

Juvenile Salmonid Monitoring on the Mainstem Trinity River, California, 2011

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Key words: Trinity River, salmon, downstream migrant trapping, Chinook salmon, coho salmon, steelhead, abundance index, juvenile salmon, rotary screw trap.

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Abstract.—This report presents juvenile salmonid emigration monitoring data conducted in 2011 at both Pear Tree Bar (PTRST; river kilometer [rkm] 118) and Willow Creek (WCRST; rkm 34), California on the mainstem Trinity River. Monitoring at PTRST is conducted to estimate juvenile salmonid population size passing PTRST during the sampling season. Monitoring at WCRST is conducted to estimate juvenile salmonid population size and emigration timing during the monitoring period. In 2011, two rotary screw traps were operated at PTRST from January 13 through August 26, with successful sampling for 206 of the 226 day sampling period. At WCRST three rotary screw traps were operated in 2011 from March 5 through September 16, with successful sampling for 163 days of the 195 day sampling period.

Age of salmonid outmigrants, mean length by week, migration rates, and hatchery contributions were estimated. Catch data were used to calculate proportional discharge based abundance indices for juvenile Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), and steelhead (*O. mykiss*). Catch data of other fishes are also presented.

Weekly stratified mark-recapture population estimates of emigrating age-0 Chinook salmon were calculated for both naturally and hatchery-produced sub-populations. At PTRST between January 13 and August 26, an estimated 1,922,326 (SD=146,568; CV = 0.08) naturally-produced age-0 Chinook salmon and 370,450 (SD = 38,768, CV = 0.10) age-0 hatchery Chinook salmon passed the site. At WCRST between March 5 and September 16, an estimated 3,047,673 (SD = 162,607; CV = 0.05) naturally-produced age-0 Chinook salmon and 907,892 (SD = 50,260; CV = 0.06) age-0 hatchery Chinook salmon passed the site.

Juvenile salmonid emigration target dates were developed for the Trinity River Restoration Program (TRRP) to assess at what date 80% of the juvenile salmonid population had reached Willow Creek and to help manage water temperatures in the mainstem Trinity River. The estimate of the week in which 80% of the juvenile Chinook salmon population passed WCRST, as inferred from the proportional discharge based abundance index was Week of the Year (WOY) 30 (July 23-July 29), which occurred after the TRRP management target date of July 9. The estimate of the week in which 80% of the natural coho salmon smolt population passed the WCRST was WOY 22 (May 28-June 3), which occurred prior to the TRRP management target date of June 4. The estimate of the week in which 80% of the steelhead smolt population passed the WCRST, as inferred from proportional discharge based abundance indices, was WOY 21 (May 15 – May 21), which occurred prior to the TRRP management target date of May 22.

Introduction

This report presents annual data collected to: (1) evaluate the production of juvenile salmonids, primarily Chinook salmon (*Oncorhynchus tshawytscha*), from the upper 65 kilometers of the mainstem Trinity River below Lewiston Dam, the primary restoration reach of the Trinity River Restoration Program (TRRP); and (2) evaluate the production and outmigrant timing of juvenile salmonids through the lower Trinity River in response to managed flow releases, the new thermal regimes, and restoration efforts. Information collected by this project is needed to address TRRP Integrated Assessment Plan objective 3, sub-objective 3.2 (TRRP and ESSA 2009):

Objective 3: Restore and maintain natural production of anadromous fish populations

Sub-objective 3.2: Increase freshwater production of anadromous fish.

In addition to quantifying salmonid outmigrant production and timing, fish condition and hatchery/natural composition of the outmigrants are assessed. The intent of this data series report is to provide timely dissemination of data to local managers and for inclusion in agency databases. A technical report synthesizing multi-year datasets developed by this project will be periodically published to evaluate trends in outmigrant salmonid production, outmigrant timing, hatchery/natural contribution and condition/health. Monitoring emigrating juvenile salmonid populations in conjunction with habitat availability and suitability studies is expected to provide a direct evaluation of restoration efforts because these studies focus on the early freshwater life-history phase which is directly affected by instream conditions and management actions.

For details on background, study site, and monitoring methods for the data presented in this report, the reader is referred to the 2009 Trinity River Juvenile Salmonid Outmigrant Monitoring Report.

Harris, N., P. Petros, and W.D. Pinnix. 2012. Juvenile Salmonid Monitoring on the Mainstem Trinity River, California, 2009. Yurok Tribal Fisheries Program, Hoopa Valley Tribal Fisheries Department, U. S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, Arcata Fisheries Data Series Report Number DS 2012-27, Arcata, California.

Summary

Juvenile salmonid emigration from the mainstem Trinity River has been monitored since 1989 with rotary screw traps. This data series report summarizes the outmigrant monitoring data collected in 2011 cooperatively by the U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, Hoopa Valley Tribal Fisheries Department, and Yurok Tribal Fisheries Program at Pear Tree Gulch (PTRST) and Willow Creek (WCRST) on the mainstem Trinity River (Figure 1). Data are grouped by Week of the Year (WOY; Table 1) to aid in cross year comparisons. Graphs of water temperature and discharge through the sampling periods are presented in Figure 2. It is intended that this information will provide basic biological information that can be used by managers to evaluate the effectiveness of habitat restoration efforts, especially flow regimes recommended in the Record of Decision (USDOI 2000), in restoring the fishery resources of the Trinity River.

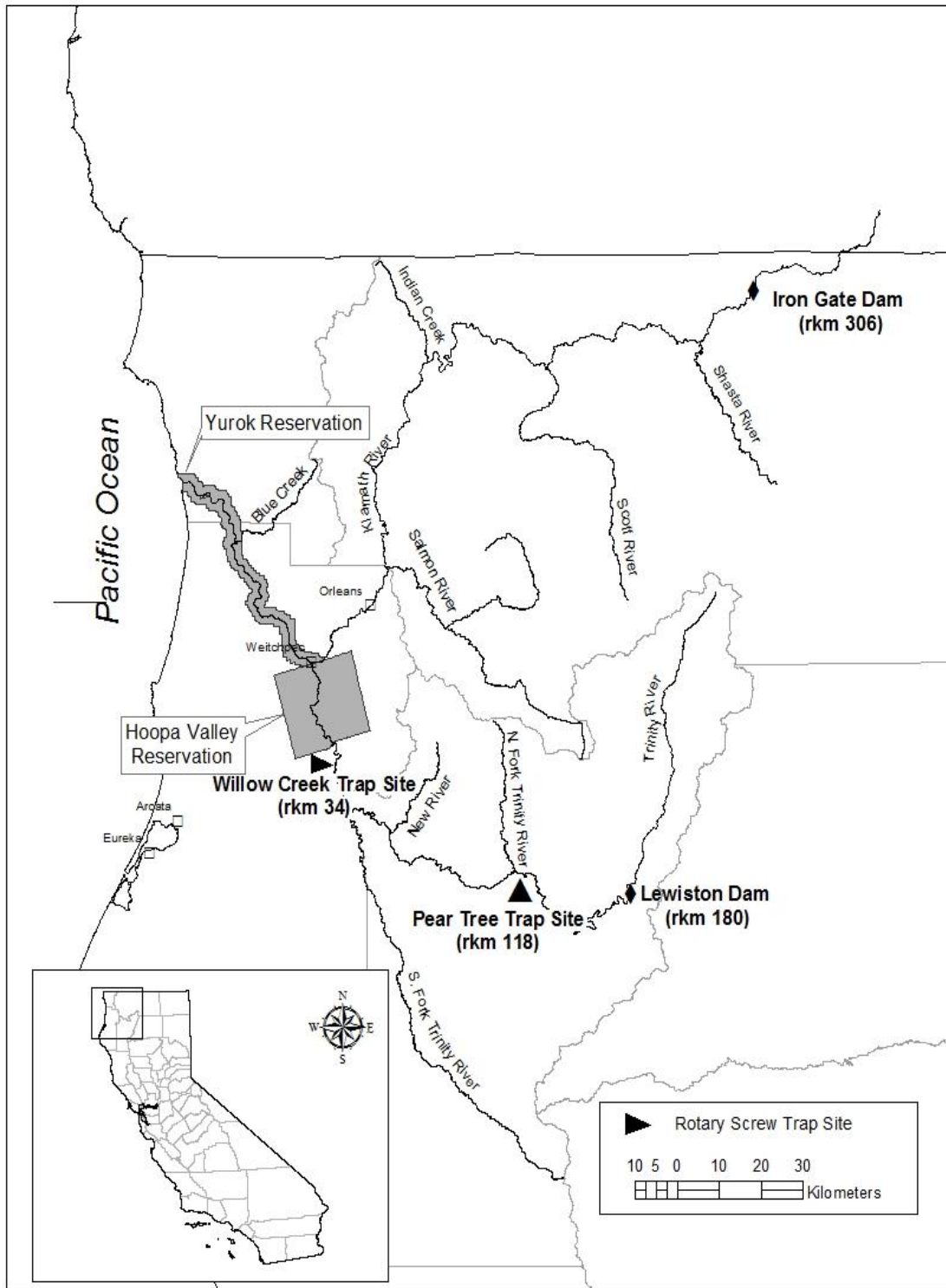


Figure 1. Location of the Trinity River rotary screw trap sites near Willow Creek (rkm 34) and Pear Tree Gulch (rkm 118), California, operated by the Yurok Tribal Fisheries Program, U. S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, and the Hoopa Valley Tribal Fisheries Department.

Table 1. Week of the Year (WOY) and corresponding first calendar date.

WOY	Week beginning	WOY	Week beginning	WOY	Week Beginning
1	01/01	18	04/30	35	08/27
2	01/08	19	05/07	36	09/03
3	01/15	20	05/14	37	09/10
4	01/22	21	05/21	38	09/17
5	01/29	22	05/28	39	09/24
6	02/05	23	06/04	40	10/01
7	02/12	24	06/11	41	10/08
8	02/19	25	06/18	42	10/15
9	02/26	26	06/25	43	10/22
10	03/05	27	07/02	44	10/29
11	03/12	28	07/09	45	11/05
12	03/19	29	07/16	46	11/12
13	03/26	30	07/23	47	11/19
14	04/02	31	07/30	48	11/26
15	04/09	32	08/06	49	12/03
16	04/16	33	08/13	50	12/10
17	04/23	34	08/20	51	12/17
				52	12/24

Sampling Efforts

In 2011, trapping at PTRST began in the third week of January and trapping at WCRST was initiated the first week of March (Table 2). Sampling occurred at both sites in each sampling week, although occasionally traps were not run for complete sample weeks. To ensure that the greatest portion of the natural Chinook salmon emigration, as well as portions of the hatchery and natural coho salmon (*O. kisutch*) and steelhead (*O. mykiss*) smolt emigration, were sampled, efforts were made to install the traps as early as possible and continue sampling throughout the summer. This allowed comparable data to be collected for inter-annual comparisons in emigration timing (duration and peak) and abundance. Additionally, it is important to note that sampling a portion of the year (i.e. the spring/summer season) samples only a portion of the annual production, and all estimates of production refer only to the sampling period.

Catch Totals

Catch totals of the primary salmonids of interest (Chinook salmon, coho salmon and steelhead) are presented in Table 3. Hatchery salmonid releases are presented in Table 4. Catch totals of other fish species are presented in Table 5.

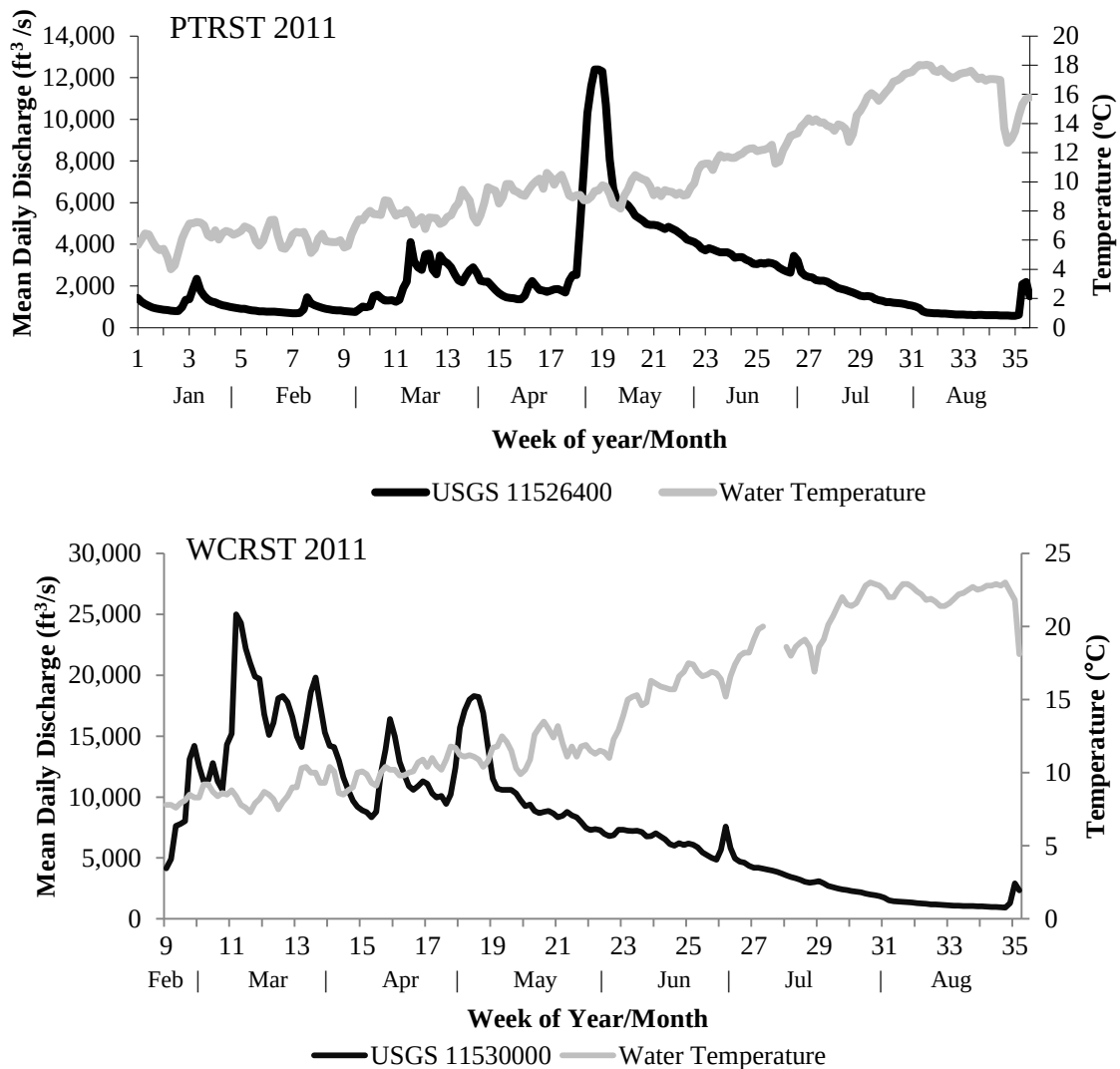


Figure 2. Mean daily discharge (ft³/s) as recorded near Helena, California (U.S. Geological Survey Water Resource gauge station #11-526400) and Hoopa (HPA; U.S. Geological Survey Water Resource gauge station #11-530000), California and mean daily water temperatures (°C) recorded at Pear Tree Rotary Screw Trap (PTRST) and Willow Creek Rotary Screw Trap (WCRST) in 2011.

