State of California
The Resources Agency
DEPARTMENT OF FISH AND WILDLIFE

ANNUAL REPORT
TRINITY RIVER BASIN SALMON AND STEELHEAD MONITORING PROJECT: CHINOOK AND COHO SALMON AND FALL-RUN STEELHEAD RUN-SIZE ESTIMATES USING MARK-RECAPTURE METHODS
2017-18 SEASON

On the cover: Rainbow over the Trinity River. October 2017.

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2017-18 SEASON

by

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AUGUST 2018

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FOREWORD

This is the California Department of Fish and Wildlife's (CDFW) Trinity River Basin Salmon and Steelhead Monitoring Project's twenty-ninth annual report to the United States Bureau of Reclamation (Reclamation). Reported activities were funded by CDFW/Reclamation Cooperative Agreement Number R13AC20027.

This report presents work performed on the main stem Trinity River and at Trinity River Hatchery. Necessity for performing our Klamath-Trinity basin monitoring activities are outlined in several Acts of Congress including Public Law 386 (69 Stat. 719), August 12, 1955; Public Law 98-541, October 24, 1984; the "*Trinity River Basin Fish and Wildlife Management Reauthorization Act*" of 1995; and the Trinity River "*Record of Decision*", 2000.

ACKNOWLEDGMENTS

The CDFW fisheries technicians on whom we relied heavily for the bulk of the field work in the 2017 season include: Michael Bradford, Liv Carter, Chris Hubler, Todd Newhouse, Melissa Reneski, Jane Sartori, Ron Smith, Steven Strite, Ted Tillinghast, and Nathan Keiki Yamasaki. Hoopa Valley Tribal Fisheries (HVTF) performed admirably during the installation and removal of both weirs, once again, and provided Billy Colegrove and Dexter Cooper as technicians to assist throughout weir season. We continue to benefit from our relationship with the HVTF department and appreciate the help we get from everyone who works on our weir installation and pull days.

We value the cooperation of the CDFW Trinity River Hatchery staff during recovery efforts, and Doris Chase, Tom O'Gorman, Steve Strite, and the U.S. Forest Service for access, off-season in-basin equipment storage, and general project support.

The CDFW monitoring program was approved by the Trinity Management Council (TMC) and funded by Reclamation through the Trinity River Restoration Program (TRRP) office in Weaverville, CA. We thank Caryn Hunt DeCarlo and the TRRP for their contract administration efforts.

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ABSTRACT

California Department of Fish and Wildlife's Trinity River Project conducted tagging and recapture operations from July 2017 through March 2018 to produce run-size, angler harvest, and spawner escapement estimates of spring- and fall-run Chinook Salmon (*Oncorhynchus tshawytscha*), Coho Salmon (*O. kisutch*), and fall-run steelhead (*O. mykiss*) in the Trinity River basin. Monitoring results inform the Trinity River Restoration Program's (TRRP) adaptive management decision making process and help evaluate progress toward achieving fundamental objectives outlined in the Integrated Assessment Plan (TRRP 2009). Additionally, run-size estimates are used in annual fishery management decisions, feeding into the Pacific Fishery Management Council's Klamath River basin fishery regulation and harvest allocation process.

Using a Petersen mark-recapture methodology, we estimated 4,425 (95% CI 3,387 – 5,959) spring-run Chinook Salmon migrated into Trinity River basin upstream of Junction City weir. The run was comprised of an estimated 1,454 natural-origin adults, 280 natural-origin jacks, 2,139 hatchery-origin adults and 447 hatchery-origin jacks. Using tags returned by anglers we estimate 104 spring Chinook were harvested, yielding an escapement of 4,320 fish. Escapement of 1,454 natural-origin adult spring Chinook is 24.2% of the TRRP goal of 6,000.

An estimated 15,450 fall-run Chinook Salmon migrated upstream of Willow Creek weir (WCW) in 2017. The stratified run-size of 5,837 jacks (95% CI 5,212 – 6,502) and 9,613 adult fall Chinook Salmon adults (95% CI 8,701 – 10,573) was comprised of an estimated 4,961 natural-origin adults, 3,096 natural-origin jacks, 4,652 hatchery-origin adults and 2,741 hatchery-origin jacks. There was no harvest reported (there was no legal harvest of fall Chinook Salmon permitted in 2017) so the total escapement is the same as the estimated run-size. Escapement of 4,475 natural-origin adult fall Chinook Salmon is 8.0% of the 62,000 fish TRRP goal.

Both Coho Salmon run-size and escapement in the Trinity above WCW were estimated at 655 (95% CI 475 - 921), because no Coho Salmon were reported as harvested. Coho Salmon escapement was comprised of an estimated 57 natural-origin adult and 9 natural-origin jacks and 354 hatchery-origin adult and 236 hatchery-origin jacks. Escapement of 57 natural-origin Coho adults was 4.1% of the TRRP goal of 1,400 fish.

Using a Peterson mark-recapture methodology we estimated 6,846 (95% CI 5,873 – 7,897) adult fall steelhead returned to the Trinity River basin upstream of WCW. Anglers harvested an estimated 253 adult fall steelhead upstream of the weir, leaving 6,593 (2,348 natural-origin and 4,245 hatchery-origin) fish as potential spawners. Escapement of 2,348 natural-origin adult steelhead is 5.9% of the 40,000 fish TRRP goal.

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PROJECT OBJECTIVES

- Determine run-size, age composition, hatchery/natural origin proportions, distribution, and timing of adult Chinook Salmon (*Oncorhynchus tshawytscha*), Coho Salmon (*O. kisutch*), and steelhead (*O. mykiss*) in the Trinity River basin (Integrated Assessment Plan [IAP] assessment 13A – "*Monitor adult escapement of hatchery and naturally produced spring and fall Chinook, coho, and fall steelhead [TRRP, 2009])*".
- Determine in-river sport angler harvest and spawner escapements of Trinity River Chinook Salmon, Coho Salmon, and steelhead (IAP assessments 16A, 17A, 18A, and 19A – "*Monitor harvest [tribal, sport and commercial] of naturally produced spring Chinook, fall Chinook, coho and steelhead)*".

INTRODUCTION

CDFW's Trinity River Project (TRP) annually monitors run-size and spawner escapement of spring Chinook Salmon (spring Chinook) in the Trinity River basin upstream of a weir near Junction City, California and the run-size and spawner escapement of fall Chinook Salmon (fall Chinook), Coho Salmon (Coho), and adult fall-run steelhead (steelhead) in the Trinity River basin upstream of a weir near Willow Creek, California. The project is conducted in cooperation with the Hoopa Valley Tribal Fisheries Department (HVTF). We use a Peterson type mark-recapture methodology to estimate run-size (the number of fish estimated to migrate from the ocean) into the Trinity River basin upstream of the weir sites. Spawner escapement is the number of fish that survive in-river tribal and recreational harvest to spawn in natural areas or enter Trinity River Hatchery (TRH). This is a continuation of studies that began in 1977.

Results from this investigation are provided to the Trinity River Restoration Program (TRRP) to help evaluate program objectives including natural-origin (progeny of fish that spawned in the river) salmonid escapement goals (13A, 17A, 16A, 18A and 19A) outlined in the IAP (TRRP 2009). Current Trinity River basin adult escapement goals set by the TRRP for natural-origin adults are 6,000 spring Chinook, 62,000 fall Chinook, 1,400 Coho and 40,000 steelhead. Similar goals for hatchery adult escapement are 3,000 spring Chinook, 9,000 fall Chinook, 2,100 Coho and 10,000 steelhead. Investigation data are used to assess progress toward the goal stated in the Record of Decision (ROD) (Interior, 2000) of increasing harvest opportunity for dependent fisheries. Data are also used in the short term to inform adaptive management decisions and stock management through the Pacific Fishery Management Council process, and in the long term for trend analysis in pre- and post-ROD fish populations, cross-functional ecological and physical evaluations, composition (race and proportion of

hatchery-marked[1] or TRP-tagged[2] fish), spatial distribution, and timing of salmonid runs in the Trinity River basin.

METHODS

Our general study design employs a simple Peterson mark/recapture experiment in which fish are marked at a weir (located near either Junction City or Willow Creek), then recaptured at a single recovery location, when fish return to the Trinity River Hatchery. A tag return program is integrated into the study design to estimate angler sport harvest. These methods have been followed essentially unchanged for the 41 years this project has been underway.

Trapping, Tagging and Marking

Locations and Periods

Trapping and tagging operations were conducted from July 24, 2017 through November 8, 2017 by TRP and HVTF personnel at two temporary weir sites located on the main stem Trinity River (Figure 1).

Junction City weir (JCW) was located at approximately 136.5 river kilometers (rkm) (~river mile [rm] 84.4) upstream from the Klamath River confluence near Weitchpec ((40°41'0.24"N 123° 1'37.71"W.) and upstream of Junction City. The JCW was operated July 24 through October 6, 2017, and is primarily operated to capture, measure, and tag spring Chinook Salmon.

Willow Creek weir (WCW), was located 36.5 rkm (~rm 22.7) upstream from the Trinity River's confluence with the Klamath River (40º 58’ 29.85” N, 123º 38’ 8.61” W) and was operated August 30 through November 8, 2017. The WCW is primarily operated to capture, measure and tag fall Chinook Salmon, Coho Salmon, and adult steelhead.

Trinity River Hatchery (TRH) is located at rkm 179.8 (~rm 111.7) just downstream of Lewiston Dam, the current terminus of anadromy on the main stem Trinity River. Pre-release clipping of fish reared at TRH is performed by TRP and HVTF staff to identify fish of hatchery origin. All steelhead and 25% of Chinook produced at TRH are adipose fin-clipped (ad-clipped) before release. Ad-clipped Chinook are also coded-wire tagged (CWT). Additionally, all Coho reared at TRH have their right maxillary (RM) clipped as a hatchery identifier.

[1] Adipose fin-clipped and coded-wire-tagged (ad-clipped and CWT), hatchery-produced Chinook and right-maxillary (RM)-clipped Coho Salmon.

[2] Spaghetti tags applied by CDFW personnel to salmonids on their up-river migration (spawning run).

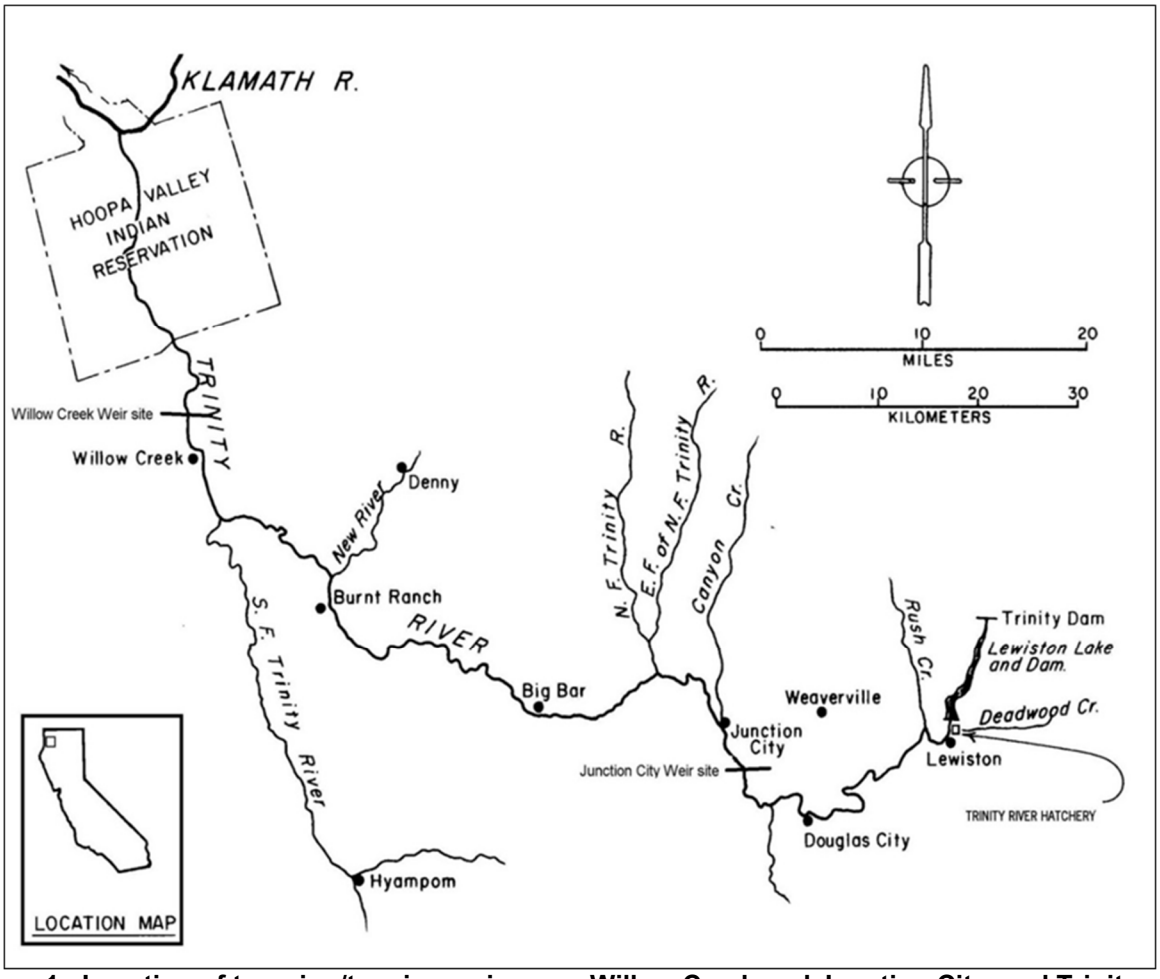

Figure 1. Location of trapping/tagging weirs near Willow Creek and Junction City, and Trinity River Hatchery, in the Trinity River basin, 2017.

Weir and Trap Design

Bertoni (Alaskan-style) weirs operated at both sites consist of fixed picket sections, trap boxes (1-3 per weir) and a boat gate. The weirs are supported by wooden tripods set 2.5 m apart. Weir panels consist of 3.0 m x 1.9 cm (10 ft x ¾ in) electrical conduit spaced less than 5.1 cm apart on center, leaving a gap of 2.5 cm between conduit pieces. Conduit is supported by three sections of aluminum channel arranged 0.92 m apart, which are connected to the supporting tripods. The tripods are anchored with cable to 1.8 m stakes driven into the stream bottom. The weir panels are angled at roughly a 45° angle, with the top of the weir standing 1.8 m above the river bottom (Figure 2 and Figure 3).

At WCW, in 2017, we built a passage tunnel from the opening in the weir approximately 9 m upstream to a trap because there was not an appropriate site for trap placement on the weir line (Figure 4).

Figure 2. Photograph of Alaskan-style weir, tripods, support channels, and conduit (looking upstream). Picture taken at Willow Creek weir, 2017.

Figure 3. Typical Junction City weir (JCW) configuration. This shows the weir in afternoon "open" mode, with conduit raised and boat gate removed.

Figure 4. Configuration of Willow Creek weir in 2017. Note the boat gate on the left, with a tunnel leading to the closer of the two traps, and the far side trap mostly submerged.

The trap boxes are made of 1.9 cm (¾ in) electrical conduit spaced 2.5 cm apart and welded into panels. The panels are wired together at the corners to produce a 2.4 m (8 ft) square box which is fastened to a plywood floor and covered with a plywood lid to prevent fish from jumping out. A fyke, also made of conduit panels, is installed on the downstream side of the trap to guide fish into the trap box and prevent their escape. The trap is placed on the upstream side of the weir, directly in front of 24 raised conduit pieces creating an opening approximately 96 cm. This opening allows fish to pass through the weir, through the fyke, then into the trap.

To allow boat passage at JCW, gates approximately 4.8 m wide are inserted between two weir panels. The gate at JCW is constructed of welded conduit panels with 2.5 cm spacing between pieces of conduit and is perpendicular to the stream substrate. The gate at WCW consisted of two tubular agricultural-type gates covered in coated chain link material which are attached to tripods and, when closed, rest at the same angle as the rest of the weir. A set of light-weight PVC and plastic mesh panels extends the height of the gates.

Trapping for mark/recapture at both weirs is scheduled five nights a week, beginning around dusk of each trapping night, and continuing until mid-day the next day. The fish are processed from the previous night's trapping each morning (usually by 0830 hours) and from the morning’s trapping at approximately 1230 hours.

After the afternoon processing, the weir is opened to allow for fish passage for 4 - 8 hours, until it is again set at dusk for overnight trapping. The opening procedure entails

pulling up approximately 24 conduit/pickets in every other panel (creating a hole approximately 4 feet in width), opening the boat gates (approximately 16 feet in width) and opening the traps (approximately 4 feet per trap). The weir is also opened in the same manner from Friday afternoon to Sunday at dusk. This practice was found to substantially reduce migration delay by a Yurok tribe migration study using radio telemetry (Strange, 2008). Additionally, there is a no fishing zone 750 ft upstream and downstream of the weirs to alleviate fishing-related stress.

Occasionally, trapping schedules are modified to allow for holidays or high flows which prevent trapping in a safe manner. The weirs generally operate in flows ranging from 300 to 1,400 cubic feet per second (cfs). Conduit is raised (at a minimum as above) to allow free passage in periods of high discharge, and trapping will cease if flows reach approximately 1,750 cfs. The weir structure can be modified to remain in place in the river and withstand flows of 3,500 cfs but will be removed from the river entirely if flows are anticipated to exceed 5,000 cfs. Trapping and tagging are not conducted if stream temperatures exceed 21º Celsius.

Processing of Fish at Weirs

All trapped salmonids were identified to species, measured, examined, tagged (mark), and released (see details below). All salmonid carcasses recovered at the weir were measured to the nearest cm fork length (FL), examined for wounds, tags, fin clips, and spawning condition. All heads from ad-clipped Chinook Salmon carcasses were removed for recovery and decoding of the coded wire tag (which the ad clip indicates is in the snout of the fish). After processing, all carcasses are cut in half to prevent recounting and returned to the river downstream of the weir.

All fish are netted in the trap and individually placed into a submerged cradle and measured to the nearest cm FL, and examined for hook, predator, or gill-net wounds or scars, fin clips, signs of disease or parasites or tags. We do not anesthetize any fish, nor do we hold them for any length of time after tagging unless they appear stressed; those we place in an instream recovery tube until they volitionally swim away.

Each untagged, unspawned salmonid judged to be in good condition is tagged with a serially numbered Floy Tag and Manufacturing, Inc. FT-43 spaghetti tag. The 2-millimeter diameter tags are inserted using a solid applicator needle through the fish's back approximately two cm below the base of the dorsal fin, anterior of the posterior edge of the dorsal fin. We tag all salmon regardless of length. Steelhead less than 42 cm FL are considered “*half-pounders*” and not tagged.

In 2017 we collected scales for age determination from every Chinook Salmon in good condition that we encountered at each weir. This differed from our normal methodology of sampling every other Chinook because pre-season projections suggested the run was going to be very small (PFMC 2017), and we wanted to ensure a sufficient sample size for estimating age structure. Scales were removed from the left side of the fish above the lateral line and posterior to the dorsal fin with a sharp knife. Scale samples

were then placed on Rite-in-the-Rain paper, folded, and put in a coin envelope labeled with the date, location, species, length, and tag number.

Tagging of Fish at Weirs

All Chinook tagged at JCW received $20 tags, and steelhead received $10 tags. At WCW, tags with $0 reward, $20 rewards, and $50 rewards were applied to adult steelhead at a 1:1:1 ratio, whereas fall Chinook were tagged 100% with $50 tags until we ran out them in the middle of October, then we used 100% $0 (non-reward) tags. Coho at WCW were tagged with non-reward tags, no Coho were trapped at JCW. Juvenile ("*half-pounder*") steelhead were not tagged at either weir, and natural-origin steelhead (those with intact adipose fins) were not tagged at JCW.

Recovery of Tagged Fish

Fish tagged at JCW and WCW were recovered from four sources: (1) angler return of tags, (2) tags found during Trinity River spawner surveys, (3) tagging mortalities found on or near the tagging weirs, and (4) from fish returning to Trinity River Hatchery.

Angler Tag Returns

Tags returned to the TRP Arcata field office through May 31, 2018 were included in assessing harvest and catch and release rates for the 2017 runs. Tags returned after that date were processed for payment but not used for analysis. Public service announcements distributed to press throughout the Northern California region, posted online in social media and in store-front windows throughout the Trinity basin encouraged the timely (same-season) return of tags.

Trinity River Hatchery Recovery

Trinity River Hatchery commenced 2017-18 spawning operations on September 5, 2017. All fish entering TRH were inspected for TRP tags during spawning operations. All tags were removed and tag information recorded. Scales were collected from every 5th fall Chinook by HVTF personnel (beginning in JW 43), and any fin or maxillary clips or other marks were recorded. Snouts from all ad-clipped Chinook were retained during the spawning process for later CWT reading.

The fish ladder was mechanically closed for a break in spawning of fish October 7 to October 22 (all of Julian weeks 41-42)to temporally segregate spring and fall runs of Chinook. Spawning operations resumed on October 23, 2017. Spawning operations were generally conducted two days per week during the Chinook spawn, with additional spawn days occurring during the peak of the fall Chinook run in November.

Trinity River spring Chinook immigrate mainly between April and September, whereas fall Chinook immigrate August through December. Although CDFW acknowledges temporal overlap of runs, for analysis we designate a hard date for a spring/fall separation point, and we group data by Julian Week (JW) to allow inter-annual comparisons of identical weekly periods (Appendix 1). To determine the separation date

between runs we calculate weekly proportions of spring vs. fall run fish based on expanded CWT recoveries. The JW in which the proportion of fall Chinook entering TRH exceeds 50% is designated as the first week of the fall run, and all fish from that week are designated as fall run. All Chinook arriving prior to that JW are designated as spring run. We also track the arrival of TRP-tagged Chinook from both JCW and WCW at TRH. Tags recovered at TRH prior to the cutoff week are designated spring run, and tags arriving after the cutoff are designated fall run. These run designations, assigned to the weir tagging data, are used to determine cutoff dates at the weirs in the same way as CWT data are used at TRH.

Run-size, Angler Harvest and Spawner Escapement Estimates

Run-size Estimates

Run-size estimates in 2017 for spring and fall Chinook and Coho Salmon and adult steelhead were calculated using Chapman's version[3] of the Petersen Single Census Method [as modified by Ricker (1975)].

$$N = \frac{(M+1)\ (C+1)}{(R+1)}, \text{ where}$$

N = estimated run-size
M = the number of effectively tagged fish[4]
C = the number of fish examined at TRH
R = the number of TRP-marked fish recovered in the hatchery sample.

During the 2017-18 spawning season, we marked and recovered insufficient numbers of jack and adult spring Chinook to obtain stratified jack and adult estimates with 95% confidence intervals for each stratum, therefore the estimate we used was for the total (un-stratified) run-size. We used fork length frequency distribution analysis (identified the nadir in the distribution as the cut-off point between age classes) to arrive at the size threshold to separate jacks from adults for both spring Chinook and Coho Salmon. We then applied the combined TRH/JCW proportion of jacks/adults to estimate the number of jacks/adults in the spring Chinook run and used the TRH/WCW proportion (FL frequency distribution) for the Coho age class split.

We tagged and recovered enough jack and adult fall Chinook to obtain stratified jack and adult estimates. We used HVTF's scale/aging analysis performed for the Klamath River Technical Team (KRTT, 2017) to estimate both the jack and adult populations. Estimates of steelhead abundance upstream of WCW are for adults only.

[3] Chapman, D. G. 1951. Some properties of the hyper-geometric distribution with applications to zoological census. Univ. CA Publ. Stat. 1:131-160, as cited in Ricker (1975).

[4] Effectively tagged means the estimated number of tagged fish minus any tagging mortalities (fish having died within 30 days without spawning), and minus tagged fish anglers caught and released after removing the tag.

Any single digit disagreement in numbers throughout this report is due solely to rounding errors.

RESULTS

Trapping, Tagging and Recovery

Spring/Fall Run Chinook Salmon Separation and Run Timing

Fifty-nine Chinook (both adipose fin-clipped and unclipped) tagged at JCW were subsequently recovered at TRH between JW 36 and 45. Fifty-three of those (14 spring CWT and 34 others) entered TRH before JW 41, while the remaining 13 (one fall CWT and 10 others) entered TRH after the ladder was reopened in JW 43. Based on timing of passage through JCW, the arrival dates of JCW-tagged fish at TRH, and CWT analysis, we designated Chinook that passed through JCW from JW 30 through JW 38 (Figure 5) to be spring run, and those that passed through JCW after JW 38 to be fall run.

One TRH-origin spring CWT fish was tagged at WCW during JW 38 and subsequently recovered at TRH in JW 44, and no Chinook tagged at WCW arrived at TRH prior to JW 43; we determined, therefore, all Chinook tagged at WCW in 2017 to be fall Chinook.

We recovered 7,013 Chinook Salmon at TRH in 2017, of which 1,552 (22.13%) had ad-clips. We recovered CWTs from 328 known spring Chinook and 1,190 from known fall Chinook. Forty Chinook with shed, lost, or unreadable CWTs were classified as either spring- or fall-run based on their date of entry into TRH (as determined above). Spring Chinook CWTs were represented by 17 release (code) groups from the 2012 through 2015 BYs (Appendix 2). Fall Chinook CWTs were composed of 19 release groups representing the 2012 through 2015 BYs.

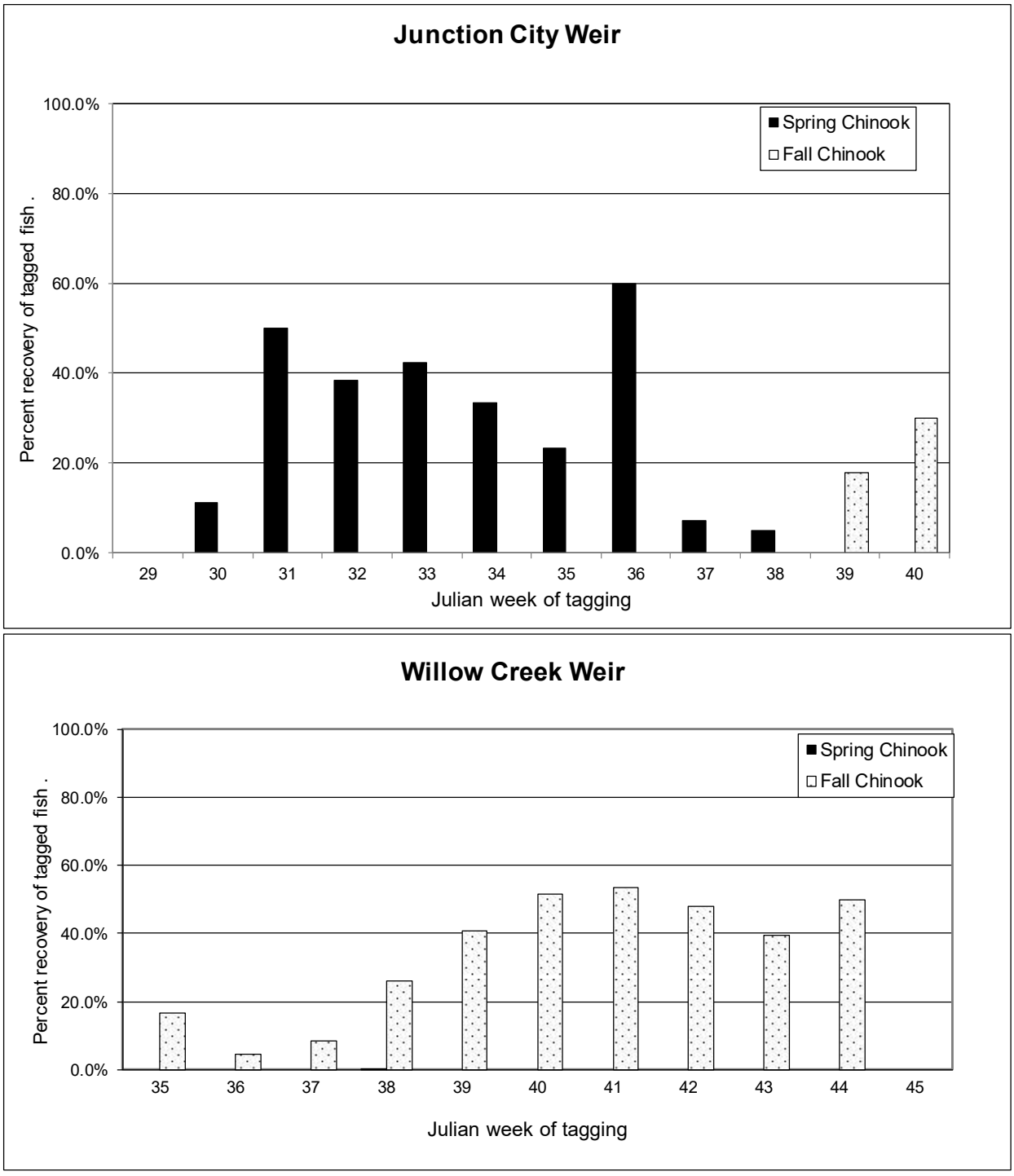

Figure 5. Percent recovery of Junction City weir and Willow Creek weir marked Chinook at Trinity River Hatchery during the 2017-18 season. Junction City weir trapped during Julian weeks 30 through 40; Willow Creek during Julian weeks 35 through 45.

Spring Chinook Salmon Trapping and Tagging

The CDFW and HVTF installed JCW July 24 (JW 30) and trapped the first night. The number of spring Chinook trapped at JCW peaked at 7.5 fish per night during JW 33 (Table 1, Figure 6). The weir was modified in advance of the 2017 ceremonial Boat Dance flow increase, but large woody debris caused a weir malfunction resulting in a few lost days of sampling. A mandatory wildfire evacuation cost additional sampling days. Trapping was completed on October 6, 2017.

A total of 159 spring Chinook were trapped at JCW, all of which were tagged (Appendix 3). One jack tagging mortality and two fish had their tags removed by anglers in the catch-and-release fishery leaving 156 (32 jack and 124 adult) spring Chinook effectively tagged. Three jack and 1 adult were reported as harvested by anglers. Ad-clipped fish comprised 14.5% of the spring Chinook captured (23 of 159) at JCW. Chinook trapped and tagged prior to JW 39 at JCW were determined to be spring Chinook.

Size and Age of Trapped Fish

Spring Chinook trapped at JCW averaged 61.3 cm FL (Figure 7). Fork length distribution analysis shows the nadir separating jack from adult spring Chinook was between 51 and 52 cm FL.

Spring Chinook Salmon Recovery

Angler Tag Recovery

Anglers reported a harvest of three jack and one adult TRP-tagged spring Chinook Salmon, representing an estimated harvest of 104 total fish (Appendix 3). Total harvest rate of TRP-tagged spring Chinook upstream of JCW was 9.38% for jacks, 0.81% for adults. There were two tag returns from adults (none from jacks) in the catch and release fishery.

Spawner Survey Recovery

Main stem Trinity spawner surveys were conducted by TRP personnel in cooperation with Yurok Tribal Fisheries, Hoopa Valley Tribal Fisheries (HVTF), US Forest Service and the US Fish and Wildlife Service from August 30 to December 19, 2017, from TRH to Weitchpec. There were five TRP-tagged adult spring Chinook recovered during the spawner surveys in 2017.

Tagging Mortalities

There was one spring Chinook jack identified as a tagging mortality at JCW in 2017.

Table 1. Weekly summary of spring Chinook Salmon trapped in the Trinity River at Junction City weir during 2017. [a]

			Number trapped							
Julian week	Inclusive dates	Nights trapped	Jacks [b]	Ad-clip Jacks [c]	Adults	Ad-clip Adults	Total trapped	Ad-clips total	Fish/ night	Ad-clips /night
30	23-Jul - 29-Jul	4	1	0	8	1	9	1	2.3	0.3
31	30-Jul - 5-Aug	5	7	3	27	4	34	7	6.8	1.4
32	6-Aug - 12-Aug	5	0	0	13	3	13	3	2.6	0.6
33	13-Aug - 19-Aug	5	10	1	17	2	27	3	5.4	0.6
34	20-Aug 26-Aug	1	1	0	6	1	7	1	7.0	1.0
35	27-Aug 2-Sep	4	11	1	19	2	30	3	7.5	0.8
36	3-Sep 9-Sep	4	2	0	3	2	5	2	1.3	0.5
37	10-Sep - 16-Sep	5	4	1	10	1	14	2	2.8	0.4
38	17-Sep - 23-Sep	5	4	0	16	1	20	1	4.0	0.2
39	24-Sep - 30-Sep	5	8	0	20	2	28	2	5.6	0.4
40	1-Oct - 7-Oct	5	10	1	11	0	21	1	4.2	0.2
	Total:	48	58	7	150	19	208	26		
	Mean:								4.3	0.5

a/ Trapping at Junction City weir took place July 24 - October 6, 2017 (Julian weeks 30-40).
b/ Spring Chinook <52 cm FL were considered jacks in 2017.
c/ Adipose fin-clipped Chinook. Number shown is a subset of weekly jack and adult Chinook totals.

