

# **2025 Fall Chinook Salmon Run Size in the Salmon River and Mid-Klamath River Tributaries**



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### **ABSTRACT**

Collaborative spawning ground surveys were conducted on the Salmon River and other mid-Klamath River tributary creeks known to support fall Chinook Salmon spawning runs. The 2025 fall Chinook Salmon run-size estimate for the Salmon River was derived from redd survey data. The run-size estimate for miscellaneous tributary creeks was derived from redd survey data. The data collected by the California Department of Fish and Wildlife (CDFW) and survey collaborators was provided to the Klamath River Technical Team (KRTT) for age structure determination and inclusion in Klamath basin fall Chinook Salmon run-size estimates. The escapement estimate for the Salmon River basin totaled 2,153 fall Chinook Salmon. Based upon scale age analysis, 1,304 were adults and 849 were grilse. Fork lengths of carcasses from the Salmon River basin ranged from 43 cm to 96 cm. The escapement estimate for the mid-Klamath River tributaries totaled 1,698 fall Chinook Salmon. Based upon scale age analysis, 1,523 were adults and 175 were grilse. Fork lengths of carcasses from mid-Klamath tributaries ranged from 41 cm to 96 cm. The mid-Klamath mainstem spawner survey, a boat-based redd survey effort previously conducted by the USFS Orleans/Ukonom District Fisheries Biologist was completed with the assistance of the Karuk Tribe this year. The escapement estimate for the mid-Klamath mainstem totaled 167 fall Chinook Salmon. Based upon surrogate scale age apportionment, 150 were adults and 17 were grilse (KRTT, 2026).

### **INTRODUCTION**

The primary objective of the CDFW Klamath-Trinity Program is to annually determine the population estimates, age structure, size, composition, distribution and run timing of Klamath River Fall Chinook (KRFC) within the entire Klamath basin. The CDFW and basin partners have been monitoring fall Chinook spawning escapement levels in the Klamath basin since 1978. To achieve this task cooperators employ several techniques which include creel surveys of recreational anglers, surveys of tribal fisheries, recovery of fish returning to basin hatcheries, collaborative spawning grounds surveys in portions of the mainstem Klamath River and tributary rivers and creeks, a mark recapture weir on the Trinity River, operation of video counting weirs on the Shasta River, Scott River and Bogus Creek, as well as newly available mainstem and tributary habitat above the site of the former Iron Gate Dam up to the California/Oregon border. Within the Mid-Klamath Collaborative Spawning Grounds Survey, the role of CDFW's Klamath River Project (KRP) based in Arcata, is focused almost exclusively on the Klamath side of the basin, with primary survey efforts throughout the Salmon River basin as well as mid-Klamath tributary creeks in the Orleans and Happy Camp areas.

The methods used to develop fall Chinook Salmon run size estimates for the Salmon River have evolved since the late 1970s. From 1979 through 1984 the estimate was derived from a limited number of spawning ground surveys that were generally completed by either CDFW or the U.S. Forest Service (USFS). In 1985 the number of surveys and total area covered increased to improve the estimate. The area surveyed expanded to include twelve miles of the mainstem, the South Fork from Hotelling Gulch to Forks of Salmon, and the North Fork from Sawyers Bar to Forks of Salmon. A temporary weir and fish marking facility was operated near the mouth of the Salmon River at Oak Bottom from 1986 to 1991. Spawning ground surveys were conducted to recover marked fish and document spawning distribution. The operation of the temporary weir was discontinued in 1992 in favor of conducting more intensive cooperative spawning ground surveys. Elimination of the weir was deemed desirable to eliminate unnecessary handling stress on adult salmon during their migration upstream. The weir was also vulnerable to high flow and required a large investment of money and time to operate effectively. Over the years, participation in the cooperative spawning ground survey in the mid-Klamath region has grown substantially, and in recent years has included staff from the CDFW, USFS, U.S. Fish and Wildlife Service, Karuk Tribe, Salmon River Restoration Council, Mid-Klamath Watershed Council, Northern California Resource Center, local schools and volunteers.

From 1979 through the late 1990s estimates of fall Chinook run size in mid-Klamath River tributaries upstream of the confluence with the Trinity River and downstream of the Shasta River (excluding streams in the Salmon and Scott sub-basins) was derived from a limited number of spawning ground surveys. These surveys were primarily completed by CDFW and/or the USFS. The USFS conducted most of the spawning surveys on these streams during the 1990s. Spawning ground surveys of these streams have been increasingly collaborative since 2000. Current surveys in the mid-Klamath tributaries are conducted primarily under the coordination of USFS for tributaries in the Orleans area and the Mid-Klamath Watershed Council in the Happy Camp area. These efforts are generally supported by CDFW, the Karuk Tribe, and volunteers. Additionally, the Hoopa Valley Tribal Fisheries Department independently conducts surveys of Pine Creek, a tributary to the mainstem Klamath River just downstream of the confluence of the Trinity River (*which is included in the KRTT estimates for the Mid-Klamath Tributaries sector*). The number and location of tributary streams and stream reaches surveyed by cooperators each year varies based on run size and availability of staff. Stream reaches where most fall Chinook Salmon spawning occurs has been surveyed on a consistent basis each year.

## METHODS

The run-size estimate for fall Chinook Salmon spawning in the upper Salmon River (upstream from and including Nordheimer Creek) is ideally derived from mark-recapture data obtained from salmon carcasses. However, if insufficient marks and recaptures occur, the adult run-size estimate is derived from redd counts; (redds times two, plus last day live adults), with an additional grilse component estimated from scale aging. The lower Salmon River (below Nordheimer Creek and including Wooley Creek)

adult run size estimate is derived from a redd based estimate, with an additional grilse component estimated from scale aging. The collective run-size estimate for the mid-Klamath tributaries is solely derived from redd count method described above. The upper Salmon River is surveyed twice each week (Tuesday and Friday) and the lower mainstem of the Salmon River was surveyed once per week (Thursday). The mid-Klamath River tributary streams were surveyed on several days throughout the week (primarily Monday through Thursday). Spawning ground surveys were conducted by walking and/or snorkeling, and occasionally by inflatable boat or stand-up paddle board if conditions warrant. Spawning ground surveys generally begin during the second week of October and continue until early December in the Salmon River basin, and through late December or early January on the mid-Klamath tributaries.

Beginning in 2018, the office of the USFS District Fisheries Biologist in Orleans has undertaken a boat-based redd survey of the mainstem Klamath River from Persido Bar (approximately 20 river miles above Orleans, CA) to Big Bar (approximately 7.5 miles downstream from Orleans, CA), excluding impassable Ishi-Pishi Falls and Ike's Falls near the mouth of the Salmon River. The estimates derived from these surveys were first included in the KRTT estimates in 2020.

Both the Salmon River and mid-Klamath tributary survey reaches have remained fairly consistent since the beginning of the cooperative spawning grounds survey in 1992. During the Chinook Salmon spawning season, decisions regarding which reaches should be surveyed are based on the known distribution of the Chinook Salmon run each week and the available staff present during each survey day.

A total of 26 survey reaches have been identified for fall Chinook Salmon within the Salmon River survey area. The lower mainstem includes four snorkel survey reaches from Nordheimer Campground to the confluence with the Klamath River, as well as three reaches on Wooley Creek. The upper Salmon River survey area includes two reaches on the upper mainstem, six reaches on the North Fork, four reaches on the South Fork, and seven tributary reaches (Table 1 and Appendix D).