Abundance Indices

The proportional discharge based abundance indices for natural age-0 Chinook salmon were approximately 1.05 million and 1.42 million at PTRST and WCRST, respectively (Figure 3; Table 6; Appendix 1 & 2). The age-0 hatchery Chinook salmon abundance indices were approximately 0.10 million at PTRST and 0.45 million at WCRST. It is unclear what caused the PTRST abundance index for hatchery Chinook salmon to be less than the WCRST estimate. This discrepancy was also observed in the mark-recapture population estimates. Future analyses will attempt to explain this difference. Because natural age-0 Chinook salmon were captured on the first day of trap operation in 2011, it is possible that a portion of the early spring natural age-0 Chinook salmon emigrated prior to trap installation.

Table 2. Period and duration of 2011 spring/summer monitoring and percent of time sampled at Pear Tree Rotary Screw Trap site (PTRST; rkm 118) and Willow Creek Rotary Screw Trap site (WCRST; rkm 34). Combined value is total number of days sampled with at least one trap.

Site	Trap	Start-End dates	Days Trapped	Days possible	Trapping Rate
PTRST	1 (2.4m)	13 Jan – 26 Aug	205	226	91%
PTRST	2 (1.5m)	13 Jan – 26 Aug	180	205	88%
Combined		13 Jan – 26 Aug	206	226	91%
WCRST	1 (2.4m)	05 Mar – 16 Sep	149	195	76%
WCRST	2 (2.4m)	05 Mar – 16 Sep	159	195	82%
WCRST	3 (2.4m)	05 Mar – 16 Sep	131	195	67%
Combined		05 Mar – 16 Sep	163	195	84%

Table 3. Juvenile salmonid catch totals in 2011 for trapping at Pear Tree Rotary Screw Trap (PTRST; rkm 118) and Willow Creek Rotary Screw Trap (WCRST; rkm 34), on the Trinity River, California, operated by the Hoopa Valley Tribal Fisheries Department, U. S. Fish and Wildlife Service, Arcata Fish and Wildlife Office and the Yurok Tribal Fisheries Program. NA = Not Applicable (i.e. no fish of a particular age class exist in the Trinity River).

Site	Species	Hatchery Age-0	Hatchery Age-1+	Natural Age-0	Natural Age-1+	Natural Age-2+	Total
PTRST	Chinook salmon	3,759	47	89,981	87	NA	93,874
PTRST	coho salmon	NA	50	615	64	NA	729
PTRST	steelhead	NA	863	376	1,396	45	2,680
WCRST	Chinook salmon	35,269	4	101,242	18	NA	136,533
WCRST	coho salmon	NA	1,074	193	153	NA	1,420
WCRST	steelhead	NA	1,700	218	1,866	90	3,874

Table 4. California Department of Fish and Game, Trinity River Hatchery juvenile salmonid releases, 2011. AD-clipped = adipose fin clipped fish.

Species ¹	Release Season	Number Released	Percentage AD-clipped or Marked	Release Dates
Chinook salmon	Spring	2,664,455	23.9%	06/01 - 06/17
Chinook salmon	Fall	1,365,418	24.2%	10/03 - 10/12
coho salmon ²	Spring	490,998	100.0%	03/15 - 03/30
steelhead	Spring	775,372	99.6%	03/15 - 03/28

1. Chinook salmon releases include both spring-run and fall-run races released in the spring and fall release seasons.
2. Coho salmon were marked with a right maxillary clip.

Table 5. Catch totals of non-target fish species captured at Pear Tree Rotary Screw Trap site (PTRST) and Willow Creek Rotary Screw Trap site (WCRST) on the mainstem Trinity River, California, 2011.

Common name	Species	Life stage	PTRST Catch (n)	WCRST Catch (n)
Lamprey	<i>Entosphenus spp.</i>	Ammocete	6,351	4,262
		Eyed juvenile	292	12
		Adult	2	10
Sucker	<i>Catostomus spp.</i>		159	2,674
Speckled dace	<i>Rhinichthys osculus</i>		155	167
Threespine stickleback	<i>Gasterosteus aculeatus</i>		46	69
Golden shiner	<i>Notemigonus crysoleucas</i>		7	4
Sculpin	<i>Cottus spp.</i>		0	98
Green sturgeon	<i>Acipenser medirostris</i>		0	28
Brown trout	<i>Salmo trutta</i>	Juvenile	844	51
Sunfish	<i>Lepomis spp.</i>		0	5
Fathead minnow	<i>Pimephales promelas</i>		0	8
Sockeye salmon	<i>Oncorhynchus nerka</i>		0	36
Smallmouth bass	<i>Micropterus dolimieu</i>		1	0
Bullhead catfish	<i>Ictalurus melas</i>		0	4
Season Total			7,857	7,428

Table 6. Juvenile salmonid proportional discharge based abundance indices, at Pear Tree Rotary Screw Trap (PTRST) and Willow Creek Rotary Screw Trap (WCRST), 2011. NA = Not Applicable (i.e. no fish of a particular age class exist in the Trinity River).

Site	Species	Hatchery Age-0	Hatchery Age-1	Natural Age-0	Natural Age-1	Natural Age-2+	Total
PTRST	Chinook	103,354	541	1,047,413	1,086	NA	1,152,394
PTRST	coho salmon	NA	2,395	13,559	764	NA	16,718
PTRST	steelhead	NA	17,394	8,910	20,978	1,336	48,618
WCRST	Chinook	452,510	112	1,417,717	770	NA	1,871,109
WCRST	coho salmon	NA	55,855	8,002	5,263	NA	69,120
WCRST	steelhead	NA	78,141	2,514	66,190	5,089	151,934

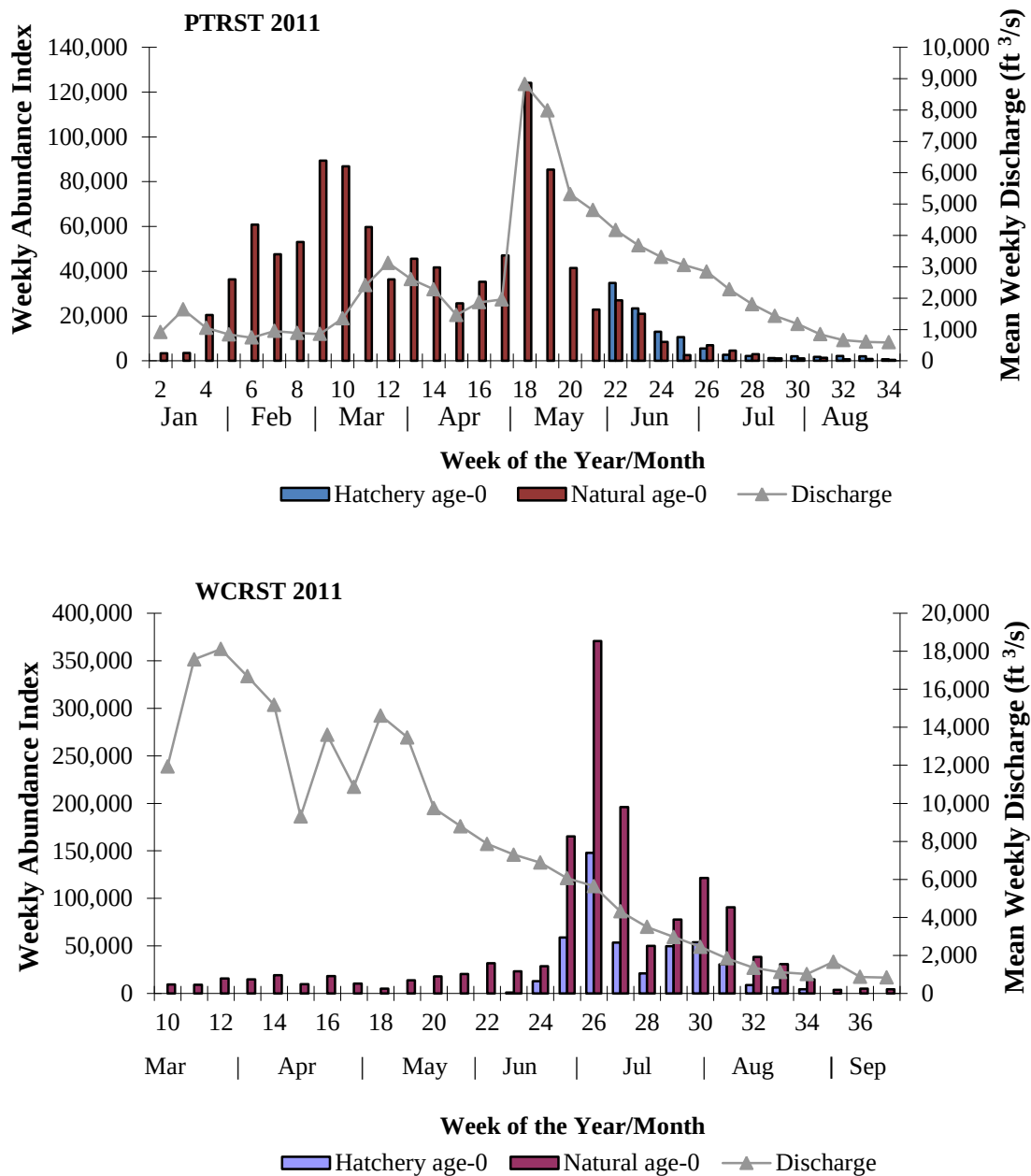


Figure 3. Weekly proportional discharge based abundance indices for natural age-0 and hatchery age-0 Chinook salmon captured at Pear Tree Rotary Screw Trap (PTRST; rkm 118) and Willow Creek Rotary Screw Trap (WCRST; rkm 34) in 2011. Mean daily discharge (ft³/s) was recorded by U.S. Geological Survey Water Resource gauge station #11-526400, near Helena, California, and U.S. Geological Survey Water Resource gauge station #11-530000 at Hoopa, California. Please note differences in scale of axes.

The proportional discharge based abundance indices for age 1+ naturally produced coho salmon were 764 and 5,263 fish at the PTRST and WCRST, respectively (Figure 4; Table 6; Appendix 3 & 4). The age-0 naturally produced coho salmon abundance indices were 13,559 and 8,002 for PTRST and WCRST, respectively. The abundance indices for hatchery age-1 coho salmon were 2,395 and 55,855 for PTRST and WCRST, respectively. The value for age-1 hatchery coho salmon for the WCRST was greater than that for PTRST for an unknown reason.

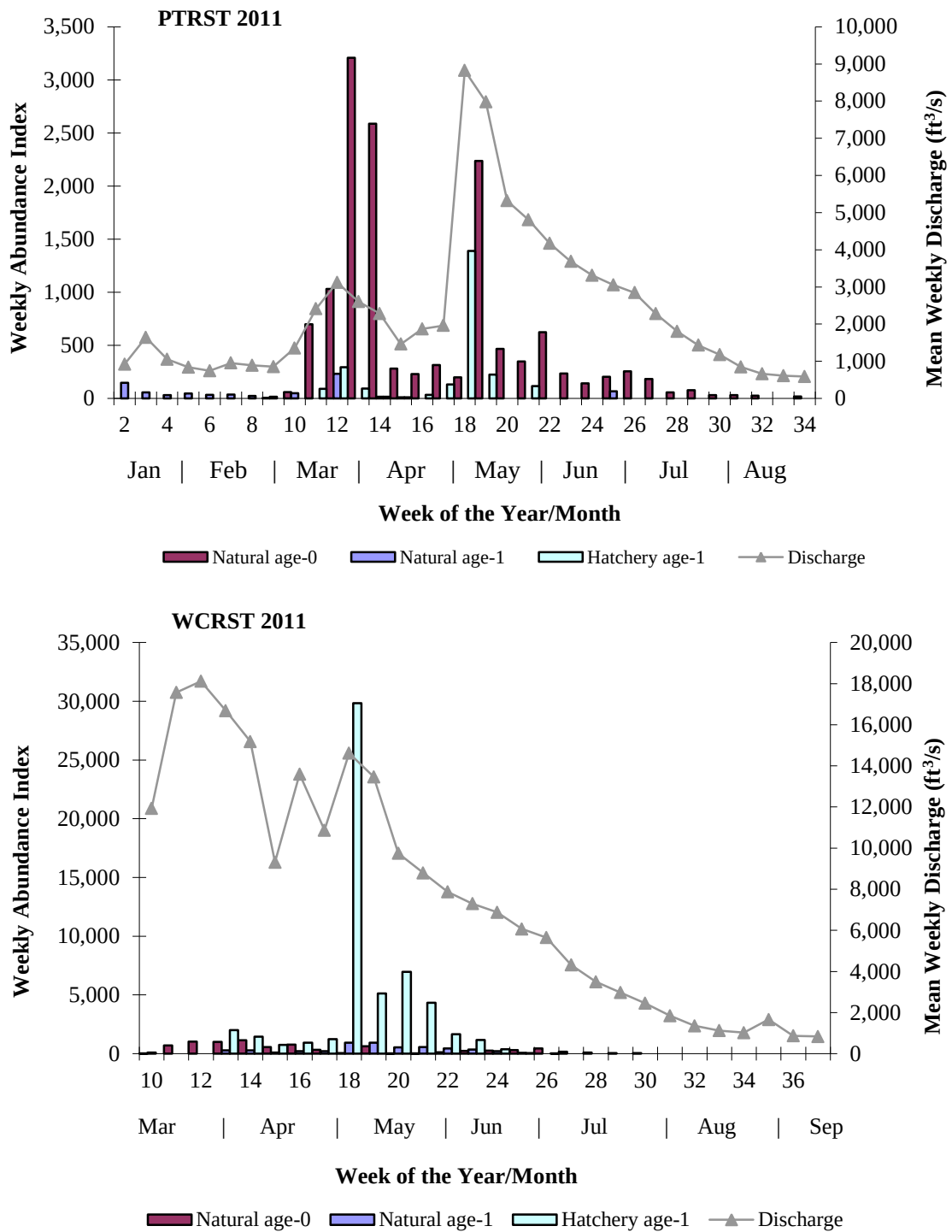


Figure 4. Weekly proportional discharge based abundance indices for natural age-0, natural age-1, and hatchery age-1 coho salmon captured at Pear Tree Rotary Screw Trap (PTRST, rkm 118) and Willow Creek Rotary Screw Trap (WCRST, rkm 34) in 2011. Mean daily discharge (ft³/s) was recorded by U.S. Geological Survey Water Resource gauge station #11-526400, near Helena, California, and U.S. Geological Survey Water Resource gauge station #11-530000 at Hoopa, California. Please note differences in scale of axes.

