

**Downstream Migration Monitoring at Woodbridge Dam
on the Lower Mokelumne River, Ca.
December 2001 through July 2002**

September 2002

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SUMMARY

Two rotary screw traps fished in tandem below Woodbridge Irrigation District Dam (WIDD) from December 17, 2001 through June 28, 2002 capturing 10,866 juvenile fall-run Chinook salmon (*Oncorhynchus tshawytscha*). On July 1, 2002 an incline plane trap was positioned over the smolt bypass pipe in the low-stage fish ladder. The bypass trap captured 577 juvenile fall-run Chinook salmon. From July 1, 2002 through July 17, 2002 all juvenile fall-run Chinook salmon from the smolt bypass trap were trucked to Brannan Island State Park.

The first juvenile fall-run Chinook salmon was captured on January 3, 2002 at the rotary screw traps at WIDD. The estimate of abundance for screw trap captures derived from calibrations of the traps was 77,346 (95% Confidence Interval: 59,854 -116,698). This number added to bypass catch data resulted in an estimate of 77,923 naturally produced juvenile fall-run Chinook salmon passing WIDD from December 17, 2001 through July 17, 2002. As in years past (Marine 2000, Workman 2001), emigration past WIDD was bimodal with a distinct peak of fry passing by mid-March, and a peak of smolts passing in May and June. Fry and smolt passing numbered 11,791 and 66,132, respectively. Sixty-three age 1+ fall-run Chinook salmon were captured between December and May.

The first steelhead (*O. mykiss*) young-of-year (YOY) were captured in mid-February. Screw trap captures for YOY steelhead totaled 55 fish. The bypass trap captured 7 YOY steelhead. Estimated abundance from screw trap captures was 209 steelhead (95% C.I.:169-289). This number, when added to bypass catch data results in an estimate of 216 YOY steelhead passing WIDD from February through July, 2002. In addition, 149 age 1+ steelhead were captured between December and April. Ten of these steelhead were adipose clipped. Two adult steelhead were captured by screw trap in December (1) and March (1). Both were adipose fin clipped.

Twenty-six fish species were recorded in the rotary screw traps and bypass trap. The most common species in order of abundance, were fall-run Chinook salmon, black bass (*Micropterus sp.*), Pacific lamprey (*Lampetra tridentata*), and prickly sculpin (*Cottus asper*).

Camanche release was stable at approximately 225 cfs from December 17, 2001 to March 20, 2002. As WIDD started the irrigation season, Camanche releases were adjusted to maintain minimum flows of 150 cfs downstream of WIDD through April, and 200 cfs downstream in May and June, and 20 cfs downstream in July. Camanche releases ranged from 221-523 cfs from December through July.

INTRODUCTION

East Bay Municipal Utility District (EBMUD) has been monitoring the lower Mokelumne River (LMR) juvenile salmonid emigration since 1990 (Bianchi et al 1992, Marine 2000). This report presents the monitoring results from December 2001 through July 2002.

OBJECTIVES

The objectives of this study are to:

- 1) Monitor the abundance and emigration patterns of anadromous salmonids on the lower Mokelumne River past WIDD
- 2) Monitor movement patterns and timing of all fish species utilizing the LMR from December through July
- 3) Coded-wire tag a portion of naturally produced juvenile fall-run Chinook salmon
- 4) Conform data collection with the standards set out in the 1997 Comprehensive Assessment and Monitoring Program report on rotary screw trap protocols (USFWS 1997)

METHODS

Rotary Screw traps

Two 8 foot diameter rotary screw traps (EG Solutions, Inc.) were fished in tandem below WIDD. Traps were checked twice daily, 5 days per week, and not operated on the weekends. Estimates were generated for the remaining days by averaging the catch for three days before and after the non-trapping period. Traps were operated to maintain a rotational speed of two rotations per minute (RPM) or greater (USFWS 1997). Rotations were measured using a stopwatch and recorded the time for three full rotations. RPMs were taken at each trap check. Morning checks were conducted within one hour of sunrise, and evening checks were conducted within one hour of sunset.

During each trap check, weather was assessed using the Beaufort Scale for wind conditions and a percent cloud cover was estimated. Cone rotations since previous trap check were read off of a Remington® mechanical counter mounted on side rails near the mouth of each cone, and then counters were zeroed. Water velocity into the cone was measured using a Flo-Probe® digital readout propeller driven flow meter placed at approximately one foot water depth on the upstream side of the catwalks in front of the

center of each cone. Water temperature and dissolved oxygen (DO), in percent and parts per million (PPM), were taken with a YSI® 55 DO meter, and water samples for turbidity were collected by submerging an inverted sample jar to a depth of 1 foot and then allowing it to fill with water. Temperature, DO and turbidity samples were taken off of the downstream end of the screw traps. Water samples for turbidity were read in the lab on a Hach ®P1000 turbidimeter. Debris load in the trap was given a rating of light, medium, or heavy. Traps were cleared of debris and fish were offloaded into 5 gallon (19 liter) buckets. pontoons, cones, live boxes and decks were scrubbed each day to reduce algal build up and maintain trap rotation. All cables, pulleys, counters, and cones were inspected daily to ensure proper function. For rotary screw trap positioning see Marine (2000).

Bypass trap

On July 1, 2002 an incline plane trap was installed over the bypass pipe upstream of bay 9a in the low stage fish ladder (Figure 1). This pipe conveys fish that are screened off of the Woodbridge Irrigation District Canal upstream. The trap was checked daily until July 17 and then removed. During trap checks, a fish crowder was placed at the entrance from the incline plane to the live box. Fish were netted with a long-handled dip net into buckets. Debris accumulation was cleared from the live box at each trap check.

Fish Handling

Fish were processed in a small trailer equipped with a flow-through water supply, and a recirculating anesthetic bath of Finquel®MS-222 anesthetic. Concentration varied with temperature based on minimum required concentrations for Chinook salmon (Finquel® instructional leaflet). Electric aerators (air stones) were used to maintain oxygen concentrations. Fish were anesthetized and the first 50 fall-run Chinook salmon, and the first 20 of any other species were weighed to the nearest 0.1 gram (with an Ohaus® Navigator scale) and measured to the nearest millimeter. Life stage of each fish and any observations of marks, injuries or anomalies were recorded. Fish were allowed to recover in oxygenated water and were then transported, via 5 gallon (19 liter) buckets equipped with battery operated aerators, to the lower Mokelumne River just downstream of the Lower Sacramento Road Bridge. Release locations varied to reduce predation on released fish.