**Table 1.** Reach descriptions for Salmon River spawning grounds surveys.

| <b>Stream Name</b> | <b>Reach Name</b>             | <b>Reach Number</b> | <b>Miles</b> |
|--------------------|-------------------------------|---------------------|--------------|
| Lower Mainstem     | Brannons Bar to Mouth         | 1                   | 4.2          |
|                    | Butler Flat to Brannons Bar   | 2                   | 4.1          |
|                    | Tripp Point to Butler Flat    | 3                   | 2.9          |
|                    | Nordheimer to Tripp Point     | 4                   | 3.6          |
| Wooley             | Gates to Mouth                | 1                   | 3.8          |
|                    | Bridge to Gates               | 2                   | 3.4          |
|                    | Hancock to Bridge             | 3                   | 3.1          |
|                    |                               |                     |              |
| Upper Mainstem     | Otter Bar to Nordheimer Ck    | 4A                  | 2.1          |
|                    | Forks of Salmon to Otter Bar  | 4B                  | 2.5          |
| North Fork         | Mile 2 to Forks of Salmon     | 9A                  | 1.8          |
|                    | Mile 4 to Mile 2              | 9B                  | 2.1          |
|                    | Mile 6 to Mile 4              | 10A                 | 2.4          |
|                    | Mile 8 to Mile 6              | 10B                 | 2            |
|                    | Mile 10 to Mile 8             | 11A                 | 2.1          |
|                    | Mile 12 to Mile 10            | 11B                 | 1.7          |
| South Fork         | Henry Bell to Forks of Salmon | 5A                  | 3.1          |
|                    | O’Farrill Gulch to Henry Bell | 5B                  | 1.7          |
|                    | Indian Ck to O’Farrill Gulch  | 6A                  | 3            |
|                    | Matthews Ck to Indian Ck      | 6B                  | 2.4          |
| Upper Tributaries  | Knownothing Creek             | KNO                 | 2.5          |
|                    | Knownothing Ck (EF)           | EFK                 | 1.5          |
|                    | Knownothing Ck (WF)           | WFK                 | 1.7          |
|                    | Little NF Salmon River        | LNF                 | 2.3          |
|                    | Methodist Creek               | MET                 | 2.4          |
|                    | Nordheimer Creek              | NOR                 | 1.8          |
|                    | Plummer Creek                 | PLM                 | 1.5          |

On the morning of each survey, crews of at least two people were given daily instructions, data sheets, field equipment, vehicle assignments, and assigned a survey reach. Crews walked and/or snorkeled (or on rare occasions, conducted a boat-based survey) their assigned reach in a downstream direction enumerating live fish, recovering salmon carcasses and locating redds. All new completed redds were marked with flagging along the streambank at a location perpendicular to the upstream limit of the redd pit. Historically, some redds were not flagged on private lands at the request of some landowners; however, since 2019, all redds on all reaches have been flagged. Redd locations were mapped on USGS topographic maps throughout the duration of the survey as well as marked with a GPS waypoint. Each recovered carcass was identified to species and sex, checked for marks or tags, measured for fork length (FL), scale-

sampled for age composition analysis, and examined for spawning success (females only). Additional biological sampling of some carcasses included tissue and otolith collection. These samples were archived for future analysis and/or to be used in a non-project related study.

For purposes of the mark recapture estimate, each newly located carcass was categorized into one of three possible dispositions or Pathways (Path). Fresh carcasses with at least one clear eye and/or firm flesh were designated as Path 1. All Path 1 carcasses were sampled as described above, as well as having individually numbered jaw tags attached to the lower right jaw before being returned to the river for potential recapture during later surveys. Older carcasses, those with cloudy eyes and/or mushy flesh, were categorized as Path 2. All Path 2 carcasses were cut in half and returned to the river following any collection of biological data and samples. Path 4 carcasses were carcasses that were observed by a survey crew but could not be sampled and/or recovered for data collection because either they were too decomposed or located in inaccessible or unsafe locations. Release of a successfully tagged Path 1 carcass allowed for a possible recapture in a subsequent survey. Recaptured carcasses were designated as Path 3; upon recapture and dependent upon carcass condition, carcasses were either re-released, or the tag was removed, and the carcass chopped in half before being returned into the river.

For run-size estimation, the mark-recapture carcass data is input into a modified Cormack-Jolly-Seber (CJS) estimator. This estimation method aims to provide the most accurate estimate with the least amount of bias as applied to the dataset. The CJS assumptions fit best with carcass mark-recapture surveys in that carcasses are considered an open population allowing for additions and removals in the population. Additionally, the CJS model can account for varying survival rates and recapture probabilities. Although the superpopulation approach was originally applied to the Jolly-Seber model, it can just as easily utilize the CJS model (Bergman et al. 2012). However, if the run-size cannot be effectively determined using the CJS estimator (due to insufficient tagging or recovery), adult population estimation defaults to the redd-based estimate (assuming one male and one female adult Chinook Salmon per redd). The grilse component is added to the adult total by applying the proportion of scale-aged 2 year-olds to the total adult estimate  $(\text{Total adult estimate}) / (1 - \text{proportion grilse})$  (KRTT, 2026).

## **RESULTS**

### **SALMON RIVER**

A total of ten cooperative surveys were conducted on the upper Salmon River between October 10<sup>th</sup> and December 12<sup>th</sup>, 2025. An additional survey day was exclusively dedicated to the upper Salmon tributaries on November 25<sup>th</sup>. After October 31<sup>st</sup> most survey days in November were cancelled in this sector due to continued rainfall and subsequent elevated flows. The USFS and cooperators conducted five survey days on the lower Salmon River between October 9<sup>th</sup> and December 11<sup>th</sup>, with similar cancellations for October 30<sup>th</sup> and all of November. Two survey days of Wooley Creek were carried out on November 17<sup>th</sup> to complete Reaches 2 and 3, and on November 19<sup>th</sup> to complete Reach 1.

For the upper Salmon River survey sector, staffing levels were generally equivalent to the previous season. Survey effort was constrained in 2025, with six survey days being cancelled due to increased flows. Surveys were originally scheduled through December 5<sup>th</sup>, but two additional surveys were completed in the second week of December. All upper Salmon River reaches were surveyed at least five times over the course of the season with the exception of Reach 6B, which was surveyed only three times, primarily due to high levels of suspended sediment, resulting in poor visibility. These sediment issues impacted the remaining South Fork reaches to a lesser extent. Overall, it is believed that sediment issues did not affect surveyor ability to locate redds but likely impacted the locating of carcasses and live fish observations. Certain reaches have been historically more productive and were completed with greater frequency than others (see Appendix A). Additionally, six tributary reaches in the upper Salmon River sector were surveyed. On the lower Salmon River, surveys resumed December 4<sup>th</sup> and staffing levels were adequate to complete all four mainstem survey reaches in each scheduled survey week that was completed (Table 2).

