	4 95	2	0	0	0	6 97	Scale unre	adable 2		0	0	0	0	0
Scale	- 3	194	0	12	0	0	206	Scale	3	,	3 0	0	0	0	8
Ages	4	214	Ő	1	6	0	221	Ages	4		3 0	Ő	0	0	8
23	5	15	0	0	0	0	15	0	5		0	0	0	0	1
518		522	2	14	7	0	545	18		18	3 0	0	0	0	18
HUPAHARV =		Harvest plus Tribal						TRH = Trinity River Ha				Cwt Age			
		no cwt age	2	3	4	5	Total			no cwt age	2	3	4	5	Total
	Scale unreadable	13	0	0	2	0	15	Scale unre	adable	20		1	3	0	24
. <i>.</i> .	2	18	0	0	0	0	18		2	30		0	0	0	40
Scale	3	145 490	0	16 1	0 34	0	161	Scale	3	49		155 1	2 132	0	653
Ages 53	4	490 31	0	0	34	0	525 31	Ages 305	4	45		0	0	0	592 9
684	5	697	0	17	36	0	750	993	5	101:	, v	157	137	1	1318
004		007	0		00	Ŭ	100	550		101	, 10	101	107		1010
LOWTRINTRIE	BS = Lower Trinity	Tribs - Includes sa	nples taken by U (Cwt Age				UPKLAMREC Upper M	Clamath	Recreationa	I	Cwt Age			
		no cwt age	2	3	4	5		NO DATA		no cwt age	2	3	4	5	Total
	Scale unreadable	0	0	0	0	0	0	Scale unre	adable						
	2	3	0	0	0	0	3		2						
Scale	3	8	0	0	0	0	8	Scale	3						
Ages	4	23	0	0	0	0	23	Ages	4						
0	5	2	0	0	0	0	2	0	5			0	0		0
36		36	0	0	0	0	36	0		(0 0	0	0	0	0
	NSTEM = Lower Tr	inity Mainstem	(Cwt Age				0				Cwt Age			
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	Scale unreadable	1 1	0	0	0	0	1	Scale unre		no om ago	2	Ŭ		Ű	10101
	2	1	0	0	0	0	1		2						
Scale	3	2	0	0	0	0	2	Scale	3						
Ages	4	14	0	0	0	0	14	Ages	4						
0	5	4	0	0	0	0	4	0	5						
21		22	0	0	0	0	22	0		() 0	0	0	0	0
				ge-CWT age matrix ge and CWT known				(B) Seale (o motrix of n	roportions of co	lumn cume			
		LIDATION MATRIX	with both scale ag		age.) 4	5		Scale-	CWI ay		-			-	
													4	5	
		2		•		5 0				;	2 1.0000	0.0000	0.0000	0.0000	
		2	12	0	0	0 0				:	1.0000	0.0000	0.0000	0.0000	
	4x4	2 3 4	12 0	0 183	0	0 0 0				:	2 1.0000 3 0.0000	0.0000 0.9839	0.0000 0.0115	0.0000 0.0000	
	4x4	2 3 4 5	12	0	0	0 0 0 1	0.99				1.0000	0.0000	0.0000	0.0000	
	4x4	2 3 4 5	12 0 0	0 183 3	0 2 172	0 0 0 1	0.99				2 1.0000 3 0.0000 4 0.0000	0.0000 0.9839 0.0161	0.0000 0.0115 0.9885	0.0000 0.0000 0.0000	
		2 3 4 5	12 0 0	0 183 3	0 2 172	0 0 0 1	0.99				2 1.0000 3 0.0000 4 0.0000	0.0000 0.9839 0.0161	0.0000 0.0115 0.9885	0.0000 0.0000 0.0000	
	ale age proportion	2 3 4 5 vectors for scale-a	12 0 0 9 0	0 183 3 0	0 2 172	0 0 0 1	0.99				2 1.0000 3 0.0000 4 0.0000 5 0.0000	0.0000 0.9839 0.0161 0.0000	0.0000 0.0115 0.9885	0.0000 0.0000 0.0000	
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<pre># known scales nknown scales Age 2 3 4 5 CWTS Age 2 3 4 5 </pre>	ale age proportion 23 518 Willow Creek Weir WCW 0.1834 0.3758 0.4118 0.0290 1.00000 Willow Creek Weir WCW 2 14 7 0 0 23 0 0 0	2 3 3 4 5 5 0 684 Hoopa Tribal NET HARV 0.0263 0.2070 0.7213 0.0453 1.00000 Hoopa Tribal NET HARV 0 17 36 0 0 17 36 53 55	12 0 0 0 18 18 18 18 18 18 18 18 18 18 1000000	0 183 3 0 305 993 TRH HATCHERY 0.0302 0.5023 0.4594 0.0081 1.00000 TRH HATCHERY 53 866 722 6 1647 54 1701	0 2 172 0 Lower Trinity Mainstem 0.0476 0.0889 0.6730 0.1905 1.00000 Lower Trinity CARCASS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0	Upper Trin NATURAL 0.2203 0.3437 0.4024 0.0336 1.00000 (Estimated) Upper Trinity NATURAL 252 1491 1243 10 2996 0 WTs Apportionet	36 Lower Trin Tribs 0.0833 0.2184 0.6428 0.0556 1.00000 Hoopa Hook&Line 0 0 0 0 0 0 0	2270	2	Correction Matt (Inverse of Sca (Inverse of Sca 2 2 3 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.0000 0.9839 0.0161 0.0000 itx for ages 2,3,4,5. le-CWT age proportio 3 -0.0040 1.0535 -0.0494 0.0000 known age cwts scales 2 14 7 <u>0</u>	0.0000 0.0115 0.9885 0.0000 on matrix.) 4 0.0001 -0.0380 1.0378 0.0000 Total age all scales 97 209 220 15	0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 0.0000 1.0000 1.0000 1.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000	