Trapping and Trucking

The LMR Joint Settlement Agreement (1998) recommends outmigrating smolts be trapped and transported around the Delta in critically dry years, when agreed upon by the California Department of Fish and Game (CDFG), the United States Fish and Wildlife Service (USFWS), and EBMUD. Trapping and trucking of juvenile fall-run Chinook salmon began on July 1, 2002. A transport unit consisting of two 75-gallon (283 liter) tanks equipped with mechanical aerators was used to haul fish. Tanks were filled from the high stage fish ladder using a submersible pump. Water was treated with Novaqua®, ice made from Mokelumne River water, pressurized O₂ and salt to minimize

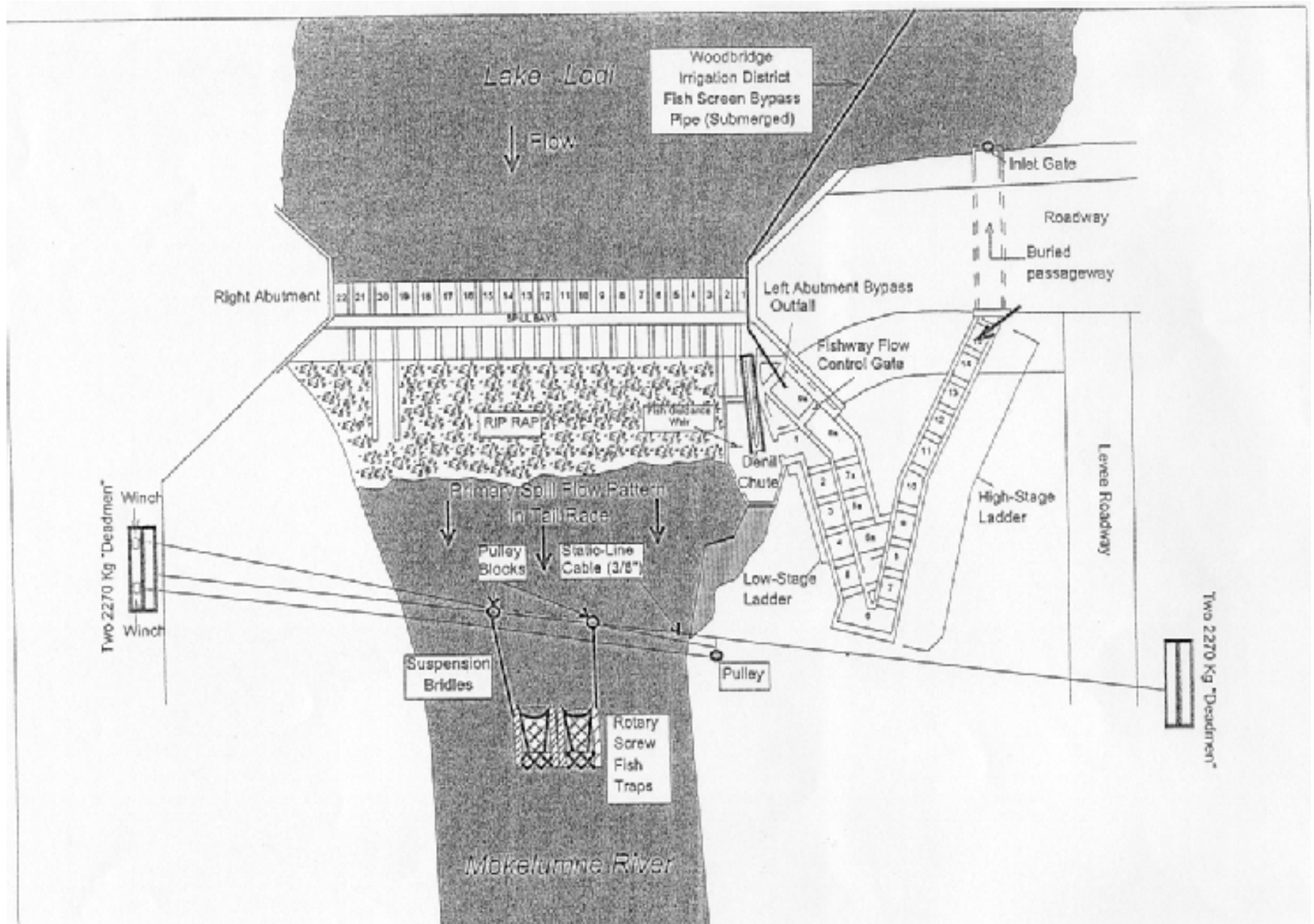


Figure 1. Plan view of Woodbridge Dam showing locations of downstream migrant traps employed during 2002.

stress to fish. A concentration of salt for fish transport of a 0.1% to 0.3% salt solution was used in transport (Piper et al 1992). Oxygen levels in transport tanks were initially set at 9.00 ppm to accommodate high oxygen consumption associated with stress. Transport levels were kept at > 7.00 ppm. Each tank was supplied with a 1-gallon (3.8 liter) container of frozen Mokelumne River water to maintain constant temperatures during transport.

Fish were released at Brannan Island State Park (Figure 2). Release site determination was based on appropriate water temperatures.

Fish were acclimated before release by adding release site water back into the tanks using a submersible pump. Once tank temperatures were within 1 °C of release water, fish were released through a 4" diameter hose clamped to the drain of each tank.

Coded Wire Tagging

Coded wire tagging (CWT) was conducted from March 19, 2002 through June 28, 2002. Chinook salmon >38mm fork length (FL), and completely buttoned-up were tagged. Two Northwest Marine Technologies Mark IV tagging machines with QC devices were used to implant CWT in juvenile fall-run Chinook salmon.

Calibrations

Twelve calibration tests for fall-run Chinook salmon captures were conducted, consisting of 6 nighttime tests and 6 daytime tests. The first group of calibration fish was marked using upper and lower caudal clips. Subsequent groups were marked using a NewWest® photonic tagging gun. Caudal clips were used on fish that were too small to tag with the photonic gun. Calibration fish were marked and held overnight to assess mark retention and mortality. Fish were held in live-cars in bay 9a of the lower ladder. Releases were conducted after the morning trap check for the am release, and at full darkness for the pm release. Fish were released at the crest of the spill of Woodbridge Dam.

Diel Surveys

Two diel surveys were conducted to represent fry and smolt sized fish. During diel surveys rotary screw traps were checked at two- hour intervals during a 24-hour period to assess specific hourly movement patterns of fall-run Chinook salmon.

RESULTS/DISCUSSION

Fall-run Chinook salmon

During rotary screw trap monitoring, 10,866 juvenile fall-run Chinook salmon were captured. Calibrations produced an estimate of 77,346 emigrants, consisting of 11,791 fry and 66,132 smolts, through the screw traps (95% C.I.: 59,854- 116,698). The bypass trap captured 577 juvenile fall-run Chinook salmon. The total estimate of outmigration juvenile fall-run Chinook salmon was 77,923 (Figure 3). Data are in Appendix A.