Future analyses will attempt to explain this difference. Since natural age-1+ coho salmon were captured at the beginning of the sampling period at both trap sites, it is likely that portions of each respective population emigrated prior to trap installation. Additionally, any outmigration that may occur in the fall of age-0 coho salmon is not accounted for because sampling typically ends in late August.

For the PTRST, proportional discharge based abundance indices for natural age-0 and age-1 steelhead were 8,910 and 20,978, respectively (Figure 5; Table 6; Appendix 5). The abundance indices for age-0 and age-1 steelhead at the WCRST were 2,514 and 66,190, respectively (Figure 5; Table 6; Appendix 6). The abundance indices for hatchery age-1 steelhead were 17,394 for the PTRST and 78,141 for the WCRST; again showing the unexplained pattern of higher values for the lower trapping site. Future analyses will attempt to explain this difference. As with coho salmon, the sampling period at both trap sites misses portions of each respective population that emigrated prior to or after trapping operations. Additionally, any outmigration that may occur in the fall of age-0 steelhead is not accounted for because sampling typically ends in late August.

Chinook Salmon Population Estimation

During the 2011 sampling season, freeze branded hatchery Chinook salmon were used to estimate capture efficiency to generate population estimates during the sampling period (Appendix 7 & 8). Weekly stratified mark-recapture population estimates of emigrating age-0 Chinook salmon were calculated for both naturally and hatchery-produced sub-populations. At PTRST between January 13 and August 26, an estimated 1,922,326 (SD=146,568; CV = 0.08) naturally-produced age-0 Chinook salmon and 370,450 (SD = 38,768; CV = 0.10) age-0 hatchery Chinook salmon passed the site. At WCRST between March 5 and September 16, an estimated 3,047,673 (SD = 162,607; CV = 0.05) naturally-produced age-0 Chinook salmon and 907,892 (SD = 50,260; CV = 0.06) age-0 hatchery Chinook salmon passed the site.

It is likely that the WCRST estimate of naturally produced Chinook was higher in part due to recruitment of juvenile Chinook salmon from tributaries (i.e. North Fork Trinity River, South Fork Trinity River, and Willow Creek) and mainstem spawning below PTRST, but we cannot account for why the hatchery estimate was higher at WCRST compared to PTRST. Future analyses will attempt to explain this difference.

Hatchery/Natural Contribution

Chinook salmon were captured at PTRST and WCRST throughout the 2011 sampling season with the spring/summer emigration dominated by naturally-produced fish comprising 91% and 76%, respectively, of the total proportional discharge based abundance indices (Appendix 1 & 2).

The age-1 coho salmon emigration was composed primarily of hatchery-produced fish at PTRST, comprising 76% of the total age-1 proportional discharge based index in 2011 (Appendix 3), and dominated by hatchery-produced fish at WCRST, comprising 91% of the total age-1 proportional discharge based index in 2011 (Appendix 4).

Based on proportional discharge based abundance indices at PTRST and WCRST, the age-1 hatchery steelhead hatchery produced fish comprised 45% (Appendix 5) and 54% (Appendix 6), of the total age-1 abundance indices, respectively.

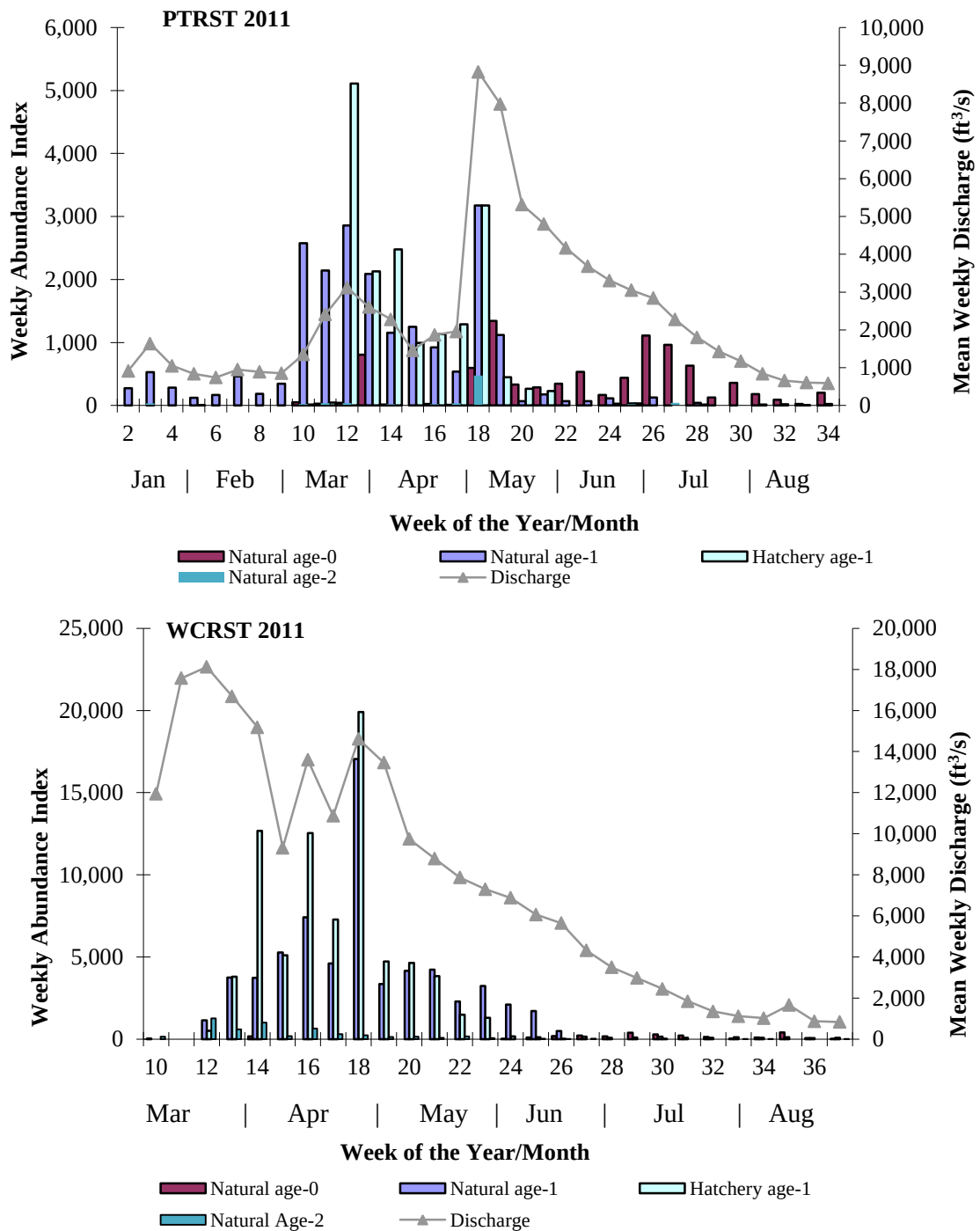


Figure 5. Weekly proportional discharge based abundance indices for natural age-0, natural age-1, natural age-2, and hatchery age-1 steelhead captured at Pear Tree Rotary Screw Trap (PTRST, rkm 118) and Willow Creek Rotary Screw Trap (WCRST, rkm 34) in 2011. Mean daily discharge (ft³/s) was recorded by U.S. Geological Survey Water Resource gauge station #11-526400, near Helena, California, and U.S. Geological Survey Water Resource gauge station #11-530000 at Hoopa, California. Please note differences in scale of axes.

Outmigrant Timing

The Chinook salmon population in the Trinity River is composed of both naturally-produced and hatchery-produced fish of both spring and fall races. The vast majority of juveniles during the spring/summer emigration period emigrate as age-0 fish, with the natural and hatchery emigration periods overlapping (Table 7; Appendix 1 & 2). The week marking the cumulative passage of 80% of the natural juvenile Chinook salmon population at WCRST, as inferred from the proportional discharge based abundance index, was WOY 30 (July 23-July 29), which occurred after the TRRP management target date of July 9 (TRRP and ESSA 2009). Based on proportional discharge based abundance indices, the natural age-0 Chinook salmon emigration had two peaks at PTRST in WOY 9 and 18, and had multiple peaks at WCRST occurring in WOY 14, 26, and 30. The hatchery age-0 Chinook salmon emigration peaked in WOY 22 at PTRST and WOY 26 at WCRST.

The coho salmon population in the Trinity River is composed of both naturally-produced and hatchery populations. The vast majority of Trinity River coho salmon emigrate to the ocean as age-1 smolts while the emigration of age-0 fish is presumably a redistribution of juveniles rearing in the mainstem. Natural age-1 coho salmon emigrated through the Trinity River at PTRST and WCRST beginning prior to trap installation and continued through mid-July in 2011, while hatchery age-1 coho salmon emigrated following their release in early April through late June (Table 7; Appendix 3 & 4). Interpretation of the data suggests that the sampling period did not encompass the entire naturally-produced age-1 coho salmon emigration period at WCRST. It is possible that these naturally-produced age-1 coho salmon spend extended rearing in the Trinity Basin and emigrate in the late fall as larger individuals. The week marking the cumulative passage of 80% of the naturally produced age-1 coho population at WCRST, as inferred from the proportional discharge based index, was WOY 22 (May 28-June 3), which occurred prior to the TRRP management target date of June 4 (TRRP and ESSA 2009). Natural age-0 coho salmon emigration peaked in WOY 13 at PTRST and WOY 14 at WCRST. Natural age-1 coho salmon emigration peaked in WOY 12 at PTRST and WOY 19 at WCRST. Hatchery coho salmon emigration peaked in WOY 18 at PTRST and WOY 18 at WCRST.

The steelhead populations (summer, fall, and winter races) in the Trinity River are composed of both natural populations that exhibit highly variable juvenile life history patterns, as well as a hatchery-produced component. All age classes of steelhead were generally captured throughout the sampling season at PTRST and WCRST, with peaks in abundance occurring during the early portion of sampling for age-1, and in July for age-0 fish. Age-1 or older natural steelhead were present throughout the sampling period (Table 7; Appendix 5 & 6). The majority of hatchery-produced age-1 steelhead emigrated by the end of June. As with coho salmon smolts, it is likely that naturally-produced age-1 steelhead exhibit extended rearing in the Trinity Basin and emigrate in the fall/winter as larger individuals. The week marking the cumulative passage of 80% of the natural steelhead smolt population at WCRST, as inferred from proportional discharge based abundance indices, was WOY 21 (May 15 – May 21), which occurred prior to the TRRP management target date of May 22 (TRRP and ESSA 2009). Natural age-0 steelhead emigration peaked in WOY 19 at PTRST and WOY 35 at WCRST. Natural age-1 steelhead emigration peaked in WOY 18 at PTRST and WOY 18 at WCRST. Hatchery steelhead emigration peaked in WOY 12 at PTRST and WOY 18 at WCRST.

Table 7. Juvenile salmonid emigration duration and peak as inferred from proportional discharge based abundance indices, at Pear Tree Rotary Screw Trap (PTRST) and Willow Creek Rotary Screw Trap (WCRST), 2011. Values represent week of the year.

Site	Species	Emigration Duration			Emigration Peak		
		Natural Age-0	Natural Age-1+	Hatchery	Natural Age-0	Natural Age-1+	Hatchery
PTRST	Chinook salmon	2-34	3-20	22-34	9, 18	19	22
PTRST	coho salmon	9-34	2-25	11-21	13	12	18
PTRST	steelhead	10-34	2-34	12-28	19	18	12
WC	Chinook salmon	10-37	13-17	23-37	14, 26, 30	15	26
WC	coho salmon	10-30	10-25	13-26	14	19	18
WC	steelhead	10-37	10-37	12-30	35	18	18

Migration Rate

Maximum migration rates of all salmonids are presented in Table 8. These values should be considered maximums, as hatchery fish are released on a volitional basis from the Trinity River Hatchery.

Fish Size

Chinook salmon fork lengths generally increased through the season at both PTRST and WCRST (Figure 6; Appendix 9 & 10).