<pre># known scales nknown scales Age 2 3 4 5 CWTS Age 2 3 4 5 4 4 5 4 4 5 4 4 5 4 4 5 4 4 5 4 5</pre>	ale age proportion 23 518 Willow Creek Weir WCW 0.1834 0.3758 0.4118 0.0290 1.00000 Willow Creek Weir WCW 2 14 7 0 23 0 0 0 0 0 0 0	2 3 3 4 5 vectors for scale-a 684 Hoopa Tribal NET HARV 0.0263 0.2070 0.7213 0.0453 1.00000 Hoopa Tribal NET HARV 0 17 36 0 0 17 36 0 0 17 36 0 0 17 36 0 0 17 36 0 0 17 36 0 0 17 36 0 0 17 36 0 0 17 36 0 0 17 36 0 0 17 36 0 0 17 36 0 0 17 17 18 18 18 19 19 10 19 10 10 10 10 10 10 10 10 10 10 10 10 10	12 0 0 0 18 18 18 18 18 18 18 18 18 18 1000000	0 183 3 0 305 993 TRH HATCHERY 0.0302 0.5023 0.4594 0.0081 1.00000 TRH HATCHERY 53 866 762 6 1647 154 1701 tructure. Age	0 2 172 0 Lower Trinity Mainstem 0.0476 0.0889 0.6730 0.1905 1.00000 Lower Trinity CARCASS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 1 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0	Upper Trin NATURAL 0.2203 0.3437 0.4024 0.0336 1.00000 (Estimated) Upper Trinity NATURAL 252 1491 1243 10 2996 0 WTs Apportionew minus TRH #s mi Escapement	36 Lower Trin Tribs 0.0833 0.2184 0.6428 0.6556 1.00000 Hoopa Hook&Line 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2270	2	Correction Matt (Inverse of Sca (Inverse of Sca 2 2 3 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.0000 0.9839 0.0161 0.0000 itx for ages 2,3,4,5. le-CWT age proportio 3 -0.0040 1.0535 -0.0494 0.0000 known age cwts scales 2 14 7 <u>0</u>	0.0000 0.0115 0.9885 0.0000 on matrix.) 4 0.0001 -0.0380 1.0378 0.0000 Total age all scales 97 209 220 15	0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 0.0000 1.0000 1.0000 1.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000	
t known scales nknown scales Age 2 3 4 5 CWTS Age 2 3 4 5 4 4 5 4 4 5 4 4 5 7 4 5 8 4 5 8 4 5 8 4 9 8 4 9 8 4 9 8 4 9 8 9 8 9 9 9 9 9	ale age proportion 23 518 Willow Creek Weir WCW 0.1834 0.3758 0.4118 0.0290 1.00000 Willow Creek Weir WCW 2 14 7 0 23 0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 4 5 vectors for scale-a 53 684 Hoopa Tribal NET HARV 0.0263 0.2070 0.7213 0.0453 1.00000 Hoopa Tribal NET HARV 0 17 36 0 0 17 36 0 0 17 36 0 0 17 36 0 0 17 36 0 0 17 36 0 0 17 36 0 0 17 36 0 0 17 18 18 18 18 18 18 18 18 18 18	12 0 0 0 18 18 18 18 18 18 18 18 18 18 1000000	0 183 3 0 305 993 TRH HATCHERY 0.0302 0.5023 0.4594 0.0081 1.00000 TRH HATCHERY 53 866 722 6 1647 54 1701 tructure. Age 2	0 2 172 0 Lower Trinity Mainstem 0.0476 0.0889 0.6730 0.1905 1.00000 1.00000 0 Lower Trinity CARCASS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 1 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0	Upper Trin NATURAL 0.2203 0.3437 0.4024 0.0336 1.00000 (Estimated) Upper Trinity NATURAL 252 1491 1243 10 2996 0 WTs Apportionee minus TRH #s mi Escapement 6576	36 Lower Trin Tribs 0.0833 0.2184 0.6428 0.0556 1.00000 Hoopa Hook&Line 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2270	2	Correction Matt (Inverse of Sca (Inverse of Sca 2 2 3 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.0000 0.9839 0.0161 0.0000 itx for ages 2,3,4,5. le-CWT age proportio 3 -0.0040 1.0535 -0.0494 0.0000 known age cwts scales 2 14 7 <u>0</u>	0.0000 0.0115 0.9885 0.0000 on matrix.) 4 0.0001 -0.0380 1.0378 0.0000 Total age all scales 97 209 220 15	0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 0.0000 1.0000 1.0000 1.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000	
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Appendix F. 2014 Klamath	Basin fall Chinook ag	e-composition calculation	on worksheet.