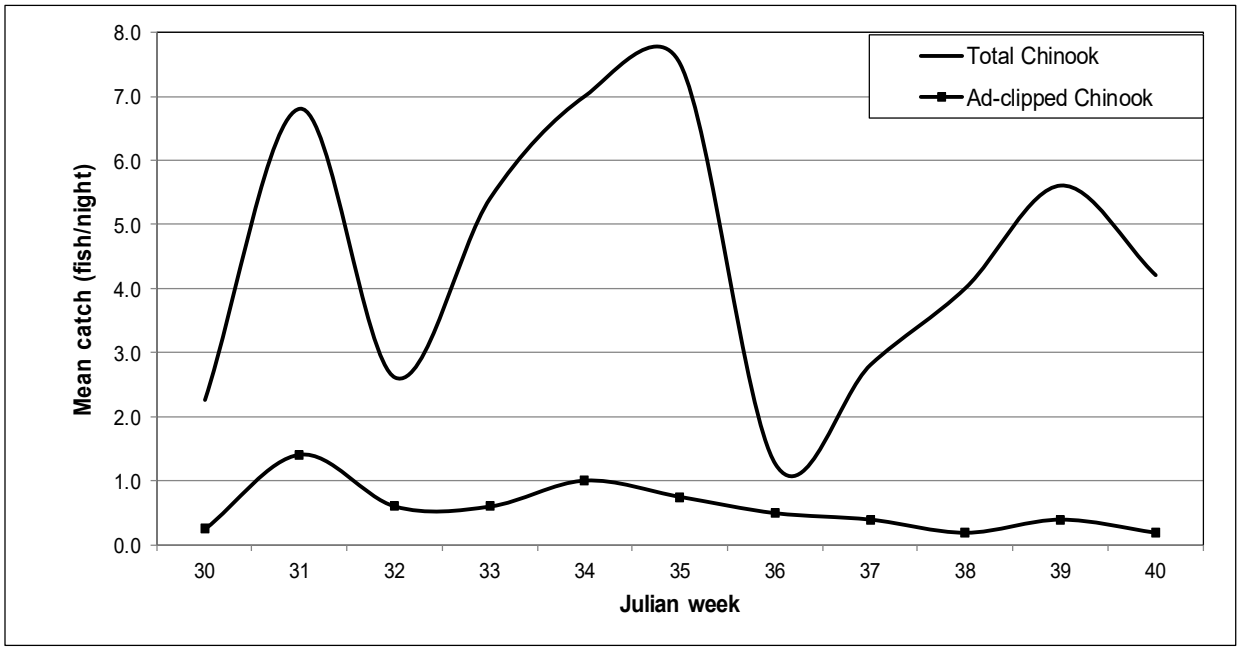

Figure 6. Mean catch of spring Chinook Salmon in the Trinity River at Junction City weir, 2017.

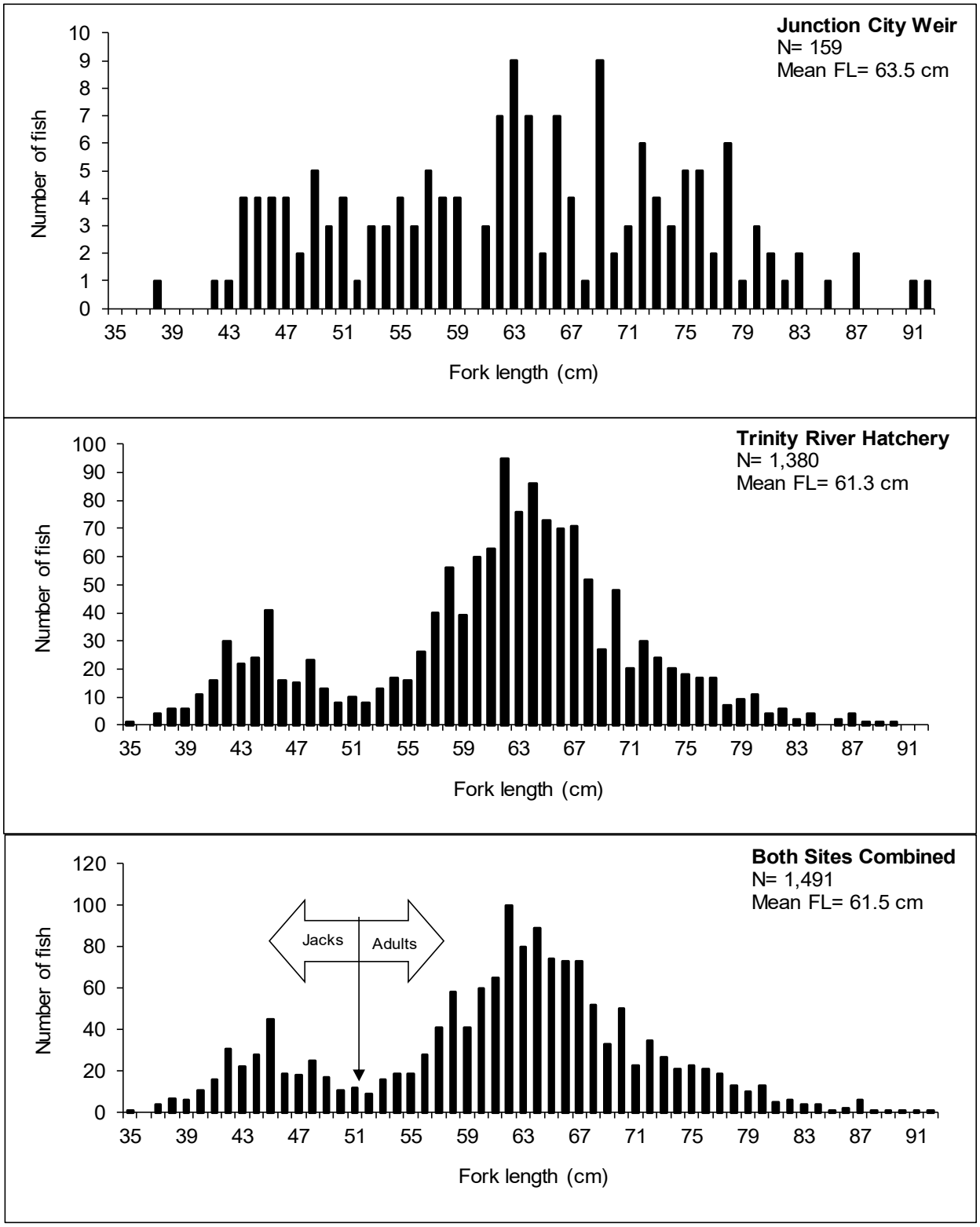

Figure 7. Spring Chinook Salmon fork lengths (cm) observed at Junction City weir, Trinity River Hatchery, and both sites combined during the 2017-18 season. Arrow denotes size used to separate jacks and adults for analysis.

Trinity River Hatchery Recovery

Spring Chinook began entering TRH on September 5, 2017 (JW 36) and continued to enter TRH through JW 40 (Appendix 5). Recovery of spring Chinook peaked in JW 39 with 521 fish, which coincided with the peak week of spring CWT Chinook recovery (Table 2). Of the 156 spring Chinook effectively tagged at JCW, 48 (30.8%) were recovered at TRH. Based on run-timing (by CWT analysis) an estimated 1,380 (246 jack and 1,134 adult) spring Chinook were recovered at TRH, from which 328 readable CWTs were recovered.

Size and Age of Trapped Fish

Spring Chinook trapped at TRH averaged 61.5 cm FL (Figure 7). Fork length distribution analysis shows the nadir separating jack from adult spring Chinook was between 51 and 52 cm FL. Data from known age, hatchery-marked spring Chinook that entered TRH mostly supported the minimum adult fork length of 52 cm. There was some overlap between sizes of age 2 and age 3 fish (Appendix 4), but the mean FL of those CWT brood years (BY) were distinctly different. Applying the minimum adult size of 52 cm FL to the observed population, an estimated 20.8% and 17.8% of the spring Chinook observed were jacks at JCW and TRH, respectively.

Table 2. Recoveries at Trinity River Hatchery (TRH), by Julian week, of TRH-origin coded-wire tagged spring Chinook Salmon during the 2017-18 season.

Coded-wire tag number and release type[b]	Brood year	Number of spring Chinook entering TRH, by Julian week [a]										
		36	37	38	39	40	41	42	43	44	45	Totals
060491-f	2012		1									1
060492-f	2012				2							2
060497-y	2012		3	1								4
060605-f	2013	2		2	1							5
060606-f	2013		1		2	4						7
060607-f	2013		1	4	1	2						8
060612-y	2013	5	1	4	1							11
060689-f	2014	4		11	10	9			1			35
060690-f	2014	22	16	40	21	10						109
060691-f	2014		2	10	9	5			2		1	29
060696-y	2014	2	4	8	18	9						41
068772-f	2014			2	4	1						7
060772-f	2015		1	4	8	4			1			18
060773-f	2015				6	2			1			9
060774-f	2015		1	4	7	4			3	1		20
060779-y	2015		1	5	7	6						19
060781-f	2015				3							3
No CWT[c]		1	1	1	3							6
	Weekly totals:	36	33	96	103	56	0	0	8	1	1	0
												334

a/ Trapping occurred at Trinity River Hatchery September 5, 2017 - March 6, 2018 (JWs 36-10; closed parts or all of JWs 41-43).

b/ Release types are either fingerling (f) or yearling (y).

c/ No CWTs were recovered from these ad-clipped fish. Chinook with shed or lost tags recovered after JW 41 were considered fall run.

Run size, Angler Harvest and Escapement of Coded-wire Tagged Spring Chinook

Based on estimated total spring Chinook run-size above JCW, estimated angler harvest rate, the ad-clip rate of spring Chinook at JCW, and recovery of spring-run CWT fish at TRH, 628 (119 jack and 508 adult) CWT spring Chinook returned to the Trinity River above JCW during the 2017 season (Table 3). We estimate 11 jack and 4 adult CWT spring Chinook were harvested by anglers during the season. Estimated escapement of CWT spring Chinook was 331 fish recovered at TRH and 281 available to spawn in natural areas. Based on CWT recoveries, the estimated known-age composition of the 2017 hatchery-origin spring Chinook run was 119 (19.0%) age 2, 434 (69.1%) age 3, 61 (9.7%) age 4, and 14 (2.2%) age 5 fish.

Table 3. Run-size estimate for Trinity River Hatchery (TRH)-origin, coded-wire tagged spring Chinook Salmon returning to the Trinity River, upstream of Junction City weir, during 2017.

Spring Chinook Run-size estimate		Harvest rates		TRH ad-clipped with	Percentage ad-clipped at weir		Ad+CWT run-size estimates		
Jacks	Adults	Jacks	Adults	CWTs	Jacks	Adults	Jacks	Adults	Total
802	3,623	9.38%	0.81%	98.20%	15.2%	14.3%	119	508	628

2012 Brood Year

The 2017 spawning season was the last year for return of spring Chinook from the 2012 BY. Total contribution of the five (four fingerling and one yearling) 2012 CWT release groups that returned to the Trinity River ranged from 0.02% (a very small fingerling group that was released downstream of the hatchery as trapping efficiency subjects for a different fisheries experiment) to 0.19% (Appendix 6). Percent return of the 2012 BY fingerlings release type was 0.13%, and 0.19% for the yearlings, with a combined final total return rate for all 2012 BY spring Chinook release groups (including all that returned in 2014-2017) of approximately 0.15%, falling well short of the mean return rate of 0.67% since 1986 (Appendix 7 and Figure 8).

Contribution of Hatchery-Origin Spring Chinook to Total Estimated Run-Size

Estimated contribution of TRH-origin spring Chinook to the total Trinity River run-size estimate upstream of JCW was 2,650 fish. This represents 61.4% (493/802) of jacks, 59.5% (2,157/3,623) of adults, and 59.9% (2,650/4,425) overall (Table 4).

Of the 2,157 TRH-origin adult spring Chinook in the run-size estimate, 1,109 escaped to TRH, 1,030 escaped to natural spawning areas and 17 were estimated to have been harvested. The contribution of TRH-origin spring Chinook (at 59.9%) to the total run-size is just above the 25 year mean of 59.1% (Table 5 and Figure 9).

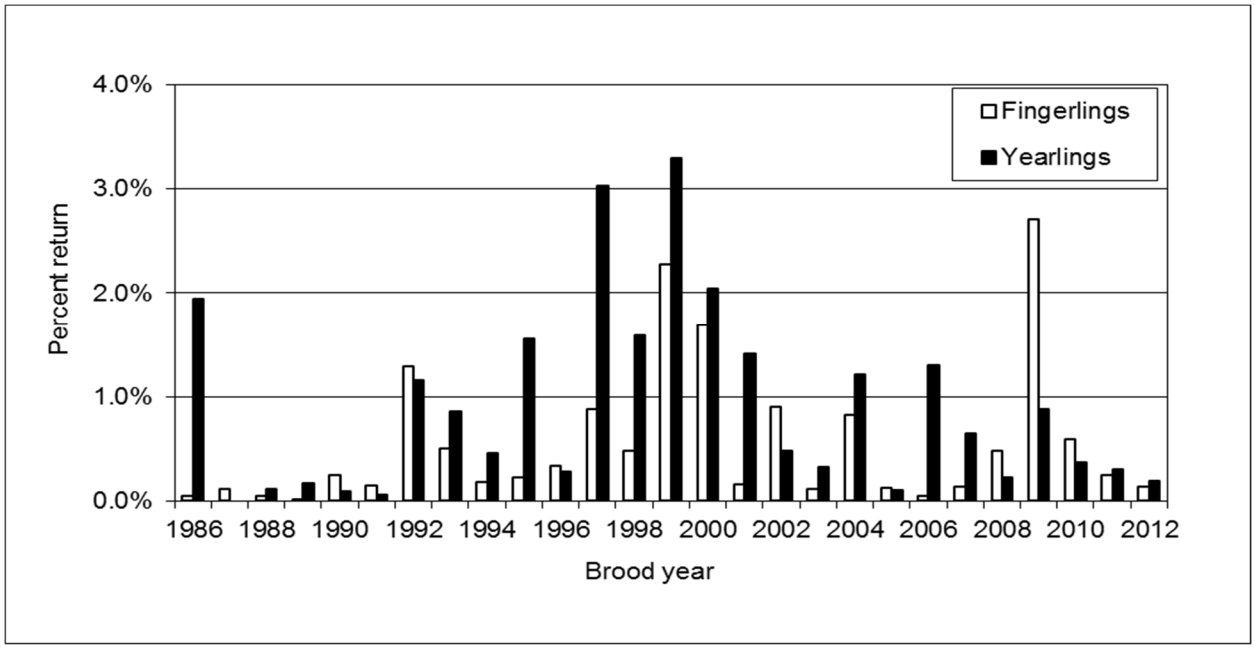

Figure 8. Percent return of Trinity River Hatchery origin, coded-wire tagged, spring Chinook Salmon, brood years 1986-2012.

Table 4. Estimated run-size, angler harvest, and spawner escapement estimates, by tag code, of Trinity River Hatchery-origin, spring Chinook Salmon and associated expanded estimates for unmarked releases (hatchery multiplier) returning to the Trinity River during the 2017-18 season. [a]

CWT code [b]	BY [c]	Age	TRH expansion factor [d]	TRH Total CWTs [e]	Percent of total CWTs	Run-size	Expanded run-size [f]	Angler harvest	Expanded angler harvest [f]	Spawning escapement					
										TRH	Expanded TRH [f]	River	Expanded River [fg]	Total [h]	Expanded Total
Adults															
060491-f	12	5	4.17	1.00	0.38%	1.94	8.10	0.02	0	1.00	4	0.93	4	1.93	8
060492-f	12	5	4.21	2.04	0.78%	3.97	16.71	0.03	0	2.04	9	1.90	8	3.94	17
060497-y	12	5	4.31	4.00	1.53%	7.78	33.50	0.06	0	4.00	17	3.72	16	7.72	33
060605-f	13	4	4.22	5.08	1.94%	9.87	41.70	0.08	0	5.08	21	4.72	20	9.79	41
060606-f	13	4	4.15	7.04	2.69%	13.69	56.75	0.11	0	7.04	29	6.54	27	13.58	56
060607-f	13	4	4.15	8.02	3.07%	15.60	64.79	0.13	1	8.02	33	7.45	31	15.47	64
060612-y	13	4	4.22	11.16	4.27%	21.71	91.53	0.18	1	11.16	47	10.37	44	21.53	91
060689-f	14	3	4.27	35.32	13.51%	68.70	293.67	0.56	2	35.32	151	32.82	140	68.14	291
060690-f	14	3	4.27	110.05	42.10%	214.03	912.90	1.73	7	110.05	469	102.25	436	212.29	906
060691-f	14	3	4.14	29.20	11.17%	56.80	234.92	0.46	2	29.20	121	27.13	112	56.34	233
060696-y	14	3	4.27	41.42	15.84%	80.55	344.28	0.65	3	41.42	177	38.48	164	79.90	341
068772-f	14	3	4.23	7.08	2.71%	13.77	58.20	0.11	0	7.08	30	6.58	28	13.66	58
		Adult totals:		**261.41**	**100.00%**	**508.41**	**2,157**	**4.12**	**17**	**261.41**	**1,109**	**242.88**	**1,030**	**504.29**	**2,140**
Jacks															
060772-f	15	2	4.15	18.17	26.08%	31.11	129.25	2.92	12	18.17	75	10.02	42	28.19	117
060773-f	15	2	4.12	9.13	13.10%	15.63	64.35	1.47	6	9.13	38	5.04	21	14.17	58
060774-f	15	2	4.13	20.18	28.96%	34.56	142.58	3.24	13	20.18	83	11.13	46	31.32	129
060779-y	15	2	4.08	19.14	27.47%	32.77	133.78	3.07	13	19.14	78	10.56	43	29.70	121
060781-f	15	2	4.36	3.06	4.39%	5.24	22.87	0.49	2	3.06	13	1.69	7	4.75	21
		Jack totals:		**69.68**	**100.00%**	**119.32**	**492.82**	**11.19**	**46**	**69.68**	**288**	**38.44**	**159**	**108.12**	**447**
		Spring Totals:		**331.09**		**627.72**	**2,650**	**15.31**	**64**	**331.09**	**1,397**	**281.32**	**1,189**	**612.41**	**2,586**

a/ Estimate is for upstream of Junction City weir.
b/ CWT=coded-wire tag code. Fish are of the same race and release type (f=fingerling and y=yearling).
c/ BY=brood year.
d/ Expansion factors used to account for untagged releases of the same BY and release type for each CWT group.
e/ Number of ad-clipped fish observed at Trinity River Hatchery, expanded by the number of ad-clipped fish with lost or unreadable tags.
f/ Expanded run-size, angler harvest, TRH escapement and river (natural area) escapement estimates are the product of each of those respective estimates multiplied by the TRH expansion factors.
g/ River (natural area) escapement estimates equal the total escapment minus the TRH escapement.
h/ Run-size estimate minus harvest estimate equals escapment estimate.

Table 5. Estimated contributions of Trinity River Hatchery (TRH)-origin spring Chinook to total estimated run-size above Junction City weir, 1991-2017 seasons.

Year	Run-size	TRH component	Natural component	% TRH composition
1991	2,381	1,016	1,365	42.7%
1992	4,030	1,794	2,236	44.5%
1993	5,232	3,206	2,026	61.3%
1994	6,788	2,659	4,129	39.2%
1995	No estimate	No estimate	No estimate	No estimate
1996	23,416	12,524	10,892	53.5%
1997	20,039	8,303	11,736	41.4%
1998	16,167	8,774	7,393	54.3%
1999	11,293	7,616	3,677	67.4%
2000	26,083	19,730	6,353	75.6%
2001	19,622	12,051	7,571	61.4%
2002	38,485	24,599	13,886	63.9%
2003	47,795	33,546	14,249	70.2%
2004	16,147	11,324	4,823	70.1%
2005	13,984	10,966	3,018	78.4%
2006	7,483	3,649	3,834	48.8%
2007	14,835	12,099	2,736	81.6%
2008	10,283	4,577	5,706	44.5%
2009	7,426	3,973	3,453	53.5%
2010	11,285	4,505	6,780	39.9%
2011	19,219	9,846	9,373	51.2%
2012	25,617	16,306	9,311	63.7%
2013	8,961	6,146	2,815	68.6%
2014	6,959	4,828	2,131	69.4%
2015	4,408	3,085	1,323	70.0%
2016	3,904	2,389	1,515	61.2%
2017	4,425	2,650	1,775	59.9%
Means:	14,472	8,929	5,543	59.1%

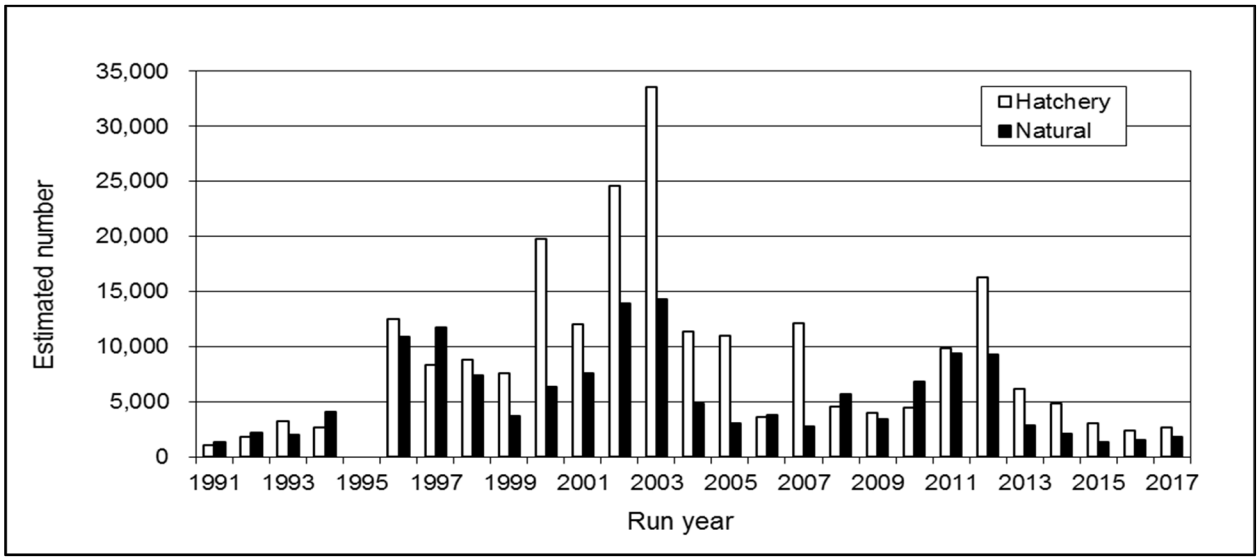

Figure 9. Hatchery and natural contributions to total spring Chinook run-size, upstream of Junction City weir, 1991 – 2017.

Spring Chinook Run-size, Angler Harvest and Spawner Escapement Estimates

An estimated 4,425 (95% CI 3,387 – 5,959) spring Chinook, composed of 802 jack and 3,623 adults, migrated into the Trinity River basin upstream of JCW in 2017 (Appendix 8). Based on expansions of the tags returned by anglers, we estimate angler harvest of 75 jack and 29 adult spring Chinook during the 2017 season. Spawning escapement above JCW was an estimated 4,320 fish, including the 1,380 spring Chinook that entered TRH and 2,940 estimated natural area spawners (Appendix 9). The escapement of 1,454 natural-origin adult spring Chinook was 24.2% of the TRRP goal of 6,000 (Appendix 10.). This year's run-size estimate is approximately 27.5% of the 38-year average of 16,088. Estimated spring Chinook run-size has ranged from 2,381 fish in 1991 to 62,692 fish in 1988 (Appendix 11 - 13).

Fall Chinook Salmon Trapping and Tagging

Willow Creek weir was installed August 28th and started trapping August 29th (JW 35) in 2017. The number of fall Chinook captured at WCW peaked during JW 39, with 126.2 fish per night (Table 6 and Figure 10). Trinity River Project personnel pulled conduit November 8th to ready the weir for a forecasted rain event. Continued high flows precluded any further trapping in 2017.

A total of 1,892 fall Chinook were trapped at WCW. Of those 1,892 fish, 24 were not tagged due to poor condition, three succumbed to post-tagging stress and died, and 90 had their tags removed by catch-and-release anglers, leaving 1,775 (845 jack and 930 adult) effectively tagged (Appendix 14). Ad-clipped fish comprised 11.73% of the fall Chinook captured (222 of 1,892) at WCW. Through CWT analysis (and entry date of tagged WCW fish to TRH as described in "*Spring/Fall Run Chinook Salmon Separation and Run Timing*", above) all Chinook trapped at WCW in 2017 were designated to be fall Chinook.

Size and Age of Trapped Fish

Fall Chinook trapped at WCW and TRH averaged 57.3 and 58.9 cm FL, respectively, with a combined average of 58.6 cm FL (Figure 11). Preliminarily, using fork length distribution analysis, the nadir separating jacks from adults was between 54 and 55 cm FL. Data from known age, hatchery-marked fall Chinook that entered TRH supported that minimum adult fork length of 55 cm. As with spring Chinook, there was some overlap between sizes of age 2 and age 3 fish (Appendix 15), but, similar to spring Chinook, the mean FL for the two age classes was distinctly different. We used scales collected at WCW and TRH and aged by HVTF to estimate proportions of jacks at 47.6% and 32.9% at WCW and TRH, respectively. The HVTF age proportions were used to divide jacks from adults in the final run-size estimates.

Table 6. Weekly summary of Chinook Salmon trapped in the Trinity River at Willow Creek weir during 2017.[a]

			Number trapped						
Julian week	Inclusive dates	Nights trapped	Jacks [b]	Ad-clip[c] Jacks	Adults	Ad-clip Adults	Total	Ad-clip total	Fish/ night
35	27-Aug - 2-Sep	2	4		3		7	0	3.5
36	3-Sep - 9-Sep	4	82		52	3	134	3	33.5
37	10-Sep - 16-Sep	5	108	3	69	5	177	8	35.4
38	17-Sep - 23-Sep	5	150	14	185	11	335	25	67.0
39	24-Sep - 30-Sep	5	345	56	286	35	631	91	126.2
40	1-Oct - 7-Oct	5	112	19	162	22	274	41	54.8
41	8-Oct - 14-Oct	5	57	8	96	15	153	23	30.6
42	15-Oct - 21-Oct	5	21	2	111	21	132	23	26.4
43	22-Oct - 28-Oct	5	8	1	26	4	34	5	6.8
44	29-Oct - 4-Nov	5	1		10	3	11	3	2.2
45	5-Nov - 11-Nov	3	0		4		4	0	1.3
	Total:	49	888	103	1,004	119	1,892	222	
	Mean:								38.6

a/ Trapping at Willow Creek weir took place August 30 - November 8, 2017 (Julian weeks 35-45).
All Chinook trapped at Willow Creek weir in 2017 were considered Fall run.
b/ Chinook <56 cm FL were considered jacks in 2017 for this table, though scale-age proportions were used elsewhere in this report.
c/ Adipose fin-clipped Chinook. Number shown is a subset of weekly jack and adult Chinook totals.

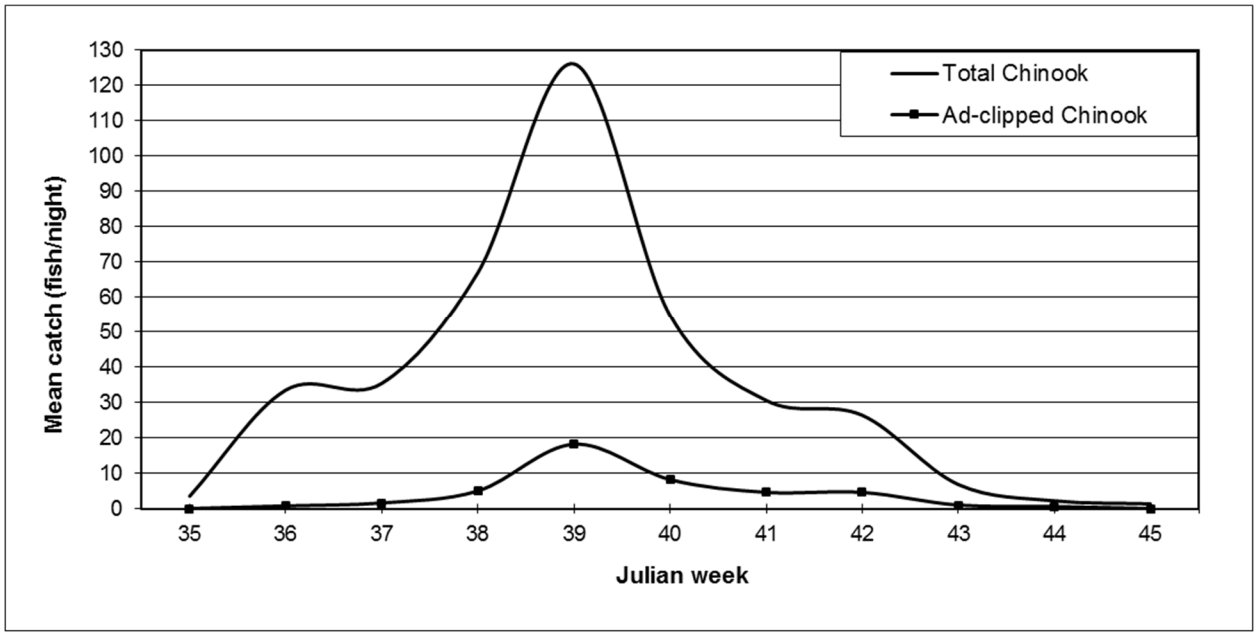

Figure 10. Mean catch of fall Chinook Salmon in the Trinity River at Willow Creek weir, 2017.

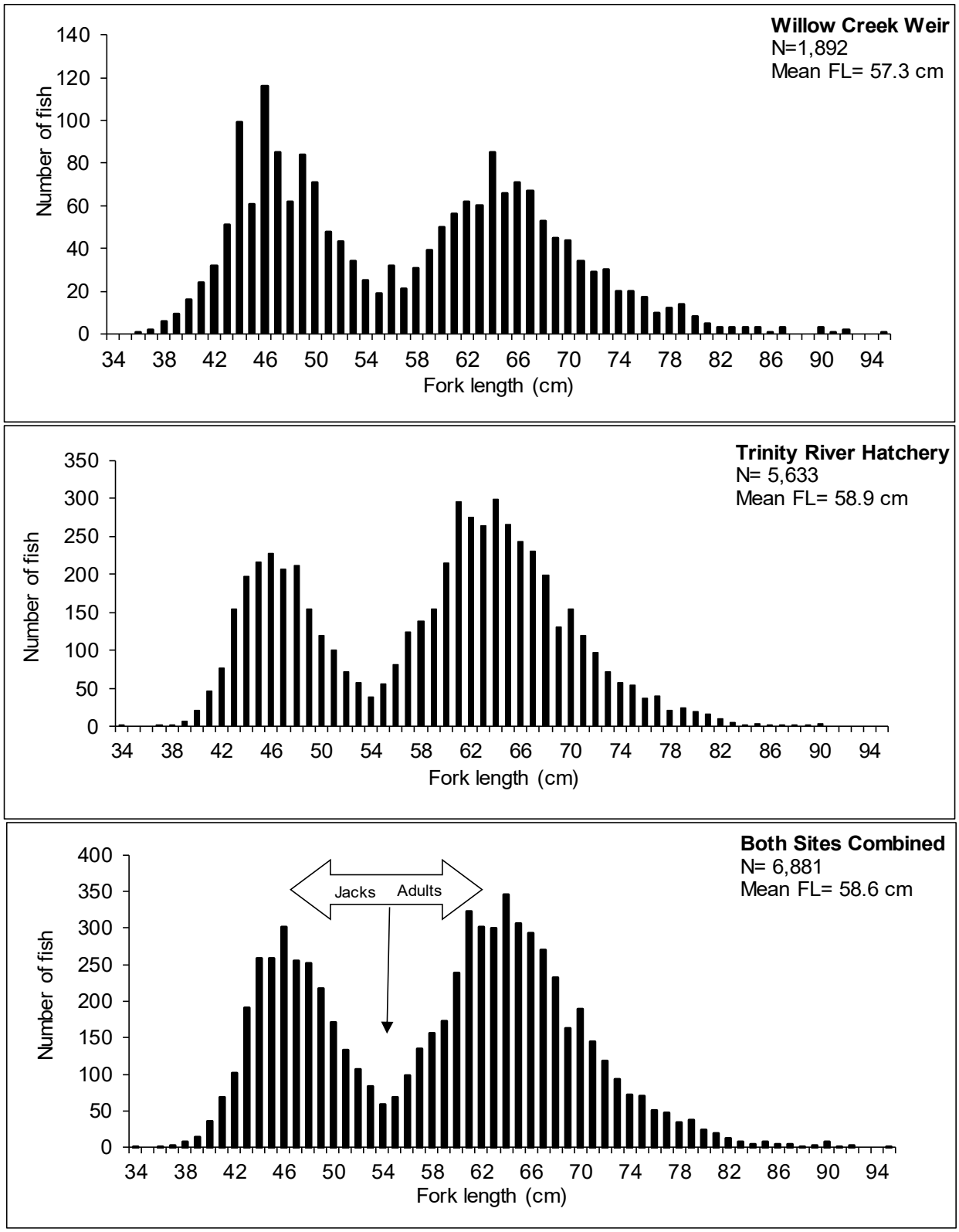

Figure 11. Fork length frequency distribution of fall Chinook Salmon at Willow Creek weir and Trinity River Hatchery, 2017.

Fall Chinook Salmon Recovery

Angler Tag Recovery

There was no legal fall Chinook fishery in the Trinity in 2017, resulting in zero TRP-tagged fall Chinook reported harvested (Appendix 14) and a total harvest rate of TRP-tagged fall Chinook upstream of WCW of 0.0% for jacks, 0.0% for adults. There were, however, 90 tag returns from fall Chinook caught and released in the steelhead fishery, and 11 tags found loose, no fish attached, returned by anglers or other river users.

Spawner Survey Recovery

Forty-one TRP-tagged fall Chinook were recovered during spawner surveys in 2017.

Tagging Mortalities

There were three observed fall Chinook tagging mortalities at WCW in 2017.

Trinity River Hatchery Recovery

All CWT fall Chinook entered TRH in JWs 43 – 50, the traditional fall spawning period. Peak week for CWT arrivals was JW 46 (Table 7) when 315 CWTs entered TRH. Recovery of fall Chinook peaked in JW 46 when 1,505 fish entered (Appendix 5). Of the 1,775 fall Chinook effectively tagged at WCW, 633 (35.7%) were recovered at TRH. Based on run-timing (from CWT analysis) an estimated 5,633 (1,855 jack and 3,778 adult) fall Chinook entered TRH, from which 1,190 readable CWTs were recovered.

Run size, Angler Harvest and Escapement of Coded-wire Tagged Fall Chinook

Based on estimated total fall Chinook run-size above WCW, estimated angler harvest rate, the ad-clip rate at WCW, and recovery of fall-run CWT fish at TRH, we estimate 1,784 (665 jack and 1,119 adult) CWT fall Chinook returned to the Trinity River above WCW during the 2017 season, and zero CWT fall fish were harvested by anglers (Table 8). Escapement of CWT fall Chinook was estimated at 1,199 fish recovered at TRH and 584 estimated available to spawn in natural areas. Age composition derived from known age CWT recoveries in 2017 indicate the hatchery origin fall Chinook run was composed of 665 (37.3%) age 2; 1,028 (57.7%) age 3; 82 (4.61%) age 4; and 8 (0.5%) age 5 fish.

