

KLAMATH RIVER FISHERIES ASSESSMENT PROGRAM

JUVENILE SALMONID MONITORING ON THE MAINSTEM KLAMATH RIVER  
AT BIG BAR AND MAINSTEM TRINITY RIVER AT WILLOW CREEK  
1997-2000



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Trinity River Task Force  
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DEPARTMENT OF THE INTERIOR  
U.S. FISH AND WILDLIFE SERVICE  
AFWO  
ARCATA, CALIFORNIA

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## Abstract

Monitoring of juvenile salmonid emigration on the mainstem Klamath and Trinity rivers has been conducted by the Arcata Fish and Wildlife Office since 1988. Rotary screw traps have been utilized as monitoring devices on these rivers since 1989. This report describes monitoring conducted during 1997 through 2000. Catch data were used to calculate abundance indices for juvenile chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), and steelhead (*O. mykiss*). The age of outmigrants, length frequency distributions, development stages, migration rates, and hatchery contributions were also determined. River discharge and temperature data are also presented. Non-target species abundance and biological data are presented for sculpin (*Cottus sp.*), speckled dace (*Rhinichthys osculus*), Klamath smallscale sucker (*Catostomus rimiculus*), Pacific lamprey (*Lampetra tridentata*), American shad (*Alosa sapidissima*), green sturgeon (*Acipenser medirostris*), and threespine stickleback (*Gasterosteus aculeatus*). Catch data is also presented for less abundant species.

## Introduction

The Klamath River system is the second largest river system in California, draining an area of approximately 26,000 square kilometers (km<sup>2</sup>) in California, and 14,400 km<sup>2</sup> in Oregon. The Trinity River is the largest tributary to the Klamath River, draining approximately 7,690 km<sup>2</sup> in California. Two dams, Iron Gate Dam on the Klamath River and Lewiston Dam on the Trinity River, are the upper limits of anadromous fish migration in the Basin. Two fish hatcheries, Iron Gate Hatchery (IGH) on the Klamath River and Trinity River Hatchery (TRH), were constructed to mitigate for losses of anadromous fish habitat upstream of Iron Gate and Lewiston dams.

The Klamath and Trinity rivers once supported large runs of chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*) and steelhead trout (*O. mykiss*) which supported tribal, ocean troll and recreational fisheries. Declines in the Klamath Basin anadromous fish populations due to floods, water and land management, and fish harvest management (Klamath River Basin TF, 1991), led Congress to enact the Trinity River Basin Fish and Wildlife Restoration Act (PL 98-541) in 1984 and the Klamath River Basin Conservation Area Fishery Restoration Program (PL 99-552) in 1986. Both of these Acts directed the Secretary of the Interior to take actions necessary to restore the fishery resources of the Klamath Basin, primarily by addressing restoration of freshwater habitat.

Past fishery investigations in the Basin have focused primarily on adult returns, due to harvest allocation and escapement objectives. Data on adult returns is not adequate for monitoring restoration efforts in the basin because adult return data is affected by ocean mortality (both juveniles entering the ocean, and adult mortality), harvest at sea, and a number of other factors. The monitoring of emigrating juvenile salmonid populations in conjunction with habitat availability data and suitability studies may permit for the evaluation of restoration efforts because these studies focus on the juvenile phase of life which is most affected by instream conditions.

Intermittent juvenile salmonid investigations have been conducted in the Klamath River Basin by the Coastal California Fish and Wildlife Office (CCFWO) since 1981 (USFWS 1982, 1983). In 1988, a substantial monitoring effort was undertaken in both the mainstem Klamath and Trinity rivers utilizing frame nets, and in 1989, the utilization of rotary screw traps. The purpose of this project was to monitor the abundance, timing, hatchery contribution, and biological parameters of emigrating anadromous salmonids in the mainstem Klamath and Trinity Rivers. It is intended that this information will provide basic biological information that can be used by freshwater habitat managers and potentially fishery harvest managers.

## Methods

### Trapping Sites

During the spring months (Julian Weeks 1-39) of 1997 through 2000, Klamath River trapping was conducted at the Big Bar river access, located at river kilometer (rkm) 80 (16 rkms downstream of Orleans CA, and 10 rkm above the Trinity River confluence). The Big Bar trapping site was originally chosen in 1988. The site was selected because it allowed sampling of fish outmigrating from virtually the entire Klamath River Basin upstream of the Trinity River confluence, and the year-to-year channel configuration appeared to be consistent. The Big Bar site also allowed ready access by boat or vehicle and was not visible from Highway 96. During the spring and early fall (Julian Weeks 40-52) months of 1996 through 2000, Trinity River trapping was conducted at the Riverdale Campground (rkm 34) near Willow Creek (Figure 1). This location has been used since 1991 because the channel configuration is fairly consistent, it has private access, and the trap is not visible from Highway 96.

### Trap Design and Operation

Rotary screw traps with 2.44 m diameter cones were used (Figure 2). Traps were anchored with 0.64 cm diameter aircraft cable to large trees or a series of steel fence stakes upstream. One or two 0.1 x 0.15 x 6.0 m (4"x6"x10') beams were used to push the trap out from the bank and to compensate for changes in river stage and velocity. Cone revolutions were used to determine where and when the trap could be operated without inducing unnecessary risk to the trap. River conditions ultimately dictated when traps were deployed. An effort was made to place rotary traps in the river prior to the emigration of young-of-year (YOY) or age 0 chinook so that emigration patterns and the relative abundance of natural and hatchery chinook within all life history stages could be evaluated. The traps were fished on the edge of the thalweg during high river discharge, and incrementally moved back into the thalweg as river discharge decreased. When deployed, the bottom of the cone was generally <1 m from the stream bottom. A sampling day was defined as the time period between the setting of the trap one day, and removal of captured fish approximately 24 hours later. This period encompassed all night hours, when the majority of juvenile salmonids emigrate. Trap checks usually occurred during late morning or early afternoon. During peak emigration periods, fish were removed from traps several times during the sampling period (the frequency dictated by water temperatures, fish numbers, and mortality rates).

Daily trap data were summarized by Julian week (JW; Table 1), with the first day of JW 1 commencing on the first day of the year. All JWs are seven days in length except the last JW of the year and the 9<sup>th</sup> JW during leap years, which are both eight days in length.

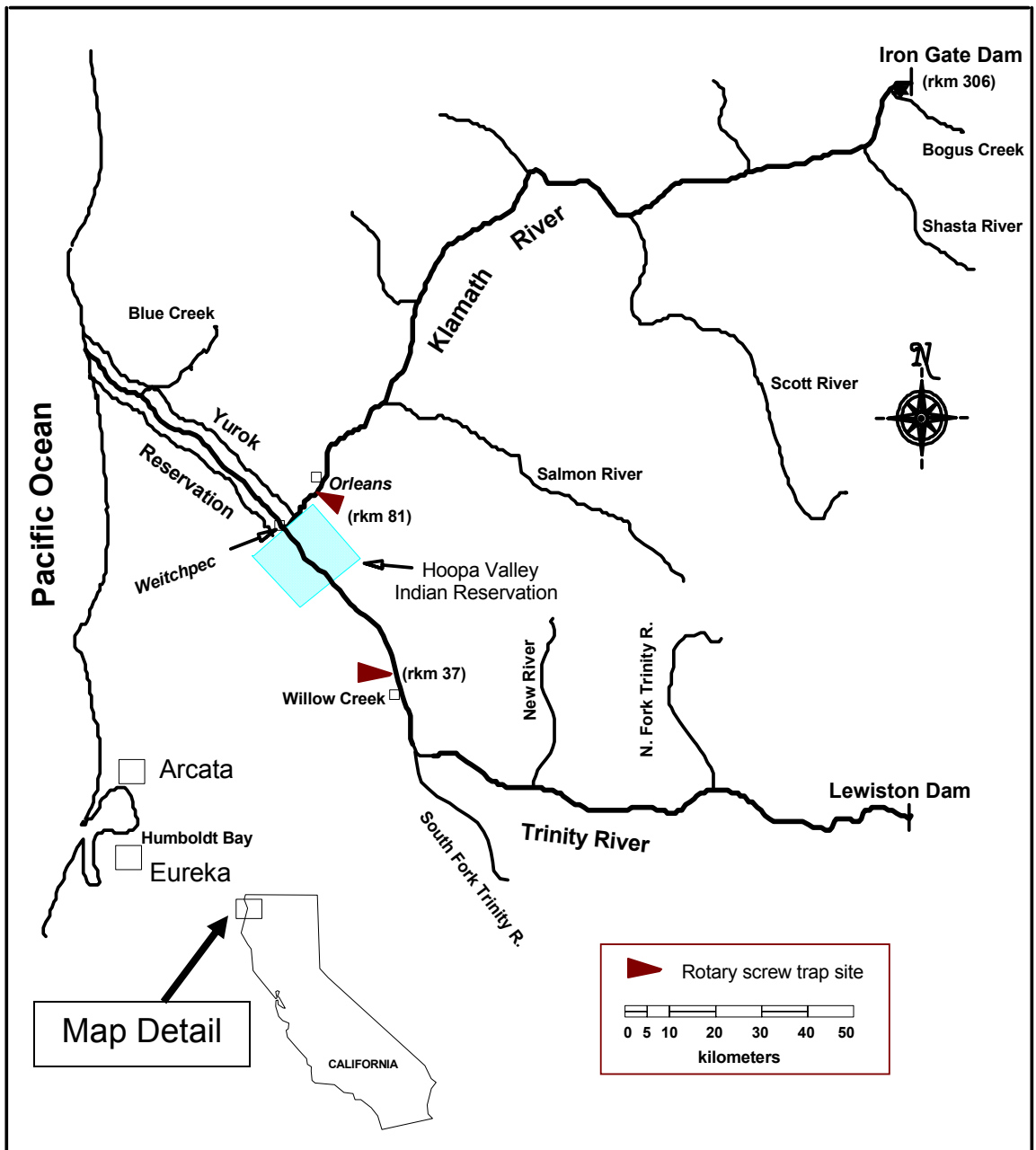


Figure 1. Location of rotary screw trap sites on the Klamath and Trinity rivers in Northwestern CA.

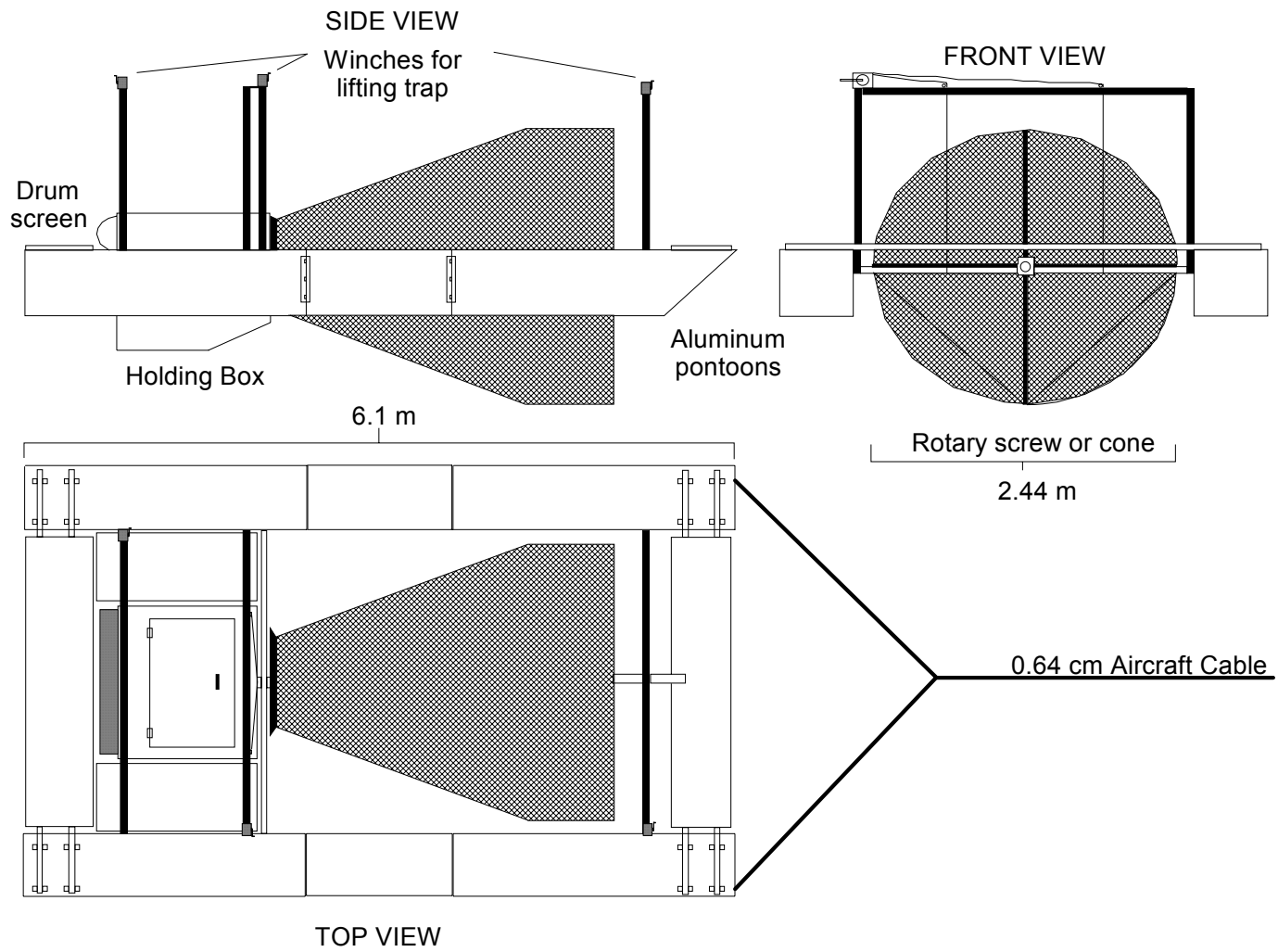


Figure 2. Rotary screw trap design depicting key components and dimensions.

Table 1. Julian week and corresponding first date.

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

#### Water Flow and Temperature Measurements

Normal cone operating depth was 1.07 m. Daily velocity measurements were taken directly in front of the cone as follows: the submerged portion of the cone was divided into three cells (right, center, left); within each cell, velocity was measured at 0.2 and 0.8 of the cone operating depth for 60 seconds using a General Oceanics digital flowmeter (Model 2030) (General Oceanics, Inc. 1983). Mean water velocity (m/s) was calculated for each cell. Each cell area (m<sup>2</sup>) was calculated, then multiplied by its corresponding mean water velocity (m/s). The values for each cell were summed, yielding an estimate of volume of river discharge sampled (Q<sub>s</sub>) in cubic meters per second (m<sup>3</sup>/s). Discharge data from U.S. Geological Survey Water Resource gauge stations at Orleans (#11-523000 at rkm 95.2) on the Klamath River and at Hoopa (#11-530000 at rkm 19.9) on the Trinity River were used as surrogate measures of mean daily river discharge (Q) at the trap sites. It was assumed that there was no significant difference between river discharge at these gauging stations and the respective trap locations.

Water temperature data were collected using an Onset Stow Away Tidbit temperature logger attached to the outside bottom edge of each traps live box. Temperature was recorded every two hours for the entire sampling season. Mean daily river temperatures were calculated by averaging over 24-hour periods.

## Biological Sampling Procedures

All fish captured were anesthetized with tricaine methanesulfonate (MS-222) prior to processing. Up to 30 individuals of each species and developmental stage (parr, pre-smolt, smolt, etc.) were randomly subsampled (biosampled) from the daily catch. Biosampled salmonids were measured to the nearest mm fork length (FL), weighed by volumetric displacement, and examined for developmental stage, fin clips, and physical irregularities. All captured salmonids that were not biosampled were tallied by species, development stage and/or age and examined for fin clips.

Fish other than chinook, coho, or steelhead were considered non-target species. Non-target fishes captured were identified to species (or genus in some cases), enumerated, and up to 30 specimens were measured to FL. Total length (TL) was measured on species without a forked caudal fin. All anesthetized fish not retained were allowed to resuscitate in buckets of ambient river water before being released downstream of the trap. NovAqua® water conditioner was added to recovery buckets to help protect fish during handling, minimize infection, reduce stress and aid in recovery. Adult salmonids were not anesthetized. Fork lengths of adult salmonids were approximated before release. Any salmonid mortality in the live box was checked for a fin clip and, if included in the subsample, measured (FL). If a salmonid escaped during netting or handling before it could be identified to species or checked for a hatchery mark (i.e. fin or maxillary clip), it was counted in the sample tally as an "unknown". Based on the probability of occurrence, unknown fish were redistributed into the most likely marked or unmarked species categories.

When present, daily subsamples of marked hatchery chinook were collected. A missing adipose fin (Ad-clip) was the external marker depicting fish with a coded wire tag (CWT) embedded in the snout. A maximum of five hatchery chinook were collected daily. Ad-clipped fish were sacrificed for subsequent CWT retrieval. Collected fish were stored in a freezer until time of dissection. Occasionally, Ad-clipped fish were also collected for disease sampling, after which the CWT's were removed.

Juvenile chinook were classified as Age 0 (young of year) or Age 1, based on size and date of capture. Coho were classified as either Age 0 or Age 1; the latter of which were much larger in size, silvery, and lacked distinct parr marks. Steelhead were also classified by age classes based on size and scale analysis. Scale samples were collected from a subsample of chinook, coho, and steelhead for age analysis. Fish were assigned an age based on the number of annuli (overwinter period) present. A fish with one annuli was classified as a Age 1, two annuli designated as Age 2, etc.

Age 0 chinook and coho captured in 1997 were produced from adult spawners in 1996 and were therefore considered 1996 brood year (BY), while Age 1 chinook and coho were BY 1995 fish. Age 0 steelhead captured in 1997 were considered BY 1997, while Age 1 and Age 2 steelhead were considered BY 1996 and BY 1995 respectively.



## Hatchery and Natural Stocks Estimate

Captured chinook and coho were later categorized as being either of hatchery or natural origin, based on hatchery marks and hatchery release data provided by TRH and IGH. The California Department of Fish and Game (CDFG) coded wire tagged and Ad-clipped natural chinook from the upper Trinity River as part of their natural stocks assessment program. Natural fish are defined as the progeny of river or tributary spawning adults regardless of parental genetics. Hatchery release strategies for chinook consist of fingerling releases in the spring and "yearling" releases in the fall. These two distinct release periods prompted the division of the trapping season into spring and fall monitoring periods. The spring monitoring period was designated as JW 1 through 39 and the fall period 40 through 52. Hatchery coho and steelhead were released as Age 1 fish in the spring.

### Chinook

All Ad-clipped fish collected were passed through a magnetic field detector manufactured by Northwest Marine Technology to determine the presence or absence of a CWT. The snout of each fish that registered positive for a tag was dissected until the CWT was recovered. Each fish registering negative for a tag had its head dissolved in a solution of potassium hydroxide. A magnet was then stirred through the resultant slurry. If the tag was not recovered, the fish was considered an Ad-clipped fish that had shed its tag (No-Tag). Recovered tags were decoded using a dissection microscope. CWT recoveries were summed by specific CWT code for each JW.

The number of CWT fish captured for each code was estimated by multiplying the number of CWT's recovered by an expansion factor (E) which accounted for subsampling of Ad-clipped fish, CWT's that were lost during dissection, and unreadable tags. The expansion factor (E) was calculated using the formula:

$$E = (C/MS)(Ad/H)(T/TR)$$

Where,

C =	Total # of chinook captured,
MS=	Number of fish examined for Ad-clips,
Ad=	Number of Ad-clipped fish observed,
H =	Number of Ad-clipped fish collected,
T =	Number of collected Ad-clipped fish containing a CWT,
TR=	Total number of CWT's recovered and decoded after processing.

To account for unmarked hatchery fish over a JW, the expanded estimates for each CWT code were multiplied by a production multiplier (PM) specific to each CWT code. Each PM was calculated from hatchery release data (Pacific States Marine Fisheries Commission, 1997,1998,1999, 2000), using the following formula:

$$PM = \frac{\# \text{ Tagged} + \# \text{ Poor Tagged} + \# \text{ Unmarked}}{\# \text{ Tagged}}$$

Where:

# Tagged =	The actual number of Ad-clipped fish released with a CWT,
# Poor Tagged =	The number of Ad-clipped fish that were tagged and shed the tag (No-Tags),
# Unmarked =	The number of unmarked fish in a release group.

The estimated contribution of hatchery fish attributable to a specific CWT code for a given JW, was calculated by the following formula:

$$\# \text{Hatchery}_{\text{code } i} = (\# \text{recovered}_{\text{code } i}) * (E_{\text{code } i}) * (PM_{\text{code } i})$$

The total weekly estimated hatchery contribution to the catch was the sum of all estimated hatchery fish attributable to CWT codes. The weekly contribution of naturally produced chinook to the catch was estimated by subtracting the estimated hatchery contribution from the total weekly catch. Occasionally, the daily estimated hatchery contribution exceeded the total daily catch. In such instances the estimated hatchery contribution was limited to the actual daily catch.

Towards the end of each emigration period, due to relatively few fish passing by the trap, it is possible that we captured juveniles of hatchery origin not represented by Ad-clipped fish. If no hatchery fish captured within a given time period were marked, the hatchery contribution for that period could not be differentiated from the natural component. Thus, all fish captured during that period were considered of natural origin. The hatchery and natural stock estimates assume no differential mortality between tagged and untagged fish of the same release group, equal vulnerability to capture and accurate estimates of the numbers of marked, unmarked and poor tagged fish released from the hatchery. The estimate does not account for Ad-clipped or non-Ad-clipped hatchery fish removed from the river upstream.

#### Coho

All hatchery coho released in 1997-2000, were marked with a maxillary clip (TRH coho received a right maxillary clip and IGH coho received a left maxillary clip). The weekly contribution of naturally produced coho to the catch was estimated by subtracting the actual hatchery contribution (marked fish) from the total weekly catch.

#### Steelhead

Hatchery steelhead released in 1997-2000 were marked with an adipose fin clip. Analysis of scale samples taken over the sampling season provided length to age relationships.

#### Abundance Index

Catch effort data were recorded and evaluated for each sample day. Trends in emigration were analyzed on a JW basis using daily abundance indices, adjusting for days not sampled (occasionally woody debris or an accumulation of aquatic vegetation would cause the cone to cease rotating). Daily abundance indices ( $\text{Index}_d$ ) for each species and development stage were calculated by the following equation:

$$\text{Index}_d = \text{Catch}_d / (Q_s / Q)$$

Where:             $\text{Catch}_d$  = daily catch of a species  
                        $Q_s$  = volume of water sampled (cfs)  
                        $Q$  = mean daily river discharge (cfs)

Weekly abundance indices were calculated for each JW using the following equation:

$$\text{Index}_{\text{JW}_i} = \sum \text{Index}_d (\# \text{ days in JW}_i / \# \text{ days sampled during JW}_i)$$

Abundance indices were also calculated for the more abundant non-target species in the same manner as for salmonids.

The usefulness of this index as an estimator of abundance is contingent upon the assumptions that catch rates are directly proportional to the percentage of river flow sampled and that individuals from a given species are equally susceptible to capture. The abundance index is not intended to represent a population estimate it is used to compare relative abundance between weeks during the trapping season, between trapping seasons, and between years.

### Migration Rate

Initial migration rates for hatchery chinook and coho were estimated by dividing the distance (rkm) traveled by the number of days elapsed between the initial release date and initial capture date for specific CWT codes or marked fish. Mean migration rates were calculated for each CWT group throughout the trapping period. Because IGH released chinook over a 3-day period (June 3-5) during the spring of 1997, the median date of June 4 was used as the initial release date when calculating mean migration rates. Due to a prolonged release period (March 18 to March 31), mean migration rates were not calculated for TRH chinook. Naturally produced chinook tagged by CDFG on the Trinity River were tagged in early spring of 1997, before initiation of migration, so migration rates for these CWT groups were not calculated.

Daily migration rates were weighted by the proportion of river flow sampled to reflect the untrapped fish passing through the sampling area. A mean migration rate per CWT code or marked fish was calculated by the following formula with the first 10% and last 10% of each group excluded:

$$Rate_{mean} = \frac{(\# \frac{rkm}{d} \frac{Q}{Q_s})}{(\# \frac{Q}{Q_s})}$$

Where # = Daily expanded CWT<sub>i</sub> code or fin clip counts,  
 rkm/d= distance traveled divided by number of days taken to reach trap after initial release,  
 Q = mean daily volume of river discharge ,  
 Q<sub>s</sub>= volume of river discharge sampled.

The 10 through 90 percent capture dates were used to calculate the migration rate of the majority of each specific CWT or mark group. When less than ten tags of any specific release group were recovered all tags were used. Ad-clipped chinook not collected (i.e.; released at time of capture) were included in migration rate calculations using tag allocation procedures previously described in the hatchery and natural stocks estimation section of this report (page 8).

## Results and Discussion

### Chinook monitoring on the mainstem Klamath River at Big Bar

Juvenile salmonid monitoring on the Klamath River at Big Bar occurred for 126, 97, 115 and 87 days respectively in 1997, 1998, 1999 and 2000, coinciding with trap deployment in March or April and ending in July or August. End dates are in part due to the water-year type, timing and duration of sustained high water temperatures, catch levels and the accumulation rate of algal drift. The Big Bar trap (BBT) effectively fished 82, 87, 91 and 89 percent of the total days possible (start date to end date) respectively, in 1997, 1998, 1999 and 2000 (Table 2).

Table 2. Period and duration of Spring monitoring, trapping rate and date of peak daily average water temperature at the BBT, 1997-2000.

Year	Start-end dates	Days Trapped	Days possible	Trapping rate	Peak daily average water temperature °C	Date occurred
1997	Mar 28-Aug 20	126	154	82%	25.5	Aug 8
1998	Apr 30-Aug 15	97	112	87%	24.3	Jul 27
1999	Apr 11-Aug 10	118	126	94%	23.5	Jul 27
2000	Apr 06-July 19	93	98	94%	23.3	Jun 29

Annually, Iron Gate Hatchery (IGH) released between 4.7 and 5.6 million chinook fingerlings in June. Releases include AD-clipped CWT groups representing between 3.6 and 4.3 percent of a given brood-years fingerling release total. There are 225 river kilometers (rkm) between IGH and the BBT. The time between release and first capture of an Ad-clipped fingerling at the BBT ranged from 4 days in 2000 to 16 days in 1999. The 4 day travel time in 2000 represents an initial emigration rate of 56.3 rkm/day. The mean emigration rate is more representational of the total release rate. Mean emigration rates for IGH fingerlings and ranged between 7.4 and 11.8 rkm/day (Table 3).

Table 3. Iron Gate Hatchery fall-run fingerling releases and recoveries at the BBT, 1997-2000.

IGH Age 0 Fall Chinook Releases				Migration rates				
Year	Number Released	Percentage (AD-clipped)	Release dates	Date first AD-clip Captured	Days After Release	Initial Rate (rkm/day)	Mean Rate (rkm/day)	Ad-clips Captured (n)
1997	5,600,000	3.7%	6/03-6/05	6/18/97	15	15.0	7.42	944
1998	5,100,000	4.1%	6/08-6/11	6/17/98	9	25.0	11.82	594
1999	4,700,000	4.3%	6/21-6/22	7/07/99	16	14.0	10.00	450
2000	5,028,070	3.6%	6/09-6/10	6/13/00	4	56.3	8.12	205

### Chinook Catch Totals

For spring monitoring 1997 through 2000, the number of Age 0 chinook captured at the BBT ranged from 11,153 to 27,067 fish. Catch-per-unit effort totals ranged from 120 in 2000, to 279 in 1998. The overall chinook Age 0 catch in 1998 was the largest since initiating downstream migrant trapping at Big Bar in 1988. Hatchery percentage in trap catches for 1997-2000, ranged from 44% in 2000 to 83% in 1997 (Table 4).

Table 4. BBT hatchery and natural Age 0 chinook catch totals, catch-per-unit effort (CPUE), and hatchery percentages, Spring monitoring, 1997-2000.

Spring Monitoring	Days Fished	Age 0 Chinook				
		Hatchery	Natural	Total	CPUE	% Hatchery
1997	126	15,700	3,108	18,808	149	83%
1998	97	14,359	12,708	27,067	279	53%
1999	118	10,935	7,877	18,812	159	58%
2000	93	4,962	6,191	11,153	120	44%
97-00 Totals	434	45,956	29,884	75,840	707	61%
97-00 Avg	109	11,489	7,471	18,960	177	

As in past years (USFWS, 1991, 1992a, 1992b, 1994), a few Age 1 “yearling” chinook are captured each spring. Ad-clipped yearlings are released from Iron Gate Hatchery each October. A total of 28 non-Ad-clipped chinook and 3 Ad-clipped yearlings were captured in the four spring trapping periods.

#### Chinook Catches and Fork Lengths

**Spring 1997:** Fork lengths from 1,691 chinook (9% of the total catch) were measured. Mean fork lengths of Age 1 chinook range from 116mm to 140mm (n=6) and were captured in 3 consecutive weeks (JW 19-21) in May. Initial catches of Age 0 chinook occurred in JW 15 (0=39, sd=1.0, n=3) (Figure 3). Mean fork lengths increased steadily through JW 24 (0=104, sd=12.4, n=199). In JW 25 hatchery fish were first observed and comprised 59% of the catch that week. CPUE increased significantly from 244 fish in JW 25 to a peak of 1,033 fish in JW 27 before dropping off significantly. Upon the arrival of hatchery fish, mean weekly fork lengths decreased from a mean of 104 mm (sd=12.37, n=199) to a mean of 88 mm (sd=7.5, n=246). Trapping became intermittent after JW 32. The mean fork length at that time was 102mm (sd=12.6, n=33) (Appendix 25).

**Spring 1998:** Fork lengths from 1,650 chinook ( 6.1% of the total catch) were measured. Mean fork lengths of Age 1 chinook range from 128mm to 193mm (n=10) and were captured from the beginning of trapping in April through mid-June (Figure 3). Initial catches of Age 0 chinook occurred in JW 18 (0=73, sd=30.4, n=5) (Figure 3). Mean fork lengths increased steadily through JW 23 (0=101, sd=9.7, n=212). In JW 24 hatchery fish were first observed and comprised 2% of the catch that week. CPUE increased significantly from 145 fish in JW 24 to a peak of 900 in JW 25. The CPUE remained high, greater than 200 fish, before dropping off significantly during JW 30. Upon arrival of hatchery fish, mean weekly fork lengths decreased from a mean of 101mm (sd=9.7, n=212) to a mean of 91mm (, sd=7.0, n=210). Trapping concluded on JW 31, with a mean weekly fork length of 93mm (sd=9.1, n=125) (Appendix 27).

**Spring 1999:** Fork lengths from 1,577 chinook ( 8.4% of the total catch) were measured during spring 1999 monitoring. Age 1 chinook were captured in JW 17 (0=152, n=1) and again in JW 22 (0=134, sd=8.5, n=2) (Figure 3). Initial catches of Age 0 chinook occurred in JW 15 (0=38, sd=2.1, n=2) (Figure 3). Mean fork lengths increased steadily through JW 23 (0=61, sd=14.2, n=12). In JW 27 hatchery fish were first observed and comprised 19% of the catch that week. CPUE steadily increased from 2 fish in JW 24 to a peak of 1,729 fish in JW 28 before dropping of significantly. Upon the arrival of hatchery fish, mean weekly fork lengths decreased from a mean of 97mm (sd=9.0, n=200) to a mean of 92mm (sd=6.7, n=180). Trapping concluded on JW 32, with a mean weekly fork length of 94mm (sd=11.2, n=49) (Appendix 29).

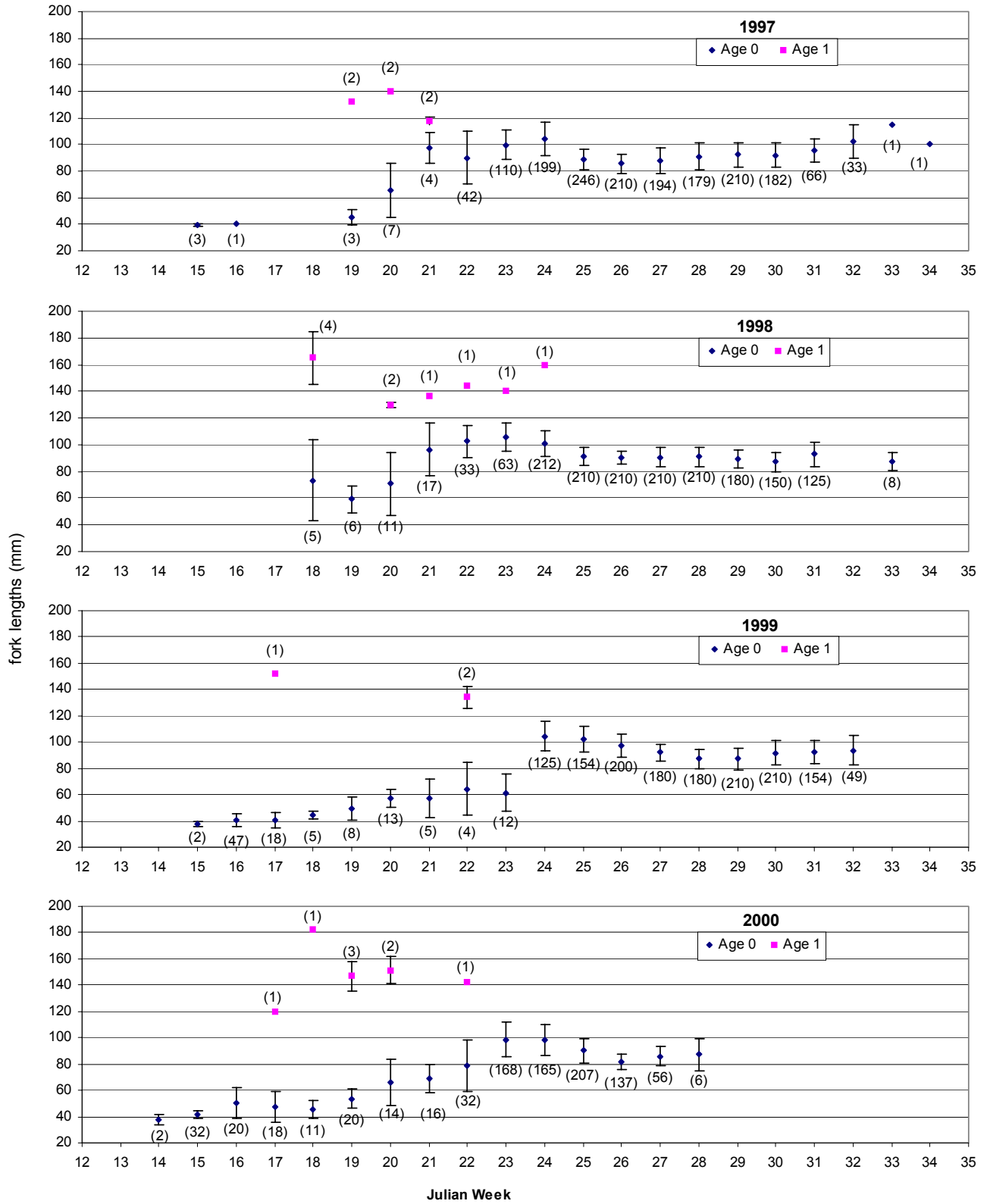


Figure 3. Chinook Age 0 and Age 1 mean fork lengths (mm) by Julian week on the BBT, 1997-2000. (+/- 1 standard error, sample size)

**Spring 2000:** Fork lengths from 904 chinook (8.2% of the total catch) were measured during spring 2000 monitoring. Mean fork lengths of Age 1 chinook, captured between JW 17 and JW 22, ranged from 120-182mm (n=8) (Figure 3). Initial catches of Age 0 chinook occurred in JW 14 (0=38, sd=3.5, n=2). Mean fork lengths increased steadily through JW 21 (0=98, sd=11.3, n=165) (Figure 3). In JW 22 hatchery fish were first observed and comprised 17% of the catch that week. CPUE increased from 37 fish in JW 22 to a peak of 762 fish in JW 26 before dropping off significantly. Upon arrival of hatchery fish, mean weekly fork lengths increased from a mean of 69mm (sd=10.8, n=16) to a mean of 79mm (sd=19.5, n=32). Trapping became intermittent after JW 27. The mean fork length at that time was 87mm (sd=12.5, n=6) (Appendix 31).