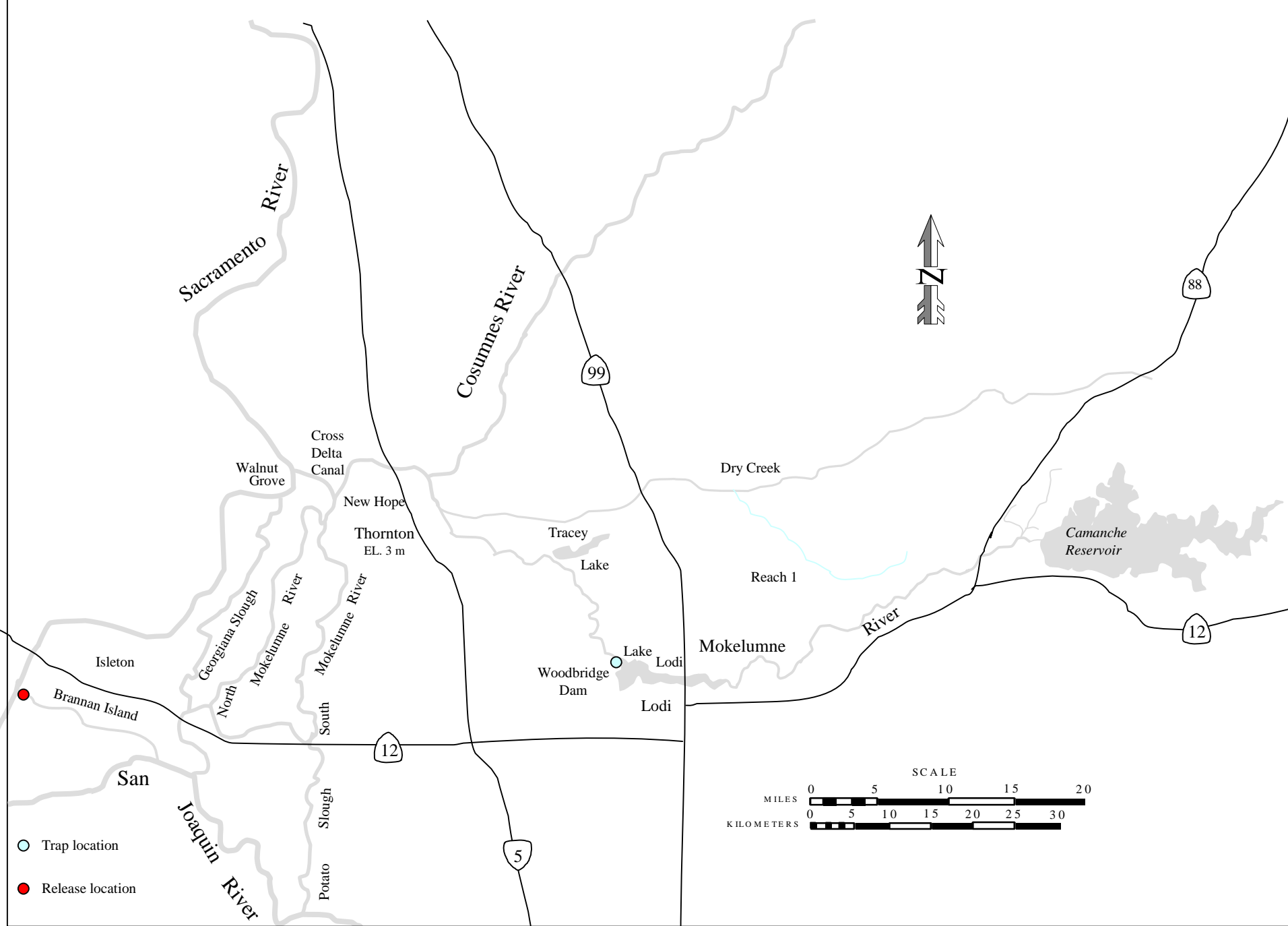


Figure 2. Trap and Release locations for juvenile fall-run Chinook Salmon trapped at Woodbridge Irrigation District Dam from July 1, 2002 through July 17, 2002.

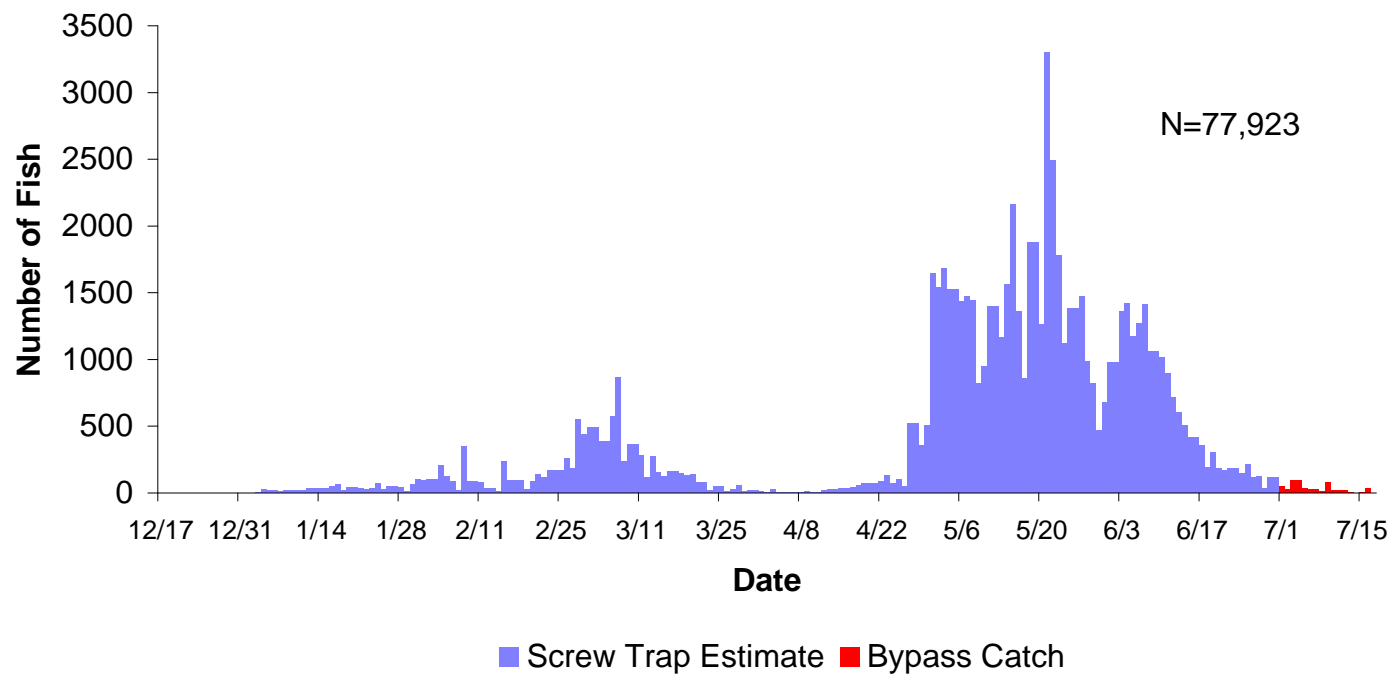


Figure 3. Estimated abundance of young-of-year fall-run Chinook salmon passing Woodbridge Irrigation District Dam on the lower Mokelumne River from December 17, 2001 through July 17, 2002.

Juvenile salmon were described to lifestage as fry, parr, silvery parr or smolt. Average fork lengths by month for fry were 35.2-36.2 mm FL; parr were 37.0-70.0 mm, silvery parr were 77.3-160.5 mm and smolts averaged between 90.2-103.0 mm. Average condition factor (K) ranged from 0.59 for fry in January to 1.11 for smolts in July (Figures 4 and 5).

Sixty-three age 1+ fall-run Chinook salmon were recorded between December and May. Size range of these fish was 121 mm – 207 mm. This pattern of yearling smolts migrating out of the Mokelumne has been observed in past years (Marine and Vogel 2000, Workman 2001).