2012 Brood Year

The 2017 spawning season was the last year for return of fall Chinook Salmon from the 2012 BY. Total contribution of the six (five fingerling and one yearling) 2012 BY tag code release groups that returned to the Trinity River ranged from 0.01% (a fingerling group) to 0.32% (the yearling group) (Appendix 16). Percent return of the combined 2012 BY fingerlings release type was 0.02%, and 0.32% for the yearlings (Figure 12), with a combined final total return rate for all 2012 BY fall Chinook release groups (including all that returned in 2014-2017) of approximately 0.13%, well below the mean return rate of 0.77% since 1986 (Appendix 17).

Table 7. Recoveries at Trinity River Hatchery, by Julian week, of TRH-origin coded-wire tagged fall Chinook Salmon during the 2017-18 season. [a]

CWT number and release type [b]	Brood year	43	44	45	46	47	48	49	50	Totals
060499-f	2012		1							1
060504-y	2012	1	1	1	1	1				5
060608-f	2013		2	1						3
060609-f	2013				2	1				3
060610-f	2013	1		1	1					3
060611-f	2013				2					2
060613-y	2013	6	23	7	10	1	1			48
060615-f	2014		1							1
060692-f	2014	19	41	19	18	5	2			104
060693-f	2014	11	20	16	15	14	2			78
060694-f	2014	1		3	7	2	2	2		17
060697-f	2014	30	95	104	158	81	48	10	2	528
068829-f	2014	1	2	2	4	2		1		12
060775-f	2015	5	27	14	10	3				59
060776-f	2015	6	26	13	13	7	2			67
060777-f	2015		9	5	11	5	6			36
060778-f	2015	2	6	2	9	3	1	1		24
060780-y	2015	15	54	40	47	22	16	1		195
060782-f	2015				2	1	1			4
No CWT [c]		3	5	5	5	1	2			21
Weekly totals:		101	313	233	315	149	83	15	2	1,211

a/ Although trapping occurred at Trinity River Hatchery September 5, 2017 - March 6, 2018 (JWs 36-10; closed parts or all of JWs 41-43) all fall CWT salmon entered during the traditional fall spawning window after JW 42..
b/ Release types are either fingerling (f) or yearling (y).
c/ No CWTs were recovered from these ad-clipped fish. Chinook with shed or lost tags recovered after Julian week 42 were considered fall Chinook.

Table 8. Run-size estimate for Trinity River Hatchery (TRH)-origin coded-wire tagged fall Chinook Salmon returning to the Trinity River, upstream of Willow Creek weir, during the 2017-18 season.

Fall Chinook Run-size estimate		Harvest rates		TRH Ad-clipped with CWTs	Percentage ad-clipped at WCW		Ad+CWT run-size estimates		
Jacks	Adults	Jacks	Adults		Jacks	Adults	Jacks	Adults	Total
5,837	9,613	0.00%	0.00%	98.2%	11.60%	11.85%	665	1,119	1,784

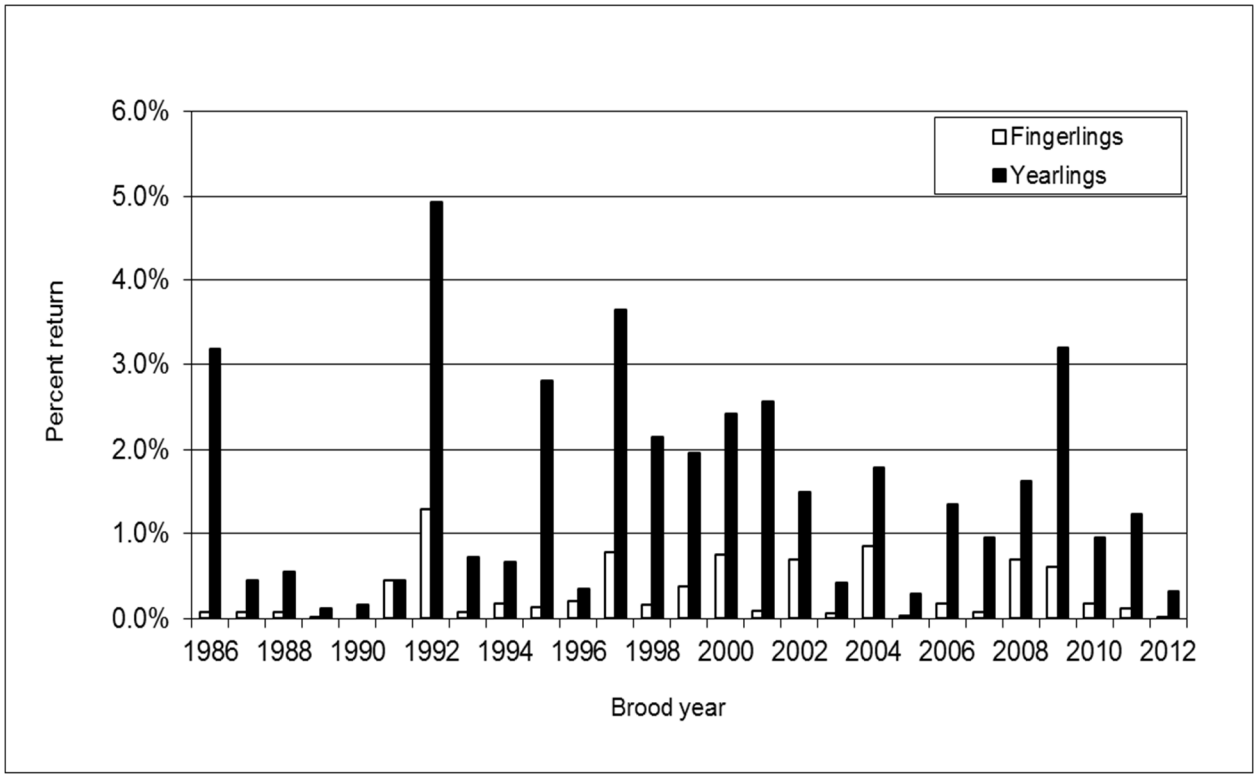

Figure 12. Percent return of Trinity River Hatchery origin, coded-wire tagged, fall Chinook Salmon, brood years 1986-2012.

Contribution of Hatchery-Origin Fall Chinook to Total Estimated Run-Size

Estimated contribution of hatchery-origin fall Chinook to the total Trinity River run-size estimate upstream of WCW was 7,393 fish. This represents 46.9% (2,741/5,837) of jacks, 48.4% (4,652/9,613) of adults, and 47.9% (7,393/15,450) overall (Table 9). Of the 4,652 TRH adult fall Chinook in the run-size estimate 3,375 escaped to TRH, 1,277 escaped to natural areas, and none were estimated as harvested. The contribution of TRH-origin fall Chinook (47.9%) to the total run-size is similar to the 27 year mean of 49.8% (Table 10 and Figure 13).

Table 9. Estimated run-size, angler harvest, and spawner escapement estimates for Trinity River Hatchery-origin fall Chinook Salmon expanded for unmarked releases (hatchery multiplier) returning to the Trinity River during the 2017-18 season. [a]

CWT code [b]	BY [c]	Age	TRH expansion factor [d]	TRH Total CWTs [e]	Percent of total CWTs	Run-size	Expanded run-size [f]	Angler harvest	Expanded angler harvest [f]	Spawning escapement					
										TRH	Expanded TRH [f]	River	Expanded River [fg]	Escapement Total [h]	Expanded Total
Adults															
060499-f	12	5	4.94	1.01	0.12%	1.40	6.90	0.00	0.00	1.01	5.01	0.38	1.89	1.40	6.90
060504-y	12	5	4.44	5.04	0.62%	6.95	30.88	0.00	0.00	5.04	22.41	1.91	8.48	6.95	30.88
060608-f	13	4	4.10	3.03	0.37%	4.18	17.14	0.00	0.00	3.03	12.43	1.15	4.70	4.18	17.14
060609-f	13	4	4.12	3.03	0.37%	4.17	17.20	0.00	0.00	3.03	12.48	1.14	4.72	4.17	17.20
060610-f	13	4	4.08	3.02	0.37%	4.17	17.00	0.00	0.00	3.02	12.34	1.14	4.67	4.17	17.00
060611-f	13	4	4.08	2.02	0.25%	2.78	11.35	0.00	0.00	2.02	8.23	0.76	3.11	2.78	11.35
060613-y	13	4	4.12	48.49	5.97%	66.83	275.36	0.00	0.00	48.49	199.77	18.35	75.58	66.83	275.36
060615-f	14	3	4.13	1.01	0.12%	1.40	5.76	0.00	0.00	1.01	4.18	0.38	1.58	1.40	5.76
060692-f	14	3	4.09	105.00	12.94%	144.73	592.58	0.00	0.00	105.00	429.92	39.73	162.66	144.73	592.58
060693-f	14	3	4.08	78.67	9.69%	108.44	441.96	0.00	0.00	78.67	320.64	29.77	121.32	108.44	441.96
060694-f	14	3	4.28	17.10	2.11%	23.58	101.01	0.00	0.00	17.10	73.28	6.47	27.73	23.58	101.01
060697-y	14	3	4.18	532.04	65.56%	733.34	3,064.65	0.00	0.00	532.04	2,223.41	201.30	841.24	733.34	3,064.65
068829-f	14	3	4.21	12.10	1.49%	16.67	70.23	0.00	0.00	12.10	50.96	4.58	19.28	16.67	70.23
		Adult totals:		**811.57**	**100.00%**	**1,118.64**	**4,652.03**	**0.00**	**0.00**	**811.57**	**3,375.06**	**307.06**	**1,276.97**	**1,118.64**	**4,652.03**
Jacks															
060775-f	15	2	4.10	59.57	15.34%	102.00	418.62	0.00	0.00	59.57	244.49	42.43	174.13	102.00	418.62
060776-f	15	2	4.09	67.62	17.41%	115.78	473.24	0.00	0.00	67.62	276.39	48.16	196.85	115.78	473.24
060777-f	15	2	4.12	36.28	9.34%	62.12	256.10	0.00	0.00	36.28	149.58	25.84	106.53	62.12	256.10
060778-f	15	2	4.13	24.21	6.24%	41.46	171.24	0.00	0.00	24.21	100.01	17.24	71.23	41.46	171.24
060780-y	15	2	4.14	196.62	50.63%	336.65	1,392.38	0.00	0.00	196.62	813.21	140.03	579.17	336.65	1,392.38
060782-f	15	2	4.28	4.03	1.04%	6.89	29.52	0.00	0.00	4.03	17.24	2.87	12.28	6.89	29.52
		Jack totals:		**388.33**	**100.00%**	**664.90**	**2,741.10**	**0.00**	**0.00**	**388.33**	**1,600.93**	**276.57**	**1,140.18**	**664.90**	**2,741.10**
Fall Chinook CWT Totals:				**1,199.91**		**1,783.54**	**7,393.13**	**0.00**	**0.00**	**1,199.91**	**4,975.98**	**583.63**	**2,417.15**	**1,783.54**	**7,393.13**

a/ Estimate is for upstream of Willow Creek weir (WCW).
b/ CWT=coded-wire tag code. Fish are of the same race and release type (f=fingerling and y=yearling).
c/ BY=brood year.
d/ Expansion factors used to account for untagged releases of the same BY and release type for each CWT group.
e/ Number of ad-clipped fish observed at Trinity River Hatchery, expanded by the number of ad-clipped fish with lost or unreadable tags.
f/ Expanded run-size, angler harvest, TRH escapement and river (natural area) escapement estimates are the product of each of those respective estimates multiplied by the TRH expansion factors.
g/ River (natural area) escapement estimates equal the total escapment minus the TRH escapement.
h/ Run-size estimate minus harvest estimate equals escapment estimate.

Fall Chinook Run-size, Angler Harvest and Spawner Escapement Estimates

An estimated 15,450 fall-run Chinook migrated upstream of WCW in 2017 (Appendix 8). The stratified run-size of 5,837 jacks (95% CI 5,212 – 6,502) and 9,613 adult fall Chinook adults (95% CI 8,701 – 10,573) was comprised of an estimated 4,961 natural-origin adults, 3,096 natural-origin jacks, 4,652 hatchery-origin adults and 2,741 hatchery-origin jacks. There was no harvest reported (there was no legal harvest of fall Chinook in 2017) so the total escapement is the same as the estimated run-size (Appendix 9). Escapement of 4,475 natural-origin adult fall Chinook is 8.0% of the 62,000 fish TRRP goal (Appendix 10).

Table 10. Estimated contributions of Trinity River Hatchery (TRH)-origin fall Chinook Salmon to total estimated run-size above Willow Creek weir, 1991-2017.

Year	Run-size	TRH component	Natural component	% TRH composition
1991	9,207	5,597	3,610	60.8%
1992	14,164	4,651	9,513	32.8%
1993	10,485	1,499	8,986	14.3%
1994	21,924	11,880	10,044	54.2%
1995	105,725	53,263	52,462	50.4%
1996	55,646	20,824	34,822	37.4%
1997	21,347	9,977	11,370	46.7%
1998	43,189	23,536	19,653	54.5%
1999	18,516	13,081	5,435	70.6%
2000	55,473	38,881	16,592	70.1%
2001	57,109	33,984	23,125	59.5%
2002	18,156	6,884	11,272	37.9%
2003	64,362	52,944	11,418	82.3%
2004	29,534	25,956	3,578	87.9%
2005	28,231	19,674	8,557	69.7%
2006	34,912	21,768	13,144	62.4%
2007	58,873	24,633	34,240	41.8%
2008	22,997	8,585	14,412	37.3%
2009	29,593	10,072	19,521	34.0%
2010	40,792	15,853	24,939	38.9%
2011	80,818	32,875	47,943	40.7%
2012	73,666	32,735	40,931	44.4%
2013	36,989	13,371	23,618	36.1%
2014	37,829	20,463	17,366	54.1%
2015	10,365	4,531	5,834	43.7%
2016	6,196	2,188	4,008	35.3%
2017	15,450	7,393	8,057	47.9%
Means:	37,094	19,152	17,943	49.8%

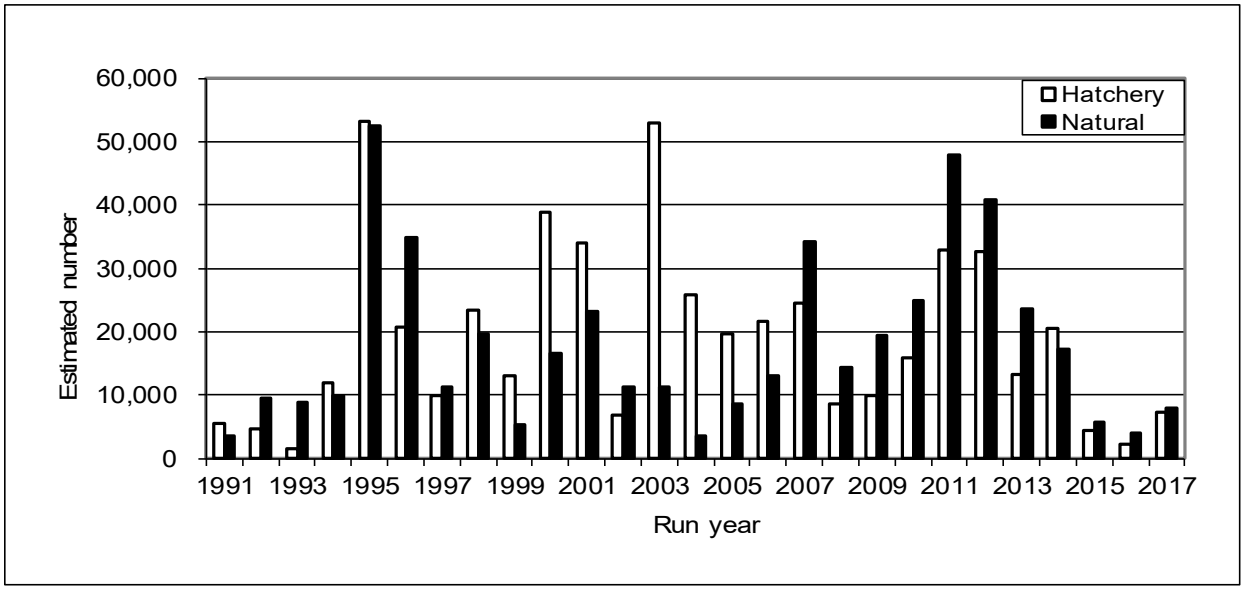

Figure 13. Hatchery and natural contributions to total fall Chinook Salmon run-size, upstream of Willow Creek weir, 1991 - 2017.

Coho Salmon Trapping and Tagging

A total of 57 Coho Salmon (28 jack and 29 adults) were trapped at WCW during the 2017 season. Coho were trapped in JWs 39 – 45, peaking in JW 41 with a mean of 3.2/night. (Table 11, Figure 14); 91.2% were right-maxillary (RM) clipped, indicating TRH origin.

Size and Age of Trapped Fish

Coho trapped at WCW and TRH averaged 48.8 and 52.7 cm FL, respectively, with a combined average of 52.5 cm FL (Figure 15). Using FL distribution analysis of Coho trapped at WCW and TRH, the nadir separating jack from adult Coho was between 48 and 49 cm FL. Based on the nadir, jacks comprised 49.1% of the run at WCW, and 35.7% at TRH.

Coho Salmon Recovery

Angler Tag Recovery

There was no reported harvest of TRP-tagged Coho in 2017 (Appendix 21), and no tags were returned from the catch and release fishery.

Spawner Survey Recovery

There were no reported TRP-tagged Coho recovered during spawner surveys in 2017.

Tagging Mortalities

We observed zero Coho mortalities at WCW in 2017.

Trinity River Hatchery Recovery

The first Coho entered TRH during JW 43 and they continued returning through JW 4 of 2018 (Appendix 5). The run peaked in JW 48 when 95 Coho entered TRH. A total of 420 Coho (150 jack and 270 adults) were recovered at TRH during the season. Of the 55 Coho effectively tagged at WCW, 35 were recaptured at TRH.

Of the 420 Coho that entered TRH in 2017, we observed 396 (94.3%) with right-maxillary (RM) clips, indicating TRH-origin; 24 (5.7%) had no clip. Unclipped fish are assumed to be natural-origin Coho Salmon.

Based on length frequency analysis, TRH-origin RM-clipped Coho were assigned into two brood years (Table 12). The 149 Coho measuring less than 49 cm FL were considered jacks (age 2, from the 2015 BY), and the 247 greater than 48 cm FL were considered adults (age 3, from the 2014 BY). The 24 Coho without RM clips that entered the hatchery were also considered jacks or adults based on those lengths.

Table 11. Weekly summary of Coho Salmon trapped in the Trinity River at Willow Creek weir during 2017.[a]

Julian week	Inclusive dates	Nights trapped	Number trapped: Jacks[b]	RM clip[c] Jacks	Adults	RM clip Adults	Total trapped	Total RM clips	Total Coho
39	24-Sep - 30-Sep	5	3	3	1	0	4	3	0.8
40	1-Oct - 7-Oct	5	5	5	2	2	7	7	1.4
41	8-Oct - 14-Oct	5	12	11	4	3	16	14	3.2
42	15-Oct - 21-Oct	5	5	5	6	6	11	11	2.2
43	22-Oct - 28-Oct	5	1	1	1	1	2	2	0.4
44	29-Oct - 4-Nov	5	2	2	12	10	14	12	2.8
45	5-Nov - 11-Nov	3	0	0	3	3	3	3	1.0
	Total:	33	28	27	29	25	57	52	
	Mean:								1.7

a/ Trapping at Willow Creek weir took place August 30 -November 8, 2017 (Julian weeks 39 - 45).
b/ Coho <49cm FL were considered jacks in 2017.
c/ Right maxillary clipped Coho. Number shown is a subset of weekly jack and adult Coho totals.

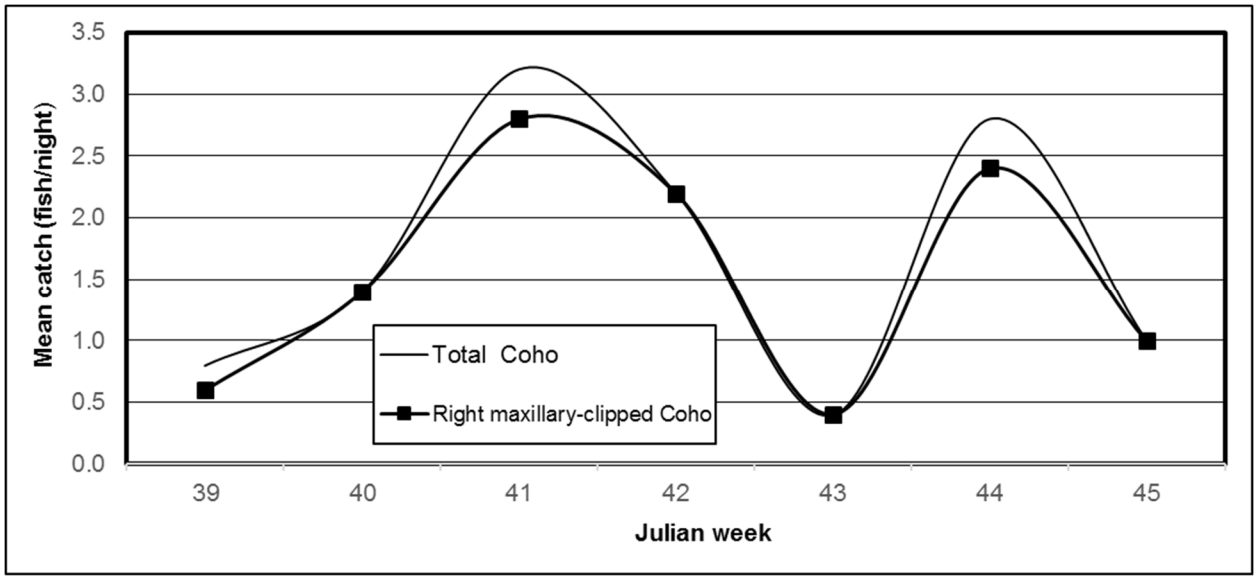

Figure 14. Mean catch of Coho Salmon trapped in the Trinity River at Willow Creek weir, 2017.

Table 12. Release and recovery data for right maxillary-clipped Coho Salmon recovered at Trinity River Hatchery (TRH) during the 2017-18 season.

Release data: Mark	Egg source	Brood year	Date	Number	Site	TRH Recovery data: Males No.	Males FL[a]	Females No.	Females FL[a]	Total No.	Number recovered: Tagging site WCW	Tagging site JCW
RM[b]	TRH	2014	3/15-21/16	230,821	TRH	130	60.6	117	60.6	247	20	--
RM[b]	TRH	2015	3/16-24/17	248,102	TRH	146	38.6	3	44.0	149	15	--
				Total coho:		276		120		396	35	0

a/ FL = Mean fork length in cm.
b/ Since 1996, all coho produced at TRH have received a right maxillary clip (RM). Coho <49 cm FL were classified as brood year 2015 and coho >48 cm FL were classified as brood year 2014. Age cutoff based on fork length distribution.

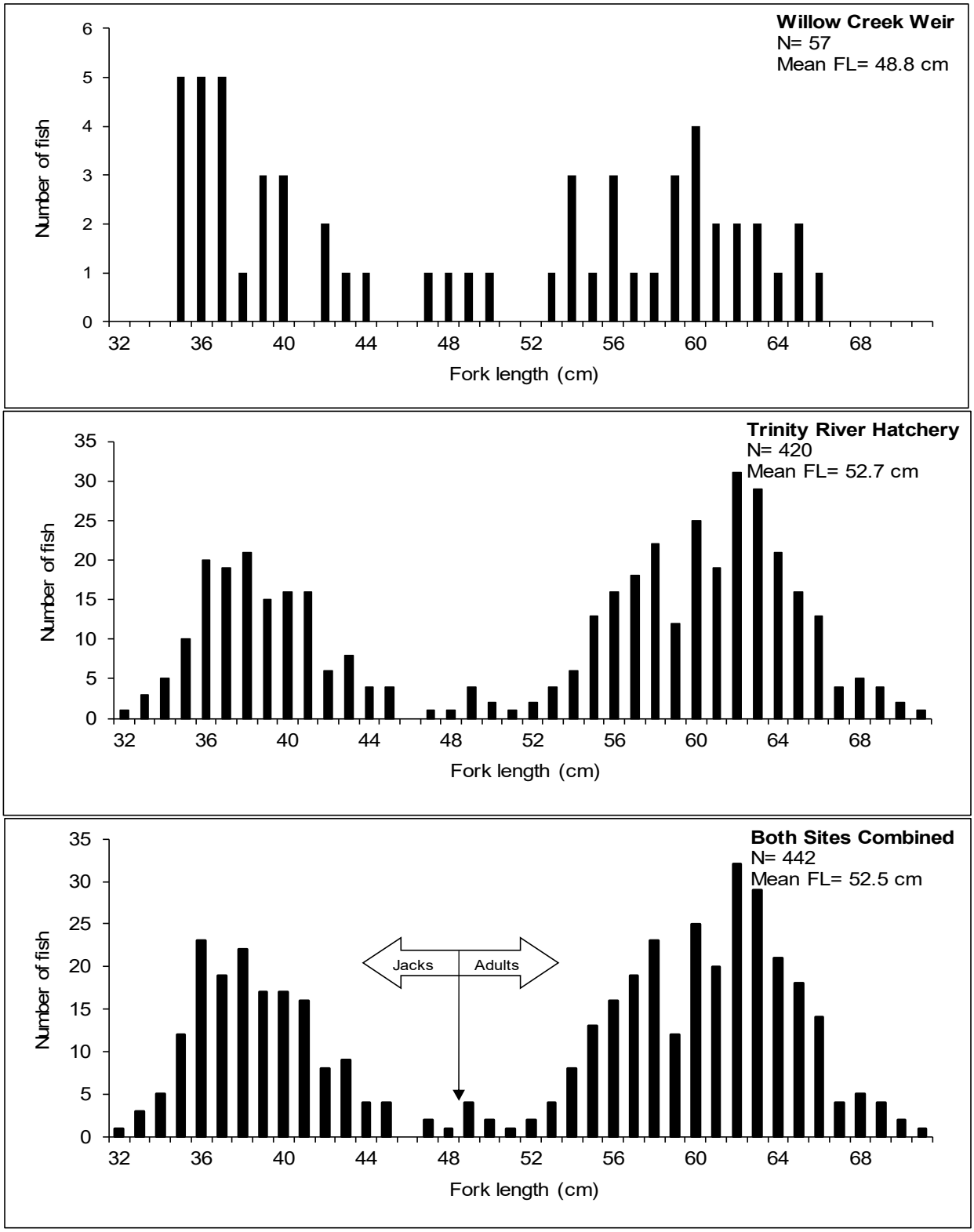

Figure 15. Coho Salmon fork lengths (cm) observed at Willow Creek weir, Trinity River Hatchery and both sites combined during the 2017-18 season. The arrow denotes the size used to separate jacks and adults for analysis.

Coho Salmon Run-size, Angler Harvest and Spawner Escapement Estimates

An estimated run-size of 655 Coho (95% CI 475 – 921) comprised of 244 jacks and 411 adults, migrated into the Trinity River basin upstream of the WCW in 2017 (Appendix 8). A count of 420 entered TRH (Appendix 9) and we estimate 235 were natural area spawners. The 2017 Coho escapement was comprised of an estimated 57 adult and 9 jack natural-origin Coho, in addition to 354 hatchery-origin adults and 236 hatchery-origin jacks (Appendix 22 and Appendix 23). There were no project tags returned by anglers who reported harvest, therefore we assume no Coho harvest in 2017. Escapement of 57 natural-origin Coho adults was 4.1% the TRRP goal of 1,400 fish (Appendix 10.). Estimated Coho run-size, upstream of WCW, has ranged from 655 fish in 2017 to 59,079 fish in 1987 (Appendix 24 and Appendix 25). This year's run-size of 655 is ranked 41st of the 41 years on record and is 4.1% of the 15,978 fish average.

Coho Salmon Brood Year Performance

Coho in the Trinity River typically have a three-year life-cycle with juveniles rearing in freshwater during their first year, then migrating to the ocean. After approximately one year at sea, jacks (mostly males) return to the river as two-year olds and a year later as three-year-old adults. Coho jacks (age 2) returning during 2017 were of BY 2015 brood stock; Coho adults (age 3) returning to the Trinity River in 2017 were of BY 2014 brood stock. Total percent return for RM-clipped TRH-origin Coho from BY 2014 was 0.17% (Table 13). Since 1994 the BY total return rate has ranged from 0.17 to 6.60 % (Appendix 26 and Appendix 27). The 2017 adult escapement of TRH BY 2014 was an estimated 354 fish. This consisted of 247 that entered TRH and an estimated 107 that spawned in natural areas. Total adult run-size estimate (411) for 2017 consisted of 86.1% TRH-origin fish. The TRH-origin jack escapement in 2017 from BY 2015 was estimated at 236 fish or 0.02% of that BY's total release and contributed 96.7% of the total jack Trinity River Coho run.

Table 13. Run-size, percent return, in-river angler harvest and spawner escapement estimates for Trinity River Hatchery (TRH) Coho Salmon returning to the Trinity River upstream of WCW during the 2017-18 season.

Release data					Return data						
									Spawner Escapement		
Clip[a]	Brood year	Date	Number[b]	Site	Age[c]	Run-size	% of release	In-river harvest	TRH[d]	Natural	Total
RM	2014	3/15/-21/16	230,821	TRH	2	45	0.00%	0	45	0	45
					3	354	0.17%	0	247	107	354
					Totals:	399	0.17%	0	292	107	399
RM	2015	3/16-24/17	230,834	TRH	2	236	0.02%	0	87	149	236

a/ Identifying clip. Beginning with the 1994 brood year, all Coho Salmon released from Trinity River Hatchery received right maxillary (RM) clips.
b/ Number of marked (RM) Coho estimated released.
c/ Age classes are determined using length frequency analysis.
d/ TRH= Trinity River Hatchery, actual count.

Juvenile Coho Salmon Marking at Trinity River Hatchery

The RM clipping of all BY 2016 Coho Salmon (age 1) at TRH was completed by January 26, 2018. Approximately 2% of these fish (5,294) were sampled for RM clip quality and FL prior to the start of their volitional release. We estimate 258,447 of the 258,496 yearling Coho released from TRH were effectively marked with a RM clip (Table 14).

Based on the quality control sampling, an estimated 99.98% of the BY 2016 production was effectively RM clipped.

Table 14. Production, marking totals, and quality control data for BY 2016 TRH Coho Salmon volitionally released beginning March 15, 2018.

Raceway	Number marked	QC # checked	Estimated % unmarked	Effectively marked[a]	Estimated unmarked releases	Marked releases	***Total released***
M3-M4	44,266	898	0.00	44,265	0	44,265	44,265
M1-M2	36,260	745	0.00	36,256	0	36,249	36,249
N3-N4	44,354	961	0.10	44,327	46	44,321	44,367
N1-N2	45,378	895	0.00	45,376	0	45,375	45,375
O3-O4	44,013	903	0.00	43,973	0	43,946	43,946
O1-O2	44,288	892	0.00	44,250	0	44,241	44,241
Total	258,559	5,294	0.10	258,447	46	258,397	258,443

a/ Effectively marked = Net marked + QC re-clipped

Adult Fall Steelhead Trapping and Tagging

Two half-pounder (<42 cm FL) and 50 adult steelhead were trapped at JCW in 2017; 24 of the adults were ad-clipped, indicating TRH-origin. Steelhead peaked at JCW in JW 35. Ad-clipped fish were tagged, but because the run-size estimate for steelhead is above WCW, results of this tagging are purely qualitative in nature and not included in run-size estimates.

We trapped 746 steelhead at WCW in 2017 (Table 15, Figure 16); 55 half-pounders and 691 adults. The steelhead run peaked in JW 43 when we averaged 30.2 steelhead per night.

We did not tag any half-pounder steelhead. Of the 691 adult steelhead trapped during the season, 685 were tagged (). Two tagging mortalities were observed, and 143 fish were reported as caught and released (their tags removed) by anglers, leaving 540 effective tags. Hatchery-origin adult fish comprised 65.7% (454 of 691) of the adult steelhead captured at WCW, and 97.4% (1,996 of 2,049) of the adult steelhead at TRH.

Size of Trapped Fish

Steelhead trapped at WCW and TRH averaged 55.2 and 57.5 cm FL, respectively, with a combined average of 56.8 cm FL (Figure 17). Adult steelhead (>41 cm FL) made up 92.6% and 98.2% of the steelhead trapped at WCW and TRH respectively.

Table 15. Weekly summary of fall-run steelhead trapped in the Trinity River at Willow Creek weir during 2017.[a]

			Number trapped						
Julian		Nights		Ad-clipped		Ad-clipped		Ad-clip	Fish/
week	Inclusive dates	trapped	1/2 lbers	1/2 lbers [c]	Adults	Adults	Total	total	night
35	27-Aug - 2-Sep	2	6	3	38	26	44	29	22.0
36	3-Sep - 9-Sep	4	2	0	45	26	47	26	11.8
37	10-Sep 16-Sep	5	4	1	116	75	120	76	24.0
38	17-Sep 23-Sep	5	1	1	49	37	50	38	10.0
39	24-Sep 30-Sep	5	3	3	105	67	108	70	21.6
40	1-Oct 7-Oct	5	1	0	46	37	47	37	9.4
41	8-Oct - 14-Oct	5	1	1	49	38	50	39	10.0
42	15-Oct - 21-Oct	5	2	1	116	83	118	84	23.6
43	22-Oct - 28-Oct	5	34	25	117	59	151	84	30.2
44	29-Oct - 4-Nov	5	1	0	3	2	4	2	0.8
45	5-Nov - 11-Nov	3	0	0	7	4	7	4	2.3
	Total:	49	55	35	691	454	746	489	
	Mean:								15.2

a/ Trapping at Willow Creek weir took place August 30 - November 8, 2017 (Julian weeks 35-45).
b/ Steelhead <42 cm FL were considered 1/2 lbers (half-pounders).
c/ Adipose fin-clipped steelhead. Number shown is a subset of weekly half-pounder and adult steelhead totals.

