

Klamath River Fall Chinook Salmon Age-Specific Escapement, River Harvest, and Run Size Estimates, 2025 Run

Klamath River Technical Team
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Summary

The number of Klamath River fall Chinook Salmon returning to the Klamath - Trinity Basin (Basin) in 2025 was estimated to be:

<i>Age</i>	<i>Run Size</i>	
	<i>Number</i>	<i>Proportion</i>
2	18,601	0.27
3	37,470	0.53
4	13,572	0.19
5	379	0.01
Total	70,022	1.00

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

<i>Sector</i>	<i>Adults</i>		
	<i>Preseason Forecast</i>	<i>Postseason Estimate</i>	<i>Pre / Post</i>
<i>Run Size</i>	28,600	51,400	0.56
<i>Fishery Mortality</i>			
Tribal Harvest	1,400	3,600	0.39
Recreational Harvest	1,000	22	45.45
Drop-off Mortality	100	300	0.33
	2,500	3,922	0.64
<i>Escapement</i>			
Hatchery Spawners	6,600	7,600	0.87
Natural Area Spawners	19,400	39,900	0.49
	26,000	47,500	0.55

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 2025. The estimates

provided in this report are consistent with the Klamath Basin Megatable (CDFW 2026) and with the 2026 forecast of ocean stock abundance (PFMC 2026).

Age-specific escapement estimates for 2025 and previous years, coupled with the coded-wire tag (CWT) recovery data from 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). 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. 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. Random and nonrandom sampling methods of various types were used throughout the Basin (Table 1) to estimate the numbers of fall Chinook salmon and to obtain the data from which the 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 is aged independently by two experienced scale readers. In cases of disagreement, a third read is 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 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 analyses of length-frequency histograms. In such 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 generally based on the first length-frequency nadir. Scales were then used to estimate the age composition of adults (Appendix A).

Redd surveys have been conducted on the mainstem Klamath River downstream of Persido Bar in recent years. From 2018-2021, these surveys were conducted between Persido Bar and Big Bar, and in 2022 the survey occurred between Persido Bar and Green Riffle. Surveys in this reach generally did not occur prior to 2018. The KRTT decided to include the results of this survey beginning in 2020 due to an apparent increase in lower mainstem spawning and the desire to capture this contribution to the run size for future estimation of biological reference points. However, due to turbidity and poor river conditions, this reach was not surveyed in 2023 and 2024. The survey resumed in 2025 in the reach between Persido Bar and the Ullathorne River Access, approximately 8 rkm upstream from the Big Bar River Access.

Spawning ground survey efforts in 2025 in the mainstem Klamath River from the CA-OR state line to Wingate Bar were affected by a U.S. government shutdown. The shutdown lasted from October 1 to November 12 and included the first 4-5 weeks of redd and carcass surveys in this area. While USFWS was unable to participate in surveys during the shutdown, Karuk and Yurok tribal fisheries crews did conduct surveys, covering as much of the river and collecting as much data as possible. Once the shutdown concluded, USFWS resumed participation in the surveys for the remainder of the season. Due to reduced effort while USFWS was absent, the accuracy and precision of escapement estimates in this reach may have been compromised.

The specific protocols used to develop estimates of age composition for each sector are provided in

Table 3. A summary of the KRTT methods specific to each sector is given in Appendix B for the Klamath River and Appendix C for the Trinity River.

Results

A total of 9,787 scales from 25 different sectors were aged for this analysis (Table 2). Of these, 1,085 were from known-age CWT fish. Known-age scales provide a direct check, or “validation”, of accuracy of the scale-based age estimates (Table 4, Appendices E and F). Accuracy within the Trinity River Basin was 99% for age-2 fish, 99% for age-3 fish, 96% for age-4 fish, and 100% for age-5 fish. Accuracy within the Klamath River Basin was 100% for age-2 fish, 86% for age-3 fish, 93% for age-4 fish, and 91% for age-5 fish (Table 4). 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 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 D.

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List of Acronyms and Abbreviations

ad-clipped	adipose fin removed
CDFW	California Department of Fish and Wildlife
CWT	coded-wire tag
EST	Klamath River estuary
FCH	Fall Creek Hatchery
FL	fork length
HVT	Hoopa Valley Tribe
KRTT	Klamath River Technical Team
KT	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
ODFW	Oregon Department of Fish and Wildlife
QVIR	Quartz Valley Indian Reservation
SRCD	Siskiyou Resource Conservation District
SRRC	Salmon River Restoration Council
TKT	The Klamath Tribes
TRH	Trinity River Hatchery
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WCW	Willow Creek Weir
YT	Yurok Tribe
YTFP	Yurok Tribal Fisheries Program

Literature Cited

- CDFW (California Department of Fish and Wildlife). 2026. Klamath River Basin fall Chinook salmon spawner escapement, in-river harvest and run-size estimates, 1978–2023. Available from K. Lindke, CDFW, 5341 Ericson Way, Arcata, CA 95521.
- Cook, R.C. and G.E. Lord. 1978. Identification of stocks of Bristol Bay sockeye salmon, *Oncorhynchus nerka*, by evaluating scale patterns with a polynomial discriminant method. *Fishery Bulletin* 76:415–423.
- Cook, R.C. 1983. Simulation and application of stock composition estimators. *Canadian Journal of Fisheries and Aquatic Sciences* 40:2113–2118.
- Goldwasser, L., M.S. Mohr, A.M. Grover, and M.L. Palmer-Zwahlen. 2001. The supporting databases and biological analyses for the revision of the Klamath Ocean Harvest Model. Unpublished report. National Marine Fisheries Service, Santa Cruz, CA.
- Kimura, D.K., and Chikuni, S. 1987. Mixtures of empirical distributions: an iterative application of the age-length key. *Biometrics* 43:23–35.
- Mohr, M.S. 2006a. The cohort reconstruction model for Klamath River fall Chinook salmon. Unpublished report. National Marine Fisheries Service, Santa Cruz, CA.
- Mohr, M.S. 2006b. The Klamath Ocean Harvest Model (KOHM): model specification. Unpublished report. National Marine Fisheries Service, Santa Cruz, CA.
- PFMC (Pacific Fishery Management Council). 2026. Preseason Report I: Stock Abundance Analysis and Environmental Assessment Part 1 for 2024 Ocean Salmon Fishery Regulations. (Document prepared for the Council and its advisory entities.) Pacific Fishery Management Council, 7700 NE Ambassador Place, Suite 101, Portland, Oregon 97220-1384.

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Appendix I – Inclusion of sector “Upstream of Iron Gate (SONAR)”

Table 1. Estimation and sampling methods used for the 2025 Klamath River Chinook fall run assessment.