#### Chinook Abundance Indexes and Hatchery Contributions by Year

**Spring 1997:** Monitoring at the BBT began in late March, with very few natural Age 0 chinook were captured before the beginning of June. Catches increased weekly throughout the month of June, with the peak weekly catch occurring in the last week of June (JW 26). Hatchery Age 0 chinook contributions began during JW 25 and peaked in JW 27 (Figure 4). Spring monitoring at the BBT ended in late August due to low trap catches and large algae loads. The 1997 BBT abundance index total was 546,736.

**Spring 1998:** Monitoring at the BBT began in late April, with very few natural Age 0 chinook being captured before the beginning of June. Catches increased weekly throughout the month of June, with the peak weekly catch occurring in the second week of July (JW 28). Hatchery Age 0 chinook contributions began during JW 24 and peaked in JW 25 (Figure 4). Spring monitoring at the BBT ended in mid August due to low trap catches and large algae loads. The 1998 BBT abundance index total was 1,914,406.

**Spring 1999:** Monitoring at the BBT began in early April, with very few natural Age 0 chinook being captured before the middle of June. Catches increased weekly throughout the month of June, with the peak weekly catch occurring in the second week of July (JW 28). Hatchery Age 0 chinook contributions began during JW 27 and peaked in JW 28 (Figure 4). Spring monitoring at the BBT ended in early August due to low trap catches and large algae loads. The 1999 BBT abundance index total was 798,674.

**Spring 2000:** Monitoring at the BBT began in early April, with few natural Age 0 chinook being captured before early June. Catches increased weekly throughout the month of June, with the peak weekly catch occurring in the third week in June (JW 25). Hatchery Age 0 chinook contributions began during JW 22 and peaked in JW 26 (Figure 4). Spring monitoring at the BBT ended in early Mid July due to low trap catches and large algae loads. The 2000 BBT abundance index total was 511,798.

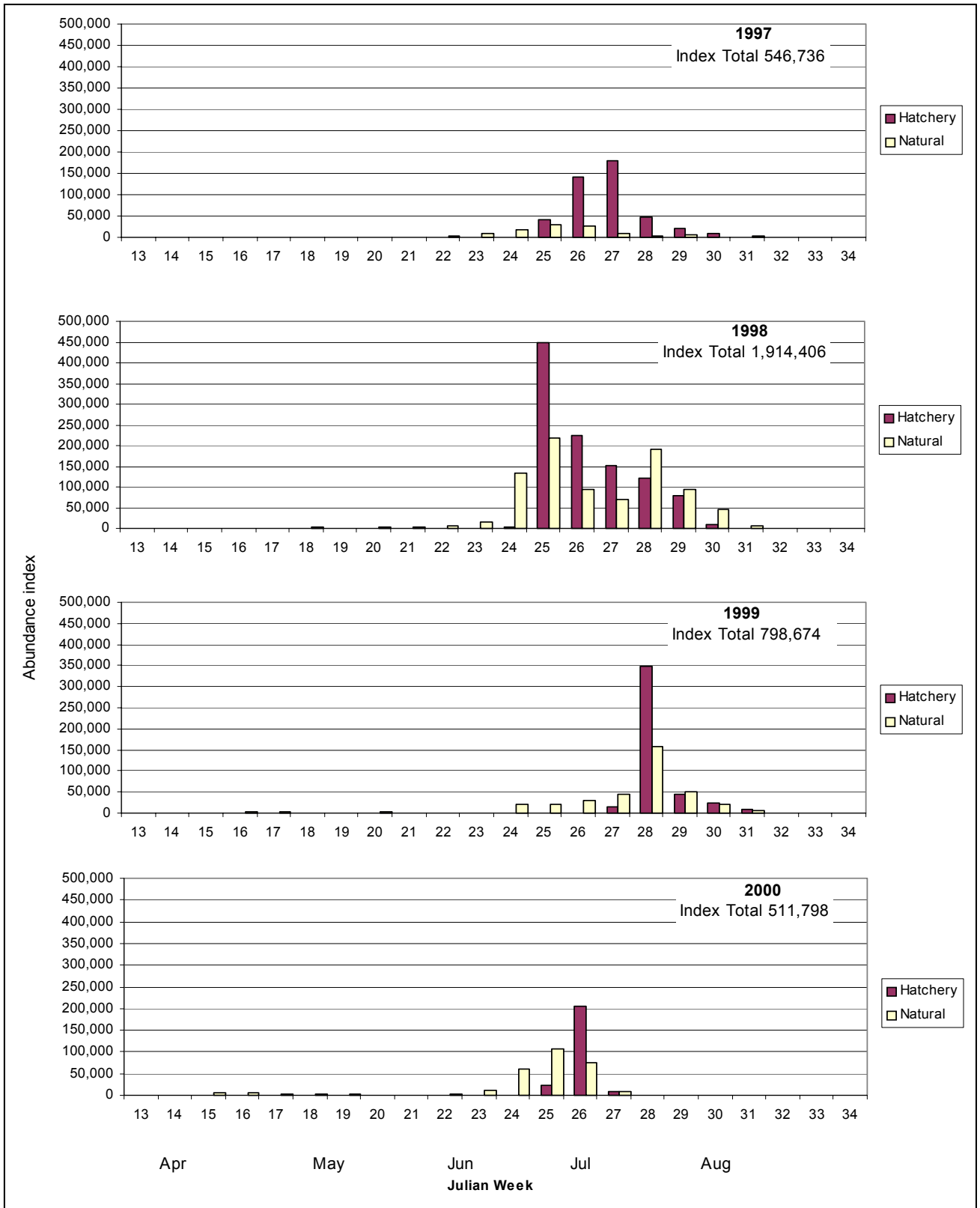


Figure 4. Weekly abundance index totals for natural and hatchery chinook at the BBT, 1997-2000



## Emigration Timing

A consistent feature in all four spring monitoring periods 1997-2000, is that few natural Age 0 chinook were captured prior to the beginning of June (JW 23). Natural chinook emigration occurred earlier in 1997 and 2000 compared to 1998 and 1999, and corresponds to increased water temperatures occurring earlier in the spring (Figure 5). Water temperatures reached 15°C in early May 1997, mid-May in 2000, late May in 1998 and early June in 1999 (Figure 6). Sustained high water temperatures occurred in both 1997 and 2000, leading to stress related fish kills. In 2000, dead fish were observed in late June and early July. CDFG estimated fish deaths in the tens of thousands as a conservative estimate, and that the true number could be as many as 100,000 to 300,000 fish (chinook, Age 0, and Age 0, Age 1 and Age 2 steelhead) that died in the mainstem Klamath River (CDFG 2000). A similar fish kill occurred in 1997, but later in the summer (August) and included a wider range of non-salmonid species. Both the 1997 and 2000 fish kills occurred following a period of sustained high air temperatures with resultant increases in mainstem water temperatures. Two pathogens endemic to the Klamath Basin: *Ceratomyxa shasta* (ceratomyxosis) and *Flavobacterium columnare* (columnaris) are stress triggered infections and likely the direct cause of death, although low dissolved oxygen levels are also suspected in 1997.

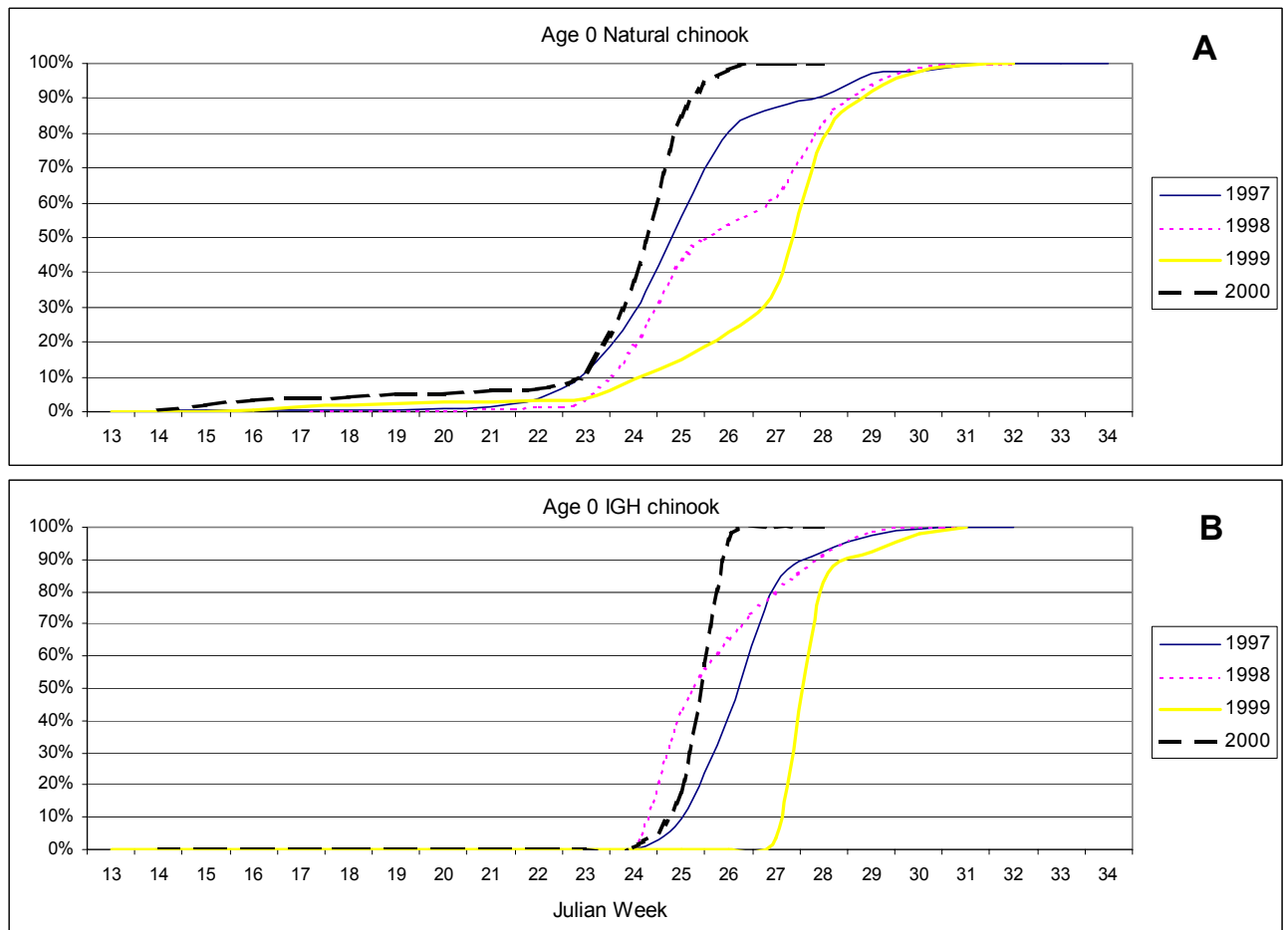


Figure 5. Emigration timing of natural (A) and hatchery Chinook (B) captured at the BBT, Spring 1997-2000.

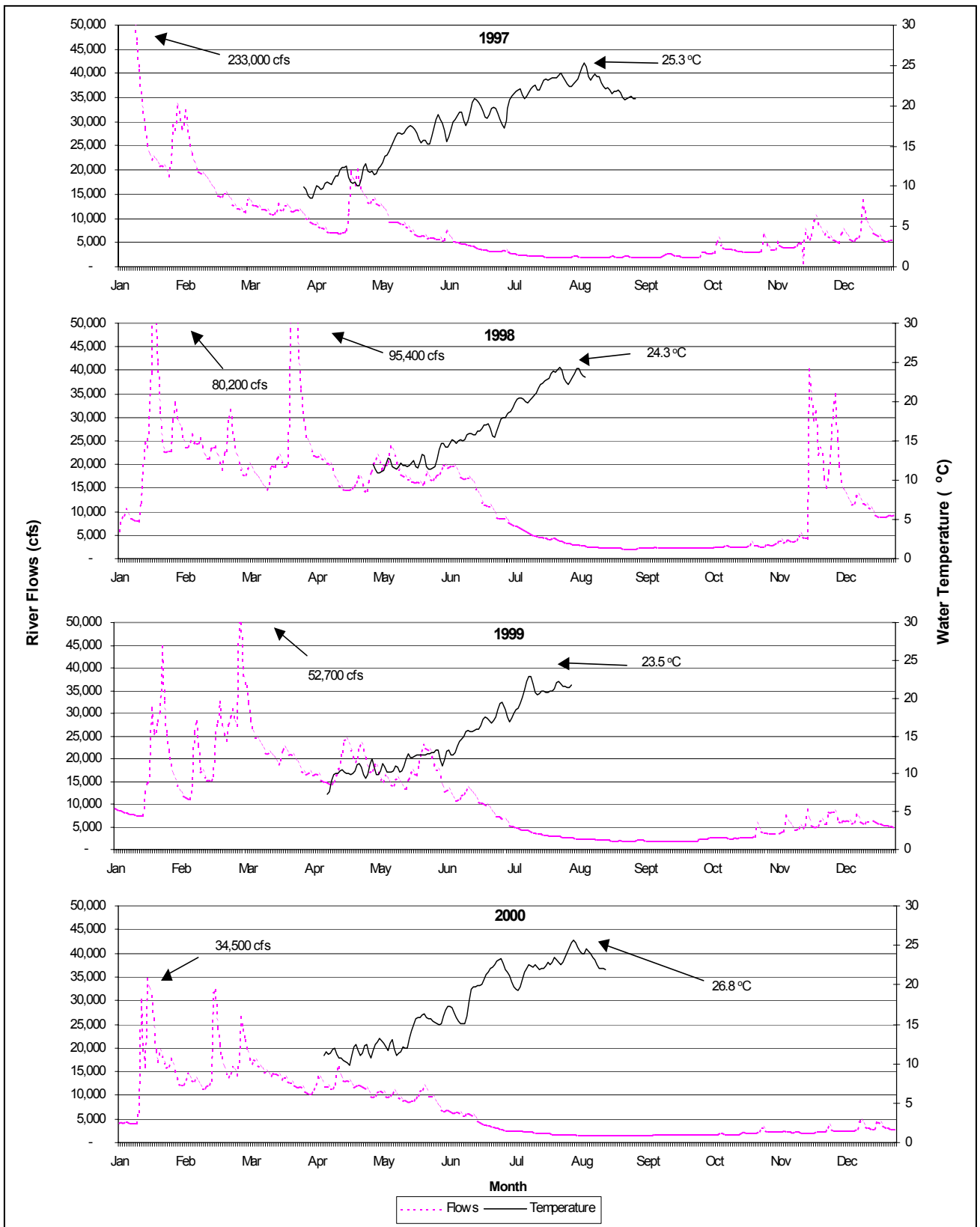


Figure 6. Mean daily flow (cfs) at Orleans and mean daily river temperature (°C) at the BBT, 1997-2000.

Chinook Monitoring on the Mainstem Trinity River at Willow Creek:

Juvenile salmonid monitoring on the Trinity River at Willow Creek occurred for 231, 206, 189 and 143 days respectively in 1997, 1998, 1999 and 2000. Trapping began prior to significant natural fall-run chinook outmigration in late March or April and continued through late September or October (Table 5). Because the Trinity River Hatchery (TRH) conducts both spring (fingerling) and fall (yearling) releases, trapping at Willow Creek trap (WCT) was divided into spring and fall monitoring periods. Trapping was concluded when funding was exhausted or when fall storms made trapping difficult. Late summer algae blooms were not as problematic on the Trinity River as on the Klamath River, therefore trapping operations could continue on the Trinity throughout the summer and into the fall.

The Willow Creek Trap effectively fished 90, 94, 96 and 99 percent respectively, of the total possible trap days in 1997, 1998, 1999 and 2000 monitoring period (Table 5). Consistent daily data collection was disrupted (flawed set) intermittently by large woody debris and mechanical difficulties.

Table 5. Period and duration of Spring and Fall monitoring, trapping rate and date of peak daily average water temperature at the WCT, 1997-2000.

Year	Start-end dates	Days Trapped	Days possible	Trapping rate	Peak daily average water temperature oC	Date occurred
1997	March 26 -Dec 07	231	257	90%	23.9	Aug 8
1998	April 16 - Nov 20	206	220	94%	24.6	Aug 14
1999	March 18 - August 30	189	197	96%	22.3	July 13
2000	May 16 - Oct 06	143	144	99%	23.9	Aug 2

Winter and spring storms produced high flow events ranging from 31,000 cfs to 101,000 cfs during the 1997-2000 trapping period. In 1997 a peak flow of 101,000cfs was recorded at Hoopa on January 1<sup>st</sup>. Intermittent storms in 1998, produced two high flow events, 57,000 cfs on January 17<sup>th</sup> and 66,800 cfs on March 23<sup>rd</sup>. In 1999 a peak flow of 31,000 cfs was recorded at Hoopa on March 1<sup>st</sup>. In 2000 a peak flow of 37,000 cfs was recorded on February 15<sup>th</sup>.

Trinity River Hatchery (TRH) released 3.1, 3.7, 3.2 and 2.9 million chinook fingerlings in spring of 1997, 1998, 1999 and 2000 respectively (Table 6). Releases included adipose fin clipped (AD-clip) CWT groups, representing 8.9 to 21.1 percent of brood-year fingerling releases. Fingerlings were released at Hardhat and Sky Ranch which are 134 and 148 river kilometers ,respectfully, upstream of the WCT. Ad-clipped TRH releases were first captured at the WCT 3 to 129 days after release, representing mean outmigration rates from the upper Trinity River of 10.8 to 1.4 rkm's per day.

TRH released 1.3, 1.3, 1.4, and 1.2 million chinook fingerlings in fall of 1997, 1998, 1999, and 2000 respectively (Table 6). Releases included AD-clip CWT groups, representing 12.0 to 35.1 percent of brood-year fingerlings releases. Fingerlings were released at Hardhat and Sky Ranch which are 134 and 148 river kilometers, respectfully, upstream of the WCT. Ad-clipped TRH releases were first captured at the WCT 3 to 4 days after release, representing mean outmigration rates from the upper Trinity River of 6.9 to 18.2 rkm's per day.

Table 6. Trinity River Hatchery fingerling releases and recoveries at the WCT, 1997-2000.

Trinity River Hatchery Age 0 Fall chinook Releases					Migration Rates				
Year	Race	Number Released	Percentage (AD-clipped)	Release dates	Date First Ad-clip Captured	Days After Release	Initial Rate (rkm)/day	Mean Rate (rkm)/day	Ad-clips captured (n)
1997	Spring	1,036,538	21.1%	6/2-6/6	6/13/1997	11	13.09	5	1,818
	Fall	2,101,524	10.4%	6/5-6/12	6/14/1997	9	16	2.6	1,174
	Spring	414,579	26.6%	10/1-10/7	10/4/1997	3	48	18.2	626
	Fall	918,078	12.0%	10/1-10/7	10/4/1997	3	48	10.8	1,170
1998	Spring	2,398,295	12.9%	6/15	6/20/1998	5	29	3.99	293
	Fall	1,309,523	8.9%	6/15	7/10/1998	25	6	0.29	191
	Spring	420,663	35.1%	10/1-10/7	10/4/1998	3	48	9.5	47
	Fall	907,600	34.5%	10/1-10/7	10/5/1998	4	36	6.9	135
1999	Spring	1,161,439	15.2%	6/1-6/7	6/23/1999	7	6.5	2.4	685
	Fall	2,057,036	9.1%	6/1-6/7	6/5/1999	4	36	2.9	614
	Spring	401,727	34.3%	10/4-10/13	No data collected				
	Fall	970,935	34.5%	10/4-10/13	No data collected				
	Fall	49,439	33.7%	10/4-10/13	No data collected				
	Spring	952,715	15.6%	7/1-7/7	6/7/2000	6	24	7.38	380
2000	Fall	1,967,854	9.2%	7/1-7/7	6/15/2000	14	10.29	2.72	731
	Spring	381,497	34.3%	10/2-10/15	No data collected				
	Fall	863,988	34.7%	10/2-10/15	No data collected				

### Spring Monitoring Catch Totals

Spring monitoring on the WCT was conducted from 137 to 189 days during the 1997-2000 trapping period (Table 7). During the spring season monitoring, the number of Age 0 chinook captured ranged from 23,443 to 47,417 fish. Catches were predominately Age 0 with few yearling fish captured. The two years that Age 1 chinook were captured (1997 and 2000) they comprised only .02 and .004 percent respectively of the total spring chinook catch (Appendix 1 and 10). Hatchery Age 1 chinook released in the fall and captured the following spring also occurred in past monitoring (USFWS 1991, 1992a, 1992b, 1994).

Table 7. Chinook catch totals at the WCT, Spring monitoring, 1997-2000.

Spring monitoring	Days trapped	Age 0 Chinook				
		Hatchery	Natural	Total	CPUE	% Hatchery
1997	171	17,847	10,184	28,031	164	64%
1998	157	28,824	18,436	47,260	301	61%
1999	189	10749	14920	25,669	136	42%
2000	137	10263	13042	23,305	170	44%
97-00 Totals	654	67,683	56,582	124,265	190	54%
97-00 Avg	164	16,921	14,146	31,066	193	53%

### Fall Monitoring Catch Totals

Fall Monitoring on the WCT was conducted from 0 to 60 days during the 1997-2000 trapping period. (Table 8). During fall season monitoring the number of Age 0 chinook captured ranged from 160 to 51479. Catches were all Age 0 chinook with hatchery fish making up the majority of the catch for all years (Table 8).

Table 8. Chinook catch totals at the WCT, Fall monitoring, 1997-2000.

Fall monitoring	Days trapped	Age 0 Chinook				
		Hatchery	Natural	Total	CPUE	% Hatchery
1997	60	11,263	1,995	13,318	222	85%
1998	49	28,567	22,863	51,479	1051	55%
1999	0					
2000	6	98	56	160	27	61%
97-00 Totals	115	39,928	24,914	64,842	564	62%
97-00 Avg	29	13,309	8,305	21,652	433	67%

## Chinook Catches and Fork lengths

**Spring and Fall 1997:** Fork lengths from 4,538 chinook (10.7% of the total catch) were measured (Appendix 33). Mean fork lengths of Age 1 chinook range from 115mm to 145mm (n=4) and were captured between JW 15 and JW 24. Initial catches of Age 0 chinook occurred in JW 13 (0=38mm, sd=1.5, n=14) (Figure 7). Mean weekly fork lengths increased steadily throughout JW 23 (0=98mm, sd=12.4, n=113). In JW 24 hatchery fish were first observed and comprised 68% of the catch that week. CPUE increased from 33 fish in JW 23 to a peak of 966 fish in JW 28 before dropping off. Upon the arrival of hatchery fish, mean weekly fork lengths increased slightly from 98mm (sd=12.4, n=113) to 100mm (sd=10.1, n=208). Spring trapping concluded on JW 39 with a mean fork length of 106mm (sd=9.9, n=179). Fall trapping began on JW 40 with significant increases in hatchery and natural Age 0 chinook catches. Mean weekly fork lengths also increased from 106mm (sd=9.9, n=179) to 119mm (sd=19.4, n=195). Catch for both hatchery and natural Age 0 chinook peaked during JW 41. The mean fork length at that time was 135mm (sd=13.6, n=210). Trapping concluded on JW 49 with a mean fork length of 133mm (sd=14.8, n=8).

**Spring and Fall 1998:** Fork lengths from 4,347 chinook ( 5.4% of the total catch) were measured (Appendix 35). No Age 1 chinook were captured in 1998. Initial catches of Age 0 chinook occurred in JW 16 (0=38mm, sd=1.7, n=19). Mean weekly fork lengths increased steadily throughout JW 24 (0=78mm, sd=19.9, n=29). In JW 25 hatchery fish were first observed and comprised 17% of the catch that week. CPUE increased from 4 fish in JW 24 to a peak of 1,277 fish in JW 31. Upon arrival of hatchery fish, mean weekly fork lengths increased from 78mm (sd=19.9, n=29) to 87mm (sd=13.6, n=91). Spring trapping concluded on JW 39 with a mean fork length of 105mm (sd=6.4, n=210). Fall trapping began on JW 40 with significant increases in hatchery and natural Age 0 chinook catches. Mean weekly fork lengths also increased from 105mm (sd=6.4, n=210) to 114mm (sd=13.1, n=210). Catch for both hatchery and natural Age 0 chinook peaked during JW 41. The mean fork length at that time was 125mm (sd=11.9, n=210). Trapping concluded on JW 47 with a mean fork length of 121mm (sd=19.7, n=4).

**Spring 1999:** Fork lengths from 3,796 chinook (14.8% of the total catch) were measured during spring monitoring (Appendix 37). No Age 1 chinook were captured in 1999. Initial catches of Age 0 chinook occurred in JW 11 (0=37mm, n=1). Mean fork lengths increased steadily throughout the trapping period. In JW 23 hatchery fish were first observed and comprised 5% of the catch that week. CPUE increased from 3 fish in JW 22 to a peak of 478 fish in JW 30. Upon the arrival of hatchery fish, mean weekly fork lengths increased from 62mm (sd=18.3, n=133) to 72mm (sd=14.9, n=189). Spring trapping concluded on JW 39 with a mean fork length 101mm (sd=7.3, n=209)

**Spring and Fall 2000:** Fork lengths from 3,911 chinook (16.5% of the total catch) were measured (Appendix 39). No yearling chinook were captured during 2000. Initial catches of Age 0 chinook occurred in JW 20 (0=59mm, sd=9.6, n=78). In JW 23 hatchery fish were first observed and comprised 20% of the catch that week. CPUE increased from 40 fish in JW 22 to a peak of 496 fish in JW 30. Upon the arrival of hatchery fish, mean weekly fork lengths increased from 70mm (sd=14.1, n=202) to 84mm (sd=14.9, n=210). Spring trapping concluded on JW 39 with a mean fork length of 103mm (sd=7.5, n=170). Trapping was conducted for only one week (JW 40) during the fall season. Catch numbers for hatchery Age 0 chinook increased while natural Age 0 chinook catch numbers decreased. The mean fork length for JW 40 was 117mm (sd=20.1, n=150).

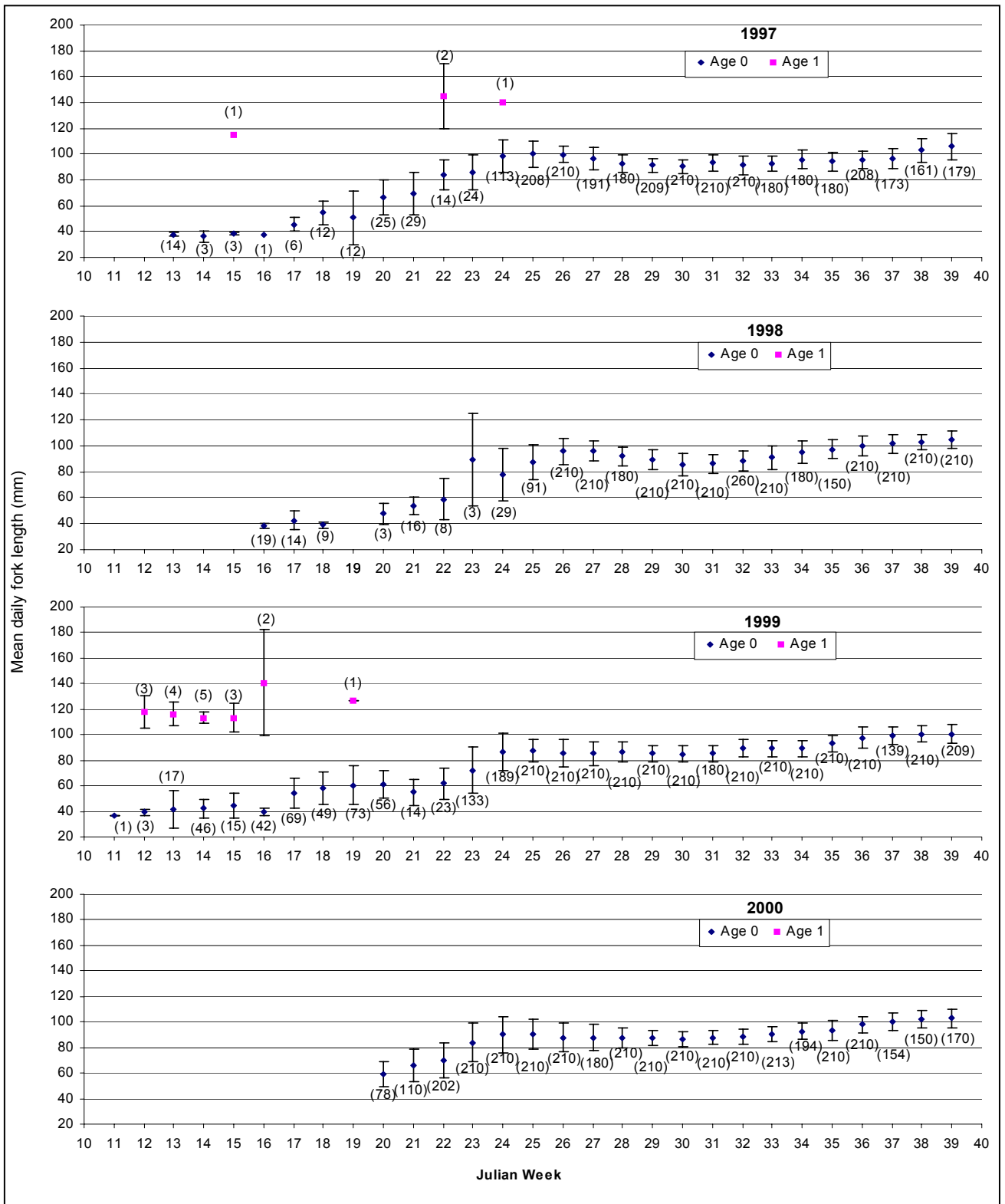


Figure 7. Chinook Age 0 and Age 1 mean fork lengths (mm) by Julian week at the WCT, 1997-2000. (+/- 1 standard error, sample size)

## Chinook Abundance Index and Hatchery Contributions by Year – Spring Monitoring

**Spring 1997:** Monitoring at the WCT started in late March (JW 13). Initial catches were small and consisted largely of natural Age 0 chinook. Several Age 1 chinook were captured early in the trapping season (JW 13-JW 22). Catches increased weekly throughout the months of April and May, with the peak weekly catch occurring in the beginning of July (JW 28). Hatchery Age 0 chinook contributions began during JW 24 and peaked in JW 28 (Figure 8). Monitoring at the WCT continued throughout the spring and into the fall season. The spring 1997 WCT abundance index total was 397,558 (Appendix 13).

**Spring 1998:** Spring monitoring at the WCT began in mid-April (JW 16), with few natural Age 0 chinook being captured before the middle of June (JW 25). Catches increased weekly throughout the months of June and July, with the peak weekly catch occurring in the end of July (JW 31). Hatchery Age 0 chinook contributions began during JW 25 and peaked in JW 31 (Figure 8). Spring monitoring at the WCT concluded at the end of August (JW 39). The spring 1998 WCT abundance index was 910,729 (Appendix 16).

**Spring 1999:** Spring monitoring at the WCT began in mid-March (JW 11), with few natural Age 0 chinook being captured before early June (JW 23). Catches increased weekly throughout the months of June and July, with the peak weekly catch occurring in the end of July (JW 30). Hatchery Age 0 chinook contributions began during JW 23 and peaked in JW 31 (Figure 8). Spring monitoring at the WCT concluded at the end of August (JW 39). The spring 1999 WCT abundance index was 544,172 (Appendix 19).

**Spring 2000:** Spring monitoring at the WCT began in mid-May (JW 20), with few natural Age 0 chinook being captured before late May (JW 22). Catches increased weekly throughout June and July with the peak weekly catch occurring in late July (JW 30). Hatchery Age 0 chinook contributions began during early JW 23 and peaked in JW 29 (Figure 8). Spring monitoring at the WCT concluded at the end of August (JW 39). The spring 2000 WCT abundance index was 451,212 (Appendix 22).

## Chinook Abundance Index and Hatchery Contributions by Year – Fall Monitoring

**Fall 1997:** Fall monitoring at the WCT began in early October (JW 40). Natural Age 0 catch numbers dramatically increased in the first week of fall trapping with the peak weekly catch occurring in the second week of October (JW 41). Hatchery Age 0 chinook contributions increased during JW 40 and peaked in JW 41. Monitoring at the WCT concluded in the beginning of December JW 49 (Appendix 13). The fall 1997 WCT abundance index was 172,849.

**Fall 1998:** Fall monitoring on the WCT began in early October (JW 40). Natural age 0 catch numbers initially decreased but peaked in mid-October (JW 41). Hatchery Age 0 contributions increased during JW 40 with the peak weekly catch occurring in mid-October (JW 41). Monitoring at the WCT concluded in mid-November (JW 47) (Appendix 16). The fall 1998 WCT abundance index was 327,224.

**Fall 1999:** No Fall monitoring on the WCT occurred in 1999 (Appendix 19).

**Fall 2000:** The Fall monitoring on the WCT consisted of six trapping days in JW 40. The abundance index for this period was 4,957 (Appendix 22).