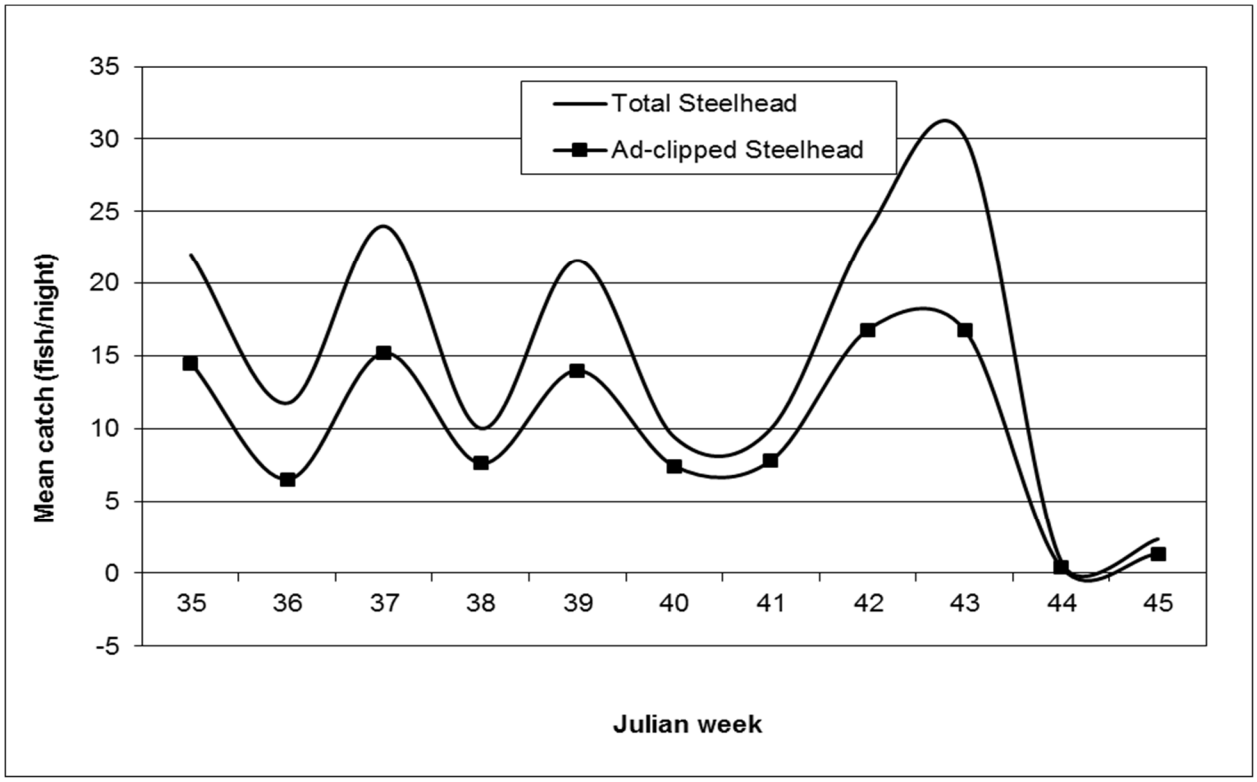

Figure 16. Mean catch of fall-run steelhead in the Trinity River at Willow Creek weir, 2017.

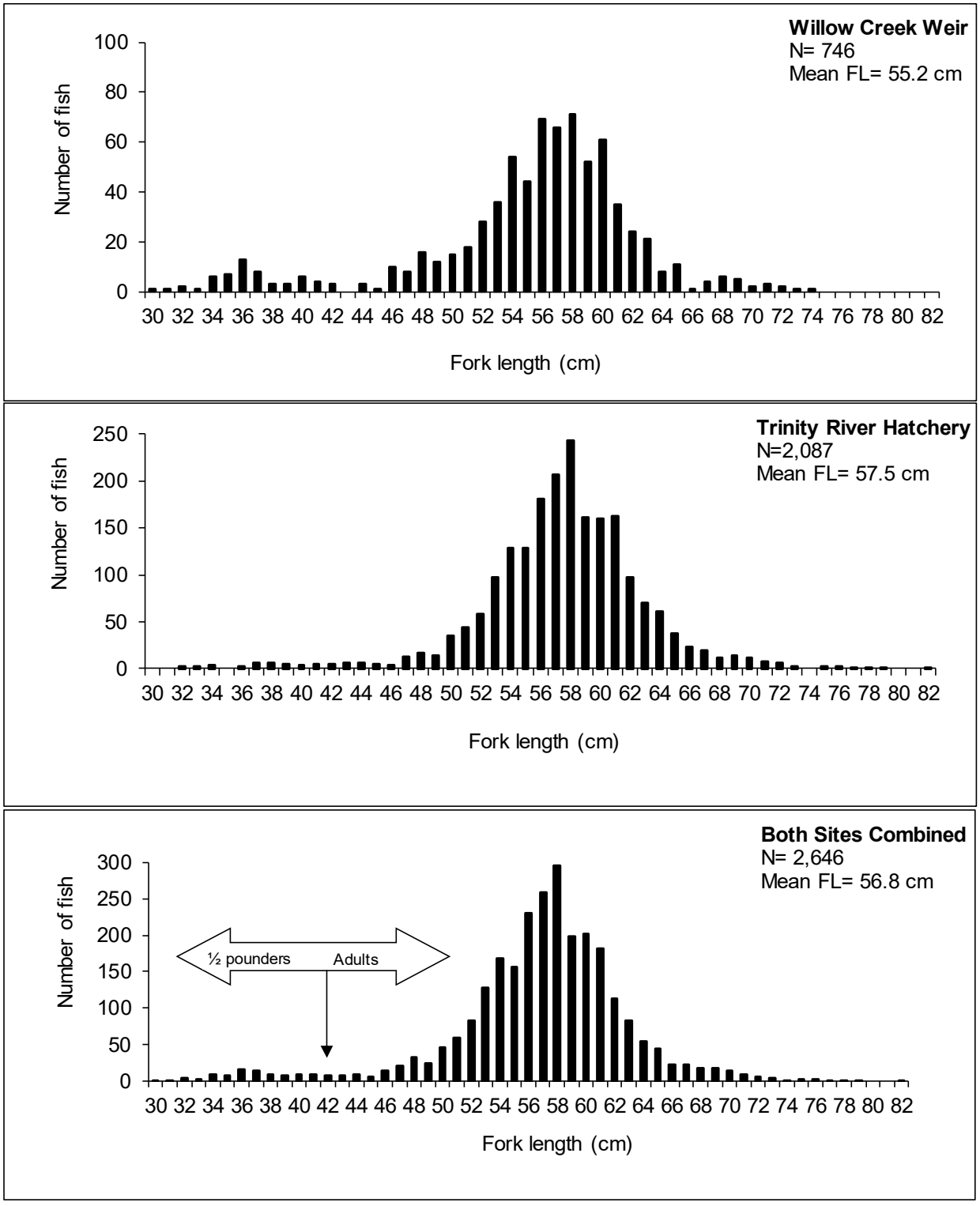

Figure 17. Steelhead fork lengths (cm) observed at Willow Creek weir, Trinity River Hatchery and both sites combined during the 2017-18 season. Arrow denotes the size used to separate ½ pounders (sub-adults) and adults for analysis.

Fall Steelhead Recovery

Angler Tag Recovery
There were 20 TRP-tagged steelhead reported as harvested in 2017 (Appendix 28), and two tags found on the riverbank and returned by anglers or other river users. There were 143 tags returned from the catch and release fishery.

Spawner Survey Recovery
There were no Project-tagged steelhead recovered during spawner surveys in 2017.

Tagging Mortalities
There were two steelhead mortalities identified as a result of tagging stress at WCW in 2017.

Trinity River Hatchery Recovery
Steelhead entered TRH during every week the fish ladder was open (Appendix 29), except for JW 38. Julian week 3 of 2018 was the peak of the run, when 517 steelhead entered TRH. A total of 2,049 adult steelhead (plus 38 half pounders) were recovered at TRH during the season. Of the 540 steelhead effectively tagged at WCW, 161 (29.8%) were recaptured at TRH.

Adult Fall Steelhead Run-size, Angler Harvest and Spawner Escapement Estimates

An estimated 6,846 adult fall steelhead (95% CI 5,873 – 7,897) migrated upstream of WCW this season (Appendix 8). Of those, 253 were estimated to have been harvested by anglers (all of TRH-origin). Of the estimated 6,593 fish that escaped the fishery, 2,049 (53 natural-origin and 1,996 hatchery-origin) entered TRH, and 4,544 (2,295 natural-origin, and 2,249 hatchery-origin) escaped to natural spawning areas (Appendix 9).

In the 34 years for which we have data since 1980, run-size estimates have ranged from 2,972 in 1998 to 53,885 in 2007 (Appendix 30). Mean estimated run-size for fall adult steelhead in the Trinity River above WCW across the period of record is 14,470 fish. This year's run was 47.3% of the average. The natural-origin spawner escapement above WCW of 2,348 is 5.9% of the TRRP goal of 40,000 natural-origin steelhead (Appendix 10.).

DISCUSSION

Spring Chinook Salmon

Results from the 2017 mark-recapture study indicate the total run-size of 4,425 (95% CI 3,387 – 5,959) spring Chinook is an increase of approximately 500 fish from the 2016 estimate (Appendix 11), and ranks 32nd lowest of 38 years of monitoring. While the estimated contribution of natural-origin adults showed a slight increase from last year, it remains below the TRRP annual escapement goal of 6,000 natural-origin adult spring Chinook (Figure 18).

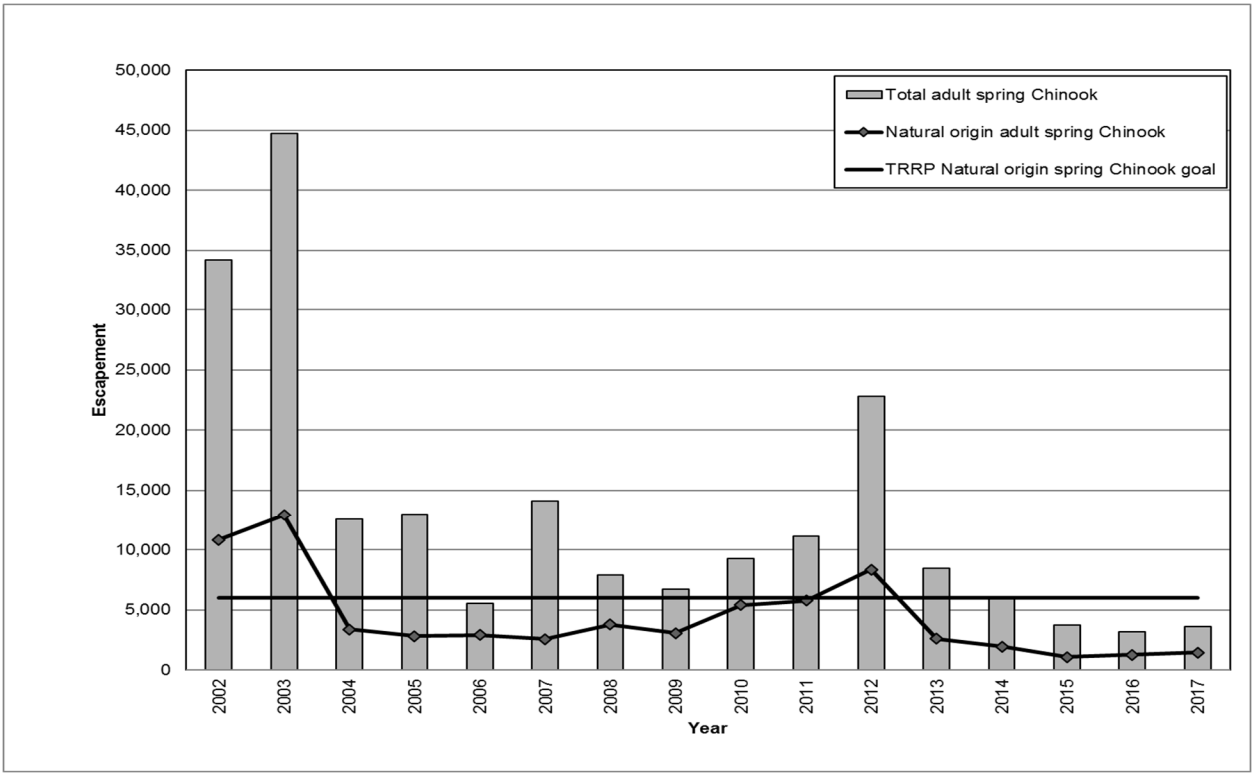

Figure 18. Total adult escapement, and escapement of natural origin spring Chinook Salmon to the Trinity River above Junction City weir, 2002-2017.

Moyle, et al (2017) lays out myriad factors contributing to the continued low numbers of spring Chinook in the Trinity system, including the California drought from 2012 – 2016, decreases in appropriate holding and spawning habitat, reduced fitness of hatchery-origin fish spawning in natural areas, a general increase in river temperatures resulting from increased numbers of diversions (both legal and illegal), and climate change, just to name a few. There is increased focus on the dire situation of the spring Chinook and an associated call for its listing under the Endangered Species Act. The Karuk tribe submitted notice of its intent to file a petition to list the species as endangered (Houston, 2017) shortly after Prince, et al (2018) published a study which found spring-run Chinook are genetically distinct from their fall-run counterparts. A status review of the Chinook in the Upper Klamath Trinity Basin is currently ongoing.

Fall Chinook

The stratified run-size of 5,837 jacks (95% CI 5,212 – 6,502) and 9,613 adult fall Chinook adults (95% CI 8,701 – 10,573), for a total of 15,450 fall Chinook, was ranked 34th of the 41-year period of record (Appendix 18 - 20) and is 37.5% of the average run-size of 41,196 across those years. The 2017 escapement of 4,961 natural-origin adult fall Chinook returning to the Trinity basin is well below the 62,000 TRRP goal but is an increase from the previous two years (Figure 19).

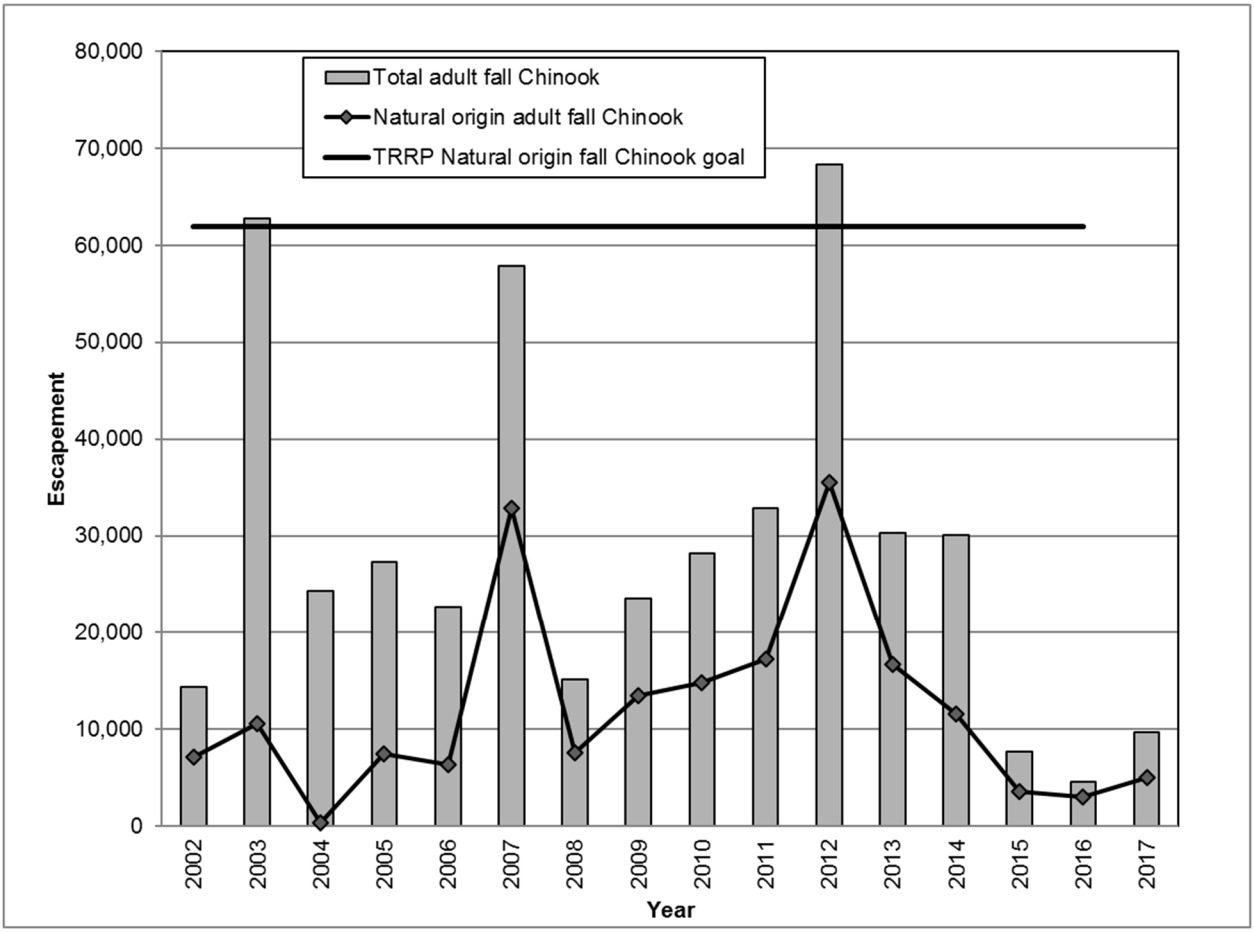

Figure 19. Total adult escapement, and escapement of natural origin fall Chinook Salmon to the Trinity River upstream of Willow Creek weir, 2002-2017.

Though the run-size was not large, it was larger than anticipated by the Klamath River Technical Team. The pre-season forecast for Klamath River basin fall Chinook adults was 18,400 (PFMC, 2017), whereas the post-season estimate was 31,800 (KRTT, 2018). The number of two-year olds was particularly surprising in 2017, comprising 47.6% of the estimate trapped at WCW and 36.6% at TRH, which is two to three times the long-term average, making up 37.8% of the total estimated escapement.

For the first time ever in 2017 we built a passage tunnel from an opening in the weir approximately 9 m (~30 ft) upstream to one of the trap boxes. We did this to adapt to

the scouring of the channel that had occurred during the 2016 winter flows. We noticed a remarkable increase in trapping efficiency for fall Chinook at WCW (Figure 20).

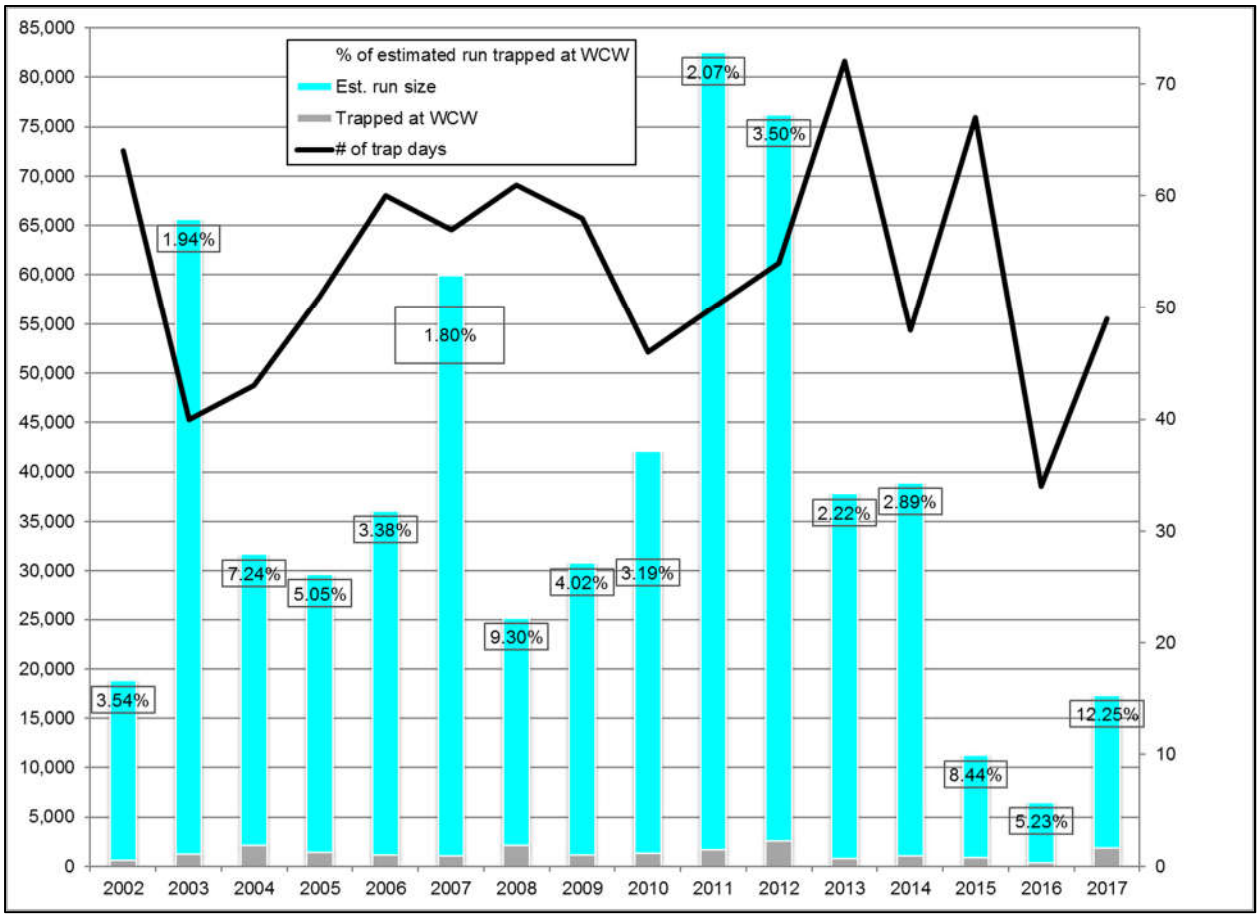

Figure 20. Percent of total estimated run-size of fall Chinook Salmon tagged at Willow Creek weir, 2002 – 2017.

Informally, we attempt to trap and tag 5-10% of the run, and in 2017 we trapped more than 12%. We intend to build a tunnel again in 2018 to see if this increase can be duplicated. Fish presumably come upon the barrier of the weir structure and after exploring along it they find the passage tunnel and swim into it more readily than they might into a trap situated directly upstream of the weir line. One possible explanation is that the disturbance in flow occurring immediately downstream of the trap box is no longer felt at the weir line, which results in a more natural flow where the weir opens to the tunnel.

Coho Salmon

The 2017 estimated run-size of 655 Coho (95% CI 475 – 921) is the lowest in 41 years (Appendix 23). Coho jacks comprised only 15.7% of the 1,325 estimated run-size in 2016, which suggested this year's run would be very small. The percentage of jacks in the run has ranged from 1.5 - 80.5% since 1977, with a median of 18.2%. In 2017 the

jacks comprised 37.3% of the run so we are hoping for an increased run size in 2018. Natural origin adult contribution to the total Coho run was nearly non-existent (Figure 21).

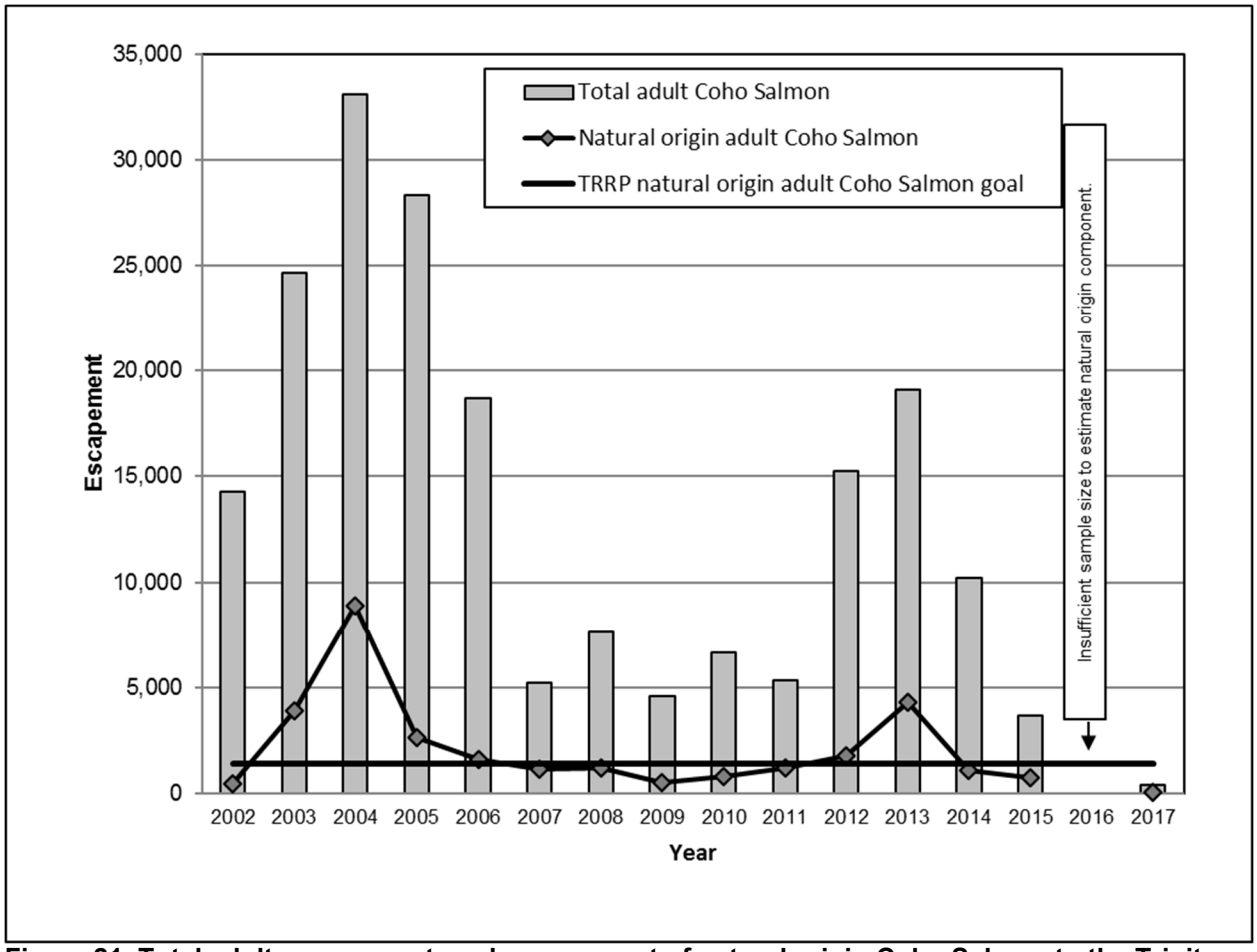

Figure 21. Total adult escapement, and escapement of natural origin Coho Salmon to the Trinity River upstream of Willow Creek weir, 2002-2017.

Both the jack and adult TRH-origin Coho BYs returning to the Trinity River this year were subject to decreases in production from 500,000 to 300,000 resulting from EPIC v. Lehr, et al (2014). This consent decree capped TRH production of Coho at 300,000 until a hatchery genetics management plan can be adopted. Decreased production, in addition to being released during the tail end of the 2012 – 2016 California drought, likely contributed to the low return observed in 2017.

The Hoopa Valley Tribe installed a weir across the Trinity River downstream of WCW near the southern boundary of the Hoopa Valley Reservation (near Tish Tang Creek confluence) for the second year in 2017. Harvest estimates for Coho at this weir are not publicly available. We anticipate that an additional weir six miles downstream could increase weir wariness and stress, but effects on Coho have not been quantified or investigated.

Fall Steelhead

The 2017 run-size estimate for adult fall steelhead of 6,846 (95% CI 5,873 – 7,897) is 47% of the average run-size of 14,470 over the 34-year period of record (Appendix 30). The 2017 total escapement of 6,593 adult steelhead was comprised of only 35% natural-origin fish (Figure 22) overall, and comprised 50% of the natural area (in-river) adult steelhead escapement in 2017, as compared to 65% in 2016.

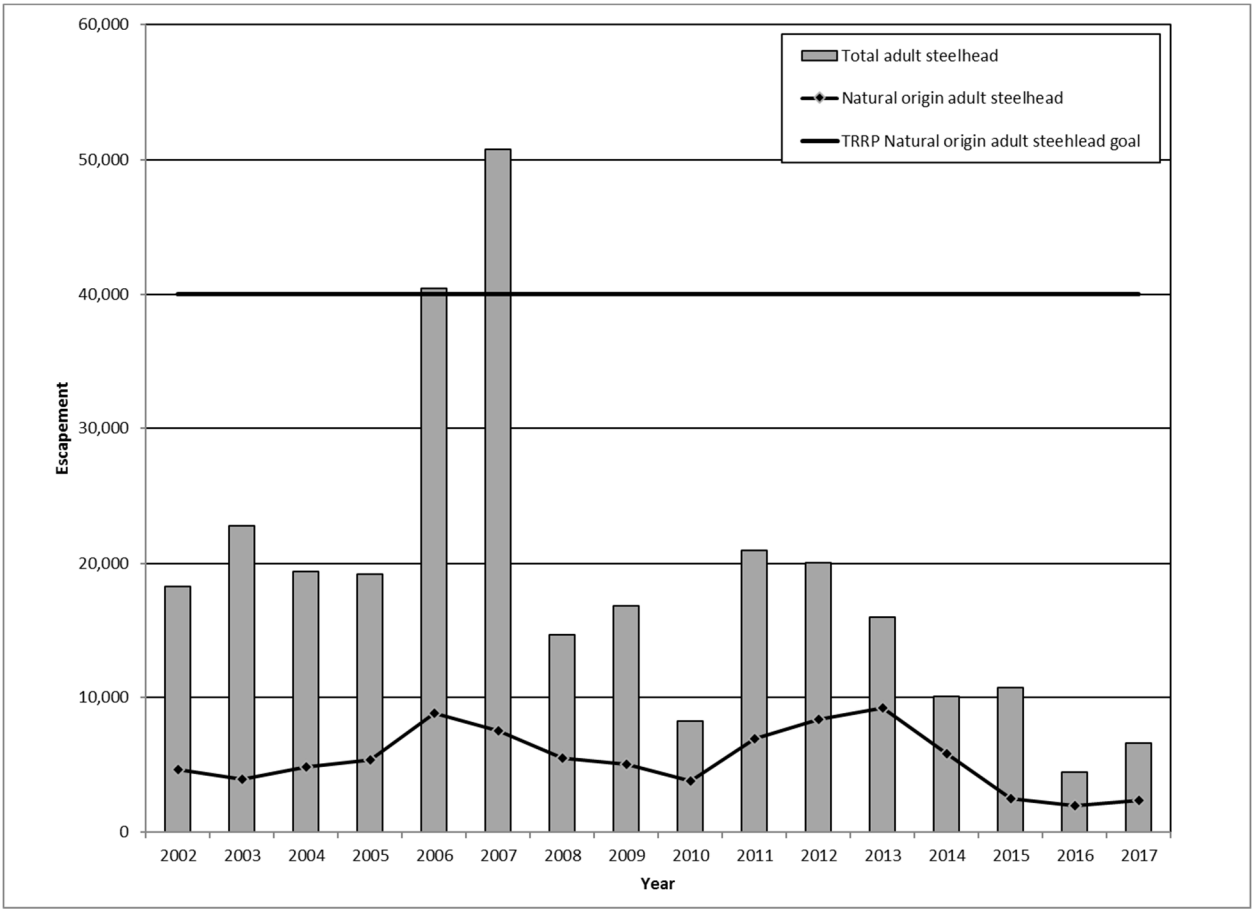

Figure 22. Total adult escapement, and escapement of natural origin steelhead to the Trinity River upstream of Willow Creek weir, 2002-2017.

The lawsuit and consent decree that curtailed production of Coho at TRH also affected production of the steelhead at TRH. In 2014 production was decreased from 800,000 to no more than 448,000 steelhead and may have contributed to this year's reduced run-size.

Factors Influencing Run-Size, Harvest and Escapement Estimates

Attaining adult natural-origin salmonid production goals while providing dependent tribal and non-tribal harvest are fundamental objectives of the TRRP. Factors that directly affect salmonid run-size and, therefore, progress toward TRRP goals, include availability and quality of habitat for all life stages, natural mortality and the amount of ocean and in-river harvest. Environmental conditions are also contributing factors and include ocean-atmospheric climate variability over the North Pacific Ocean that result in inter-annual and inter-decadal changes in Pacific salmon survival (Beamish, et. al 2009).

This year's sampling, and therefore our run-size and escapement estimates, were somewhat affected by the Lewiston Dam flow release schedules, more so for JCW than WCW. Water year designation in 2017 was "*Extremely Wet*" (Reclamation, 2017a); and because it was an odd-numbered year there was a Hoopa Tribal ceremonial ("*Boat Dance*") flow allocation with a peak release of 2,650 cfs on August 21 (Reclamation, 2017b). An "*Extremely Wet*" water year designation allocates 815,000 acre-feet of water for release to the Trinity River (Interior, 2000).

The receding arm on the releases from Lewiston Dam did not allow the river to drop enough to put JCW in until July 23, 2017 (Appendix 32). The Junction City weir was prepared for the Boat Dance flows by pulling conduit and cabling traps and tripods, but the weir was still partially disabled when it was hit by a large tree. The structure was rebuilt and trapping resumed on August 25. A fire broke out near Junction City and access was limited to the site for a number of days. Trapping resumed September 5 and remained on schedule until October 6th when JCW was pulled for the season after 48 days of trapping.

We waited to install WCW until the Boat Dance flows receded sufficiently to allow us to work safely in the water and installed on August 28. Our first night of trapping was the next night, with the Hoopa Valley gage at ~850cfs (Appendix 33). The water remained relatively high throughout most of our trapping season.

At WCW we removed the conduit (leaving the framework and traps in-river) in preparation for high flows produced by the first big rain event of the season (November 8) with the hope of resuming trapping after the flows receded, but the storm door had opened, and flows did not return to fishable levels. We removed our gear and called the season over having trapped 49 days at WCW, slightly fewer than the 57-day average season.