Sampling Location	Estimation and Sampling Methods ^{a/}	Agency/Tribe ^{b/}
Hatchery Spawners		
Fall Creek Hatchery (FCH)	Direct count. All fish examined for fin clips, tags, and marks. Bio-samples collected from every fish (100%).	CDFW
Trinity River Hatchery (TRH)	Direct count. All fish bio-sampled and examined for fin clips, tags, and marks. Scales collected from fish at a systematic random sample rate of 1:5 (20%).	CDFW, HVT
Natural Spawners		
Salmon River	Weekly redd surveys. Total run based on expanded redd count (2*total redd count)/(1-proportion of jacks). Jacks estimated from scale-age data from all areas. Bio-data collected from all carcasses recovered.	CDFW, USFS, KT, SRRC, MKWC, NCRC
Scott River	Video count above fish counting facility at river mile 18.2 and twice weekly redd and carcass (CJS) surveys below the counting station. Total run estimated by adding video count to redd based estimate (2*total redd count)/(1-proportion of jacks) downstream of the counting station. Bio-samples collected from all recovered carcasses.	CDFW, QVIR, USFS, KT, NCRC, SRCD
Shasta River	Video count above weir. Bio-samples collected from carcasses stranded on weir at a systematic random sample rate of (1:5) 20%, all fish captured in a trap immediately upstream of video chute, and all fish encountered during spawning ground surveys.	CDFW
Bogus Creek	Video count above weir and twice weekly direct carcass count below weir. Bio-samples collected from every (1:1) carcass observed during surveys above and below weir, including all ad-clipped fish.	CDFW
Fall Creek	Carcass count used to estimate abundance. All carcasses encountered were bio-sampled and inspected for ad clips.	CDFW
Spencer Creek	Weekly redd surveys. Total run estimated by adding video count to redd based estimate (2*total redd count)/(1-proportion of jacks) below the video weir. Bio-samples collected from all fresh carcasses encountered.	ODFW
Sprague River	Semi-weekly surveys conducted. Total run = (2*total redd count)/(1-proportion jacks). Bio-samples collected from all fresh carcasses encountered.	TKT
Williamson River	Semi-weekly surveys conducted. Total run = (2*total redd count)/(1-proportion jacks). Bio-samples collected from all fresh carcasses encountered.	TKT
Wood River	Semi-weekly surveys conducted. Total run = (2*total redd count)/(1-proportion jacks). Bio-samples collected from all fresh carcasses encountered.	TKT
Upper Klamath Lake	Semi-weekly surveys conducted. Total run estimated from area-under-the-curve live fish observations.	TKT
Klamath River mainstem (Link to Keno)	Opportunistic surveys conducted.	ODFW
Klamath River mainstem (Keno to CA/OR)	Weekly redd surveys. Total run = (2*total redd count)/(1-proportion jacks). Bio-samples collected from all fresh carcasses encountered.	ODFW
Klamath River mainstem (CA/OR to Iron Gate)	Weekly redd and carcass surveys. CA/OR state line to Grizzly Hill: Hierarchical Latent Variable Model from weekly mark-recapture of carcasses. Ward's Canyon: Not surveyed.	USFWS, KT, YT

	Fall Creek confluence to Iron Gate: $(2 \times \text{total redd count}) / (1 - \text{proportion jacks})$. Bio-samples collected from all fresh carcasses encountered.	
Klamath River mainstem (Iron Gate to Shasta River)	Weekly redd surveys from Iron Gate to Klamathon. Klamathon to Shasta River not surveyed. Total run = $(2 \times \text{total redd count}) / (1 - \text{proportion jacks})$ and expanded by 2001-2023 mean proportion of female carcasses between Klamathon and Shasta River. Bio-samples collected from all fresh carcasses encountered.	USFWS, KT, YT
Klamath River mainstem (Ash Creek to Wingate Bar)	Weekly redd surveys. Total run = $(2 \times \text{total redd count}) / (1 - \text{proportion jacks})$.	USFWS, KT
Klamath River mainstem (Persido Bar to Big Bar)	Single pass redd count. Total run = $(2 \times \text{total redd count}) / (1 - \text{proportion jacks})$.	KT
Upstream of Iron Gate (SONAR)	Sonar count above Iron Gate apportioned to species by size and run timing. Spawning ground survey estimates from above Iron Gate subtracted from total survey count.	CalTrout
Upper Klamath tributaries (OR/CA to Iron Gate)	Jenny Creek: Video count above weir and once weekly direct carcass count below weir. Shovel Creek: video count above weir plus redd-based estimate $(2 \times \text{total redd count}) / (1 - \text{proportion jacks})$ downstream of weir. Bio-samples collected from all carcasses recovered above and below weir.	CDFW
Mid Klamath tributaries (Iron Gate to Pine Creek) Blue Creek	Periodic redd surveys. Total run = $(2 \times \text{total redd count} + \text{last day live adults}) / (1 - \text{proportion jacks})$. Bio-samples collected from all carcasses recovered. Escapement estimate is the maximum count from weekly dive surveys.	USFS, CDFW, KT, MKWC, SRRC YT
Trinity River basin (above WCW)	Total escapement was estimated using an unstratified Petersen mark-recapture estimator. All fish trapped at WCW were bio-sampled and scales were collected from every other Chinook Salmon in good condition. Natural area spawning escapement estimated by subtracting age-specific estimates of hatchery returns and recreational harvest above WCW from age-specific estimates of the total run upstream of WCW.	CDFW, HVT
Trinity River mainstem (below WCW)	Bi-weekly redd surveys. Total run = $(2 \times \text{total redd count}) / (1 - \text{proportion jacks})$. Bio-data collected from all carcasses encountered.	HVT, USFWS
Trinity tributaries (above Reservation; below WCW)	Bi-weekly redd surveys. Total run = $(2 \times \text{total redd count} + \text{last day live adults}) / (1 - \text{proportion jacks})$. Bio-data collected from all carcasses encountered.	CDFW, USFS, HVT
Hoopla Reservation tributaries	Periodic redd surveys. Total run = $(2 \times \text{total redd count}) / (1 - \text{proportion jacks})$. Biodata collected from all carcasses encountered.	HVT
Recreational Harvest		
Klamath River (below Hwy 101)	Fishery closure. Limited creel survey conducted; no harvest estimated.	CDFW
Klamath River (Weitchpec to Hwy 101)	Fishery closure. Limited creel survey conducted; no harvest estimated.	CDFW
Klamath River (Iron Gate to Weitchpec)	Fishery closure. Ratio estimator based on lower sectors; no harvest estimated.	CDFW
Trinity River basin (above WCW)	Fishery closure. Angler tag returns used for harvest estimate; no harvest estimated.	CDFW, HVT
Trinity River basin (below WCW)	Fishery closure. Roving access creel survey during three randomly selected days per statistical week stratified by weekdays (one day Monday-Thursday) and weekend days (two days Friday-Sunday). Bio-samples collected during angler interviews. Survey conducted from below Willow Creek Weir to the Klamath-Trinity confluence in Weitchpec.	HVT

<u>Tribal Harvest</u>		
Klamath River (below Hwy 101)	Total harvest derived by direct count. Bio-samples collected during harvest monitoring.	YT
Klamath River (Weitchpec to Hwy 101)	Total harvest derived by direct count. Bio-samples collected during harvest monitoring.	YT
Trinity River (net, hook-and-line and tribal creel)	Roving effort and catch-per-unit effort surveys during four randomly selected days per statistical week for the net fishery, and three randomly selected days for the tribal hook-and-line fishery. Roving access creel survey during three randomly selected days per statistical week stratified by weekdays (one day Monday-Thursday) and weekend days (two days Friday-Sunday) for the tribal creel fishery. Bio-samples collected during harvest surveys.	HVT
Trinity River (Selective harvest weir)	Direct count of all harvested fish. Bio-samples collected from all harvested fish.	HVT
<u>Fishery Dropoff Mortality</u>		
Recreational angling dropoff mortality (2.04%)	Not directly estimated. Assumed rate relative to fishery impacts = 0.02; relative to fishery harvest = $0.02/(1-0.02)$.	KRTT
Tribal net dropoff mortality (8.7%)	Not directly estimated. Assumed rate relative to fishery impacts = 0.08; relative to fishery harvest = $0.08/(1-0.08)$.	KRTT

a/ Bio-samples generally include: fork length, scale, sex, tags or marks, and CWT recovery from ad-clipped carcasses.

b/ CalTrout = California Trout, CDFW = California Department of Fish and Wildlife, HVT = Hoopa Valley Tribe, KRTT = Klamath River Technical Team, KT = Karuk Tribe, MKWC = Mid Klamath Watershed Council, NCRC = Northern California Resource Center, ODFW = Oregon Department of Fish and Wildlife, QVIR = Quartz Valley Indian Reservation, SRCD = Siskiyou Resource Conservation District, SRRC = Salmon River Restoration Council, TKT = The Klamath Tribes, USFS = United States Forest Service, USFWS = United States Fish and Wildlife Service, YT = Yurok Tribe.