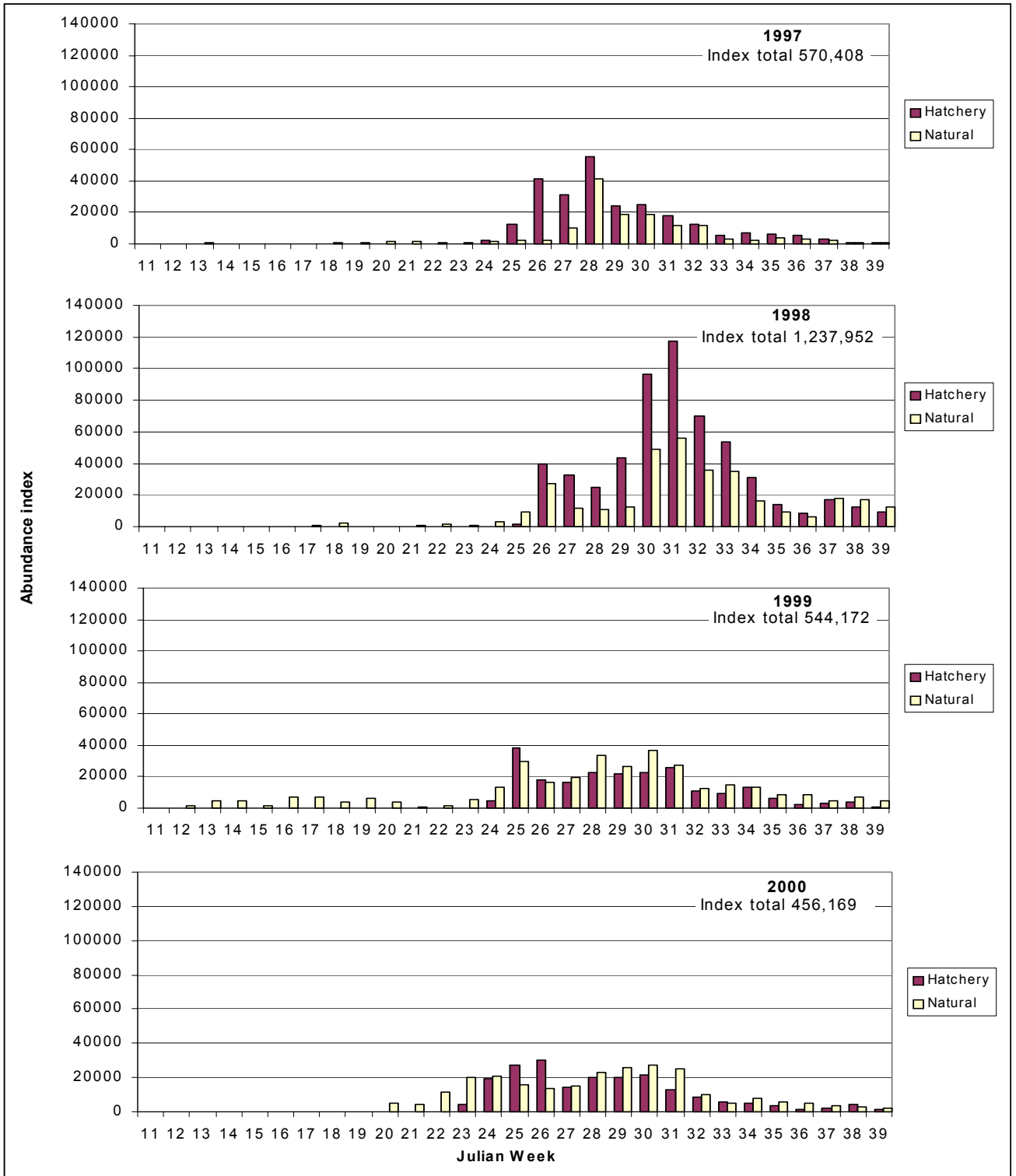


Figure 8. Weekly abundance index totals for natural and hatchery chinook at the WCT, spring 1997-2000.

## Emigration Timing

Like the BBT, very few natural Age 0 chinook were captured prior to the beginning of June (JW 23). This trend was consistent for all four years (Figure 9). However, unlike the BBT, natural chinook emigration occurred earlier in 1999 and 2000 compared to 1997 and 1998. Water temperatures reached 15 °C in early May 1997, early June 1998, late May 1999, and late May 2000. The maximum of flows in June 2000 (range 1,900-3,300 cfs) were lower than June 1999 (range 2,500-5,600 cfs), June 1998 (range 6,000-12,100 cfs) or June 1997 (1,400-4,100 cfs) (Figure 10).

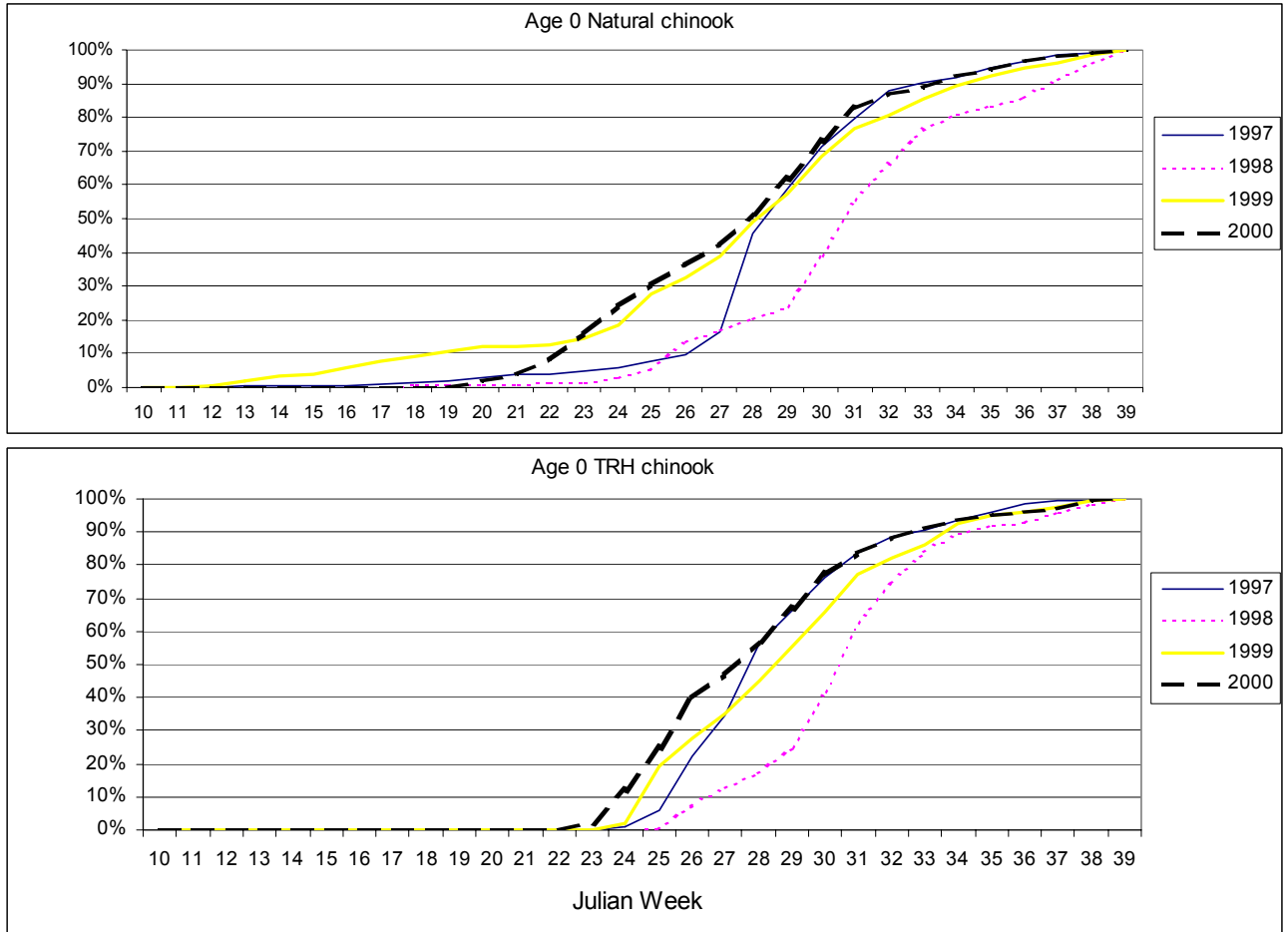


Figure 9. Emigration timing of natural (A) and TRH released chinook (B) at the WCT, spring 1997-2000.

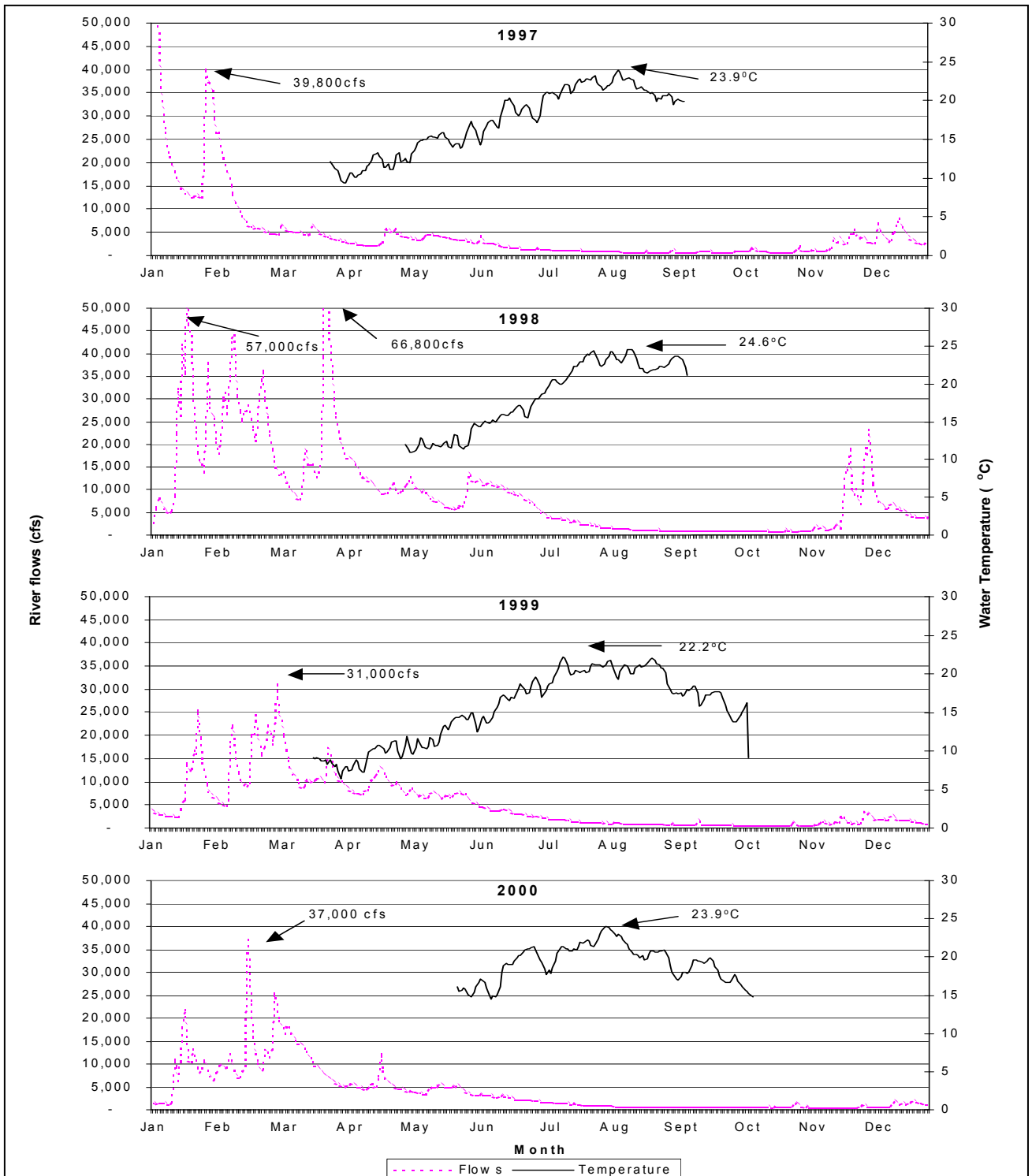


Figure 10. Mean daily flow (cfs) at Hoopa and mean daily river temperature (°C) at the WCT, 1997-2000.

### Intra Basin Comparison

Flows in the Trinity River were generally higher than the Klamath River during most of the periods both traps were operating. Mean daily water temperatures (MDT) were slightly lower in the Klamath River for most of the period both traps were operating (Figure 11). The MDT of both rivers exceeded "stressful conditions" ( $>20^{\circ}\text{C}$ ) by the beginning of July (JW 27) or sooner. Water temperatures on the Trinity would often return to below  $20^{\circ}\text{C}$  by the beginning of August (JW 35). The Klamath trap was removed before temperatures had dropped below  $20^{\circ}\text{C}$ .

On both rivers, the bulk of the 1997-2000 natural Age 0 chinook emigration corresponded with periods of rapidly increasing water temperatures. Most chinook had emigrated past the traps before MDTs reached stressful levels. The peak of the Klamath River natural Age 0 chinook emigration is often more pronounced and larger in magnitude than in the Trinity River. However, Age 0 emigration tapered off faster in the Klamath River than in the Trinity River.

Winter storms in late December 1996 and early January 1997, produced a high flow event and peak flow of 233,000 cfs recorded at Orleans on January 1, 1997 (Figure 6). Intermittent storms in 1998, produced two high flow events, 80,200 cfs in mid-January, and 95,400 in late March and storms in the fall of 1998 resulted in high flows in November and December (Figure 6). The magnitude and timing of these November/December flow events may have resulted in scouring of fall chinook and coho redds. A peak flow of 52,700 cfs occurred in early March 1999 (Figure 6). In 2000 a peak flow of only 34,500 cfs occurred in mid January.

High flow events occurring in December and January can scour salmon redds resulting in poor egg-to-fry survival. Conversely, moderate to low flows in December and January will result in little or no negative effects to salmon egg-to-fry survival. Steelhead spawn in early spring, primarily in tributaries. The effects of high spring flows and steelhead egg-to-fry survival is not well understood. However, the protracted spawning period into late spring/early summer may reduce negative impacts. High winter flows, snowpack and subsequent spring runoff conditions, summer meteorological conditions, and smoke due to forest fire, all contribute to the yearly variability observed in the timing and duration of salmonid outmigration in spring/summer.

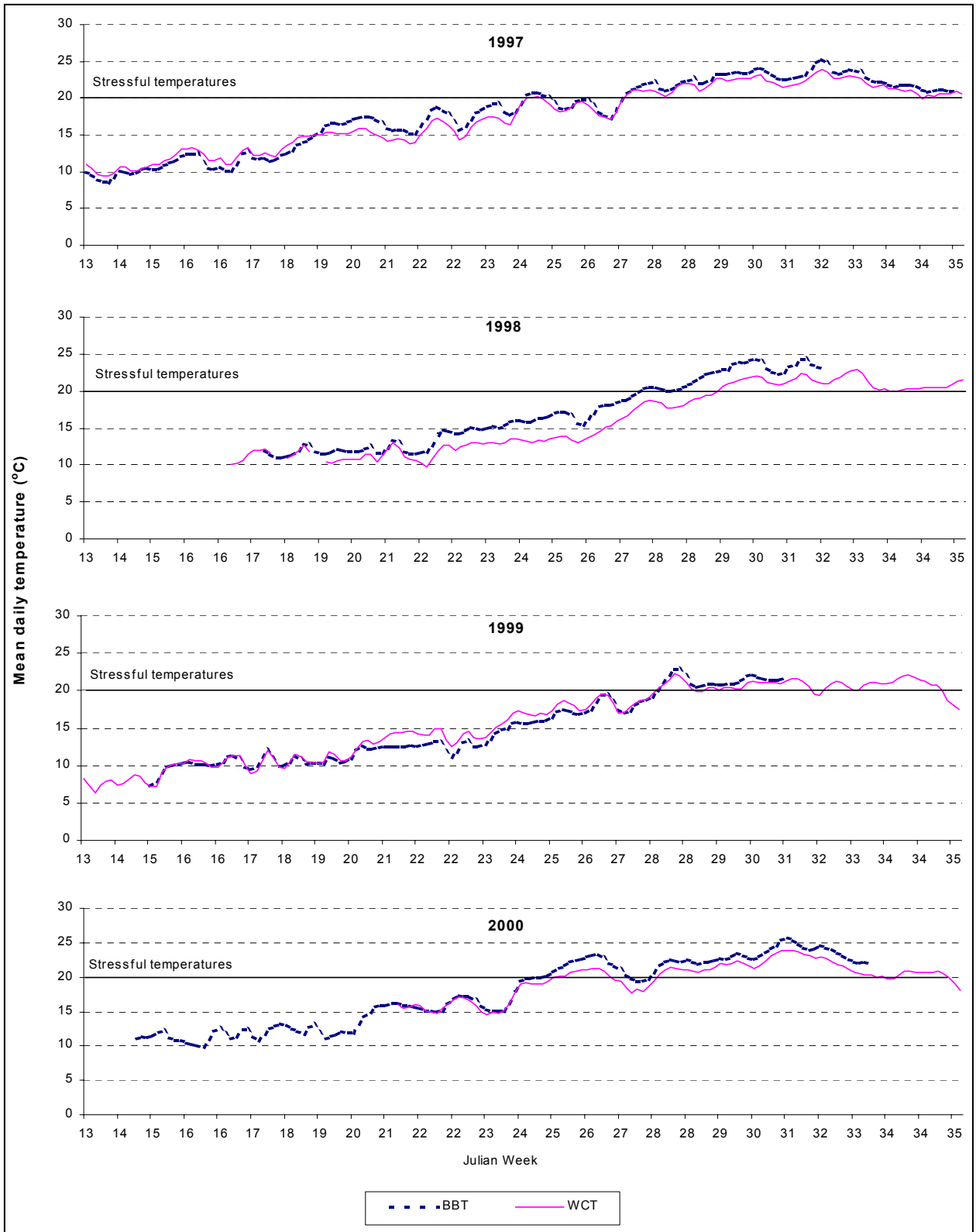


Figure 11. Mean daily Klamath and Trinity river temperatures (°C) at the BBT and WCT sites during the period of peak chinook Age 0 emigration, 1997-2000.

### Additional Salmonid Catches

The capture of additional salmonid species (steelhead, coho, chum) were incidental to the capture of chinook juveniles, which was the primary objective of this monitoring project. Results reflect emigration trends during periods of coemigration with juvenile chinook.

#### Klamath River Coho

As in previous years, coho catches at the BBT from 1997 to 2000 were very low. Typically, coho smolts (age 1+) were captured in early May to mid-June, and coho Age 0 from late February to early July. Coho smolts age 1+ were released from IGH during late-March for all monitoring periods in 1997-2000. IGH released between 74,250 and 150,312 age 1+ coho smolts during the 1997-2000 monitoring period, (Table 9).

Table 9. Iron Gate Hatchery coho releases, 1997-2000.

Brood Year & age	Date of Release	Size (grams)	Release # and Mark		Total released
			Left Maxillary	Un-Marked	
coho-95 2+	4/11/1997	10	74,250	0	74,250
coho-96 2+	3/30/1998	41.2	79,607	0	79,607
coho-97 2+	3/30/1999	37.8	146,858	3,454	150,312
coho-98 2+	3/30/2000	NA	77,147	0	77,147

#### Coho Catches

A total of 152 coho (natural and hatchery) were captured at the BBT during the four spring monitoring periods (Table 10). Age 0 coho comprised 71% of the total four year catch. Natural age 1+ fish comprised 20% and hatchery fish comprised 9% of the total four year catch. No Fall trapping operations were conducted on the Klamath River from 1997-2000.

Table 10. BBT coho catch numbers by age, Spring monitoring, 1997-2000.

Year	Days trapped	Coho				% of Total		
		Nat Age 1	Hat Age 1	Nat Age 0	Total	% Nat 1	% Hat 1	% Nat 0
1997	126	17	3	13	33	52%	9%	39%
1998	97	1	2	12	15	7%	13%	80%
1999	118	4	6	38	48	8%	13%	79%
2000	92	8	3	45	56	14%	5%	80%
<b>Totals</b>		<b>30</b>	<b>14</b>	<b>108</b>	<b>152</b>	<b>20%</b>	<b>9%</b>	<b>71%</b>

## Abundance Index and Hatchery Contributions

The total (fry, parr, smolt) coho abundance index for spring monitoring 1997-2000, ranged from 4,805 to 6,918, with the largest abundance index total occurring in spring 1999 (Figure 12). Hatchery contributions ranged from 6 to 17 percent with the greatest number occurring in 1998 (Table 11). All IGH coho were tagged with a left maxillary clip in 1997, 1998 and 2000. In 1999, 97% of the IGH coho received left maxillary clips, the remaining 3% were released unmarked.

Table 11. BBT coho abundance index by age, Spring monitoring, 1997-2000.

Year	Days trapped	Coho				% of Total		
		Nat Age 1	Hat Age 1	Nat Age 0	Total	% Nat 1	% Hat 1	% Nat 0
1997	126	1,268	196	811	2,275	56%	9%	36%
1998	97	160	368	1,580	2,108	8%	17%	75%
1999	118	457	885	5,576	6,918	7%	13%	81%
2000	92	799	284	3,722	4,805	17%	6%	77%
Totals		2,684	1,733	11,689	16,106	17%	11%	73%

### Fork length and emigration timing

**Spring 1997:** A total of 32 coho were measured in 1997, between JW 17 and 27 (Appendix 25). Coho Age 0 were first observed during JW 17 with a mean fork length of 68mm (sd=16.9, n=2) (Figure 13). The last Age 0 coho was captured during JW 27 with a fork length of 63mm. Age 1 coho were captured throughout JW 17-24. The mean fork length during this period ranged from 100 to 180mm. Hatchery coho were captured beginning JW 19 through JW 22, with fork lengths ranging from 132 to 165mm (Figure 13).

**Spring 1998:** A total of 15 coho were measured in 1998, between JW 18 and 28 (Appendix 27). Coho Age 0 were first observed during JW 18 with a mean fork length of 63mm (sd=10.6, n=2) (Figure 13). The last Age 0 coho was captured during JW 28 with a fork length of 54mm. Only one age 1 coho was captured during JW 24 with a fork length of 115mm. Two hatchery coho were captured during JW 21 and 24 which measured 252 and 175mm respectively (Figure 12).

**Spring 1999:** A total of 55 coho were measured in 1999, between JW 16 and 30 (Appendix 29). Coho Age 0 were first observed during JW 16 with a mean fork length of 35mm (sd=2.1, n=2) (Figure 13). The last Age 0 coho was captured during JW 30 with a fork length of 76mm. Age 1 coho were captured during JW 22 and JW 25. The fork lengths of these fish ranged from 153mm to 164mm. Hatchery coho were captured beginning JW 22 through JW 24, with fork lengths ranging from 153 to 164mm (Figure 12).

**Spring 2000:** A total of 56 coho were measured in 2000, between JW 16 and 26 (Appendix 31). Coho Age 0 were first observed during JW 16 with a mean fork length of 48mm (sd=23.79, n=3) (Figure 13). The last Age 0 coho was captured during JW 26 with a mean fork length of 70mm (sd=.58, n=3). Age 1 coho were captured during JW 18 and JW 22. The fork lengths of these fish ranged from 110mm to 146mm. Hatchery coho were captured during JW 18 and JW 20, with fork lengths ranging from 147 to 183mm (Figure 12).

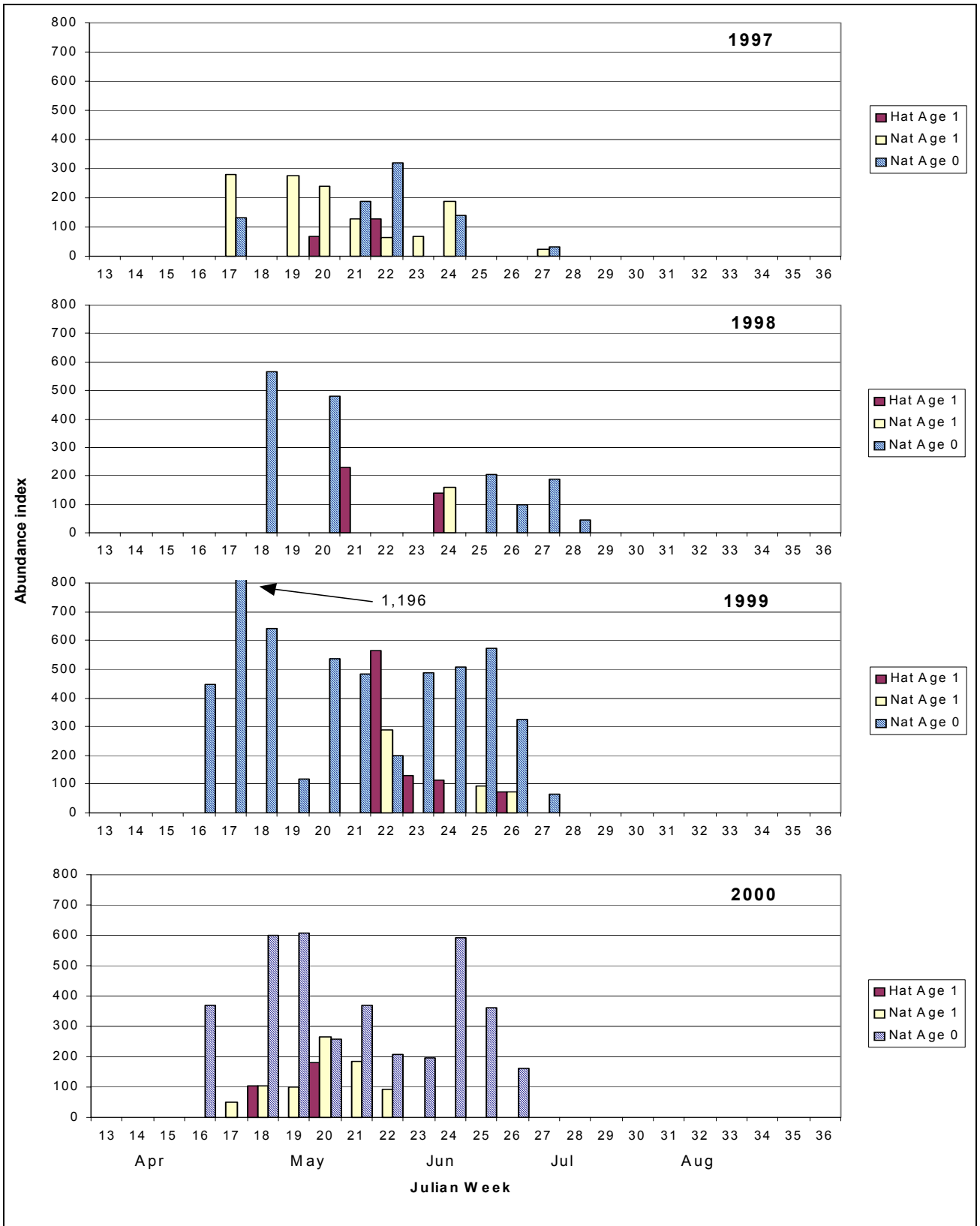


Figure 12. Weekly abundance index totals for natural and hatchery coho at the BBT, 1997-2000.



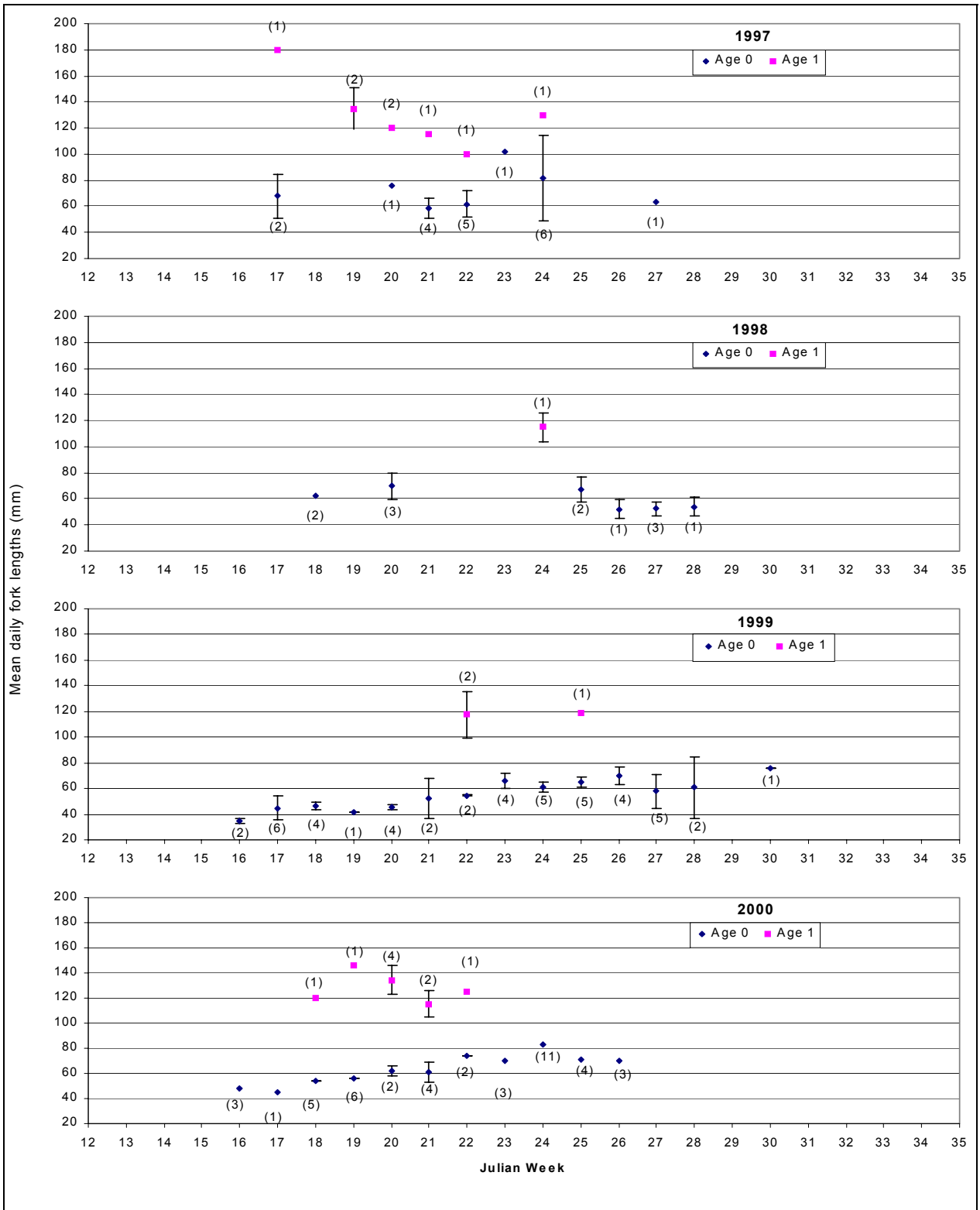


Figure 13. Natural coho Age 0 and Age 1 mean fork lengths (mm) by Julian week at the BBT, 1997-2000. (+/- 1 standard error, sample size).

## Klamath River Steelhead

Fry, parr and smolt life history phases of natural steelhead juveniles were captured at the BBT during spring monitoring. IGH steelhead are typically reared one year and released in mid-May. In 1997 no steelhead release occurred. In 1998 100% of age 1+ steelhead were released with adipose clips. In 1999, 50% of age 1+ steelhead received AD and left maxillary clips. In 2000 100% of age 1+ steelhead received AD and right maxillary clips (Table 12).

Table 12. Iron Gate Hatchery steelhead releases, 1997-2000.

(AD-LM = adipose and left maxillary clip, AD-RM= adipose and right maxillary clip).

Brood Year & age	Date of Release	Size (grams)	Release # and mark				Total released
			AD	AD-LM	AD-RM	Un-Marked	
	1997	No release					
SH-97 1+	5/1/1998	44.5	35,802				35,802
SH-97 2+	4/30/1999	37.8		73,050		1,110	74,160
SH-99 1+	4/28/2000	NA			51320		51,320

## Steelhead Catches

A total of 1,342 steelhead (natural and hatchery) were captured at the BBT during the four spring monitoring periods (Table 13). YOY steelhead comprised 34% of the total four year catch. Fish of age 1,2 and 3 comprised 37, 27 and 2 percent of the combined catch, respectively. No Fall trapping operations were conducted at the BBT during 1997-2000.

Table 13. BBT steelhead catch by age, Spring monitoring, 1997-2000.

Year	Steelhead						% of Total					
	Age0	Age1	Age2	Age3	Hat	Total	% Hat	% Nat	%Age 0	% Age1	% Age2	% Age3
1997	255	115	52	4	1	427	0%	100%	60%	27%	12%	1%
1998	77	185	198	8	0	468	0%	100%	16%	40%	42%	2%
1999	108	127	63	4	0	302	0%	100%	36%	42%	21%	1%
2000	14	68	52	10	1	145	1%	99%	10%	47%	36%	7%
Total	454	495	365	26	2	1,342	0.15%	99.85%	34%	37%	27%	2%

## Abundance Index and Hatchery Contributions

The total steelhead abundance index for spring monitoring 1997-2000, ranged from 14,456 to 66,125 fish, with the largest abundance index total occurring in spring 1998 (Table 14). Hatchery contributions were small, ranging from 0 to 1 percent of each years catch. Natural Age 1 steelhead comprised the majority of the steelhead index.

Table 14. BBT steelhead abundance index by age, Spring monitoring, 1997-2000.

Year	Steelhead						% of Total					
	Age0	Age1	Age2	Age3	Hat	Total	% Hat	% Nat	%Age 0	% Age1	% Age2	% Age3
1997	7,639	5,951	4,563	325	140	18,618	1%	99%	41%	32%	25%	2%
1998	3,695	30,058	30,982	1,390	0	66,125	0%	100%	6%	45%	47%	2%
1999	4,510	19,727	9,163	678	0	34,078	0%	100%	13%	58%	27%	2%
2000	1,022	7,400	4,963	961	110	14,456	1%	99%	7%	52%	35%	7%
Total	16,866	63,136	49,671	3,354	250	133,277	0.19%	99.81%	13%	47%	37%	3%

## Fork length and Emigration Timing

**Spring 1997:** A total of 386 steelhead were measured in 1997, between JW 13 and 34 (Appendix 26). Steelhead Age 0 were first observed during JW 21 with a mean fork length of 41mm (sd=7.5, n=4). Trapping concluded on JW 34 at which time, Age 0 mean fork length had increased to 70mm (sd=12.4, n=12). Age 1 steelhead were captured throughout the monitoring period. Age 1 mean fork lengths during the beginning of trapping (JW 13) were 82mm (sd=10.6, n=2). By the conclusion of the trapping period (JW 34), Age 1 mean fork lengths were 134mm (sd=4.8, n=4). Mean fork lengths for Age 2 and Age 3 steelhead did not show a consistent increase during the monitoring period. Age 2 mean weekly fork lengths ranged from 149 to 191mm (sd=17.3, n=59). Age 3 mean fork lengths ranged from 219 to 250mm (sd=13.6, n=4) (Figure 14). Only one hatchery steelhead was captured during 1997.