	Appendix F. 2014 Klamath	Basin						ation w	orksh								2/9/2015 1		
Data Data <th< th=""><th>Hatchery spawners</th><th># Grilse</th><th># Adults</th><th>Total Run</th><th></th><th></th><th></th><th>5</th><th>Total</th><th>SC</th><th></th><th></th><th></th><th></th><th>Total</th><th>Unk. Age Scales Read</th><th></th><th></th></th<>	Hatchery spawners	# Grilse	# Adults	Total Run				5	Total	SC					Total	Unk. Age Scales Read			
	Iron Gate Hatchery (IGH)	1039	24300	25339	1039	12864	11276	160	25339							1,012	<60		
Image: state	Trinity River Hatchery (TRH)									scales	0.03021	0.50232	0.45941	0.00806	1.0	993	<55		
The set of the	Hatchery spawner subtotal:				1260	16517				TRH cwts	53	866	722	6	1647				
Interior local matrix base with the local mat	Natural Spawners	6576	23276	20852	6576	10261	12011	1004	20852	scalos	0 22028	0 24272	0 40226	0.03364	1.0	519	~55		
Sciel More Sole Note Note Note Note	Trinity River mainstem below WCW	74	262	336	74	115	135	11	336								131		
Share Share <th< td=""><td>Salmon River Basin (includes Wooley Cr) Scott River</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>642</td><td>262 ≤62</td></th<>	Salmon River Basin (includes Wooley Cr) Scott River																642	262 ≤62	
Base Crock Size										Scott CWT	0	0	0	1	1			-02	
Answer Bit all	Shasta River	3945	14412	18357	3945	4064	10265	83	18357							224	<64		
Detailed Product (1) Diago Diago <thdiago< th=""> Diago Diago<td>Bogus Creek</td><td>323</td><td>12607</td><td>12930</td><td>323</td><td>6119</td><td>6448</td><td>40</td><td>12930</td><td></td><td></td><td></td><td></td><td></td><td></td><td>935</td><td><62</td><td></td></thdiago<>	Bogus Creek	323	12607	12930	323	6119	6448	40	12930							935	<62		
Waterest	Mainstem Klamath (IGH to Shasta R)	1269	15451	16720	1269	6491	8847	114		scales	0.07600	0.38743	0.52997	0.00660	1.0	673	≤61		
All for the state is 10.36 97.25 97.64 17.62 97.64 17.62 97.64 17.65 97.66 9	Mainstem Klamath (Ash Cr to Indian Cr)	575	6992	7567	575	2932	4010	50								IGH to Shasta	3496	≤61	
Mach C 4 1 1 2 4 4 1 1 2 5 0 <td>Main basin subtotals:</td> <td>15,340</td> <td>86,125</td> <td>101,465</td> <td>15,340</td> <td>33,824</td> <td>50,549</td> <td>1,752</td> <td>101,465</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Main basin subtotals:	15,340	86,125	101,465	15,340	33,824	50,549	1,752	101,465										
Base of the transmission of the transmission of transmi	Klamath Tributaries																		
Bit C 0 <td></td>																			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Bluff Cr	0	0	0	0	0	0		0										
Charle C																			
Differ C 119 645 667 119 119 119 119 119 120 12	Clear Cr																		
E. Gent Cr.	Dillon Cr																	74	
Glader Crisch H1 S1 Add The S1 Add S2																			
Disk Disk T I </td <td>Grider Cr</td> <td>116</td> <td>531</td> <td></td> <td>116</td> <td>127</td> <td>385</td> <td>19</td> <td>646</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>260</td> <td>13</td>	Grider Cr	116	531		116	127	385	19	646								260	13	
Indim C 153 701 65 153 610 500 25 645 parts C.TMB 0.1000 0.000 <	Horse Cr	46	211		46	51	153	7		scales	0.17888	0.19690	0.59539	0.02883	1.0	504	105	1	
binding Cr 0	Independence Cr Indian Cr	-		7 854					7 854										