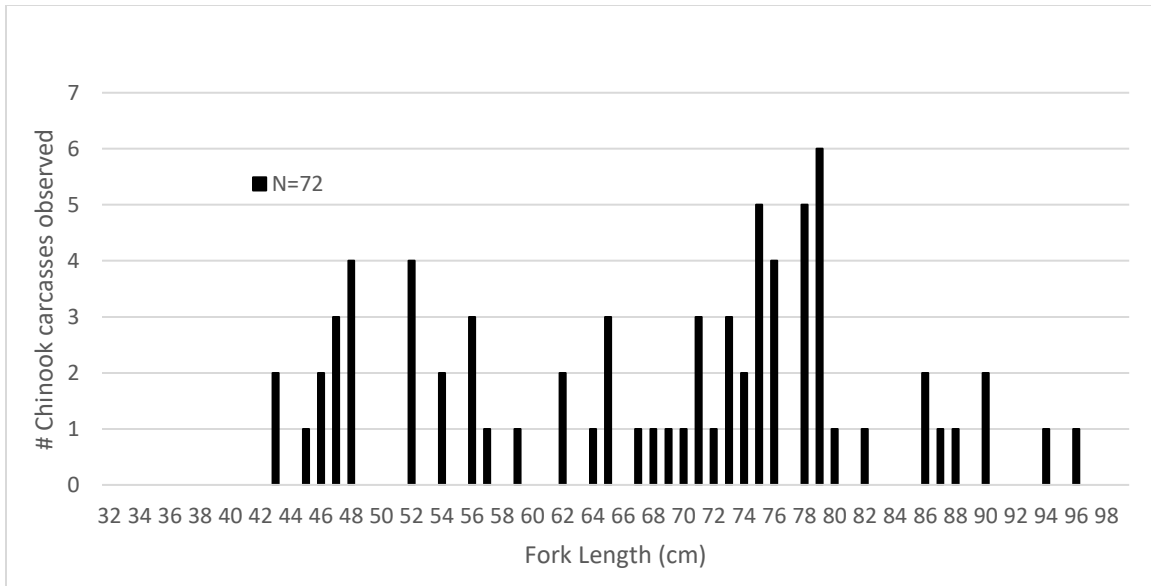
**Table 2.** Salmon river basin Fall Chinook Salmon redd totals and last day live fish from Salmon River mainstem and tributary reaches.

| Reach # | Reach Description       | Total Redds | # of Last Day Fish |
|---------|-------------------------|-------------|--------------------|
| 1       | Brannons to Mouth       | 24          | 0                  |
| 2       | Butler to Brannons      | 36          | 0                  |
| 3       | Tripp to Butler         | 31          | 0                  |
| 4       | Nordheimer to Tripp     | 31          | 0                  |
| 1       | Wooley 1                | 14          | 3                  |
| 2       | Wooley 2                | 9           | 5                  |
| 3       | Wooley 3                | 7           | 3                  |
| 4A      | Otter Bar to Nordheimer | 34          | 0                  |
| 4B      | Forks to Otter Bar      | 59          | 0                  |
| 5A      | Henry Bell to Forks     | 56          | 0                  |
| 5B      | O'Farrill to Henry Bell | 58          | 0                  |
| 6A      | Indian to O'Farrill     | 57          | 0                  |
| 6B      | Matthews to Indian      | 36          | 0                  |
| 9A      | Mile 2 to Forks         | 67          | 0                  |
| 9B      | Mile 4 to Mile 2        | 15          | 0                  |
| 10A     | Mile 6 to Mile 4        | 22          | 0                  |
| 10B     | Mile 8 to Mile 6        | 25          | 0                  |
| 11A     | Mile 10 to Mile 8       | 23          | 0                  |
| 11B     | Mile 12 to Mile 10      | 23          | 0                  |
| KNO     | Knownothing             | 4           | 0                  |
| WFK     | WF Knownothing          | 0           | 0                  |
| EFK     | EF Knownothing          | 0           | 0                  |
| NOR     | Nordheimer              | 13          | 0                  |
| MET     | Methodist               | 2           | 1                  |
| LNF     | Little NF Salmon        | 0           | 0                  |
| PLM     | Plummer Creek           | NS          | NS                 |
| Total   |                         | 646         | 12                 |

NS = not surveyed

## Carcass Surveys

A total of 72 Chinook Salmon carcasses (Path 1 and 2) were sampled during the upper and lower Salmon River surveys. Eight additional carcasses were recovered but not measured due to partial decomposition. A total of 25 instances of non-retrievable carcasses (Path 4) were recorded. It is possible that individual unrecovered carcass could have been observed multiple times over the course of separate surveys. Salmon River basin Chinook Salmon ranged in FL from 43 cm to 96 cm (Figure 1). No adipose fin clipped carcasses were observed this season.



**Figure 1.** Combined length frequency distribution of measured fall Chinook Salmon carcasses during the Salmon River basin spawning ground survey.

## Upper Salmon Carcass Mark-Recapture Survey

A Cormack-Jolly-Seber (CJS) mark-recapture model based on carcass jaw tags is the preferred method for generating a population estimate for the upper river survey area when there is sufficient data. During the 2025 season, only 46 carcasses were tagged and released back into the river. Of these, 2 tags were recaptured in 2 recapture events (two tags recaptured a single time). Using the CJS program, nine models are fit using various combinations of size and sex covariates for capture probability and carcass survival to find the best fit model. Across the nine models, estimated escapement in this area including jacks and adults ranged from 190 to 296 individuals (Figure 2). Due to the low number of tags at large, minimal number of recaptures, and the significantly greater number of redds observed, confidence in the statistical validity of these estimates is null. Additionally, with the significant number of surveys in November that were cancelled, there is no way to effectively extrapolate additional mark-recapture population estimation after October 31. Due to this, the mark-recapture estimate was not considered for estimating the population of the upper Salmon River sector.