Interruption in trapping, or missing part of the run, may lead to a violation of the assumption that fish trapped and released at the weir are a random sample representative of the population. Our goal is to trap and tag between 5 – 10% of each run at the weir; in 2017 we sampled only an estimated 3.6% of the spring Chinook at JCW but were more successful with 12.3% of the fall Chinook run at WCW. The amount of sport and commercial ocean harvest, in-river sport harvest, and tribal harvest affect

salmon and steelhead run-size and escapement. Ocean and in–river harvest quotas are determined by the Pacific Fisheries Management Council (PFMC) only for fall Chinook. Total annual harvest allocation of Klamath/Trinity Basin fall Chinook determined by the PFMC can range from no harvest up to two-thirds of the projected run-size to the basin, thus dependent fisheries may have a large impact on fall Chinook escapement to the basin and Trinity River. In 2017 there was no legal in-river commercial tribal or recreational harvest of the Klamath-Trinity Basin fall Chinook run (CDFW 2018), but there was an estimated in-river harvest of 4.2%. The basin-wide estimated harvest of spring Chinook was unknown in 2017, though an estimated 2.4% of Trinity basin spring Chinook were estimated to have been taken in the recreational fishery above Willow Creek weir. Coho salmon are protected from sport harvest entirely, and only hatchery marked steelhead are allowed for sport harvest.

Accuracy and precision of mark-recapture field studies and data analyses also influence escapement estimates. Accuracy of the modified Peterson mark-recapture estimator relies on a set of assumptions described in this and previous Annual Reports (CDFW, 2014b). Estimator bias can occur if assumptions are violated. For example, unaccounted tagging mortality creates a positive bias in mark-recapture studies (Hankin, 2001). Hankin makes evident the magnitude of potential bias in the following scenario: If 90% of untagged fish passing WCW survive to arrive at TRH, but only 75% of WCW tagged fish survive to arrive at TRH, then the approximate positive proportional bias would be almost 30%.

We take steps to minimize tagging-associated mortality through our operational protocol at the weirs. In the past we observed most tagging mortalities when water temperatures were high (near 22° C), therefore trapping is suspended if water temperatures exceed 21°C. In addition, fish are not tagged if deemed in poor condition or if they have already spawned. We account for tagging mortalities through recovery of tagged fish found dead during surveys conducted near the weir sites throughout the trapping season, in the mainstem Trinity spawning surveys (any unspawned fish within 30 days of tagging) as well as checking any TRP-tagged carcasses washed back on the weir for signs of spawning. Tagged fish that are judged to have died due to the stress of handling and tagging are removed from the tagged population for purposes of estimating total escapement. Reliance on experienced crew and adherence to protocol contributes to a relatively small number of tagging mortalities.

Our harvest estimates are based on TRP tags returned by anglers and other river users. Unreported angler harvest of tagged fish results in an under-estimate of harvest rate and a corresponding over-estimate in escapement. Although the number of TRP tags returned is usually sufficient to generate a harvest estimate, we are trying to increase the rate of tag return, especially from Chinook anglers. Even when we tag similar numbers of Chinook and steelhead, we receive tag returns from the steelhead fishery at a greater rate than the salmon fishery. Some likely explanations for the disproportion include the longer steelhead season and the fact that emigrating steelhead are typically more active feeders than Chinook. We continue to work toward calculating confidence intervals around our harvest estimates.

Hankin and Bradford (2012) recommend using a high-value tag to increase tag returns and lay the groundwork to test the assumptions upon which our harvest estimate is based. We are currently conducting a study [based on a similar one reported in Heubach et al (1992)], to collect information on tag return rates. The study involves increasing the reward on a portion of TRP tags to determine the reward level at which 100% of the tags are returned (one of our harvest estimate assumptions). Early analysis seemed to show that anglers tend to return tags with greater rewards at higher rates than tags with lessor or no value. However, small sample size in the past few years continues to complicate drawing robust conclusions for the study overall. We intend to continue this study for at least an additional year.

We know splitting the run into jacks and adults based on a hard point cutoff (i.e., using the nadir of fork length distributions) will assign some fish to the wrong age class. However, when we have compared jack vs. adult proportions based on mixture distribution analyses vs. our fork length distribution analysis, bias associated with using the nadir appeared to be insignificant (Kier and Hileman, 2016). We plan to rely solely on scale-age proportions for fall Chinook going forward, but will explore additional age determination methods for other species in the future.

Because estimates of hatchery contributions to total run-size estimates are based, in part, on the overall run-size estimates for each race of Chinook, they are subject to the precision and potential biases associated with the mark-recapture estimates, as well as the accuracy of reported CWT expansion factors. The effect of this potential bias is most relevant to estimates of natural-origin fish spawning in natural areas because hatchery recoveries are actual counts, whereas hatchery proportions in natural spawning grounds are estimated by subtracting angler harvest and expanded CWT recoveries from the natural-area run-size estimate.

Run-size estimates have the potential for bias, in many cases due to violations of underlying assumptions of the estimator. However, biases that may affect estimates of total may not affect hatchery contribution rates since hatchery contribution rates are based on ad-clip rates observed at either JCW or WCW. Even if total run-size were biased, the ad-clip rate would remain the same and result in the same hatchery contribution rates. If, however, hatchery-origin fish are more or less vulnerable to capture than their natural counterparts, the estimated contribution of hatchery fish could be biased. This could occur, for example, if the run timing of hatchery fish coincided with weir operations more so than natural fish. In 2017 we believe trapping at WCW and JCW spanned the majority of fall and spring runs, respectively, thus reducing potential bias due to vulnerability of capture.

Assumptions of the CWT analysis rely on accurate estimates of expansion factors. If the reported expansion factor is greater or less than the true proportion of hatchery-origin fish with CWTs, total hatchery returns would be over- or under-estimated, respectively. In addition, we assume the CWT fish that enter the hatchery are representative of the entire CWT population, but if an age or release type of hatchery-origin Chinook is more likely to stray than others, then the estimated proportions of hatchery-origin fish, based

on fish recovered at TRH, will be biased. The TRH-origin Chinook recovered during the 2017 carcass surveys (n=43) represented tag groups across the range of those that entered TRH.

RECOMMENDATIONS

- Run-size and escapement estimates of naturally- and hatchery-origin spring and fall Chinook Salmon, Coho Salmon, and adult fall steelhead in the Trinity River basin should be continued on an annual basis to maintain short- and long-term baselines which help assess objectives stated in the IAP and ROD and inform adaptive management decision making.

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- Continue educating the angling public and try to increase buy-in by the river guides to the angler tag return program. Continue to test assumption that higher tag rewards (incentives) will increase returns.

- Management and operations of the TRRP and TRH should be coordinated to ensure that objectives for natural fish production and hatchery management goals are synchronized across restoration and mitigation programs.

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APPENDICES

Appendix 1. List of Julian weeks and their calendar date equivalents.

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

* Eight day Julian week only during leap years

**Eight day Julian week every year

Appendix 2. Release and recovery data for adipose fin-clipped spring and fall Chinook Salmon recovered at Trinity River Hatchery (TRH) during the 2017-18 season.

Release data						TRH Recovery data					# tagged fish recovered from	
						Males		Females		Total		
CWT[a] code	Egg source	Brood year	Date	Number	Site	#	FL[b]	#	FL[b]	#	JCW	WCW
SPRING CHINOOK												
060491	TRH	2012	06/01-15/13	67,661	TRH	1	88.0	0	--	1		
060492	TRH	2012	06/01-15/13	88,310	TRH	1	81.0	1	75.0	2		
060497	TRH	2012	10/01-14/13	101,471	TRH	2	81.0	2	75.5	4		
060605	TRH	2013	06/01-04/14	80,615	TRH	1	82.0	4	71.3	5		
060606	TRH	2013	06/01-04/14	69,846	TRH	4	81.3	3	72.0	7	1	
060607	TRH	2013	06/01-04/14	89,761	TRH	3	75.7	5	69.8	8		
060612	TRH	2013	10/01-22/14	103,872	TRH	7	74.0	4	70.5	11		
060689	TRH	2014	06/01-15/15	55,275	TRH	12	67.6	23	61.7	35	3	
060690	TRH	2014	06/01-15/15	85,278	TRH	40	66.9	69	62.3	109	5	
060691	TRH	2014	06/01-15/15	88,724	TRH	14	66.1	15	62.6	29	2	
060696	TRH	2014	10/01-15/15	102,032	TRH	22	60.6	19	57.8	41	2	
068772[f]	TRH	2014	03/11-06/10/15	17,668	River	3	70.3	4	62.3	7		
060772	TRH	2015	06/01-15/16	89,636	TRH	18	44.1	0	--	18		
060773	TRH	2015	06/01-15/16	68,126	TRH	9	44.9	0	--	9		
060774	TRH	2015	06/01-15/16	89,986	TRH	20	45.8	0	--	20		1
060779	TRH	2015	10/01-15/16	107,160	TRH	19	43.1	0	--	19	1	
060781[f]	TRH	2015	03/29-07/11/16	12,943	River	3	47.0	0	--	3		
Lost CWT[c e]						2	51.0	1	56.0	3		
No CWT[d e]						2	57.0	4	62.5	6		
				Spring Chinook totals:		183		154		337	14	1
FALL CHINOOK												
060499[f]	TRH	2012	05/29-0/29/13	13,758	River	0	--	1	75.0	1		1
060504	TRH	2012	10/01-14/13	221,247	TRH	2	77.0	3	80.3	5		1
060608	TRH	2013	06/01-04/14	128,061	TRH	1	82.0	2	74.0	3		
060609	TRH	2013	06/01-04/14	124,107	TRH	1	79.0	2	73.5	3		
060610	TRH	2013	06/01-04/14	127,893	TRH	1	85.0	2	73.0	3		
060611	TRH	2013	06/01-04/14	128,022	TRH	1	90.0	1	72.0	2		
060613	TRH	2013	10/01-22/14	239,886	TRH	22	73.9	26	71.1	48		2
060615[f]	TRH	2014	06/17-08/26/15	8,075	River	1	63.0	0	--	1		
060692	TRH	2014	06/01-15/15	94,892	TRH	24	68.6	80	65.9	104		13
060693	TRH	2014	06/01-15/15	93,755	TRH	35	69.2	43	65.4	78		8
060694	TRH	2014	06/01-15/15	92,404	TRH	6	67.8	11	64.7	17		1
060697	TRH	2014	10/01-15/15	236,204	TRH	250	65.0	278	62.1	528		50
068829	TRH	2014	06/01-15/16	48,962	TRH	4	71.0	8	67.4	12		
060775	TRH	2015	06/01-15/16	116,945	TRH	59	47.7	0	--	59		12
060776	TRH	2015	06/01-15/16	115,416	TRH	66	46.7	1	45.0	67	1	11
060777	TRH	2015	06/01-15/16	111,222	TRH	36	46.3	0	--	36		5
060778	TRH	2015	06/01-15/16	111,020	TRH	24	47.1	0	--	24		5
060780	TRH	2015	10/01-15/16	239,139	TRH	195	46.8	0	--	195		
060782[f]	TRH	2015	06/19-8/30/16	6,444	River	4	47.0	0	--	4		
Lost CWT[c e]						8	51.4	2	64.5	10		1
No CWT[d e]						8	52.6	13	63.9	21		1
				Fall Chinook totals:		748		473		1,221	1	111

a/ CWT = Coded-wire tag.

b/ FL = Mean fork length in cm.

c/ CWT lost or un-readable during recovery (CWT CODES 200,000 - 400,000).

d/ No CWT was detected (CWT CODE = 100,000).

e/ Assigned as either spring or fall Chinook based on entry date into Trinity River Hatchery.

f/ Experimental release groups; fish used in screw trap efficiency studies on main stem Trinity River.

Appendix 3. Fork length (FL) distribution of spring Chinook Salmon trapped and tagged at Junction City weir (JCW), and subsequently recovered during the 2017-18 season. [a]

FL (cm)	JCW		RECOVERIES						Total Recoveries	% Recoveries
	Total Trapped and Tagged[b]	Ad-clips[c]	Tag Morts[d]	Angler Harvest[e]	TRH[f] Recoveries	Carcass[g] Recoveries	Found Tags[h]	Angler Released[i]		
38	1	1							0	0.0
39									--	--
40									--	--
41									--	--
42	1			1					1	100.0
43	1				1				1	100.0
44	4	1							0	0.0
45	4		1						1	25.0
46	4				1				1	25.0
47	4	1			1				1	25.0
48	2	1		1					1	50.0
49	5				1				1	20.0
50	3			1					1	33.3
51	4	1			2				2	50.0
52	1								0	0.0
53	3								0	0.0
54	3	1			2				2	66.7
55	4				1				1	25.0
56	3				1				1	33.3
57	5	1			4				4	80.0
58	4				2			1	3	75.0
59	4	1			2				2	50.0
60									--	--
61	3	1			1				1	33.3
62	7	1			2				2	28.6
63	9				5				5	55.6
64	7	1			4				4	57.1
65	2	1			1				1	50.0
66	7	1		1	4	1			6	85.7
67	4	4			2				2	50.0
68	1	1			1				1	100.0
69	9	2			3				3	33.3
70	2								0	0.0
71	3					1			1	33.3
72	6	1			1				1	16.7
73	4				1				1	25.0
74	3				1				1	33.3
75	5					1			1	20.0
76	5				1	2			3	60.0
77	2								0	0.0
78	6								0	0.0
79	1								0	0.0
80	3	2			1				1	33.3
81	2				1				1	50.0
82	1				1				1	100.0
83	2								0	0.0
84									--	--
85	1								0	0.0
86									--	--
87	2								0	0.0
88									--	--
89									--	--
90									--	--
91	1								0	0.0
92	1							1	1	100.0
Totals:	159	23	1	4	48	5	0	2	60	37.7%
Mean FL:	63.4	61.8	--	51.5	62.5	--	--	75.0	62.8	
Total jacks:[j]	33	5	0	1	3	6	0	0	10	30.3%
Total adults:	126	18	0	0	1	42	5	0	2	50	39.7%

a/ Trapping at JCW took place July 24 - October 6, 2017 (Julian weeks 30-40). Chinook trapped after JW38 in 2017 were considered fall Chinook.
b/ All Chinook trapped at Junction City weir in 2017 were tagged.
c/ Ad-clip = Adipose fin clipped fish.
d/ Tagged fish found dead and unspawned within 30 days of tagging are considered tagging mortalities.
e/ Fish reported as harvested by anglers.
f/ Trapping occurred at Trinity River Hatchery September 5, 2017 - March 6, 2018 (JWs 36-10; closed parts or all of JWs 41-43).
g/ Fish recovered in upper Trinity River spawner surveys.
h/ Fish tags found loose or on dead fish and returned by anglers or other river enthusiasts.
i/ Fish caught and released by anglers, their tag removed.
j/ Spring Chinook <52 cm FL were considered jacks in 2017.

Appendix 4. Fork length distribution of coded-wire tagged Trinity River Hatchery-origin spring Chinook Salmon recovered at TRH during the 2017-18 season.[a]

FL	Coded wire tag code group, by Brood Year and type[b]																		
	2012			2013				2014					2015						
(cm)	060491-f	060492-f	060497-y	060605-f	060606-f	060607-f	060612-y	060689-f	060690-f	060691-f	060696-y	068772-f	060772-f	060773-f	060774-f	060779-y	060781-f	Total
35															1			1
36																		0
37													1					1
38													1		1			2
39																2		2
40													2			2		4
41														1		2		3
42													3	1	1	1		6
43													2	1	2	2		7
44													1		1	5		7
45											2		4	2	5	2	1	16
46														2		1	1	4
47													1		1	1		3
48											1		1	2	3	1		8
49															2			2
50											1		1		1		1	4
51								1			1							2
52															1			1
53											1							1
54											3				1			4
55									1	1	3	1						6
56								1	5									6
57								1	5		1							7
58								3	3	2	5		1					14
59								2	5	1	1							9
60								1	8	1	1							11
61								1	7	3	2							13
62								4	12	1	4							21
63								1	11	3	1	1						17
64								4	12	5	4							25
65				1				4	5	2	6	1						19
66						1		4	4	1	3	1						14
67								2	8	2								12
68				1	1		1	2	3	3								11
69									4	1	1							6
70						2	3	1	5	1		2						14
71					1	1	1		1	1		1						6
72			1			2	2	2	1									8
73			1						2									3
74				1					2									3
75		1				1	1		2									5
76					1		1		3									5
77					1		1	1		1								4
78				1														1
79			1				1											2
80					1	1												2
81		1																1
82				1	1													2
83																		0
84																		0
85																		0
86																		0
87					1													1
88	1																	1
89			1															1
Totals:	1	2	4	5	7	8	11	35	109	29	41	7	18	9	20	19	3	328
Mean	88.00	78.00	78.25	73.40	77.29	72.00	72.73	63.69	63.95	64.31	59.29	65.71	44.11	44.89	45.75	43.11	47.00	60.58

a/ Trapping occurred at Trinity River Hatchery September 5, 2017 - March 6, 2018 (JWs 36-10; closed parts or all of JWs 41-43).

b/ Age at release: f = fingerlings, y = yearlings.

Appendix 5. Total number and numbers of Junction City weir (JCW) and Willow Creek weir (WCW) tagged Chinook Salmon and Coho Salmon that entered Trinity River Hatchery (TRH) during the 2017-18 season. [a]

		Chinook					Coho		
		Total	Spring run tagging site		Fall run tagging site		Total		
Julian		entering					entering	Tagging site	
week	Inclusive dates	TRH	JCW	WCW	JCW	WCW	TRH	JCW	WCW
36	3-Sep - 9-Sep	63	3						
37	10-Sep - 16-Sep	87	4						
38	17-Sep - 23-Sep	291	8						
39	24-Sep - 30-Sep	521	22						
40	1-Oct - 7-Oct	418	11						
41	8-Oct - 14-Oct								
42	15-Oct - 21-Oct								
43	22-Oct - 28-Oct	369			5	64	40		2
44	29-Oct - 4-Nov	1,126			4	205	34		3
45	5-Nov - 11-Nov	1,069			2	131	23		4
46	12-Nov - 18-Nov	1,550				121	58		5
47	19-Nov - 25-Nov	903				72	92		7
48	26-Nov - 2-Dec	509				36	95		8
49	3-Dec - 9-Dec	87				4	54		6
50	10-Dec - 16-Dec	14					4		
51	17-Dec - 23-Dec	6					11		
52	24-Dec - 31-Dec						5		
1	1-Jan - 7-Jan						1		
2	8-Jan - 14-Jan								
3	15-Jan - 21-Jan						1		
4	22-Jan - 28-Jan						2		
5	29-Jan - 4-Feb								
6	5-Feb - 11-Feb								
7	12-Feb - 18-Feb								
8	19-Feb - 25-Feb								
9	26-Feb - 4-Mar								
10	5-Mar - 11-Mar								
	Totals:	7,013	48	0	11	633	420	0	35

a/ Trapping occurred at Trinity River Hatchery September 5, 2017 - March 6, 2018 (JWs 36-10; closed parts or all of JWs 41-43).

Appendix 6. Run-size, percent return, in-river sport catch and spawner escapement estimates for Trinity River Hatchery-origin, coded-wire tagged, spring Chinook Salmon returning to the Trinity River basin upstream of Junction City weir during the period 2014 through 2017.

Release data						Estimated returns					
CWT a/	Brood					Run-	% of	Angler	Spawning escapement		
code	year	Date b/	Number	Site	Age	size	release	harvest	TRH c/	Natural	Total[f]
060490	2012	06/01-15/13	94,284	TRH	2	55	0.06	1	29	24	54
060490	2012				3	100	0.11	5	53	42	95
060490	2012				4	27	0.03	2	23	2	25
060490	2012				5	0	0.00	0	0	0	0
				Totals: d/		182	0.19	8	106	68	174
				Total adults: e/		127	0.13	6	76	44	121
060491	2012	06/01-15/13	67,661	TRH	2	29	0.04	0.7	15	13	28
060491	2012				3	40	0.06	1.9	21	17	38
060491	2012				4	23	0.03	1.4	20	2	22
060491	2012				5	2	0.00	0.2	1	1	2
				Totals: d/		93	0.14	4	57	32	89
				Total adults: e/		65	0.10	3	42	19	62
060492	2012	06/01-15/13	88,310	TRH	2	13	0.01	0.3	7	6	13
060492	2012				3	23	0.03	1.1	12	10	22
060492	2012				4	31	0.04	1.9	27	3	30
060492	2012				5	4	0.00	0.0	2	2	4
				Totals: d/		71	0.08	3	48	20	68
				Total adults: e/		58	0.07	3	41	14	55
068843	2012	03/15-06/06/	9850	RIVER	2	0	0.00	0.0	0	0	0
068843	2012				3	0	0.00	0.0	0	0	0
068843	2012				4	2	0.02	0.1	2	0	2
068843	2012				5	0	0.00	0.0	0	0	0
				Totals: d/		2	0.02	0	2	0	2
				Total adults: e/		2	0.02	0	2	0	2
060497	2012	10/01-14/13	101,471	TRH	2	28	0.03	0.7	15	12	28
060497	2012				3	66	0.07	3.2	35	28	63
060497	2012				4	90	0.09	5.3	77	7	85
060497	2012				5	8	0.01	0.1	4	4	8
				Totals: d/		192	0.19	9	132	51	183
				Total adults: e/		164	0.16	9	117	39	155
060605	2013	06/01-04/14	80,615	TRH	2	36	0.04	0.0	21	15	36
060605	2013				3	123	0.15	7.2	105	10	115
060605	2013				4	10	0.01	0.1	5	5	10
060606	2013	06/01-04/14	69,846	TRH	2	22	0.03	0.0	13	9	22
060606	2013				3	63	0.09	3.7	54	5	59
060606	2013				4	14	0.02	0.1	7	7	14
060607	2013	06/01-04/14	89,761	TRH	2	14	0.02	0.0	8	6	14
060607	2013				3	46	0.05	2.7	39	4	43
060607	2013				4	16	0.02	0.1	8	7	15
060612	2013	10/01-22/14	103,872	TRH	2	2	0.00	0.0	1	1	2
060612	2013				3	51	0.05	3.0	44	4	48
060612	2013				4	22	0.02	0.2	11	10	22
068848	2013	03/14-6/26/14	10,065	TRH	2	2	0.02	0.0	1	1	2
068848	2013				3	2	0.02	0.1	2	0	2
068848	2013				4	0	0.00	0.0	0	0	0
068849	2013	03/14-6/26/14	8,474	RIVER	2	0	0.00	0.0	0	0	0
068849	2013				3	1	0.01	0.1	1	0	1
068849	2013				4	0	0.00	0.0	0	0	0
060689	2014	06/01-15/15	55,275	TRH	2	30	0.05	1.0	21	8	29
060689	2014				3	69	0.12	0.6	35	33	68
060690	2014	06/01-15/15	85,278	TRH	2	31	0.04	1.0	22	8	30
060690	2014				3	214	0.25	1.7	110	102	212
060691	2014	06/01-15/15	88,724	TRH	2	16	0.02	0.5	11	4	15
060691	2014				3	57	0.06	0.5	29	27	56
060696	2014	10/01-15/15	102,032	TRH	2	7	0.01	0.2	5	2	7
060696	2014				3	81	0.08	0.7	41	38	80
068772	2014	03/11-06/15/15	17,668	RIVER	2	3	0.02	0.1	2	1	3
068772	2014				3	14	0.08	0.1	7	7	14
060772	2015	06/01-15/16	89,636	TRH	2	31	0.03	2.9	18	10	28
060773	2015	06/01-15/16	68,126	TRH	2	16	0.02	1.5	9	5	14
060774	2015	06/01-15/16	89,986	TRH	2	35	0.04	3.2	20	11	31
060779	2015	06/01-15/16	107,160	TRH	2	33	0.03	3.1	19	11	30
060781	2015	03/29-7/11/16	12,943	RIVER	2	5	0.04	0.5	3	2	5

a/ CWT = coded-wire tag.

b/ Chinook salmon released during June were fingerlings, those released in October were yearlings.

c/ TRH = Trinity River Hatchery.

d/ Totals are presented only for brood year 2012. These fish have reached five years of age and are considered to have completed their life cycle.

e/ The term "adults" includes Chinook aged three through five.

f/ Rounding sometimes makes for seeming addition errors in this column.

Appendix 7. Percent return of Trinity River Hatchery origin, coded-wire tagged, spring Chinook Salmon, brood years 1986-2012.[a]

	Fingerling releases			Yearling releases		
Brood year	Number released	Number of returns	Percent return	Number released	Number of returns	Percent return
1986	197,113	103	0.05%	101,030	1,960	1.94%
1987	185,718	208	0.11%	0	0	---
1988	181,698	84	0.05%	98,820	112	0.11%
1989	186,413	7	0.00%	102,555	176	0.17%
1990	196,908	479	0.24%	94,639	82	0.09%
1991	198,277	297	0.15%	110,797	68	0.06%
1992	215,038	2,766	1.29%	109,856	1,272	1.16%
1993	222,056	1,125	0.51%	111,525	958	0.86%
1994	113,236	202	0.18%	113,491	513	0.45%
1995 [a]	196,211	450	0.23%	101,934	1,581	1.55%
1996	222,950	743	0.33%	112,464	312	0.28%
1997	209,155	1,834	0.88%	147,507	4,471	3.03%
1998	176,968	845	0.48%	137,602	2,186	1.59%
1999	148,380	3,372	2.27%	129,919	4,288	3.30%
2000	261,193	4,422	1.69%	99,304	2,029	2.04%
2001	253,248	412	0.16%	104,627	1,480	1.41%
2002	244,754	2,217	0.91%	106,139	514	0.48%
2003	265,556	310	0.12%	104,974	339	0.32%
2004	253,830	2,095	0.83%	104,478	1,269	1.21%
2005	263,108	317	0.12%	107,607	111	0.10%
2006	486,833	229	0.05%	104,019	1,354	1.30%
2007	180,083	252	0.14%	96,803	626	0.65%
2008	229,956	1,107	0.48%	104,078	231	0.22%
2009	161,053	4,364	2.71%	108,824	959	0.88%
2010	168,702	994	0.59%	97,128	361	0.37%
2011	167,205	406	0.24%	97,771	292	0.30%
2012	260,105	349	0.13%	101,471	192	0.19%
Means:	216,509	1,111	0.55%	104,050	1,027	0.93%

a/ Based on estimated returns upstream of Junction City weir. No estimate was produced in 1995, therefore returns of age 2 through 5 Chinook from that year are hatchery returns only. Does not include ocean harvest, in-river harvest, and escapement below Junction City weir.

Appendix 8. Run-size estimates and 95% confidence limits for Trinity River basin spring and fall Chinook Salmon, Coho Salmon and adult fall steelhead during the 2017-18 season.

Species/ race	Area of Trinity River basin for run-size estimate	Stratum [a]	Trinity River Hatchery recoveries: Number effectively tagged [b]	Trinity River Hatchery recoveries: Number examined for tags [c]	Trinity River Hatchery recoveries: Number of tags in sample	Run-size estimate [d]	Confidence limits 1-p= 0.95	Confidence limit estimator
Spring Chinook	Upstream of Junction City weir	Jacks	32	246	6	802	3,384 - 5,959	Poisson Approximation
		Adults	124	1,134	42	3,623		
		Total	156	1,380	48	4,425		
Fall Chinook	Upstream of Willow Creek weir	Jacks	845	1,855	268	5,837	5,212 - 6,505	Normal Approximation
		Adults	930	3,778	365	9,613	8,701 - 10,573	
		Total	1,775	5,633	633	15,450		
Coho	Upstream of Willow Creek weir	Jacks	28	150	15	244	475 - 921	Poisson Approximation
		Adults	27	270	20	411		
		Total	55	420	35	655		
Fall-run steelhead	Upstream of Willow Creek weir	Adults	540	2,049	161	6,846	5,873 - 7,897	Normal Approx

a/ Stratum: Jacks = two year old salmon; Adults = three years or older; Steelhead adults = fish greater than 41 cm FL.

b/ The number of effectively tagged fish was corrected for fish not tagged, tagging mortalities, and fish which had their tags removed (caught and released).

c/ Numbers of spring and fall run Chinook Salmon were estimated from expansion of coded wire tag recoveries at Trinity River Hatchery; Coho Salmon and steelhead numbers were actual recoveries.

d/ The run size estimate for jack and adult spring Chinook was based on the proportion of jacks to adults observed at Junction City weir and Trinity River Hatchery (TRH) combined, as the Coho Salmon jack/adult assignment was based on the WCW/TRH combined proportions (using FL frequency analysis to split age classes). The fall Chinook run size estimate was stratified on jack and adult scaled-aged proportions.

Appendix 9. Estimates of Trinity River basin spring and fall Chinook Salmon, Coho Salmon, and adult fall-run steelhead run-size, angler harvest, and spawner escapement during the 2017-18 season.

Species/ race	Area of Trinity River basin for run-size estimate	Stratum [a]	Run-size estimate	Angler Harvest: Harvest rate [b]	Angler Harvest: Number of fish [c]	Spawner Escapement: Natural area spawners [d]	Spawner Escapement: Trinity River Hatchery	Total
Spring Chinook	Upstream of Junction City weir	Jacks	802	9.4%	75	481	246	727
		Adults	3,623	0.8%	29	2,459	1,134	3,593
		Total	4,425		104	2,940	1,380	4,320
Fall Chinook	Upstream of Willow Creek weir	Jacks	5,837	0.0%	0	3,982	1,855	5,837
		Adults	9,613	0.0%	0	5,835	3,778	9,613
		Total	15,450		0	9,817	5,633	15,450
Coho	Upstream of Willow Creek weir	Jacks	244	0.0%	0	94	150	244
		Adults	411	0.0%	0	141	270	411
		Total	655		0	235	420	655
Fall-run adult steelhead	Upstream of Willow Creek weir	Natural	2,348	0.0%	0	2,295	53	2,348
		Hatchery	4,498	5.6%	253	2,249	1,996	4,245
		Total	6,846		253	4,544	2,049	6,593

a/ Stratum: Jacks = two year old salmon, Adults = three years old or older, Steelhead adults were fish greater than 41 cm FL.

b/ Harvest rates were based on the return of reward tags for fall Chinook and steelhead, and a combination of reward and no reward tags for spring Chinook. There was no legal fall Chinook or Coho Salmon harvest allowed, nor any reported.

c/ Calculated as the run-size times the harvest rate.

d/ Calculated as run-size minus angler harvest minus hatchery escapement. Natural area spawners includes both wild and hatchery fish that spawn in areas outside Trinity River Hatchery. Any difference between these numbers and others throughout this report are due to rounding.

Appendix 10. Estimates of contribution of natural-origin and hatchery-origin adult spring and fall Chinook Salmon and Coho Salmon, and adult fall-run steelhead to the Trinity River basin spawner escapement during the 2017-18 season.

			Total Spawner Escapement			Natural-origin contribution to escapement	
Species/ race	Area of Trinity River	Produced	Natural area spawners [a]	Trinity River Hatchery	Total	TRRP Goal	% of Goal
Spring Chinook	Upstream of Junction City weir	Naturally	1,429	25	1,454	6,000	24.2%
		Hatchery	1,030	1,109	2,139		
		Total	2,459	1,134	3,593		
Fall Chinook	Upstream of Willow Creek weir	Naturally	4,558	403	4,961	62,000	8.0%
		Hatchery	1,277	3,375	4,652		
		Total	5,835	3,778	9,613		
Coho	Upstream of Willow Creek weir	Naturally	34	23	57	1,400	4.1%
		Hatchery	107	247	354		
		Total	141	270	411		
Fall-run steelhead	Upstream of Willow Creek weir	Naturally	2,295	53	2,348	40,000	5.9%
		Hatchery	2,249	1,996	4,245		
		Total	4,544	2,049	6,593		

a/ Natural area spawners includes both wild and hatchery fish that spawn in areas outside Trinity River Hatchery. Any difference between these numbers and others throughout this report are due to rounding.

Appendix 11. Spring Chinook Salmon estimated run-size, spawner escapement, and angler harvest estimates for the Trinity River upstream of Junction City weir, 1977 - 2017.

	Run-size estimate					Spawner escapements						Angler harvest			
						Natural Area Spawers [a]			Trinity River Hatchery						
	Jacks[d]		Adults		Total	Jacks	Adults	Total	Jacks	Adults	Total	Jacks	Adults		Total
Year	Number	Percent	Number	Percent											
1977	no estimates					no estimates			385	1,124	1,509	no estimates			
1978	190	1.0	18,816	99.0	19,006	29	14,384	14,413	153	3,680	3,833	8	752	b/	760
1979	113	1.4	7,964	98.6	8,077	0	5,008	5,008	113	1,658	1,771	0	1,298		1,298
1980	1,949	45.9	2,301	54.1	4,250	1,312	1,614	2,926	353	547	900	284	140		424
1981	347	4.2	7,913	95.8	8,260	242	3,362	3,604	95	2,405	2,500	10	2,146		2,156
1982	656	10.3	5,731	89.7	6,387	387	3,868	4,255	150	1,226	1,376	119	637		756
1983	no estimates					no estimates			385	930	1,315	no estimates			
1984	255	9.4	2,465	90.6	2,720	140	1,354	1,494	76	736	812	39	375		414
1985	1,434	14.8	8,278	85.2	9,712	799	4,897	5,696	508	2,645	3,153	127	736	c/	863
1986	7,018	23.1	23,403	76.9	30,421	4,335	13,371	17,706	1,461	7,083	8,544	1,222	2,949		4,171
1987	4,858	9.5	46,016	90.5	50,874	2,577	29,083	31,660	1,387	8,466	9,853	894	8,467		9,361
1988	720	1.1	61,972	98.9	62,692	241	39,329	39,570	377	13,905	14,282	102	8,738		8,840
1989	502	1.9	25,804	98.1	26,306	435	18,241	18,676	17	4,983	5,000	50	2,580		2,630
1990	265	4.1	6,123	95.9	6,388	126	2,880	3,006	104	2,433	2,537	35	810		845
1991	190	8.0	2,191	92.0	2,381	92	1,268	1,360	71	614	685	27	309		336
1992	1,671	41.5	2,359	58.5	4,030	944	942	1,886	533	1,313	1,846	194	104	c/	298
1993	68	1.3	5,164	98.7	5,232	37	2,111	2,148	31	2,630	2,661	0	423	c/	423
1994	1,793	26.4	4,995	73.6	6,788	550	2,897	3,447	944	1,943	2,887	299	155	c/	454
1995	no estimates					no estimates			385	8,722	9,107	no estimates			
1996	489	2.1	22,927	97.9	23,416	370	16,283	16,653	119	5,131	5,250	0	1,513	c/	1,513
1997	768	3.8	19,271	96.2	20,039	543	13,049	13,592	225	4,892	5,117	0	1,330	c/	1,330
1998	802	5.0	15,365	95.0	16,167	567	9,057	9,624	184	4,679	4,863	51	1,629	c/	1,680
1999	1,028	9.1	10,265	90.9	11,293	440	5,968	6,408	547	3,671	4,218	41	626	c/	667
2000	2,159	8.3	23,923	91.7	26,082	1,264	10,846	12,110	571	11,594	12,165	324	1,483	c/	1,807
2001	2,065	10.5	17,556	89.5	19,621	1,178	10,284	11,462	629	6,366	6,995	258	906		1,164

Appendix 11 (continued). Spring Chinook Salmon estimated run-size, spawner escapement, and angler harvest estimates for the Trinity River upstream of Junction City weir, 1977 - 2017.