Bad Cap C (C) 112 167 500 24 640 acce 0.7788 0.1080 0.0020 0.000000 0.00000 0.00000 <td>Irving Cr</td> <td></td> <td></td> <td>0</td> <td></td>	Irving Cr			0															
Back C 12 66 12 73 41 2 06 State 5.07 5.000 <t< td=""><td>Perch Cr Red Cap Cr</td><td></td><td></td><td>0</td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>045</td><td>00</td></t<>	Perch Cr Red Cap Cr			0				-									045	00	
Sine C 5 24 27 5 6 77 1 23 state 0.1788< 0.1898 0.0898 0.0888 0.9848 0.9948 0.1898 0.1898 0.1898 0.1898 0.1898 0.1898 0.1898 0.1898 0.1898 0.1898 0.1898 0.1998	Red Cap Cr Rock Cr																		
Single Cr 0 0 0 0<	Slate Cr	5	24	29	5	6	17	1	29	scales	0.17888	0.19690	0.59539	0.02883	1.0	504	11	2	
Tick 100 474 677 103 114 494 17 77 Filte 1788 1990 0.003 <		-		23													9	1	
Ubio Norm 38 81 27 39 43 131 6 27 source 0.1980 0.5859 0.0283 1.0 5.0 4.8 1.0 5.0 4.8 1.0 5.0 4.8 1.0 5.0 4.8 1.0 5.0 4.8 1.0 5.0 4.8 1.0 5.0 4.8 1.0 5.0 4.8 1.0 5.0 4.8 1.0 5.0 4.8 1.0 1.0 1.0 5.0 5.0 4.8 1.0 1.0 1.0 5.0 5.0 4.8 1.0 1.0 1.0 1.0 5.0 1.0 3.0 1.0 5.0 1.0 3.0 1.0 5.0 1.0 3.0 1.0 5.0 1.0 <	Thompson Cr			577	-			-									237	0	
Offer Offer <th< td=""><td>Ti Cr</td><td></td><td></td><td>0</td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	Ti Cr			0				-											
Fine C Reveal Fiel 36 36 39 119 6 200 subset 0.1980 0.5980 0.02801 1.0 50 8221 627 Traily Trainabilities 0 20 220 52 164 110 6 200 1.10 50 1.0 50				221															
Control Control <t< td=""><td>Pine Cr (formerly in Hoopa tribs)</td><td></td><td></td><td>200</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Pine Cr (formerly in Hoopa tribs)			200															
Trinity	Klamath trib subtotal:	1498	6877	8375	1498	1649	4987		8375								3251	457	
Charler C. Marger Data United to Home Line) Color State	Trinity Tributaries							241											
Offer for statistics <	Horse Linto Cr																		
Theyr yie automatical in a subbasic 4.7 515 4.7 172 3.61 3.1 502 Rescription Thubraties-Hoopa Valuy Competed Cr 1 1 1 1 1 4 0 7 L Time tess 0.00533 0.21086 0.64276 0.05556 1.0 9 3		20	219	239					239										
Reservation Tributaries Hoopa Valley Campbell Cr 1 6 7 1 1 1 4 0 7 L Tributaries Hoopa Valley Campbell Cr 1 6 7 1		47		562	47	123	361	31	562	E. minubo	0.00000	0.21000	0.04210	0.00000	1.0	50			
Reservation Tributaries Hoops Valley I 1 1 <th colspa<="" td=""><td>Non-reservation trib subtotal:</td><td>1545</td><td>7392</td><td>8937</td><td>1545</td><td>1772</td><td>5348</td><td></td><td>8937</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th>	<td>Non-reservation trib subtotal:</td> <td>1545</td> <td>7392</td> <td>8937</td> <td>1545</td> <td>1772</td> <td>5348</td> <td></td> <td>8937</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Non-reservation trib subtotal:	1545	7392	8937	1545	1772	5348		8937									
Housie Cr 1 8 9 1 2 6 9 1 0.8333 0.1288 0.4278 0.0556 1.0 3.8 1.3 Pine Gr 1 1 2 6 1	Reservation Tributaries-Hoopa Valley							212											
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Pine-Gr. Supply Cr 3 3 3 3 2 7 1 1 1 2 7 1 1 1 1 1 1 1 1 1 1 1 1 1 2 7 1 1 1 1 2 7 1 1 1 2 7 1				-					303										
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HVT reservation trib subtoaties 52 68 62 13 38 34 620 74	Tish Tang Cr																		
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Reservation Tributaries Yunder 332 107 332 105 103 2 107 Scale 0.207 0.008 0.007 0.0000 0.000 0.0000	HVT reservation trib subtotal:	52	568	620	52	135	398		620								284		