Natural coho salmon fork lengths generally increased through the sampling season at both PTRST and WCRST (Figure 7; Appendix 9 & 10), however, hatchery coho salmon fork lengths generally decreased through the sampling season at WCRST.

Natural steelhead fork lengths generally increased through the sampling season at both PTRST and WCRST (Figure 8; Appendix 11 & 12), however, hatchery steelhead fork lengths generally decreased through the sampling season at WCRST.

Fish Condition

Fulton's condition factor ($K = 100,000 * (\text{weight} / \text{length}^3)$) was calculated on a subsample of age-0 Chinook salmon larger than 50 mm (Appendix 13), age-1 coho salmon (Appendix 14), and age 1+ steelhead (Appendix 15). Due to the inability to determine if an unmarked Chinook salmon was of hatchery origin, all juvenile Chinook salmon are pooled in weekly mean calculations. Weekly mean condition factor of juvenile Chinook salmon generally increased through the season. Coho salmon condition factor data presented are hatchery and natural combined due to the small sample size of natural origin coho salmon. Weekly mean condition factor of juvenile coho salmon generally remained level through the season. Weekly mean condition factor of steelhead generally remained level through the sampling season.

Table 8. Juvenile salmonid maximum migration rate from Trinity River Hatchery to Pear Tree Rotary Screw Trap (PTRST) and Willow Creek Rotary Screw Trap (WCRST) sampling sites, operated by the Hoopa Valley Tribal Fisheries Department, U. S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, and the Yurok Tribal Fisheries Program, 2011.

Site	Species	Date First Released	Date First Captured	# of Days	Maximum Migration Rate
PTRST	Chinook salmon	06/01/2011	06/02/2011	1	64 rkm/day
PTRST	coho salmon	03/15/2011	03/17/2011	2	32 rkm/day
PTRST	steelhead	03/15/2011	03/17/2011	2	32 rkm/day
WCRST	Chinook salmon	06/01/2011	06/07/2011	6	18 rkm/day
WCRST	coho salmon	03/15/2011	03/30/2011	15	7 rkm/day
WCRST	steelhead	03/15/2011	03/23/2011	8	14 rkm/day

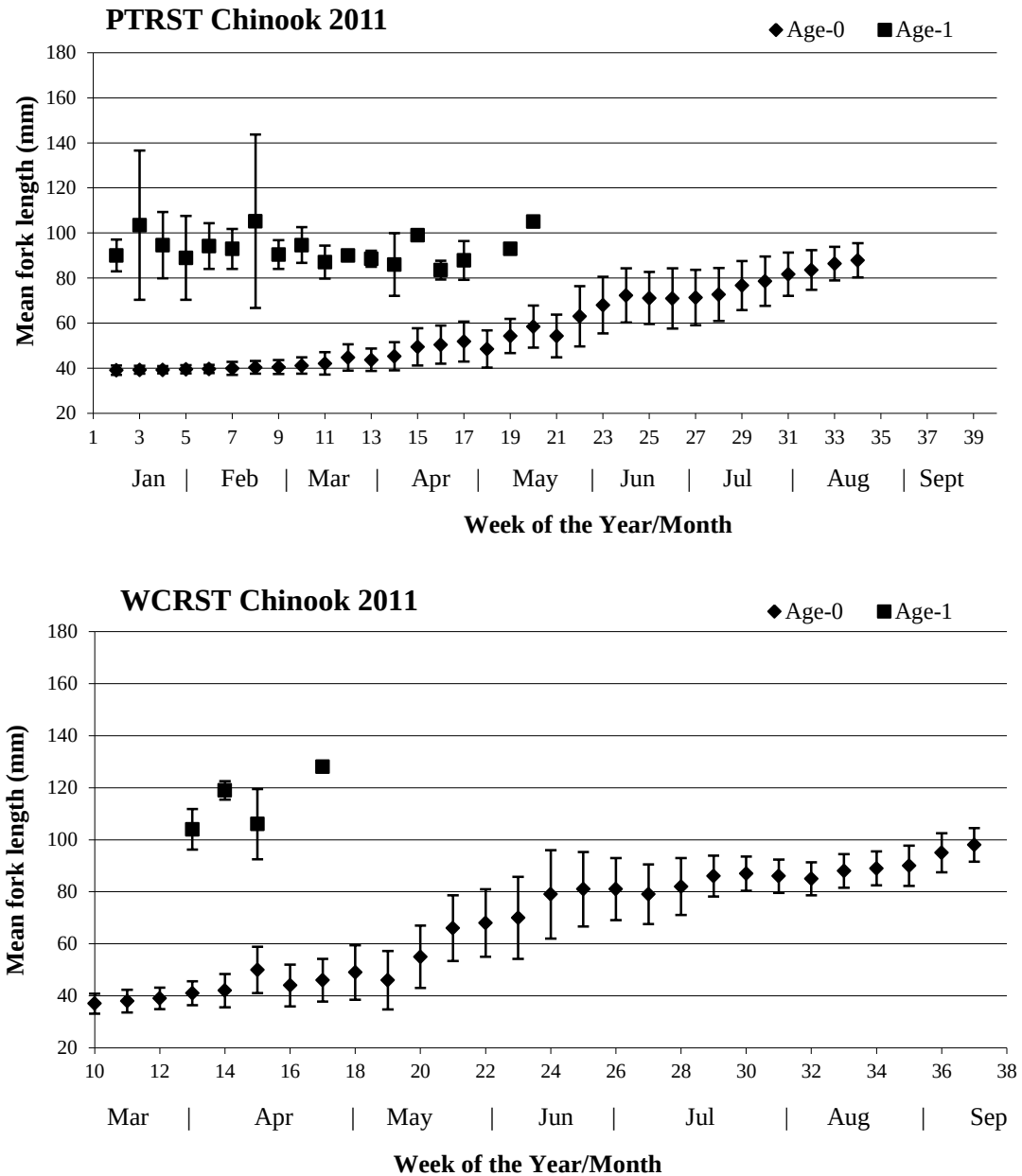


Figure 6. Weekly mean fork lengths of age-0 and age-1 Chinook salmon captured at Pear Tree Rotary Screw Trap (PTRST) and Willow Creek Rotary Screw Trap (WCRST), 2011. Error bars represent one standard deviation of the mean.

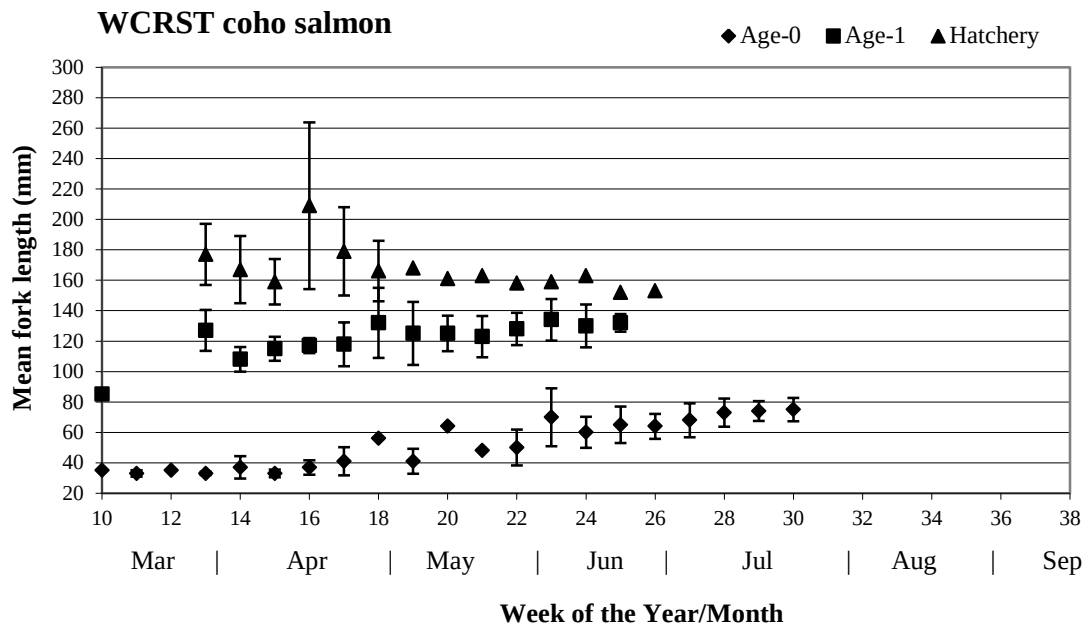
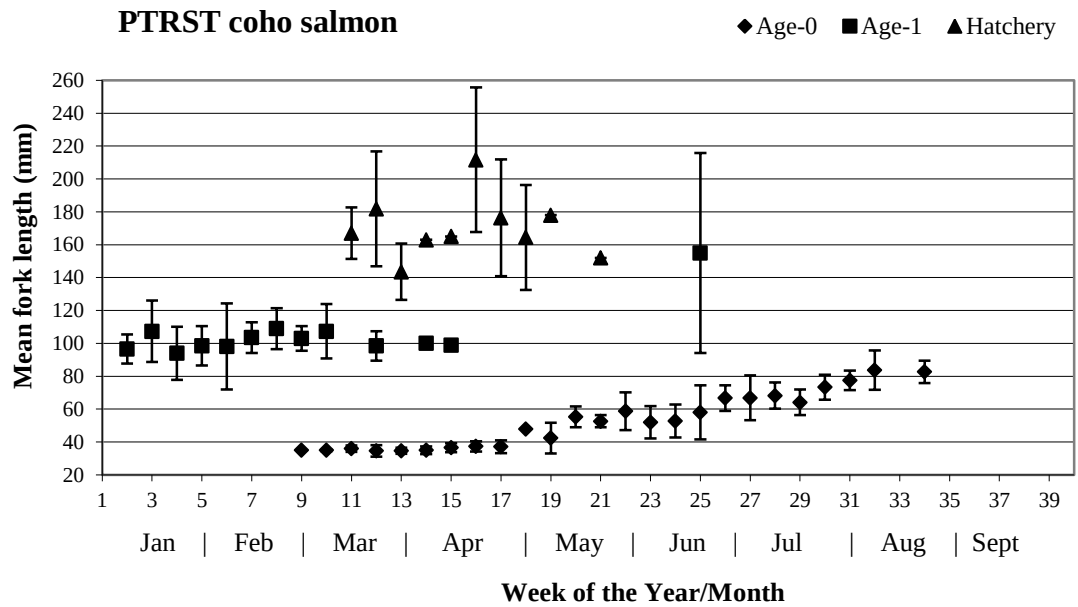


Figure 7. Weekly mean fork lengths for natural age-0, natural age-1, and hatchery coho salmon captured at Pear Tree Rotary Screw Trap (PTRST) and Willow Creek Rotary Screw Trap (WCRST), 2011. Error bars represent one standard deviation of the mean.

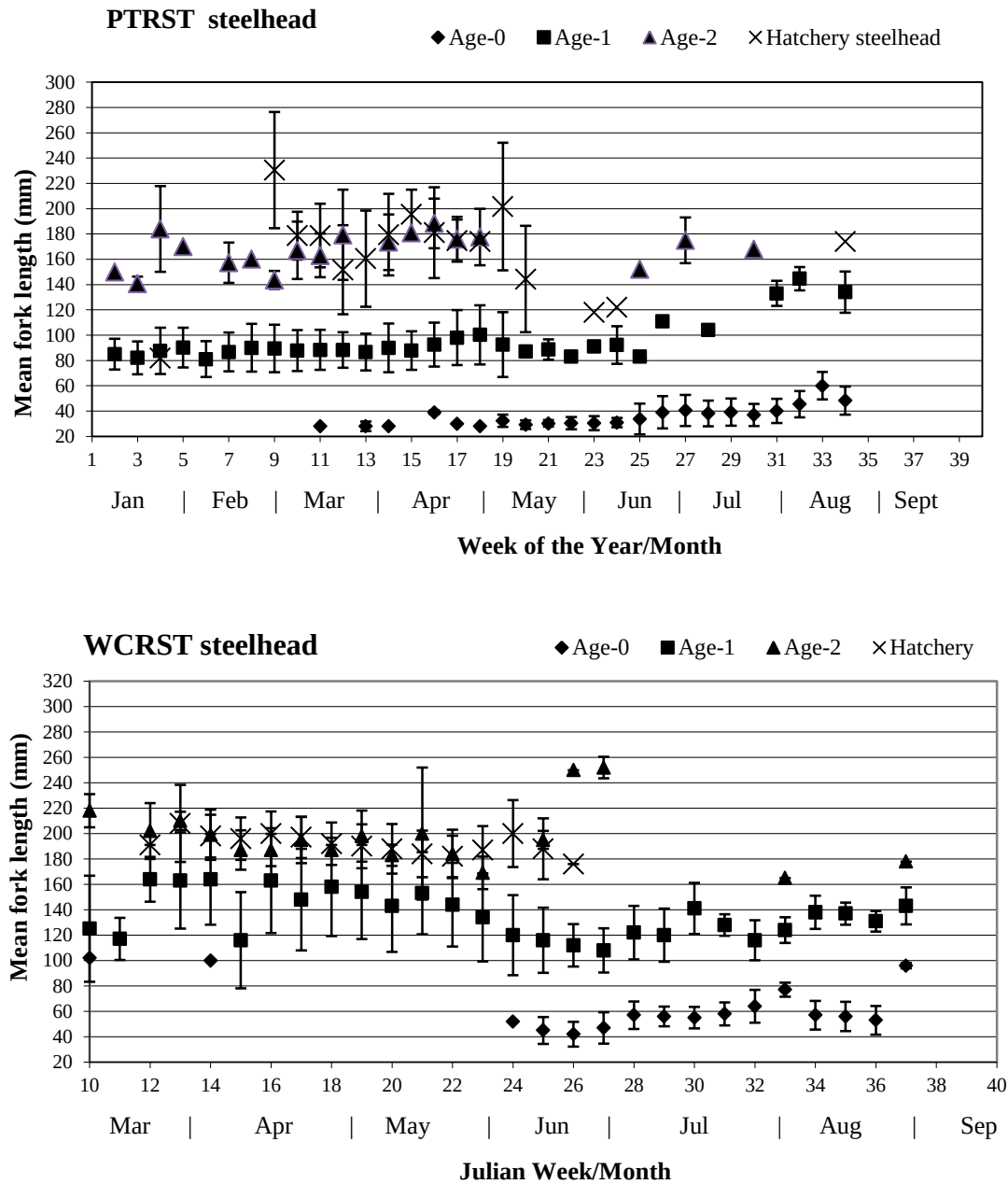


Figure 8. Weekly mean fork lengths for natural age-0, age-1, age-2, and hatchery age-1 steelhead captured at Pear Tree Rotary Screw Trap (PTRST) and Willow Creek Rotary Screw Trap (WCRST), 2011. Error bars represent one standard deviation of the mean.