Camanche release was stable at approximately 225 cfs from December to late March. Flow below WIDD at this time was stable around 180 cfs with periodic small spikes associated with rainfall and runoff. As WIDD started the irrigation season, Camanche releases were managed to maintain minimum flows of 150 cfs downstream of WIDD through June and then 20 cfs for July. Camanche releases ranged from 279 – 461 cfs from April through July (Figures 6 and 7). Temperatures recorded at Camanche Dam were between 9.7 -13.6 °C. Average daily temperature recorded at Woodbridge Dam rose steadily throughout the monitoring period from a low of 8.8 °C in January to a high of 21.2 °C in July (Figures 8 and 9).

Juvenile fall-run Chinook emigration numbers were compared to flow, temperature, barometric pressure, turbidity, and precipitation both graphically and statistically (Figures 6-12). Simple linear regressions explained little of the total variation in daily abundance of fish as a function of the environmental variables examined. Regression coefficients ranged from $R^2 = 0.24$ for the relationship between flow below Woodbridge and abundance, to $R^2 = 0.03$ for the relationship between turbidity and abundance. Previous studies have shown a similar statistical relationship between these variables and emigration patterns for multiple year analyses (Workman 1999).

Diel Abundance

Smaller fish (< 50mm) dominated the catch from December through mid March. Movements at this time were predominantly during nighttime hours. From December through mid-March, nocturnal passage accounted for 79% of passage. From mid-March through June, when screw trapping ended, nocturnal passage accounted for 43% of passage. Weekly average fork length also increased to between 80-100mm during this period (Figures 13-14). Diel surveys conducted in February and April showed a crepuscular pattern of movement, which is consistent with past surveys (Bianchi et al. 1992, Vogel and Marine 1999a,b, Workman 2002) (Figure 15).

Calibrations

Rotary screw trap efficiencies for Chinook salmon ranged from 0.09 to 0.54. We saw higher efficiencies earlier in the season, with smaller fish, than later in the season with larger fish. Larger fish are better able to avoid the traps. Daily catch numbers and associated calibration coefficients (trap efficiencies), for Chinook salmon, are presented

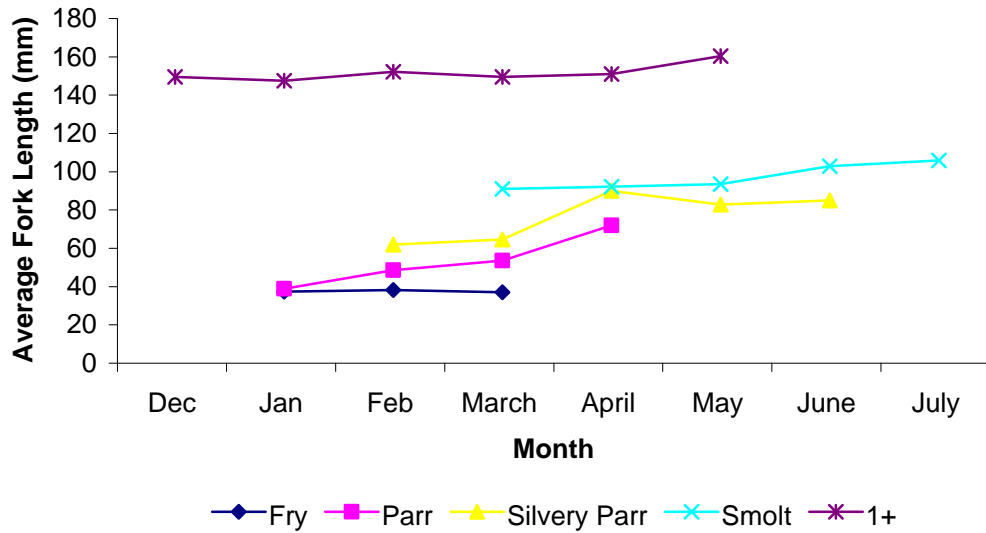


Figure 4. Average fork length (mm) of juvenile fall-run Chinook salmon, by lifestage, on the lower Mokelumne River from December 17, 2000 through July 24, 2001.

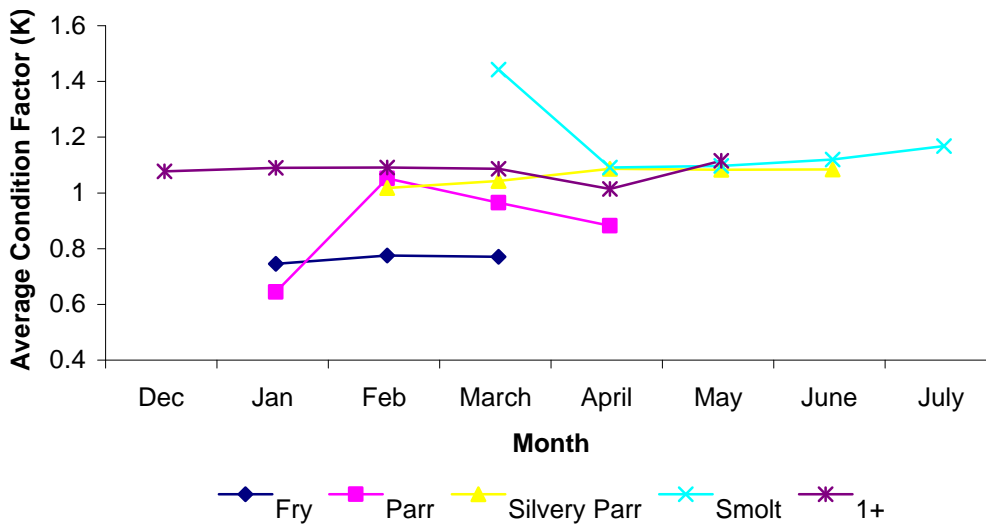


Figure 5. Average Condition Factor (K) of juvenile fall-run Chinook salmon, by lifestage, on the lower Mokelumne River from December 17, 2000 through July 24, 2001.

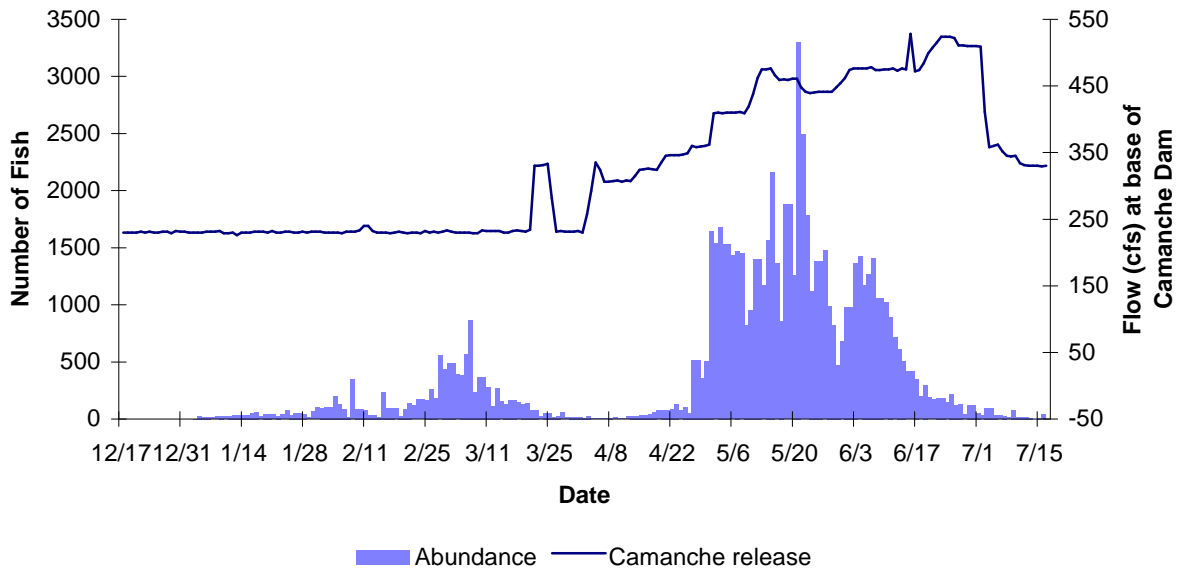


Figure 6. Juvenile fall-run Chinook salmon emigration below Woodbridge Irrigation District Dam and Camanche release flows, December 17, 2001 through July 17, 2002.