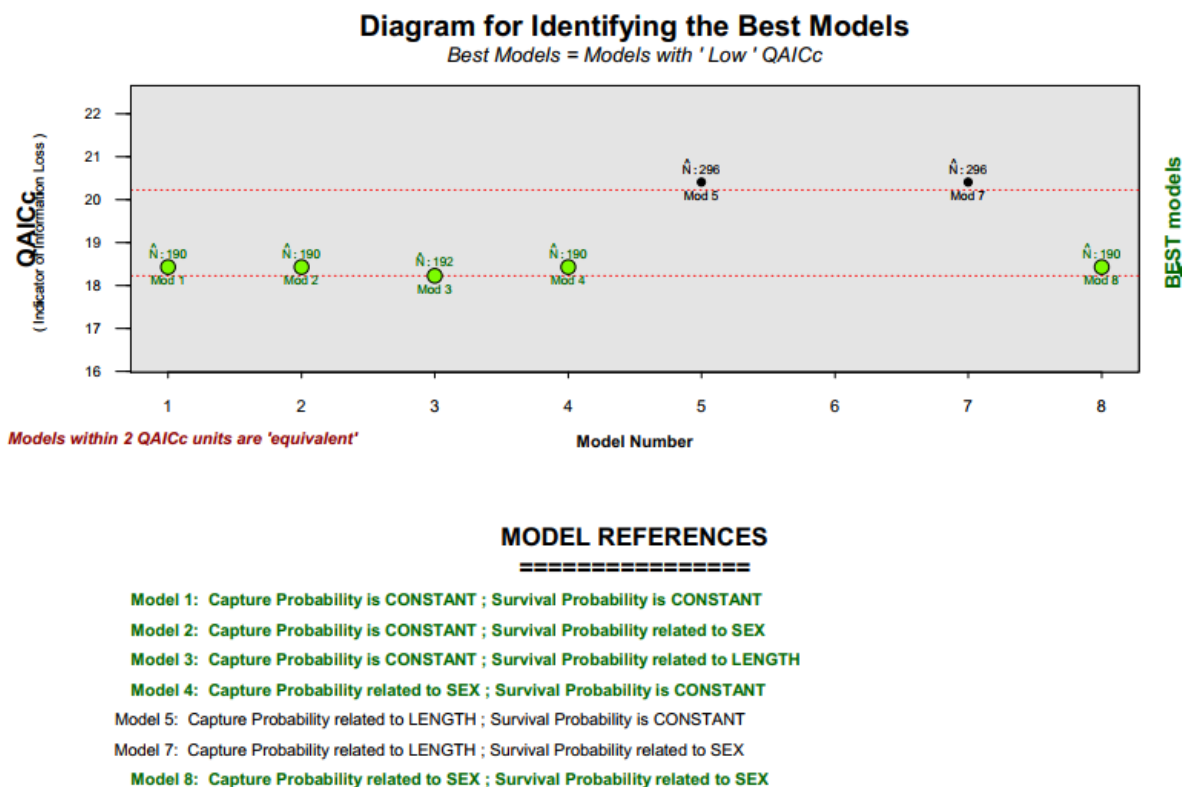


Figure 2. QAICc (Quasi Akaike's Information Criterion) plot for Cormack-Jolly-Seber models.

## Salmon River Fall Chinook Salmon Population Estimation

Total run-size estimates for adult fall Chinook Salmon in the Salmon River for the 2025 season were based upon summing the redd based estimates for both the upper and lower survey sectors. The resulting estimate totaled 1,304 adult Chinook Salmon for the entire basin. Based upon scale age apportionment 849 grilse Chinook Salmon were estimated, for a total fall Chinook Salmon run-size of 2,153 in the Salmon River basin. A total of 58 scales were read and aged to assess age structure for the Salmon River basin (KRTT, 2026).

### **Mid-Klamath Tributaries - Fall Chinook Salmon**

The 2025 fall Chinook Salmon spawning ground surveys on mid-Klamath River tributaries began October 7<sup>th</sup> and ended December 16<sup>th</sup>, 2025. Miscellaneous tributary streams were surveyed on several days throughout the week (primarily Mondays through Thursdays), either as walking or snorkel surveys. Run-size estimates for each for mid-Klamath tributaries was derived from the total observed redd counts expanded by an assumed number of two adult fish per redd. These individual tributary estimates were summed to collectively estimate the adult population for the mid-Klamath River tributaries. In addition, the number of adult live fish observed on the last day of the survey is added to the redd estimate. The grilse component was derived from scale-based aging of salmon carcasses across the entire sector.

Surveys on the mid-Klamath River tributaries are conducted under the direction of the USFS District Fisheries Biologist for the Orleans/Ukonom Ranger District for tributaries in the Orleans area, and under the direction of Mid-Klamath Watershed Council in the Happy Camp area. The schedule operates around a ten-day rotation of surveying the most heavily utilized reaches by spawning Chinook Salmon. Other stream reaches and smaller tributaries, where annual Chinook spawning is typically low were surveyed less frequently. Generally, all streams are attempted to be surveyed at least one time prior to the end of the survey season. Additionally, Pine Creek, a tributary to the Klamath that is 4.25 km downstream from the confluence with the Trinity River, is surveyed independently by the Hoopa Valley Tribe. This tributary population estimate is included in the Mid-Klamath Tributaries sector. The redd-based estimator (total # of redds times two, plus last day survey live adults) was used for estimating the adult population (Table 3).

**Table 3.** Total adult Chinook Salmon estimates from Mid-Klamath tributary surveys from Happy Camp and Orleans areas (Happy Camp in **BOLD**, OR – Orleans in *Italic*). NS = Not surveyed. “Other” includes Portuguese, Sandy Bar and Seiad Creeks.

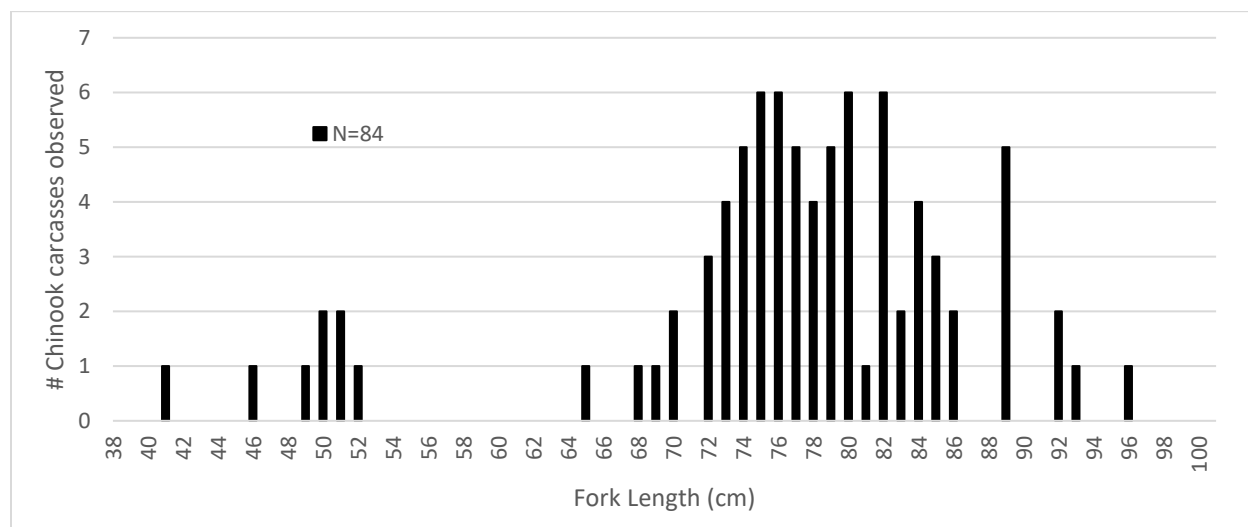
| Creek Name          | Total Redds | Last Day Live Adult | 2025 Estimate | 2024 Estimate | 2023 Estimate | 2022 Estimate | 2021 Estimate |
|---------------------|-------------|---------------------|---------------|---------------|---------------|---------------|---------------|
| <i>Aikens</i>       | 0           | 0                   | 0             | 0             | 0             | 0             | 0             |
| <b>Beaver</b>       | 61          | 5                   | 127           | 192           | 334           | 103           | 125           |
| <i>Bluff</i>        | NS          | NS                  | NS            | 6             | 0             | 37            | 0             |
| <i>Boise</i>        | 5           | 0                   | 10            | 2             | 2             | 2             | 30            |
| <i>Camp</i>         | 147         | 2                   | 296           | 150           | 244           | 170           | 235           |
| <b>China</b>        | NS          | NS                  | NS            | 3             | 0             | 0             | 0             |
| <b>Clear</b>        | 83          | 8                   | 174           | 92            | 309           | 135           | 144           |
| <b>Clear SF</b>     | 0           | 0                   | 0             | 0             | 0             | 0             | 0             |
| <b>Dillon</b>       | 50          | 6                   | 106           | 8             | 154           | 61            | 40            |
| <b>Elk</b>          | 50          | 9                   | 109           | 69            | 146           | 126           | 77            |
| <b>Fort Goff</b>    | 0           | 0                   | 0             | 2             | 2             | 6             | 2             |
| <b>Grider</b>       | 34          | 5                   | 73            | 86            | 208           | 74            | 40            |
| <b>Horse</b>        | 0           | 0                   | 0             | 28            | 28            | 0             | 24            |
| <b>Independence</b> | 2           | 1                   | 5             | 6             | 0             | 0             | 0             |
| <b>Indian</b>       | 129         | 24                  | 282           | 364           | 343           | 196           | 38            |
| <b>Indian SF</b>    | NS          | NS                  | NS            | NS            | 0             | 0             | 0             |
| <i>Irving</i>       | NS          | NS                  | NS            | 0             | 4             | 0             | 0             |
| <i>Pearch</i>       | NS          | NS                  | NS            | NS            | 0             | 0             | 0             |
| <i>Red Cap</i>      | 126         | 0                   | 252           | 136           | 244           | 186           | 127           |
| <i>Rock</i>         | 1           | 0                   | 2             | 10            | 30            | 29            | 42            |
| <i>Rogers</i>       | NS          | NS                  | NS            | 0             | 0             | 0             | 0             |
| <i>Slate</i>        | 7           | 0                   | 14            | 0             | 1             | 0             | 8             |
| <b>Swillup</b>      | NS          | NS                  | NS            | NS            | 0             | 0             | 0             |
| <b>Thompson</b>     | 9           | 1                   | 19            | 106           | 128           | 137           | 69            |
| <i>Ti</i>           | 0           | 0                   | 0             | 0             | 8             | 0             | 0             |
| <b>Ukonom</b>       | 6           | 4                   | 16            | 16            | 6             | 19            | 0             |
| <b>Other</b>        | 1           | 0                   | 2             | 2             | 0             | 0             | 3             |
| Pine*               | 18          | 0                   | 36            | 12            | 0             | 6             | 0             |
| <b>TOTALS</b>       | <b>729</b>  | <b>65</b>           | <b>1523</b>   | <b>1290</b>   | <b>2191</b>   | <b>1287</b>   | <b>1004</b>   |