Reservation tributaries subtotal: 3.4 11259 3.4 2.40 15.06 6.7 2.107 Netward spawners subtotal: 17269 95330 112590 112590 25335 71900 2302 14513 4559 4559 4559 4559 4559 4559 4559 4559 4559 4559 4500 1 1 3.76 450 450 Angler Harves 1852 12660 1267 1267 1267 1269 1269 1269 0.05071 1.0 3.76 450 450 Kiamath River (wetcheec to GH) 75 1875 1726 258 1269 1267 1267 258 1269	Reservation Tributaries-Yurok	000	1015	4577	000	105	4400	00	4577							50			
Natural spawner subcisite 17269 9530 112599 17269 3588 57403 2091 112599 112599 112599 112599 112599 112599 112599 112599 112599 112599 112599 112599 112599 112599 112599 112599 112599 112599 112599 1138 scales 0.19802 0.18182 0.58945 0.56971 1.0 376 650 - Klamath River (whore they 101 0.284 1.087 4722 scales 0.69075 0.07611 0.3030 0.0480 1.0 1.0 0.1026 Klamath River (whore they 01 to Wore they 01 75 728 75 728 75 728 75 758	Blue Cr	332	1245	1577	332	105	1108	32	1577	scales	0.21071	0.06647	0.70277	0.02005	1.0	50	<55		
Total spawners: 16529 12609 14513 12629 12533 7190 2302 14513 Adgr Harvest Namath River (below Hw 101) 268 1033 1036 268 249 775 69 1361 scales 0.1902 0.1812 0.66057 0.0071 1.0 376 660 Klamath River (Hw 101 to Watchpec) 2847 1875 4722 2847 385 1438 71 4722 scales 0.60573 0.0571 0.05071 1.0 376 660 Klamath River (Welchpec to IGH) 75 1498 1571 728 759 9 1571 0.0478 0.0483 0.0482 0.0507 1.0 75 649 Trinhy River (below Wilow Cr. Weir) 168 758 758 355 56 35 758<	Reservation tributaries subtotal:																		
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micLRC CVT 13 9 19 2 43 SURROGATE - Ion Gate-Boge-Kimanh Mainteen Weighted Totals SURROGATE - Ion Gate-Boge-Kimanh Mainteen Weighted Totals SHRBOGATE SURROGATE 2657474 26571 314 54989 1571 0.0478 0.4623 0.0482 0.0057 1.0 54989 1571 0.0278 0.0478 0.4623 0.0482 0.0057 1.0 75 758 759 9 1571 0.0478 0.4633 0.4822 0.0057 1.0 75 54989 1571 0.0478 0.4633 0.4822 0.0057 1.0 75 758	Klamath River (Hwy 101 to Weitchnec)	2847	1875	4722	2847	365	1438	71								1 072	<60		
ratio estimator ratio ratio <thr> ratio ratio r</thr>	Ramati River (nwy for to wellenpec)	2047	10/0		2047	000	1400			nid-LRC CWT	13	9	19	2	43				
Klamath River (Weitchec to IGH) 75 1496 1571 75 728 759 9 1571 0.0478 0.4482 0.0453 0.4482 0.0453 0.4482 0.0453 0.4482 0.0453 0.4482 0.0453 0.4482 0.0453 0.0551 1.0 Paper CWTs 65 55 56 3 26 26 26 3 58 scales 0.0478 0.0478 0.0473 0.0551 1.0 Paper CWTs 65 455 455 456				nator												s			
Trinity River (above Willow Cr. Weir) 168 758 926 168 355 45 926 TR. LPC. Count 0.47283 0.46835 0.05822 1.0 100 Paper CWTs 55 Trinity River (below Willow Cr. Weir) 3 55 58 3.361 1.726 3.353 198 8638 0.05556 0.44633 0.0556 0.410 Paper CWTs 56 Angler harvest subtotal: 3.361 5,277 8,638 3.361 1,726 3.353 198 8,638 777 0.0556 0.41665 0.4551 1.0 1.8 56 Tribal Harvest Tribal Harvest 3.361 5,277 8,638 130 593 2785 56 3364 5.0076 0.110 0.8264 0.0551 1.0 1,490 Klamath River (101 to Trinity R) 130 3434 3564 5264 526 3264 5364 5268 0.0076 0.7110 0.8264 0.0551 1.0 1,490 0.0079 0.110 53 0.0079 0.0173 0.0079 0.0173 0.0079 0.110 0.8264	Klamath River (Weitchpec to IGH)				75	728	759	9	1571	IGH+Bog+Klam									