**Spring 1998:** A total of 428 steelhead were measured in 1998, between JW 18 and 33 (Appendix 28). In 1998 no steelhead age class showed a consistently increasing length frequency. Age 0 mean weekly fork lengths ranged from 53 to 83mm (sd=13.7, n=83). Age 1 mean weekly fork lengths ranged from 111 to 149mm (sd=16, n=115). Age 2 mean weekly fork lengths ranged from 152 to 190mm (sd=18.9, n=221). Age 3 mean weekly fork lengths ranged from 229 to 248mm (sd=11.5, n=9). No hatchery steelhead were observed during 1998 (Figure 14).

**Spring 1999:** A total of 302 steelhead were measured in 1999 between JW 18 and 33 (Appendix 30). In 1998 no steelhead age class showed a consistently increasing length frequency. Age 0 mean weekly fork lengths ranged from 41 to 59mm (sd=12, n=98). Age 1 mean weekly fork lengths ranged from 53 to 197mm (sd=53.4, n=165). Age 2 steelhead mean fork lengths ranged from 132 to 181mm (sd=37.6, n=39). No Age 3 or hatchery steelhead were observed during 1998 (Figure 14).

**Spring 2000:** A total of 137 steelhead were measured in 2000, between JW 14 and 29 (Appendix 32). Steelhead Age 0 were first observed during JW 17 with a fork length of 43mm (n=1). Trapping concluded on JW 29 at which time, Age 0 mean weekly fork length had increased to 52mm (sd=8.5, n=2). Age 1 steelhead were captured throughout the monitoring period. Age 1 mean weekly fork lengths at the beginning of trapping (JW 14) were 77mm (sd=8.3, n=4). By the conclusion of the trapping (JW 29), Age 1 mean weekly fork lengths were 153mm (sd=2.7, n=3). The mean weekly fork lengths for age 2 and age 3 steelhead did not show a consistent increase during the monitoring period. Age 2 mean weekly fork lengths ranged from 156 to 222mm (sd=41.8, n=51). Age 3 mean fork lengths ranged from 217 to 247mm (sd=18.4, n=10) (Figure 14). Only one hatchery steelhead was captured during 2000.

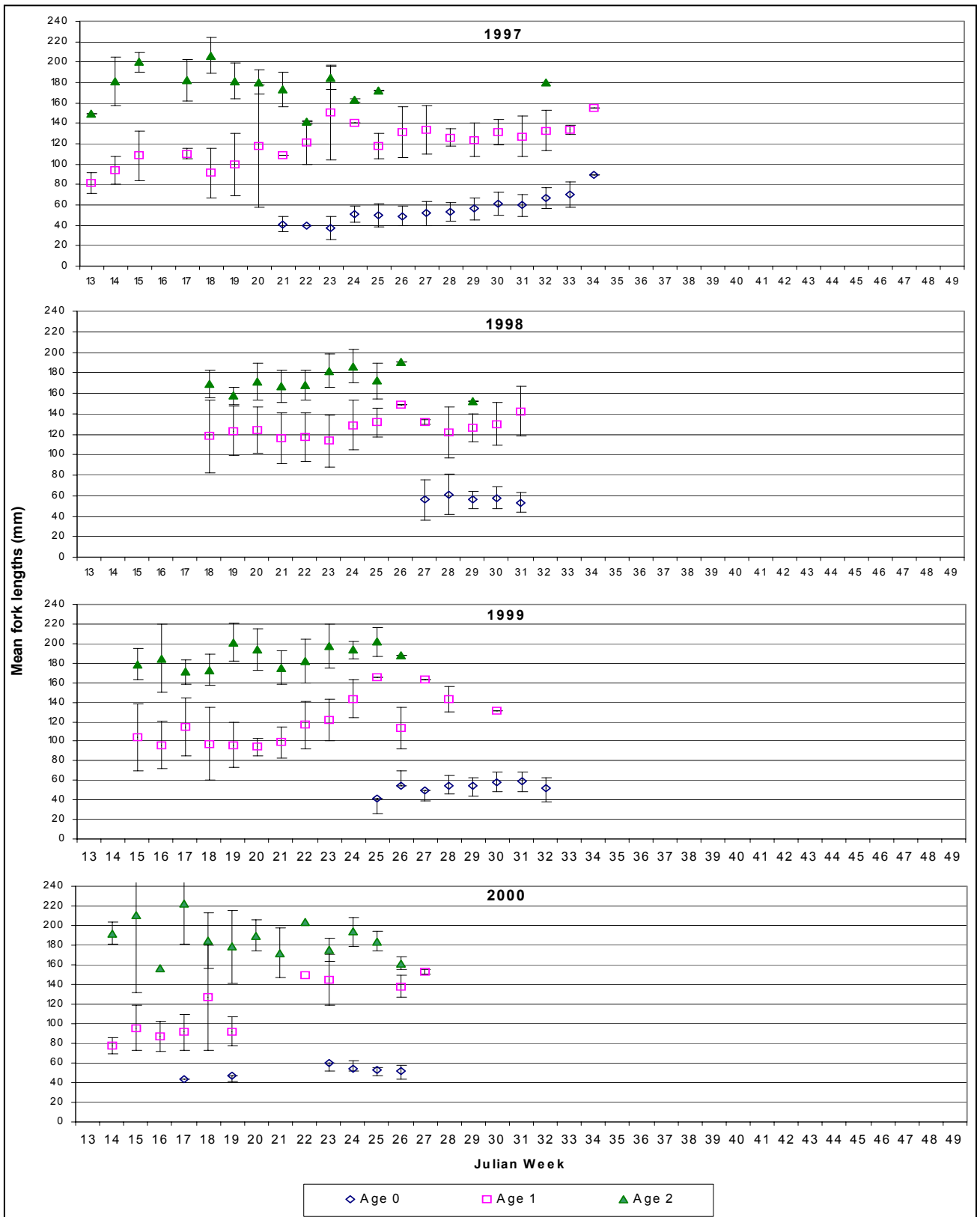


Figure 14. Mean lengths-at-age, standard deviation, and sample size by Julian week for natural steelhead at the BBT, 1997-2000.

## Trinity River Coho

Trinity River coho catch numbers were significantly higher than those of the BBT. Coho smolts (Age 1+) were captured in early May to mid-June, and coho Age 0 from late February to early July. Coho smolts Age 1+ were released from Trinity River Hatchery during mid to late March in 1997 through 2000. TRH released smolts between 69,993 and 516,192 age 1+ coho smolts during the 1997-2000 monitoring period (Table 15).

Table 15. Trinity River Hatchery coho releases, 1997-2000.

Brood Year & age	Date of Release	Size (grams)	Release # and Mark		Total released
			Right Maxillary	Un-Marked	
coho-95 1+	3/18/97-3/31/97	9.7	71,675	0	71,675
coho-97 2+	3/16/98-3/20/98	54.7	516,192	0	516,192
coho-97 1+	3/15/99-3/22/99	45.8	69,993	0	69,993
coho-97 1+	3/15/99-3/22/99	48.4	147,677	0	147,677
coho-97 1+	3/15/99-3/22/99	41.6	301,603	0	301,603
coho-98 1+	3/15/00-3/20/00	40.1	415,341	0	415,341
coho-98 1+	3/15/00-3/20/00	50.4	78,386	0	78,386

## Coho Catches

A total of 2,813 coho (natural and hatchery) were captured at the WCT during the four spring monitoring periods (Table 16; Appendix 14, 17, 20, and 23). Age 0 coho comprised 12% of the total four year catch. Natural Age 1 and hatchery Age 1 coho comprised the majority of the total catch (79% and 9% respectively). Four Age 0 coho were captured during the fall monitoring period in 1997 and 1998.

Table 16. WCT coho catch by age, Spring and Fall monitoring, 1997-2000.

Year	Days Fished	Coho				% of Total		
		Nat 1	Hat 1	Nat 0	Total	% Nat 1	% Hat 1	% Nat 0
1997	144	117	477	50	644	18%	74%	8%
1998	189	42	351	11	404	10%	87%	3%
1999	206	48	1,302	240	1,590	3%	82%	15%
2000	231	47	97	31	175	27%	55%	18%
Totals		254	2,227	332	2,813	9%	79%	12%

## Abundance Index and Hatchery Contribution

The total coho abundance index for spring monitoring 1997-2000, ranged from 8,576 to 108,995 with the largest abundance index total occurring in spring 1999. Hatchery contributions were much larger on the Trinity River, ranging from 62 to 92 percent with the greatest number occurring in 1998 (Table 17). All coho were tagged with a right maxillary clip for 1997 through 2000 (Table 15).

Table 17. WCT coho abundance index by age, Spring and Fall monitoring, 1997-2000.

Year	Days trapped	Coho				% of Total		
		Nat 1	Hat 1	Nat 0	Total	% Nat 1	% Hat 1	% Nat 0
1997	144	4,326	16,275	1,613	22,214	19%	73%	7%
1998	189	2,311	39,100	1,098	42,509	5%	92%	3%
1999	206	3,564	96,448	8,983	108,995	3%	88%	8%
2000	231	2,286	5,346	944	8,576	27%	62%	11%
Totals		12,487	157,169	12,638	182,294	7%	86%	7%

### Fork length and emigration timing

**Spring and Fall 1997:** A total of 609 coho were measured in 1997, between JW 13 and 49 (Appendix 33). Coho Age 0 were first observed during JW 18 with a mean fork length of 49mm (sd=1.0, n=3) (Figure 15). The last Age 0 coho was captured during JW 49 with a fork length of 85mm. Age 1 coho were captured throughout JW 14-27. The fork lengths of these fish ranged from 100 to 191mm. Hatchery coho (n=446) were captured from JW 13 through JW 29, with fork lengths ranging from 68 to 190mm (Figure 16).

**Spring and Fall 1998:** A total of 353 coho were measured in 1998, between JW 16 and 46 (Appendix 35). Coho Age 0 were first observed during JW 17 with a fork length of 47mm (n=1) (Figure 15). The last Age 0 coho was captured during JW 46 with a fork length of 93mm (n=1). Age 1 coho were captured during JW 24 through 35. The fork lengths of these fish ranged from 114 to 181mm. Hatchery coho (n=302) were captured from JW 16 through JW 27, with fork lengths ranging from 115 to 275mm (Figure 16).

**Spring and Fall 1999:** A total of 1,293 coho were measured in 1999, between JW 11 and 39 (Appendix 37). Coho Age 0 were first observed during JW 14 with a mean fork length of 36mm (sd=3.1, n=3) (Figure 15). The last Age 0 coho was captured during JW 39 with a fork length of 74mm (n=1). Age 1 coho were captured during JW 12 through JW 30. The fork lengths of these fish ranged from 95 to 188mm. Hatchery coho (1039) were captured from JW 11 through JW 27, with fork lengths ranging from 100 to 250mm (Figure 16).

**Spring and Fall 2000:** A total of 159 coho were measured in 2000, between JW 20 and 39 (Appendix 39). The first Coho Age 0 was first observed during JW 21 with a fork length of 58mm (n=1) (Figure 15). The last Age 0 coho was captured during JW 35 with a fork length of 104mm (n=1). Age 1 coho were captured during JW 19 through JW 39. The fork lengths of these fish ranged from 99 to 158mm. Hatchery coho (n=83) were captured during JW 20 through JW 24, with fork lengths ranging from 110 to 210mm (Figure 16).

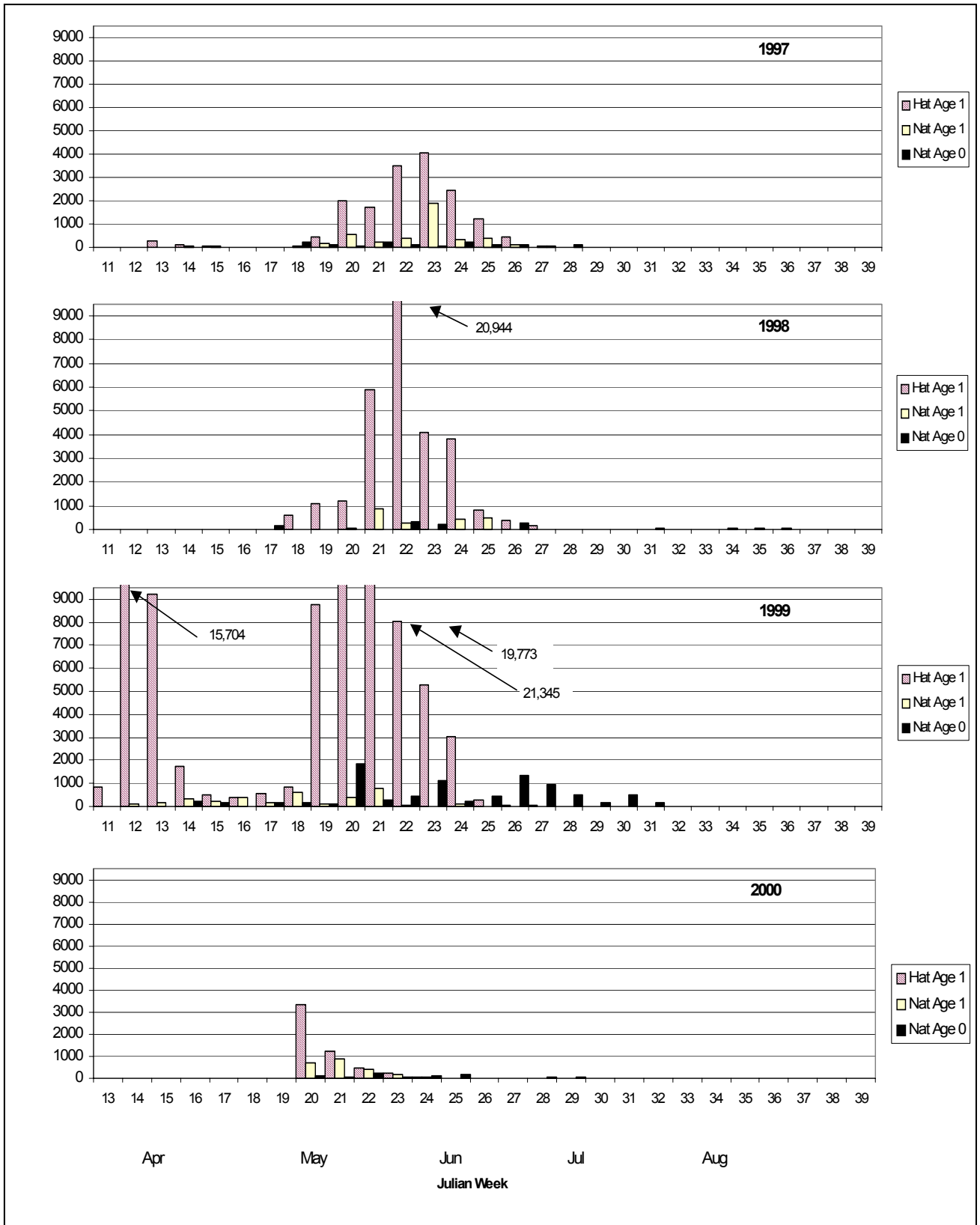


Figure 15. Weekly abundance index totals for natural and hatchery coho at the WCT, 1997-2000.



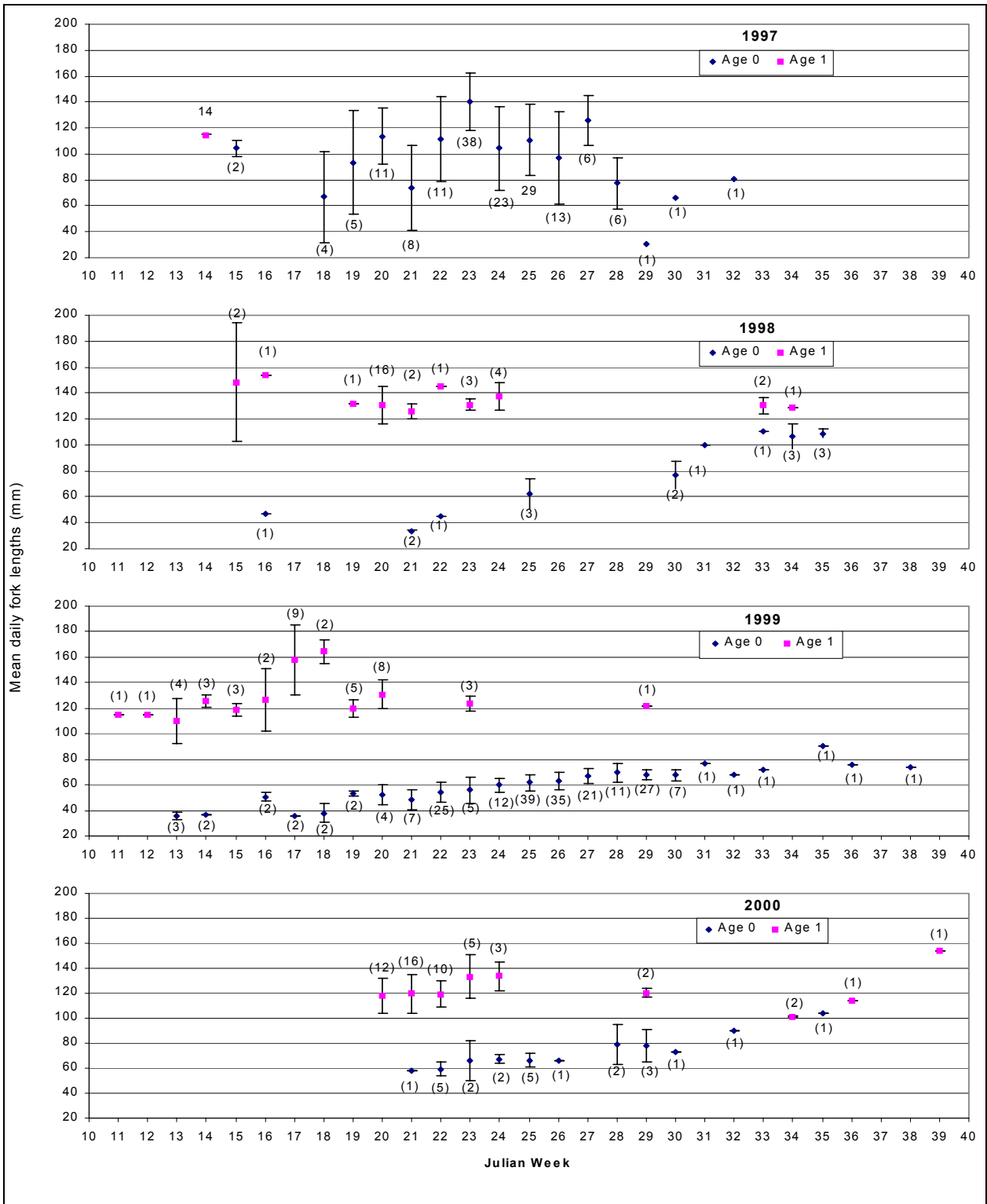


Figure 16. Coho Age 0 and Age 1 mean fork lengths (mm) by Julian week at the WCT, 1997-2000. (+/- 1 standard error, sample size).

## Trinity River Steelhead

All life history phases of natural and hatchery steelhead juveniles were captured at the WCT during spring and fall monitoring. Trinity River Hatchery steelhead are typically reared one year and released in mid-May. In 1997 no steelhead release occurred. In 1998 through 2000 between 9,163 and 811,513 steelhead were released (Table 18).

Table 18. Trinity River Hatchery steelhead releases, 1997-2000.

(AD=adipose clip)

Brood Year & age	Date of Release	Size (grams)	Release # and Mark		Total released
			AD	Un-Marked	
1997-No Releases					
SH-97 1+	3/23/98-3/31/98	64.8	36,064	0	36,064
SH-97 1+	3/23/98-3/31/98	113.4	811,513	0	811,513
SH-98 1+	3/15/99-3/22/99	80.9	602,280	0	602,280
SH-98 1+	3/15/99-3/22/99	26.7	9,163	0	9,163
SH-99 1+	3/15/00-3/21/00	64.8	49,850	0	49,850

## Steelhead Catches

A total of 6,988 steelhead (natural and hatchery) were captured at the WCT during the four spring monitoring periods. Age 0 comprised between 38% to 60% of the yearly catch. Age 1 steelhead comprised between 21% to 33% of the yearly catch. Age 2 steelhead comprised between 10% to 27% of the yearly catch. Age 3 steelhead comprised only 0 to 2% of the total catch (Table 19).

Table 19. WCT steelhead catch by age, Spring and Fall monitoring, 1997-2000.

Year	Steelhead						% of Total					
	Age0	Age1	Age2	Age3	Hat	Total	% Hat	% Nat	%Age 0	% Age1	% Age2	% Age3
1997	788	423	386	16	312	1,925	16%	84%	49%	26%	24%	1%
1998	660	205	94	4	144	1,107	13%	87%	69%	21%	10%	0%
1999	1,174	682	479	20	741	3,096	24%	76%	50%	29%	20%	1%
2000	311	272	222	17	38	860	4%	96%	38%	33%	27%	2%
Total	2,933	1,582	1,181	57	1,235	6,988	18%	82%	51%	27%	21%	1%

## Abundance Index and Hatchery Contributions

The total steelhead abundance index for spring monitoring 1997-2000, ranged from 27,213 to 158,684, with the largest abundance index total occurring in spring 1999 (Table 20). No clear trend was apparent from the percent change in age class for a given spring period.

Table 20. WCT steelhead abundance index by age, Spring and Fall monitoring 1997-2000.

Date	Steelhead						% of Total					
	Age0	Age1	Age2	Age3	Hat	Total	% Hat	% Nat	%Age 0	% Age1	% Age2	% Age3
1997	11,195	14,192	10,775	412	11,123	47,697	23%	77%	31%	39%	29%	1%
1998	13,801	16,277	9,782	705	15,668	56,233	28%	72%	34%	40%	24%	2%
1999	22,495	41,323	36,630	1,865	56,371	158,684	36%	64%	22%	40%	36%	2%
2000	6,043	9,988	8,569	864	1,749	27,213	6%	94%	24%	39%	34%	3%
Total	53,534	68,780	65,756	3,846	84,911	276,827	31%	69%	28%	36%	34%	2%

## Fork length and Emigration Timing

Steelhead Age 1 emigration timing ranged from March to June in the 1997-2000 monitoring period (Appendix 15, 18, 21, and 24). Fifty percent of Age 1 steelhead had been observed by JW 18, 23, 19, and 22 respectively for 1997, 1998, 1999 and 2000. By JW 28, 26, 25 and 32, 95% of Age 1 steelhead had been captured for 1997, 1998, 1999 and 2000.

**Spring and Fall 1997:** A total of 1,892 steelhead were measured in 1997, between JW 13 and 49. (Appendix 34) Steelhead Age 0 were first observed during JW 23 with a fork length of 54mm. By the end of the monitoring period (JW 49) the Age 0 mean fork length had increased to 93mm (sd=23.6, n=4). Age 1 steelhead were captured throughout the monitoring period. The mean fork length during the beginning of trapping (JW 13) was 91mm (sd=18.7, n=34). By the conclusion of the trapping period (JW 49) the mean fork length was 139mm (sd=11.3, n=2). The mean fork lengths for Age 2 and Age 3 steelhead did not show a consistent increase during the monitoring period. Age 2 mean fork lengths ranged from 150 to 220mm. Age 3 mean fork lengths ranged from 209 to 274mm. Hatchery steelhead were captured between JW 13 and JW 40. Hatchery fork lengths ranged from 130 to 248mm (Figure 17). No Age 2 hatchery fish were captured.

**Spring and Fall 1998:** A total of 1,074 steelhead were measured in 1998, between JW 16 and 47 (Appendix 36). Steelhead Age 0 were first observed during JW 22 with a fork length of 49mm. By the end of the monitoring period (JW 47) the Age 0 mean fork length had increased to 70mm (sd=9.8, n=13). Age 1 steelhead were captured throughout the monitoring period. The mean fork length during the beginning of trapping (JW 16) was 88mm (sd=22.9, n=7). By the conclusion of the trapping period (JW 47) the last steelhead captured measured 145mm. The mean fork lengths for Age 2 and Age 3 steelhead did not show a consistent increase during the monitoring period. Age 2 mean fork lengths ranged from 132 to 220mm. Age 3 mean fork lengths ranged from 225 to 280mm. Hatchery steelhead were captured between JW 16 and JW 40. Hatchery fork lengths ranged from 117 to 275mm. Two Age 2 hatchery fish were captured measuring 280 and 180mm during JW 27 and 46 respectively (Figure 17).

**Spring and Fall 1999:** A total of 3,108 steelhead were measured in 1999 between JW 11 and 39 (Appendix 38). Steelhead Age 0 were first observed during JW 23 with a fork length of 44mm. By the end of the monitoring period (JW 49) the Age 0 mean fork length had increased to 88mm (sd=13.4, n=28). Age 1 steelhead were captured throughout the monitoring period. The mean fork length during the beginning of trapping (JW 11) was 105mm (sd=15.1, n=3). By the conclusion of the trapping period (JW 40) the mean fork length was 140mm (sd=25.1, n=10). The mean fork lengths for Age 2 and Age 3 steelhead did not show a consistent increase during the monitoring period. Age 2 fork lengths ranged from 72 to 261mm. Age 3 fork lengths ranged from 170 to 400mm. Hatchery steelhead were captured between JW 12 and JW 27. Hatchery fork lengths ranged from 133 to 254mm

**Spring and Fall 2000:** A total of 859 steelhead were measured in 2000, between JW 20 and 40 (Appendix 40). Steelhead Age 0 were first observed during JW 21 with a fork length of 40mm (n=1). By the end of the monitoring period (JW 40) the Age 0 mean fork length had increased to 98mm (sd=15.7, n=6). Age 1 steelhead were captured throughout the monitoring period. The mean fork length during the beginning of trapping (JW 20) was 113mm (sd=31.9, n=29). By the conclusion of the trapping period (JW 40) a fork length of 152mm (n=1) was recorded. The mean fork lengths for age 2 and age 3 steelhead did not show a consistent increase during the monitoring period. Age 2 fork lengths ranged from 119mm to 215mm. Age 3 mean fork lengths ranged from 129mm to 210mm. Hatchery age 1 fish were captured from JW 20 through JW 24. Hatchery fork lengths ranged from 161mm to 235mm (Figure 17).

#### Chum Salmon

A total of three juvenile chum salmon (*Oncorhynchus keta*) were captured during the four years of monitoring from 1997-2000. All three were captured from the Trinity River at Willow Creek on June 21, 1999. Fork lengths measured 37, 38 and 40mm. No other chum observations were recorded (Appendix 41-47).

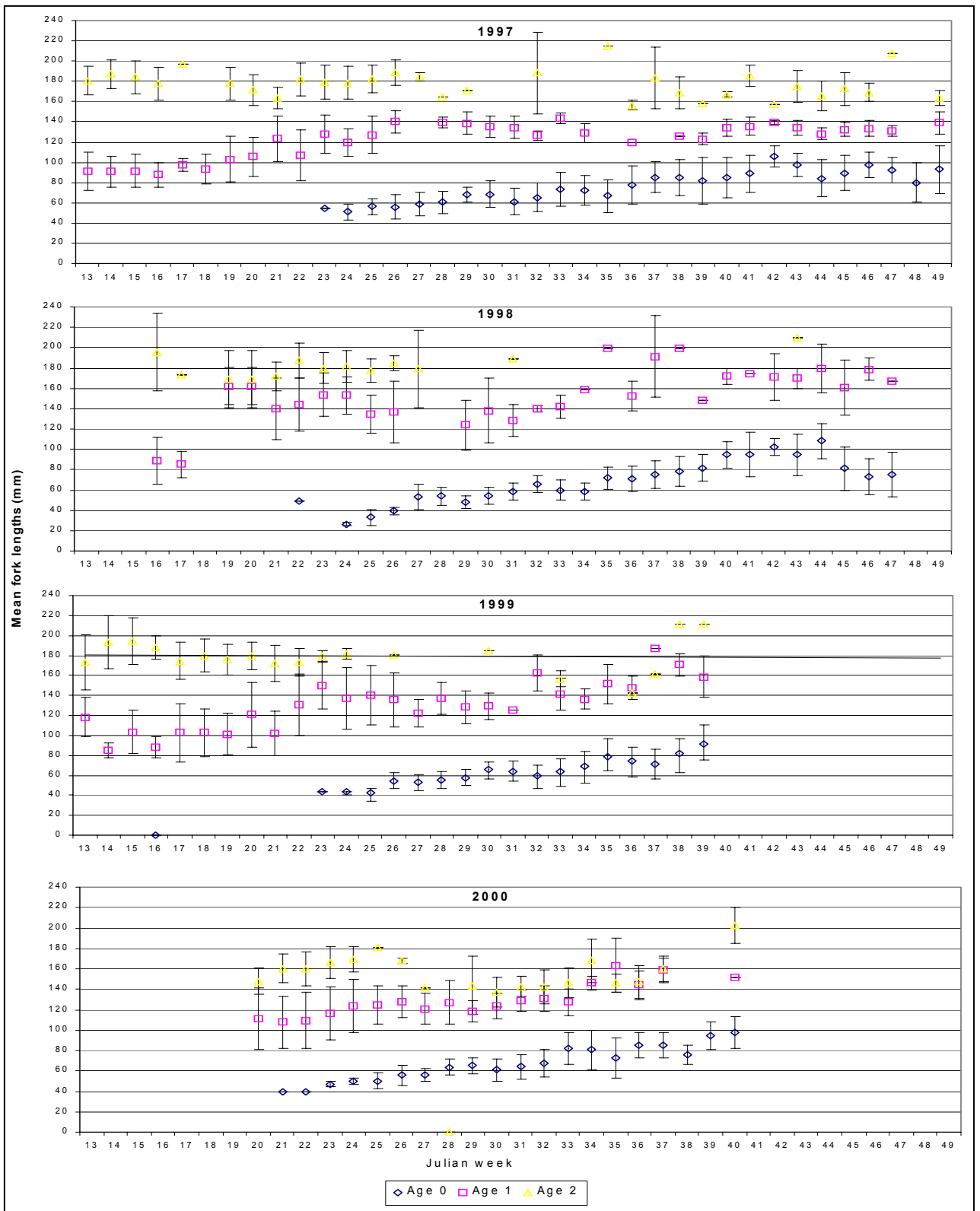


Figure 17. Mean lengths-at-age, standard deviation, and sample size by Julian week for natural steelhead at the WCT, 1997-2000

## Non-target Species

Non-salmonid fish species captured in the Big Bar and Willow Creek rotary traps were enumerated and measured during both spring and fall of the monitoring period. The total catch for individual species varied greatly between years (Table 21), and much of this variation is likely attributable to trapping duration and discharge. One other factor that may have affected catch rates was the variation in trap placement. A total of 13,766 non-target fish were captured in the WCT. These were comprised of 13 species from 10 families. Total catch for the BBT was 3,729 fish comprised of 13 species from 9 families. Six introduced and six endemic species were captured at both the BBT and WCT. The BBT and WCT had four of the six introduced species in common (Appendix 41-Appendix 48).

Table 21. Season catch totals of non-target fish species captured at the BBT and the WCT, 1997-2000.

			Total number captured								Trinity Total		Species Total		
			Klamath					Trinity							
			Days Trapped	126	96	116	93	Klamath Total	231	206					191
Common Name	Species	Status*	1997	1998	1999	2000	Klamath Total	1997	1998	1999	2000	Trinity Total	Species Total		
Klamath smallscale sucker	Catostomus rimiculus	N	1,930	388	285	132	2,735	6,403	1,923	1,045	514	9,885	12,620		
Pacific lamprey	Entosphenus tridentatus	NA	1,085	1,444	2,121	815	5,465	1,281	1,140	387	28	2,836	8,301		
Speckled dace	Rhinichthys osculus	N	618	147	167	130	1,062	950	385	476	519	2,330	3,392		
Sculpin	Cottus sp.	N	186	24	42	14	266	123	16	61	31	231	497		
Threespine stickleback	Gasterosteus aculeatus	N	6	0	0	0	6	103	13	58	197	371	377		
Green Sturgeon	Acipenser medirostris	N/A	127	9	80	10	226	49	16	0	0	65	291		
Golden shiner	Notemigonus crysoleucas	I	3	49	196	20	268	3	4	7	8	22	290		
sockeye salmon	Oncorhynchus nerka	O/A	0	0	0	0	0	17	30	223	13	283	283		
American shad	Alosa sapidissima	I/A	11	0	2	1	14	148	2	0	73	223	237		
Brown Bullhead	Ameirus sp.	I	3	5	2	1	11	6	0	32	1	39	50		
Brown trout	Salmo trutta	I	2	1	0	0	3	6	0	3	10	19	22		
fathead minnow	Pimephales promelas	I	2	0	2	9	13	0	0	0	0	0	13		
Green Sunfish	Lepomis cyanellus	I	0	1	2	0	3	5	1	1	0	7	10		
Crappie	Pomoxis sp.	I	2	0	1	0	3	0	0	0	0	0	3		
Largemouth bass	Micropterus salmoides	I	0	0	0	0	0	0	0	0	0	0	0		
Season Total			2,045	1,680	2,615	1,000	7,340	2,691	1,607	1,248	880	6,426	13,766		

\*N = native; O = occasional; A = anadromous; I = introduced.

To account for variation in weekly trapping effort and discharge, abundance indices were calculated for the more abundant non-target species in the same manner as was done for the salmonids. As with the salmonids, validity of this abundance index is contingent upon the assumption that catch rates are directly proportional to the percentage of river flow sampled. For fish emigrating downstream, such as the salmonid smolts, this assumption seems reasonable. However, this may not be the case for other species that are not actively emigrating, or for fish that preferentially use different parts of the river..

Weekly abundance indices were higher in the early part of the trapping season for many species. Because flows are higher during this period (sometimes several orders of magnitude), the higher indices may simply represent higher rates of “passive” fish displacement rather than “active” emigration. A brief discussion on each of the more abundant non-salmonid species captured in the Big Bar and Willow Creek rotary traps follows.

Due to the difficulty in identifying sculpin species, this group was identified to genus only. Potentially up to four species of sculpin could have been collected, with prickly sculpin *Cottus asper*, the most likely sculpin to be caught in both rivers. The coastrange sculpin *C. aleuticus* is probably also present in both rivers, but it is seldom as abundant as the prickly sculpin when they occur together (Moyle 1976). Marbled sculpin *C. klamathensis* are reportedly widely distributed in the Klamath River, and the reticulate sculpin *C. perplexus* may occasionally be found in the lower Klamath (Moyle 1976).