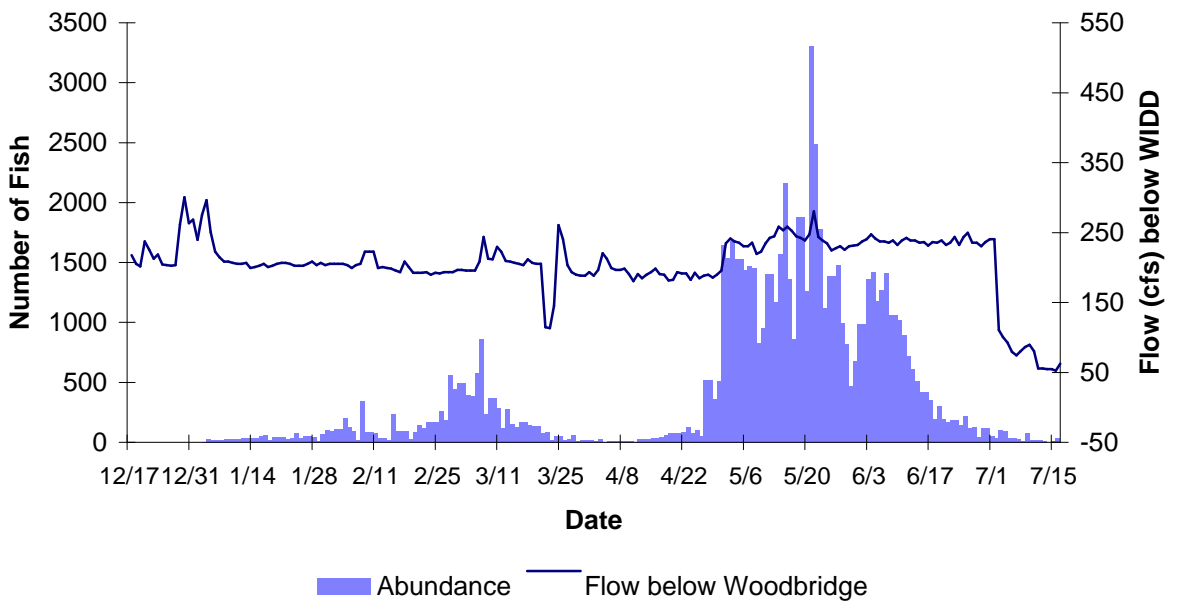


Figure 7. Juvenile fall-run Chinook salmon emigration below Woodbridge Irrigation District Dam and flow below Woodbridge Irrigation District Dam, December 17, 2001 through July 17, 2002.

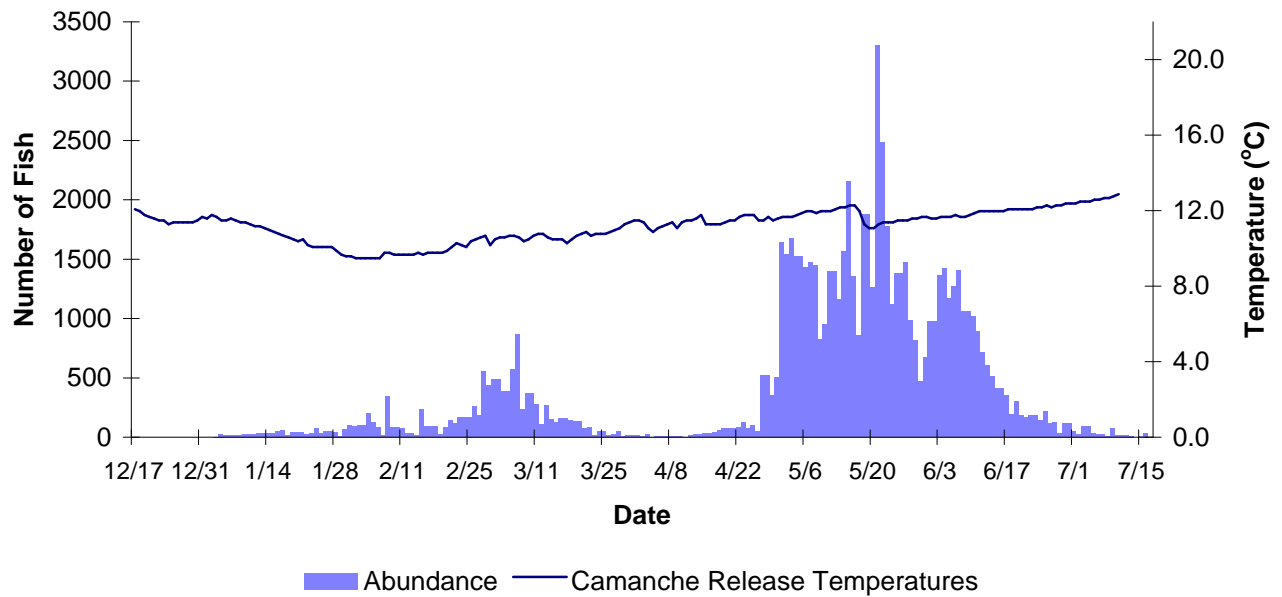


Figure 8. Juvenile fall-run Chinook salmon emigration below Woodbridge Irrigation District Dam and water temperature at Camanche Dam, December 17, 2001 through July 17, 2002.