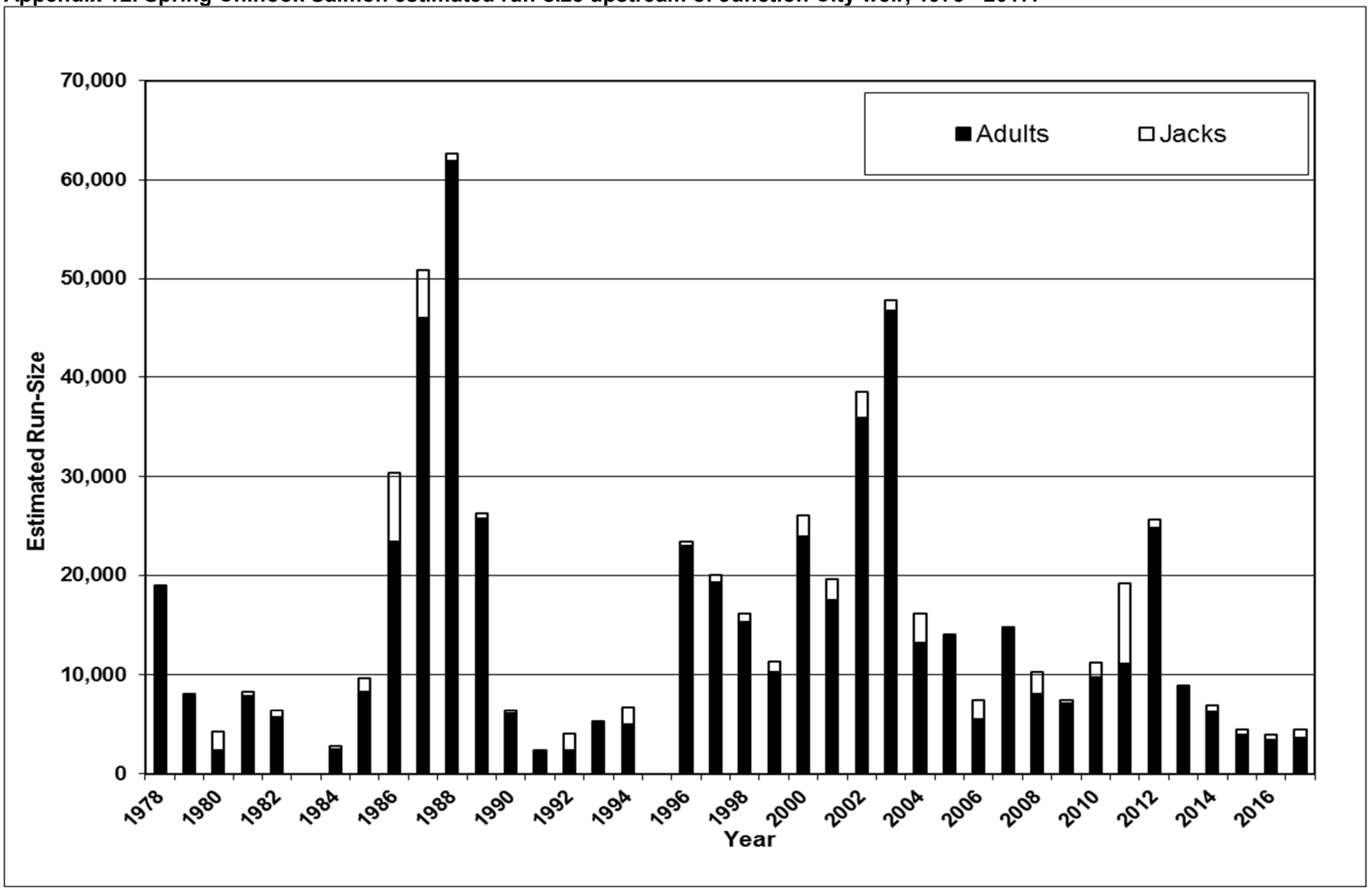
	Run-size estimate					Spawner escapements						Angler harvest [c]		
						Natural Area Spawers [b]			Trinity River Hatchery					
	Jacks[a]		Adults		Total	Jacks	Adults	Total	Jacks	Adults	Total	Jacks	Adults	Total
Year	Number	Percent	Number	Percent										
2002 NATURAL	1,238	10%	11,398	90%	12,636	1,109	10,097	11,206	87	722	809	41	579	620
2002 TRH	1,337	5%	24,512	95%	25,849	774	13,577	14,351	530	9,718	10,248	34	1,217	1,251
2002 TOTAL	**2,575**	**7%**	**35,910**	**93%**	**38,485**	**1,883**	**23,674**	**25,557**	**617**	**10,440**	**11,057**	**75**	**1,796**	**1,871**
2003 NATURAL	740	5%	13,509	95%	14,249	729	11,490	12,219	11	1,432	1,443	0	587	587
2003 TRH	299	1%	33,247	99%	33,546	180	18,721	18,901	119	13,080	13,199	0	1,446	1,446
2003 TOTAL	**1,039**	**2%**	**46,756**	**98%**	**47,795**	**909**	**30,211**	**31,120**	**130**	**14,512**	**14,642**	**0**	**2,033**	**2,033**
2004 NATURAL	1,266	26%	3,556	74%	4,822	1,009	2,966	3,975	154	410	564	103	180	283
2004 TRH	1,663	15%	9,662	85%	11,325	699	4,348	5,047	831	4,841	5,672	133	473	606
2004 TOTAL	**2,929**	**18%**	**13,218**	**82%**	**16,147**	**1,708**	**7,314**	**9,022**	**985**	**5,251**	**6,236**	**236**	**653**	**889**
2005 NATURAL	-14	0%	3,032	100%	3,018	-2	2,028	2,026	-11	799	788	0	206	206
2005 TRH	69	1%	10,897	99%	10,966	32	3,975	4,007	36	6,167	6,203	0	755	755
2005 TOTAL	**55**	**0%**	**13,929**	**100%**	**13,984**	**30**	**6,003**	**6,033**	**25**	**6,966**	**6,991**	**0**	**961**	**961**
2006 NATURAL	914	24%	2,911	76%	3,825	792	2,418	3,210	114	494	608	8	0	8
2006 TRH	1,049	29%	2,609	71%	3,658	335	537	872	705	2,071	2,776	9	0	9
2006 TOTAL	**1,963**	**26%**	**5,520**	**74%**	**7,483**	**1,127**	**2,955**	**4,082**	**819**	**2,565**	**3,384**	**17**	**0**	**17**
2007 NATURAL	56	2%	2,680	98%	2,736	67	1,705	1,772	-11	862	851	0	113	113
2007 TRH	79	1%	12,020	99%	12,099	13	6,449	6,462	66	5,119	5,185	0	452	452
2007 TOTAL	**135**	**1%**	**14,700**	**99%**	**14,835**	**80**	**8,154**	**8,234**	**55**	**5,981**	**6,036**	**0**	**565**	**565**
2008 NATURAL	1,846	32%	3,860	68%	5,706	1,614	3,210	4,824	108	571	679	123	79	202
2008 TRH	372	8%	4,205	92%	4,577	127	1,260	1,387	221	2,866	3,087	25	79	104
2008 TOTAL	**2,218**	**22%**	**8,065**	**78%**	**10,283**	**1,741**	**4,470**	**6,211**	**329**	**3,437**	**3,766**	**148**	**158**	**306**
2009 NATURAL	175	5%	3,278	95%	3,453	155	2,672	2,827	20	404	424	0	202	202
2009 TRH	85	2%	3,888	98%	3,973	36	1,052	1,088	49	2,596	2,645	0	240	240
2009 TOTAL	**260**	**4%**	**7,166**	**96%**	**7,426**	**191**	**3,724**	**3,915**	**69**	**3,000**	**3,069**	**0**	**442**	**442**
2010 NATURAL	1,020	15%	5,756	85%	6,776	959	5,066	6,025	61	321	382	0	368	368
2010 TRH	534	12%	3,975	88%	4,509	350	1,744	2,094	184	2,136	2,320	0	95	95
2010 TOTAL	**1,554**	**14%**	**9,731**	**86%**	**11,285**	**1,309**	**6,810**	**8,119**	**245**	**2,457**	**2,702**	**0**	**463**	**463**
2011 NATURAL	3,592	38%	5,781	62%	9,373	3,350	5,577	8,927	193	204	397	50	0	50
2011 TRH	4,495	46%	5,351	54%	9,846	1,867	1,732	3,599	2,565	3,619	6,184	62	0	62
2011 TOTAL	**8,087**	**42%**	**11,132**	**58%**	**19,219**	**5,217**	**7,309**	**12,526**	**2,758**	**3,823**	**6,581**	**112**	**0**	**112**
2012 NATURAL	251	3%	9,060	97%	9,311	116	7,569	7,685	31	788	819	105	703	808
2012 TRH	562	3%	15,744	97%	16,306	426	8,548	8,974	78	5,924	6,002	58	1,273	1,331
2012 TOTAL	**813**	**3%**	**24,804**	**97%**	**25,617**	**542**	**16,117**	**16,659**	**109**	**6,712**	**6,821**	**163**	**1,976**	**2,139**
2013 NATURAL	146	5%	2,669	95%	2,815	127	2,487	2,614	19	116	135	0	67	67
2013 TRH	135	2%	6,011	98%	6,146	58	3,469	3,527	77	2,366	2,443	0	176	176
2013 TOTAL	**281**	**3%**	**8,680**	**97%**	**8,961**	**185**	**5,956**	**6,141**	**96**	**2,482**	**2,578**	**0**	**243**	**243**
2014 NATURAL	132	6%	1,998	94%	2,130	49	1,559	1,608	80	372	452	3	66	211
2014 TRH	528	11%	4,300	89%	4,828	233	1,274	1,507	282	2,883	3,165	13	144	15
2014 TOTAL	**660**	**9%**	**6,298**	**91%**	**6,958**	**282**	**2,833**	**3,115**	**362**	**3,255**	**3,617**	**16**	**210**	**226**
2015 NATURAL	177	13%	1,146	87%	1,323	123	817	940	55	273	327	0	56	56
2015 TRH	313	10%	2,772	90%	3,085	127	1,163	1,290	185	1,475	1,661	0	134	134
2015 TOTAL	**490**	**11%**	**3,918**	**89%**	**4,408**	**250**	**1,980**	**2,230**	**240**	**1,748**	**1,988**	**0**	**190**	**190**
2016 NATURAL	178	12%	1,337	88%	1,515	155	1,168	1,323	17	90	107	6	79	85
2016 TRH	367	15%	2,022	85%	2,389	95	163	258	260	1,740	2,000	12	119	131
2016 TOTAL	**545**	**14%**	**3,359**	**86%**	**3,904**	**250**	**1,331**	**1,581**	**277**	**1,830**	**2,107**	**18**	**198**	**216**
2017 NATURAL	309	17%	1,466	83%	1,775	322	1,429	1,751	-42	25	-17	29	12	41
2017 TRH	493	19%	2,157	81%	2,650	159	1,030	1,189	288	1,109	1,397	46	17	63
2017 TOTAL	**802**	**18%**	**3,623**	**82%**	**4,425**	**481**	**2,459**	**2,940**	**246**	**1,134**	**1,380**	**75**	**29**	**104**

a/ Jacks are two year old salmon, adults are three years old or older.

b/ Natural area spawners includes both wild and hatchery fish that spawn in areas outside Trinity River Hatchery.

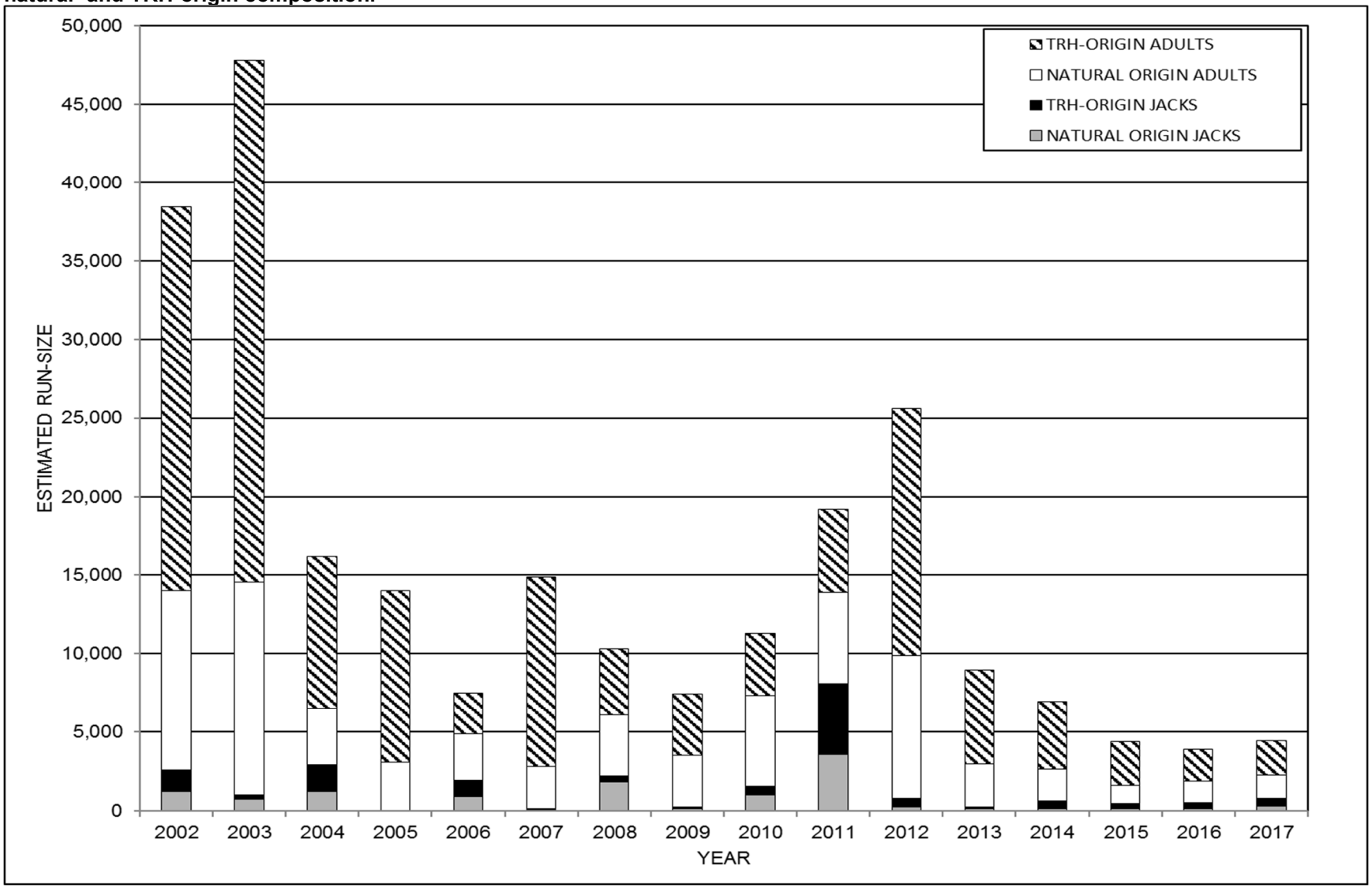
c/ The sport harvest of spring Chinook Salmon was subject to seasonal and size limit restrictions.

Appendix 12. Spring Chinook Salmon estimated run-size upstream of Junction City weir, 1978 - 2017. [a]



a. No estimate in 1983 or 1995 due to lack of funding.

Appendix 13. Spring Chinook Salmon estimated run-size for the Trinity River upstream of Junction City weir, 2002 – 2017, showing natural- and TRH-origin composition.



Appendix 14. Fork length (FL) distribution of fall Chinook Salmon trapped and tagged at Willow Creek (WCW) weir, and subsequently recovered during the 2017-18 season.[a]

FL (cm)	WCW			RECOVERIES							
	Total Trapped	Total Tagged[b]	Ad-clips[c]	Tag Morts[d]	Angler Harvest[e]	TRH[f] Recoveries	Carcass[g] Recoveries	Found Tags[h]	Angler Released[i]	Total Recoveries	% Recoveries
36	1	1								0	0.0
37	2	2								0	0.0
38	6	6								0	0.0
39	9	9	1			1	1			2	22.2
40	16	16	2			2		1		3	18.8
41	24	23	2			2			2	4	17.4
42	32	32	3			8			4	12	37.5
43	51	50	10			16	1		2	19	38.0
44	99	98	17			37	2	2	5	46	46.9
45	61	61	5			19	1		4	24	39.3
46	116	116	18			41	3		9	53	45.7
47	85	85	13			36			5	41	48.2
48	62	61	8			21			6	27	44.3
49	84	83	6			21	1		12	34	41.0
50	71	70	3			20			5	25	35.7
51	48	48	8			15	1		2	18	37.5
52	43	41	3			8			7	15	36.6
53	34	34	4	1		9				10	29.4
54	25	25		1		4	1			6	24.0
55	19	19				6				6	31.6
56	32	32	5			15	1		1	17	53.1
57	21	21	3			11	1		3	15	71.4
58	31	31	8			14				14	45.2
59	39	39	9			21	2			23	59.0
60	50	48	7	1		26	2		1	30	62.5
61	56	54	9			27	1		5	33	61.1
62	62	61	8			35	2		2	39	63.9
63	60	58	9			23	4		1	28	48.3
64	85	83	12			38	2	1	3	44	53.0
65	66	66	6			23	1		1	25	37.9
66	71	71	8			21	5		2	28	39.4
67	67	65	9			26		2	1	29	44.6
68	53	53	7			18		1	1	20	37.7
69	45	44	2			14	2			16	36.4
70	44	43	1			9	1		3	13	30.2
71	34	33	3			7		1		8	24.2
72	29	28				8	1			9	32.1
73	30	30	3			9	1	2	1	13	43.3
74	20	19	3			5	1		2	8	42.1
75	20	20	2			4	1			5	25.0
76	17	17	1			3				3	17.6
77	10	10	1			3	1			4	40.0
78	12	12	1			1	1			2	16.7
79	14	14	2			2		1		3	21.4
80	8	8				3				3	37.5
81	5	5				1				1	20.0
82	3	3								0	0.0
83	3	3								0	0.0
84	3	3								0	0.0
85	3	3								0	0.0
86	1	1								0	0.0
87	3	3								0	0.0
88										--	--
89										--	--
90	3	3								0	0.0
91	1	1								0	0.0
92	2	2								0	0.0
93										--	--
94										--	--
95	1	1								0	0.0
Totals:	1,892	1,868	222	3	0	633	41	11	90	778	41.6
Mean FL:	57.3	57.3	55.9	55.7	--	57.1	60.4	62.7	52.3	56.8	
Total jacks:[j]	888	880	103	2	0	266	11	3	63	345	39.2
Total adults:	1,004	988	119	1	0	367	30	8	27	433	43.8

a/ Trapping at Willow Creek weir took place August 30 - November 8, 2017 (Julian weeks 35-45). All Chinook trapped at WCW in 2017 were considered fall
b/ Twenty-four (11 jack and 13 adult) fall Chinook were not tagged due to poor condition.
c/ Ad-clip = Adipose fin clipped fish.
d/ Tagged fish found dead and unspawned within 30 days of tagging are considered tagging mortalities.
e/ Fish reported as harvested by anglers. There was no legal harvest of Chinook Salmon after August 31, 2017.
f/ Trapping occurred at Trinity River Hatchery September 5, 2017 - March 6, 2018 (JWs 36-10; closed parts or all of JWs 41-43).
g/ Fish recovered in upper Trinity River spawner surveys.
h/ Fish tags found loose or on dead fish and returned by anglers or other river enthusiasts.
i/ Fish caught and released by anglers, their tag removed.
j/ Fall Chinook <56 cm FL were considered jacks in 2017 (for this analysis).

Appendix 15. Fork length distribution of coded-wire tagged, Trinity River Hatchery-origin fall Chinook recovered at TRH during the 2017-18 season.[a]

	Coded wire tag code group, by Brood Year and type[b]																						
	2012			2013						2014							2015						
FL (cm)	060499-f	060504-y		060608-f	060609-f	060610-f	060611-f	060613-y		060615-y	060692-f	060693-f	060694-f	060697-y	068829-f		060775-f	060776-f	060777-f	060778-f	060780-y	060782-f	TOTALS
38																		1					1
39																					1		1
40																	1				1		2
41																		2	1	1	3		7
42																	3		2	1	13		19
43																	3	7	7		15		32
44																	4	8	3	4	17	1	37
45																	7	8	2	1	23		41
46																	5	8	6	3	18		40
47																	4	5	2	2	23	2	38
48																	9	10	3	5	29		56
49																	4	6	1	1	18		30
50																	2	3	3	2	8	1	19
51																	9	5	5	3	10		32
52																	3	2	1		8		14
53														2			4			1	4		11
54														5							2		7
55								1						7				2			1		11
56											1			21							1		23
57												1		26			1						28
58								1			2	2		21									26
59											1	1		30									32
60											2	4	1	43									50
61								1			8	5		52									66
62											2	3	2	37									44
63										1	7	3	3	48									62
64								2			6	7	2	45	1								63
65											11	6		37	1								55
66											15	11	2	23	1								52
67								1			10	4	3	30	2								50
68					1			4			13	5	2	23	4								52
69								1			4	2		16									23
70								3			5	4		14	1								27
71				1		1		6			5	2		8									23
72							1	4			3	4		9	1								22
73								5			5	2		6									18
74		1						2			1	3	1	4									12
75	1					1		2				3	1	6									14
76								5				2		5									12
77		1		1				1			1	1		3									8
78								1			1			2									4
79		1			2			3				1		3									10
80		1						3				1		1	1								7
81												1											1
82				1				2			1			1									5
83																							0
84																							0
85		1				1																	2
86																							0
87																							0
88																							0
89																							0
90							1																1
Totals:	1	5	0	3	3	3	2	48	0	1	104	78	17	528	12	0	59	67	36	24	195	4	1,190
Mean	75.0	79.0		76.7	75.3	77.0	81.0	72.4		63.0	66.5	67.1	65.8	63.5	68.6		47.7	46.1	46.3	47.1	46.5	47.0	

a/ Trapping occurred at Trinity River Hatchery September 5, 2017 - March 6, 2018 (JWs 36-10; closed parts or all of JWs 41-43).
b/ Age at release: f = fingerlings, y = yearlings.

Appendix 16. Run-size, percent return, in-river sport catch, and spawner escapement estimates for Trinity River Hatchery-origin, coded-wire tagged, fall Chinook Salmon returning to the Trinity River upstream of Willow Creek weir during the period 2014 - 2017.

Release data					Estimated returns						
CWT [a] code	Brood year	Date [b]	Number	Site	Age	Run-size	% of release	River harvest	Spawning escapement TRH [c]	Spawning escapement Natural	Spawning escapement Total [g]
060493	2012	06/01-15/13	105,581	TRH	2	10	0.01	0.2	4	6	10
060493	2012				3	20	0.02	0.1	15	4	19
060493	2012				4	3	0.00	0.0	2	1	3
060493	2012				5	0	0.00	0.0	0	0	0
				Totals: [d]		33	0.03	0	21	11	33
				Total adults: [e]		23	0.02	0	17	5	22
060494	2012	06/01-15/13	102,559	TRH	2	18	0.02	0.4	7	11	18
060494	2012				3	17	0.02	0.1	13	4	17
060494	2012				4	0	0.00	0.0	0	0	0
060494	2012				5	0	0.00	0.0	0	0	0
				Totals: [d]		35	0.03	0	20	14	35
				Total adults: [e]		17	0.02	0	13	4	17
060495	2012	06/01-15/13	67,315	TRH	2	0	0.00	--	--	--	0
060495	2012				3	5	0.01	0.0	4	1	5
060495	2012				4	2	0.00	0.0	1	0	2
060495	2012				5	0	0.00	0.0	0	0	0
				Totals: [d]		7	0.01	0	5	2	7
				Total adults: [e]		7	0.01	0	5	2	7
060496	2012	06/01-15/13	103,825	TRH	2	0	0.00	--	--	--	0
060496	2012				3	3	0.00	0.0	2	1	3
060496	2012				4	2	0.00	0.0	1	0	1
060496	2012				5	2	0.00	0.0	1	0	1
				Totals: [d]		6	0.01	0	4	2	6
				Total adults: [e]		6	0.01	0	4	2	6
060499 [f]	2012	5/29-8/29/13	13,758	River	2	0	0.00	--	--	--	0
060499 [f]	2012				3	1	0.01	0.0	1	0	1
060499 [f]	2012				4	2	0.01	0.0	1	0	1
060499 [f]	2012				5	1	0.01	0.0	1	0	1
				Totals: [d]		4	0.03	0	3	1	4
				Total adults: [e]		4	0.03	0	3	1	4
060504	2012	10/01-14/13	221,247	TRH	2	108	0.05	2.1	43	63	106
060504	2012				3	463	0.21	2.1	360	101	461
060504	2012				4	136	0.06	1.2	91	44	134
060504	2012				5	7	0.00	0.0	5	2	7
				Totals: [d]		714	0.32	5	499	210	709
				Total adults: [e]		606	0.27	3	456	147	602

Appendix 16 (continued). Run-size, percent return, in-river sport catch, and spawner escapement estimates for Trinity River Hatchery-origin, coded-wire tagged, fall Chinook returning to the Trinity River upstream of Willow Creek weir during the period 2011 through 2017.

Release data						Estimated returns					
CWT [a] code	Brood year	Date [b]	Number	Site	Age	Run-size	% of release	River harvest	Spawning escapement TRH [c]	Natural	Total [g]
060608	2013	06/01-04/14	128,061	TRH	2	26	0.02	0.2	9	17	26
060608	2013				3	21	0.02	0.2	14	7	21
060608	2013				4	4	0.00	0.0	3	1	4
060609	2013	06/01-04/14	124,107	TRH	2	17	0.01	0.1	6	11	17
060609	2013				3	20	0.02	0.2	13	6	19
060609	2013				4	4	0.00	0.0	3	1	4
060610	2013	06/01-04/14	127,893	TRH	2	9	0.01	0.1	3	6	9
060610	2013				3	6	0.00	0.1	4	2	6
060610	2013				4	4	0.00	0.0	3	1	4
060611	2013	06/01-04/14	128,022	TRH	2	9	0.01	0.1	3	6	9
060611	2013				3	9	0.01	0.1	6	3	9
060611	2013				4	3	0.00	0.0	2	1	3
060613	2013	10/01-22/14	239,886	TRH	2	64	0.03	0.5	22	41	63
060613	2013				3	160	0.07	1.4	107	52	158
060613	2013				4	67	0.03	0.0	48	18	67
060614	2013	06/01-04/14	9,305	TRH	2	0	0.00	0.0	0	0	0
060614	2013				3	2	0.02	0.0	1	0	2
060614	2013				4	0	0.00	0.0	0	0	0
068850 [f]	2013	5/16-8/28/14	9,372	River	2	3	0.03	0.0	1	2	3
068850 [f]	2013				3	2	0.02	0.0	1	0	1
068850 [f]	2013				4	0	0.00	0.0	0	0	0
060615	2014	06/17-8/26/15	8,075	River	2	0	0.00	0.0	0	0	0
					3	1	0.00	0.0	1	0	1
060692	2014	06/01-15/15	94,892	TRH	2	43	0.05	0.0	24	19	43
060692					3	145	0.15	0.0	105	40	145
060693	2014	06/01-15/15	93,755	TRH	2	61	0.07	0.0	34	27	61
060693					3	108	0.12	0.0	79	30	108
060694	2014	06/01-15/15	92,404	TRH	2	27	0.03	0.0	15	12	27
060694					3	24	0.03	0.0	17	6	24
060697	2014	10/01-15/15	236,204	TRH	2	20	0.01	0.0	11	9	20
060697					3	733	0.31	0.0	532	201	733
068829	2014	06/01-15/15	48,962	TRH	2	4	0.01	0.0	2	2	4
068829					3	17	0.03	0.0	12	5	17
060775	2015	06/01-15/16	116,945	TRH	2	102	0.09	0	60	42	102
060776	2015	06/01-15/16	115,416	TRH	2	116	0.10	0	68	48	116
060777	2015	06/01-15/16	111,222	TRH	2	62	0.06	0	36	26	62
060778	2015	06/01-15/16	111,020	TRH	2	41	0.04	0	24	17	41
060782 [f]	2015	06/19-8/30/16	6,444	River	2	337	5.22	0	197	140	337
060780	2015	10/01-15/16	239,139	TRH	2	7	0.00	0	4	3	7

a/ CWT = coded-wire tag.
b/ Chinook Salmon released during June were smolts, those released in October were yearlings.
c/ TRH = Trinity River Hatchery.
d/ Totals are presented only for brood year 2012. These fish have reached five years of age and are considered to have completed their life cycle.
e/ The term "adults" includes Chinook aged three through five.
f/ Experimental release group. Fish used in screw trap efficiency studies; released near North Fork Trinity River or Willow Creek.
g/ Rounding sometimes makes for seeming addition errors in this column.

Appendix 17. Percent return of Trinity River Hatchery-origin, coded-wire tagged, fall Chinook Salmon, brood years 1986-2012. [a]

	Fingerling releases			Yearling releases		
Brood year	Number released	Number of returns	Percent return	Number released	Number of returns	Percent return
1986	393,955	292	0.07%	153,700	4,899	3.19%
1987	172,980	129	0.07%	92,300	418	0.45%
1988	194,197	138	0.07%	143,934	796	0.55%
1989	201,622	21	0.01%	143,978	174	0.12%
1990	0	0	---	103,040	166	0.16%
1991	206,416	937	0.45%	115,300	517	0.45%
1992	192,032	2,503	1.30%	108,894	5,369	4.93%
1993	201,032	158	0.08%	110,336	798	0.72%
1994	216,563	374	0.17%	113,124	756	0.67%
1995	216,051	285	0.13%	110,327	3,106	2.82%
1996	217,981	445	0.20%	112,746	394	0.35%
1997	216,772	1,707	0.79%	313,080	11,396	3.64%
1998	184,781	292	0.16%	334,726	7,173	2.14%
1999	181,301	693	0.38%	296,892	5,833	1.96%
2000	522,316	3,909	0.75%	216,593	5,245	2.42%
2001	499,919	476	0.10%	230,055	5,894	2.56%
2002	508,963	3,563	0.70%	236,319	3,561	1.51%
2003	534,219	289	0.05%	225,798	944	0.42%
2004	486,369	4,125	0.85%	218,386	3,909	1.79%
2005	488,466	157	0.03%	227,903	675	0.30%
2006	486,833	849	0.17%	238,156	3,240	1.36%
2007	446,316	324	0.07%	244,661	2,330	0.95%
2008	518,269	3,576	0.69%	259,330	4,211	1.62%
2009	496,761	2,988	0.60%	230,461	7,361	3.19%
2010	475,062	856	0.18%	231,430	2,221	0.96%
2011	406,418	461	0.11%	200,337	2,489	1.24%
2012	393,038	84	0.02%	221,247	714	0.32%
Means:	335,505	1,097	0.32%	193,817	3,133	1.51%

a/ Based on estimated returns upstream of Willow Creek weir. Does not include ocean harvest, in-river harvest and escapement downstream of Willow Creek weir.

Appendix 18. Fall Chinook Salmon estimated run-size, spawner escapement, and angler harvest estimates for the Trinity River upstream of Willow Creek weir, 1977 – 2017.