Sculpin captures were highest in the early part of the trapping season on both rivers and during all years, (Figures 20 - 23). In general, prickly and coastrange sculpin typically migrate downstream to breeding areas between January and March and may spawn between February and June (Moyle 1976). Thus, the high abundance index values early in the season likely reflect breeding related activity.

Speckled dace capture trends and numbers were variable between years and traps. Dace numbers at the WCT were less than the BBT, but were more consistent throughout the monitoring period. BBT dace numbers were greater than at WCT with a larger index being captured early in the monitoring period. Speckled dace numbers for 1997 at WCT and BBT do not show this trend. Catch numbers were larger and more consistent than 1998-2000, (Figures 20 - 23).

Four species of sucker are found in the Klamath drainage, Klamath smallscale sucker *Catostomus rimiculus*, Klamath largescale sucker *C. snyderi*, Lost River sucker *C. luxatus*, and shortnose sucker *Chasmistes brevirostris* (Moyle 1976). The Klamath smallscale sucker is the only sucker found in the Trinity River, and it is rare to find any other sucker species in the Klamath River below Klamath Falls (Moyle 1976). As such, all suckers captured were assumed to be of *C. rimiculus* species. Klamath largescale suckers are a relatively uncommon species found almost exclusively above Klamath Falls, though there are a few records for the lower Klamath River (Moyle 1976). Shortnose and Lost River suckers are confined to lakes and their tributaries in the upper Klamath drainage (Moyle 1976). Klamath smallscale suckers, almost all of which were juveniles, were the most frequently captured non-salmonid species at the WCT and second most captured at the BBT (Figures 20 - 23).

Threespine stickleback capture rates varied dramatically between rivers and monitoring years. On the Klamath, few sticklebacks were captured during 1997-2000. On the Trinity, stickleback captures were sporadic until May or June (JW 20-25) after which catches began to increase. Numbers peaked around August (JW 35). Stickleback numbers for the 1998 monitoring period on the Trinity do not conform to this trend (Figures 20-23).

Three different life history stages of Pacific lamprey were captured: ammocetes, eyed juveniles, and adults. Pacific lamprey ammocetes are a non-parasitic larval stage that are categorized by lack of developed eyes. Most ammocetes were captured between April and July, (Figures 18 and 19). All ammocete larvae captured in the traps were most likely Age 0, which often move downstream with the current to areas of greater organic bottom debris, where they take up a filter feeding existence and remain buried several years as a larval stage (M<sup>c</sup>Ginnis 1984). Metamorphosis to a macrophthalmia stage (obvious morphological change [i.e. eyes and lateral tooth plates]) marks the onset of parasitic feeding (Hardisty and Potter 1971, *in* Beamish 1980). Eyed juveniles were captured at both traps during their downstream migration throughout all trapping seasons. Catch numbers peaked in late May and early June (JW 18-24) for the BBT, while the peak of the WCT catch occurred during October to December, (JW 40-49) (Figures 18 and 19). Catch numbers for eyed juveniles were much greater for the periods of 1997 and 1998. Adult lamprey were captured during or following their spawning migration, primarily between late April (JW 17) and late July (JW 26), and looked to be in post-spawning condition (Figures 18 and 19).

American shad, a non-native anadromous species, spawn in the Trinity and Klamath Rivers annually. Live adults are rarely captured in the rotary traps but are commonly observed by crews in the late spring/early summer. Emigrating Age 0 were captured primarily between August (JW 32) and October (JW 44) on the Trinity River and very few on the Klamath.

Juvenile sturgeon were captured in two of the four monitoring periods at the WCT. Fifty nine juveniles were captured in 1997, sixteen in 1998, zero in 1999 and 2000. In 1997 captures occurred from mid May (JW 25) to late July (JW 31). In 1998 captures ranged from late July (JW 31) to mid October (JW 43). Total lengths ranged from 32 to 143mm. Juvenile sturgeon were present in trap catches as late as October (JW 43). (Figures 20 - 23).

Juvenile sturgeon were captured in all four of the monitoring periods at the BBT. One hundred and twenty seven were captured in 1997, only nine were captured in 1997, eighty were captured in 1999, and only ten were captured in 2000. In all years captures ranged from early May (JW 18) to mid August (JW 33), (Figures 20 - 23). Total lengths ranged from 22 to 400mm.



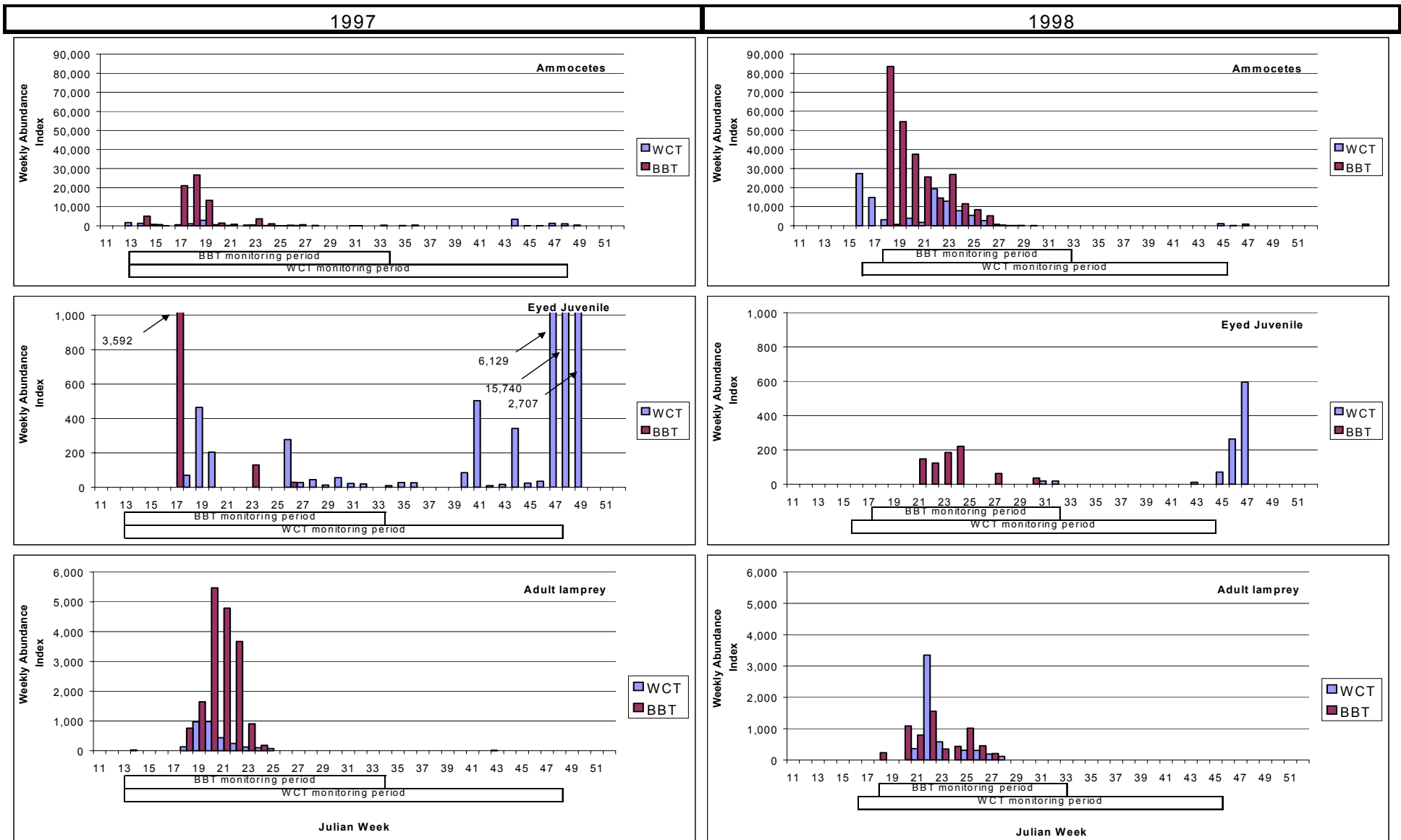


Figure 18. Weekly abundance index totals for lamprey ammocetes, eyed-juveniles, and adults captured at the BBT and WCT, 1997-1998.

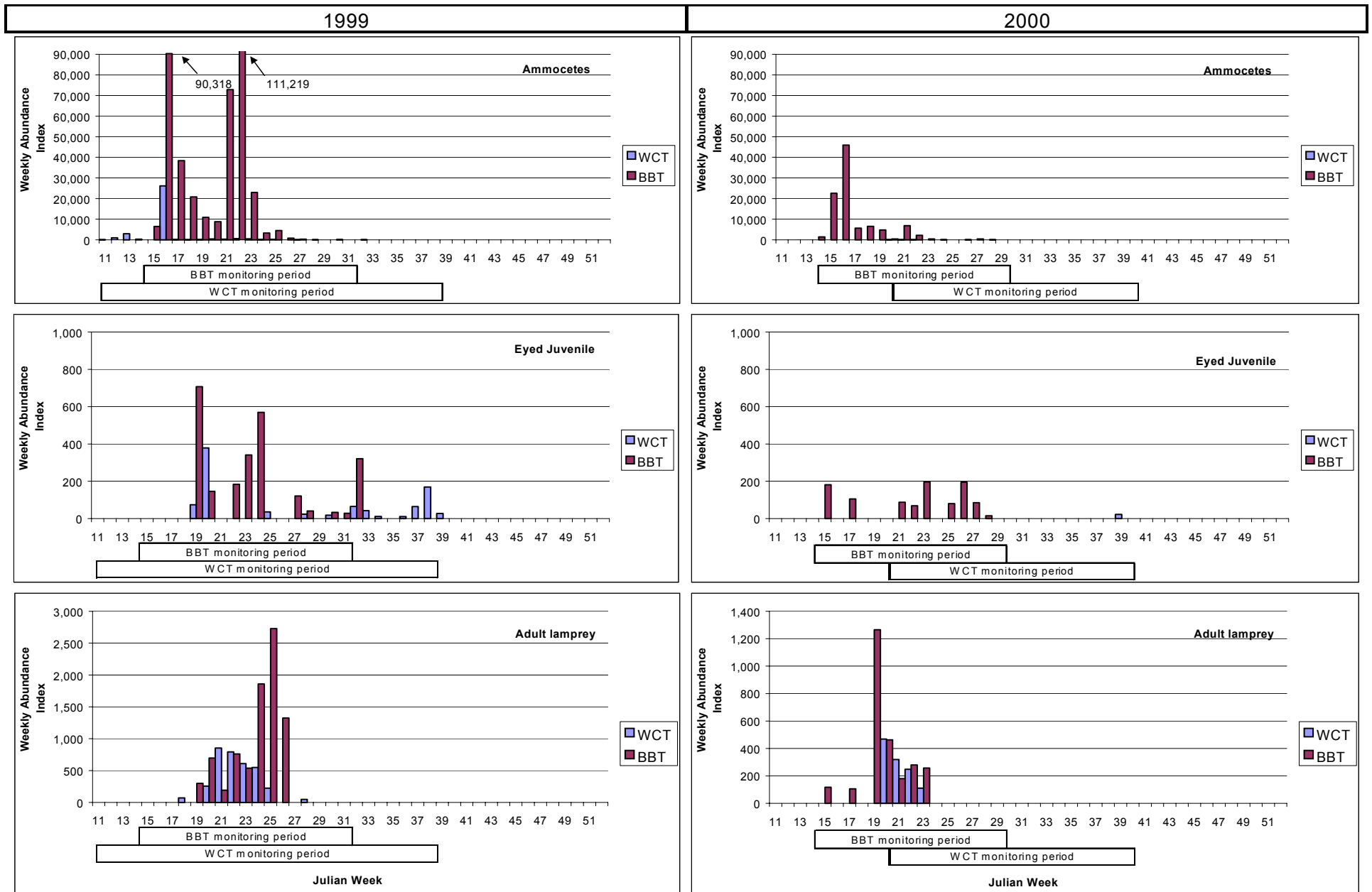


Figure 19. Weekly abundance index totals for lamprey ammocetes, eyed-juveniles, and adults captured at the BBT and WCT, 1999-2000.

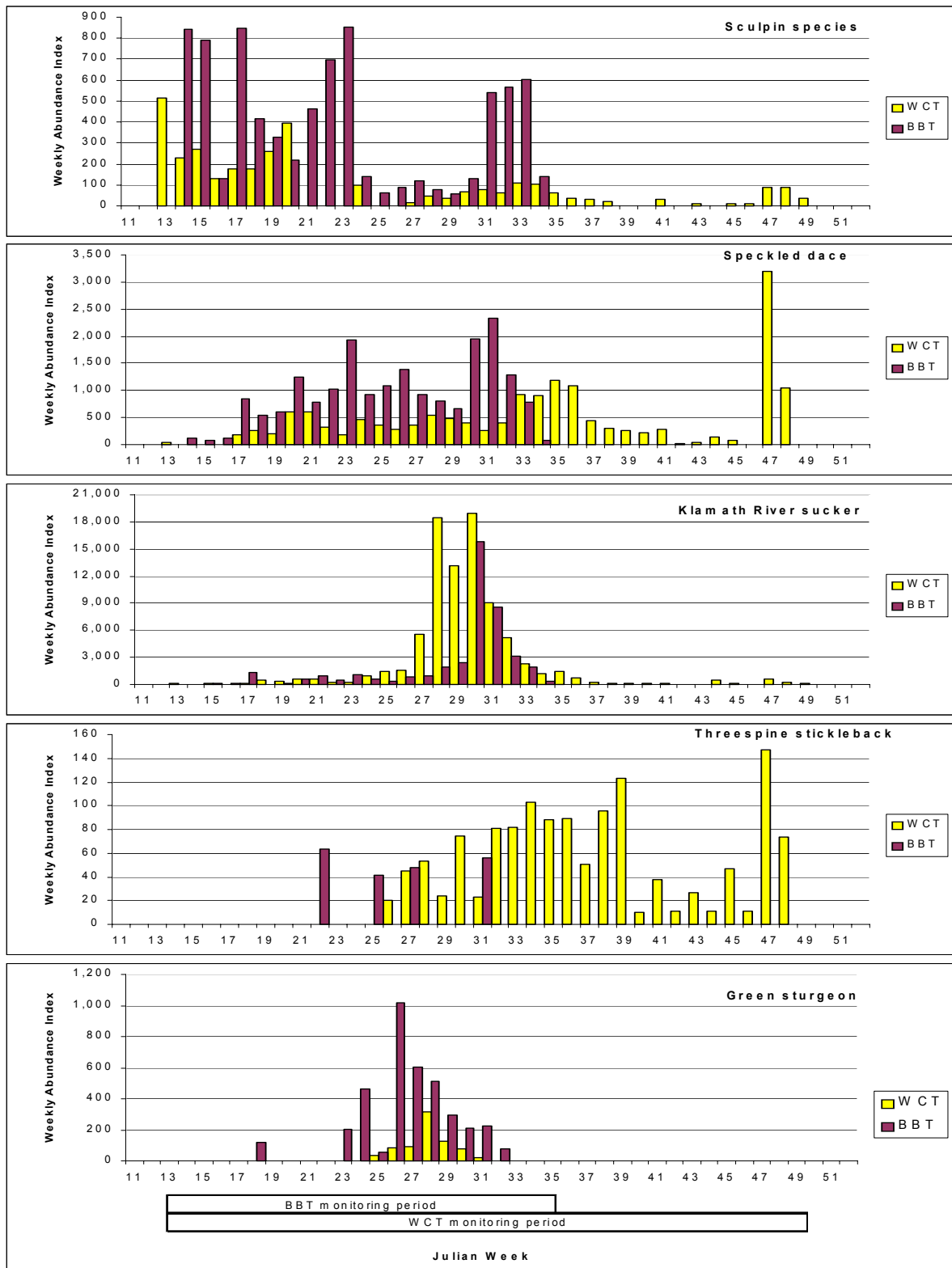


Figure 20. Non-Target Species abundance index at the BBT and WCT, 1997.

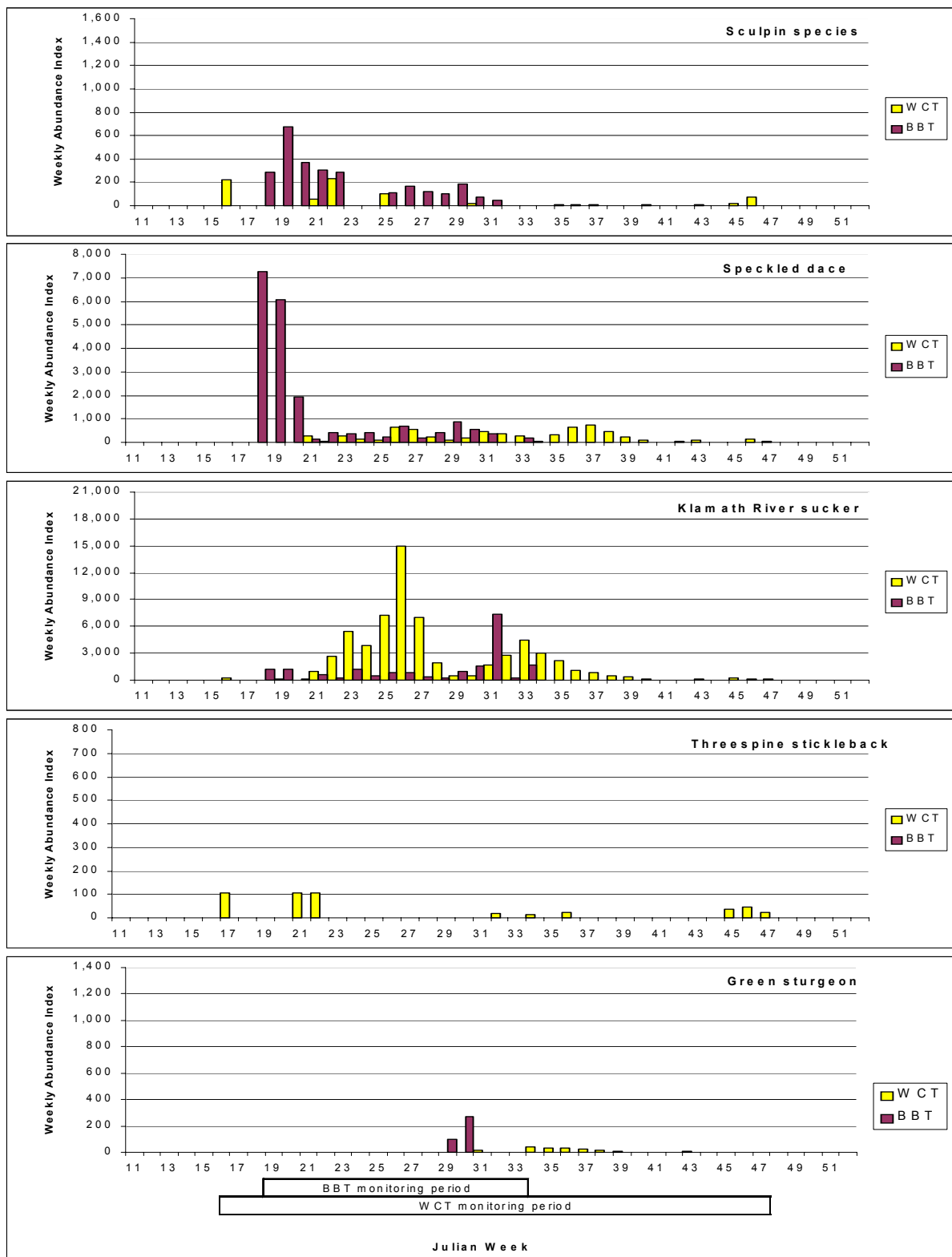


Figure 21. Non-Target Species abundance index at the BBT and WCT, 1998.

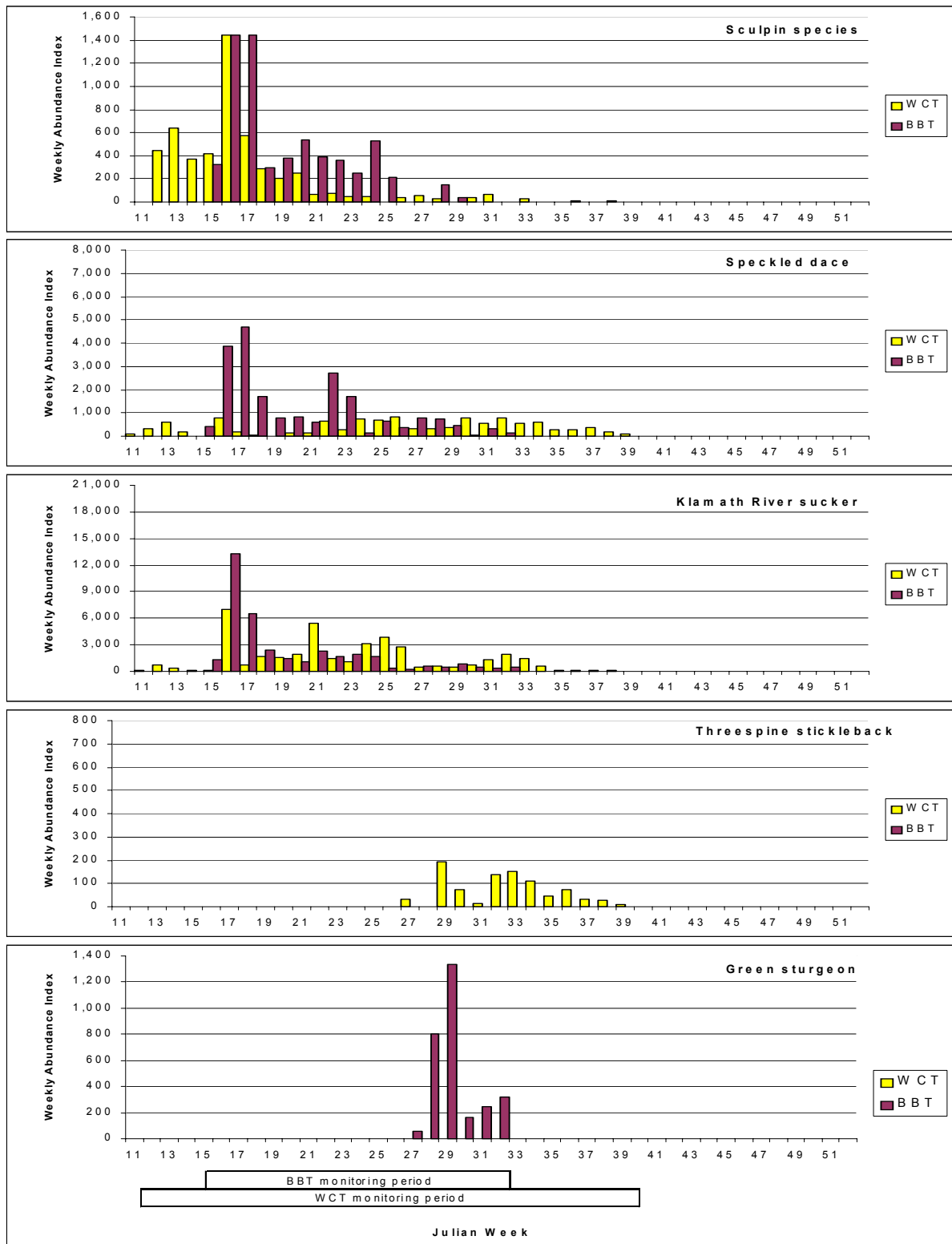


Figure 22. Non-Target Species abundance index at the BBT and WCT, 1999.

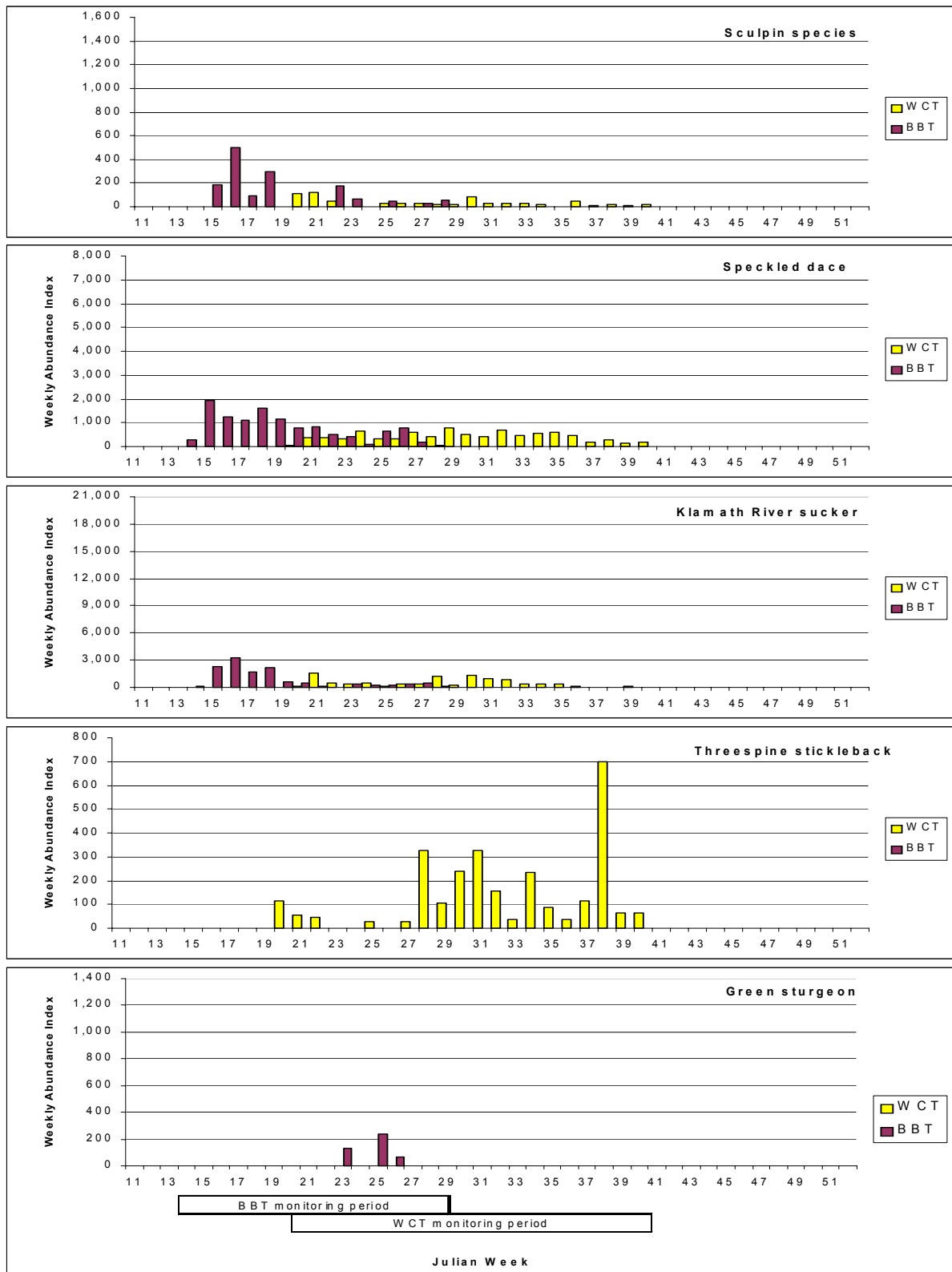


Figure 23. Non-Target Species abundance index at the BBT and WCT, 2000.

## Recommendations

Rotary screw traps have proven to be an effective tool in assessing juvenile salmonid downstream migration. Traps can sample a large volume of water 24 hours a day, and can handle large amounts of debris. However, on large rivers such as the Klamath and Trinity, only a very small portion of the total river flow can be effectively sampled. Thus, an unknown portion of downstream migrants pass the traps unsampled, making it difficult to estimate the true population. Currently AFWO uses the trapping data to develop an abundance index that is used to compare relative abundance of fish caught at a particular site over time. The index method must be used because river flows, and thus the proportion of the flow sampled, vary daily. One assumption of the index is that the catch at the trapping site is directly proportional to the proportion of flow sampled. It is not known to what degree this assumption may be violated, but it likely depends on the trapping site. Currently, the abundance index does not account for other factors that may affect emigration and trapping efficiency, such as moon phase, temperature, turbidity, etc.

If known numbers of marked fish were released an appropriate distance above a trap each day the trap was operating, changes in flow, moon phase, temperature, turbidity, and other factors would not be an issue, and an actual population estimate could be made. The proportion of marked fish caught would then provide an estimate of trap efficiency for that particular day which could then be applied to the catch of unmarked fish to estimate the number of unmarked fish that passed the trap unsampled. The proportion of marked fish captured each day may vary according to a myriad of factors, but what those factors are and how much each one affects the catch does not need to be known to calculate the population estimate.

The AFWO has conducted varying numbers of efficiency tests each year at the WCT since 1989 (U.S. Fish and Wildlife Service 1991, 1992, 1994, 1998). Calculated efficiencies have ranged from 0% to 17.6% (0=3.61%). Several attempts to conduct efficiency tests on the Klamath River were aborted due to low catches, poor fish health and associated high mortalities (U.S. Fish and Wildlife Service 1991, 1992,).

A major obstacle to conducting valid efficiency tests on both rivers is lack of adequate fish capture in one day for a single marking event (U.S. Fish and Wildlife Service 1991, 1992, 1994, 1998). One or two day marking events have been desirable because of the extra manpower and equipment required to mark, transport, hold and release fish upstream, in addition to the regular trapping duties. Fish marked at the trap must be transported a sufficient distance upstream to allow random mixing with unmarked fish prior to their arrival at the trap. Also, the fish must be held in pens at the release site until dark.

One way to avoid many of the above problems would be to run two screw traps in the same river a relatively short distance apart. Fish captured at the upstream trap would be measured and marked (using a different mark each JW), then released. Captures of marked fish at the downstream trap would be used to calculate trap efficiency. This method was used successfully by Dempson and Stansbury (1991). The distance between the traps should be great enough to allow for random mixing of marked and unmarked fish, but close enough so that between trap mortality is negligible. It would also be desirable to have the traps far enough apart so that fish released in the morning or afternoon could not arrive at the trap before nightfall. One possibility would be to mark fish at the current WCT location and recapture somewhere downstream in the Hoopa Valley.

The AFWO recommends the continuation of annual rotary trapping programs to collect data used to assess: hatchery and natural contributions, salmonid abundance indices, size and emigration rate relationships and emigration duration. The traps also provide fish for health and disease assessment. Collecting abundance data on non-target species may also provide additional insight into the health of the Klamath River Basin.

The continuance of juvenile salmon monitoring may enable fisheries biologists a means of relating natural juvenile abundance indices and adult escapement estimates. Monitoring also provides information regarding the effects of water resource management policies on juvenile salmonid emigration. Such data are necessary for effectively implementing an "adaptive management" approach that will best meet the water needs of the fishery and various interests.



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Appendix 2. BBT weekly coho catch, abundance total and hatchery contribution, 1997.

Week Starting	Julian Week	Mean River Flow	Trap Days	WEEKLY COHO CATCH					WEEKLY COHO INDEX TOTALS				Cumulative Index (%)			
				Hatchery Age 1 (LMAX)	Natural		Catch Total	CPUE	Hatchery Age 1 (LMAX)	Natural		Index Total	Hat Age 1	Nat Age 1	Nat Age 0	
					Age 1	Age 0				Age 1	Age 0					
03/12/1997	11	11,571	0													
03/19/1997	12	12,043	0													
03/26/1997	13	10,720	1	0	0	0	0	0.0	0	0	0	0	0%	0%	0%	
04/02/1997	14	8,510	4	0	0	0	0	0.0	0	0	0	0	0%	0%	0%	
04/09/1997	15	7,123	4	0	0	0	0	0.0	0	0	0	0	0%	0%	0%	
04/16/1997	16	12,576	1	0	0	0	0	0.0	0	0	0	0	0%	0%	0%	
04/23/1997	17	15,557	6	0	2	1	3	0.5	0	280	131	412	0%	22%	16%	
04/30/1997	18	12,943	7	0	0	0	0	0.0	0	0	0	0	0%	22%	16%	
05/07/1997	19	9,553	7	0	3	0	3	0.4	0	275	0	275	0%	44%	16%	
05/14/1997	20	8,014	7	1	3	0	4	0.6	68	238	0	306	35%	63%	16%	
05/21/1997	21	6,327	7	0	2	3	5	0.7	0	130	190	319	35%	73%	40%	
05/28/1997	22	5,821	7	2	1	5	8	1.1	128	65	319	512	100%	78%	79%	
06/04/1997	23	5,734	7	0	1	0	1	0.1	0	68	0	68		83%	79%	
06/11/1997	24	4,577	7	0	4	3	7	1.0	0	187	139	326		98%	96%	
06/18/1997	25	3,654	7	0	0	0	0	0.0	0	0	0	0		98%	96%	
06/25/1997	26	3,334	7	0	0	0	0	0.0	0	0	0	0		98%	96%	
07/02/1997	27	2,893	7	0	1	1	2	0.3	0	24	31	56		100%	100%	
07/09/1997	28	2,454	6	0	0	0	0	0.0	0	0	0	0				
07/16/1997	29	2,180	7	0	0	0	0	0.0	0	0	0	0				
07/23/1997	30	2,031	7	0	0	0	0	0.0	0	0	0	0				
07/30/1997	31	2,099	7	0	0	0	0	0.0	0	0	0	0				
08/06/1997	32	2,090	7	0	0	0	0	0.0	0	0	0	0				
08/13/1997	33	1,981	5	0	0	0	0	0.0	0	0	0	0				
08/20/1997	34	2,144	1	0	0	0	0	0.0	0	0	0	0				
08/27/1997	35	2,124	0													
09/03/1997	36	1,963	0													
09/10/1997	37	2,217	0													
09/17/1997	38	2,434	0													
09/24/1997	39	2,063	0													
10/01/1997	40	2,794	0													
10/08/1997	41	4,283	0													
10/15/1997	42	3,493	0													
10/22/1997	43	3,060	0													
10/29/1997	44	4,431	0													
11/05/1997	45	4,177	0													
11/12/1997	46	4,294	0													
11/19/1997	47	6,594	0													
11/26/1997	48	7,173	0													
12/03/1997	49	6,150	0													
12/10/1997	50	6,030	0													
12/17/1997	51	9,153	0													
12/24/1997	52	5,803	0													
Spring total			126	3	17	13	33			196	1,268	811	2,274	<b>8.6%</b>		
Fall total																
Total			126	3	17	13	33	0.0		196	1,268	811	2,274	<b>8.6%</b>		



Appendix 4. BBT weekly chinook catches, abundance index totals and hatchery contributions, 1998.