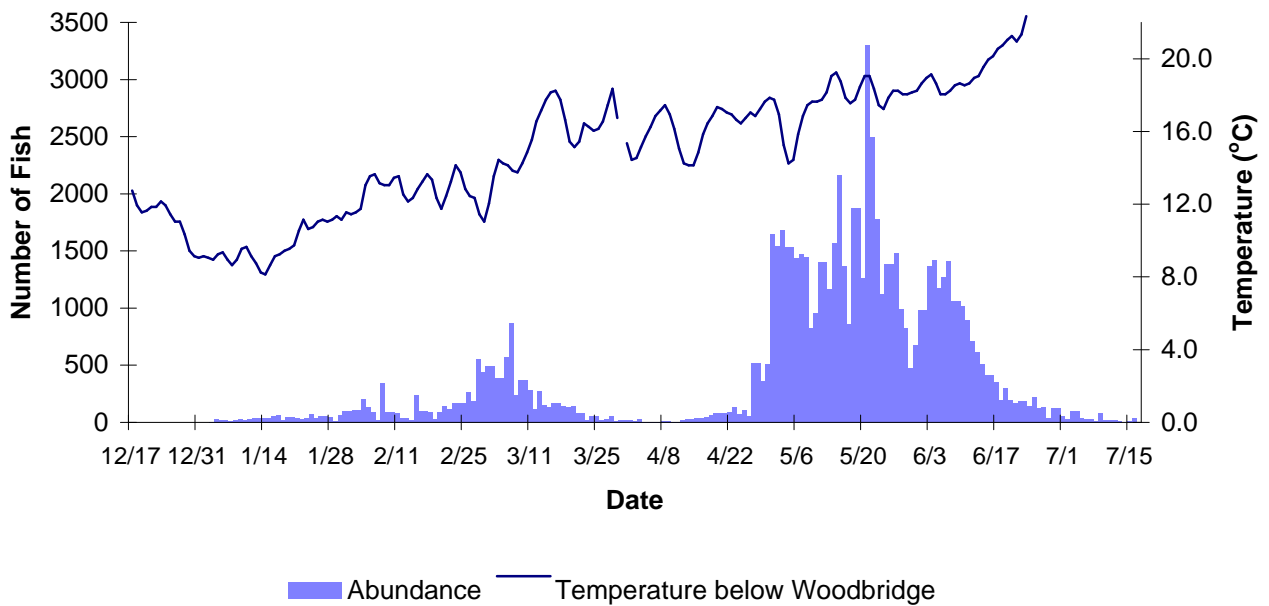


Figure 9. Juvenile fall-run Chinook salmon emigration below Woodbridge Irrigation District Dam and water temperature at Woodbridge Dam, December 17, 2001 through July 17, 2002.

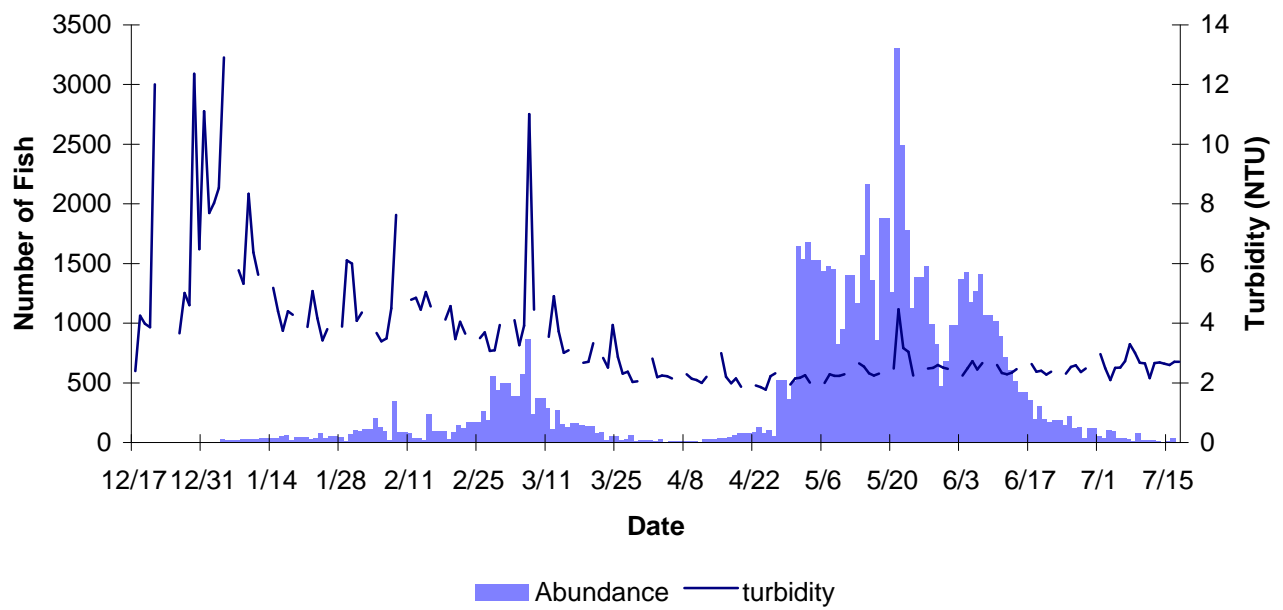


Figure 10. Juvenile fall-run Chinook salmon emigration below Woodbridge Irrigation District Dam and turbidity, December 17, 2001 through July 17, 2002.

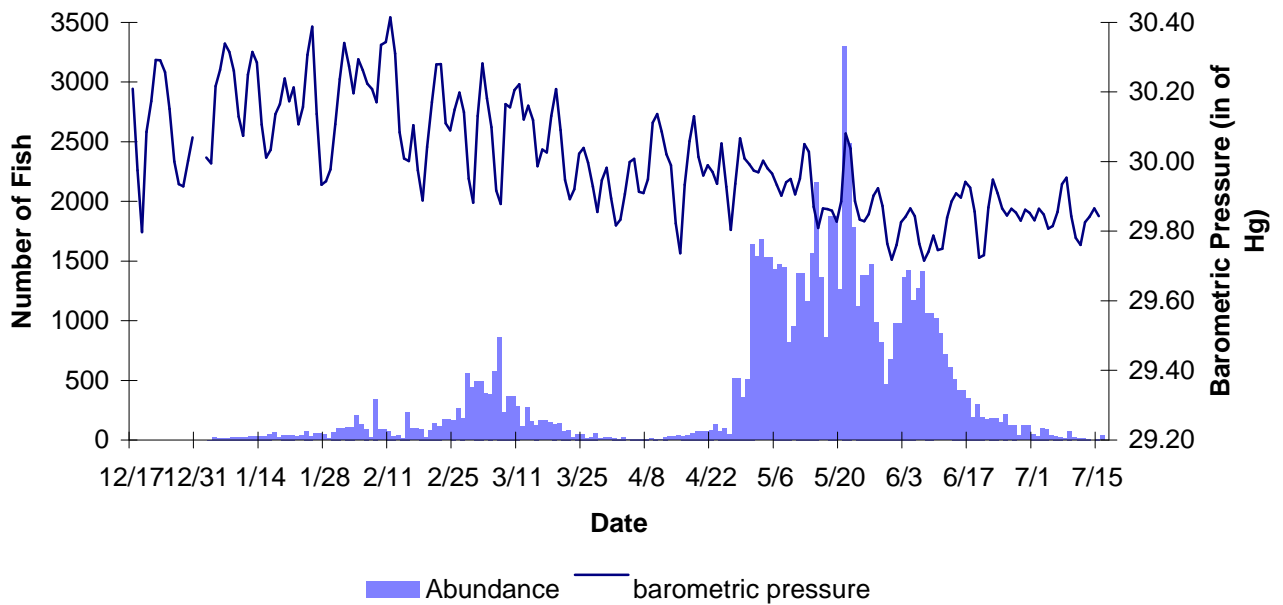


Figure 11. Juvenile fall-run Chinook salmon emigration below Woodbridge Irrigation District Dam and barometric pressure, December 17, 2001 through July 17, 2002.