NS = not surveyed,

\* = Tributary to Klamath River on Hoopa Reservation below Trinity confluence

### Carcass Surveys

A total of 95 carcasses were recovered on the mid-Klamath River tributaries. Fish were measured to FL (cm), assessed for sex and spawning status, and were worked up for bio samples of scales, tissues and otoliths. A total of 84 were measured for fork length; 32 from Orleans area and 52 from Happy Camp area tributaries. Scale samples were taken from all 95 carcasses. Carcasses ranged in size from 41 to 96 cm (Figure 1). A total of 86 carcasses were sexed; including 28 males and 58 females. No adipose fin clipped carcasses were observed this season.



**Figure 3.** Combined length frequency of carcasses recovered on mid-Klamath Tributaries.

### Mid-Klamath Tributary Fall Chinook Salmon Population Estimation

Based upon expanded redd counts and observed adult last day live fish, an estimated 1,523 adult fall Chinook returned to mid-Klamath tributaries during the 2025 season. The grilse component is added to the adult total by applying the proportion of scale-aged 2 year-olds to the total adult estimate (Total adult estimate)/(1-proportion grilse) (KRTT, 2026). Scale-age grilse apportionment results in an additional 175 grilse, resulting in a total run size estimate for the mid-Klamath tributaries of 1,698 fall Chinook Salmon. A total of 85 scales were read and aged to assess age structure for the mid-Klamath tributaries (KRTT, 2026).

## Mainstem Klamath – Persido Bar to Big Bar

The District Fisheries Biologist office for the Orleans/Ukonom Ranger District was unable to complete mid-Klamath mainstem surveys, however cooperators for the Karuk Tribe were able to execute this effort in December when flows in the mainstem Klamath receded. This survey had not been completed since 2022. Survey Reaches 3 and 4 were completed on December 11, and a slightly longer version (to the Ullathorne River Access; approximately 1.3 km further downstream from the Camp Creek River access) of the Reach 2 survey was completed on December 12, 2025 (Table 4).

**Table 4.** Reach survey total for mainstem Klamath River in the Orleans area.

| Reach                       | # Redds | Adult | Carcass | CFS  | Date      |
|-----------------------------|---------|-------|---------|------|-----------|
| 1-Camp Creek to Big Bar     | NS      | NS    | NS      | NS   | NS        |
| 2-Orleans to Ullathorne     | 3       | 2     | 0       | 2280 | 12-Dec-25 |
| 3-Sandy Bar to Green Riffle | 30      | 0     | 0       | 2310 | 11-Dec-25 |
| 4-Persido to Sandy Bar      | 42      | 0     | 0       | 2310 | 11-Dec-25 |

## Mid-Klamath Mainstem Population Estimation

Based upon expanded redd counts only (last day live adult are not included in this sector), an estimated 150 adult fall Chinook returned to mid-Klamath mainstem during the 2025 season. The grilse component is added to the adult total by applying the proportion of scale-aged 2 year-olds to the total adult estimate (Total adult estimate)/(1-proportion grilse) (KRTT, 2026). Surrogate (from Mid-Klamath Tributaries) scale-age grilse apportionment resulted in an additional 17 grilse, for a total run size estimate for the mid-Klamath mainstem of 167 fall Chinook Salmon.

## DISCUSSION

The spawning ground surveys have been generating run size estimates for the Klamath basin since 1978. As discussed earlier in this document, the methods used to generate estimates for the Salmon River and mid-Klamath tributaries have changed over the years to incorporate better survey techniques and increase cooperation with stakeholders. The cooperative spawning ground surveys began in 1992 and since that time have remained the most consistent and reliable method to estimate fall Chinook Salmon escapement in these sectors.

## Salmon River Basin

Final population estimates were derived from combined redd-based estimates for both the upper and lower sectors resulting in 1,304 adults and 849 grilse, for a total of 2,153 fall Chinook Salmon. This estimate represents an approximate 22% increase over 2024. Since 2016, the current year estimate is the eighth year in which adult estimates for the Salmon River basin were below 1,500 adult fall Chinook Salmon. The 2025 total run size ranks 24<sup>th</sup> in the running 48-year period of record (see Appendix E).

### *Upper Salmon*

Like the previous year, the CJS mark-recapture estimation method was not used to estimate spawner abundance for the upper Salmon sector due to gross discrepancies with the redd based method. The redd based method estimated significantly more fish than the CJS method. The low CJS estimate is likely due to the relatively few tags at large, and the minimal subset of recaptures. Continuing discussions regarding the performance of this estimator have identified potential biases from inconsistent carcass recovery rates related to survey method (walk versus snorkel) and scavenger effects related to flow (i.e. lower flows allow carcasses to be scavenged more efficiently). With consideration to the 2025 estimate, carcass marking and recovery was relatively unsuccessful, and was only able to be carried out for part of the season due to continued rainfall and persistent elevated flows.

With regards to potential spring and fall Chinook Salmon overlap, it is assumed that any spring-run Chinook spawning activity had already been identified and flagged during the spring spawning survey (mostly upstream of but also including some reaches in the fall survey area). The 2025 season was no exception, the Salmon River Restoration Council carried out spring Chinook spawner surveys from September 17 through October 30. As mentioned in last year's report, there have been discussions of methods to determine overlap between spring and fall run Chinook in the Salmon River basin. For the second season, collaborative research efforts between Salmon River Restoration Council, Karuk Tribe and University of California Berkeley have been conducted. These efforts include additional tissue collection for genetic analysis during spring and fall Chinook spawner surveys, downstream migrant trapping and other efforts that will hopefully provide more information in the coming years.