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Acknowledgements

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Appendices

Appendix 1. Trinity River at Pear Tree rotary screw trap site weekly Chinook salmon catches, and abundance indices, 2011. NC = no clip, AD = adipose fin clip. Hatchery fish captured before WOY 23 were assumed to be age-1.

Week Starting	Week of Year	Mean Daily Discharge	Trap Days Sampled	Weekly Chinook Catch						Weekly Chinook Index Totals					
				NC	Hatchery AD	Age-1 ¹	Natural Age-0	Age-1	Catch Total	NC	Hatchery AD	Age-1	Natural Age-0	Age-1	Index Total
01/08/2011	2	919	4	0	0	2	158	0	160	0	0	42	3,350	0	3,392
01/15/2011	3	1,639	8	0	0	0	184	6	190	0	0	0	3,470	113	3,583
01/22/2011	4	1,052	14	0	0	8	3,368	3	3,379	0	0	48	20,452	19	20,519
01/30/2011	5	839	14	0	0	4	6,891	7	6,902	0	0	20	36,343	38	36,401
02/05/2011	6	742	14	0	0	8	12,765	8	12,781	0	0	40	60,784	37	60,861
02/12/2011	7	950	14	0	0	4	7,930	12	7,946	0	0	24	47,581	72	47,677
02/19/2011	8	890	10	0	0	4	6,636	1	6,641	0	0	32	53,133	8	53,173
02/26/2011	9	853	14	0	0	8	16,307	11	16,326	0	0	44	89,329	60	89,433
03/05/2011	10	1,353	14	0	0	4	10,463	13	10,480	0	0	32	86,867	109	87,008
03/12/2011	11	2,409	14	0	0	4	3,940	7	3,951	0	0	60	59,813	107	59,980
03/19/2011	12	3,121	14	0	0	0	1,731	1	1,732	0	0	0	36,391	21	36,412
03/26/2011	13	2,604	14	0	0	0	2,489	2	2,491	0	0	0	45,646	37	45,683
04/02/2011	14	2,281	14	0	0	0	2,712	3	2,715	0	0	0	41,755	46	41,801
04/09/2011	15	1,461	14	0	0	0	2,742	2	2,744	0	0	0	25,741	19	25,760
04/16/2011	16	1,867	14	0	0	0	3,242	4	3,246	0	0	0	35,245	43	35,288
04/23/2011	17	1,959	13	0	0	0	3,583	5	3,588	0	0	0	47,073	66	47,139
04/30/2011	18	8,823	3	0	0	1	625	0	626	0	0	199	124,094	0	124,293
05/07/2011	19	7,979	4	0	0	0	382	1	383	0	0	0	85,448	224	85,672
05/14/2011	20	5,316	7	0	0	0	623	1	624	0	0	0	41,498	67	41,565
05/21/2011	21	4,806	7	0	0	0	396	0	396	0	0	0	22,916	0	22,916
05/28/2011	22	4,171	5	382	120	0	389	0	891	26,450	8,315	0	26,971	0	61,736
06/04/2011	23	3,684	12	531	167	0	628	0	1,326	17,775	5,588	0	21,005	0	44,368
06/11/2011	24	3,310	14	349	110	0	303	0	762	9,880	3,106	0	8,529	0	21,515
06/18/2011	25	3,053	14	238	75	0	76	0	389	8,115	2,551	0	2,564	0	13,230
06/25/2011	26	2,844	12	198	62	0	323	0	583	4,937	1,552	0	8,104	0	14,593
07/02/2011	27	2,277	10	92	29	0	200	0	321	2,112	664	0	4,577	0	7,353
07/09/2011	28	1,803	14	116	37	0	214	0	367	1,686	530	0	3,045	0	5,261
07/16/2011	29	1,430	14	76	24	0	85	0	185	970	305	0	1,079	0	2,354
07/23/2011	30	1,176	14	156	49	0	106	0	311	1,559	490	0	1,059	0	3,108
07/30/2011	31	844	14	174	54	0	178	0	406	1,342	422	0	1,408	0	3,172
08/06/2011	32	659	14	256	80	0	119	0	455	1,629	512	0	769	0	2,910
08/13/2011	33	609	10	190	60	0	103	0	353	1,594	501	0	853	0	2,948
08/20/2011	34	588	14	102	32	0	90	0	224	585	184	0	521	0	1,290
Total			385	2,860	899	47	89,981	87	93,874	78,634	24,720	541	1,047,413	1,086	1,152,394

¹Age-1 hatchery Chinook salmon catch is expanded by ad-clip marking rate.

Appendix 2. Trinity River at Willow Creek rotary screw trap site weekly Chinook salmon catches, and abundance indices, 2011. NC = no clip, AD = adipose fin clip.

	Week Starting	Week of Year	Mean Daily Discharge	Trap Days Sampled	Weekly Chinook Catch					Weekly Chinook Index Totals							
					Hatchery			Natural		Catch Total	Hatchery			Natural		Index Total	
					NC	AD	Age-1 ¹	Age-0	Age-1		NC	AD	Age-1	Age-0	Age-1		
20	03/05/2011	10	11,937	12	0	0	0	92	0	92	0	0	0	9,505	0	9,505	
	03/12/2011	11	17,574	6	0	0	0	47	0	47	0	0	0	9,223	0	9,223	
	03/19/2011	12	18,119	2	0	0	0	29	0	29	0	0	0	15,701	0	15,701	
	03/26/2011	13	16,688	7	0	0	0	93	2	95	0	0	0	14,824	277	15,101	
	04/02/2011	14	15,183	11	0	0	0	168	2	170	0	0	0	19,258	104	19,362	
	04/09/2011	15	9,315	20	0	0	0	371	13	384	0	0	0	9,916	361	10,277	
	04/16/2011	16	13,599	15	0	0	4	415	0	419	0	0	112	18,177	0	18,289	
	04/23/2011	17	10,871	21	0	0	0	364	1	365	0	0	0	10,386	28	10,414	
	04/30/2011	18	14,616	8	0	0	0	84	0	84	0	0	0	4,982	0	4,982	
	05/07/2011	19	13,464	13	0	0	0	204	0	204	0	0	0	13,951	0	13,951	
	05/14/2011	20	9,744	21	0	0	0	713	0	713	0	0	0	18,091	0	18,091	
	05/21/2011	21	8,793	20	0	0	0	893	0	893	0	0	0	20,638	0	20,638	
	05/28/2011	22	7,867	20	0	0	0	1,472	0	1,472	0	0	0	31,970	0	31,970	
	06/04/2011	23	7,300	21	35	11	0	1,355	0	1,401	622	196	0	23,264	0	24,082	
	06/11/2011	24	6,881	21	580	182	0	1,731	0	2,493	9,784	3,073	0	28,523	0	41,380	
	06/18/2011	25	6,067	21	2,990	939	0	11,230	0	15,159	44,692	14,036	0	165,314	0	224,042	
	06/25/2011	26	5,646	17	6,717	2,109	0	22,746	0	31,572	112,553	35,349	0	370,793	0	518,695	
	07/02/2011	27	4,319	19	2,885	906	0	13,614	0	17,405	40,672	12,773	0	195,957	0	249,402	
	07/09/2011	28	3,498	21	1,366	429	0	4,110	0	5,905	16,034	5,035	0	50,147	0	71,216	
	07/16/2011	29	2,975	21	3,917	1,230	0	8,153	0	13,300	37,864	11,891	0	77,746	0	127,501	
	07/23/2011	30	2,450	15	3,535	1,110	0	10,631	0	15,276	40,940	12,858	0	121,353	0	175,151	
	07/30/2011	31	1,846	15	2,557	803	0	10,124	0	13,484	23,274	7,309	0	90,702	0	121,285	
	08/06/2011	32	1,354	15	850	267	0	4,877	0	5,994	6,784	2,131	0	38,419	0	47,334	
	08/13/2011	33	1,119	15	618	194	0	4,091	0	4,903	4,712	1,480	0	30,834	0	37,026	
	08/20/2011	34	1,023	15	462	145	0	2,019	0	2,626	3,399	1,067	0	14,671	0	19,137	
	08/27/2011	35	1,662	12	105	33	0	355	0	493	1,218	383	0	3,721	0	5,322	
	09/03/2011	36	868	12	169	53	0	598	0	820	1,452	456	0	5,107	0	7,015	
	09/10/2011	37	836	15	54	17	0	664	0	735	360	113	0	4,544	0	5,017	
		Total			431	26,841	8,428	4	101,242	18	136,533	344,360	108,150	112	1,417,717	770	1,871,109

¹Age-1 hatchery Chinook salmon catch is expanded by ad-clip marking rate.

Appendix 3. Trinity River at Pear Tree rotary screw trap site weekly coho salmon catches, and abundance indices, 2011. R-MAX = right maxillary clip.

Week Starting	Week of Year	Mean Daily Discharge	Trap Days Sampled	Weekly Coho Salmon Catches				Weekly Coho Salmon Indices			
				Hatchery R-MAX	Natural Age-0	Natural Age-1	Catch Total	Hatchery R-MAX	Natural Age-0	Natural Age-1	Index Total
01/08/2011	2	919	4	0	0	7	7	0	0	148	148
01/15/2011	3	1,639	8	0	0	3	3	0	0	57	57
01/22/2011	4	1,052	14	0	0	5	5	0	0	30	30
01/30/2011	5	839	14	0	0	9	9	0	0	47	47
02/05/2011	6	742	14	0	0	7	7	0	0	33	33
02/12/2011	7	950	14	0	0	6	6	0	0	36	36
02/19/2011	8	890	10	0	0	3	3	0	0	24	24
02/26/2011	9	853	14	0	1	3	4	0	5	16	21
03/05/2011	10	1,353	14	0	7	6	13	0	58	50	108
03/12/2011	11	2,409	14	6	46	0	52	91	698	0	789
03/19/2011	12	3,121	14	14	49	11	74	294	1,030	231	1,555
03/26/2011	13	2,604	14	5	175	0	180	92	3,209	0	3,301
04/02/2011	14	2,281	14	1	168	1	170	15	2,587	15	2,617
04/09/2011	15	1,461	14	1	30	1	32	9	282	9	300
04/16/2011	16	1,867	14	3	21	0	24	33	228	0	261
04/23/2011	17	1,959	13	10	24	0	34	131	315	0	446
04/30/2011	18	8,823	3	7	1	0	8	1,390	199	0	1,589
05/07/2011	19	7,979	4	1	10	0	11	224	2,237	0	2,461
05/14/2011	20	5,316	7	0	7	0	7	0	466	0	466
05/21/2011	21	4,806	7	2	6	0	8	116	347	0	463
05/28/2011	22	4,171	5	0	9	0	9	0	624	0	624
06/04/2011	23	3,684	12	0	7	0	7	0	234	0	234
06/11/2011	24	3,310	14	0	5	0	5	0	141	0	141
06/18/2011	25	3,053	14	0	6	2	8	0	204	68	272
06/25/2011	26	2,844	12	0	11	0	11	0	275	0	275
07/02/2011	27	2,277	10	0	8	0	8	0	183	0	183
07/09/2011	28	1,803	14	0	4	0	4	0	57	0	57
07/16/2011	29	1,430	14	0	6	0	6	0	76	0	76
07/23/2011	30	1,176	14	0	3	0	3	0	30	0	30
07/30/2011	31	844	14	0	4	0	4	0	31	0	31
08/06/2011	32	659	14	0	4	0	4	0	26	0	26
08/13/2011	33	609	10	0	0	0	0	0	0	0	0
08/20/2011	34	588	14	0	3	0	3	0	17	0	17
Total			385	50	615	64	729	2,395	13,559	764	16,718

Appendix 4. Trinity River at Willow Creek rotary screw trap site weekly coho salmon catches, and abundance indices, 2011. R-MAX = right maxillary clip.