Table 2. Scale sampling locations and numbers of scales collected and read for the 2025 Klamath Basin fall Chinook age-composition assessment.

Sampling Location	Aged			Total Collected	Agency/Tribe ^{e/}
	Unknown-age ^{a/c/}	Known-age ^{b/}	Total		
Hatchery Spawners					
Fall Creek Hatchery (FCH)	779	246	1,025	1,191	CDFW
Trinity River Hatchery (TRH)	1,138	314	1,452	1,529	HVT
Natural Spawners					
Salmon River	58	0	58	60	CDFW, USFS
Scott River	318	0	318	321	CDFW
Shasta River	224	15	239	284	CDFW
Bogus Creek	146	22	168	183	CDFW
Fall Creek	37	12	49	61	CDFW
Spencer Creek	755	86	841	863	ODFW, TKT
Upstream of Keno Dam	62	7	69	69	ODFW, TKT
Klamath River mainstem (Keno to CA/OR)	411	49	460	470	ODFW, TKT
Klamath River mainstem (CA/OR to IG)	137	4	141	144	USFWS, KT, YT
Klamath River mainstem (Iron Gate to Shasta River)	38	1	39	44	USFWS, YT
Upper Klamath tributaries (Iron Gate to CA/OR border)	196	29	225	242	CDFW
Mid Klamath tributaries (Pine Creek to Iron Gate)	85	0	85	95	USFS, MKWC
Blue Creek	5	0	5	5	YT
Willow Creek Weir	886	62	948	979	HVT, CDFW
Trinity River mainstem (below WCW)	0	0	0	0	HVT, USFWS
Trinity tributaries	19	0	19	19	HVT, USFS
Recreational Harvest					
Lower Klamath River creel	0	0	0	0	CDFW
Lower Trinity River creel	13	0	13	14	HVT
Tribal Harvest					
Klamath River (below Hwy 101)	101	9	110	116	YT
Klamath River (Weitchpec to Hwy 101)	99	7	106	108	YT
Trinity River (net, hook-and-line and tribal creel)	1,118	110	1,228	1,283	HVT
Trinity River (Selective harvest weir)	2,056	112	2,168	2,174	HVT
Ich Disease Monitoring					
	21	0	21	d/	YT
TOTAL	8,702	1,085	9,787	10,254	

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

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

c/ Weir washback collected scales were read but not used

d/ Data not provided.

e/ CDFW = California Department of Fish and Wildlife, HVT = Hoopa Valley Tribe, KT = Karuk Tribe, MKWC = Mid Klamath Watershed Council, ODFW = Oregon Department of Fish and Wildlife, TKT = The Klamath Tribes, USFS = United States Forest Service, USFWS = United States Fish and Wildlife Service, YT = Yurok Tribe.

Table 3. Age-composition methods used for the 2025 Klamath Basin Chinook fall run assessment.

Sampling Location	Age Composition Method
Hatchery Spawners	
Fall Creek Hatchery (FCH)	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.
Fall Creek	Jack/adult structure from scale-age analysis.
Spencer Creek	Jack/adult structure from scale-age analysis.
Sprague River	Jack/adult structure from scale-age analysis from all scales collected upstream of Keno
Williamson River	Jack/adult structure from scale-age analysis from all scales collected upstream of Keno
Wood River	Jack/adult structure from scale-age analysis from all scales collected upstream of Keno
Upper Klamath Lake	Jack/adult structure from scale-age analysis from all scales collected upstream of Keno
Klamath River mainstem (Link to Keno)	Jack/adult structure from scale-age analysis from all scales collected upstream of Keno
Klamath River mainstem (Keno to CA/OR)	Jack/adult structure from scale-age analysis.
Klamath River mainstem (CA/OR to IG)	Jack/adult structure from scale-age analysis.
Klamath River mainstem (Iron Gate to Shasta River)	Jack/adult structure from scale-age analysis.
Klamath River mainstem (Ash Creek to Wingate Bar)	Surrogate: Klamath mainstem (Iron Gate to Shasta R.) age structure.
Klamath River mainstem (Persido Bar to Big Bar)	Surrogate: Mid-Klamath tributaries age structure.
Upper Klamath Tributaries (OR/CA to Iron Gate)	Jack/adult structure from scale-age analysis.
Upstream of Iron Gate (SONAR)	Jack/adult structure from scale-age analysis from all scales collected upstream of Iron Gate
Mid Klamath tributaries (Iron Gate to Pine Creek)	Jack/adult structure from scale-age analysis.
Blue Creek	Jacks estimated through direct observation. Unweighted average of scale-based adult age structure from Blue Creek in 2007-2009, 2011-2015, 2017, 2020 and 2023.
Trinity River basin (above WCW)	Jack/adult structure derived from subtracting age-specific TRH counts and recreational harvest estimates above WCW from the age-specific total run estimates above WCW.
Trinity River mainstem (below WCW)	Surrogate: adult structure from scale-age analysis from tributaries downstream of WCW; jack proportion from natural area escapement above WCW.
Trinity tributaries (above Reservation; below WCW)	Surrogate: adult structure from scale-age analysis from tributaries downstream of WCW; jack proportion from natural area escapement above WCW.
Hoopa Reservation tributaries	Surrogate: adult structure from scale-age analysis from tributaries downstream of WCW; jack proportion from natural area escapement above WCW.
Recreational Harvest	
Klamath River (below Hwy 101)	Zero harvest estimated.
Klamath River (Weitchpec to Hwy 101)	Zero harvest estimated.
Klamath River (Iron Gate to Weitchpec)	Zero harvest estimated.
Trinity River Basin (above WCW)	Zero harvest estimated.
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 (Weitchpec to Hwy 101)	Jack/adult structure from scale-age analysis.
Trinity River (net, hook-and-line and tribal creel)	Jack/adult structure from scale-age analysis.
Trinity River (Selective harvest weir)	Jack/adult structure from scale-age analysis.
Ich Disease Monitoring	
Klamath-Trinity Basin	Jack/adult structure from scale-age analysis.

Table 4a. 2025 Klamath River Basin scale validation matrices.

		<u>Number</u>				
		Known Age				
		2	3	4	5	
Read Age	2	41	2	0	0	Total 367
	3	0	185	7	0	
	4	0	28	93	1	
	5	0	0	0	10	
Total		41	215	100	11	

		<u>Percentage</u>				
		Known Age				
		2	3	4	5	
Read Age	2	1.00	0.01	0.00	0.00	Total 367
	3	0.00	0.86	0.07	0.00	
	4	0.00	0.13	0.93	0.09	
	5	0.00	0.00	0.00	0.91	
Total		1.00	1.00	1.00	1.00	

Table 4b. 2025 Trinity River Basin scale validation matrices.

		<u>Number</u>				
		Known Age				
		2	3	4	5	
Read Age	2	156	4	0	0	Total 599
	3	2	407	1	0	
	4	0	2	26	0	
	5	0	0	0	1	
Total		158	413	27	1	

		<u>Percentage</u>				
		Known Age				
		2	3	4	5	
Read Age	2	0.99	0.01	0.00	0.00	Total 599
	3	0.01	0.99	0.04	0.00	
	4	0.00	0.00	0.96	0.00	
	5	0.00	0.00	0.00	1.00	
Total		1.00	1.00	1.00	1.00	

Table 5. Age composition of the 2025 Klamath Basin fall Chinook run.