As noted, the onset of persistent rainfall starting in late October, most surveys during the month of November were cancelled. Despite the rainfall, conditions were favorable enough to complete six of the seven tributary reaches in the upper Salmon River sector in the latter half of the month. It is suggested that flows during November were high enough to make most regularly scheduled surveys unsafe but were not high enough to cause significant scouring and deformation of redds (Appendix F). When regular surveys resumed in December, there were relatively few new redds identified and very few live fish observed. Paired with this, it is worth noting that the redds flagged earlier in the season were still clearly identifiable, further supporting the assumption that the flows were not significant enough to deform or scour redds that may have been deposited during the month of November. Due to this, the conclusion was made that there was relatively little spawning activity that occurred after October 31, and the redd-based population estimate for the basin is valid. Similarly, despite multiple cancelled surveys, enough scale samples were collected and analyzed to provide sufficient age structure data for this sector. As the bulk of the spawning appears to have been completed prior to November, it is believed that the scale samples are representative of the entire Chinook Salmon run in the Salmon River basin.

### *Lower Salmon and Wooley Creek*

The lower Salmon River was surveyed consistently through October 23<sup>rd</sup>, after which surveys were cancelled until resuming on December 4<sup>th</sup>. Consistent with previous seasons, Wooley Creek was surveyed a single time approximately mid-season. Similar to the upper sector, little to no new redds or live fish were found in the lower Salmon River sector during December surveys.

### Mid-Klamath Tributaries

The 2025 survey season on the Mid-Klamath tributaries was minimally impacted by precipitation and high flows. In the Happy Camp area, surveys of the upper-most reaches of Indian Creek could not be completed due to legacy wildfire impacts, but otherwise survey effort was very good for this area. Similarly in the Orleans area, survey coverage was good, with very few surveys being cancelled, and if so, surveyors were usually redirected to other tributary creeks, hence the increased number of surveys carried out for the entire season (131, as compared to 112 reach surveys completed in 2024). In 2025, a total of 1,698 fall Chinook returned to mid-Klamath tributaries; approximately a 30% increase in total run size as compared to the previous year.

### Mainstem Klamath

During the 2025 season, the survey was completed from Persido Bar to Ullathorne River Access. This encompassed survey Reaches 2, 3 and 4, and approximately 1.3 km of the upper section of Reach 1. As this survey is somewhat of an opportunistic effort, the redd data collected was used to furnish the population estimate, with no additional estimation for the portion not surveyed.

In conclusion, the Salmon River sector showed a ~22% increase in the basin population estimate as compared to the previous year. It is worth noting that the 2024 estimate was derived from redd counts and the ratio estimator to account for the shortened survey season. The mid-Klamath tributaries sector showed a ~30% increase in the run-size estimate over the previous year. The 2025 season also had an increased number of surveys completed in this sector.

During the 2025 season, some cooperating agencies and non-governmental organizations were subject to limitations in participation. A federal government shutdown occurred October 1 and ran through November 12. During this time, USFS participation was effectively halted. Additionally, federal funding cuts to fall Chinook Salmon monitoring impacted the Mid-Klamath Watershed Council, specifically in the Salmon River basin. However, they were able to utilize other funding sources to more extensively support work in the Mid-Klamath Tributaries sector in both the Happy Camp and Orleans areas. All survey cooperators worked together to effectively redirect staff and survey effort for the entire season.

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Appendix A. Dates and Redd Totals for upper Salmon River Survey 2025 (Meneks, 2026).

| Reach                             | Date            |                 |        |        |        |            |        |        |        |            |        |        |            |        |        |        |        |        |        |
|-----------------------------------|-----------------|-----------------|--------|--------|--------|------------|--------|--------|--------|------------|--------|--------|------------|--------|--------|--------|--------|--------|--------|
|                                   | Oct-10          | Oct-14          | Oct-17 | Oct-21 | Oct-24 | Oct-28     | Oct-31 | Nov-04 | Nov-07 | Nov-11     | Nov-14 | Nov-18 | Nov-21     | Nov-25 | Nov-28 | Dec-02 | Dec-05 | Dec-09 | Dec-12 |
| Mainstem                          |                 |                 |        |        |        |            |        |        |        |            |        |        |            |        |        |        |        |        |        |
| 4A - Otter Bar to Nordheimer Ck   | 5               |                 | 18     | 0      | 11     | ---        |        | ---    | ---    | ---        | ---    | ---    | ---        | ---    | ---    | 0      |        | 0      |        |
| 4B - Forks to Otter Bar           | 5               | 8 <sup>1</sup>  |        | 39     | 6      | ---        | 1      | ---    | ---    | ---        | ---    | ---    | ---        | ---    | ---    | 0      |        | 0      |        |
| North Fork                        |                 |                 |        |        |        |            |        |        |        |            |        |        |            |        |        |        |        |        |        |
| 9A - Mile 2 to Forks              |                 | 10              | 25     |        | 28     | High Water |        |        | 4      | High Water |        |        | High Water |        |        | 0      |        | 0      |        |
| 9B - Mile 4 to Mile 2             |                 | 5               |        | 7      |        |            | 2      |        |        |            |        |        |            |        |        |        | 0      | 1      |        |
| 10A - Mile 6 to Mile 4            |                 | 8               |        | 11     |        |            | 3      |        |        |            |        |        |            |        |        |        | 0      |        | 0      |
| 10B - Mile 8 to Mile 6            |                 | 8               |        | 9      |        |            | 8      |        |        |            |        |        |            |        |        |        | 0      |        | 0      |
| 11A - Mile 10 to Mile 8           |                 | 16              |        | 5      |        |            | 2      |        |        |            |        |        |            |        |        |        | 0      |        | 0      |
| 11B - Mile 12 to Mile 10          |                 | 6               |        | 11     |        |            | 4      |        |        |            |        |        |            |        |        |        | 2      |        | 0      |
| South Fork                        |                 |                 |        |        |        |            |        |        |        |            |        |        |            |        |        |        |        |        |        |
| 5A - Henry Bell to Forks          | 12              |                 | 9      |        | 35     |            |        |        |        |            |        |        |            |        |        | 0      |        | 0      |        |
| 5B - OFarrill Gulch to Henry Bell | 38              |                 | 11     | 9      |        |            |        |        |        |            |        |        |            |        |        | 0      |        | 0      |        |
| 6A - Indian Ck to OFarrill Gulch  | 27 <sup>1</sup> | 11 <sup>1</sup> | 17     |        | 1      | ---        |        |        |        | ---        |        |        | ---        |        |        | 1      |        | 0      |        |
| 6B - Matthews Ck to Indian Ck     |                 |                 | 24     |        | 12     |            |        |        |        |            |        |        |            |        |        |        |        | 0      |        |

\*nd = no data (surveys performed, but redd count not reported) / Underline = days which included pulling flagging  
1Incomplete survey - not completed due to injury, time constraint, or gear issue; partial reach survey to finish a prior day incomplete survey.