	Run-size estimate					Spawner escapements						Angler harvest			
						Natural Area Spawners [a]			Trinity River Hatchery						
	Jacks[e]		Adults		Total	Jacks	Adults	Total	Jacks	Adults	Total	Jacks	Adults		Total
Year	Number	Percent	Number	Percent											
1977	14,318	43.5	18,596	56.5	32,914	9,737	13,501	23,238	2,177	2,035	4,212	2,404	3,060		5,464
1978	6,037	14.0	37,086	86.0	43,123	4,712	31,052	35,764	1,325	6,034	7,359	Fishing closure		b/	0
1979	5,665	35.0	10,520	65.0	16,185	3,936	8,028	11,964	964	1,335	2,299	765	1,157		1,922
1980	21,549	62.7	12,797	37.3	34,346	16,837	7,700	24,537	2,256	4,099	6,355	2,456	998		3,454
1981	8,366	28.6	20,884	71.4	29,250	5,906	15,340	21,246	1,004	2,370	3,374	1,456	3,174		4,630
1982	14,938	52.2	13,653	47.8	28,591	8,149	9,274	17,423	4,235	2,058	6,293	2,554	2,321		4,875
1983	1,240	4.7	25,138	95.3	26,378	853	17,284	18,137	271	5,494	5,765	116	2,360		2,476
1984	4,575	34.8	8,556	65.2	13,131	3,416	5,654	9,070	766	2,166	2,932	393	736		1,129
1985	53,062	81.6	11,954	18.4	65,016	29,454	9,217	38,671	18,166	2,583	20,749	5,442	154	c/	5,596
1986	27,506	18.6	120,382	81.4	147,888	20,459	92,548	113,007	3,609	15,795	19,404	3,438	12,039		15,477
1987	9,325	8.9	95,287	91.1	104,612	5,949	71,920	77,869	2,453	13,934	16,387	923	9,433		10,356
1988	18,113	20.3	71,309	79.7	89,422	10,626	44,616	55,242	4,752	17,352	22,104	2,735	9,341		12,076
1989	2,991	6.4	43,631	93.6	46,622	2,543	29,445	31,988	239	11,132	11,371	209	3,054		3,263
1990	634	6.3	9,358	93.7	9,992	241	7,682	7,923	371	1,348	1,719	22	328		350
1991	681	7.4	8,526	92.6	9,207	382	4,867	5,249	205	2,482	2,687	94	1,177		1,271
1992	2,932	20.7	11,232	79.3	14,164	2,563	7,139	9,702	211	3,779	3,990	158	314	c/	472
1993	3,381	32.2	7,104	67.8	10,485	2,473	5,898	8,371	736	815	1,551	172	391	c/	563
1994	7,494	34.2	14,430	65.8	21,924	2,505	10,906	13,411	4,442	3,264	7,706	547	260	c/	807
1995	9,892	9.4	95,833	90.6	105,725	9,262	77,876	87,138	76	15,178	15,254	554	2,779	c/	3,333
1996	5,072	9.1	50,574	90.9	55,646	4,478	42,646	47,124	249	6,411	6,660	345	1,517	c/	1,862
1997	3,767	17.6	17,580	82.4	21,347	2,845	11,507	14,352	820	5,387	6,207	102	686	c/	788
1998	2,307	5.3	40,882	94.7	43,189	1,974	24,460	26,434	192	14,296	14,488	141	2,126	c/	2,267
1999	6,583	35.6	11,933	64.4	18,516	4,154	6,753	10,907	2,027	5,037	7,064	402	143	d/	545
2000	3,163	5.7	52,310	94.3	55,473	1,964	24,880	26,844	1,028	26,018	27,046	171	1,412	d/	1,583
2001	1,214	2.1	55,895	97.9	57,109	914	36,152	37,066	204	17,971	18,175	96	1,772	d/	1,868

a/ Natural area spawners includes both wild and hatchery fish that spawn in areas outside Trinity River Hatchery.

b/ The 1978 sport harvest of fall Chinook was restricted by a salmon fishing closure beginning August 25, 1978.

c/ The sport harvest of adult fall Chinook was subject to seasonal and size limit restrictions.

d/ The 1999-2013 sport harvest of Klamath Basin fall Chinook was managed with a quota system. The quota for adult fall Chinook was 957 in 1999; 693 in 2000; 9,834 in 2001; 6,926 in 2002; 10,800 in 2003; 4,700 in 2004; 1,262 in 2005, zero in 2006, 10,600 in 2007, 20,500 in 2008, 30,800 in 2009, 12,000 in 2010, 7,900 in 2011, 67,600 in 2012, and 40,006 in 2013.

e/ Jacks are two year old fish, adults are a minimum of three years old.

Appendix 18 (continued). Fall Chinook Salmon estimated run-size, spawner escapement, and angler harvest estimates for the Trinity River upstream of Willow Creek weir, 1977 – 2017.

	Run-size estimate					Spawner escapements						Angler harvest			
						Natural Area Spawners [a]			Trinity River Hatchery						
	Jacks[e]		Adults		Total	Jacks	Adults	Total	Jacks	Adults	Total	Jacks	Adults		Total
Year	Number	Percent	Number	Percent											
2002 NATURAL	1,314	15.1	7,367	84.9	8,681	1,231	6,549	9,019	26	523	549	57	295		352
2002 TRH	2,498	26.4	6,977	73.6	9,475	1,335	3,761	3,857	1,052	2,952	4,004	111	264		375
2002 TOTAL	**3,812**	21.0	**14,344**	79.0	**18,156**	**2,566**	**10,310**	**12,876**	**1,078**	**3,475**	**4,553**	**168**	**559**	**d/**	**727**
2003 NATURAL	579	5.1	10,839	94.9	11,418	415	9,273	9,688	105	1,243	1,349	58	322		380
2003 TRH	968	1.8	51,976	98.2	52,944	343	21,922	22,265	529	28,509	29,037	97	1,545		1,642
2003 TOTAL	**1,547**	**2.4**	**62,815**	**97.6**	**64,362**	**758**	**31,195**	**31,953**	**634**	**29,752**	**30,386**	**155**	**1,867**	**d/**	**2,022**
2004 NATURAL	3,210	90	369	10	3,578	2,941	-223	2,718	70	595	664	200	-3		197
2004 TRH	2,014	8	23,941	92	25,956	898	11,768	12,666	989	11,789	12,779	127	384		511
2004 TOTAL	**5,224**	**17.7**	**24,310**	**82.3**	**29,534**	**3,839**	**11,545**	**15,384**	**1,059**	**12,384**	**13,443**	**327**	**381**	**d/**	**708**
2005 NATURAL	879	10.3	7,678	89.7	8,557	743	6,364	7,107	36	1,065	1,101	100	247		347
2005 TRH	20	0.1	19,654	99.9	19,674	8	6,353	6,361	12	12,693	12,705	0	609		609
2005 TOTAL	**899**	**3.2**	**27,332**	**96.8**	**28,231**	**751**	**12,717**	**13,468**	**48**	**13,758**	**13,806**	**100**	**856**	**d/**	**956**
2006 NATURAL	6,845	52	6,299	48	13,144	6,358	5,114	11,472	421	1,185	1,606	66	0		66
2006 TRH	5,445	25	16,323	75	21,768	1,870	9,452	11,322	3,517	6,871	10,388	58	0		58
2006 TOTAL	**12,290**	**35.2**	**22,622**	**64.8**	**34,912**	**8,228**	**14,566**	**22,794**	**3,938**	**8,056**	**11,994**	**124**	**0**	**d/**	**124**
2007 NATURAL	819	2.4	33,421	97.6	34,240	723	31,412	32,135	16	1,457	1,473	81	552		633
2007 TRH	67	0.3	24,566	99.7	24,633	42	7,555	7,597	17	16,624	16,641	8	387		395
2007 TOTAL	**886**	**1.5**	**57,987**	**98.5**	**58,873**	**765**	**38,967**	**39,732**	**33**	**18,081**	**18,114**	**89**	**939**	**d/**	**1,028**
2008 NATURAL	6,723	46.6	7,689	53.4	14,412	6,373	6,951	13,324	185	599	784	165	138		303
2008 TRH	1,133	13.2	7,452	86.8	8,585	488	3,457	3,945	616	3,852	4,468	29	143		172
2008 TOTAL	**7,856**	34.2	**15,141**	65.8	**22,997**	**6,861**	**10,408**	**17,269**	**801**	**4,451**	**5,252**	**194**	**281**	**d/**	**475**
2009 NATURAL	5,733	29.4	13,788	70.6	19,521	5,602	12,537	18,139	-9	921	912	141	330		471
2009 TRH	285	2.8	9,787	97.2	10,072	130	3,126	3,256	150	6,432	6,582	4	229		233
2009 TOTAL	**6,018**	20.3	**23,575**	79.7	**29,593**	**5,732**	**15,663**	**21,395**	**141**	**7,353**	**7,494**	**145**	**559**	**d/**	**704**
2010 NATURAL	10,125	40.6	14,814	59.4	24,939	9,782	14,104	23,886	241	611	852	102	99		201
2010 TRH	2,429	15.3	13,424	84.7	15,853	1,187	6,197	7,384	1,217	7,138	8,355	25	89		114
2010 TOTAL	**12,554**	30.8	**28,238**	69.2	**40,792**	**10,969**	**20,301**	**31,270**	**1,458**	**7,749**	**9,207**	**127**	**188**	**d/**	**315**
2011 NATURAL	30,462	63.5	17,482	36.5	47,944	29,530	15,470	45,000	146	1,688	1,834	786	327		1,113
2011 TRH	4,815	14.6	28,060	85.4	32,875	2,997	15,340	18,337	1,694	12,194	13,888	124	524		648
2011 TOTAL	**35,277**	43.6	**45,542**	56.4	**80,819**	**32,527**	**30,810**	**63,337**	**1,840**	**13,882**	**15,722**	**910**	**851**	**d/**	**1,761**
2012 NATURAL	4,514	11.0	36,416	89.0	40,931	4,530	34,702	39,232	-42	838	796	31	1,644		1,675
2012 TRH	729	2.2	32,007	97.8	32,735	590	14,615	15,205	134	16,623	16,757	4	769		773
2012 TOTAL	**5,243**	**7.1**	**68,423**	**92.9**	**73,666**	**5,120**	**49,317**	**54,437**	**92**	**17,461**	**17,553**	**31**	**1,644**	**d/**	**2,448**
2013 NATURAL	6,514	27.6	17,104	72.4	23,618	6,515	16,689	23,204	-1	-82	-83	0	498		498
2013 TRH	203	1.5	13,168	98.5	13,371	67	8,986	9,053	136	3,799	3,935	0	382		382
2013 TOTAL	**6,717**	**18.2**	**30,272**	**81.8**	**36,989**	**6,582**	**25,675**	**32,257**	**135**	**3,717**	**3,852**	**0**	**880**	**d/**	**880**
2014 NATURAL	5,553	32.0	11,814	68.0	17,367	5,492	11,528	17,020	-19	10	-9	80	276		356
2014 TRH	1,385	6.8	19,078	93.2	20,463	1,111	11,577	12,688	240	6,965	7,205	34	536		570
2014 TOTAL	**6,938**	**18.3**	**30,892**	**81.7**	**37,830**	**6,603**	**23,105**	**29,708**	**221**	**6,975**	**7,196**	**114**	**812**	**d/**	**926**
2015 NATURAL	2,226	38.1	3,609	61.9	5,834	2,167	3,576	5,744	41	16	57	17	17		34
2015 TRH	524	11.6	4,006	88.4	4,531	338	875	1,212	183	3,113	3,296	4	18		22
2015 TOTAL	**2,750**	**26.5**	**7,615**	**73.5**	**10,365**	**2,505**	**4,451**	**6,956**	**224**	**3,129**	**3,353**	**21**	**35**	**d/**	**56**
2016 NATURAL	1,022	25.5	2,987	74.5	4,008	979	2,853	3,831	43	108	151	0	26		26
2016 TRH	639	29.2	1,548	70.8	2,188	281	500	782	358	1,034	1,392	0	14		14
2016 TOTAL	**1,661**	**26.8**	**4,535**	**73.2**	**6,196**	**1,260**	**3,353**	**4,613**	**401**	**1,142**	**1,543**	**0**	**40**	**d/**	**40**
2017 NATURAL	3,096	38.4	4,961	61.6	8,057	2,842	4,558	7,400	254	403	657	0	0		0
2017 TRH	2,741	37.1	4,652	62.9	7,393	1,140	1,277	2,417	1,601	3,375	4,976	0	0		0
2017 TOTAL	**5,837**	**37.8**	**9,613**	**62.2**	**15,450**	**3,982**	**5,835**	**9,817**	**1,855**	**3,778**	**5,633**	**0**	**0**	**d/**	**0**

a/ Natural area spawners includes both wild and hatchery fish that spawn in areas outside Trinity River Hatchery.

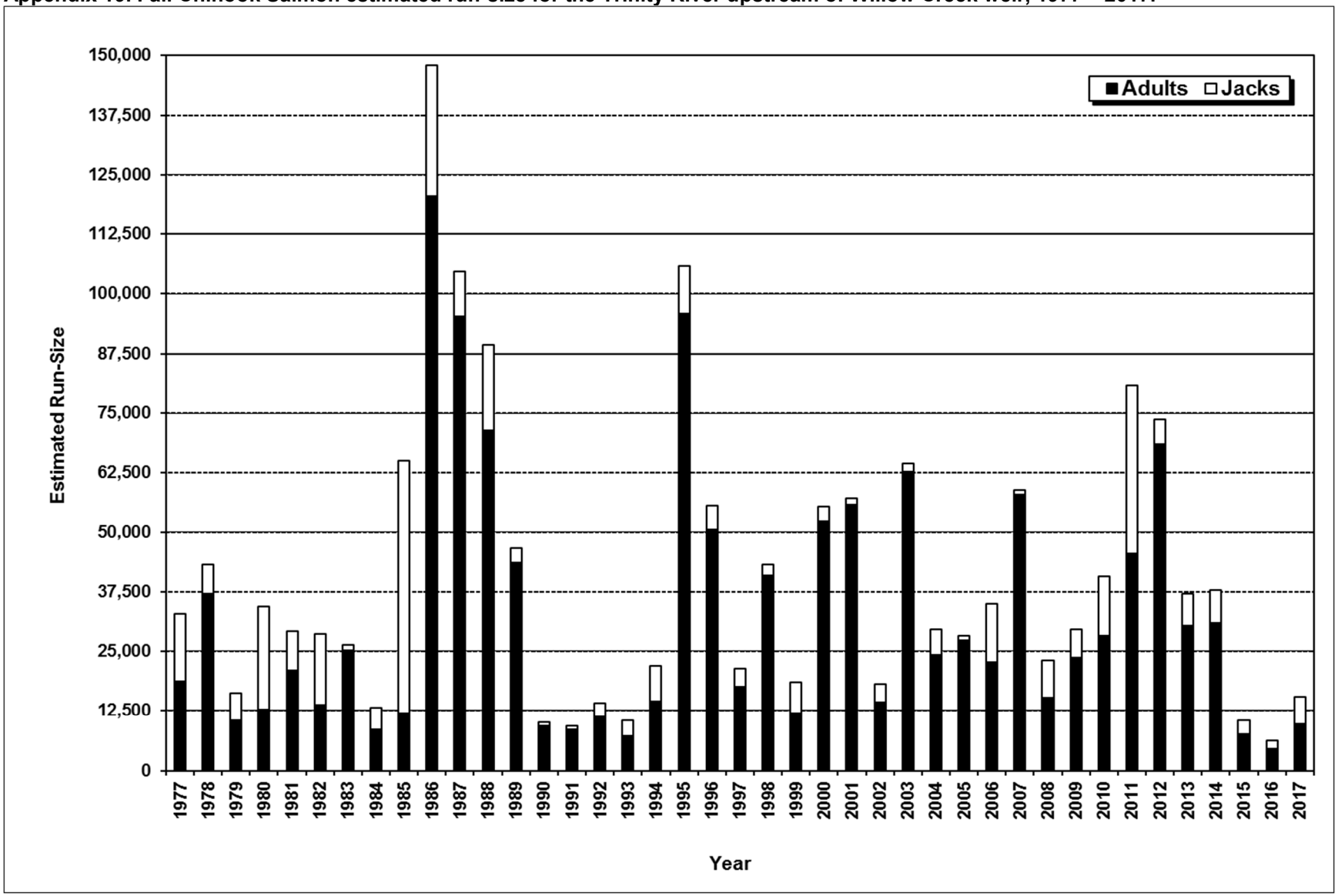
b/ The 1978 sport harvest of fall Chinook was restricted by a salmon fishing closure beginning August 25, 1978.

c/ The sport harvest of adult fall Chinook was subject to seasonal and size limit restrictions.

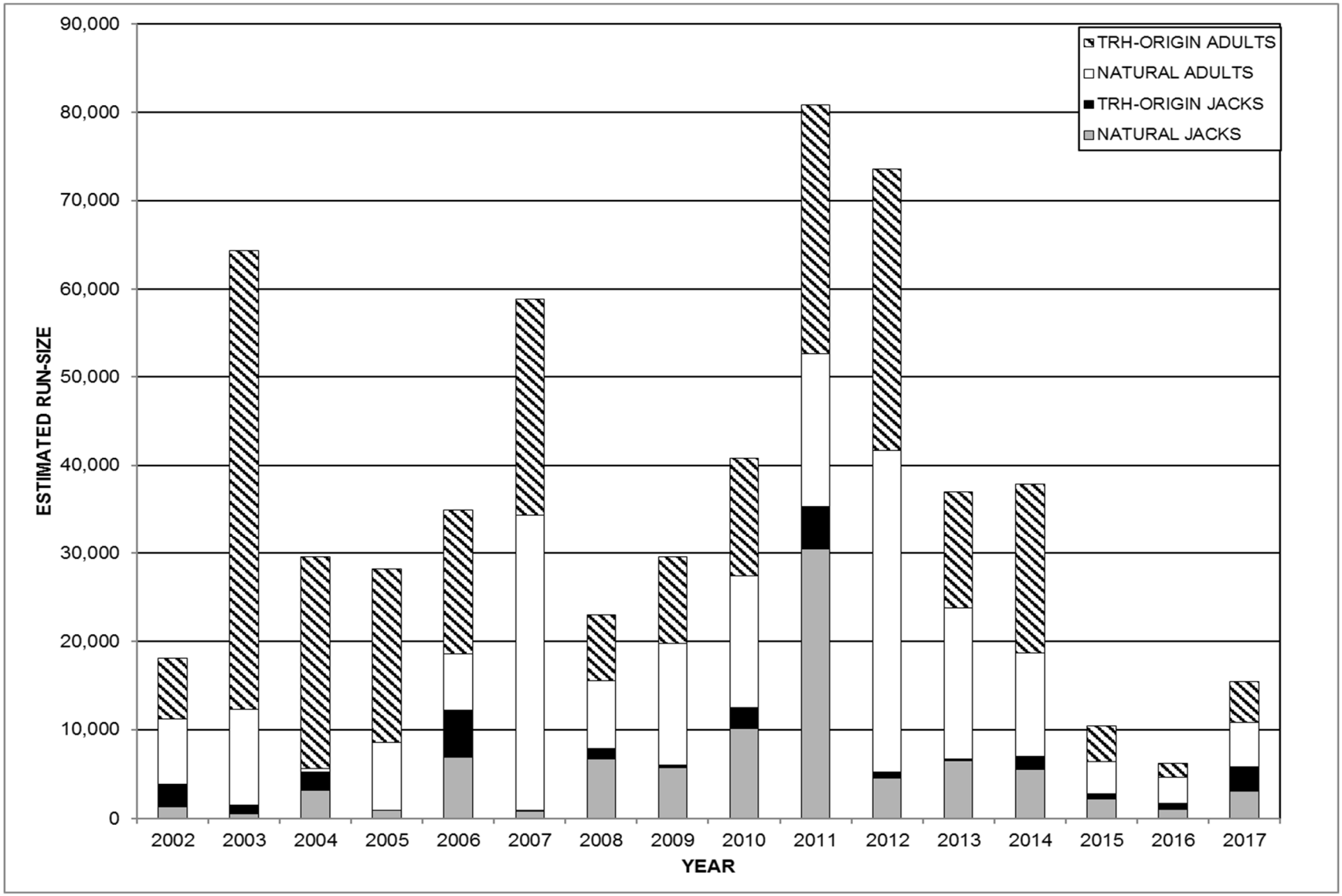
d/ The 1999-2017 sport harvest of Klamath Basin fall Chinook was managed with a quota system. The quota for adult fall Chinook was 957 in 1999; 693 in 2000; 9,834 in 2001; 6,926 in 2002; 10,800 in 2003; 4,700 in 2004; 1,262 in 2005, zero in 2006, 10,600 in 2007, 20,500 in 2008, 30,800 in 2009, 12,000 in 2010, 7,900 in 2011, 67,600 in 2012, 40,006 in 2013, 4,128 in 2014, 14,133 in 2015, 1,110 in 2016, and zero (no allowable harvest) in 2017.

e/ Jacks are two year old fish, adults are a minimum of three years old.

Appendix 19. Fall Chinook Salmon estimated run-size for the Trinity River upstream of Willow Creek weir, 1977 – 2017.



Appendix 20. Fall Chinook Salmon estimated run-size for the Trinity River upstream of Willow Creek weir, 2002 – 2017, showing natural- and TRH-origin composition.



Appendix 21. Fork length (FL) distribution of Coho Salmon trapped and tagged at Willow Creek (WCW) weir, and subsequently recovered during the 2017-18 season. [a]

FL (cm)	WCW			RECOVERIES							
	Total Trapped	Total Tagged[b]	RM-clips[c]	Tag Morts [d]	Angler Harvest [e]	TRH [f] Recoveries	Carcass [g] Recoveries	Found Tags [h]	Angler Released [i]	Total Recoveries	% Recoveries
35	5	5	5			3				3	60.0
36	5	5	4			2				2	40.0
37	5	5	5			5				5	100.0
38	1	1	1							0	0.0
39	3	3	3			1				1	33.3
40	3	3	3			2				2	66.7
41										--	--
42	2	2	2							0	0.0
43	1	1	1							0	0.0
44	1	1	1			1				1	100.0
45										--	--
46										--	--
47	1	1	1							0	0.0
48	1	1	1			1				1	100.0
49	1	1	1			1				1	100.0
50	1	1	1			1				1	100.0
51										--	--
52										--	--
53	1	1	1			1				1	100.0
54	3	3	2			1				1	33.3
55	1	1	1			1				1	100.0
56	3	3	3			3				3	100.0
57	1	1	1							0	0.0
58	1	1	1							0	0.0
59	3	3	3			3				3	100.0
60	4	4	2			4				4	100.0
61	2	2	2			1				1	50.0
62	2	1	2			1				1	100.0
63	2	2	1			2				2	100.0
64	1	1	1			1				1	100.0
65	2	1	2							0	0.0
66	1	1	1							0	0.0
Totals:	57	55	52	0	0	35	0	0	0	35	63.6
Mean FL:	48.8	48.3	48.3	--	--	49.5	--	--	--	49.5	
Total jacks:[j]	28	28	27	0	0	15	0	0	0	15	53.6
Total adults:	29	27	25	0	0	20	0	0	0	20	74.1

a/ Trapping at Willow Creek weir took place August 30 - November 8, 2017 (Julian weeks 35-45).
b/ Coho not tagged due to poor condition.
c/ RM-clips = Right maxillary clipped fish of Trinity River Hatchery origin.
d/ There were no tagged fish found dead and unspawned within 30 days of tagging (considered tagging mortalities) in 2017.
e/ Fish reported as harvested by anglers. There were zero reported as harvested by anglers in 2017.
f/ Trapping occurred at Trinity River Hatchery September 5, 2017 - March 6, 2018 (JWs 36-10; closed parts or all of JWs 41-43).
g/ There were no WCW tagged Coho recovered in upper Trinity River spawner surveys.
h/ There were no fish tags found loose or on dead fish and returned by anglers or other river enthusiasts in 2017.
i/ There were no Coho reported as caught and released by anglers, their tag removed, in 2017.
j/ Coho <49 cm FL were considered jacks in 2017.

Appendix 22. Coho Salmon run-size, spawner escapement, and angler harvest estimates for the Trinity River upstream of Willow Creek weir, 1977- 2017.

	Run-size estimate					Spawner escapements						Angler harvest		
	Number	Percent	Number	Percent		Natural Area Spawners[a]			Trinity River Hatchery					
YEAR	Jacks[e]		Adults		Total	Jacks	Adults	Total	Jacks	Adults	Total	Jacks	Adults	Total
1977	3,106	80.5	752	19.5	3,858	1,756	25	1,781	1,230	698	1,928	120	29	149
1978	6,685	73.2	2,447	26.8	9,132	4,309	1,168	5,477	2,376	1,279	3,655	Fishing closure[b]		0
1979	9,067	78.0	2,557	22.0	11,624	5,567	1,695	7,262	2,793	742	3,535	707	120	827
1980	2,499	41.0	3,595	59.0	6,094	954	1,817	2,771	1,545	1,778	3,323			0
1981	6,144	56.0	4,826	44.0	10,970	3,486	1,995	5,481	1,994	2,529	4,523	664	302	966
1982	2,021	17.5	9,508	82.5	11,529	1,158	5,097	6,255	823	3,975	4,798	40	436	476
1983	536	27.2	1,435	72.8	1,971	295	788	1,083	192	514	706	49	133	182
1984	15,208	77.2	4,486	22.8	19,694	6,188	2,971	9,159	7,727	1,134	8,861	1,293	381	1,674
1985	9,216	23.7	29,717	76.3	38,933	4,798	21,586	26,384	4,237	7,549	11,786	181	582	763[c]
1986	18,909	67.6	9,063	32.4	27,972	13,034	6,247	19,281	5,402	2,589	7,991	473	227	700
1987	7,253	12.3	51,826	87.7	59,079	3,975	28,398	32,373	2,865	20,473	23,338	413	2,955	3,368
1988	2,731	7.0	36,173	93.0	38,904	1,850	22,277	24,127	743	12,073	12,816	138	1,823	1,961
1989	290	1.5	18,462	98.5	18,752	208	13,274	13,482	77	4,893	4,970	5	295	300
1990	412	10.6	3,485	89.4	3,897	234	1,981	2,215	173	1,462	1,635	5	42	47
1991	265	2.9	8,859	97.1	9,124	164	6,163	6,327	98	2,590	2,688	3	106	109
1992	2,378	23.0	7,961	77.0	10,339	1,168	5,565	6,733	1,210	2,372	3,582	0	24	24
1993	573	10.2	5,048	89.8	5,621	416	3,024	3,440	93	2,024	2,117	64	0	64
1994	613	71.9	239	28.1	852	453	105	558	160	134	294	0	0	0
1995	634	3.9	15,477	96.1	16,111	370	10,680	11,050	264	4,503	4,767	0	294	294
1996	1,269	3.5	35,391	96.5	36,660	1,149	25,308	26,457	120	9,835	9,955	0	248	248[d]
1997	5,951	75.0	1,984	25.0	7,935	5,038	1,097	6,135	871	887	1,758	42	0	42[d]
1998	2,471	19.8	10,009	80.2	12,480	1,494	5,995	7,489	977	4,014	4,991	0	0	0[d]
1999	623	11.3	4,912	88.7	5,535	234	1,696	1,930	389	3,118	3,507	0	98	98[d]
2000	5,486	35.3	10,046	64.7	15,532	4,560	6,585	11,145	926	3,461	4,387	0	0	0[d]
2001	3,670	11.4	28,470	88.6	32,140	2,644	18,715	21,359	1,026	9,755	10,781	0	0	0[d]
2002	1,709	10.7	14,307	89.3	16,016	1,006	7,812	8,818	703	6,495	7,198	0	0	0[d]
2003	3,501	12.4	24,651	87.6	28,152	2,038	14,255	16,293	1,463	10,396	11,859	0	0	0[d]
2004	5,819	15.0	33,063	85.0	38,882	4,742	23,117	27,859	1,077	9,906	10,983	0	40	40[d]
2005	3,093	9.8	28,326	90.2	31,419	1,341	11,702	13,043	1,731	16,624	18,355	21	0	21[d]
2006	1,369	6.8	18,709	93.2	20,078	708	8,870	9,578	661	9,839	10,500	0	0	0[d]
2007	545	9.5	5,205	90.5	5,750	270	2,552	2,822	275	2,653	2,928	0	0	0[d]
2008	2,379	23.8	7,603	76.2	9,982	1,730	3,064	4,794	649	4,539	5,188	0	0	0[d]
2009	1,762	27.5	4,634	72.5	6,396	888	2,157	3,045	874	2,477	3,351	0	0	0[d]
2010	1,278	16.1	6,669	83.9	7,947	752	2,770	3,522	526	3,899	4,425	0	0	0[d]
2011	9,722	64.6	5,318	35.4	15,040	6,792	3,394	10,186	2,886	1,924	4,810	44	0	44[d]
2012	3,389	18.2	15,268	81.8	18,657	2,510	7,912	10,422	879	7,357	8,236	0	0	0[d]
2013	2,819	12.9	19,087	87.1	21,906	2,392	12,883	15,275	427	6,204	6,631	0	0	0[d]
2014	3,338	24.7	10,199	75.3	13,537	2,401	7,228	9,629	937	2,971	3,908	0	0	0[d]
2015	935	20.2	3,684	79.8	4,619	657	625	1,282	278	3,059	3,337	0	0	0[d]
2016	208	15.7	1,117	84.3	1,325	163	635	798	45	482	527	0	0	0[d]
2017	244	37.3	411	62.7	655	94	141	235	150	270	420	0	0	0[d]

a/ Natural area spawners includes both wild and hatchery fish that spawn in areas outside Trinity River Hatchery.

b/ The 1978 sport harvest of coho was essentially eliminated by a salmon fishing closure beginning August 25, 1978.

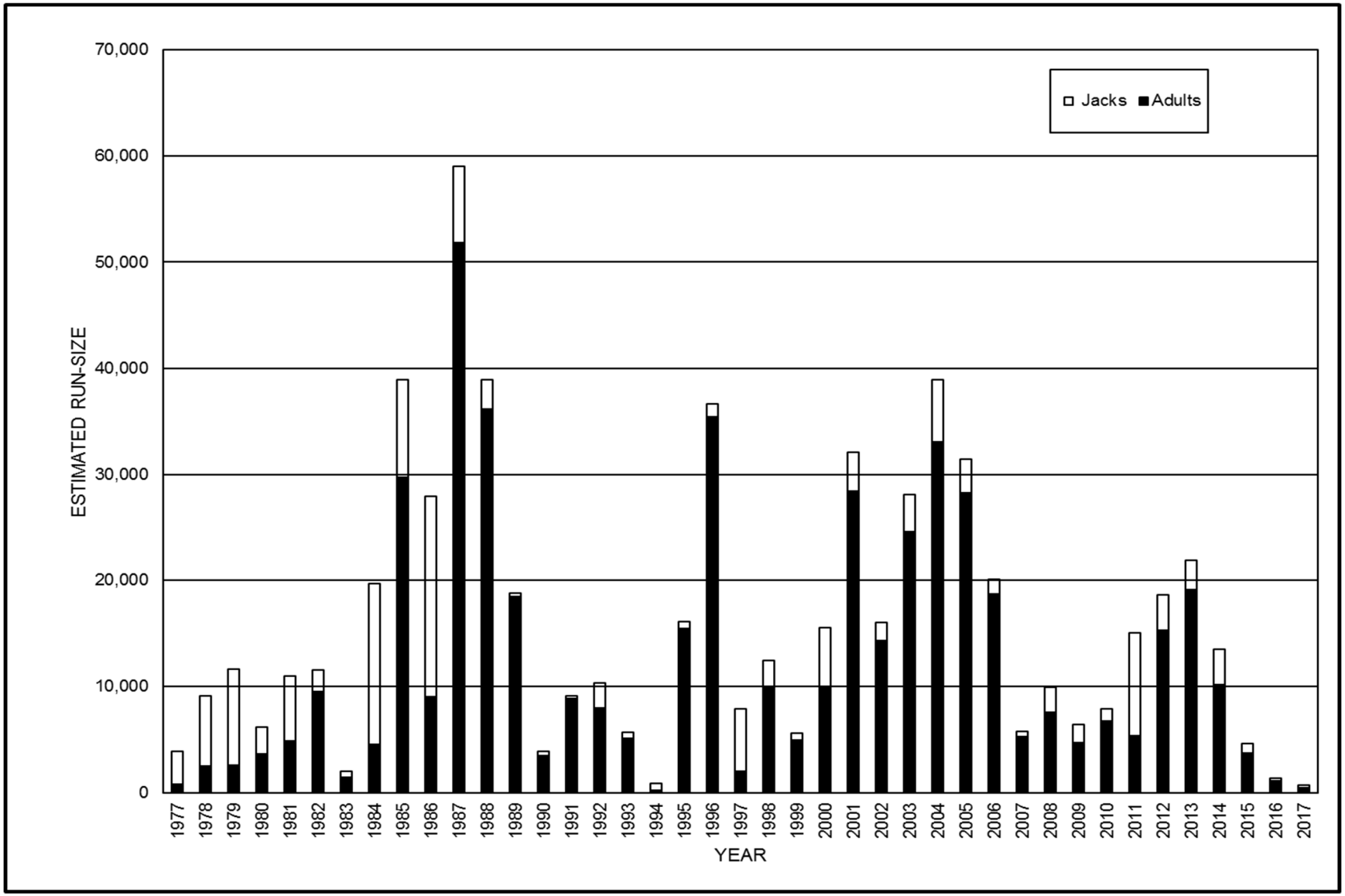
c/ The 1985 sport harvest of adult coho was limited by a closure for the taking of salmon > 55 cm total length beginning September 22, 1985.

d/ The 1996-2017 sport fishery was closed to the take of coho salmon.

e/ Jacks are two year old fish, adults are three years.

f/ The methods used to estimate the run-size and escapement of coho in 2016 differs from those in other years due to insufficient sample marked at Willow Creek weir.

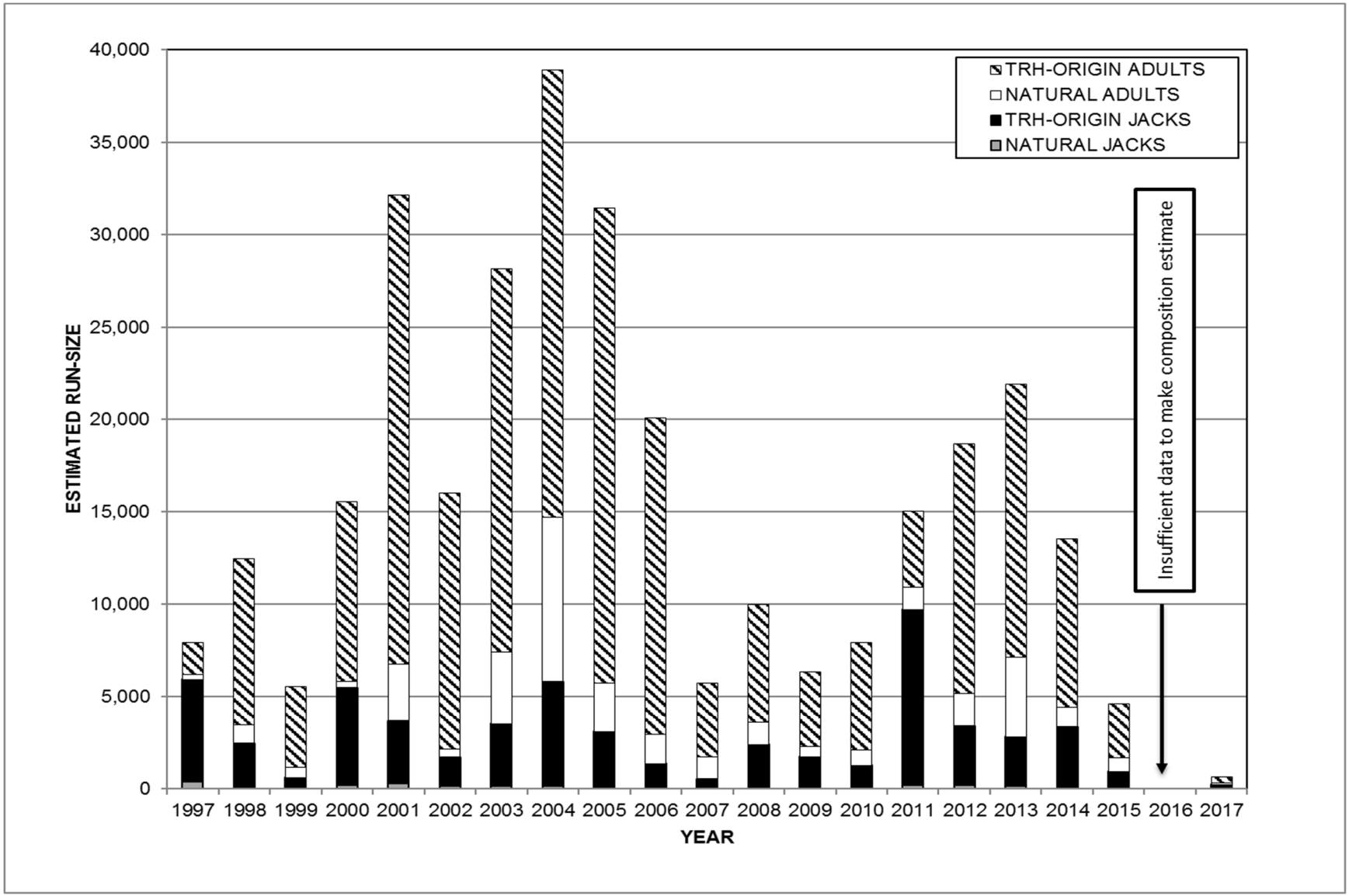
Appendix 23. Coho estimated run-size for the Trinity River upstream of Willow Creek weir, 1977- 2017.