Escapement & Harvest	AGE				Total Adults	Total Run
	2	3	4	5		
Hatchery Spawners						
Fall Creek Hatchery (FCH)*	172	977	91	5	1,073	1,245
Trinity River Hatchery (TRH)	1,422	6,063	473	14	6,550	7,972
Hatchery Spawner subtotal	1,594	7,040	564	19	7,623	9,217
Natural Spawners						
Salmon River Basin	849	481	775	48	1,304	2,153
Scott River Basin	1,560	352	1,891	83	2,326	3,886
Shasta River Basin	303	3,881	1,680	1	5,562	5,865
Bogus Creek Basin	5	253	89	3	345	350
Fall Creek*	3	59	35	0	94	97
Spencer Creek*	0	1,562	326	7	1,895	1,895
Upstream of Keno Dam*	3	255	109	0	364	367
Klamath River mainstem (Keno to CA/OR)*	2	1,099	364	5	1,468	1,470
Klamath River mainstem (CA/OR to Iron Gate)*	0	563	176	0	739	739
Upstream of Iron Gate (SONAR)* ^{a/}	319	5,700	925	13	6,638	6,957
Klamath River mainstem (Iron Gate to Shasta River)	0	148	187	0	335	335
Klamath River mainstem (Ash Creek to Wingate Bar)	0	734	919	1	1,654	1,654
Klamath River mainstem (Persido Bar to Big Bar)	17	46	104	0	150	167
Upper Klamath tributaries (OR/CA to Iron Gate)*	5	489	38	6	533	538
Mid Klamath tributaries (Iron Gate to Pine Creek)	175	468	1055	0	1,523	1698
Blue Creek	28	42	100	17	159	187
Klamath Basin subtotal	3,269	16,132	8,773	184	25,089	28,358
Trinity River basin (above WCW)	10,572	11,633	2,214	61	13,908	24,480
Trinity River mainstem (below WCW)	392	251	233	32	516	908
Trinity tributaries (above Reservation; below WCW)	143	91	85	12	188	331
Hoopa Reservation tributaries	128	83	75	10	168	296
Trinity Basin subtotal	11,235	12,058	2,607	115	14,780	26,015
Natural Spawners subtotal	14,504	28,190	11,380	299	39,869	54,373
Total Spawner Escapement	16,098	35,230	11,944	318	47,492	63,590
Recreational Harvest						
Klamath River (below Hwy 101 bridge)	0	0	0	0	0	0
Klamath River (Weitchpec to Hwy 101)	0	0	0	0	0	0
Klamath River (Iron Gate to Weitchpec)	0	0	0	0	0	0
Trinity River Basin (above WCW)	0	0	0	0	0	0
Trinity River Basin (below WCW)	35	22	0	0	22	57
Subtotals	35	22	0	0	22	57
Tribal Harvest						
Klamath River (below Hwy 101)	0	287	683	34	1,004	1,004
Klamath River (Hwy 101 to Trinity mouth)	82	139	168	11	318	400
Trinity River (net, hook-and-line, and tribal creel)	404	1,439	620	8	2,067	2,471
Trinity River (selective harvest weir)	1,939	191	29	3	223	2,162
Subtotals	2,425	2,056	1,500	56	3,612	6,037
Total Harvest	2,460	2,078	1,500	56	3,634	6,094
Totals						
Harvest and escapement	18,558	37,308	13,444	374	51,126	69,684
Recreational angling dropoff mortality 2.04%	1	0	0	0	0	1
Tribal Net dropoff mortality 8.7%	42	162	128	5	295	337
Klamath-Trinity Basin Ich disease monitoring	0	0	0	0	0	0
Total River Run	18,601	37,470	13,572	379	51,421	70,022

* New survey reach and/or data source due to removal of Klamath dams.

^{a/} Row includes Chinook not accounted for after subtracting spawning ground survey estimates from total SONAR count.

Table 6. Age proportion of the 2025 Klamath Basin fall Chinook run.

Escapement & Harvest	AGE			
	2	3	4	5
Hatchery Spawners				
Fall Creek Hatchery (FCH)*	0.14	0.78	0.07	0.00
Trinity River Hatchery (TRH)	0.18	0.76	0.06	0.00
Hatchery Spawner subtotal	0.17	0.76	0.06	0.00
Natural Spawners				
Salmon River Basin	0.39	0.22	0.36	0.02
Scott River Basin	0.40	0.09	0.49	0.02
Shasta River Basin	0.05	0.66	0.29	0.00
Bogus Creek Basin	0.01	0.72	0.25	0.01
Fall Creek*	0.03	0.61	0.36	0.00
Spencer Creek*	0.00	0.82	0.17	0.00
Upstream of Keno Dam*	0.01	0.69	0.30	0.00
Klamath River mainstem (Keno to CA/OR)*	0.00	0.75	0.25	0.00
Klamath River mainstem (CA/OR to Iron Gate)*	0.00	0.76	0.24	0.00
Upstream of Iron Gate (SONAR)*	0.05	0.82	0.13	0.00
Klamath River mainstem (Iron Gate to Shasta River)	0.00	0.44	0.56	0.00
Klamath River mainstem (Ash Cr. to Wingate Bar)	0.00	0.44	0.56	0.00
Klamath River mainstem (Persido Bar to Big Bar)	0.10	0.28	0.62	0.00
Upper Klamath Tributaries (CA/OR to Iron Gate)*	0.01	0.91	0.07	0.01
Mid Klamath tributaries (Iron Gate to Pine Creek)	0.10	0.28	0.62	0.00
Blue Creek	0.15	0.22	0.53	0.09
Klamath Basin subtotal	0.12	0.57	0.31	0.01
Trinity River basin (above WCW)	0.43	0.48	0.09	0.00
Trinity River mainstem (below WCW)	0.43	0.28	0.26	0.04
Trinity tributaries (above Reservation; below WCW)	0.43	0.27	0.26	0.04
Hoopla Reservation tributaries	0.43	0.28	0.25	0.03
Trinity Basin subtotal	0.43	0.46	0.10	0.00
Natural Spawners subtotal	0.27	0.52	0.21	0.01
Total Spawner Escapement	0.25	0.55	0.19	0.01
Recreational Harvest				
Klamath River (below Hwy 101)	0.00	0.00	0.00	0.00
Klamath River (Weitchpec to Hwy 101)	0.00	0.00	0.00	0.00
Klamath River (Iron Gate to Weitchpec)	0.00	0.00	0.00	0.00
Trinity River basin (above WCW)	0.00	0.00	0.00	0.00
Trinity River basin (below WCW)	0.61	0.39	0.00	0.00
Subtotals	0.61	0.39	0.00	0.00
Tribal Harvest				
Klamath River (below Hwy 101)	0.00	0.29	0.68	0.03
Klamath River (Weitchpec to Hwy 101)	0.21	0.35	0.42	0.03
Trinity River (net, hook-and-line, and Tribal creel)	0.16	0.58	0.25	0.00
Trinity River (selective harvest weir)	0.90	0.09	0.01	0.00
Subtotals	0.40	0.34	0.25	0.01
Total Harvest	0.40	0.34	0.25	0.01
Totals				
Harvest and escapement	0.27	0.54	0.19	0.01
Recreational angling dropoff mortality 2.04%	1.00	0.00	0.00	0.00
Tribal net dropoff mortality 8.7%	0.12	0.48	0.38	0.01
Total River Run	0.27	0.54	0.19	0.01

* New survey reach and/or data source due to removal of Klamath dams.