Trinity River (below Willow Cr. Weir) 3 55 58 3 26 26 3 58 TR-up CWT 60 50 0 110 Paper CWTs Angler harvest subtotal: 3,361 5,277 8,638 3,361 1,726 3,353 198 8,638 7 7 60 50 0 110 Paper CWTs 56 Angler harvest subtotal: 3,361 5,277 8,638 3,361 1,726 3,353 198 8,638 7 7 60 50.0 0 0 0 0 0 0 0 0 0 0 13 50 0.0079 50 0.13 1,490 1,490 141 113 5 100 1,490 100 535 100 1,490 100 535 100 1,490 100 535 100 1,490 100 535 100 100 535 100 100 535 100 100 535 100 100 535 100 100 535 100 100 535 100			750																
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Angler harvest subtotal: 3,361 5,277 8,638 3,361 1,726 3,353 198 8,638 Tribal Harvest Klamath River (Estuary) 153 20039 20192 153 2262 16668 1108 20192 scales 0.0076 0.1109 0.8264 0.00551 1.0 1.400 1.400 1.400 0.0079 0.0178 1.0 0.40079 0.0079 0.0079 0.0167 0.7812 0.0158 1.0 5.35 0.0075 0.0179 0.8264 0.00551 1.0 5.35 0.0079 0.0079 0.0079 0.0079 0.0079 0.0079 0.0075 0.0075 0.0158 1.0 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 5.35 0.0045 <td>Trinity River (below Willow Cr. Weir)</td> <td>3</td> <td>55</td> <td><mark>58</mark></td> <td>3</td> <td>26</td> <td>26</td> <td>3</td> <td>58</td> <td>scales</td> <td></td> <td>0.44656</td> <td>0.44233</td> <td>0.05556</td> <td>1.0</td> <td></td> <td><56</td> <td></td>	Trinity River (below Willow Cr. Weir)	3	55	<mark>58</mark>	3	26	26	3	58	scales		0.44656	0.44233	0.05556	1.0		<56		
Tribal Harvest Tribal Harvest 153 20139 20192 153 2262 16668 1108 20192 scales 0.0076 0.1109 0.8264 0.0551 1.0 1.490 Klamath River (101 to Trinity R) 130 3434 3564 130 593 2785 56 3564 scales 0.00363 0.1667 0.7812 0.0158 1.0 533 560 Trinity River 65 2440 2504 65 524 1804 111 2504 scales 0.02632 0.02704 0.72133 0.04532 1.0 684 <56	Angler harvest subtotal:	3.361	5.277	8,638	3.361	1.726	3.353	198	8,638	I R-low CWT	0	0	0	0	0				
Klamath River (Estuary) 153 2003 20192 153 2262 16668 1108 20192 scales 0.0076 0.1109 0.8264 0.0551 1.0 1.490 0.0079 Klamath River (101 to Trinity R) 130 3434 3564 130 593 2785 56 3564 scales 0.0076 0.1109 0.8264 0.0551 1.0 1.490 0.0079 Klamath River (101 to Trinity R) 130 3434 3564 130 593 2785 56 3564 scales 0.02632 0.0167 0.7812 0.0158 1.0 6.0045 csales 0.02632 0.20704 0.72133 0.04532 1.0 6.84 <56		0,001	5,211	0,000	0,001	.,. 20	2,000		0,000										
Klamath River (101 to Trinity R) 130 3434 3564	Tribal Harvest Klamath River (Estuary)	150	20020	20102	150	2260	16669	1100	20100	coolor	0.0070	0 1100	0 9064	0.0554					
Trinity River 65 2440 2504 65 524 1804 111 2504 scales 0.02632 0.20704 0.72133 0.04532 1.0 684 <56 Tribal harvest subtotal: 348 25913 26260 348 3379 5105 24610 1475 34898 777 1 2 13 0 16 0.0045 <56 Tribal harvest subtotal: 348 25913 26260 348 3379 5105 24610 1475 34898 777 10032 77 10032 77 10032 77 10032 777 10032 777 10032 777 10032 777 10032 777 10032 777 10032 777 10032 777 0.02041 angling drop-off mortality rate on harvest									YT	FP EST CWT	1	41	113	5	160	0.0079			
Trinity River 65 2440 2504 65 524 1804 111 2504 scales 0.02632 0.02704 0.72133 0.04532 1.0 684 <56 Tribal harvest subtotal: 348 25913 26260 348 3379 21257 1277 2660 HVT CWT 0 17 36 0 53 684 <56 Total harvest: 3709 31190 34898 3379 5105 24610 1475 34898 17 36 0 53 684 <56 Total harvest: 3709 31190 34898 3379 5105 24610 1475 34898 17 36 0 53 684 <56 Totals Univer run and escapement 22238 157795 180032 35 68 5 177 0.02041 angling drop-off mortality rate on harvest 0.02041 angling drop-off mortality rate on harvest 0.02041 angling drop-off mortality rate on harvest 0.06896 net drop-off mortality rate on harvest 0.06896 net drop-off mortality rate on harvest 0.06167 0.7812 0.0158 0.000 <td>Klamath River (101 to Trinity R)</td> <td>130</td> <td>3434</td> <td>3564</td> <td>130</td> <td>593</td> <td>2785</td> <td>56</td> <td></td>	Klamath River (101 to Trinity R)	130	3434	3564	130	593	2785	56											