Appendix B. 2025 Survey Periodicity of Mid-Klamath tributary surveys (Happy Camp in **BOLD**, OR – Orleans in *Italic*) # indicates the number of surveys completed in the Julian Week.

| Creek Name         | Julian Week  |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
|--------------------|--------------|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|--|
|                    | 40           | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 1 | 2 | 3 |  |
| Aikens             | 1            |    |    |    |    |    |    |    | 1  |    |    |    |    |   |   |   |  |
| Beaver WF          |              |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Beaver 1           | 1            |    |    | 1  |    |    | 1  |    |    |    |    |    |    |   |   |   |  |
| Beaver 2           | 1            |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Bluff              | Not surveyed |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Boise 1            | 1            |    |    |    | 1  |    | 1  |    |    |    |    |    | 1  |   |   |   |  |
| Boise 2            | 1            |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Camp 1             | 1            |    | 1  |    | 1  |    | 2  |    | 1  |    | 3  |    | 1  |   | 2 |   |  |
| Camp 2             | 1            |    | 1  |    | 1  |    |    |    | 1  |    | 1  |    | 1  |   | 1 |   |  |
| Camp 3             | 1            |    |    | 1  |    |    |    | 1  |    |    |    | 1  |    |   |   |   |  |
| Camp 4             | 1            |    |    | 1  |    |    |    |    |    |    |    |    |    |   |   |   |  |
| China              |              |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Clear              | 1            | 1  | 1  |    | 1  |    | 1  |    | 1  |    |    |    |    |   |   |   |  |
| Clear SF           | 1            |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Dillon 1           | 1            |    |    | 1  |    | 1  |    |    |    | 1  |    |    |    |   |   |   |  |
| Dillon 2           | 1            |    | 1  |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Elk 1              | 1            |    | 1  |    | 1  |    |    |    |    |    |    |    |    |   |   |   |  |
| Elk 2              | 1            |    | 2  |    | 2  |    |    |    |    |    |    |    |    |   |   |   |  |
| Elk 3              | 1            |    | 1  |    |    | 1  |    |    |    |    |    |    |    |   |   |   |  |
| Elk 4              | 1            |    |    | 1  |    |    |    | 1  |    |    |    |    |    |   |   |   |  |
| Elk EF             | 1            |    |    | 1  |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Fort Goff          | 1            |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Grider 1           | 1            |    |    | 1  |    | 1  |    |    |    |    |    |    |    |   |   |   |  |
| Grider 2           | 1            |    | 1  |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Horse 1            | 1            |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Horse 2            | 1            |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Horse 3            | 1            |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Independence       | 1            |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Indian 1           | 1            |    | 1  |    | 1  |    |    |    |    |    |    |    |    |   |   |   |  |
| Indian 2           | 1            |    | 1  |    | 1  |    |    |    |    |    |    |    |    |   |   |   |  |
| Indian 3           | 1            |    |    | 1  |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Indian 4           | Not surveyed |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Indian SF          | Not surveyed |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Irving             | Not surveyed |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Pearch             | Not surveyed |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Red Cap 1          | 1            |    | 1  |    | 2  |    | 1  |    | 1  |    | 1  |    | 3  |   | 1 |   |  |
| Red Cap 2          | 1            |    | 1  |    | 2  |    | 2  |    | 1  |    | 1  |    | 1  |   | 1 |   |  |
| Red Cap 3          | 1            |    | 1  |    | 1  |    | 1  |    | 1  |    | 1  |    | 1  |   | 1 |   |  |
| Red Cap 4          | 1            |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Rock               | 1            |    | 1  |    | 1  |    |    |    |    |    |    |    |    |   |   |   |  |
| Rogers             | Not surveyed |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Slate1             | 1            |    |    |    |    | 1  |    | 1  |    | 1  |    |    |    |   |   |   |  |
| Slate 2            | Not surveyed |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Swillup            | Not surveyed |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Thompson 1         | 1            |    |    | 1  |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Thompson 2         | 1            |    |    | 1  |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Thompson 3         | 1            |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Ti                 | 1            |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Ukonom             | 1            |    | 1  |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Other (Kings)      | Not surveyed |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Other (Portuguese) | 1            |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Other (Sandy Bar)  | 1            |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Other (Stanshaw)   | Not surveyed |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Other (Titus)      | Not surveyed |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Other (Walker)     | Not surveyed |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |

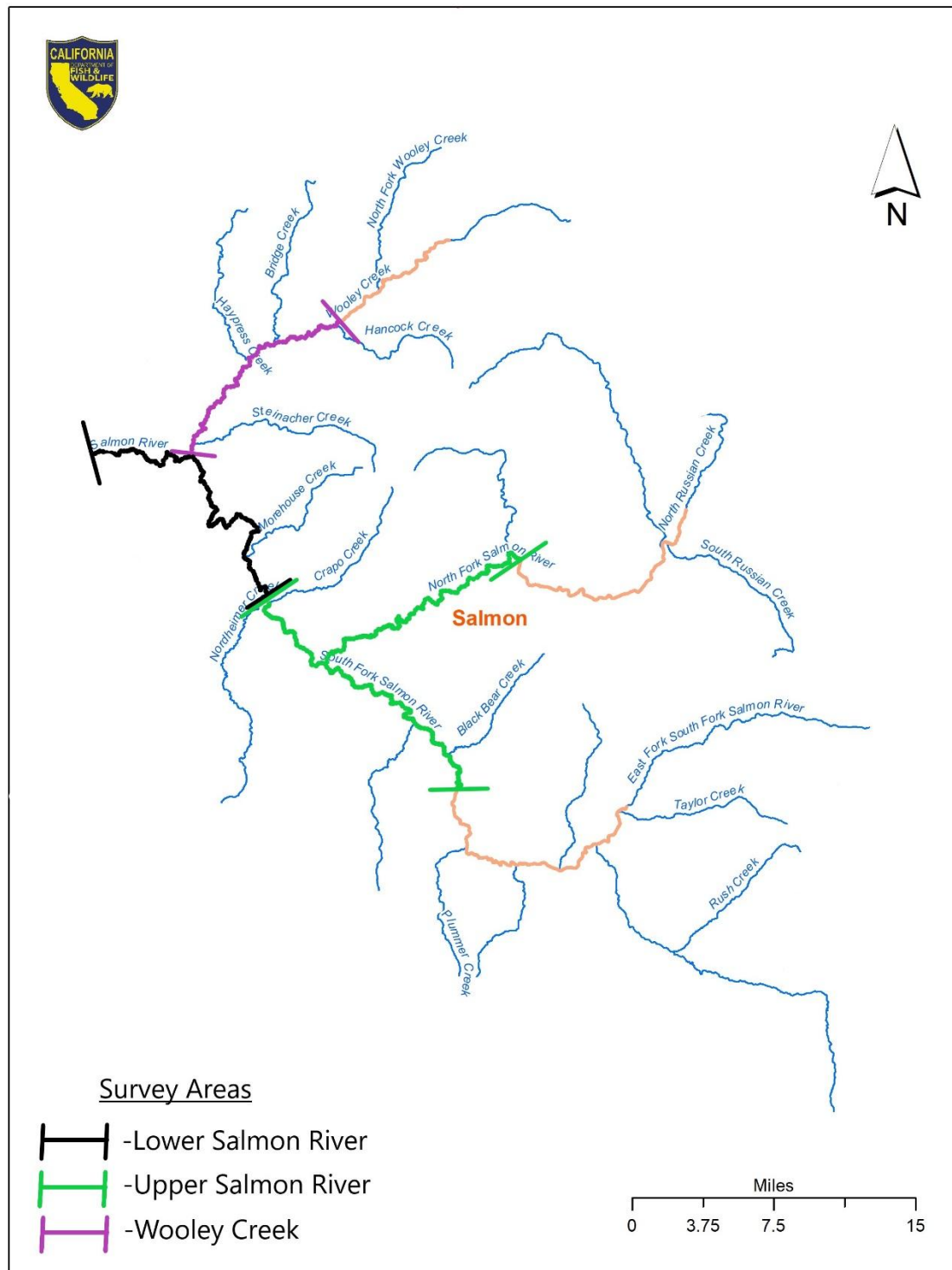
Appendix C. Julian Week and Inclusive Dates.