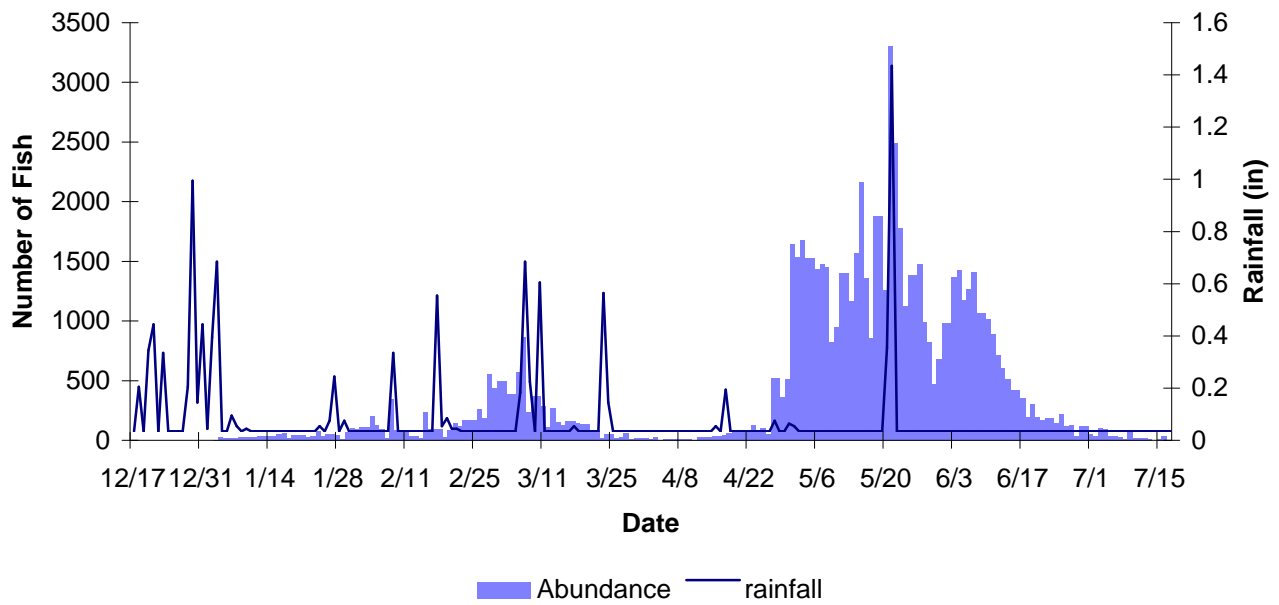


Figure 12. Juvenile fall-run Chinook salmon emigration below Woodbridge Irrigation District Dam and rainfall, December 17, 2001 through July 17, 2002.

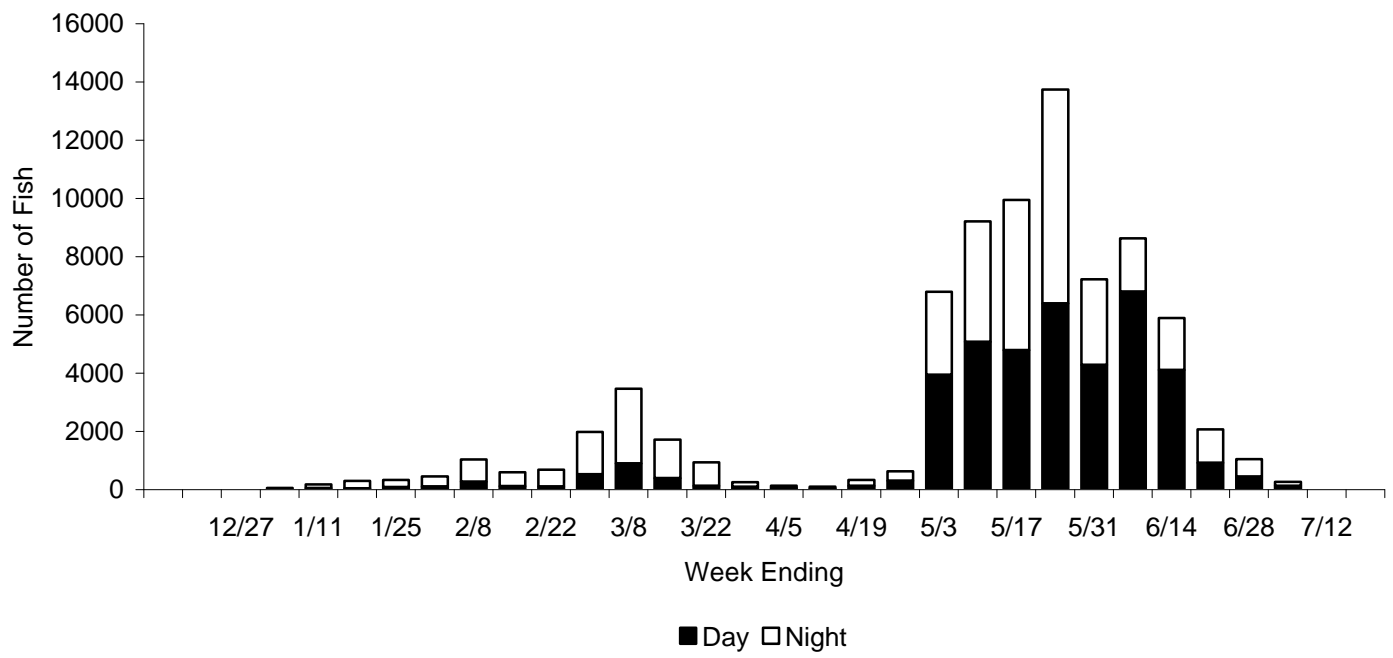


Figure 13. Weekly diel abundance of young-of-year fall-run Chinook salmon emigrating past Woodbridge Dam from December 17, 2001 through July 17, 2002.