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: s_2

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):

$$N_a = \begin{cases} Ns_2, & a = 3,4,5 \\ np_a + [N(1 - s_2) - n(1 - p_2)](r_a^*/r_A^*), & a = 3,4,5 \end{cases}$$

Appendix B. Klamath River – 2025 methodology details.

Fall Creek Hatchery (FCH)

Escapement to FCH is a direct count of the number of fall Chinook Salmon entering the hatchery over the duration of the spawning season. A bio-sample was obtained from every Chinook Salmon returning to FCH. Heads were also collected for CWT analysis from all ad-clipped fish. Scale-based age compositions were used to apportion all age classes.

Fall Creek

Escapement was estimated as the number of carcasses handled during spawning grounds surveys. Bio-samples were obtained from every carcass during spawning grounds surveys.

Shovel Creek and Jenny Creek

Escapement was estimated by multiplying the pooled redd counts from below the video weirs and videography counts above the weir on each creek. Scale-based age compositions were used to apportion all age classes and expand the below weir estimate to account for grilse. Spawning grounds surveys were also conducted above the weir. Bio-samples were obtained from every carcass above and below the weir.

Bogus Creek

Escapement was estimated by summing carcasses encountered during spawning ground surveys below the video weir and videography counts above the weir. Spawning ground surveys were also conducted upstream of the weir. Bio-samples were obtained from every carcass recovered above and below the weir. Scale-based age compositions were used to apportion all age classes.

Shasta River

Escapement was estimated by videography as the net count of fish moving upstream (total observed moving upstream minus total moving downstream). Bio-samples were obtained from a 1:5 systematic sample of carcasses that washed back onto the counting weir. A trap was also installed on the upstream end of the video flume to bolster scale sample collection for a total of 99.7 hours of effort between September 9 and October 31. Every fish was bio-sampled from the video flume trap. 15 ad clipped fish were recovered as washbacks, 15 were decoded. Spawning ground surveys were also conducted to document spawning and collect biosamples. Scale-based age compositions from trap data were used to apportion all age classes.

Scott River

Independent estimates from above and below the weir were combined to estimate total escapement. Escapement above the weir was estimated using videography as the net count of fish moving upstream. Escapement below the weir was estimated by expanding the total redd count ($2 \times \text{total redd count} / (1 - \text{proportion of jacks})$). Bio-samples were obtained from all non-deteriorated carcasses recovered above and below the weir. Scale-based age compositions were used to apportion all age classes.

Salmon River

Adult escapement was estimated by expanding the total redd count (redds*2) and then adding the number of live adult fish observed on the last survey. Total escapement was then estimated by expanding adult escapement by the scale-based age-2 proportion. Bio-samples were obtained from recovered carcasses. Scale-based age compositions were used to apportion all age classes.

Spencer Creek

Adult escapement was estimated by combining the net upstream count at the Spencer Creek video weir with the expanded total redd count (redds*2) below the weir down to the confluence with the Klamath River. Total escapement was then estimated by expanding adult escapement by the scale-based age-2 proportion. Scale-based age compositions were used to apportion all age classes. Bio-samples were obtained from every carcass encountered.

Mid-Klamath River Tributaries

Adult escapement was estimated by expanding the total redd count (redds*2) and then adding the number of live adult fish observed on the last survey. Total escapement was then estimated by expanding adult escapement by the scale-based age-2 proportion. Scale-based age compositions were used to apportion all age classes.

Wood River

Adult escapement was estimated by expanding total redd count (redds*2). Total escapement was then estimated by expanding adult escapement by the scale-based age-2 proportion. Scale-based age composition was used to apportion all age classes. No carcasses were encountered.

Williamson River

Adult escapement was estimated by expanding total redd count (redds*2). Total escapement was then estimated by expanding adult escapement by the scale-based age-2 proportion. Scale-based age composition was used to apportion all age classes. Bio-samples were taken from all encountered carcasses.

Sprague River

Adult escapement was estimated by expanding total redd count (redd*2). Total escapement was then estimated by expanding adult escapement by the scale-based age-2 proportion. Scale-based age composition was used to apportion all age classes. No carcasses were encountered.

Upper Klamath Lake

Adult escapement estimated from repeated live counts using the trapezoidal approximation method to calculate area under the curve. Total escapement was then estimated by expanding adult escapement by the scale-based age-2 proportion. Scale-based age composition was used to apportion all age classes. Bio-samples were taken from all encountered carcasses.

Klamath River Mainstem (Link to Keno Dam)

Adult escapement was estimated by counting live adults encountered during periodic surveys and combining these with counts of carcasses encountered. Scale-based age compositions were used to apportion all age classes. Bio-samples were obtained from every carcass encountered.

Klamath River Mainstem (Keno to CA–OR State Line)

Adult escapement was estimated by expanding total redd count (redds*2). Total escapement was then estimated by expanding adult escapement by the scale-based age-2 proportion. Scale-based age compositions were used to apportion all age classes. Bio-samples were obtained from every carcass encountered.

Klamath River Mainstem (CA–OR State Line to IG)

A hierarchical latent variables model based on weekly carcass counts and mark-recapture data was used to estimate escapement from CA-OR State Line to Grizzly Hill. Adult escapement from Fall Creek to Iron Gate was estimated by expanding total redd counts (redds*2) from weekly surveys, and total escapement in this reach estimated by expanding adult escapement by the scale-based age-2 proportion. All surveyed fresh carcasses were bio-sampled. Jacks (<60 cm FL) estimated from length-frequency analysis. Scale-based age compositions were used to apportion all adult age classes.

Klamath River Mainstem (IG to Shasta River)

Adult escapement from Iron Gate to Klamathon was estimated by expanding total redd counts (redds*2) from semi-weekly surveys. Adult escapement from Klamathon to Shasta River extrapolated using the 2001-2023 mean proportion of female carcasses. Total escapement was then estimated by expanding adult escapement by the scale-based age-2 proportion. Scale-based age compositions were used to apportion all adult age classes.

Klamath River Mainstem (Ash Creek to Wingate Bar)

Adult escapement was estimated by expanding total redd counts (redds*2) from weekly surveys. Total escapement was then estimated by expanding adult escapement by the scale-based age-2 proportion from CA-OR to Shasta River. Age assignments were based on age proportions from scales collected in the CA-OR to Shasta River reaches.

Klamath River Mainstem (Persido Bar to Big Bar)

Adult escapement was estimated by expanding total redd counts (redds*2) from single pass survey. Total escapement was then estimated by expanding adult escapement by the scale-based age-2 proportion from mid-Klamath tributaries. Age assignments were based on age proportions from scales collected in the same areas.

Lower Klamath River Creel

A limited survey was conducted this year due to fishery closure. Total harvest was estimated by combining creel estimates from the two sub-areas (above the Highway 101 Bridge to Weitchpec and below the Highway 101 Bridge to the mouth). In each sub-

area, estimates were based on access point and roving creel surveys during two randomly selected days per Julian week (JW) through JW 39, ending the survey approximately 5 weeks earlier than normal. No salmon harvest was recorded during the survey.

Upper Klamath River Recreational Fishery

Fishery closure. No associated harvest from the lower Klamath resulted in an estimate of zero for this sector.

Yurok Tribal Estuary Fishery (Klamath mouth to Hwy 101)

Subsistence Yurok harvest in this sub-area was directly counted, stratified by day and night. Scale-based age composition was used to apportion all age classes.

Yurok Tribal Fishery Above Hwy 101

Yurok harvest in this sub-area was directly counted. Jacks (<56 cm FL) estimated from length frequency analysis. Scale-based age compositions were used to apportion all adult age classes.

Blue Creek

Total escapement was estimated using the maximum single-day count from dive surveys conducted from October 29 to December 2. Bio-samples were collected from five recovered carcasses. Adult age proportions were estimated as the unweighted average of age-specific proportions in Blue Creek from years when scales were used to apportion adult age classes (2007-2009, 2011-2015, 2017, 2020, and 2023).