Week Starting	Week of Year	Man Daily Discharge	Trap Days Sampled	Weekly Coho Salmon Catches				Weekly Coho Salmon Indices			
				Hatchery R-MAX	Natural Age-0	Natural Age-1	Catch Total	Hatchery R-MAX	Natural Age-0	Natural Age-1	Index Total
03/05/2011	10	11,937	12	0	1	1	2	0	31	103	134
03/12/2011	11	17,574	6	0	5	0	5	0	695	0	695
03/19/2011	12	18,119	2	0	2	0	2	0	1,026	0	1,026
03/26/2011	13	16,688	7	14	5	2	21	2,013	1,012	277	3,302
04/02/2011	14	15,183	11	21	10	3	34	1,437	1,140	280	2,857
04/09/2011	15	9,315	20	28	21	4	53	739	562	102	1,403
04/16/2011	16	13,599	15	15	13	3	31	926	768	214	1,908
04/23/2011	17	10,871	21	46	12	8	66	1,238	335	218	1,791
04/30/2011	18	14,616	8	252	1	11	264	29,832	58	929	30,819
05/07/2011	19	13,464	13	72	13	14	99	5,115	625	944	6,684
05/14/2011	20	9,744	21	272	1	21	294	6,958	21	547	7,526
05/21/2011	21	8,793	20	183	1	25	209	4,325	22	566	4,913
05/28/2011	22	7,867	20	76	6	21	103	1,659	110	450	2,219
06/04/2011	23	7,300	21	68	12	22	102	1,173	244	344	1,761
06/11/2011	24	6,881	21	22	16	13	51	368	265	216	849
06/18/2011	25	6,067	21	3	20	5	28	45	297	73	415
06/25/2011	26	5,646	17	2	25	0	27	27	436	0	463
07/02/2011	27	4,319	19	0	12	0	12	0	163	0	163
07/09/2011	28	3,498	21	0	7	0	7	0	88	0	88
07/16/2011	29	2,975	21	0	6	0	6	0	58	0	58
07/23/2011	30	2,450	15	0	4	0	4	0	46	0	46
07/30/2011	31	1,846	15	0	0	0	0	0	0	0	0
08/06/2011	32	1,354	15	0	0	0	0	0	0	0	0
08/13/2011	33	1,119	15	0	0	0	0	0	0	0	0
08/20/2011	34	1,023	15	0	0	0	0	0	0	0	0
08/27/2011	35	1,662	12	0	0	0	0	0	0	0	0
09/03/2011	36	868	12	0	0	0	0	0	0	0	0
09/10/2011	37	836	15	0	0	0	0	0	0	0	0
Total			431	1,074	193	153	1,420	55,855	8,002	5,263	69,120

Appendix 5. Trinity River at Pear Tree rotary screw trap site weekly steelhead catches, and abundance indices, 2011. AD = adipose fin clip.

	Week Starting	Week of Year	Mean Daily Discharge	Trap Days Sampled	Weekly Steelhead Catch				Weekly Steelhead Abundance Indices					
					Hatchery AD	Natural			Catch Total	Hatchery AD	Natural			Index Total
						Age-0	Age-1	Age 2+			Age-0	Age-1	Age 2+	
23	01/08/2011	2	919	4	0	0	13	1	14	0	0	276	21	297
	01/15/2011	3	1,639	8	0	0	28	3	31	0	0	528	57	585
	01/22/2011	4	1,052	14	0	0	47	2	49	0	0	285	12	297
	01/30/2011	5	839	14	1	0	23	1	25	5	0	121	5	131
	02/05/2011	6	742	14	0	0	35	0	35	0	0	167	0	167
	02/12/2011	7	950	14	0	0	77	3	80	0	0	462	18	480
	02/19/2011	8	890	10	0	0	23	1	24	0	0	184	8	192
	02/26/2011	9	853	14	0	0	63	3	66	0	0	345	16	361
	03/05/2011	10	1,353	14	2	6	310	5	323	17	50	2,574	42	2,683
	03/12/2011	11	2,409	14	3	2	141	4	150	46	30	2,141	61	2,278
	03/19/2011	12	3,121	14	243	2	136	3	384	5,109	42	2,859	63	8,073
	03/26/2011	13	2,604	14	116	44	114	0	274	2,127	807	2,091	0	5,025
	04/02/2011	14	2,281	14	161	1	75	2	239	2,479	15	1,155	31	3,680
	04/09/2011	15	1,461	14	106	0	133	1	240	995	0	1,249	9	2,253
	04/16/2011	16	1,867	14	104	2	85	3	194	1,131	22	924	33	2,110
	04/23/2011	17	1,959	13	98	1	41	4	144	1,288	13	539	53	1,893
	04/30/2011	18	8,823	3	16	3	16	4	39	3,177	596	3,177	794	7,744
	05/07/2011	19	7,979	4	2	6	5	0	13	447	1,342	1,118	0	2,907
	05/14/2011	20	5,316	7	4	5	1	0	10	266	333	67	0	666
	05/21/2011	21	4,806	7	4	5	3	0	12	231	289	174	0	694
	05/28/2011	22	4,171	5	0	5	1	0	6	0	346	69	0	415
	06/04/2011	23	3,684	12	0	16	2	0	18	0	535	67	0	602
	06/11/2011	24	3,310	14	1	6	4	0	11	28	169	113	0	310
	06/18/2011	25	3,053	14	1	13	1	1	16	34	442	34	34	544
	06/25/2011	26	2,844	12	0	52	6	0	58	0	1,302	150	0	1,452
	07/02/2011	27	2,277	10	0	42	0	3	45	0	962	0	69	1,031
	07/09/2011	28	1,803	14	1	44	3	0	48	14	631	43	0	688
	07/16/2011	29	1,430	14	0	10	0	0	10	0	127	0	0	127
	07/23/2011	30	1,176	14	0	36	0	1	37	0	360	0	10	370
	07/30/2011	31	844	14	0	23	2	0	25	0	180	16	0	196
	08/06/2011	32	659	14	0	14	3	0	17	0	90	19	0	109
	08/13/2011	33	609	10	0	3	1	0	4	0	25	8	0	33
	08/20/2011	34	588	14	0	35	4	0	39	0	202	23	0	225
	Total				385	863	376	1,396	45	2,680	17,394	8,910	20,978	1,336

Appendix 6. Trinity River at Willow Creek rotary screw trap site weekly steelhead catches, and abundance indices, 2011. AD = adipose fin clip.

Week Starting	Week of Year	Man Daily Discharge	Trap Days Sampled	Weekly Steelhead Catch				Weekly Steelhead Abundance Indices					
				Hatchery AD	Natural			Catch Total	Hatchery AD	Natural			Index Total
					Age-0	Age-1	Age-2+			Age-0	Age-1	Age-2+	
03/05/2011	10	11,937	12	0	1	17	6	24	0	24	408	144	576
03/12/2011	11	17,574	6	0	0	3	0	3	0	0	145	0	145
03/19/2011	12	18,119	2	1	0	2	2	5	511	0	1,145	1,264	2,920
03/26/2011	13	16,688	7	24	0	24	4	52	3,805	0	3,754	588	8,147
04/02/2011	14	15,183	11	152	1	42	11	206	12,674	168	3,735	1,008	17,585
04/09/2011	15	9,315	20	191	0	195	7	393	5,099	0	5,276	182	10,557
04/16/2011	16	13,599	15	217	0	131	11	359	12,541	0	7,415	651	20,607
04/23/2011	17	10,871	21	263	0	166	11	440	7,280	0	4,603	308	12,191
04/30/2011	18	14,616	8	217	0	182	4	403	19,915	0	17,052	231	37,198
05/07/2011	19	13,464	13	113	0	71	3	187	4,727	0	3,347	139	8,213
05/14/2011	20	9,744	21	183	0	163	6	352	4,642	0	4,152	153	8,947
05/21/2011	21	8,793	20	168	0	187	4	359	3,835	0	4,222	87	8,144
05/28/2011	22	7,867	20	76	0	111	8	195	1,493	0	2,288	162	3,943
06/04/2011	23	7,300	21	76	0	188	4	268	1,306	0	3,231	69	4,606
06/11/2011	24	6,881	21	10	1	126	0	137	169	17	2,106	0	2,292
06/18/2011	25	6,067	21	7	7	116	2	132	119	103	1,717	30	1,969
06/25/2011	26	5,646	17	1	12	28	1	42	14	179	492	13	698
07/02/2011	27	4,319	19	0	14	9	3	26	0	218	144	39	401
07/09/2011	28	3,498	21	0	13	6	0	19	0	160	79	0	239
07/16/2011	29	2,975	21	0	41	11	0	52	0	390	107	0	497
07/23/2011	30	2,450	15	1	25	13	0	39	11	290	150	0	451
07/30/2011	31	1,846	15	0	25	10	0	35	0	214	88	0	302
08/06/2011	32	1,354	15	0	17	10	0	27	0	137	80	0	217
08/13/2011	33	1,119	15	0	4	16	1	21	0	31	123	7	161
08/20/2011	34	1,023	15	0	14	11	1	26	0	99	77	7	183
08/27/2011	35	1,662	12	0	33	9	0	42	0	403	110	0	513
09/03/2011	36	868	12	0	7	8	0	15	0	60	68	0	128
09/10/2011	37	836	15	0	3	11	1	15	0	21	76	7	104
Total			431	1,700	218	1,866	90	3,874	78,141	2,514	66,190	5,089	151,934

Appendix 7. Trinity River at Pear Tree rotary screw trap site weekly age-0 Chinook salmon population estimate input and results, 2011.

Week Starting	Week of Year	Sampling Fraction ¹	Catch NC	Catch AC	Marks Released	Marks Recaptured	Recapture Rate	Estimated Natural	SD Natural	Estimated Hatchery	SD Hatchery
01/08/2011	2	0.29	158	0	0	0	----	48,394	50,275	----	----
01/15/2011	3	0.57	184	0	0	0	----	51,327	34,157	----	----
01/22/2011	4	1	3,368	0	0	0	----	63,426	30,569	----	----
01/30/2011	5	1	6,891	0	595	37	0.062	107,919	19,027	----	----
02/05/2011	6	1	12,765	0	729	89	0.122	104,556	7,446	----	----
02/12/2011	7	1	7,930	0	1,715	265	0.155	52,054	2,910	----	----
02/19/2011	8	0.71	6,636	0	569	86	0.151	63,390	6,580	----	----
02/26/2011	9	1	16,307	0	968	144	0.149	108,646	9,114	----	----
03/05/2011	10	1	10,463	0	951	195	0.205	51,760	3,398	----	----
03/12/2011	11	1	3,940	0	950	71	0.075	55,951	6,427	----	----
03/19/2011	12	1	1,731	0	1,173	46	0.039	48,157	7,187	----	----
03/26/2011	13	1	2,489	0	909	31	0.034	77,070	12,860	----	----
04/02/2011	14	1	2,712	0	1,549	59	0.038	73,593	9,759	----	----
04/09/2011	15	1	2,742	0	695	12	0.017	136,951	31,087	----	----
04/16/2011	16	1	3,242	0	1,787	89	0.050	67,290	7,261	----	----
04/23/2011	17	1	3,583	0	1,688	29	0.017	184,875	29,272	----	----
04/30/2011	18	0.29	625	0	0	0	----	72,242	34,586	----	----
05/07/2011	19	0.57	382	0	3,760	22	0.006	105,306	20,413	----	----
05/14/2011	20	1	623	0	2,987	11	0.004	127,251	30,905	----	----
05/21/2011	21	1	396	0	0	0	----	57,195	31,082	----	----
05/28/2011	22	0.71	771	120	1,232	11	0.009	61,353	16,573	85,399	25,369
06/04/2011	23	1	1,159	167	1,745	22	0.013	50,773	10,637	58,764	12,829
06/11/2011	24	1	652	110	2,397	16	0.007	40,975	9,371	63,447	12,464
06/18/2011	25	1	314	75	2,888	8	0.003	23,887	7,050	68,313	15,855
06/25/2011	26	0.86	521	62	3,665	50	0.014	26,787	4,206	22,047	3,506
07/02/2011	27	0.71	292	29	2,446	35	0.014	19,698	3,609	13,813	2,867
07/09/2011	28	1	330	37	1,538	22	0.014	14,749	3,271	12,059	2,707
07/16/2011	29	1	161	24	1,456	23	0.016	6,823	1,802	8,372	2,078
07/23/2011	30	1	262	49	959	11	0.011	7,570	2,216	14,928	3,767
07/30/2011	31	1	352	54	972	30	0.031	5,617	1,259	7,733	1,599
08/06/2011	32	1	375	80	723	42	0.058	2,519	614	6,026	1,033
08/13/2011	33	0.71	293	60	737	39	0.053	2,530	662	6,425	1,118
08/20/2011	34	1	192	32	0	0	----	1,693	927	3,124	1,482
Total			92,841	899	41,783	1,495	0.036	1,922,326	146,568	370,450	38,768

¹Sampling Fraction is the proportion of trap days sampled during the week.

Appendix 8. Trinity River at Willow Creek rotary screw trap site weekly age-0 Chinook salmon population estimate input and results, 2011.

Week Starting	Week of Year	Sampling Fraction ¹	Catch NC	Catch AD-Clip	Marks Released	Marks Recaptured	Recapture Rate	Estimated Natural	SD Natural	Estimated Hatchery	SD Hatchery
03/05/2011	10	0.93	92	0	970	14	0.01	6,315	1,695	---	---
03/12/2011	11	0.86	47	0	1,412	33	0.02	2,617	572	---	---
03/19/2011	12	0.29	29	0	0	0	---	7,134	4,524	---	---
03/26/2011	13	1	93	0	0	0	---	8,689	5,972	---	---
04/02/2011	14	0.86	168	0	2,695	10	0.00	39,150	10,568	---	---
04/09/2011	15	0.95	371	0	0	0	---	21,306	13,953	---	---
04/16/2011	16	0.76	415	0	1,859	13	0.01	65,873	15,688	---	---
04/23/2011	17	1	364	0	965	11	0.01	31,997	8,745	---	---
04/30/2011	18	0.38	84	0	2,541	17	0.01	32,057	7,511	---	---
05/07/2011	19	0.62	204	0	2,460	24	0.01	34,222	7,107	---	---
05/14/2011	20	1	713	0	2,400	19	0.01	82,499	17,445	---	---
05/21/2011	21	0.95	893	0	1,395	25	0.02	53,718	10,524	---	---
05/28/2011	22	1	1,472	0	0	0	---	70,250	36,866	---	---
06/04/2011	23	1	1,390	11	1,499	116	0.08	18,875	1,840	745	215
06/11/2011	24	1	2,311	182	1,498	37	0.02	71,802	10,496	29,219	4,651
06/18/2011	25	1	14,220	939	1,499	55	0.04	309,837	35,510	101,843	11,916
06/25/2011	26	0.81	29,463	2,109	1,526	76	0.05	557,703	60,584	203,299	22,381
07/02/2011	27	1	16,499	906	1,500	95	0.06	228,832	24,231	60,341	6,554
07/09/2011	28	1	5,476	429	1,474	39	0.03	174,129	25,382	71,953	10,855
07/16/2011	29	1	12,070	1,230	1,500	66	0.04	198,003	22,031	116,072	13,208
07/23/2011	30	0.71	14,166	1,110	1,500	60	0.04	373,454	55,773	153,131	23,715
07/30/2011	31	0.71	12,681	803	1,500	99	0.07	218,865	21,216	68,357	7,002
08/06/2011	32	0.71	5,727	267	0	0	---	151,374	35,876	32,952	7,924
08/13/2011	33	0.71	4,709	194	0	0	---	122,830	28,911	23,043	5,488
08/20/2011	34	0.71	2,481	145	0	0	---	60,163	29,890	17,133	8,600
08/27/2011	35	0.71	460	33	0	0	---	40,346	19,882	14,803	7,443
09/03/2011	36	0.57	767	53	0	0	---	34,005	13,536	11,749	4,619
09/10/2011	37	0.67	718	17	0	0	---	31,630	23,540	3,251	2,568
Total			128,083	8,428	30,193	809	0.03	3,047,673	162,607	907,892	50,260

Sampling Fraction is the proportion of trap days sampled during the week.