Week Starting	Julian Week	Mean River Flow (cfs)	Trap Days	WEEKLY CHINOOK CATCH							WEEKLY CHINOOK INDEX TOTALS					Cumulative Index (%)			(%) Hat			
				Hatchery		Natural	Age 1		Catch Total	CPUE	Hatchery		Natural	Age 1		Index Total	Nat Age 0	Hat Age 0	Age 1	Hat Age 0		
				Age 0	Age 0	Age 0	Age 1	Age 0			Age 0	Age 0	Age 1									
				NC	AD	NC	NC	AD	NC	AD	NC	AD	NC	NC	AD							
03/12/1998	11	19,814	0																			
03/19/1998	12	48,414	0																			
03/26/1998	13	29,871	0																			
04/02/1998	14	21,429	0																			
04/09/1998	15	17,657	0																			
04/16/1998	16	14,986	0																			
04/23/1998	17	16,271	0																			
04/30/1998	18	20,429	7		0	0		1	4	0	5	1	0	0	117	1,073	0	1,190	0.01%	0.00%	0%	
05/07/1998	19	20,900	7		0	0		6	0	0	6	1	0	0	1,436	0	0	1,436	0.18%	0.00%	0%	
05/14/1998	20	16,829	7		0	0		11	0	2	13	2	0	0	1,789	0	309	2,098	0.38%	0.00%	0%	
05/21/1998	21	16,686	7		0	0		17	1	0	18	3	0	0	2,766	159	0	2,926	0.70%	0.00%	0%	
05/28/1998	22	18,314	7		0	0		33	1	0	34	5	0	0	4,898	138	0	5,036	1.26%	0.00%	0%	
06/04/1998	23	18,971	7		0	0		67	2	0	69	10	0	0	14,287	339	0	14,626	2.89%	0.00%	0%	
06/11/1998	24	16,614	7		26	1		984	1	0	1,012	145	2,789	110	134,443	160	0	137,501	18.28%	0.28%	2%	
06/18/1998	25	12,086	7		4,117	193		1,991	0	0	6,301	900	429,401	19,896	216,743	0	0	666,039	43.07%	43.56%	67%	
06/25/1998	26	9,083	7		2,770	121		1,123	0	0	4,014	573	214,351	9,395	92,617	0	0	316,363	53.67%	65.11%	71%	
07/02/1998	27	7,323	7		2,356	95		1,128	0	0	3,579	511	147,059	5,948	68,679	0	0	221,686	61.53%	79.85%	69%	
07/09/1998	28	5,751	7		2,367	93		3,736	0	0	6,196	885	117,241	4,612	190,671	0	0	312,524	83.34%	91.58%	39%	
07/16/1998	29	4,556	7		1,929	79		2,448	0	0	4,456	637	74,614	3,072	93,665	0	0	171,350	94.06%	99.07%	45%	
07/23/1998	30	4,113	5		178	7		982	0	0	1,167	233	8,542	336	44,209	0	0	53,088	99.12%	99.92%	17%	
07/30/1998	31	3,224	5		25	1		171	0	0	197	39	778	31	7,440	0	0	8,248	99.97%	100.00%	10%	
08/06/1998	32	2,734	2		0	0		0	0	0	0	0	0	0	0	0	0	0	99.97%		0%	
08/13/1998	33	2,429	1		0	0		10	0	0	10	10	0	0	295	0	0	295	100.00%		0%	
08/20/1998	34	2,264	0																		0%	
08/27/1998	35	2,127	0																		0%	
09/03/1998	36	2,327	0																		0%	
09/10/1998	37	2,387	0																		0%	
09/17/1998	38	2,357	0																		0%	
09/24/1998	39	2,404	0																		0%	
10/01/1998	40	2,430	0																		0%	
10/08/1998	41	2,636	0																		0%	
10/15/1998	42	2,583	0																		0%	
10/22/1998	43	2,811	0																		0%	
10/29/1998	44	2,851	0																		0%	
11/05/1998	45	3,626	0																		0%	
11/12/1998	46	4,254	0																		0%	
11/19/1998	47	23,661	0																		0%	
11/26/1998	48	21,643	0																		0%	
12/03/1998	49	19,571	0																		0%	
12/10/1998	50	12,357	0																		0%	
12/17/1998	51	10,451	0																		0%	
12/24/1998	52	9,044	0																		0%	
Spring total				97	13,768	591	12,708	9	2	27,077			994,774	43,399	874,056	1,869	309	1,914,406			54%	
Fall total																						
Total				97	13,768	591	12,708	9	2	27,077			994,774	43,399	874,056	1,869	309	1,914,406			54%	

Appendix 5. BBT weekly coho catch, abundance total and hatchery contribution, 1998.

Week Starting	Julian Week	Mean River Flow	Trap Days	WEEKLY COHO CATCH					WEEKLY COHO INDEX TOTALS				Cumulative Index (%)			
				Hatchery Age 1 (LMAX)	Natural		Catch Total	CPUE	Hatchery Age 1 (LMAX)	Natural		Index Total	Hat Age 1	Nat Age 1	Nat Age 0	
					Age 1	Age 0				Age 1	Age 0					
03/12/1998	11	19,814	0													
03/19/1998	12	48,414	0													
03/26/1998	13	29,871	0													
04/02/1998	14	21,429	0													
04/09/1998	15	17,657	0													
04/16/1998	16	14,986	0													
04/23/1998	17	16,271	0													
04/30/1998	18	20,429	7	0	0	2	2	0.3	0	0	566	566	0%	0%	36%	
05/07/1998	19	20,900	7	0	0	0	0	0.0	0	0	0	0	0%	0%	36%	
05/14/1998	20	16,829	7	0	0	3	3	0.4	0	0	481	481	0%	0%	66%	
05/21/1998	21	16,686	7	1	0	0	1	0.1	230	0	0	230	62%	0%	66%	
05/28/1998	22	18,314	7	0	0	0	0	0.0	0	0	0	0	62%	0%	66%	
06/04/1998	23	18,971	7	0	0	0	0	0.0	0	0	0	0	62%	0%	66%	
06/11/1998	24	16,614	7	1	1	0	2	0.3	138	160	0	298	100%	100%	66%	
06/18/1998	25	12,086	7	0	0	2	2	0.3	0	0	205	205			79%	
06/25/1998	26	9,083	7	0	0	1	1	0.1	0	0	97	97			85%	
07/02/1998	27	7,323	7	0	0	3	3	0.4	0	0	188	188			97%	
07/09/1998	28	5,751	7	0	0	1	1	0.1	0	0	43	43			100%	
07/16/1998	29	4,556	7	0	0	0	0	0.0	0	0	0	0				
07/23/1998	30	4,113	5	0	0	0	0	0.0	0	0	0	0				
07/30/1998	31	3,224	5	0	0	0	0	0.0	0	0	0	0				
08/06/1998	32	2,734	2	0	0	0	0	0.0	0	0	0	0				
08/13/1998	33	2,429	1	0	0	0	0	0.0	0	0	0	0				
08/20/1998	34	2,264	0													
08/27/1998	35	2,127	0													
09/03/1998	36	2,327	0													
09/10/1998	37	2,387	0													
09/17/1998	38	2,357	0													
09/24/1998	39	2,404	0													
10/01/1998	40	2,430	0													
10/08/1998	41	2,636	0													
10/15/1998	42	2,583	0													
10/22/1998	43	2,811	0													
10/29/1998	44	2,851	0													
11/05/1998	45	3,626	0													
11/12/1998	46	4,254	0													
11/19/1998	47	23,661	0													
11/26/1998	48	21,643	0													
12/03/1998	49	19,571	0													
12/10/1998	50	12,357	0													
12/17/1998	51	10,451	0													
12/24/1998	52	9,044	0													
Spring total			97	2	1	12	15		368	160	1,580	2,108	17.5%			
Fall total																
Total			97	2	1	12	15		368	160	1,580	2,108	17.5%			





Appendix 7. BBT weekly chinook catches, abundance index totals and hatchery contributions, 1999.

Week Starting	Julian Week	Mean River Flow (cfs)	Trap Days	WEEKLY CHINOOK CATCH							WEEKLY CHINOOK INDEX TOTALS										
				Hatchery		Natural	Age 1		Catch Total	CPUE	Hatchery		Natural	Age 1		Index Total	Cumulative Index (%)			(% Hat Age 0)	
				Age 0		Age 0	NC	AD			Age 0		NC	AD	Age 0		NC	AD	Age 0		Age 1
				NC	AD	NC			NC	AD	NC	AD				NC				AD	
03/12/1999	11	20,457	0																		
03/19/1999	12	21,171	0																		
03/26/1999	13	17,843	0																		
04/02/1999	14	16,229	0																		
04/09/1999	15	15,357	4	0	0	2	0	0	2	1	0	0	370	0	0	370	0.1%	0.0%		0%	
04/16/1999	16	22,071	7	0	0	50	0	0	50	7	0	0	1,998	0	0	1,998	0.6%	0.0%		0%	
04/23/1999	17	20,743	7	0	0	17	1	0	18	3	0	0	3,155	188	0	3,343	1.5%	0.0%		0%	
04/30/1999	18	16,914	7	0	0	5	0	0	5	1	0	0	882	0	0	882	1.8%	0.0%		0%	
05/07/1999	19	15,086	7	0	0	8	0	0	8	1	0	0	1,117	0	0	1,117	2.1%	0.0%		0%	
05/14/1999	20	15,043	7	0	0	12	0	0	12	2	0	0	1,710	0	0	1,710	2.5%	0.0%		0%	
05/21/1999	21	20,200	4	0	0	5	0	0	5	1	0	0	726	0	0	726	2.7%	0.0%		0%	
05/28/1999	22	17,943	7	0	0	3	2	0	5	1	0	0	489	394	0	882	2.9%	0.0%		0%	
06/04/1999	23	12,029	7	0	0	12	0	0	12	2	0	0	1,386	0	0	1,386	3.2%	0.0%		0%	
06/11/1999	24	12,443	7	0	0	185	0	0	185	26	0	0	19,086	0	0	19,086	8.5%	0.0%		0%	
06/18/1999	25	10,583	7	0	0	181	0	0	181	26	0	0	18,923	0	0	18,923	13.7%	0.0%		0%	
06/25/1999	26	7,783	7	0	0	391	0	0	391	56	0	0	29,675	0	0	29,675	21.8%	0.0%		0%	
07/02/1999	27	5,409	7	283	12	1,036	0	0	1,331	190	13,025	556	56,125	0	0	69,707	37.2%	3.1%		19%	
07/09/1999	28	4,271	7	8,022	343	3,736	0	0	12,101	1,729	332,304	14,193	156,100	0	0	502,597	79.9%	83.2%		69%	
07/16/1999	29	3,401	7	1,175	50	1,279	0	0	2,504	358	40,155	1,715	44,677	0	0	86,548	92.1%	92.8%		48%	
07/23/1999	30	2,950	7	696	31	668	0	0	1,394	199	21,206	931	20,847	0	0	42,984	97.9%	97.9%		52%	
07/30/1999	31	2,579	7	310	14	230	0	0	554	79	8,535	389	6,305	0	0	15,229	99.6%	100.0%		59%	
08/06/1999	32	2,426	5	0	0	57	0	0	57	11	0	0	1,509	0	0	1,509	100.0%			0%	
08/13/1999	33	2,184	0																		
08/20/1999	34	2,007	0																		
08/27/1999	35	1,986	0																		
09/03/1999	36	2,039	0																		
09/10/1999	37	1,979	0																		
09/17/1999	38	1,949	0																		
09/24/1999	39	1,921	0																		
10/01/1999	40	2,574	0																		
10/08/1999	41	2,613	0																		
10/15/1999	42	2,567	0																		
10/22/1999	43	3,133	0																		
10/29/1999	44	3,792	0																		
11/05/1999	45	4,065	0																		
11/12/1999	46	4,776	0																		
11/19/1999	47	5,893	0																		
11/26/1999	48	6,999	0																		
12/03/1999	49	6,657	0																		
12/10/1999	50	6,358	0																		
12/17/1999	51	5,218	0																		
12/24/1999	52	5,337	0																		
Spring total			118	10,485	450	7,877	3	0	18,815		415,227	17,785	365,081	582	0	798,674				54%	
Fall total																					
Total			118	10,485	450	7,877	3	0	18,815		415,227	17,785	365,081	582	0	798,674				54%	

Appendix 8. BBT weekly coho catch, abundance total and hatchery contribution, 1999.

Week Starting	Julian Week	Mean River Flow	Trap Days	WEEKLY COHO CATCH					WEEKLY COHO INDEX TOTALS				Cumulative Index (%)				
				Hatchery Age 1 (LMAX)	Natural		Catch Total	CPUE	Hatchery Age 1 (LMAX)	Natural		Index Total	Hat Age 1	Nat Age 1	Nat Age 0		
					Age 1	Age 0				Age 1	Age 0						
03/12/99	11	20,457	0														
03/19/99	12	21,171	0														
03/26/99	13	17,843	0														
04/02/99	14	16,229	0														
04/09/99	15	15,357	4	0	0	0	0	0.0		0	0	0	0	0%	0%	0%	
04/16/99	16	22,071	7	0	0	2	2	0.3		0	0	447	447	0%	0%	8%	
04/23/99	17	20,743	7	0	0	6	6	0.9		0	0	1,196	1,196	0%	0%	29%	
04/30/99	18	16,914	7	0	0	4	4	0.6		0	0	642	642	0%	0%	41%	
05/07/99	19	15,086	7	0	0	1	1	0.1		0	0	118	118	0%	0%	43%	
05/14/99	20	15,043	7	0	0	4	4	0.6		0	0	535	535	0%	0%	53%	
05/21/99	21	20,200	4	0	0	2	2	0.5		0	0	482	482	0%	0%	61%	
05/28/99	22	17,943	7	3	2	1	6	0.9		565	288	200	1,052	64%	63%	65%	
06/04/99	23	12,029	7	1	0	4	5	0.7		132	0	489	621	79%	63%	74%	
06/11/99	24	12,443	7	1	0	5	6	0.9		114	0	506	620	92%	63%	83%	
06/18/99	25	10,583	7	0	1	5	6	0.9		0	95	573	668	92%	84%	93%	
06/25/99	26	7,783	7	1	1	3	5	0.7		74	74	326	475	100%	100%	99%	
07/02/99	27	5,409	7	0	0	1	1	0.1		0	0	63	63			100%	
07/09/99	28	4,271	7	0	0	0	0	0.0		0	0	0	0				
07/16/99	29	3,401	7	0	0	0	0	0.0		0	0	0	0				
07/23/99	30	2,950	7	0	0	0	0	0.0		0	0	0	0				
07/30/99	31	2,579	7	0	0	0	0	0.0		0	0	0	0				
08/06/99	32	2,426	5	0	0	0	0	0.0		0	0	0	0				
08/13/99	33	2,184	0														
08/20/99	34	2,007	0														
08/27/99	35	1,986	0														
09/03/99	36	2,039	0														
09/10/99	37	1,979	0														
09/17/99	38	1,949	0														
09/24/99	39	1,921	0														
10/01/99	40		0														
10/08/99	41		0														
10/15/99	42		0														
10/22/99	43		0														
10/29/99	44		0														
11/05/99	45		0														
11/12/99	46		0														
11/19/99	47		0														
11/26/99	48		0														
12/03/99	49		0														
12/10/99	50		0														
12/17/99	51		0														
12/24/99	52		0														
Spring total			118	6	4	38	48			885	457	5,576	6,918	12.8%			
Fall total																	
Total			118	6	4	38	48			885	457	5,576	6,918	12.8%			



Appendix 10. BBT weekly chinook catches, abundance index totals and hatchery contributions, 2000.

Week Starting	Julian Week	Mean River Flow (cfs)	Trap Days	WEEKLY CHINOOK CATCH								WEEKLY CHINOOK INDEX TOTALS						Cumulative Index (%)			(%) Hat
				Hatchery		Natural		Age 1		Catch Total	CPUE	Hatchery		Natural		Age 1	Index Total	Nat Age 0	Hat Age 0	Age 1	Age 0
				Age 0		Age 0		Age 1				Age 0		Age 0							
				NC	AD	NC	AD	NC	AD	NC	AD	NC	AD	NC	AD	NC	AD	NC	AD	NC	AD
03/12/00	11	14,243	0																		
03/19/00	12	12,843	0																		
03/26/00	13	11,071	0																		
04/02/00	14	12,529	1	0	0	2	0	0	2	2	0	0	854	0	0	854	0.3%	0.0%	0%		
04/09/00	15	13,257	6	0	0	32	0	0	32	5	0	0	4,470	0	0	4,470	1.9%	0.0%	0%		
04/16/00	16	12,543	7	0	0	20	0	0	20	3	0	0	3,887	0	0	3,887	3.2%	0.0%	0%		
04/23/00	17	11,373	7	0	0	17	1	0	18	3	0	0	1,812	100	0	1,912	3.9%	0.0%	0%		
04/30/00	18	10,306	7	0	0	10	2	0	12	2	0	0	1,386	209	0	1,595	4.3%	0.0%	0%		
05/07/00	19	9,934	7	0	0	18	2	0	20	3	0	0	1,838	214	0	2,052	5.0%	0.0%	0%		
05/14/00	20	8,869	7	0	0	12	2	0	14	2	0	0	1,091	167	0	1,258	5.4%	0.0%	0%		
05/21/00	21	10,647	7	0	0	17	0	0	17	2	0	0	1,571	0	0	1,571	5.9%	0.0%	0%		
05/28/00	22	7,804	7	6	1	29	1	0	37	5	413	69	2,370	86	0	2,938	6.7%	0.2%	17%		
06/04/00	23	6,519	7	0	0	218	0	0	218	31	0	0	13,954	0	0	13,954	11.6%	0.2%	0%		
06/11/00	24	5,807	7	10	1	1,355	0	0	1,366	195	562	56	74,024	0	0	74,642	37.5%	0.5%	1%		
06/18/00	25	4,060	7	976	41	3,340	0	0	4,357	622	36,736	1,544	135,325	0	0	173,605	84.8%	17.5%	22%		
06/25/00	26	3,053	6	3,486	150	938	0	0	4,574	762	169,043	7,299	38,275	0	0	214,617	98.1%	96.0%	82%		
07/02/00	27	2,601	6	279	13	157	0	0	449	75	8,243	392	4,704	0	0	13,338	99.8%	99.8%	65%		
07/09/00	28	2,337	3	0	0	25	0	0	25	8	411	30	664	0	0	1,105	100.0%	100.0%	40%		
07/16/00	29	2,049	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%		
07/23/00	30	0	0																		
07/30/00	31	0	0																		
08/06/00	32	0	0																		
08/13/00	33	0	0																		
08/20/00	34	0	0																		
08/27/00	35	0	0																		
09/03/00	36	0	0																		
09/10/00	37	0	0																		
09/17/00	38	0	0																		
09/24/00	39	0	0																		
10/01/00	40	0	0																		
10/08/00	41	0	0																		
10/15/00	42	0	0																		
10/22/00	43	0	0																		
10/29/00	44	0	0																		
11/05/00	45	0	0																		
11/12/00	46	0	0																		
11/19/00	47	0	0																		
11/26/00	48	0	0																		
12/03/00	49	0	0																		
12/10/00	50	0	0																		
12/17/00	51	0	0																		
12/24/00	52	0	0																		
Spring total			93	4,756	206	6,191	8	0	11,161		215,408	9,390	286,224	776	0	511,798			44%		
Fall total																					
Total			93	4,756	206	6,191	8	0	11,161		215,408	9,390	286,224	776	0	511,798			44%		

Appendix 11. BBT weekly coho catch, abundance total and hatchery contribution, 2000.

Week Starting	Julian Week	Mean River Flow	Trap Days	WEEKLY COHO CATCH					WEEKLY COHO INDEX TOTALS				Cumulative Index (%)				
				Hatchery Age 1 (LMAX)	Natural Age 1	Natural Age 0	Catch Total	CPUE	Hatchery Age 1 (LMAX)	Natural Age 1	Natural Age 0	Index Total	Hat Age 1	Nat Age 1	Nat Age 0		
03/12/00	11	14,243	0														
03/19/00	12	12,843	0														
03/26/00	13	11,071	0														
04/02/00	14	12,529	1	0	0	0	0	0.0	0	0	0	0	0	0%	0%	0%	
04/09/00	15	13,257	6	0	0	0	0	0.0	0	0	0	0	0	0%	0%	0%	
04/16/00	16	12,543	7	0	0	3	3	0.4	0	0	369	369	0%	0%	11%		
04/23/00	17	11,373	7	0	0	1	1	0.1	0	0	102	102	0%	0%	13%		
04/30/00	18	10,306	7	1	1	5	7	1.0	104	102	600	806	37%	14%	31%		
05/07/00	19	9,934	7	0	1	6	7	1.0	0	101	606	707	37%	27%	48%		
05/14/00	20	8,869	7	2	3	3	8	1.1	180	267	257	704	100%	63%	55%		
05/21/00	21	10,647	7	0	2	4	6	0.9	0	186	369	556		88%	66%		
05/28/00	22	7,804	7	0	1	2	3	0.4	0	91	138	229		100%	70%		
06/04/00	23	6,519	7	0	0	3	3	0.4	0	0	197	197			75%		
06/11/00	24	5,807	7	0	0	11	11	1.6	0	0	594	594			92%		
06/18/00	25	4,060	7	0	0	4	4	0.6	0	0	162	162			97%		
06/25/00	26	3,053	6	0	0	3	3	0.5	0	0	114	114			100%		
07/02/00	27	2,601	5	0	0	0	0	0.0	0	0	0	0					
07/09/00	28	2,337	3	0	0	0	0	0.0	0	0	0	0					
07/16/00	29	2,049	1	0	0	0	0	0.0	0	0	0	0					
07/23/00	30	1,857	0														
07/30/00	31	1,707	0														
08/06/00	32	1,623	0														
08/13/00	33	1,553	0														
08/20/00	34	1,539	0														
08/27/00	35	1,516	0														
09/03/00	36	1,639	0														
09/10/00	37	1,770	0														
09/17/00	38	1,730	0														
09/24/00	39	1,740	0														
10/01/00	40		0														
10/08/00	41		0														
10/15/00	42		0														
10/22/00	43		0														
10/29/00	44		0														
11/05/00	45		0														
11/12/00	46		0														
11/19/00	47		0														
11/26/00	48		0														
12/03/00	49		0														
12/10/00	50		0														
12/17/00	51		0														
12/24/00	52		0														
Spring total			92	3	8	45	56		284	748	3,508	4,540	6.3%				
Fall total																	
Total			92	3	8	45	56		284	748	3,508	4,540	6.3%				

Appendix 12. BBT weekly steelhead catch, abundance total and hatchery contribution, 2000.

Week Starting	Julian Week	Mean River		Steelhead Catch Totals						Steelhead Index Totals								Cumulative Index (%)				Pre-			
		Flow (cfs)	Trap Days	Age 0	Age 1	Age 2	Age 3	Hatchery	Catch Total	Age 0	Age 1	Age 2	Age 3	Hatchery	Index Total	Pre-Smolt	Smolt	Age 0	Age 1	Age 2	Age 3	Hatchery	Pre-Smolt	Smolt	
03/12/00	11	14,243	0																						
03/19/00	12	12,843	0																						
03/26/00	13	11,071	0																						
04/02/00	14	12,529	1	0	4	2	0	0	6	0	858	369	30	0	1,257	0	369	0.0%	11.6%	7.4%	3.1%	0.0%	0.0%	6.8%	
04/09/00	15	13,257	6	0	14	7	2	0	23	0	2,131	1,064	297	0	3,492	0	1,328	0.0%	40.4%	28.9%	34.0%	0.0%	0.0%	31.1%	
04/16/00	16	12,543	7	0	4	1	1	0	6	0	521	141	122	0	784	0	263	0.0%	47.4%	31.7%	46.7%	0.0%	0.0%	35.9%	
04/23/00	17	11,373	7	1	11	3	0	0	15	124	1,128	301	0	0	1,553	0	301	12.1%	62.7%	37.8%	46.7%	0.0%	0.0%	41.4%	
04/30/00	18	10,306	7	0	11	7	2	0	20	0	1,214	797	206	0	2,216	97	1,202	12.1%	79.1%	53.9%	68.1%	0.0%	22.4%	63.4%	
05/07/00	19	9,934	7	4	8	6	0	1	19	417	845	616	0	110	1,989	0	313	52.9%	90.5%	66.3%	68.1%	100.0%	22.4%	69.1%	
05/14/00	20	8,869	7	0	0	6	0	0	6	0	0	501	0	0	501	154	347	52.9%	90.5%	76.4%	68.1%		58.1%	75.5%	
05/21/00	21	10,647	7	0	0	4	0	0	4	0	0	365	0	0	365	92	273	52.9%	90.5%	83.7%	68.1%		79.4%	80.5%	
05/28/00	22	7,804	7	0	1	1	0	0	2	0	88	86	0	0	174	0	86	52.9%	91.7%	85.5%	68.1%		79.4%	82.1%	
06/04/00	23	6,519	7	2	2	3	4	0	11	129	129	186	267	0	710	0	524	65.5%	93.4%	89.2%	95.9%		79.4%	91.6%	
06/11/00	24	5,807	7	3	0	5	0	0	8	170	0	278	0	0	448	0	278	82.1%	93.4%	94.8%	95.9%		79.4%	96.7%	
06/18/00	25	4,060	7	2	0	2	1	0	5	81	0	82	39	0	202	0	121	90.0%	93.4%	96.5%	100.0%		79.4%	98.9%	
06/25/00	26	3,053	6	2	4	5	0	0	11	102	121	176	0	0	399	90	30	100.0%	95.1%	100.0%			100.0%	99.5%	
07/02/00	27	2,601	6	0	9	0	0	0	9	0	290	0	0	0	290	0	28		99.0%					100.0%	
07/09/00	28	2,337	3	0	0	0	0	0	0	0	75	0	0	0	75	0	0		100.0%						
07/16/00	29	2,049	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
07/23/00	30	1,857	0																						
07/30/00	31	1,707	0																						
08/06/00	32	1,623	0																						
08/13/00	33	1,553	0																						
08/20/00	34	1,539	0																						
08/27/00	35	1,516	0																						
09/03/00	36	1,639	0																						
09/10/00	37	1,770	0																						
09/17/00	38	1,730	0																						
09/24/00	39	1,740	0																						
10/01/00	40		0																						
10/08/00	41		0																						
10/15/00	42		0																						
10/22/00	43		0																						
10/29/00	44		0																						
11/05/00	45		0																						
11/12/00	46		0																						
11/19/00	47		0																						
11/26/00	48		0																						
12/03/00	49		0																						
12/10/00	50		0																						
12/17/00	51		0																						
12/24/00	52		0																						
Spring total			93	14	68	52	10	1	145	1,022	7,400	4,963	961	110	14,456	433	5,462	7.1%	51.2%	34.3%	6.6%	0.8%	3.0%	37.8%	
Fall total																									
Total			93	14	68	52	10	1	145	1,022	7,400	4,963	961	110	14,456	433	5,462								



Appendix 14. WCT weekly coho catch, abundance total and hatchery contribution, 1997

Week Starting	Mean River Flow Trap Days			WEEKLY COHO CATCH TOTALS					WEEKLY COHO INDEX TOTALS					Cumulative Index (%)		
				Hatchery		Natural		Catch Total	CPUE	Hatchery			Index Totals			
				Age 1 (LMAX)	Age 0	Age 1	Age 0			Age 1 (LMAX)	Age 1	Age 0		Hat Age 1	Nat Age 1	Nat Age 0
03/12/97	11	5,083	0													
03/19/97	12	4,596	0													
03/26/97	13	3,464	7	6	0	0	6	0.9		270	0	0	270	2%	0%	0%
04/02/97	14	2,650	7	3	1	0	4	0.6		95	48	0	143	2%	1%	0%
04/09/97	15	2,247	7	2	2	0	4	0.6		52	53	0	104	3%	2%	0%
04/16/97	16	3,686	2	0	0	0	0	0.0		0	0	0	0	3%	2%	0%
04/23/97	17	4,891	1	0	0	0	0	0.0		0	0	0	0	3%	2%	0%
04/30/97	18	3,727	6	0	1	3	4	0.7		0	66	207	273	3%	4%	15%
05/07/97	19	4,141	7	8	3	2	13	1.9		435	180	101	716	5%	8%	22%
05/14/97	20	4,133	7	35	10	1	46	6.6		2,005	566	54	2,625	18%	21%	26%
05/21/97	21	3,557	7	40	4	4	48	6.9		1,741	214	238	2,192	28%	26%	44%
05/28/97	22	2,996	7	86	9	2	97	13.9		3,478	378	85	3,942	50%	35%	50%
06/04/97	23	3,027	7	105	40	1	146	20.9		4,071	1,882	38	5,990	75%	78%	53%
06/11/97	24	2,161	7	95	14	10	119	17.0		2,432	360	236	3,029	90%	87%	70%
06/18/97	25	1,620	7	69	22	7	98	14.0		1,235	402	130	1,768	97%	96%	80%
06/25/97	26	1,480	7	27	7	6	40	5.7		449	117	100	666	100%	99%	87%
07/02/97	27	1,421	7	0	4	2	6	0.9		0	60	28	88		100%	89%
07/09/97	28	1,249	5	0	0	6	6	1.2		0	0	119	119			98%
07/16/97	29	1,139	7	1	0	1	2	0.3		12	0	12	25			98%
07/23/97	30	1,012	7	0	0	1	1	0.1		0	0	11	11			99%
07/30/97	31	990	7	0	0	0	0	0.0		0	0	0	0			99%
08/06/97	32	853	7	0	0	1	1	0.1		0	0	10	10			100%
08/13/97	33	788	6	0	0	0	0	0.0		0	0	0	0			
08/20/97	34	811	6	0	0	0	0	0.0		0	0	0	0			
08/27/97	35	863	6	0	0	0	0	0.0		0	0	0	0			
09/03/97	36	769	7	0	0	0	0	0.0		0	0	0	0			
09/10/97	37	771	6	0	0	0	0	0.0		0	0	0	0			
09/17/97	38	863	7	0	0	0	0	0.0		0	0	0	0			
09/24/97	39	734	7	0	0	0	0	0.0		0	0	0	0			
10/01/97	40	890	7	0	0	0	0	0.0		0	0	0	0	0%	0%	0%
10/08/97	41	1,244	6	0	0	0	0	0.0		0	0	0	0	0%	0%	0%
10/15/97	42	840	7	0	0	0	0	0.0		0	0	0	0	0%	0%	0%
10/22/97	43	688	7	0	0	0	0	0.0		0	0	0	0	0%	0%	0%
10/29/97	44	1,167	7	0	0	0	0	0.0		0	0	0	0	0%	0%	0%
11/05/97	45	1,010	7	0	0	0	0	0.0		0	0	0	0	0%	0%	0%
11/12/97	46	1,757	5	0	0	0	0	0.0		0	0	0	0	0%	0%	0%
11/19/97	47	3,303	5	0	0	2	2	0.4		0	0	56	56	0%	0%	46%
11/26/97	48	4,240	4	0	0	0	0	0.0		0	0	28	28	0%	0%	69%
12/03/97	49	3,887	5	0	0	1	1	0.2		0	0	38	38	0%	0%	100%
12/10/97	50	3,886	0													
12/17/97	51	5,577	0													
12/24/97	52	2,828	0													
Spring total			171	477	117	47	641			16275	4326	1370	21971	74%		
Fall total			60	0	0	3	3			0	0	121	121	0%		
Total			231	477	117	50	644			16,275	4,326	1,492	22,092	74%		







Appendix 17. WCT weekly coho catch, abundance total and hatchery contribution, 1998.

Week Starting	Julian Week	Mean River Flow	Trap Days	WEEKLY COHO CATCH TOTALS					WEEKLY COHO INDEX TOTALS				Cumulative Index (%)				
				Hatchery		Natural		Catch Total	CPUE	Hatchery			Index Totals	Hat Age 1	Nat Age 1	Nat Age 0	
				Age 1 (RMAX)	Age 0	Age 1	Age 0			Age 1 (RMAX)	Age 1	Age 0					
03/12/98	11	15,226	0														
03/19/98	12	36,243	0														
03/26/98	13	24,557	0														
04/02/98	14	15,757	0														
04/09/98	15	11,971	0														
04/16/98	16	9,484	7	4	3	0	7	1.00	0	0	0	0	0%	0%	0%		
04/23/98	17	10,204	7	2	1	1	4	0.57	0	0	141	141	0%	0%	13%		
04/30/98	18	11,023	4	3	0	0	3	0.75	618	0	0	618	2%	0%	13%		
05/07/98	19	8,713	3	12	0	0	12	4.00	1,065	0	0	1,065	4%	0%	13%		
05/14/98	20	6,694	7	17	1	0	18	2.57	1,220	66	0	1,287	7%	3%	13%		
05/21/98	21	6,249	7	103	16	0	119	17.00	5,899	893	0	6,792	23%	42%	13%		
05/28/98	22	11,820	4	134	2	2	138	34.50	20,944	293	349	21,586	76%	54%	46%		
06/04/98	23	11,286	7	28	0	2	30	4.29	4,117	0	241	4,358	87%	54%	69%		
06/11/98	24	10,444	7	32	4	0	36	5.14	3,828	452	0	4,281	96%	74%	69%		
06/18/98	25	8,840	7	8	4	0	12	1.71	844	471	0	1,315	99%	94%	69%		
06/25/98	26	6,834	7	5	0	3	8	1.14	403	0	283	686	100%	94%	96%		
07/02/98	27	4,240	7	3	0	0	3	0.43	162	0	0	162		94%	96%		
07/09/98	28	3,526	7	0	0	0	0	0.00	0	0	0	0		94%	96%		
07/16/98	29	2,823	7	0	0	0	0	0.00	0	0	0	0		94%	96%		
07/23/98	30	2,249	7	0	0	0	0	0.00	0	0	0	0		94%	96%		
07/30/98	31	1,686	7	0	0	2	2	0.29	0	0	39	39		94%	100%		
08/06/98	32	1,447	7	0	1	0	1	0.14	0	18	0	18		95%			
08/13/98	33	1,306	7	0	0	0	0	0.00	0	0	0	0		95%			
08/20/98	34	1,186	6	0	3	0	3	0.50	0	37	0	37		96%			
08/27/98	35	1,059	7	0	4	0	4	0.57	0	48	0	48		99%			
09/03/98	36	1,016	7	0	3	0	3	0.43	0	33	0	33		100%			
09/10/98	37	1,006	7	0	0	0	0	0.00	0	0	0	0					
09/17/98	38	945	7	0	0	0	0	0.00	0	0	0	0					
09/24/98	39	949	7	0	0	0	0	0.00	0	0	0	0					
10/01/98	40	945	7	0	0	0	0	0.00	0	0	0	0	0%	0%	0%		
10/08/98	41	980	7	0	0	0	0	0.00	0	0	0	0	0%	0%	0%		
10/15/98	42	795	7	0	0	0	0	0.00	0	0	0	0	0%	0%	0%		
10/22/98	43	886	7	0	0	0	0	0.00	0	0	0	0	0%	0%	0%		
10/29/98	44	867	7	0	0	0	0	0.00	0	0	0	0	0%	0%	0%		
11/05/98	45	1,399	6	0	0	0	0	0.00	0	0	0	0	0%	0%	0%		
11/12/98	46	1,553	6	0	0	1	1	0.17	0	0	23	23	0%	0%	100%		
11/19/98	47	10,270	2	0	0	0	0	0.00	0	0	0	0	0%	0%			
11/26/98	48	11,757	0														
12/03/98	49	11,479	0														
12/10/98	50	6,223	0														
12/17/98	51	5,036	0														
12/24/98	52	3,916	0														
Spring total			157	351	42	10	403	75.04	39,100	2,311	1,052	42,464	92.1%				
Fall total			49	0	0	1	1	0.17	0	0	23	23	----				
Total			206	351	42	11	404	75.20	39,100	2,311	1,075	42,487	92.0%				





Appendix 20. WCT weekly coho catch, abundance total and hatchery contribution, 1999.