| JW                   | Inclusive Dates | JW                    | Inclusive Dates |
|----------------------|-----------------|-----------------------|-----------------|
| <b>1</b>             | 01-Jan - 07-Jan | <b>27</b>             | 02-Jul - 08-Jul |
| <b>2</b>             | 08-Jan - 14-Jan | <b>28</b>             | 09-Jul - 15-Jul |
| <b>3</b>             | 15-Jan - 21-Jan | <b>29</b>             | 16-Jul - 22-Jul |
| <b>4</b>             | 22-Jan - 28-Jan | <b>30</b>             | 23-Jul - 29-Jul |
| <b>5</b>             | 29-Jan - 04-Feb | <b>31</b>             | 30-Jul - 05-Aug |
| <b>6</b>             | 05-Feb - 11-Feb | <b>32</b>             | 06-Aug - 12-Aug |
| <b>7</b>             | 12-Feb - 18-Feb | <b>33</b>             | 13-Aug - 19-Aug |
| <b>8</b>             | 19-Feb - 25-Feb | <b>34</b>             | 20-Aug - 26-Aug |
| <b>9<sup>1</sup></b> | 26-Feb - 04-Mar | <b>35</b>             | 27-Aug - 02-Sep |
| <b>10</b>            | 05-Mar - 11-Mar | <b>36</b>             | 03-Sep - 09-Sep |
| <b>11</b>            | 12-Mar - 18-Mar | <b>37</b>             | 10-Sep - 16-Sep |
| <b>12</b>            | 19-Mar - 25-Mar | <b>38</b>             | 17-Sep - 23-Sep |
| <b>13</b>            | 26-Mar - 01-Apr | <b>39</b>             | 24-Sep - 30-Sep |
| <b>14</b>            | 02-Apr - 08-Apr | <b>40</b>             | 01-Oct - 07-Oct |
| <b>15</b>            | 09-Apr - 15-Apr | <b>41</b>             | 08-Oct - 14-Oct |
| <b>16</b>            | 16-Apr - 22-Apr | <b>42</b>             | 15-Oct - 21-Oct |
| <b>17</b>            | 23-Apr - 29-Apr | <b>43</b>             | 22-Oct - 28-Oct |
| <b>18</b>            | 30-Apr - 06-May | <b>44</b>             | 29-Oct - 04-Nov |
| <b>19</b>            | 07-May - 13-May | <b>45</b>             | 05-Nov - 11-Nov |
| <b>20</b>            | 14-May - 20-May | <b>46</b>             | 12-Nov - 18-Nov |
| <b>21</b>            | 21-May - 27-May | <b>47</b>             | 19-Nov - 25-Nov |
| <b>22</b>            | 28-May - 03-Jun | <b>48</b>             | 26-Nov - 02-Dec |
| <b>23</b>            | 04-Jun - 10-Jun | <b>49</b>             | 03-Dec - 09-Dec |
| <b>24</b>            | 11-Jun - 17-Jun | <b>50</b>             | 10-Dec - 16-Dec |
| <b>25</b>            | 18-Jun - 24-Jun | <b>51</b>             | 17-Dec - 23-Dec |
| <b>26</b>            | 25-Jun - 01-Jul | <b>52<sup>2</sup></b> | 24-Dec - 31-Dec |

<sup>1</sup> = Eight-day week in each leap year (years divisible by 4).

<sup>2</sup> = Eight-day week every year.

Appendix D. Salmon River basin spawning grounds survey map.



Appendix E. Salmon River basin Run sizes by year (ranked), 1978 to 2025.

| Year | Jacks | Adults | Total | Rank |
|------|-------|--------|-------|------|
| 1978 | 1400  | 2600   | 4000  | 7    |
| 1979 | 150   | 1000   | 1150  | 42   |
| 1980 | 200   | 800    | 1000  | 45   |
| 1981 | 450   | 750    | 1200  | 41   |
| 1982 | 300   | 1000   | 1300  | 39   |
| 1983 | 75    | 1200   | 1275  | 40   |
| 1984 | 216   | 1226   | 1442  | 36   |
| 1985 | 905   | 2259   | 3164  | 17   |
| 1986 | 949   | 2716   | 3665  | 9    |
| 1987 | 118   | 3832   | 3950  | 8    |
| 1988 | 327   | 3273   | 3600  | 11   |
| 1989 | 695   | 2915   | 3610  | 10   |
| 1990 | 596   | 4071   | 4667  | 5    |
| 1991 | 143   | 1337   | 1480  | 34   |
| 1992 | 547   | 778    | 1325  | 38   |
| 1993 | 456   | 3077   | 3533  | 12   |
| 1994 | 277   | 3216   | 3493  | 13   |
| 1995 | 1335  | 4140   | 5475  | 3    |
| 1996 | 274   | 5189   | 5463  | 4    |
| 1997 | 217   | 5783   | 6000  | 1    |
| 1998 | 116   | 1337   | 1453  | 35   |
| 1999 | 110   | 670    | 780   | 46   |
| 2000 | 228   | 1544   | 1772  | 27   |
| 2001 | 743   | 2607   | 3350  | 15   |
| 2002 | 78    | 2669   | 2747  | 19   |
| 2003 | 73    | 3302   | 3375  | 14   |
| 2004 | 51    | 282    | 333   | 48   |
| 2005 | 105   | 401    | 506   | 47   |
| 2006 | 791   | 1278   | 2069  | 26   |
| 2007 | 55    | 1377   | 1432  | 37   |
| 2008 | 650   | 1749   | 2399  | 22   |
| 2009 | 516   | 2204   | 2720  | 20   |
| 2010 | 356   | 2478   | 2834  | 18   |
| 2011 | 1819  | 3674   | 5493  | 2    |
| 2012 | 829   | 3561   | 4390  | 6    |
| 2013 | 240   | 2240   | 2480  | 21   |
| 2014 | 527   | 2706   | 3233  | 16   |
| 2015 | 92    | 1978   | 2070  | 25   |
| 2016 | 26    | 1032   | 1058  | 44   |
| 2017 | 327   | 1338   | 1665  | 29   |
| 2018 | 285   | 1228   | 1513  | 33   |
| 2019 | 686   | 957    | 1643  | 30   |
| 2020 | 122   | 972    | 1094  | 43   |
| 2021 | 263   | 1890   | 2153  | 23   |
| 2022 | 291   | 1274   | 1565  | 32   |
| 2023 | 264   | 1355   | 1619  | 31   |
| 2024 | 245   | 1520   | 1765  | 28   |
| 2025 | 849   | 1304   | 2153  | 24   |

Appendix F. USGS discharge measurements for Salmon River flows at Somes Bar – October 1 through December 15, 2025.

Salmon R a Somes Bar CA - USGS-11522500

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