Appendix 24. Coho Salmon estimated run-size and spawner escapement for the Trinity River upstream of Willow Creek weir, 1997 – 2017, showing natural- and TRH-origin composition.

	Strata	Run-size Estimate			Natural Area Escapement			TRH Escapement		
YEAR	Component	Jacks	Adults	Total	Jacks	Adults	Total	Jacks	Adults	Total
1997	Natural	399	252	651	383	232	615	13	20	33
	TRH	5,552	1,732	7,284	4,655	865	5,520	858	867	1,725
	TOTAL	**5,951**	**1,984**	**7,935**	**5,038**	**1,097**	**6,135**	**871**	**887**	**1,758**
1998	Natural	131	1,001	1,132	123	886	1,009	8	115	123
	TRH	2,340	9,008	11,348	1,371	5,109	6,480	969	3,899	4,868
	TOTAL	**2,471**	**10,009**	**12,480**	**1,494**	**5,995**	**7,489**	**977**	**4,014**	**4,991**
1999	Natural	31	555	586	23	430	453	8	103	111
	TRH	592	4,357	4,949	211	1,266	1,477	381	3,015	3,396
	TOTAL	**623**	**4,912**	**5,535**	**234**	**1,696**	**1,930**	**389**	**3,118**	**3,507**
2000	Natural	197	342	539	187	288	475	10	54	64
	TRH	5,289	9,704	14,993	4,373	6,297	10,670	916	3,407	4,323
	TOTAL	**5,486**	**10,046**	**15,532**	**4,560**	**6,585**	**11,145**	**926**	**3,461**	**4,387**
2001	Natural	297	3,075	3,372	295	2,945	3,240	2	130	10,132
	TRH	3,373	25,395	28,768	2,349	15,770	18,119	1,024	9,625	10,649
	TOTAL	**3,670**	**28,470**	**32,140**	**2,644**	**18,715**	**21,359**	**1,026**	**9,755**	**20,781**
2002	Natural	138	458	596	123	372	495	15	86	101
	TRH	1,571	13,849	15,420	883	7,440	8,323	688	6,409	7,097
	TOTAL	**1,709**	**14,307**	**16,016**	**1,006**	**7,812**	**8,818**	**703**	**6,495**	**7,198**
2003	Natural	163	3,930	4,093	149	3,264	3,414	14	666	680
	TRH	3,338	20,721	24,059	1,889	10,991	12,880	1,449	9,730	11,179
	TOTAL	**3,501**	**24,651**	**28,152**	**2,038**	**14,255**	**16,294**	**1,463**	**10,396**	**11,859**
2004	Natural	154	8,901	9,055	145	7,830	7,975	9	1,071	1,080
	TRH	5,665	24,162	29,827	4,597	15,287	19,884	1,068	8,835	9,903
	TOTAL	**5,819**	**33,063**	**38,882**	**4,742**	**23,117**	**27,859**	**1,077**	**9,906**	**10,983**
2005	Natural	81	2,648	2,729	71	1,728	1,799	10	920	930
	TRH	3,012	25,678	28,690	1,270	9,974	11,244	1,721	15,704	17,425
	TOTAL	**3,093**	**28,326**	**31,419**	**1,341**	**11,702**	**13,043**	**1,731**	**16,624**	**18,355**
2006	Natural	38	1,586	1,624	34	1,416	1,450	4	170	174
	TRH	1,331	17,123	18,454	674	7,454	8,128	657	9,669	10,326
	TOTAL	**1,369**	**18,709**	**20,078**	**708**	**8,870**	**9,578**	**661**	**9,839**	**10,500**
2007	Natural	42	1,157	1,199	37	940	977	5	217	222
	TRH	503	4,048	4,551	233	1,612	1,845	270	2,436	2,706
	TOTAL	**545**	**5,205**	**5,750**	**270**	**2,552**	**2,822**	**275**	**2,653**	**2,928**
2008	Natural	89	1,223	1,312	83	861	944	6	362	368
	TRH	2,290	6,381	8,671	1,647	2,204	3,851	643	4,177	4,820
	TOTAL	**2,379**	**7,604**	**9,983**	**1,730**	**3,065**	**4,795**	**649**	**4,539**	**5,188**
2009	Natural	116	529	645	113	429	542	3	91	94
	TRH	1,630	4,067	5,697	758	1,681	2,439	872	2,386	3,258
	TOTAL	**1,746**	**4,596**	**6,342**	**871**	**2,110**	**2,981**	**875**	**2,477**	**3,352**
2010	Natural	44	817	861	34	624	658	10	193	203
	TRH	1,233	5,852	7,085	717	2,146	2,863	516	3,706	4,222
	TOTAL	**1,277**	**6,669**	**7,946**	**751**	**2,770**	**3,521**	**526**	**3,899**	**4,425**
2011	Natural	208	1,205	1,413	187	991	1,178	21	214	235
	TRH	9,514	4,113	13,627	6,606	2,403	9,009	2,865	1,710	4,575
	TOTAL	**9,722**	**5,318**	**15,040**	**6,793**	**3,394**	**10,187**	**2,886**	**1,924**	**4,810**
2012	Natural	192	1,774	1,966	184	1,577	1,761	8	197	205
	TRH	3,198	13,494	16,692	2,327	6,335	8,662	871	7,159	8,030
	TOTAL	**3,390**	**15,268**	**18,658**	**2,511**	**7,912**	**10,423**	**879**	**7,356**	**8,235**
2013	Natural	152	4,305	4,457	149	3,948	4,097	3	357	360
	TRH	2,667	14,782	17,448	2,243	8,935	11,177	424	5,847	6,271
	TOTAL	**2,819**	**19,087**	**21,905**	**2,392**	**12,883**	**15,274**	**427**	**6,204**	**6,631**
2014	Natural	99	902	1,001	94	823	917	5	79	84
	TRH	3,239	9,297	12,536	2,307	6,405	8,712	932	2,892	3,824
	TOTAL	**3,338**	**10,199**	**13,537**	**2,401**	**7,228**	**9,629**	**937**	**2,971**	**3,908**
2015	Natural	65	748	814	57	459	517	8	289	297
	TRH	870	2,936	3,805	600	166	765	270	2,770	3,040
	TOTAL	**935**	**3,684**	**4,619**	**657**	**625**	**1,282**	**278**	**3,059**	**3,337**
2016	Natural	163	635	798	insufficient sample to make			0	74	74
	TRH	45	482	527	estimation of composition			45	408	453
	TOTAL	**208**	**1,117**	**1,325**	**163**	**635**	**798**	**45**	**482**	**527**
2017	Natural	9	57	65	8	34	41	1	23	24
	TRH	236	354	590	87	107	194	149	247	396
	TOTAL	**244**	**411**	**655**	**94**	**141**	**235**	**150**	**270**	**420**

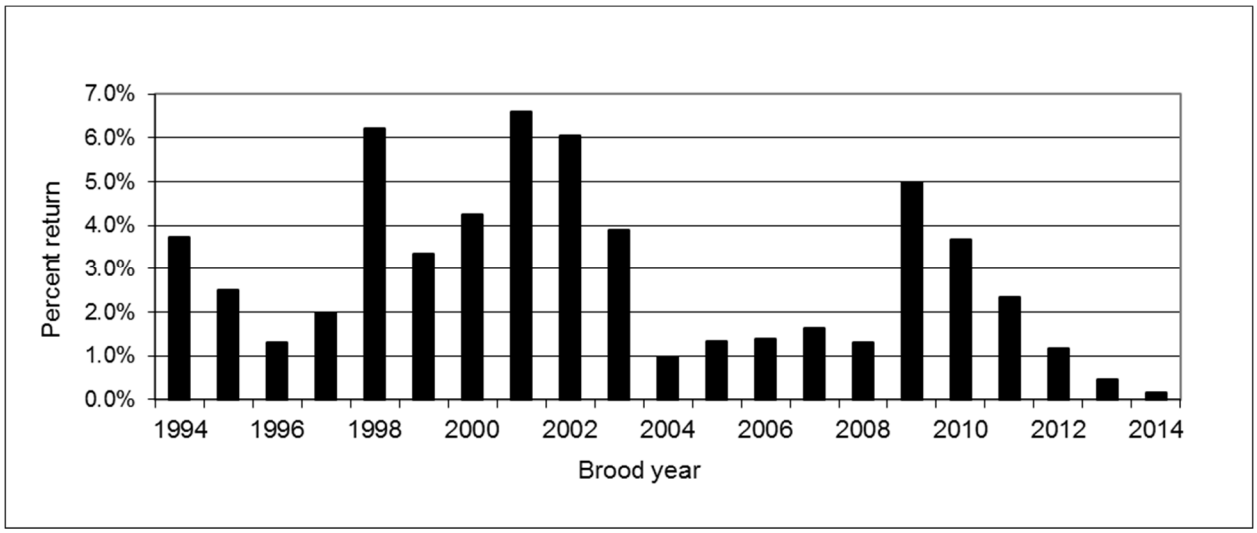
Appendix 25. Coho Salmon estimated run-size for the Trinity River upstream of Willow Creek weir, 1997 – 2017, showing natural- and TRH-origin composition.



Appendix 26. Brood year performance and return data for Trinity River Hatchery Coho Salmon returning to Trinity River, upstream of Willow Creek weir, 1994 - 2014.

Release data				Return data						
Brood year	Date	Effective Number	Site	Age	Run-size	% of release	In-river harvest	Spawner Escapement TRH	Natural	Total
1994	3/17-21/96	72,311	TRH	2	970	1.34%	0	105	865	970
				3	1,732	2.40%	0	867	865	1,732
				Totals:	2,702	3.74%	0	972	1,730	2,702
1995	3/17-21/97	580,880	TRH	2	5,552	0.96%	39	858	4,655	5,513
				3	9,008	1.55%	0	3,899	5,109	9,008
				Totals:	14,560	2.51%	39	4,757	9,764	14,521
1996	3/16-20/98	513,663	TRH	2	2,340	0.46%	0	969	1,371	2,340
				3	4,357	0.85%	86	3,015	1,256	4,271
				Totals:	6,697	1.30%	86	3,984	2,627	6,611
1997	3/15-22/99	517,196	TRH	2	592	0.11%	0	381	211	592
				3	9,704	1.88%	0	3,407	6,297	9,704
				Totals:	10,296	1.99%	0	3,788	6,508	10,296
1998	3/15-20/00	493,233	TRH	2	5,289	1.07%	0	916	4,373	5,289
				3	25,395	5.15%	0	9,625	15,770	25,395
				Totals:	30,684	6.22%	0	10,541	20,143	30,684
1999	3/15-22/01	512,986	TRH	2	3,373	0.66%	0	1,024	2,349	3,373
				3	13,849	2.70%	0	6,409	7,440	13,849
				Totals:	17,222	3.36%	0	7,433	9,789	17,222
2000	3/17-19/02	524,238	TRH	2	1,571	0.30%	0	688	883	1,571
				3	20,721	3.95%	0	9,730	10,991	20,721
				Totals:	22,292	4.25%	0	10,418	11,874	22,292
2001	3/17-19/03	416,201	TRH	2	3,338	0.80%	0	1,449	1,889	3,338
				3	24,162	5.81%	40	8,835	15,287	24,122
				Totals:	27,500	6.60%	40	10,284	17,176	27,460
2002	3/15-18/04	516,906	TRH	2	5,665	1.10%	0	1,068	4,597	5,665
				3	25,678	4.97%	0	15,704	9,974	25,678
				Totals:	31,343	6.06%	0	16,772	14,571	31,343
2003	3/14-18/05	520,847	TRH	2	3,012	0.58%	21	1,269	1,721	2,990
				3	17,123	3.29%	0	7,454	9,669	17,123
				Totals:	20,135	3.90%	21	8,723	11,390	20,113
2004	3/15-20/06	545,199	TRH	2	1,331	0.24%	0	657	674	1,331
				3	4,048	0.74%	0	2,436	1,612	4,048
				Totals:	5,379	0.99%	0	3,093	2,286	5,379
2005	3/15-20/07	511,961	TRH	2	503	0.10%	0	270	233	503
				3	6,381	1.25%	0	4,177	2,204	6381
				Totals:	6,884	1.34%	0	4,447	2,437	6,884
2006	3/15-20/08	455,482	TRH	2	2,290	0.50%	0	643	1,647	2,290
				3	4,067	0.89%	0	2,386	1,681	4,067
				Totals:	6,357	1.40%	0	3,029	3,328	6,357
2007	3/16-20/09	457,478	TRH	2	1,645	0.36%	0	871	774	1,645
				3	5,852	1.28%	0	3,706	2,146	5,852
				Totals:	7,497	1.64%	0	4,577	2,920	7,497
2008	4/6-8/10	413,178	TRH	2	1,233	0.30%	0	516	707	1,233
				3	4,113	1.00%	0	1,710	2,403	4,113
				Totals:	5,346	1.29%	0	2,226	3,110	5,336
2009	3/15-28/11	490,998	TRH	2	10,982	2.24%	0	2,862	8,120	10,982
				3	13,494	2.75%	0	7,159	6,335	13,494
				Totals:	24,476	4.98%	0	10,021	14,455	24,476
2010	3/15-26/12	489,429	TRH	2	3,198	0.65%	0	871	2,327	3,198
				3	14,782	3.02%	0	5,847	8,935	14,782
				Totals	17,980	3.67%	0	6,718	11,262	17,980
2011	3/15-20/13	511,618	TRH	2	2,667	0.52%	0	424	2,243	2,667
				3	9,297	1.82%	0	2,892	6,405	9,297
				Totals	11,964	2.34%	0	3,316	8,648	11,964
2012	3/15-18/14	528,016	TRH	2	3,239	0.61%	0	932	2,307	3,239
				3	2,936	0.56%	0	2,770	166	2,936
				Totals	6,175	1.17%	0	3,702	2,473	6,175
2013	3/15-23/15	287,720	TRH	2	870	0.30%	0	270	600	870
				3	482	0.17%	0	408	74	482
				Totals	1,352	0.47%	0	678	674	1,352
2014	3/15-21/16	230,821	TRH	2	45	0.02%	0	45	0	45
				3	354	0.15%	0	247	107	354
				Totals	399	0.17%	0	292	107	399

Appendix 27. Percent return for Trinity River Hatchery-origin Coho Salmon, 1994 – 2014 brood years.



Appendix 28. Fork length (FL) distribution of fall run steelhead trapped and tagged at Willow Creek weir (WCW), and subsequently recovered during the 2017-18 season.[a]

FL (cm)	WCW			RECOVERIES							
	Total Trapped	Total Tagged[b]	Ad-clips[c]	Tag Morts[d]	Angler Harvest[e]	TRH[f] Recoveries	Carcass[g] Recoveries	Found Tags[h]	Angler Released[i]	Total Recoveries	% Recoveries
30	1									--	--
31	1									--	--
32	2		1							--	--
33	1		1							--	--
34	6		6							--	--
35	7		5							--	--
36	13		11							--	--
37	8		7							--	--
38	3		2							--	--
39	3		2							--	--
40	6		3							--	--
41	4									--	--
42	3	2								0	0.0
43										--	--
44	3	3								0	0.0
45	1	1								0	0.0
46	10	10	1						2	2	20.0
47	8	8	1						2	2	25.0
48	16	16	4	1		1			3	5	31.3
49	12	12	3			1			3	4	33.3
50	15	15	5			3				3	20.0
51	18	18	7			3			4	7	38.9
52	28	28	20		4	4			6	14	50.0
53	36	36	23			4			9	13	36.1
54	54	54	41			13			15	28	51.9
55	44	43	33		1	14			13	28	65.1
56	69	69	53		1	18			14	33	47.8
57	66	65	51	1	2	14			15	32	49.2
58	71	71	57		5	16			21	42	59.2
59	52	51	35		2	12		1	4	19	37.3
60	61	60	44		2	18			12	32	53.3
61	35	35	24		1	13			5	19	54.3
62	24	23	15			6			3	9	39.1
63	21	21	11			8			4	12	57.1
64	8	8	5			3			1	4	50.0
65	11	11	7			4		1	2	7	63.6
66	1	1				1				1	100.0
67	4	4	2			1				1	25.0
68	6	6	3			1			2	3	50.0
69	5	5	4		2	1				3	60.0
70	2	2	1						1	1	50.0
71	3	3	2			1			2	3	100.0
72	2	2	1			1				1	50.0
73	1	1	1							0	0.0
74	1	1								0	0.0
Totals:	746	685	492	2	20	161	0	2	143	328	47.9
Mean FL:	55.3	56.8	55.7	--	58.0	58.1	--	62.0	56.6	57.4	
Total 1/2lbers	55	0	38	0	0	0	0	0	0	0	
Total adults[j]:	691	685	454	2	20	161	0	2	143	328	47.9

a/ Trapping at Willow Creek weir took place August 30 - November 8, 2017 (Julian weeks 35-45).
b/ Sixty one steelhead were trapped but not tagged at WCW in 2017; 55 were half-pounders (too small), and 6 adults were in poor condition.
c/ Ad-clip = Adipose fin clipped fish.
d/ Tagged fish found dead and unspawned within 30 days of tagging are considered tagging mortalities.
e/ Fish reported as harvested by anglers.
f/ Trapping occurred at Trinity River Hatchery September 5, 2017 - March 6, 2018 (JWs 36-10; closed parts or all of JWs 41-43).
g/ Fish recovered in upper Trinity River spawner surveys; of which we found none in 2017.
h/ Fish tags found loose or on dead fish and returned by anglers or other river enthusiasts.
i/ Fish caught and released by anglers, their tag removed.
j/ Adult steelhead are all those > 41 cm FL.

Appendix 29. Total number of adult steelhead[a] (>41 cm FL) entering Trinity River Hatchery (TRH) and number recovered that were tagged at Willow Creek (WCW) or Junction City weir (JCW) during the 2017-18 season.[b]

Julian Week of Entry [c]	Inclusive Dates			Number Entering TRH	Recoveries from WCW	Recoveries from JCW
36	3-Sep	-	9-Sep	8		1
37	10-Sep	-	16-Sep	1		
38	17-Sep	-	23-Sep			
39	24-Sep	-	30-Sep	2		
40	1-Oct	-	7-Oct	1		
41	8-Oct	-	14-Oct			
42	15-Oct	-	21-Oct			
43	22-Oct	-	28-Oct	15	1	
44	29-Oct	-	4-Nov	32	2	2
45	5-Nov	-	11-Nov	21	1	1
46	12-Nov	-	18-Nov	70	6	2
47	19-Nov	-	25-Nov	153	9	3
48	26-Nov	-	2-Dec	331	32	1
49	3-Dec	-	9-Dec	118	12	
50	10-Dec	-	16-Dec	32	1	
51	17-Dec	-	23-Dec	20	2	
52	24-Dec	-	31-Dec	7	1	
1	1-Jan	-	7-Jan	16	6	
2	8-Jan	-	14-Jan	117	25	2
3	15-Jan	-	21-Jan	517	27	
4	22-Jan	-	28-Jan	345	22	1
5	29-Jan	-	4-Feb	76	4	
6	5-Feb	-	11-Feb	92	4	1
7	12-Feb	-	18-Feb	74	4	
8	19-Feb	-	25-Feb	17	1	
9	26-Feb	-	4-Mar	9		
10	5-Mar	-	11-Mar	13	1	
			Totals:	2,087	161	14

a/ Steelhead <42 cm FL are considered sub-adults and were not counted at TRH.

b/ Trapping occurred at TRH Sep 5, 2017 - March 6, 2018 (Julian weeks 36 -10; closed all or parts of JWs 41-43).

c/ Entry week was the week the fish were initially sorted, although they may have actually entered the hatchery during a previous sorting week.

Appendix 30. Fall-run adult steelhead (>41cm FL) estimated run-size, spawner escapement, and angler harvest estimates for the Trinity River upstream of Willow Creek weir, 1977 - 2017.

	Run-size estimate					Spawner escapement						Angler harvest		
						Natural Area Spawners[a]			Trinity River Hatchery					
	Hatchery[b]		Wild[c]			Hatchery	Wild	Total	Hatchery	Wild	Total	Hatchery	Wild	Total
Year	Number	Percent	Number	Percent	Total									
1977	No estimates					No estimates			269	16	285	No estimates		
1978	"					"			628	55	683	"		
1979	"					"			329	53	382	"		
1980	8,449	33.7	16,645	66.3	25,094	5,101	14,462	19,563	1,903	102	2,005	1,445	2,081	3,526
1981	No estimates					No estimates			892	112	1,004	No estimates		
1982	2,106	20.0	8,426	80.0	10,532	971	6,889	7,860	634	79	713	501	1,458	1,959
1983	No estimates for hatchery/wild component				8,605			6,661			599			1,345
1984	"				7,833			6,430			142			1,261
1985	No estimates					No estimates					461	No estimates		
1986	"					"					3,780	"		
1987	"					"					3,007	"		
1988	No estimates for hatchery/wild component				12,743			11,926 [d]			817	"		
1989	"				37,276			28,933			4,765			3,578
1990	"				5,348			3,188			930			1,230
1991	"				11,417			8,631			446			2,340
1992	1,315	43.2	1,731	56.8	3,046	759	1,540	2,299	430	25	455	126	166	292
1993	1,894	58.4	1,349	41.6	3,243	801	1,176	1,977	875	10	885	218	163	381
1994	1,477	34.8	2,767	65.2	4,244	878	2,410	3,288	403	8	411	196	349	545
1995	1,595	37.2	2,693	62.8	4,288	1,424	1,867	3,291	681	24	705	147	145	292
1996	8,598	82.4	1,837	17.6	10,435	4,127	1,703	5,830	3,964	48	4,012	507	86	593
1997	No estimates for hatchery/wild component				5,212	No estimates		4,267	No estimates		429	No estimates		516
1998	"				2,972	"		2,463	"		441	"		68 [e]
1999	"				5,470	"		3,817	"		1,571	"		82 [e]
2000	"				8,042	"		7,097	"		768	"		177 [e]
2001	"				12,638	"		9,938	"		2,333	"		367 [e]
2002	14,408	75.6	4,650	24.4	19,058	7,715	4,551	12,266	5,996	42	6,038	697	57	754 [e]
2003	19,245	83.0	3,947	17.0	23,192	8,717	3,837	12,554	10,182	42	10,224	346	68	414 [e]
2004	15,038	75.7	4,817	24.3	19,855	8,937	4,732	13,669	5,688	37	5,725	413	48	461 [e]
2005	14,049	72.4	5,363	27.6	19,412	5,782	5,280	11,062	8,080	63	8,143	187	20	207 [e]
2006	32,609	78.8	8,781	21.2	41,390	20,272	8,660	28,932	11,509	38	11,547	828	83	911 [e]
2007	46,379	86	7,506	14	53,885	31,923	7,405	39,328	11,366	31	11,397	3,090	70	3,160 [e]
2008	9,538	64	5,477	36	15,015	6,680	5,415	12,095	2,471	24	2,495	386	38	424 [e]
2009	13,314	73	5,047	27	18,361	7,704	4,877	12,581	4,234	17	4,251	1,376	154	1,530 [e]
2010	4,640	55	3,811	45	8,451	2,468	3,749	6,217	2,000	37	2,037	172	25	197 [e]
2011	14,969	68	6,932	32	21,901	8,344	6,850	15,194	5,700	50	5,750	925	32	957 [e]
2012	12,253	59	8,359	41	20,612	6,060	8,215	14,275	5,685	52	5,737	507	92	599 [e]
2013	7,389	45	9,205	55	16,594	4,521	9,039	13,560	2,295	80	2,375	573	86	659 [e]
2014	4,460	43	5,822	57	10,282	1,822	5,691	7,513	2,499	62	2,561	139	69	208 [e]
2015	8,713	78	2,454	22	11,167	5,043	2,417	7,460	3,235	37	3,272	436	0	436 [e]
2016	2,568	57	1,972	43	4,540	943	1,927	2,870	1,557	17	1,574	68	28	96 [e]
2017	4,498	66	2,348	34	6,846	2,249	2,295	4,544	1,996	53	2,049	253	0	253 [e]

a/ Natural area spawners includes both wild and hatchery fish that spawn in areas outside Trinity River Hatchery.

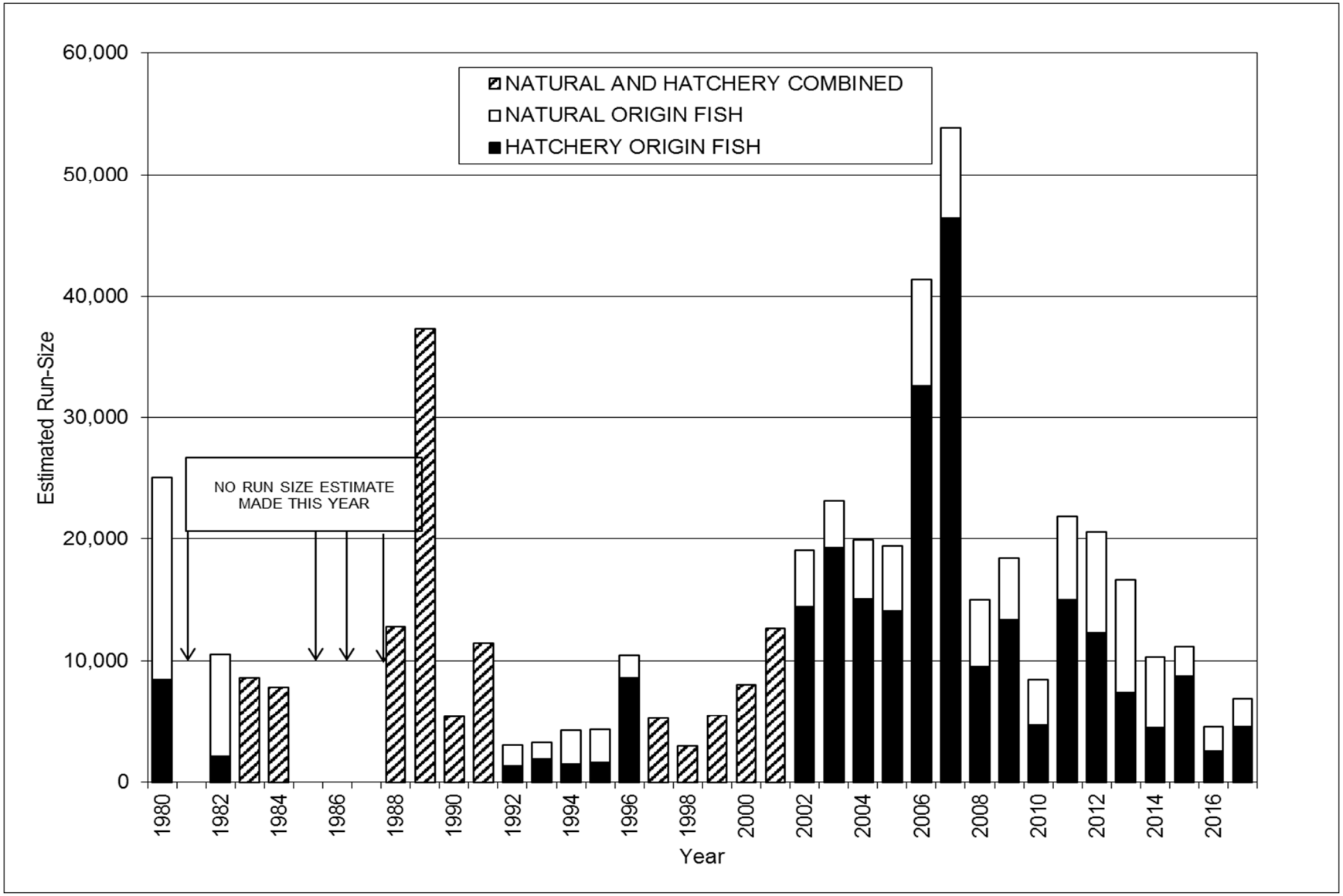
b/ Trinity River Hatchery-produced steelhead.

c/ Naturally produced steelhead.

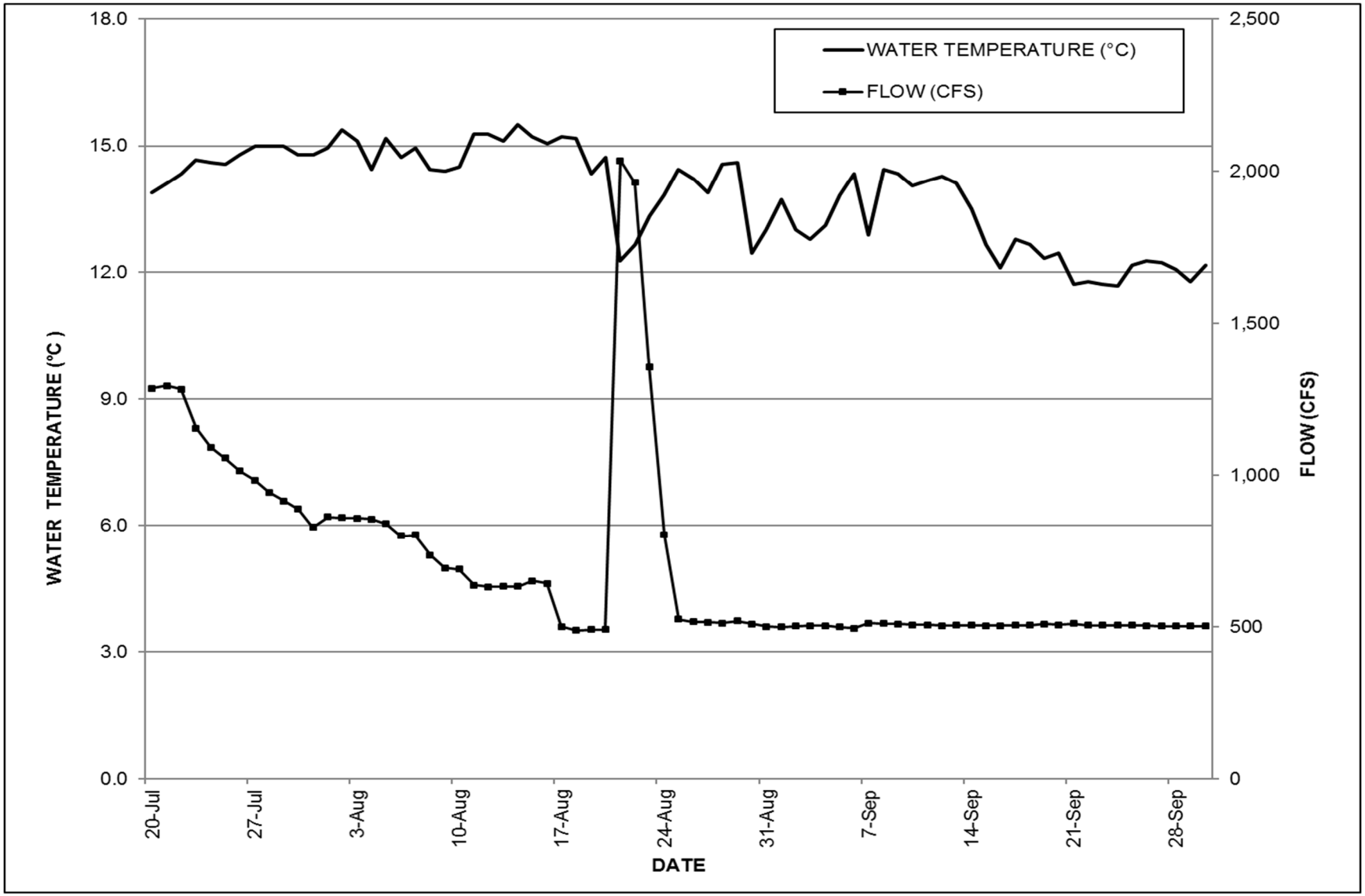
d/ The natural spawner escapement reflects an overestimate due to the unknown number of fish harvested by anglers upstream of Willow Creek Weir.

e/ Harvest was limited to hatchery-produced fish only. Hatchery fish are those with an adipose fin-clip.

Appendix 31. Fall-run adult steelhead (>41 cm FL) estimated for the Trinity River upstream of Willow Creek weir, 1977 - 2017.



Appendix 32. Daily mean flow (CFS) recorded at USGS gauge (11526250) and water (°C) temperature for Trinity River upstream of Junction City, 2017.



Appendix 33. Daily mean flow (CFS) recorded at USGS gauge (11530000) and water (°C) temperature for Trinity River near Willow Creek weir, 2017 sampling season.