Week Starting	Julian Week	Mean River Flow	Trap Days	WEEKLY COHO CATCH TOTALS					WEEKLY COHO INDEX TOTALS					Cumulative Index (%)		
				Hatchery		Natural		Catch Total	CPUE	Hatchery			Index Total	Hat Age 1	Nat Age 1	Nat Age 0
				Age 1 (RMAX)	Age 0	Age 1	Age 0			Age 1 (RMAX)	Age 1	Age 0				
03/12/99	11	9,641	1	9	0	0	9	9.0	863	0	0	863	0.9%	0.0%	0.0%	
03/19/99	12	11,571	6	112	1	0	113	18.8	15,704	98	0	15,802	17.2%	2.7%	0.0%	
03/26/99	13	11,606	5	43	1	0	44	8.8	9,246	153	0	9,399	26.8%	7.0%	0.0%	
04/02/99	14	8,093	7	21	4	3	28	4.0	1,744	342	227	2,313	28.6%	16.7%	2.5%	
04/09/99	15	8,729	7	6	3	2	11	1.6	503	249	159	911	29.1%	23.6%	4.3%	
04/16/99	16	11,800	7	3	3	0	6	0.9	414	408	0	823	29.5%	35.1%	4.3%	
04/23/99	17	9,031	7	6	2	2	10	1.4	568	195	195	957	30.1%	40.6%	6.5%	
04/30/99	18	7,510	7	12	9	2	23	3.3	841	639	154	1,634	31.0%	58.5%	8.2%	
05/07/99	19	7,009	7	127	2	2	131	18.7	8,745	124	136	9,005	40.1%	62.0%	9.7%	
05/14/99	20	6,824	7	310	6	30	346	49.4	19,773	381	1,861	22,015	60.6%	72.6%	30.4%	
05/21/99	21	7,393	7	331	12	4	347	49.6	21,345	759	287	22,391	82.7%	93.9%	33.6%	
05/28/99	22	5,876	7	128	1	7	136	19.4	8,040	70	470	8,580	91.0%	95.9%	38.8%	
06/04/99	23	4,230	7	112	0	25	137	19.6	5,267	0	1,126	6,393	96.5%	95.9%	51.4%	
06/11/99	24	3,893	7	72	3	5	80	11.4	3,036	126	213	3,375	99.6%	99.5%	53.7%	
06/18/99	25	3,261	7	8	0	12	20	2.9	291	0	439	730	99.9%	99.5%	58.6%	
06/25/99	26	2,641	7	1	0	39	40	5.7	34	0	1,331	1,366	100.0%	99.5%	73.4%	
07/02/99	27	2,144	7	1	0	35	36	5.1	33	0	958	991	100.0%	99.5%	84.1%	
07/09/99	28	1,824	7	0	0	21	21	3.0	0	0	522	522		99.5%	89.9%	
07/16/99	29	1,437	6	0	0	11	11	1.8	0	0	185	185		99.5%	92.0%	
07/23/99	30	1,234	7	0	1	27	28	4.0	0	19	494	513	100.0%		97.5%	
07/30/99	31	1,090	6	0	0	7	7	1.2	0	0	155	155			99.2%	
08/06/99	32	1,094	7	0	0	1	1	0.1	0	0	15	15			99.4%	
08/13/99	33	973	7	0	0	1	1	0.1	0	0	14	14			99.5%	
08/20/99	34	884	6	0	0	1	1	0.2	0	0	11	11			99.7%	
08/27/99	35	848	7	0	0	0	0	0.0	0	0	0	0			99.7%	
09/03/99	36	798	7	0	0	1	1	0.1	0	0	10	10			99.8%	
09/10/99	37	1,002	5	0	0	1	1	0.2	0	0	11	11			99.9%	
09/17/99	38	732	7	0	0	0	0	0.0	0	0	0	0			99.9%	
09/24/99	39	711	7	0	0	1	1	0.1	0	0	9	9			100.0%	
10/01/99	40		0													
10/08/99	41		0													
10/15/99	42		0													
10/22/99	43		0													
10/29/99	44		0													
11/05/99	45		0													
11/12/99	46		0													
11/19/99	47		0													
11/26/99	48		0													
12/03/99	49		0													
12/10/99	50		0													
12/17/99	51		0													
12/24/99	52		0													
Spring total			189	1,302	48	240	1,590	240.6	96,448	3,564	8,983	108,995	88.5%			
Fall total																
Total			189	1,302	48	240	1,590	240.6	96,448	3,564	8,983	108,995	88.5%			



Appendix 22. WCT weekly chinook catch, abundance total and hatchery contribution, 2000

				WEEKLY CHINOOK CATCH TOTALS								WEEKLY CHINOOK INDEX TOTALS										
Week Starting	Julian Week	Mean River flow	Trap Days	Hatchery				Natural				Total				Cumulative Index (%)						
				Age 0		Age 0		Age 1		Age 0		Age 0		Age 1		Age 0		Age 1				
				NC	AD	NC	AD	Tags	Total	CPUE	NC	AD	NC	AD	Tags	Index Total	Nat Age 0	Hat Age 0	Age 1	(%) Hat Age 0		
03/12/00	11	11,947	0																			
03/19/00	12	8,026	0																			
03/26/00	13	5,590	0																			
04/02/00	14	5,297	0																			
04/09/00	15	4,946	0																			
04/16/00	16	7,359	0																			
04/23/00	17	4,763	0																			
04/30/00	18	3,934	0																			
05/07/00	19	4,160	0																			
05/14/00	20	5,136	5	0	0	83	0	0	0	83	17	0	0	4,862	0	0	4,862	1.9%	0.0%	0.0%	0%	
05/21/00	21	4,787	7	0	0	111	0	0	0	111	16	0	0	5,951	0	0	5,951	4.3%	0.0%	0.0%	0%	
05/28/00	22	3,454	7	0	0	282	0	0	0	282	40	0	0	12,418	0	0	12,418	9.3%	0.0%	0.0%	0%	
06/04/00	23	3,146	7	118	15	517	0	0	0	650	93	4,401	556	19,430	0	0	24,388	17.0%	2.5%	0.0%	20%	
06/11/00	24	2,880	7	559	33	580	0	0	0	1,172	167	19,514	1,152	20,233	0	0	40,899	25.1%	12.8%	0.0%	51%	
06/18/00	25	2,336	7	928	31	532	0	0	1	1,492	213	28,749	961	16,098	0	31	45,838	31.5%	27.6%	0.0%	65%	
06/25/00	26	2,053	7	917	33	551	0	0	0	1,501	214	26,539	937	15,204	0	0	42,681	37.6%	41.3%	0.0%	64%	
07/02/00	27	1,711	7	543	34	564	0	0	0	1,141	163	13,042	825	13,698	0	0	27,565	43.0%	48.2%	0.0%	50%	
07/09/00	28	1,440	7	928	36	1,197	0	0	0	2,161	309	19,573	751	24,851	0	0	45,175	52.9%	58.4%	0.0%	45%	
07/16/00	29	1,216	7	1,370	32	1,428	0	0	0	2,830	404	23,205	562	24,727	0	0	48,494	62.8%	70.2%	0.0%	49%	
07/23/00	30	987	7	1,329	34	2,107	0	0	0	3,470	496	18,543	478	29,716	0	0	48,737	74.6%	79.7%	0.0%	39%	
07/30/00	31	904	7	829	35	1,623	0	0	0	2,487	355	10,930	461	21,570	0	0	32,962	83.2%	85.4%	0.0%	35%	
08/06/00	32	824	7	683	34	749	0	0	0	1,466	209	8,283	412	9,103	0	0	17,798	86.9%	89.8%	0.0%	49%	
08/13/00	33	785	7	446	31	459	0	0	0	936	134	5,385	372	5,508	0	0	11,266	89.1%	92.6%	0.0%	51%	
08/20/00	34	765	6	331	17	727	0	0	0	1,075	179	4,162	220	10,010	0	179	14,392	93.1%	94.8%	0.0%	30%	
08/27/00	35	735	7	272	24	449	0	0	0	745	106	3,055	270	5,062	0	0	8,387	95.1%	96.5%	0.0%	40%	
09/03/00	36	807	7	108	11	533	0	0	0	652	93	1,256	128	6,173	0	0	7,556	97.5%	97.2%	0.0%	18%	
09/10/00	37	751	7	137	13	170	0	0	0	320	46	1,563	149	1,941	0	0	3,653	98.3%	98.0%	0.0%	47%	
09/17/00	38	728	7	234	22	204	0	0	0	460	66	2,644	250	2,271	0	0	5,166	99.2%	99.5%	0.0%	56%	
09/24/00	39	735	7	88	8	176	0	0	0	272	39	973	88	1,964	0	0	3,025	100.0%	100.0%	0.0%	35%	
10/01/00	40	733	6	389	9	56	0	0	0	454	76	4,234	100	622	0	0	4,957			0.0%	87%	
10/08/00	41	786	0																			
10/15/00	42	676	0																			
10/22/00	43	696	0																			
10/29/00	44	539	0																			
11/05/00	45		0																			
11/12/00	46		0																			
11/19/00	47		0																			
11/26/00	48		0																			
12/03/00	49		0																			
12/10/00	50		0																			
12/17/00	51		0																			
12/24/00	52		0																			
Spring total			137	9,820	443	13,042	0	0	1	23,306		191,818	8,573	250,790	0	0	31	451,212				44%
Fall total			6	389	9	56	0	0	0	454		4,234	100	622	0	0	0	4,957				
Total			143	10,209	452	13,098	0	0	1	23,760		196,053	8,673	251,413	0	0	31	456,169				45%



Appendix 23. WCT weekly coho catch, abundance total and hatchery contribution, 2000.

Week Starting	Julian Week	Mean River Flow	Trap Days	WEEKLY COHO CATCH TOTALS					WEEKLY COHO INDEX TOTALS								
				Hatchery		Natural		Catch Total	CPUE	Hatchery			Cumulative Index (%)				
				Age 1 (RMAX)	Age 0	Age 1	Age 0			Age 1 (RMAX)	Age 1	Age 0	Index Total	Hatchery Age 1	Nat Age 1	Nat Age 0	
03/12/00	11	11,947															
03/19/00	12	8,026															
03/26/00	13	5,590															
04/02/00	14	5,297															
04/09/00	15	4,946															
04/16/00	16	7,359															
04/23/00	17	4,763															
04/30/00	18	3,934															
05/07/00	19	4,160															
05/14/00	20	5,136	5	56	12	2	70	14.0		3,319	691	120	4,130	62.1%	30.2%	12.5%	
05/21/00	21	4,787	7	22	16	1	39	5.6		1,236	899	49	2,184	85.2%	69.6%	17.7%	
05/28/00	22	3,454	7	10	10	5	25	3.6		459	413	237	1,109	93.8%	87.6%	42.4%	
06/04/00	23	3,146	7	7	5	2	14	2.0		261	187	74	522	98.7%	95.8%	50.2%	
06/11/00	24	2,880	7	2	2	3	7	1.0		70	69	103	242	100.0%	98.8%	61.0%	
06/18/00	25	2,336	7	0	0	5	5	0.7		0	0	151	151		98.8%	76.7%	
06/25/00	26	2,053	7	0	0	1	1	0.1		0	0	28	28		98.8%	79.7%	
07/02/00	27	1,711	7	0	0	0	0	0.0		0	0	0	0		98.8%	79.7%	
07/09/00	28	1,440	7	0	0	2	2	0.3		0	0	40	40		98.8%	83.9%	
07/16/00	29	1,216	7	0	1	4	5	0.7		0	16	67	83		99.5%	91.0%	
07/23/00	30	987	7	0	0	1	1	0.1		0	0	14	14		99.5%	92.4%	
07/30/00	31	904	7	0	0	0	0	0.0		0	0	0	0		99.5%	92.4%	
08/06/00	32	824	7	0	0	1	1	0.1		0	0	12	12		99.5%	93.7%	
08/13/00	33	785	7	0	0	0	0	0.0		0	0	0	0		99.5%	93.7%	
08/20/00	34	764	6	0	0	2	2	0.3		0	0	38	38		99.5%	97.6%	
08/27/00	35	735	7	0	0	1	1	0.1		0	0	11	11		99.5%	98.8%	
09/03/00	36	807	7	0	0	1	1	0.1		0	0	12	12		99.5%	100.0%	
09/10/00	37	751	7	0	0	0	0	0.0		0	0	0	0		99.5%		
09/17/00	38	728	7	0	0	0	0	0.0		0	0	0	0		99.5%		
09/24/00	39	735	7	0	1	0	1	0.1		0	12	0	12		100.0%		
10/01/00	40	733	6	0	0	0	0	0.0		0	0	0	0				
10/08/00	41	786															
10/15/00	42	676															
10/22/00	43	696															
10/29/00	44	1,257															
11/05/00	45																
11/12/00	46																
11/19/00	47																
11/26/00	48																
12/03/00	49																
12/10/00	50																
12/17/00	51																
12/24/00	52																
Spring total			137	97	47	31	175	29.0		5,346	2,286	957	8,588	62.2%			
Fall total			6	0	0	0	0	0.0		0	0	0	0	-----			
Total			143	97	47	31	175	29.0		5,346	2,286	957	8,588	62.2%			



Appendix 25. BBT weekly fork length data for chinook and coho, 1997.

Julian Week	Chinook *										Natural Coho										Hatchery Coho					
	Age 0					Age 1					Age 0					Age 1					Age 1					
	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	
11																										
12																										
13																										
14																										
15	3	39	38	40	1.00	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
16	1	40	40	40	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
17	0	0	0	0	----	0	0	0	0	----	2	68	56	80	16.97	1	180	180	180	----	0	0	0	0	----	
18	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
19	3	45	39	49	5.51	2	132	132	132	----	0	0	0	0	----	2	135	124	146	15.56	1	165	165	165	----	
20	7	65	44	105	20.33	2	140	140	140	----	1	76	76	76	----	2	120	120	120	----	1	143	143	143	----	
21	4	98	85	110	11.90	2	118	116	120	2.83	4	59	55	70	7.50	1	115	115	115	----	0	0	0	0	----	
22	42	90	50	116	19.99	0	0	0	0	----	5	61	47	70	10.11	1	100	100	100	----	2	145	132	158	18.38	
23	110	100	64	115	10.92	0	0	0	0	----	1	102	102	102	----	0	0	0	0	----	0	0	0	0	----	
24	199	104	60	130	12.37	0	0	0	0	----	6	81	50	115	32.63	1	130	130	130	----	0	0	0	0	----	
25	246	88	60	120	7.49	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
26	210	86	65	111	7.27	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
27	194	88	68	120	9.40	0	0	0	0	----	1	63	63	63	----	0	0	0	0	----	0	0	0	0	----	
28	179	91	65	130	10.18	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
29	210	92	70	125	8.90	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
30	182	92	65	120	9.49	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
31	66	96	73	115	8.73	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
32	33	102	81	130	12.55	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
33	1	115	115	115	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
34	1	100	100	100	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
35																										
36																										
37																										
38																										
39																										
40																										
41																										
42																										
43																										
44																										
45																										
46																										
47																										
48																										
49																										
Total Count of fl	1691	92	38	130	12.04	6	130	116	140	10.04	20	70	47	115	21.70	8	129	100	180	24.24	4	150	132	165	14.84	

\*Includes hatchery releases



Appendix 27. BBT weekly fork length data for chinook and coho, 1998.

Julian Week	Chinook *										Natural Coho										Hatchery Coho					
	Age 0					Age 1					Age 0					Age 1					Age 1					
	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	
11																										
12																										
13																										
14																										
15																										
16																										
17																										
18	5	73	47	116	30.39	4	165	149	193	19.67	2	63	55	70	10.61	0	0	0	0	----	0	0	0	0	----	
19	6	59	48	71	10.15	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
20	11	71	43	114	23.79	2	130	128	131	2.12	3	70	61	82	10.97	0	0	0	0	----	0	0	0	0	----	
21	17	96	47	114	20.15	1	136	136	136	----	0	0	0	0	----	0	0	0	0	----	1	252	252	252	----	
22	33	103	58	114	11.97	1	144	144	144	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
23	63	106	60	120	10.80	1	140	140	140	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
24	212	101	70	123	9.67	1	160	160	160	----	0	0	0	0	----	1	115	115	115	----	1	175	175	175	----	
25	210	91	60	116	7.01	0	0	0	0	----	2	67	64	70	4.24	0	0	0	0	----	0	0	0	0	----	
26	210	90	79	105	5.04	0	0	0	0	----	1	52	52	52	----	0	0	0	0	----	0	0	0	0	----	
27	210	91	70	113	6.97	0	0	0	0	----	3	52	30	79	24.79	0	0	0	0	----	0	0	0	0	----	
28	210	91	72	116	7.25	0	0	0	0	----	1	54	54	54	----	0	0	0	0	----	0	0	0	0	----	
29	180	89	77	111	6.62	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
30	150	87	65	111	7.20	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
31	125	93	73	114	9.12	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
32	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
33	8	87	75	97	6.80	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	
34																										
35																										
36																										
37																										
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40																										
41																										
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43																										
44																										
45																										
46																										
47																										
48																										
49																										
Total Count of fl	1650	92	43	123	9.93	10	150	128	193	19.34	12	61	30	82	14.32	1	115	115	115	----	2	214	175	252	54.45	

\*Includes hatchery releases



Appendix 29. BBT weekly fork length data for chinook and coho, 1999.

Julian Week	Chinook *										Natural Coho										Hatchery Coho				
	Age 0					Age 1					Age 0					Age 1					Age 1				
	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d
11																									
12																									
13																									
14																									
15	2	38	36	39	2.12	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
16	47	41	31	57	4.97	0	0	0	0	----	2	35	33	36	2.12	0	0	0	0	----	0	0	0	0	----
17	18	41	32	53	5.41	1	152	152	152	----	6	45	32	54	9.50	0	0	0	0	----	0	0	0	0	----
18	5	45	41	49	3.05	0	0	0	0	----	4	47	44	49	2.89	0	0	0	0	----	0	0	0	0	----
19	8	50	40	62	8.62	0	0	0	0	----	1	42	42	42	----	0	0	0	0	----	0	0	0	0	----
20	13	57	44	67	6.89	0	0	0	0	----	4	45	43	47	1.71	0	0	0	0	----	0	0	0	0	----
21	5	57	40	80	14.87	0	0	0	0	----	2	52	41	63	15.56	0	0	0	0	----	0	0	0	0	----
22	5	64	42	95	20.07	2	134	128	140	8.49	2	55	54	55	0.71	2	118	108	127	13.44	3	158	153	161	4.36
23	12	61	48	101	14.21	0	0	0	0	----	4	66	61	73	5.60	0	0	0	0	----	1	157	157	157	----
24	125	104	50	129	11.33	0	0	0	0	----	5	61	57	67	3.78	0	0	0	0	----	1	164	164	164	----
25	154	102	60	125	9.95	0	0	0	0	----	5	65	59	69	4.06	1	119	119	119	----	0	0	0	0	----
26	200	97	64	117	9.02	0	0	0	0	----	4	70	61	78	6.98	0	0	0	0	----	0	0	0	0	----
27	180	92	72	110	6.67	0	0	0	0	----	5	58	42	78	13.46	0	0	0	0	----	0	0	0	0	----
28	180	87	62	108	7.30	0	0	0	0	----	2	61	44	78	24.04	0	0	0	0	----	0	0	0	0	----
29	210	87	69	114	8.18	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
30	210	92	70	120	9.44	0	0	0	0	----	1	76	76	76	----	0	0	0	0	----	0	0	0	0	----
31	154	93	74	115	8.91	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
32	49	94	75	120	11.20	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
33																									
34																									
35																									
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48																									
49																									
Total Count of fi	1577	90	31	129	16.10	3	140	128	152	12.00	47	56	32	78	12.62	3	118	108	127	9.54	5	159	153	164	4.18

\*Includes hatchery releases





Appendix 31. BBT weekly fork length data for chinook and coho, 2000.

Julian Week	Chinook *										Natural Coho										Hatchery Coho				
	Age 0					Age 1					Age 0					Age 1					Age 1				
	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d
11																									
12																									
13																									
14	2	38	35	40	3.54	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
15	32	41	38	55	3.08	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
16	20	50	37	70	11.50	0	0	0	0	----	3	48	44	51	3.79	0	0	0	0	----	0	0	0	0	----
17	18	47	35	78	11.91	1	120	120	120	----	1	45	45	45	----	0	0	0	0	----	0	0	0	0	----
18	12	46	35	56	7.21	2	162	142	182	28.28	5	54	46	63	6.60	1	120	120	120	----	1	147	147	147	----
19	19	53	40	70	7.46	2	150	139	160	14.85	6	56	47	60	5.68	1	146	146	146	----	0	0	0	0	----
20	14	66	45	110	17.43	2	152	144	159	10.61	2	62	61	63	1.41	4	135	130	139	3.70	2	174	165	183	12.73
21	16	69	55	100	10.82	0	0	0	0	----	4	61	54	69	6.16	2	116	110	121	7.78	0	0	0	0	----
22	32	79	42	121	19.45	1	142	142	142	----	2	75	71	78	4.95	1	125	125	125	----	0	0	0	0	----
23	168	99	52	124	13.48	0	0	0	0	----	3	70	60	83	11.68	0	0	0	0	----	0	0	0	0	----
24	165	98	63	127	11.30	0	0	0	0	----	11	83	69	102	9.89	0	0	0	0	----	0	0	0	0	----
25	207	90	62	121	9.44	0	0	0	0	----	4	72	60	78	7.94	0	0	0	0	----	0	0	0	0	----
26	137	81	68	99	6.02	0	0	0	0	----	3	70	70	71	0.58	0	0	0	0	----	0	0	0	0	----
27	56	86	71	107	7.60	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
28	6	87	72	104	12.51	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
29	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
30																									
31																									
32																									
33																									
34																									
35																									
36																									
37																									
38																									
39																									
40																									
41																									
42																									
43																									
44																									
45																									
46																									
47																									
48																									
49																									
Total Count of fl	904	86	35	127	19.21	8	149	120	182	18.41	44	67	44	102	13.97	9	129	110	146	11.03	3	165	147	183	18.00

\*Includes hatchery releases



Appendix 33. WCT weekly fork length data for chinook and coho, 1997.

Julian Week	Chinook*										Natural Coho										Hatchery Coho				
	Age 0					Age 1					Age 0					Age 1					Age 1				
	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d
11																									
12																									
13	14	38	35	40	1.45	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	6	146	133	155	8.64
14	3	36	31	39	4.36	0	0	0	0	----	0	0	0	0	----	1	114	114	114	----	3	137	135	140	2.89
15	3	38	38	39	0.58	1	115	115	115	----	0	0	0	0	----	2	105	100	109	6.36	2	130	127	132	3.54
16	1	37	37	37	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
17	6	45	37	51	5.32	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
18	12	55	42	70	9.15	0	0	0	0	----	3	49	48	50	1.00	1	120	120	120	----	0	0	0	0	----
19	12	51	36	111	20.45	0	0	0	0	----	2	50	45	55	7.07	3	123	119	129	5.51	8	158	141	184	12.81
20	25	67	47	108	13.55	0	0	0	0	----	1	51	51	51	----	10	120	111	135	7.03	35	157	130	190	14.12
21	29	69	37	111	16.60	0	0	0	0	----	5	51	45	58	5.26	3	112	104	128	13.58	40	150	121	170	10.68
22	14	84	60	109	12.00	2	145	127	163	25.46	2	60	50	70	14.14	9	123	106	179	22.81	86	147	120	175	11.30
23	24	86	51	112	13.39	0	0	0	0	----	1	55	55	55	----	37	143	114	191	16.90	73	144	110	172	11.76
24	113	98	59	128	12.43	1	140	140	140	----	9	68	46	89	11.20	14	128	105	152	12.23	96	148	68	190	15.42
25	208	100	56	122	10.09	0	0	0	0	----	7	67	59	78	6.05	22	125	105	155	10.73	69	152	125	181	12.04
26	210	100	84	120	6.50	0	0	0	0	----	6	63	50	72	7.64	7	127	113	149	14.60	27	154	130	175	11.61
27	191	96	51	121	8.97	0	0	0	0	----	2	107	102	111	6.36	4	136	118	156	15.95	0	0	0	0	----
28	180	92	75	110	6.99	0	0	0	0	----	6	77	60	114	20.06	0	0	0	0	----	0	0	0	0	----
29	209	91	78	110	5.72	0	0	0	0	----	1	31	31	31	----	0	0	0	0	----	1	155	155	155	----
30	210	90	77	113	5.58	0	0	0	0	----	1	66	66	66	----	0	0	0	0	----	0	0	0	0	----
31	210	93	78	112	6.43	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
32	210	91	76	115	6.92	0	0	0	0	----	1	81	81	81	----	0	0	0	0	----	0	0	0	0	----
33	180	92	78	118	5.84	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
34	180	96	80	118	7.31	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
35	180	94	78	120	7.25	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
36	208	96	83	116	6.68	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
37	173	96	80	121	7.54	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
38	161	103	72	123	9.21	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
39	179	106	67	152	9.98	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
40	195	119	92	172	19.36	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
41	210	135	90	175	13.58	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
42	210	132	100	171	11.95	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
43	210	131	101	177	11.36	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
44	210	131	83	179	13.82	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
45	206	129	91	175	12.65	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
46	110	130	90	182	15.47	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
47	27	130	85	147	13.02	0	0	0	0	----	2	90	86	94	5.66	0	0	0	0	----	0	0	0	0	----
48	7	132	104	158	17.23	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
49	8	133	110	154	14.75	0	0	0	0	----	1	85	85	85	----	0	0	0	0	----	0	0	0	0	----
Totals	4538	105	31	182	20.71	4	136	115	163	20.55	50	66	31	114	16.92	113	130	100	191	17.10	446	149	68	190	13.17

\*Includes hatchery releases



Appendix 35. WCT weekly fork length data for chinook and coho, 1998.

Julian Week	Chinook*										Natural Coho										Hatchery Coho				
	Age 0					Age 1					Age 0					Age 1					Age 1				
	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d
11																									
12																									
13																									
14																									
15																									
16	19	38	35	41	1.71	0	0	0	0	----	0	0	0	0	----	2	149	116	181	45.96	4	166	147	185	17.73
17	14	42	36	61	7.27	0	0	0	0	----	1	47	47	47	----	1	154	154	154	----	2	166	165	166	0.71
18	9	39	36	44	2.22	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	3	179	143	229	44.52
19	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	12	152	135	175	12.57
20	3	48	43	57	8.08	0	0	0	0	----	0	0	0	0	----	1	132	132	132	----	17	154	128	191	16.00
21	16	54	47	69	7.14	0	0	0	0	----	0	0	0	0	----	16	130	114	160	14.57	102	160	120	210	15.49
22	8	59	48	95	15.72	0	0	0	0	----	2	34	33	34	0.71	2	126	122	130	5.66	87	158	130	275	18.32
23	3	89	53	125	36.00	0	0	0	0	----	1	45	45	45	----	1	145	145	145	----	28	158	129	180	13.69
24	29	78	34	106	19.89	0	0	0	0	----	0	0	0	0	----	3	131	127	136	4.58	32	155	138	184	9.89
25	91	87	54	128	13.60	0	0	0	0	----	0	0	0	0	----	4	137	130	153	10.72	8	148	115	186	26.80
26	210	96	61	116	10.21	0	0	0	0	----	3	62	53	75	11.53	0	0	0	0	----	4	151	135	170	14.36
27	210	96	55	115	7.79	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	3	159	155	162	3.61
28	180	92	70	115	7.03	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
29	210	89	73	111	8.02	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
30	210	85	67	116	8.67	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
31	210	86	70	110	6.82	0	0	0	0	----	2	77	69	84	10.61	0	0	0	0	----	0	0	0	0	----
32	260	88	72	126	7.77	0	0	0	0	----	1	100	100	100	----	0	0	0	0	----	0	0	0	0	----
33	210	91	74	131	9.16	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
34	180	95	81	126	8.62	0	0	0	0	----	1	110	110	110	----	2	131	126	135	6.36	0	0	0	0	----
35	150	97	82	128	7.30	0	0	0	0	----	3	107	100	118	9.64	1	129	129	129	----	0	0	0	0	----
36	210	100	85	126	7.74	0	0	0	0	----	3	109	105	112	3.61	0	0	0	0	----	0	0	0	0	----
37	210	102	83	126	7.30	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
38	210	103	89	121	6.00	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
39	210	105	84	120	6.43	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
40	210	114	91	148	13.13	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
41	210	125	94	166	11.88	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
42	210	125	78	160	11.97	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
43	211	124	98	162	12.47	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
44	210	124	90	160	11.72	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
45	113	121	78	158	13.69	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
46	117	127	79	173	15.93	0	0	0	0	----	1	93	93	93	----	0	0	0	0	----	0	0	0	0	----
47	4	121	97	144	19.71	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
48																									
49																									
Totals	4347	102	34	173	18.70	0	0	0	0	----	18	81	33	118	29.10	33	133	114	181	14.94	302	158	115	275	16.47

\*Includes hatchery releases



Appendix 37. WCT weekly fork length data for chinook and coho, 1999.

Julian Week	Chinook*										Natural Coho								Hatchery Coho						
	Age 0					Age 1					Age 0				Age 1				Age 1						
	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d
11	1	37	37	37	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	8	146	132	168	12.73
12	6	79	38	128	43.83	0	0	0	0	----	0	0	0	0	----	1	115	115	115	----	110	158	121	210	17.40
13	21	56	33	125	32.93	0	0	0	0	----	0	0	0	0	----	1	115	115	115	----	42	161	134	221	18.33
14	51	49	35	119	22.49	0	0	0	0	----	3	36	33	39	3.06	4	110	95	130	17.80	21	142	115	171	11.94
15	18	56	29	126	28.10	0	0	0	0	----	2	37	37	37	----	3	125	120	129	4.73	6	142	115	160	15.21
16	44	44	32	170	22.36	0	0	0	0	----	0	0	0	0	----	3	119	115	124	4.73	3	154	145	171	15.01
17	69	54	37	75	11.73	0	0	0	0	----	2	51	48	53	3.54	2	127	109	144	24.75	6	177	150	250	39.87
18	49	58	36	108	12.94	0	0	0	0	----	2	36	36	36	----	9	158	105	188	27.68	12	172	147	209	16.52
19	74	61	38	127	16.96	0	0	0	0	----	2	38	33	43	7.07	2	165	158	171	9.19	126	160	113	213	15.42
20	56	61	35	84	10.58	0	0	0	0	----	2	54	52	55	2.12	5	120	110	129	6.80	201	153	124	205	11.81
21	14	55	38	71	10.37	0	0	0	0	----	4	52	43	62	7.79	8	131	116	150	11.11	201	149	121	194	11.40
22	23	62	45	85	12.18	0	0	0	0	----	7	48	40	62	7.46	0	0	0	0	----	110	148	122	191	11.40
23	133	72	42	117	18.27	0	0	0	0	----	25	54	37	66	7.80	0	0	0	0	----	112	146	100	198	11.55
24	189	87	40	122	14.97	0	0	0	0	----	5	56	45	69	10.27	3	124	117	129	6.11	71	145	113	172	11.26
25	210	87	54	109	8.69	0	0	0	0	----	12	60	51	66	5.10	0	0	0	0	----	8	146	136	167	10.53
26	210	86	12	108	10.74	0	0	0	0	----	39	62	50	75	6.29	0	0	0	0	----	1	140	140	140	----
27	210	85	45	101	9.46	0	0	0	0	----	35	63	55	82	6.52	0	0	0	0	----	1	150	150	150	----
28	210	87	59	111	7.40	0	0	0	0	----	21	67	54	80	6.00	0	0	0	0	----	0	0	0	0	----
29	210	85	66	110	6.13	0	0	0	0	----	11	70	57	80	7.32	0	0	0	0	----	0	0	0	0	----
30	210	85	52	103	6.41	0	0	0	0	----	27	68	60	77	4.01	1	122	122	122	----	0	0	0	0	----
31	180	85	60	104	6.49	0	0	0	0	----	7	68	61	75	4.34	0	0	0	0	----	0	0	0	0	----
32	210	89	56	106	6.86	0	0	0	0	----	1	77	77	77	----	0	0	0	0	----	0	0	0	0	----
33	210	89	70	112	6.36	0	0	0	0	----	1	68	68	68	----	0	0	0	0	----	0	0	0	0	----
34	210	89	70	109	6.20	0	0	0	0	----	1	72	72	72	----	0	0	0	0	----	0	0	0	0	----
35	210	93	77	130	6.29	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
36	210	97	82	148	8.24	0	0	0	0	----	1	90	90	90	----	0	0	0	0	----	0	0	0	0	----
37	139	99	85	125	6.77	0	0	0	0	----	1	76	76	76	----	0	0	0	0	----	0	0	0	0	----
38	210	101	70	115	6.59	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
39	209	101	73	125	7.30	0	0	0	0	----	1	74	74	74	----	0	0	0	0	----	0	0	0	0	----
40																									
41																									
42																									
43																									
44																									
45																									
46																									
47																									
48																									
49																									
Totals	3796	86	12	170	16.05	0	0	0	0	----	212	61	33	90	9.96	42	132	95	188	22.93	1039	152	100	250	14.71

\*Includes hatchery releases





Appendix 39. WCT weekly fork length data for chinook and coho, 2000.