Appendix 9. Trinity River at Pear Tree rotary screw trap site weekly Chinook salmon and coho salmon fork lengths, 2011.

Chinook Salmon*												Natural Coho Salmon								Hatchery Coho Salmon							
Week	Week	Age-0					Age-1					Age-0				Age-1				Age-1							
Starting	of Year	n	mean	min	max	SD	n	mean	min	max	SD	n	mean	min	max	SD	n	mean	min	max	SD	n	mean	min	max	SD	
01/08/2011	2	83	39.1	34	42	2.1	2	90.0	85	95	7.1	0	----	----	----	----	5	96.6	85	106	8.8	0	----	----	----	----	
01/15/2011	3	150	39.3	35	43	1.7	6	103.5	81	167	33.1	0	----	----	----	----	3	107.3	86	121	18.7	0	----	----	----	----	
01/22/2011	4	408	39.3	35	47	1.6	11	94.5	78	120	14.7	0	----	----	----	----	5	94.0	71	111	16.2	0	----	----	----	----	
01/30/2011	5	420	39.5	35	48	1.8	11	88.9	54	130	18.6	0	----	----	----	----	8	98.5	81	117	12.0	0	----	----	----	----	
02/05/2011	6	420	39.7	30	53	1.8	16	94.2	78	118	10.2	0	----	----	----	----	7	98.1	62	141	26.1	0	----	----	----	----	
02/12/2011	7	421	39.9	35	62	2.9	15	92.9	76	110	8.9	0	----	----	----	----	6	103.5	86	112	9.3	0	----	----	----	----	
02/19/2011	8	300	40.4	36	56	2.8	5	105.2	77	173	38.5	0	----	----	----	----	3	109.0	99	123	12.5	0	----	----	----	----	
02/26/2011	9	421	40.4	30	65	3.1	19	90.4	81	110	6.4	1	35.0	35	35	----	3	103.0	95	110	7.5	0	----	----	----	----	
03/05/2011	10	420	41.2	33	60	3.6	17	94.6	85	113	8.0	7	35.0	34	36	0.6	6	107.3	87	126	16.6	0	----	----	----	----	
03/12/2011	11	379	42.1	35	64	5.0	11	87.1	76	101	7.4	43	36.0	27	40	2.0	0	----	----	----	----	6	167	143	184	16	
03/19/2011	12	421	44.7	35	70	5.8	1	90.0	90	90	----	44	34.7	25	40	3.5	9	98.4	86	114	8.9	11	182	135	260	35	
03/26/2011	13	420	43.7	31	65	5.0	2	88.5	86	91	3.5	154	34.6	28	40	1.9	0	----	----	----	----	4	144	121	160	17	
04/02/2011	14	422	45.3	31	72	6.2	3	86.0	77	102	13.9	154	35.0	31	49	2.3	1	100.0	100	100	----	1	163	163	163	----	
04/09/2011	15	428	49.5	35	76	8.3	2	99.0	98	100	1.4	29	36.6	33	44	2.7	1	99.0	99	99	----	1	165	165	165	----	
04/16/2011	16	435	50.4	35	76	8.5	4	83.5	79	87	4.1	21	37.3	34	45	3.1	0	----	----	----	----	3	212	168	256	44	
04/23/2011	17	397	51.8	35	75	8.9	5	87.8	80	97	8.6	24	37.2	29	45	3.9	0	----	----	----	----	10	176	139	240	36	
04/30/2011	18	60	48.4	35	69	8.3	0	----	----	----	----	1	48.0	48	48	----	0	----	----	----	----	7	164	133	217	32	
05/07/2011	19	120	54.3	38	72	7.6	1	93.0	93	93	----	10	42.4	28	57	9.4	0	----	----	----	----	1	178	178	178	----	
05/14/2011	20	210	58.4	37	88	9.3	1	105.0	105	105	----	7	55.3	48	65	6.3	0	----	----	----	----	0	----	----	----	----	
05/21/2011	21	215	54.3	35	89	9.5	0	----	----	----	----	6	52.7	47	58	3.7	0	----	----	----	----	1	152	152	152	----	
05/28/2011	22	200	63.0	41	100	13.4	0	----	----	----	----	9	58.8	45	79	11.5	0	----	----	----	----	0	----	----	----	----	
06/04/2011	23	277	68.0	34	100	12.6	0	----	----	----	----	6	52.0	42	70	9.8	0	----	----	----	----	0	----	----	----	----	
06/11/2011	24	384	72.3	41	113	12.0	0	----	----	----	----	5	52.8	38	62	10.0	0	----	----	----	----	0	----	----	----	----	
06/18/2011	25	298	71.1	40	101	11.6	0	----	----	----	----	6	58.0	30	77	16.5	2	155.0	112	198	60.8	0	----	----	----	----	
06/25/2011	26	264	70.9	38	113	13.4	0	----	----	----	----	10	66.8	52	77	7.8	0	----	----	----	----	0	----	----	----	----	
07/02/2011	27	219	71.3	45	100	12.3	0	----	----	----	----	8	66.9	45	87	13.6	0	----	----	----	----	0	----	----	----	----	
07/09/2011	28	282	72.7	49	103	11.8	0	----	----	----	----	4	68.3	60	79	7.9	0	----	----	----	----	0	----	----	----	----	
07/16/2011	29	169	76.6	49	107	10.9	0	----	----	----	----	6	64.2	54	73	7.8	0	----	----	----	----	0	----	----	----	----	
07/23/2011	30	255	78.6	43	104	10.9	0	----	----	----	----	3	73.3	65	80	7.6	0	----	----	----	----	0	----	----	----	----	
07/30/2011	31	331	81.7	48	109	9.6	0	----	----	----	----	4	77.5	72	84	5.9	0	----	----	----	----	0	----	----	----	----	
08/06/2011	32	393	83.6	56	120	8.8	0	----	----	----	----	4	83.8	73	100	11.9	0	----	----	----	----	0	----	----	----	----	
08/13/2011	33	268	86.3	63	116	7.5	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----	
08/20/2011	34	207	87.8	60	109	7.6	0	----	----	----	----	3	82.7	75	88	6.8	0	----	----	----	----	0	----	----	----	----	

*Natural and Hatchery combined.

Appendix 10. Trinity River at Willow Creek rotary screw trap site weekly Chinook salmon and coho salmon fork lengths, 2011.

	Week Starting	Week of Year	Chinook Salmon*										Natural Coho Salmon										Hatchery Coho Salmon				
			Age-0					Age-1					Age-0					Age-1					Age-1				
			n	mean	min	max	SD	n	mean	min	max	SD	n	mean	min	max	SD	n	mean	min	max	SD	n	mean	min	max	SD
28	03/05/2011	10	92	37	29	49	3.84	0	----	----	----	----	1	35	35	35	----	1	85	85	85	----	0	----	----	----	----
	03/12/2011	11	46	38	30	53	4.37	0	----	----	----	----	5	33	31	36	2.07	0	----	----	----	----	0	----	----	----	----
	03/19/2011	12	29	39	30	49	4.10	0	----	----	----	----	2	35	35	35	----	0	----	----	----	----	0	----	----	----	----
	03/26/2011	13	89	41	32	59	4.63	2	104	98	109	7.78	5	33	32	34	1.10	2	127	117	136	13.44	14	177	145	220	20.14
	04/02/2011	14	166	42	30	67	6.39	2	119	116	121	3.54	10	37	31	56	7.34	3	108	101	117	8.08	21	167	145	252	22.08
	04/09/2011	15	336	50	28	81	8.91	13	106	89	128	13.54	20	33	30	40	2.52	4	115	106	125	7.85	28	159	141	214	14.92
	04/16/2011	16	257	44	33	88	8.01	0	----	----	----	----	13	37	30	45	4.75	3	117	111	120	4.93	15	209	91	285	54.85
	04/23/2011	17	234	46	31	70	8.17	1	128	128	128	----	12	41	33	59	9.27	8	118	93	135	14.41	45	179	131	266	29.01
	04/30/2011	18	71	49	37	79	10.45	0	----	----	----	----	1	56	56	56	----	11	132	93	174	23.01	105	166	135	238	19.89
	05/07/2011	19	174	46	34	91	11.18	0	----	----	----	----	13	41	33	56	8.25	14	125	81	155	20.68	70	168	140	224	20.40
	05/14/2011	20	436	55	35	110	12.01	0	----	----	----	----	1	64	64	64	----	21	125	105	153	11.66	211	161	125	230	14.75
	05/21/2011	21	481	66	35	108	12.66	0	----	----	----	----	1	48	48	48	----	24	123	95	152	13.58	135	163	121	260	19.34
	05/28/2011	22	614	68	36	110	12.95	0	----	----	----	----	6	50	38	65	11.79	20	128	105	152	10.56	72	158	121	193	13.78
	06/04/2011	23	594	70	35	111	15.76	0	----	----	----	----	14	70	39	92	19.07	20	134	113	170	13.77	65	159	140	203	14.29
	06/11/2011	24	806	79	37	116	17.00	0	----	----	----	----	15	60	44	77	10.23	13	130	110	152	13.99	22	163	120	206	20.61
	06/18/2011	25	1125	81	42	114	14.30	0	----	----	----	----	20	65	45	94	11.99	5	132	125	141	5.79	3	152	150	157	4.04
	06/25/2011	26	942	81	41	113	11.95	0	----	----	----	----	25	64	40	82	8.23	0	----	----	----	----	2	153	138	168	21.21
	07/02/2011	27	970	79	43	113	11.46	0	----	----	----	----	12	68	49	93	11.11	0	----	----	----	----	0	----	----	----	----
	07/09/2011	28	823	82	41	115	10.96	0	----	----	----	----	7	73	64	87	9.23	0	----	----	----	----	0	----	----	----	----
	07/16/2011	29	1067	86	50	110	7.86	0	----	----	----	----	6	74	65	85	6.52	0	----	----	----	----	0	----	----	----	----
	07/23/2011	30	859	87	45	119	6.56	0	----	----	----	----	4	75	68	85	7.59	0	----	----	----	----	0	----	----	----	----
	07/30/2011	31	769	86	63	112	6.39	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----
	08/06/2011	32	649	85	42	110	6.38	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----
	08/13/2011	33	621	88	52	112	6.43	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----
	08/20/2011	34	553	89	50	110	6.57	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----
	08/27/2011	35	245	90	65	136	7.72	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----
	09/03/2011	36	200	95	76	127	7.46	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----
	09/10/2011	37	181	98	79	129	6.45	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----

*Natural and Hatchery combined.

Appendix 11. Trinity River at Pear Tree rotary screw trap site weekly steelhead fork lengths, 2011

	Week Starting	Week of Year	Natural Steelhead												Hatchery Steelhead							
			Age-0				Age-1				Age-2+				Age-1							
			n	mean	min	max	SD	n	mean	min	max	SD	n	mean	min	max	SD	n	mean	min	max	SD
	01/08/2011	2	0	----	----	----	----	24	85.1	68	106	12.16	1	150.0	150	150	----	0	----	----	----	----
	01/15/2011	3	0	----	----	----	----	27	82.0	64	120	13.02	3	140.7	136	147	5.69	0	----	----	----	----
	01/22/2011	4	0	----	----	----	----	47	87.6	57	125	18.31	2	184.0	160	208	33.9	1	82	82	82	----
	01/30/2011	5	0	----	----	----	----	23	90.2	61	119	15.71	1	170.0	170	170	----	0	----	----	----	----
	02/05/2011	6	0	----	----	----	----	35	81.1	63	129	14.23	0	----	----	----	----	0	----	----	----	----
	02/12/2011	7	0	----	----	----	----	65	86.7	62	133	15.26	3	157.3	139	168	15.9	0	----	----	----	----
	02/19/2011	8	0	----	----	----	----	23	90.0	49	130	18.86	1	160.0	160	160	----	0	----	----	----	----
	02/26/2011	9	0	----	----	----	----	62	89.4	60	138	18.82	3	143.7	136	150	7.1	2	231	198	263	45.96
	03/05/2011	10	0	----	----	----	----	209	87.8	53	135	16.11	5	167.0	144	200	22.7	3	179	158	195	18.88
	03/12/2011	11	2	28.0	28	28	0.00	123	88.3	62	140	15.87	4	163.0	147	185	17.2	68	179	120	237	25.25
	03/19/2011	12	0	----	----	----	----	115	88.3	57	134	14.02	3	179.3	153	220	35.7	81	152	64	223	35.28
	03/26/2011	13	41	28.0	24	47	3.80	108	86.7	63	127	14.45	0	----	----	----	----	115	160	75	230	38.09
	04/02/2011	14	1	28.0	28	28	----	74	89.9	55	150	19.26	2	173.5	158	189	21.9	86	179	91	230	32.23
	04/09/2011	15	0	----	----	----	----	133	87.8	64	146	15.19	1	181.0	181	181	----	103	196	113	233	19.49
	04/16/2011	16	2	39.0	38	40	1.41	83	92.5	56	140	17.31	3	188.3	172	210	19.6	67	181	90	265	35.86
29	04/23/2011	17	1	30.0	30	30	----	39	98.0	65	150	21.72	4	176.0	160	199	17.5	8	175	150	200	16.62
	04/30/2011	18	2	28.0	28	28	0.00	13	100.2	69	149	23.30	4	177.5	158	208	22.35	2	174	173	175	1.41
	05/07/2011	19	6	32.3	28	39	4.84	4	92.5	64	125	25.57	0	----	----	----	----	3	202	172	260	50.52
	05/14/2011	20	5	29.2	24	33	3.42	1	87.0	87	87	----	0	----	----	----	----	3	144	103	187	42.02
	05/21/2011	21	5	30.2	28	33	2.59	3	88.7	80	96	8.08	0	----	----	----	----	0	----	----	----	----
	05/28/2011	22	5	30.4	25	38	4.83	1	83.0	83	83	----	0	----	----	----	----	0	----	----	----	----
	06/04/2011	23	8	30.4	23	40	5.48	2	91.0	88	94	4.24	0	----	----	----	----	1	118	118	118	----
	06/11/2011	24	6	30.8	28	36	3.71	4	92.3	74	109	14.89	0	----	----	----	----	1	122	122	122	----
	06/18/2011	25	10	33.8	25	64	12.19	1	83.0	83	83	----	1	152.0	152	152	----	0	----	----	----	----
	06/25/2011	26	52	39.0	27	70	12.72	6	111.0	87	150	----	0	----	----	----	----	0	----	----	----	----
	07/02/2011	27	42	40.5	28	58	12.29	0	----	----	----	----	3	175.0	157	193	18.00	0	----	----	----	----
	07/09/2011	28	41	38.2	28	59	10.16	3	104.0	100	108	4.00	0	----	----	----	----	0	----	----	----	----
	07/16/2011	29	10	39.1	30	60	10.68	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----
	07/23/2011	30	36	36.9	27	60	8.68	0	----	----	----	----	1	168.0	168	168	----	0	----	----	----	----
	07/30/2011	31	23	40.1	28	63	9.49	2	133.0	126	140	9.9	0	----	----	----	----	0	----	----	----	----
	08/06/2011	32	14	45.4	32	70	10.42	3	144.7	134	150	9.2	0	----	----	----	----	0	----	----	----	----
	08/13/2011	33	3	60.0	48	69	10.82	0	----	----	----	----	0	----	----	----	----	0	----	----	----	----
	08/20/2011	34	35	48.3	33	78	11.18	4	134.0	118	150	16.3	0	----	----	----	----	544	174	64	265	35.26