Tribel harvest subtotal: 348 25913 26260 33709 5105 24610 1475 24800 HVT CWT 0 17 36 0 53 Total harvest: 3709 31190 34898 3379 5105 24610 1475 34898 44000 4400 440000 4400000 4400000 4400000 4400000 44000000 4400000000	Trinity River	65	2440	2504	65	524	1804	111		scales		0.20704	0.72133		1.0		<56		
Total harvest: 3709 31190 34898 3709 5105 24610 1475 34898 Totals In-river run and escapement 22238 15795 180032 22238 57458 96560 3777 180032 Angling drop-off mortality (2.04%) 69 108 177 69 35 68 5 177 0.02041 angling drop-off mortality rate on harvest Net drop-off mortality (8.7%) 30 2253 2283 57458 96560 3777 180032 Klamath River disease testing 11 288 299 11 50 234 4 299 YTFP MU sc 0.0363 0.1667 0.7812 0.0158 1.0000	-	940	25040	26260	040	0070	21257	1077	26260	HVT CWT	0	17	36	0	53				
Totals 22238 157795 180032 22238 57458 96560 3777 180032 0.02041 angling drop-off mortality rate on harvest Angling drop-off mortality (2.04%) 69 108 177 69 35 68 5 177 Net drop-off mortality (8.7%) 30 2253 2283 30 294 1848 111 2283 0.08696 net drop-off mortality rate on harvest Klamath River disease testing 11 288 299 11 50 234 4 299 YTFP MU sc 0.0363 0.1667 0.7812 0.0158 1.0000 Total in-river run 22348 160444 182792 22348 57837 98710 3897 182792																			
In-river run and escapement 22238 157795 180032 22238 57458 96560 3777 180032 Angling drop-off mortality (2.04%) 69 108 177 69 35 68 5 177 0.02041 angling drop-off mortality rate on harvest Ned drop-off mortality (8.7%) 30 2253 2238 30 294 1848 111 2283 0.08696 net drop-off mortality rate on harvest Klamath River disease testing 11 288 299 11 50 234 4 299 YTFP MU sc 0.0363 0.1667 0.7812 0.0158 1.0000 Total in-river run 2234 16783 98710 3897 182792																			
Angling drop-off mortality (2.04%) 69 108 177 69 35 68 5 177 0.02041 angling drop-off mortality rate on harvest Net drop-off mortality (8.7%) 30 2253 2283 30 294 1848 111 2283 0.08696 net drop-off mortality rate on harvest Klamath River disease testing 11 288 299 11 50 234 4 299 YTFP MU sc: 0.0363 0.1667 0.7812 0.0158 1.0000 Total in-river run 22348 160444 182792 22348 57837 98710 3897 182792	Totals In-river run and escapement	22238	157795	180032	22228	57458	96560	3777	180032										
Klamath River disease testing 11 288 299 11 50 234 4 299 YTFP MU sc 0.0363 0.1667 0.7812 0.0158 1.0000 Total in-river run 22348 160444 182792 22348 57837 98710 3897 182792	Angling drop-off mortality (2.04%)	69	108	177	69	35	68	5	177										
Total in-river run 22348 160444 182792 22348 57837 98710 3897 182792	Net drop-off mortality (8.7%)							111				nortality rate	on harves	t					
	Klamath River disease testing									YTFP MU sci	0.0363	0.1667	0.7812	0.0158	1.0000				
	Total in-river run	22348	160444	182792	22348 12.2%	57837 31.6%	98710 54.0%	3897 2.1%	182792										

18 <mark>2/9/2015 11</mark>45

Appendix G. Age composition of the 2013 Klamath Basin fall Chinook run.