Julian Week	Chinook*										Natural Coho										Hatchery Coho				
	Age 0					Age 1					Age 0					Age 1					Age 1				
	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20	78	59	40	86	9.58	0	0	0	0	----	0	0	0	0	----	12	118	105	157	14.01	42	150	110	185	13.64
21	110	66	47	94	12.94	0	0	0	0	----	1	58	58	58	----	16	120	99	157	15.26	22	155	123	210	16.09
22	202	70	44	117	14.06	0	0	0	0	----	5	59	53	66	5.86	10	120	102	135	10.77	10	148	125	180	15.62
23	210	84	45	122	14.89	0	0	0	0	----	2	66	55	77	15.56	5	133	116	158	17.69	7	148	135	156	7.76
24	210	90	48	115	14.01	0	0	0	0	----	2	68	65	70	3.54	3	134	122	145	11.50	2	157	151	162	7.78
25	210	90	56	118	12.12	0	0	0	0	----	5	66	59	72	5.13	0	0	0	0	----	0	0	0	0	----
26	210	88	61	115	11.42	0	0	0	0	----	1	66	66	66	----	0	0	0	0	----	0	0	0	0	----
27	180	88	51	122	10.46	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
28	210	87	63	114	7.75	0	0	0	0	----	2	79	68	90	15.56	0	0	0	0	----	0	0	0	0	----
29	210	87	72	105	5.79	0	0	0	0	----	3	78	67	92	12.77	2	121	118	123	3.54	0	0	0	0	----
30	210	87	72	101	5.66	0	0	0	0	----	1	73	73	73	----	0	0	0	0	----	0	0	0	0	----
31	210	88	72	103	5.70	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
32	210	88	66	105	5.83	0	0	0	0	----	1	90	90	90	----	0	0	0	0	----	0	0	0	0	----
33	213	90	66	107	6.00	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
34	194	93	74	111	6.27	0	0	0	0	----	0	0	0	0	----	2	102	101	102	0.71	0	0	0	0	----
35	210	93	35	112	7.39	0	0	0	0	----	1	104	104	104	----	0	0	0	0	----	0	0	0	0	----
36	210	98	80	112	6.57	0	0	0	0	----	0	0	0	0	----	1	114	114	114	----	0	0	0	0	----
37	154	100	84	120	6.97	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
38	150	102	87	126	7.02	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
39	170	103	76	120	7.48	0	0	0	0	----	0	0	0	0	----	1	154	154	154	----	0	0	0	0	----
40	150	117	92	164	20.10	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
41																									
42																									
43																									
44																									
45																									
46																									
47																									
48																									
49																									
Totals	3911	90	35	164	14.45	0	0	0	0	----	24	70	53	104	12.88	52	121	99	158	15.05	83	151	110	210	14.11

\*Includes hatchery releases

Appendix 40. WCT weekly fork length data for steelhead, 2000.

Julian Week	Natural Steelhead															Hatchery Steelhead														
	Age 0					Age 1					Age 2					Age 3				Age 1				Age 2						
	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d	n	avg	min	max	s.d
11																														
12																														
13																														
14																														
15																														
16																														
17																														
18																														
19																														
20	0	0	0	0	----	29	113	75	179	31.95	35	148	120	177	12.73	9	184	166	210	14.56	5	202	188	233	18.53	0	0	0	0	----
21	1	40	40	40	----	58	108	74	173	25.70	38	160	134	193	14.07	1	187	187	187	----	9	212	180	235	19.10	0	0	0	0	----
22	1	39	39	39	----	29	110	81	180	27.35	36	160	122	188	16.62	4	205	195	214	8.02	8	216	194	235	15.24	0	0	0	0	----
23	3	47	45	50	2.65	39	116	81	175	25.90	42	166	140	195	15.49	0	0	0	0	----	11	208	161	230	19.98	0	0	0	0	----
24	10	50	45	56	3.47	23	124	92	175	25.68	15	169	147	187	12.32	0	0	0	0	----	4	203	182	218	17.06	0	0	0	0	----
25	21	50	31	65	7.45	9	125	109	161	18.49	1	181	181	181	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
26	42	56	36	96	9.90	5	128	112	153	15.57	2	168	166	170	2.83	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
27	34	56	47	68	5.94	6	121	105	143	14.95	1	141	141	141	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
28	27	64	52	88	8.05	2	127	112	142	21.21	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
29	26	65	45	80	7.71	6	118	103	130	10.33	4	144	122	185	28.69	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
30	35	61	43	90	10.65	9	124	106	146	12.49	9	137	119	168	14.13	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
31	18	64	40	80	11.72	19	129	100	148	10.40	8	143	130	160	9.78	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
32	16	68	43	84	13.61	15	131	107	150	13.37	7	143	125	171	16.60	2	161	129	192	44.55	0	0	0	0	----	0	0	0	0	----
33	9	88	58	134	22.49	7	127	107	148	13.77	5	146	124	162	14.74	1	205	205	205	----	0	0	0	0	----	0	0	0	0	----
34	13	81	54	118	19.12	2	146	141	151	7.07	6	168	148	210	21.40	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
35	3	72	50	88	19.86	2	164	145	182	26.16	3	146	140	156	8.72	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
36	24	85	59	107	12.55	7	144	126	162	13.70	4	147	123	157	16.21	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
37	4	85	68	98	12.46	3	159	147	170	11.53	4	160	148	172	13.02	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
38	4	76	65	87	9.07	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
39	15	94	67	115	13.37	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
40	6	98	68	113	15.66	1	152	152	152	----	2	203	190	215	17.68	0	0	0	0	----	0	0	0	0	----	0	0	0	0	----
41																														
42																														
43																														
44																														
45																														
46																														
47																														
48																														
49																														
Totals	312	66	31	134	17.14	271	119	74	182	25.44	222	157	119	215	17.77	17	188	129	214	20.76	37	209	161	235	18.04	0	0	0	0	----

\*Includes hatchery releases

Appendix 41. BBT miscellaneous species, index totals, 1997.

Week Starting	Julian Week	Mean River Flow (cfs)	Trap Days	Lamprey-Ammocoete	Lamprey-Eyed Juvenile	Lamprey-Adult	speckled dace	green sturgeon	Klamath smallscale sucker	prickly sculpin	American shad	crappie	fathead minnow	golden shiner	constrange sculpin	bullhead	bryana trout	large mouth bass	chum salmon	sockeye salmon	green sturgeon	marble d. sculpin	three-spine stickleback
03/12/97	11	11,571	0																				
03/19/97	12	12,043	0																				
03/26/97	13	10,720	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04/02/97	14	8,510	4	5,134	0	0	125	0	35	414	0	0	0	0	429	0	0	0	0	0	0	0	0
04/09/97	15	7,123	4	639	0	0	74	0	145	71	0	0	0	0	720	0	0	0	0	0	0	0	0
04/16/97	16	12,576	1	0	0	0	128	0	128	0	0	0	0	128	128	0	0	0	0	0	0	0	0
04/23/97	17	15,557	6	21,033	3,592	0	849	0	1,366	416	0	0	0	0	433	0	0	0	0	0	0	0	0
04/30/97	18	12,943	7	26,638	0	756	546	122	0	122	0	0	0	0	293	122	0	0	0	0	0	0	0
05/07/97	19	9,553	7	13,424	0	1,644	610	0	125	0	0	0	89	0	327	0	0	0	0	0	0	0	0
05/14/97	20	8,014	7	1,405	0	5,468	1,242	0	621	64	0	0	0	0	153	0	0	0	0	0	0	0	0
05/21/97	21	6,327	7	801	0	4,794	792	0	928	65	0	0	0	67	398	0	0	0	0	0	0	0	0
05/28/97	22	5,821	7	379	0	3,670	1,017	0	508	191	0	0	0	0	505	0	0	0	0	0	0	0	63
06/04/97	23	5,734	7	3,655	130	906	1,939	205	1,104	444	0	0	0	0	411	0	0	0	0	0	0	0	0
06/11/97	24	4,577	7	1,123	0	183	930	461	598	45	0	0	0	0	96	0	0	0	0	0	0	0	0
06/18/97	25	3,654	7	99	0	0	1,089	59	371	0	0	0	0	0	63	0	73	0	0	0	0	0	42
06/25/97	26	3,334	7	129	29	0	1,392	1,019	838	58	0	0	0	0	28	0	0	0	0	0	0	0	0
07/02/97	27	2,893	7	25	0	0	923	604	933	79	0	0	48	0	40	40	0	0	0	0	0	0	48
07/09/97	28	2,454	6	0	0	0	798	514	1,935	23	0	21	0	0	54	0	0	0	0	0	0	0	0
07/16/97	29	2,180	7	0	0	0	672	295	2,411	38	0	20	0	19	20	0	0	0	0	0	0	0	0
07/23/97	30	2,031	7	0	0	0	1,949	209	15,788	37	0	0	0	0	93	0	0	0	0	0	0	0	0
07/30/97	31	2,099	7	75	0	0	2,328	226	8,534	392	19	0	0	0	150	19	0	0	0	0	0	0	57
08/06/97	32	2,090	7	0	0	0	1,294	79	3,177	390	0	0	0	0	178	0	0	0	0	0	0	0	0
08/13/97	33	1,981	5	297	0	0	782	0	1,906	404	261	0	0	0	202	0	0	0	0	0	0	0	0
08/20/97	34	2,144	1	0	0	0	83	0	359	111	0	0	0	0	28	0	0	0	0	0	0	0	0
08/27/97	35	2,124	0																				
09/03/97	36	1,963	0																				
09/10/97	37	2,217	0																				
09/17/97	38	2,434	0																				
09/24/97	39	2,063	0																				
10/01/97	40	2,794	0																				
10/08/97	41	4,283	0																				
10/15/97	42	3,493	0																				
10/22/97	43	3,060	0																				
10/29/97	44	4,431	0																				
11/05/97	45	4,177	0																				
11/12/97	46	4,294	0																				
11/19/97	47	6,594	0																				
11/26/97	48	7,173	0																				
12/03/97	49	6,150	0																				
12/10/97	50	6,030	0																				
12/17/97	51	9,153	0																				
12/24/97	52	5,816	0																				
Spring total			126	74,857	3,750	17,422	19,561	3,793	41,808	3,365	279	41	137	213	4,750	180	73	0	0	0	0	0	209
Fall total			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals			0	74,857	3,750	17,422	19,561	3,793	41,808	3,365	279	41	137	213	4,750	180	73	0	0	0	0	0	209

Appendix 42. BBT miscellaneous species, index totals, 1998.

Week Starting	Julian Week	Mean River Flow (cfs)	Trap Days	Lamprey-Ammocete	Lamprey-Eyed Juvenile	Lamprey-Adult	speckled dace	green sturgeon	Klamath smallscale sucker	Piedmont sculpin	American shad	crayfish	fathead minnow	golden shiner	cowtrout sculpin	bullhead	brown trout	large mouth bass	chum salmon	sockeye salmon	green sturgeon	marble d sculpin	three spine stickleback
03/12/98	11	19,814	0																				
03/19/98	12	48,414	0																				
03/26/98	13	29,871	0																				
04/02/98	14	21,429	0																				
04/09/98	15	17,657	0																				
04/16/98	16	14,986	0																				
04/23/98	17	16,271	0																				
04/30/98	18	20,429	7	83,577	0	236	7,280	0	1,235	290	0	0	0	236	0	0	0	0	0	0	0	0	0
05/07/98	19	20,900	7	54,595	0	0	6,048	0	1,172	386	0	0	0	1,342	286	503	0	0	0	0	0	0	0
05/14/98	20	16,829	7	37,510	0	1,087	1,935	0	171	171	0	0	0	675	195	0	0	0	0	0	0	0	0
05/21/98	21	16,686	7	25,610	147	797	147	0	555	305	0	0	0	503	0	0	0	0	0	0	0	0	0
05/28/98	22	18,314	7	14,510	123	1,559	419	0	300	138	0	0	0	576	0	158	0	0	0	0	0	146	0
06/04/98	23	18,971	7	26,885	184	354	366	0	1,220	0	0	0	0	1,879	0	0	208	0	0	0	0	0	0
06/11/98	24	16,614	7	11,521	221	440	434	0	437	0	0	0	0	1,559	0	361	0	0	0	0	140	0	0
06/18/98	25	12,086	7	8,428	0	1,016	213	0	816	109	0	0	0	339	0	0	0	0	0	0	0	0	0
06/25/98	26	9,083	7	5,185	0	454	670	0	884	0	0	0	0	415	97	0	0	0	0	0	0	71	0
07/02/98	27	7,323	7	374	62	209	185	0	338	120	0	0	0	0	0	0	0	0	0	0	0	0	0
07/09/98	28	5,751	7	104	0	0	432	0	203	106	0	0	0	93	0	0	0	0	0	0	0	0	0
07/16/98	29	4,556	6	0	0	0	854	99	945	128	0	0	0	0	0	0	0	0	0	0	0	55	0
07/23/98	30	4,113	5	36	36	0	554	268	1,541	75	0	0	0	35	0	0	0	0	0	0	0	0	0
07/30/98	31	3,224	5	28	0	0	350	0	7,399	48	0	0	0	28	0	0	0	0	0	0	0	0	0
08/06/98	32	2,734	2	14	0	0	14	0	251	0	0	0	0	14	0	0	0	0	0	0	0	0	0
08/13/98	33	2,429	1	0	0	0	177	0	1,653	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/20/98	34	2,264	0																				
08/27/98	35	2,127	0																				
09/03/98	36	2,327	0																				
09/10/98	37	2,387	0																				
09/17/98	38	2,357	0																				
09/24/98	39	2,404	0																				
10/01/98	40		0																				
10/08/98	41		0																				
10/15/98	42		0																				
10/22/98	43		0																				
10/29/98	44		0																				
11/05/98	45		0																				
11/12/98	46		0																				
11/19/98	47		0																				
11/26/98	48		0																				
12/03/98	49		0																				
12/10/98	50		0																				
12/17/98	51		0																				
12/24/98	52		0																				
Spring total			96	268,377	775	6,151	20,079	367	19,119	1,877	0	0	0	7,693	578	1,022	208	0	0	0	140	272	0
Fall total			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals			0	268,377	775	6,151	20,079	367	19,119	1,877	0	0	0	7,693	578	1,022	208	0	0	0	140	272	0

Appendix 43. BBT miscellaneous species, index totals, 1999.

Week Starting	Julian Week	Mean River Flow (cfs)	Trap Days	Lamprey-Ammocoete	Lamprey-Eyed Juvenile	Lamprey-Adult	speckled dace	green sturgeon	Klamath smallmouth sucker	prickly sculpin	American shad	crayfish	fathead minnow	golden shiner	coastrange sculpin	bullhead	brown trout	large mouth bass	chum salmon	sockeye salmon	green sturgeon	triple d sculpin	three spine stickleback
03/12/99	11	20,457	0																				
03/19/99	12	21,171	0																				
03/26/99	13	17,843	0																				
04/02/99	14	16,229	0																				
04/09/99	15	15,357	4	6,485	0	0	400	0	1,321	136	0	0	0	442	185	0	0	0	0	0	0	0	0
04/16/99	16	22,071	7	90,318	0	0	3,863	0	13,223	853	0	0	0	2,571	587	186	0	0	0	0	0	0	0
04/23/99	17	20,743	7	38,434	0	0	4,673	0	6,471	621	377	0	0	2,022	636	0	0	0	0	0	0	184	0
04/30/99	18	16,914	7	20,873	0	0	1,696	0	2,457	110	0	0	0	2,891	186	0	0	0	0	0	0	0	0
05/07/99	19	15,086	7	10,898	707	300	803	0	1,494	0	0	0	0	3,577	380	0	0	0	0	0	134	0	0
05/14/99	20	15,043	7	8,807	146	699	821	0	1,060	0	0	0	0	1,613	0	0	0	0	0	0	0	539	0
05/21/99	21	20,200	4	72,827	0	194	610	0	2,271	390	0	0	0	2,827	0	223	0	0	0	0	0	0	0
05/28/99	22	17,943	7	111,219	184	763	2,735	0	1,696	0	0	0	0	8,597	191	0	0	0	0	0	0	169	0
06/04/99	23	12,029	7	22,955	341	539	1,691	0	1,918	0	0	0	116	2,115	0	0	0	0	0	0	0	246	0
06/11/99	24	12,443	6	3,242	569	1,861	153	0	1,734	0	0	0	0	1,231	0	0	0	0	0	0	0	531	0
06/18/99	25	10,583	7	4,474	0	2,730	635	0	306	0	0	0	0	807	106	0	0	0	0	0	0	104	0
06/25/99	26	7,783	7	845	0	1,325	381	0	184	0	0	0	0	681	0	0	0	0	0	0	0	0	0
07/02/99	27	5,409	7	328	122	0	787	56	600	0	0	0	0	388	0	0	0	0	0	0	54	0	0
07/09/99	28	4,271	6	81	41	0	731	806	446	41	0	0	0	43	65	0	0	0	0	0	0	41	0
07/16/99	29	3,401	7	0	0	0	463	1,331	799	0	0	0	0	71	0	0	0	0	0	0	0	36	0
07/23/99	30	2,950	7	129	34	0	67	162	532	0	0	0	0	34	0	0	0	0	0	0	0	0	0
07/30/99	31	2,579	7	28	29	0	317	248	376	0	0	29	0	28	0	0	0	0	0	0	0	0	0
08/06/99	32	2,426	5	107	321	0	159	320	428	0	0	0	26	164	0	0	0	0	0	0	0	0	0
08/13/99	33	2,184	0																				
08/20/99	34	2,007	0																				
08/27/99	35	1,986	0																				
09/03/99	36	2,039	0																				
09/10/99	37	1,979	0																				
09/17/99	38	1,949	0																				
09/24/99	39	1,921	0																				
10/01/99	40		0																				
10/08/99	41		0																				
10/15/99	42		0																				
10/22/99	43		0																				
10/29/99	44		0																				
11/05/99	45		0																				
11/12/99	46		0																				
11/19/99	47		0																				
11/26/99	48		0																				
12/03/99	49		0																				
12/10/99	50		0																				
12/17/99	51		0																				
12/24/99	52		0																				
Spring total			116	392,050	2,494	8,410	20,985	2,924	37,315	2,151	377	29	142	30,099	2,337	408	0	0	0	0	188	1,850	0
Fall total			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals			0	392,050	2,494	8,410	20,985	2,924	37,315	2,151	377	29	142	30,099	2,337	408	0	0	0	0	188	1,850	0

Appendix 44. BBT miscellaneous species, index totals, 2000.

Week Starting	Julian Week	Mean River Flow (cfs)	Trap Days	Lamprey - Ammocoete	Lamprey - Eyed Juvenile	Lamprey - Adult	speckle d dace	green sturgeon	Klamath smallscale sucker	prickly sculpin	American shad	crayfish	fadged rainbow	golden shiner	coastrange sculpin	bullhead	brown trout	large mouth bass	chum salmon	sockeye salmon	green sturgeon	marble d sculpin	three spine stickleback
03/12/00	11	14,243	0																				
03/19/00	12	12,843	0																				
03/26/00	13	11,071	0																				
04/02/00	14	12,529	1	1,357	0	0	271	0	136	0	0	0	271	0	0	0	0	0	0	0	0	0	0
04/09/00	15	13,257	6	22,565	181	118	1,910	0	2,248	181	0	0	136	170	0	0	0	0	0	0	0	0	0
04/16/00	16	12,543	7	45,927	0	0	1,256	0	3,246	239	0	0	410	117	0	0	0	0	0	0	0	258	0
04/23/00	17	11,373	7	5,669	106	106	1,120	0	1,735	96	0	0	0	131	0	96	0	0	0	0	0	0	0
04/30/00	18	10,306	7	6,534	0	0	1,612	0	2,185	0	0	0	197	299	197	0	0	0	0	0	0	98	0
05/07/00	19	9,934	7	4,773	0	1,266	1,168	0	617	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/14/00	20	8,869	7	372	0	462	797	0	443	0	0	0	0	232	0	0	0	0	0	0	0	0	0
05/21/00	21	10,647	7	6,895	88	180	807	0	181	0	0	0	0	88	0	0	0	0	0	0	0	0	0
05/28/00	22	7,804	7	2,200	69	280	511	0	0	88	88	0	0	714	0	0	0	0	0	0	0	86	0
06/04/00	23	6,519	7	391	196	258	394	134	325	0	0	0	0	63	0	0	0	0	0	0	0	0	0
06/11/00	24	5,807	7	112	0	0	109	0	222	0	112	0	0	0	0	0	0	0	0	0	0	0	0
06/18/00	25	4,060	7	0	81	0	638	239	204	42	0	0	0	85	0	0	0	0	0	0	0	0	0
06/25/00	26	3,053	6	90	195	0	788	63	331	0	0	0	29	36	0	0	0	0	0	0	0	0	0
07/02/00	27	2,601	6	388	86	0	207	0	527	0	0	0	30	0	27	0	0	0	0	0	0	0	0
07/09/00	28	2,337	3	91	15	0	42	0	67	38	0	0	15	0	14	0	0	0	0	0	0	0	0
07/16/00	29	2,049	1	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/23/00	30	1,857	0																				
07/30/00	31	1,707	0																				
08/06/00	32	1,623	0																				
08/13/00	33	1,553	0																				
08/20/00	34	1,539	0																				
08/27/00	35	1,516	0																				
09/03/00	36	1,639	0																				
09/10/00	37	1,770	0																				
09/17/00	38	1,730	0																				
09/24/00	39	1,740	0																				
10/01/00	40		0																				
10/08/00	41		0																				
10/15/00	42		0																				
10/22/00	43		0																				
10/29/00	44		0																				
11/05/00	45		0																				
11/12/00	46		0																				
11/19/00	47		0																				
11/26/00	48		0																				
12/03/00	49		0																				
12/10/00	50		0																				
12/17/00	51		0																				
12/24/00	52		0																				
Spring total			93	97,385	1,016	2,669	11,632	436	12,466	685	88	0	1,088	1,872	300	96	0	0	0	0	0	442	0
Fall total			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals			0	97,385	1,016	2,669	11,632	436	12,466	685	88	0	1,088	1,872	300	96	0	0	0	0	0	442	0



Appendix 46. WCT miscellaneous species, index totals, 1998.

Week Starting	Julian Week	Mean River Flow (cfs)	Trap Days	Lamprey-Amnocoete	Lamprey-Eyed Juvenile	Lamprey-Adult	speckled dace	green sturgeon	Idanmuth-smaltside sucker	prickly sculpin	American shad	cryptic	fathead rainbow	golden shiner	coastrange sculpin	bulthead	brown trout	largemouth bass	chum salmon	sockeye salmon	green smelt	marbled sculpin	three-spine stickleback
03/12/98	11	19,814	0																				
03/19/98	12	48,414	0																				
03/26/98	13	29,871	0																				
04/02/98	14	21,429	0																				
04/09/98	15	17,657	0																				
04/16/98	16	14,986	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04/23/98	17	16,271	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04/30/98	18	20,429	7	90,317	0	237	7,175	0	1,422	356	0	0	237	0	0	0	0	0	0	0	0	0	0
05/07/98	19	20,900	7	51,289	0	0	5,797	0	1,114	393	0	0	1,232	236	522	0	0	0	0	0	0	0	0
05/14/98	20	16,829	7	35,983	0	982	1,886	0	159	159	0	0	619	165	0	0	0	0	0	0	0	0	0
05/21/98	21	16,686	7	23,671	147	902	147	0	669	284	0	0	596	0	0	0	0	0	0	0	0	0	0
05/28/98	22	18,314	7	14,833	148	1,750	454	0	328	142	0	0	580	0	170	0	0	0	0	0	123	0	0
06/04/98	23	18,971	7	27,291	202	410	414	0	1,138	0	0	0	1,751	0	0	175	0	0	0	0	0	0	0
06/11/98	24	16,614	7	10,836	160	460	438	0	454	0	0	0	1,424	0	317	0	0	0	0	158	0	0	0
06/18/98	25	12,086	7	8,189	0	931	242	0	734	125	0	0	317	0	0	0	0	0	0	0	0	0	0
06/25/98	26	9,083	7	4,968	0	414	644	0	884	0	0	0	398	83	0	0	0	0	0	0	73	0	0
07/02/98	27	7,323	7	367	63	209	185	0	326	120	0	0	0	0	0	0	0	0	0	0	0	0	0
07/09/98	28	5,751	7	95	0	0	418	0	200	96	0	0	90	0	0	0	0	0	0	0	0	0	0
07/16/98	29	4,556	6	0	0	0	681	37	623	110	0	0	0	0	0	0	0	0	0	0	37	0	0
07/23/98	30	4,113	5	39	39	0	494	216	1,569	35	0	0	0	0	0	0	0	0	0	0	0	0	0
07/30/98	31	3,224	5	0	0	0	245	0	6,135	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/06/98	32	2,734	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/13/98	33	2,429	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/20/98	34	2,264	0																				
08/27/98	35	2,127	0																				
09/03/98	36	2,327	0																				
09/10/98	37	2,387	0																				
09/17/98	38	2,357	0																				
09/24/98	39	2,404	0																				
10/01/98	40	2,430	0																				
10/08/98	41	2,636	0																				
10/15/98	42	2,583	0																				
10/22/98	43	2,811	0																				
10/29/98	44	2,851	0																				
11/05/98	45	3,626	0																				
11/12/98	46	4,254	0																				
11/19/98	47	23,661	0																				
11/26/98	48	21,643	0																				
12/03/98	49	19,571	0																				
12/10/98	50	12,357	0																				
12/17/98	51	10,451	0																				
12/24/98	52	9,001	0																				
Spring total			96	267,878	759	6,295	19,221	252	15,754	1,820	0	0	7,244	484	1,009	175	0	0	0	158	233	0	
Fall total			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals			96	267,878	759	6,295	19,221	252	15,754	1,820	0	0	7,244	484	1,009	175	0	0	0	158	233	0	



Appendix 47. WCT miscellaneous species, index totals, 1999.

Week Starting	Julian Week	Mean River Flow (cfs)	Trap Days	Lamprey-Amocete	Lamprey-Eyed Juvenile	Lamprey-Adult	speckled dace	green sturgeon	khramdi smeltscale sucker	prickly sculpin	American shad	crayfish	fathead minnow	golden shiner	cosctrange sculpin	bullhead	brown trout	large-mouth bass	chum salmon	sockeye salmon	green sturgeon	marbled sculpin	three-spine stickleback
03/12/99	11	9,641	1	96	0	0	96	0	96	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/19/99	12	11,571	6	949	0	0	322	0	692	161	0	0	0	0	286	0	137	0	0	0	0	0	0
03/26/99	13	11,606	5	2,922	0	0	589	0	415	357	0	0	0	0	277	0	0	0	0	0	0	0	0
04/02/99	14	8,093	7	369	0	0	199	0	76	96	0	0	0	0	270	0	0	0	0	0	0	0	0
04/09/99	15	8,729	7	0	0	0	0	0	161	0	0	0	0	0	413	0	0	0	0	0	0	0	0
04/16/99	16	11,800	7	26,137	0	0	773	0	7,046	834	0	0	0	0	361	0	0	0	0	0	112	252	0
04/23/99	17	9,031	7	195	0	0	190	0	752	189	0	0	0	0	382	0	90	0	0	0	0	0	0
04/30/99	18	7,510	7	65	0	72	67	0	1,633	72	0	0	0	0	215	0	68	0	0	0	0	0	0
05/07/99	19	7,009	7	136	75	0	0	0	1,582	62	0	0	0	0	137	0	0	0	0	0	0	0	0
05/14/99	20	6,824	7	376	379	257	137	0	1,991	189	0	0	0	0	62	0	0	0	0	0	0	0	0
05/21/99	21	7,393	7	342	0	855	127	0	5,427	0	0	0	0	0	63	0	0	0	0	0	0	0	0
05/28/99	22	5,876	7	587	0	795	648	0	1,468	0	0	0	0	0	73	0	0	0	0	0	0	0	0
06/04/99	23	4,230	7	457	0	610	259	0	1,078	0	0	0	0	0	46	0	0	0	0	51	0	0	0
06/11/99	24	3,893	7	170	0	550	725	0	3,128	0	0	0	0	0	42	0	0	0	0	0	0	0	0
06/18/99	25	3,261	7	222	36	226	691	0	3,813	0	0	0	0	0	0	0	0	109	0	0	0	0	0
06/25/99	26	2,641	7	35	0	0	849	0	2,781	34	0	0	0	0	0	0	0	0	103	0	0	0	0
07/02/99	27	2,144	7	58	0	0	306	0	519	0	0	0	0	0	33	0	0	0	0	315	0	25	33
07/09/99	28	1,824	7	34	24	49	331	0	546	0	0	0	0	0	0	0	0	0	344	0	24	0	0
07/16/99	29	1,437	6	21	0	0	372	0	530	0	0	0	0	0	0	0	0	0	292	0	0	0	192
07/23/99	30	1,234	7	0	18	0	782	0	784	0	0	0	0	0	36	0	0	0	92	0	0	0	74
07/30/99	31	1,090	6	0	0	0	554	0	1,371	0	0	0	0	0	0	0	0	0	31	0	66	15	0
08/06/99	32	1,094	7	0	65	0	784	0	1,892	0	0	0	0	0	0	0	0	0	64	0	0	0	140
08/13/99	33	973	7	0	42	0	543	0	1,396	0	0	0	0	0	0	0	0	0	213	0	25	151	0
08/20/99	34	884	6	0	12	0	617	0	642	0	0	0	0	0	0	0	0	0	402	0	0	0	112
08/27/99	35	848	7	0	0	0	298	0	102	0	0	0	11	0	0	0	0	0	135	0	0	0	46
09/03/99	36	798	7	0	11	0	282	0	177	0	0	0	0	0	0	0	0	0	380	0	11	72	0
09/10/99	37	1,002	7	0	64	0	352	0	137	0	0	0	11	0	0	0	0	0	271	0	0	0	31
09/17/99	38	732	7	0	170	0	194	0	81	0	0	0	9	9	0	0	0	0	362	0	0	0	30
09/24/99	39	711	7	0	27	0	82	0	36	0	0	0	37	0	0	0	0	0	72	0	0	0	9
10/01/99	40		0																				
10/08/99	41		0																				
10/15/99	42		0																				
10/22/99	43		0																				
10/29/99	44		0																				
11/05/99	45		0																				
11/12/99	46		0																				
11/19/99	47		0																				
11/26/99	48		0																				
12/03/99	49		0																				
12/10/99	50		0																				
12/17/99	51		0																				
12/24/99	52		0																				
Spring total			191	33,170	923	3,415	11,168	0	40,352	1,995	0	0	0	68	2,705	0	295	0	109	3,128	112	403	903
Fall total			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals			191	33,170	923	3,415	11,168	0	40,352	1,995	0	0	0	68	2,705	0	295	0	109	3,128	112	403	903

Appendix 48. WCT miscellaneous species, index totals, 2000.

Week Starting	Julian Week	Mean River Flow (cfs)	Trap Days	Lamprey-Ammocoete	Lamprey-Eyed Jawhale	Lamprey-Adult	speckled dace	green sturgeon	Klamath smallscale sucker	prickly sculpin	American shad	crayfish	fathead minnow	golden shiner	coastrange sculpin	bullhead	brown trout	largemouth bass	chum salmon	sockeye salmon	green sturgeon	marbled sculpin	three spine stickleback
03/12/00	11	11,947	0																				
03/19/00	12	8,026	0																				
03/26/00	13	5,590	0																				
04/02/00	14	5,297	0																				
04/09/00	15	4,946	0																				
04/16/00	16	7,359	0																				
04/23/00	17	4,763	0																				
04/30/00	18	3,934	0																				
05/07/00	19	4,160	0																				
05/14/00	20	5,136	5	58	0	469	56	0	170	0	0	0	0	112	0	0	0	0	0	0	0	0	116
05/21/00	21	4,787	7	113	0	320	376	0	1,545	0	0	0	0	117	0	0	0	0	0	0	0	0	56
05/28/00	22	3,454	7	50	0	248	375	0	435	0	0	0	0	49	0	0	0	0	0	0	0	0	46
06/04/00	23	3,146	7	0	0	111	301	0	341	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/11/00	24	2,880	7	0	0	0	629	0	490	0	0	0	34	0	0	0	0	0	0	0	0	0	0
06/18/00	25	2,336	7	0	0	0	326	0	154	0	0	0	30	30	0	0	0	0	0	0	0	0	29
06/25/00	26	2,053	7	0	0	0	331	0	333	0	0	0	0	30	0	27	0	0	29	0	0	0	0
07/02/00	27	1,711	7	0	0	0	582	0	368	0	0	0	0	0	23	0	0	0	26	0	24	26	
07/09/00	28	1,440	7	0	0	0	414	0	1,168	0	0	0	20	20	0	0	0	0	20	0	0	324	
07/16/00	29	1,216	7	0	0	0	781	0	228	0	0	0	16	0	0	0	0	0	0	0	16	105	
07/23/00	30	987	7	0	0	0	489	0	1,302	44	0	0	15	14	0	14	0	0	0	0	29	238	
07/30/00	31	904	7	0	0	0	419	0	957	0	0	0	13	0	0	0	0	0	13	0	26	325	
08/06/00	32	824	7	0	0	0	700	0	814	0	0	0	0	12	0	0	0	0	37	0	12	157	
08/13/00	33	785	7	0	0	0	457	0	312	12	0	0	0	0	0	0	0	0	13	0	13	36	
08/20/00	34	764	6	0	0	0	549	0	358	0	0	0	0	0	0	12	0	0	0	0	19	233	
08/27/00	35	735	7	0	0	0	577	0	384	0	12	0	0	0	0	11	0	0	11	0	0	89	
09/03/00	36	807	7	0	0	0	452	0	105	24	128	0	0	0	0	46	0	0	34	0	23	35	
09/10/00	37	751	7	0	0	0	170	0	34	11	34	0	11	0	0	0	0	0	0	0	0	114	
09/17/00	38	728	7	0	0	0	266	0	56	12	44	0	0	11	0	0	0	0	0	0	0	701	
09/24/00	39	735	7	0	23	0	133	0	89	0	186	0	0	11	0	23	0	0	12	0	11	66	
10/01/00	40	733	6	0	0	0	165	0	33	0	407	0	0	0	0	0	0	0	0	0	22	66	
10/08/00	41	786	0																				
10/15/00	42	676	0																				
10/22/00	43	696	0																				
10/29/00	44	1,257	0																				
11/05/00	45		0																				
11/12/00	46		0																				
11/19/00	47		0																				
11/26/00	48		0																				
12/03/00	49		0																				
12/10/00	50		0																				
12/17/00	51		0																				
12/24/00	52		0																				
Spring total			137	222	23	1,147	8,383	0	9,642	102	404	0	0	151	394	23	133	0	0	196	0	174	2,697
Fall total			6	0	0	0	165	0	33	0	407	0	0	0	0	0	0	0	0	0	22	66	
Totals			143	222	23	1,147	8,548	0	9,675	102	811	0	0	151	394	23	133	0	0	196	0	195	2,763