Appendix 12. Trinity River at Willow Creek rotary screw trap site weekly steelhead fork lengths, 2011.

	Week	Week	Natural Steelhead										Hatchery Steelhead									
			Age-0				Age-1				Age-2+				Age-1							
			Starting	of Year	n	mean	min	max	SD	n	mean	min	max	SD	n	mean	min	max	SD	n	mean	min
30	03/05/2011	10	1	102	102	102	----	17	125	74	229	41.73	4	218	200	230	12.96	0	----	----	----	----
	03/12/2011	11	0	----	----	----	----	3	117	99	132	16.62	0	----	----	----	----	0	----	----	----	----
	03/19/2011	12	0	----	----	----	----	2	164	151	176	17.68	2	202	186	217	21.92	1	191	191	191	----
	03/26/2011	13	0	----	----	----	----	24	163	92	220	37.83	4	210	203	216	7.23	24	208	146	330	30.42
	04/02/2011	14	1	100	100	100	----	41	164	79	215	35.77	11	199	162	230	19.78	133	198	159	239	16.74
	04/09/2011	15	0	----	----	----	----	190	116	72	245	37.79	7	187	163	213	15.56	172	196	138	249	16.80
	04/16/2011	16	0	----	----	----	----	127	163	70	251	41.25	11	187	170	201	12.71	203	200	102	243	17.35
	04/23/2011	17	0	----	----	----	----	166	148	74	216	40.07	11	195	158	227	18.23	256	197	153	276	16.22
	04/30/2011	18	0	----	----	----	----	107	158	78	220	38.81	4	187	183	191	4.08	126	192	147	240	16.75
	05/07/2011	19	0	----	----	----	----	69	154	78	210	37.15	3	198	179	219	20.13	105	190	153	245	17.18
	05/14/2011	20	0	----	----	----	----	158	143	78	225	36.16	6	183	172	196	8.38	179	188	148	300	19.42
	05/21/2011	21	0	----	----	----	----	174	153	81	212	32.31	4	200	158	275	51.96	164	184	125	239	18.35
	05/28/2011	22	0	----	----	----	----	108	144	76	202	32.87	8	184	167	221	19.01	76	182	146	220	16.25
	06/04/2011	23	0	----	----	----	----	184	134	82	221	34.59	4	169	158	187	12.87	74	187	145	238	18.90
	06/11/2011	24	1	52	52	52	----	122	120	77	214	31.43	0	----	----	----	----	9	200	168	243	26.46
	06/18/2011	25	6	45	30	56	10.58	102	116	85	260	25.75	2	195	190	200	7.07	3	188	161	206	24.01
	06/25/2011	26	11	42	27	54	9.68	27	112	83	150	16.62	1	250	250	250	----	1	176	176	176	----
	07/02/2011	27	14	47	31	75	12.38	9	108	85	141	17.42	3	252	246	262	8.50	0	----	----	----	----
	07/09/2011	28	13	57	44	83	10.83	5	122	86	139	21.15	0	----	----	----	----	0	----	----	----	----
	07/16/2011	29	41	56	37	70	7.79	6	120	92	145	20.86	0	----	----	----	----	0	----	----	----	----
	07/23/2011	30	23	55	40	80	8.50	9	141	109	168	20.12	0	----	----	----	----	0	----	----	----	----
	07/30/2011	31	24	58	43	76	9.13	7	128	115	137	8.40	0	----	----	----	----	0	----	----	----	----
	08/06/2011	32	14	64	38	80	12.83	5	116	98	141	15.73	0	----	----	----	----	0	----	----	----	----
	08/13/2011	33	4	77	70	82	5.50	12	124	107	136	10.08	1	165	165	165	----	0	----	----	----	----
	08/20/2011	34	14	57	35	71	11.31	9	138	121	156	13.13	1	138	138	138	----	0	----	----	----	----
	08/27/2011	35	31	56	38	81	11.64	8	137	125	152	8.72	0	----	----	----	----	0	----	----	----	----
	09/03/2011	36	7	53	38	69	11.35	8	131	117	141	8.13	0	----	----	----	----	0	----	----	----	----
	09/10/2011	37	2	96	94	97	2.12	8	143	120	160	14.64	1	178	178	178	----	0	----	----	----	----

Appendix 13. Fulton's condition factor (K) for age-0 Chinook salmon from the Pear Tree and Willow Creek rotary screw trap sites, 2011.

Week Starting	Week of Year	Pear Tree Trap Site			Willow Creek Trap Site		
		n	Average K	Standard Deviation of K	n	Average K	Standard Deviation of K
01/22/2011	4	0	---	---	0	---	---
01/29/2011	5	0	---	---	0	---	---
02/05/2011	6	0	---	---	0	---	---
02/12/2011	7	1	0.92	---	0	---	---
02/19/2011	8	1	0.91	---	0	---	---
02/26/2011	9	4	0.94	0.18	0	---	---
03/05/2011	10	5	0.97	0.11	3	0.85	0.03
03/12/2011	11	7	1.04	0.13	6	1.08	0.40
03/19/2011	12	25	1.04	0.06	1	0.93	---
03/26/2011	13	17	1.12	0.12	15	1.04	0.11
04/02/2011	14	0	---	---	26	1.05	0.09
04/09/2011	15	50	1.09	0.11	189	1.08	0.14
04/16/2011	16	42	1.08	0.12	57	1.12	0.22
04/23/2011	17	105	1.04	0.15	76	1.09	0.20
04/30/2011	18	25	1.09	0.10	30	1.11	0.13
05/07/2011	19	12	1.15	0.14	56	1.09	0.16
05/14/2011	20	46	1.11	0.16	279	1.08	0.19
05/21/2011	21	0	---	---	398	1.08	0.15
05/28/2011	22	0	---	---	518	1.11	0.21
06/04/2011	23	0	---	---	469	1.11	0.16
06/11/2011	24	0	---	---	525	1.10	0.15
06/18/2011	25	86	1.06	0.19	563	1.08	0.12
06/25/2011	26	210	1.06	0.25	465	1.08	0.14
07/02/2011	27	166	1.07	0.14	569	1.10	0.14
07/09/2011	28	276	1.06	0.12	507	1.09	0.11
07/16/2011	29	124	1.06	0.10	509	1.06	0.09
07/23/2011	30	218	1.09	0.11	374	1.07	0.08
07/30/2011	31	328	1.07	0.07	353	1.08	0.10
08/06/2011	32	338	1.07	0.10	281	1.08	0.08
08/13/2011	33	46	1.06	0.05	369	1.09	0.09
08/20/2011	34	29	1.10	0.07	362	1.10	0.08
08/27/2011	35	0	---	---	194	1.14	0.17
09/03/2011	36	0	---	---	135	1.09	0.08
09/10/2011	37	0	---	---	157	1.07	0.09

Appendix 14. Fulton's condition factor (K) for age-1 coho salmon from the Pear Tree and Willow Creek Rotary screw trap sites, 2011.

Week Starting	Week of Year	Pear Tree Trap Site			Willow Creek Trap Site		
		n	Average K	Standard Deviation of K	n	Average K	Standard Deviation of K
01/15/2011	3	0	---	---	0	---	---
01/22/2011	4	5	0.97	0.10	0	---	---
01/29/2011	5	8	1.03	0.09	0	---	---
02/05/2011	6	6	0.97	0.09	0	---	---
02/12/2011	7	6	0.97	0.08	0	---	---
02/19/2011	8	2	1.03	0.02	0	---	---
02/26/2011	9	3	0.99	0.05	0	---	---
03/05/2011	10	6	1.06	0.04	1	1.14	---
03/12/2011	11	4	1.18	0.05	0	---	---
03/19/2011	12	10	1.07	0.08	0	---	---
03/26/2011	13	3	1.03	0.07	2	1.02	0.08
04/02/2011	14	0	---	---	4	1.10	0.11
04/09/2011	15	1	1.01	---	4	1.18	0.23
04/16/2011	16	0	---	---	5	1.17	0.24
04/23/2011	17	5	0.92	0.07	10	1.12	0.23
04/30/2011	18	7	0.98	0.02	12	1.05	0.17
05/07/2011	19	0	---	---	18	1.11	0.19
05/14/2011	20	0	---	---	22	1.06	0.07
05/21/2011	21	0	---	---	24	1.03	0.09
05/28/2011	22	0	---	---	23	1.00	0.09
06/04/2011	23	0	---	---	32	1.04	0.14
06/11/2011	24	0	---	---	26	1.07	0.15
06/18/2011	25	0	---	---	24	1.09	0.16
06/25/2011	26	0	---	---	24	1.12	0.09
07/02/2011	27	0	---	---	12	1.18	0.26
07/09/2011	28	0	---	---	7	1.17	0.09
07/16/2011	29	0	---	---	6	1.17	0.09
07/23/2011	30	0	---	---	4	1.06	0.16
07/30/2011	31	0	---	---	0	---	---
08/06/2011	32	0	---	---	0	---	---
08/13/2011	33	0	---	---	0	---	---
08/20/2011	34	0	---	---	0	---	---
08/27/2011	35	0	---	---	0	---	---
09/03/2011	36	0	---	---	0	---	---
09/10/2011	37	0	---	---	0	---	---

Appendix 15. Fulton's condition factor (K) for natural age-1+ steelhead from the Pear Tree and Willow Creek rotary screw trap sites, 2011.

Week Starting	Week of Year	Pear Tree Trap Site			Willow Creek Trap Site		
		n	Average K	Standard Deviation of K	n	Average K	Standard Deviation of K
01/22/2011	4	43	1.04	0.08	0	---	---
01/29/2011	5	21	1.04	0.12	0	---	---
02/05/2011	6	30	1.02	0.07	0	---	---
02/12/2011	7	64	1.11	0.13	0	---	---
02/19/2011	8	23	1.10	0.11	0	---	---
02/26/2011	9	64	1.11	0.13	0	---	---
03/05/2011	10	212	1.12	0.14	19	1.12	0.37
03/12/2011	11	93	1.11	0.10	3	1.14	0.15
03/19/2011	12	67	1.08	0.07	4	1.06	0.11
03/26/2011	13	65	1.11	0.09	28	0.97	0.07
04/02/2011	14	0	---	---	52	1.02	0.25
04/09/2011	15	98	1.12	0.13	195	1.05	0.13
04/16/2011	16	33	1.07	0.10	137	1.02	0.12
04/23/2011	17	21	1.07	0.15	176	1.01	0.14
04/30/2011	18	17	1.08	0.08	111	0.96	0.10
05/07/2011	19	0	---	---	72	1.03	0.17
05/14/2011	20	1	1.05	---	164	1.00	0.14
05/21/2011	21	0	---	---	178	0.98	0.12
05/28/2011	22	0	---	---	115	0.99	0.10
06/04/2011	23	0	---	---	187	1.03	0.12
06/11/2011	24	0	---	---	121	1.06	0.11
06/18/2011	25	0	---	---	106	1.07	0.12
06/25/2011	26	6	0.98	0.12	31	1.05	0.13
07/02/2011	27	0	---	---	17	1.03	0.24
07/09/2011	28	0	---	---	14	1.08	0.07
07/16/2011	29	0	---	---	39	1.10	0.16
07/23/2011	30	1	0.94	---	27	1.05	0.12
07/30/2011	31	2	1.12	0.02	25	1.14	0.11
08/06/2011	32	1	0.98	---	11	1.12	0.09
08/13/2011	33	0	---	---	17	1.09	0.06
08/20/2011	34	1	1.10	---	20	1.03	0.11
08/27/2011	35	0	---	---	25	1.11	0.15
09/03/2011	36	0	---	---	13	0.99	0.13
09/10/2011	37	0	---	---	11	1.03	0.10