Appendix C. Trinity River – 2025 methodology details.

Trinity River Natural Escapement (above WCW)

Escapement was estimated using an unstratified Petersen mark-recapture estimator. The methods used for estimating age structure within the Trinity River run upstream of WCW was similar to those used in the population estimate, apportioned into three general recovery areas: TRH, Trinity basin natural spawning escapement upstream of WCW, and recreational harvest. Scales were collected from every other Chinook Salmon at WCW.

Age-specific abundances for all fish passing upstream of WCW were estimated from scales collected at WCW. Next, age-specific abundances of fish returning to TRH were estimated from scales collected at TRH. Finally, age-specific abundances from TRH were subtracted from age-specific abundances of fish passing upstream of WCW to yield age-specific abundances of fish returning to natural spawning areas above WCW. There was no recreational fishery in 2025 and no fish were reported as incidentally harvested.

Trinity River Hatchery (TRH)

Escapement to TRH is a direct count of the number of fall Chinook Salmon entering the hatchery over the duration of the spawning season. Scales were sampled systematically (1:5), ad-clipped and non-ad-clipped fish included. Scale samples were used to apportion the hatchery return into age classes.

Upper Trinity River Recreational Harvest

Estimating upper Trinity River recreational harvest depends on the application of program tags at WCW and subsequent returns by anglers. In 2025 there was a fishery closure. CDFW estimated a 0.0% harvest rate of Chinook Salmon based on the return of program tags (0 of 1,920) applied at WCW. No scales were recovered from this fishery since no creel survey was implemented in 2025.

Lower Trinity River Creel

A roving creel survey was implemented in the Trinity River from WCW to the confluence with the Klamath River. Sampling was stratified by weekend (Friday-Sunday) and weekdays (Monday-Thursday) with sampling occurring on 2 and 1 randomly selected days per stratum, respectively. Scale-age proportions were used to apportion all ages.

Trinity Mainstem Natural Escapement (below WCW)

Total escapement was estimated in 2025 by expanding total redd counts (redds*2) from surveys conducted biweekly and applying the jack proportion for the natural area escapement upstream of WCW. Adult age classes were apportioned using the combined set of scales from all tributaries downstream of WCW.

Trinity Tributaries (above Reservation; below WCW)

Total escapement was estimated by expanding total redd counts (redds*2) plus last day live adult fish, and applying the jack proportion for the natural area escapement

upstream of WCW. Adult age classes were apportioned using the combined set of scales from all tributaries downstream of WCW.

Hoopa Reservation Tributaries

Total escapement was estimated by expanding total redd counts (redds*2) and applying the jack proportion for the natural area escapement upstream of WCW. Adult age classes were apportioned using the combined set of scales from all tributaries downstream of WCW.

Hoopa Valley Tribal Harvest (net, hook-and-line and tribal creel)

Hoopa Valley Tribal member gill net and hook-and-line harvest was monitored by estimating effort and catch from three (hook-and-line, tribal creel) or four (gill net) randomly selected days per week. Total harvest was estimated by expanding randomly selected days and effort to weekly totals. Scale-age proportions were used to apportion all ages.

Hoopa Valley Tribal Harvest (selective harvest weir)

Tribal harvest was a direct count of all Chinook Salmon taken at the weir. Scale samples were taken from all harvested fish. Scale age proportions were used to apportion all ages.

Appendix D. 2025 Klamath age analysis.

Unknown scales age composition as read					
	AGE 2	AGE 3	AGE 4	AGE 5	TOTAL
BOGUS	3	94	48	1	146
FCH	119	584	76	0	779
SALMON	23	12	22	1	58
SCOTT	128	32	152	6	318
SHASTA	15	129	78	2	224
FALL	1	21	15	0	37
SPENCER	0	574	180	1	755
KENO UP	1	39	22	0	62
KENO to CAOR	2	280	128	1	411
CA/OR to IG	0	95	42	0	137
IG to SHASTA	0	16	22	0	38
UPR KR TRIBS	3	166	25	2	196
MID KR TRIBS	9	23	53	0	85
ABOVE IG (SONAR)	126	1,759	488	4	2,377
LRC EST	0	0	0	0	0
LRC UP	0	0	0	0	0
YTFP EST	0	29	69	3	101
YTFP M&U	21	31	45	2	99
ICH TESTING	0	3	18	0	21
BLUE CRK	0	0	4	1	5
	451	3,887	1,487	24	5,849
Unknown scales corrected age proportions (Kimura method)					
	AGE 2	AGE 3	AGE 4	AGE 5	TOTAL
BOGUS	0.0146	0.7141	0.2636	0.0077	1.0
FCH	0.1455	0.8121	0.0424	0.0000	1.0
SALMON	0.3943	0.2237	0.3599	0.0221	1.0
SCOTT	0.4015	0.0906	0.4866	0.0213	1.0
SHASTA	0.0517	0.6614	0.2867	0.0002	1.0
FALL	0.0216	0.6256	0.3526	0.0002	1.0
SPENCER	0.0000	0.8354	0.1631	0.0015	1.0
KENO UP	0.0105	0.6966	0.2927	0.0002	1.0
KENO to CAOR	0.0012	0.7536	0.2425	0.0028	1.0
CA/OR to IG	0.0000	0.7631	0.2368	0.0002	1.0
IG to SHASTA	0.0000	0.4437	0.5559	0.0004	1.0
UPR KR TRIBS	0.0085	0.9205	0.0602	0.0108	1.0
MID KR TRIBS	0.1032	0.2739	0.6224	0.0005	1.0
ABOVE IG (SONAR)	0.0458	0.8193	0.1330	0.0019	1.0
LRC EST	0.0000	0.0000	0.0000	0.0000	0.0

LRC UP	0.0000	0.0000	0.0000	0.0000	0.0
YTFFP EST	0.0000	0.2858	0.6808	0.0334	1.0
YTFFP M&U	0.2089	0.3389	0.4264	0.0258	1.0
ICH TESTING	0.0000	0.0000	0.0000	0.0000	0.0
BLUE CRK	0.2339	0.2010	0.4816	0.0835	1.0
Known CWT ages	<i>a/</i>				
	AGE 2	AGE 3	AGE 4	AGE 5	TOTAL
BOGUS	0	19	3	0	22
FCH	27	165	49	5	246
SALMON	0	0	0	0	0
SCOTT	0	0	0	0	0
SHASTA	1	11	3	0	15
FALL	1	6	5	0	12
SPENCER	0	51	31	4	86
SPRAGUE	0	0	0	0	0
WILLIAMSON	0	0	0	0	0
WOOD	0	0	0	0	0
UPR KLM LAKE	0	3	4	0	7
KENO to LINK	0	0	0	0	0
CAOR to KENO	0	29	19	1	49
CAOR to IG	0	2	2	0	4
IG to SHASTA R.	0	0	1	0	1
ASH to WINGATE	0	0	0	0	0
PERSIDO TO BIG	0	0	0	0	0
SONAR	0	0	0	0	0
JENNY	0	7	4	0	11
SHOVEL	0	15	3	0	18
MID KR TRIBS	0	0	0	0	0
LRC	0	0	0	0	0
YTFFP EST	0	2	6	1	9
YTFFP M&U	0	6	0	1	7
BLUE CRK	0	0	0	0	0
ICH TEST	0	0	0	0	0
	29	316	130	12	487

Appendix E. 2025 Trinity age analysis.