			AGE		Total	Total
Escapement & Harvest	2	3	4	5	Adults	Run
Hatchery Spawners						
Iron Gate Hatchery (IGH)	1,323	6,743	6,670	18	13,431	14,754
Trinity River Hatchery (TRH)	135	1,032	2,682	3	3,717	3,852
Hatchery Spawner subtotal	1,458	7,775	9,352	21	17,148	18,600
Natural Spawners						
Salmon River Basin	240	721	1,519	0	2,240	2,480
Scott River Basin	588	1,517	2,483	36	4,036	4,624
Shasta River Basin	1,096	3,896	3,029	0	6,925	8,021
Bogus Creek Basin	338	2,206	1,471	5	3,682	4,020
Klamath River mainstem (IGH to Shasta R)	388	2933	4037	0	6,970	7,358
Klamath River mainstem (Shasta R to Indian Cr)	295	2212	3010	0	5,222	5,517
Klamath Tributaries (above Trinity River)	200	718	1,591	0	2,310	2,510
Blue Creek	<u>129</u>	<u>13</u>	<u>282</u>	<u>31</u>	<u>326</u>	455
Klamath Basin subtotal	3,274	14,216	17,422	72	31,711	34,985
Trinity River (mainstem above WCW)	6,582	4,379	20,838	459	25,675	32,257
Trinity River (mainstem below WCW)	372	248	1,178	26	1,452	1,824
Trinity Tributaries (above Reservation; below WCW)	20	13	63	1	78	98
Hoopa Reservation tributaries	<u>62</u>	<u>41</u>	<u>195</u>	<u>4</u>	240	302
Trinity Basin subtotal	7,036	4,681	22,274	490	27,445	34,481
Natural Spawners subtotal	10,310	18,897	39,696	562	59,156	69,466
Total Spawner Escapement	11,768	26,672	49,048	583	76,304	88,072
Recreational Harvest						
Klamath River (below Hwy 101 bridge)	546	3,532	7,681	59	11,272	11,818
Klamath River (Hwy 101 to Weitchpec)	1,135	545	566	3	1,113	2,248
Klamath River (Weitchpec to IGH)	531	3,080	3,157	6	6,243	6,774
Trinity River Basin (above WCW)	0	390	479	11	880	880
Trinity River Basin (below WCW)	48	128	160	3	292	340
Subtotals	2,260	7,675	12,043	82	19,800	22,060
	,	,	,	-	-,	,
Tribal Harvest						
				050		57,709
Klamath River (below Hwy 101)	205	17,503	39,650	350	57,504	
Klamath River (below Hwy 101) Klamath River (Hwy 101 to Trinity mouth)	38	923	1,581	8	2,513	2,551
Klamath River (below Hwy 101) Klamath River (Hwy 101 to Trinity mouth) Trinity River (Hoopa Reservation)	38 16	923 570	1,581 2,440	8 10	2,513 3,019	2,551 3,035
Klamath River (below Hwy 101)	38	923	1,581	8	2,513	2,551
Klamath River (below Hwy 101) Klamath River (Hwy 101 to Trinity mouth) Trinity River (Hoopa Reservation) Subtotals	38 16	923 570	1,581 2,440	8 10	2,513 3,019	2,551 3,035
Klamath River (below Hwy 101) Klamath River (Hwy 101 to Trinity mouth) Trinity River (Hoopa Reservation) Subtotals Total Harvest	38 16 259	923 570 18,996	1,581 2,440 43,671	8 10 368	2,513 3,019 63,036	2,55 3,03 63,29
Klamath River (below Hwy 101) Klamath River (Hwy 101 to Trinity mouth) Trinity River (Hoopa Reservation) Subtotals Total Harvest Totals	38 16 259 2,519	923 570 18,996 26,671	1,581 2,440 43,671 55,714	8 10 368 450	2,513 3,019 63,036 82,836	2,55 ⁷ 3,035 63,29 5 85,35 5
Klamath River (below Hwy 101) Klamath River (Hwy 101 to Trinity mouth) Trinity River (Hoopa Reservation) Subtotals Total Harvest Totals Harvest and Escapement	38 16 259 2,519 14,287	923 570 18,996 26,671 53,343	1,581 2,440 43,671 55,714 104,762	8 10 368 450 1,033	2,513 3,019 63,036 82,836 159,140	2,55 ⁻ 3,035 63,295 85,355
Klamath River (below Hwy 101) Klamath River (Hwy 101 to Trinity mouth) Trinity River (Hoopa Reservation) Subtotals Total Harvest Totals	38 16 259 2,519	923 570 18,996 26,671	1,581 2,440 43,671 55,714	8 10 368 450	2,513 3,019 63,036 82,836	2,55 ⁻ 3,035 63,29 5 85,35 5