WCW = Willow Ck. Weir

	Cwt Age	Cwt Age					Total
		no cwt age	2	3	4	5	
Scale unreadable		28	0	3	0	0	31
2		328	10	1	0	0	339
Scale	3	483	1	47	0	0	531
Ages	4	73	0	1	2	0	76
65	5	2	0	0	0	0	2
886		914	11	52	2	0	979

LOWTRINREC = Lower Trinity Recreational

	Cwt Age	Cwt Age					Total
		no cwt age	2	3	4	5	
Scale unreadable		1	0	0	0	0	1
2		8	0	0	0	0	8
Scale	3	5	0	0	0	0	5
Ages	4	0	0	0	0	0	0
0	5	0	0	0	0	0	0
13		14	0	0	0	0	14

HUPAHARV = Hoopa Tribal Net Harvest plus Tribal Hook-and-Line

	Cwt Age	Cwt Age					Total
		no cwt age	2	3	4	5	
Scale unreadable		44	0	9	2	0	55
2		193	6	0	0	0	199
Scale	3	639	0	95	0	0	734
Ages	4	282	0	0	9	0	291
121	5	4	0	0	0	0	4
1118		1162	6	104	11	0	1283

TRH = Trinity River Hatchery

	Cwt Age	Cwt Age					Total
		no cwt age	2	3	4	5	
Scale unreadable		62	0	13	2	0	77
2		213	60	2	0	0	275
Scale	3	851	1	236	1	0	1089
Ages	4	72	0	1	13	0	86
329	5	2	0	0	0	0	2
1138		1200	61	252	16	0	1529

LOWTRINTRIBS = Lower Trinity Tribes - Includes samples taken by USFS from Horse Linto and Cedar

	Cwt Age	Cwt Age					Total
		no cwt age	2	3	4	5	
Scale unreadable		0	0	0	0	0	0
2		3	0	0	0	0	3
Scale	3	8	0	0	0	0	8
Ages	4	7	0	0	0	0	7
0	5	1	0	0	0	0	1
19		19	0	0	0	0	19

LOWTRINMAINSTEM = Lower Trinity Mainstem

	Cwt Age	Cwt Age					Total
		no cwt age	2	3	4	5	
Scale unreadable		0	0	0	0	0	0
2		0	0	0	0	0	0
Scale	3	0	0	0	0	0	0
Ages	4	0	0	0	0	0	0
0	5	0	0	0	0	0	0
0		0	0	0	0	0	0

HVTSELECTHARV = Hoopa Tribal Weir Harvest

	Cwt Age	Cwt Age					Total
		no cwt age	2	3	4	5	
Scale unreadable		6	0	0	0	0	6
2		1842	80	1	0	0	1923
Scale	3	184	0	29	0	0	213
Ages	4	27	0	0	2	0	29
112	5	3	0	0	0	0	3
2056		2062	80	30	2	0	2174

N/A

	Cwt Age	Cwt Age					Total
		no cwt age	2	3	4	5	
Scale unreadable		0					
2		0					
Scale	3	0					
Ages	4	0					
0	5	0					
0		0	0	0	0	0	0

POOLED data from all areas: Scale age-CWT age matrix.
(Includes only fish with both scale age and CWT known age.)

VALIDATION MATRIX

	2	3	4	5	
2	156	4	0	0	0.98
3	2	407	1	0	
4	0	2	26	0	
5	0	0	0	1	

(B) Scale-CWT age matrix of proportions of column sums.

	2	3	4	5
2	0.9873	0.0097	0.0000	0.0000
3	0.0127	0.9855	0.0370	0.0000
4	0.0000	0.0048	0.9630	0.0000
5	0.0000	0.0000	0.0000	1.0000

Corrected Scale age proportion vectors for scale-aged 2 - 5 fish.

# known scales	65	121	0	329	0	0	112
# unknown scales	886	1118	13	1138	0	19	2056

Age	Willow Creek Weir	Hoopa Tribal Member Harv	Lower Trinity Rec Harv	TRH Hatchery	Lower Trinity Main stem	Upper Trinity Rec Harv	Upper Trin Natural	Lower Trin Tribs	Hoopa Tribal Harv Weir
2	0.3696	0.1693	0.6196	0.1822	0.4319	0.0000	0.4319	0.4319	0.9066
3	0.5453	0.5680	0.3804	0.7541	0.2766	0.0000	0.4752	0.2766	0.0787
4	0.0828	0.2591	0.0000	0.0619	0.2561	0.0000	0.0904	0.2561	0.0132
5	0.0023	0.0036	0.0000	0.0018	0.0354	0.0000	0.0025	0.0354	0.0015
	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000

Correction Matrix for ages 2,3,4,5.
(Inverse of Scale-CWT age proportion matrix.)

	2	3	4	5
2	1.0129	-0.0100	0.0004	0.0000
3	-0.0130	1.0151	-0.0390	0.0000
4	0.0001	-0.0051	1.0387	0.0000
5	0.0000	0.0000	0.0000	1.0000

(Estimated)

WCW scales

CWTS	Willow Creek Weir	Hoopa Tribal Member Harv	Lower Trinity Rec Harv	TRH Hatchery	Lower Trinity Main stem	Upper Trinity Rec Harv	Upper Trin Natural	Lower Trin Tribs	Hoopa Tribal Harv Weir	Age	WCW no cwts	known age cwts scales	Total age all scales	WCW age proportions
2	11	6	0	295	0	0	0	0	80	2	327	11	338	0.3559
3	52	104	0	1401	0	0	0	0	30	3	483	52	535	0.5627
4	2	11	0	90	0	0	0	0	2	4	73	2	75	0.0792
5	0	0	0	3	0	0	0	0	0	5	2	0	2	0.0021
	65	121	0	1789	0	0	0	0	112		886	65	951	1.0000

# unknown ads	7	11	0	68	0	0	0	0	3
# total ads	72	132	0	1857	0	paper CWTs	0	0	115

Natural Escapement, Trinity basin above WCW: Apportioned to age structure.

Apportioned Natural Escapement

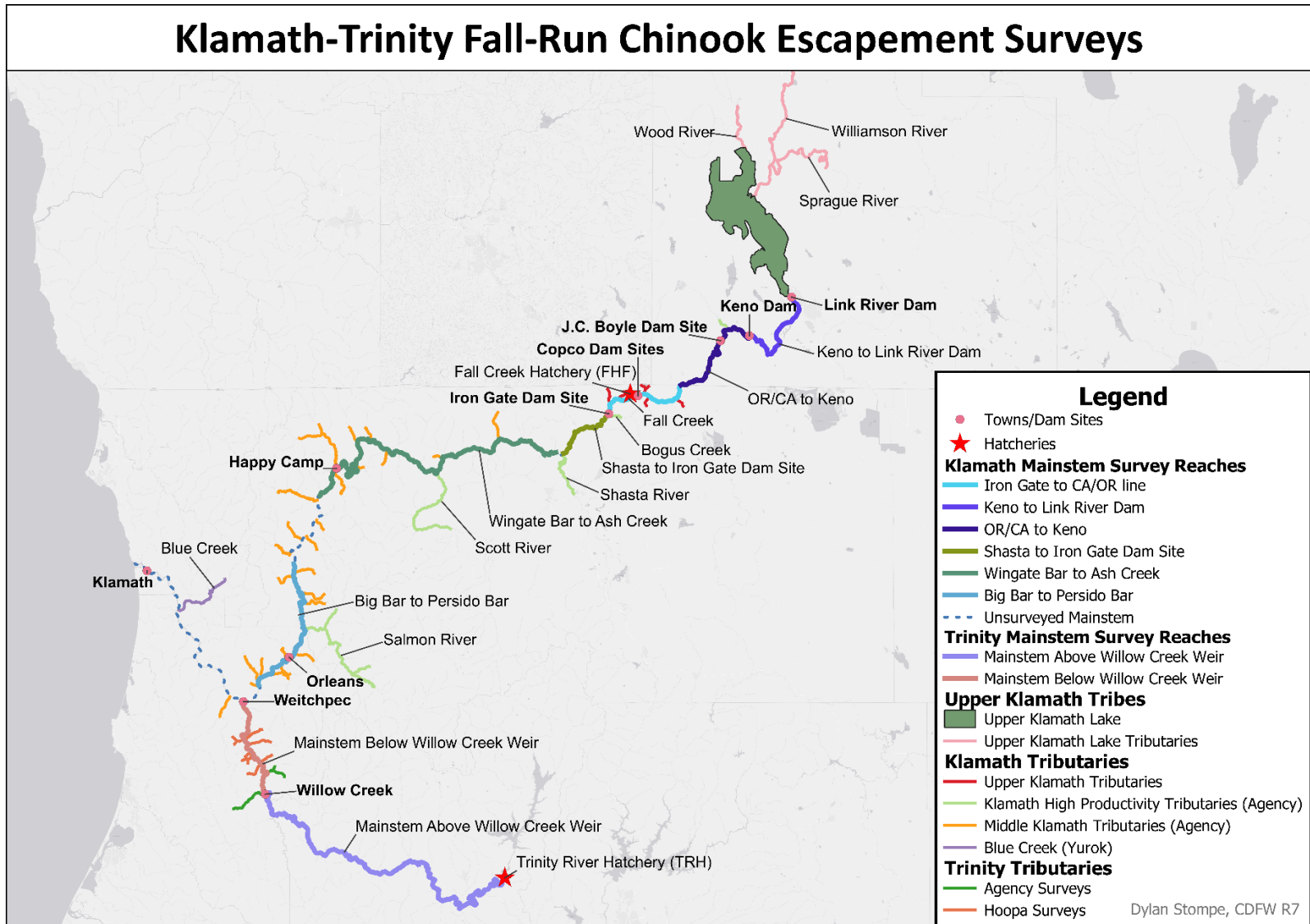
	Total Run	Age	WCW Proportions	Nat. Esc. + TRH + Rec Above WCW	Nat. Esc. - TRH - Rec Above WCW	Natural Area Proportions
Rec above WCW	0	2	0.3696	11994	10572	0.4319
TRH	7972	3	0.5453	17696	11633	0.4752
Naturals	24480	4	0.0828	2687	2214	0.0904
Total	32452	5	0.0023	75	61	0.0025
				32452	24480	

Appendix G. Final age composition of the 2024 Klamath Basin fall Chinook run.

Escapement & Harvest	AGE				Total Adults	Total Run
	2	3	4	5		
Hatchery Spawners						
Fall Creek Hatchery (FCH)*	18	127	165	7	299	317
Trinity River Hatchery (TRH)	622	3,074	1,116	0	4,190	4,812
Hatchery Spawner subtotal	640	3,201	1,281	7	4,489	5,129
Natural Spawners						
Salmon River	245	886	634	0	1,520	1,765
Scott River	29	621	197	29	847	876
Shasta River	31	3,046	1,905	0	4,951	4,982
Bogus Creek	31	220	143	24	387	418
Fall Creek*	1	64	62	12	138	139
Spencer Creek*	37	114	45	3	162	199
Klamath River mainstem (Link to Keno)*	0	0	0	0	0	0
Klamath River mainstem (Keno to CA/OR)*	20	161	125	16	302	322
Klamath River mainstem (CA/OR to Iron Gate)*	14	191	135	8	334	348
Klamath River mainstem (Iron Gate to Shasta River)	1	8	5	2	15	16
Klamath River mainstem (Ash Creek to Wingate Bar)	0	0	0	0	0	0
Klamath River mainstem (Persido Bar to Big Bar)	0	0	0	0	0	0
Upper Klamath tributaries (CA/OR to Iron Gate)*	79	436	108	12	556	635
Mid Klamath tributaries (Iron Gate to Pine Creek)	31	559	572	147	1,278	1,309
Blue Creek	49	62	174	26	262	311
Klamath Basin subtotal	568	6,367	4,103	279	10,749	11,317
Trinity River basin (above WCW)	5,283	10,863	2,153	0	13,016	18,299
Trinity River mainstem (below WCW)	54	112	22	0	134	188
Trinity tributaries (above Reservation; below WCW)	11	23	4	0	27	38
Hoopa Reservation tributaries	43	88	18	0	106	149
Trinity Basin subtotal	5,391	11,086	2,197	0	13,283	18,674
Natural Spawners subtotal	5,959	17,453	6,300	279	24,032	29,991
Total Spawner Escapement	6,599	20,654	7,581	286	28,521	35,120
Recreational Harvest						
Klamath River (below Hwy 101)	0	0	0	0	0	0
Klamath River (Weitchpec to Hwy 101)	0	0	0	0	0	0
Klamath River (Iron Gate to Weitchpec)	0	0	0	0	0	0
Trinity River basin (above WCW)	0	0	0	0	0	0
Trinity River basin (below WCW)	3	113	23	0	136	139
Subtotals	3	113	23	0	136	139
Tribal Harvest						
Klamath River (below Hwy 101)	43	1,148	1,268	1	2,417	2,460
Klamath River (Weitchpec to Hwy 101)	21	993	1,134	419	2,546	2,567
Trinity River (net, hook-and-line, and tribal creel)	75	849	620	0	1,469	1,544
Trinity River (selective harvest weir)	332	611	204	2	817	1,149
Subtotals	471	3,601	3,226	422	7,249	7,720
Total Harvest	474	3,714	3,249	422	7,385	7,859
Totals						
Harvest and escapement	7,073	24,368	10,830	708	35,906	42,979
Recreational angling dropoff mortality 2.04%	0	2	0	0	2	2
Tribal net dropoff mortality 8.7%	12	264	267	37	568	580
Klamath-Trinity Basin Ich disease monitoring	0	45	44	3	92	92
Total River Run	7,085	24,679	11,141	748	36,568	43,653

* New survey reach and/or data source due to removal of Klamath dams.

Appendix H. Map of Klamath-Trinity watershed, including locations of escapement surveys, hatcheries, and current and former dam sites.



Appendix I – Inclusion of sector “Upstream of Iron Gate (SONAR)”

Given the large expanse of new habitat available to Klamath River Fall Chinook (KRFC) upstream of the former Iron Gate Dam site, and the uncertainty associated with conducting traditional sector-specific estimation methods in the years immediately following dam removal, a SONAR camera was operated to estimate KRFC upstream of Iron Gate. It was unclear if sector-specific estimation methods would be successful given challenging new survey conditions in rugged, remote and low visibility survey conditions. Cal Trout and its partners were successful in operating a SONAR camera station near the former Iron Gate Dam site during the KRFC migration. During 2025 the SONAR camera estimated a total of 13,008 KRFC. Sector specific estimates from the same area totaled 6,351. The KRTT elected to subtract all subarea estimates above Iron Gate from the SONAR estimate and create a new sector that balanced the differences in totals resulting in 6,957 KRFC. For run-size estimation purposes, it is unnecessary to assign the difference between the two estimates to specific sub areas. The species apportionment of the SONAR targets relied on a probabilistic model that differentiated salmon from *O. mykiss* based on size and a second model that differentiated Chinook and Coho based on arrival time as described in Denton et al. 2025. The KRTT elected to assign ages to these 6,957 fish from an aggregate of all scale age estimates from sectors upstream of Iron Gate. Special thanks are given to Dr. Nicholas Som, Keith Denton, James Whelan, and Damon Goodman for making the SONAR data available for use during the 2025 KRFC run size estimation process.