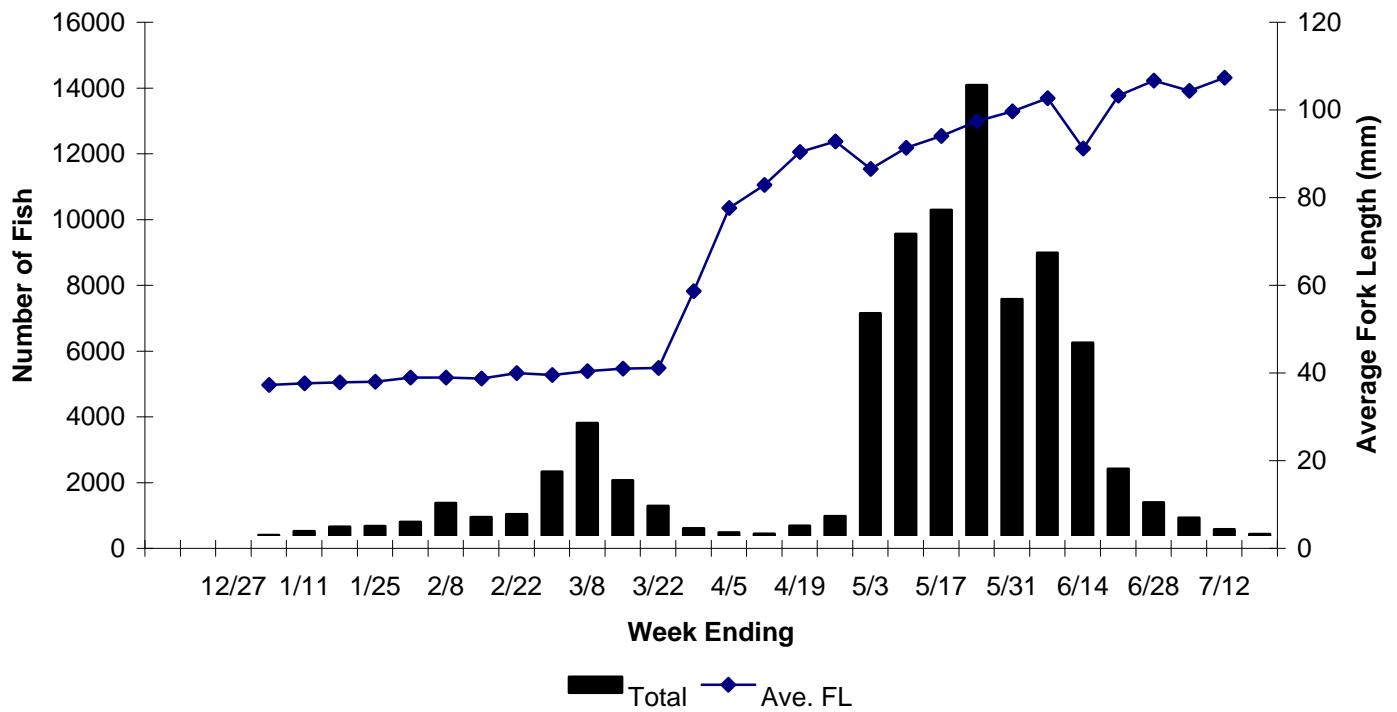


Figure 14. Average fork length of young-of-year fall-run Chinook salmon emigrating past Woodbridge Dam from December 17, 2001 through July 17, 2002.

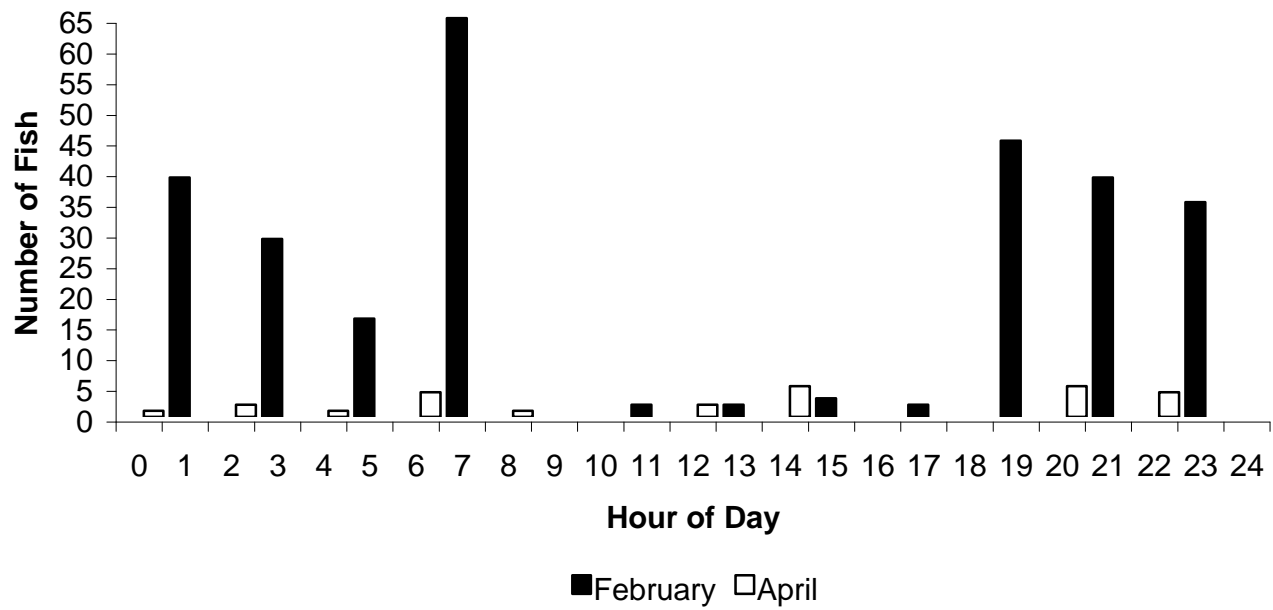


Figure 15. Diel movement pattern of juvenile fall-run Chinook salmon on the lower Mokelumne River, December 17, 2001 through July 17, 2002.

in Appendix A.

Table 1. Trap efficiency test results for rotary screw traps fished at Woodbridge Irrigation District Dam, December 17, 2001 through June 30, 2002.

Date of Test	Species	Source	Release Site	Day Release		Night Release		Trap Efficiency	
				Marked	Recaptured	Marked	Recaptured	Day	Night
1/15/2002	FCS	Hatchery	WIDD Spill			716	384		0.54
1/16/2002	FCS	Hatchery	WIDD Spill	385	85			0.22	
2/12/2002	FCS	Hatchery	WIDD Spill			296	87		0.29
2/13/2002	FCS	Hatchery	WIDD Spill	195	54			0.28	
4/2/2002	FCS	Hatchery	WIDD Spill			268	77		0.29
4/3/2002	FCS	Hatchery	WIDD Spill	285	105			0.37	
4/23/2002	FCS	Hatchery	WIDD Spill			296	92		0.31
4/24/2002	FCS	Hatchery	WIDD Spill	193	24			0.12	
5/7/2002	FCS	Hatchery	WIDD Spill			163	63		0.39
5/8/2002	FCS	Hatchery	WIDD Spill	159	15			0.09	
6/11/2002	FCS	Hatchery	WIDD Spill			314	81		0.26
6/12/2002	FCS	Hatchery	WIDD Spill	294	46			0.16	

Coded Wire Tagging

Tagging began on March 19, 2002 and ended on June 28, 2002. Two tag codes were used during tagging to accommodate variable size ranges of wild fish.

Table 2. Coded wire tag data for Mokelumne River fall-run Chinook salmon tagged and released at Woodbridge Irrigation District Dam from January 15, 2001 through March 7, 2001.

Tag I.D.	Production	Brood Year	Release Location	Date Released		Total tagged
				First	Last	
06-01-13-02-11	Wild	2001	Woodbridge Dam	03/19/02	6/28/02	8,078
06-01-13-02-13	Wild	2001	Woodbridge Dam	03/19/02	6/28/02	343

Trapping and Trucking

Trapping and trucking occurred from July 1, 2002 through July 16, 2002 and was initiated when the water temperature five-day moving average at the Frandy gaging station (approximately 8 miles downstream of WIDD) exceeded 20°C. During this period 577 smolt sized ($X = 104\text{mm FL}$, $\text{min} = 81\text{mm}$, $\text{max} = 123\text{mm}$) fall-run Chinook salmon were trapped, and transported, with 575 released alive (Table 3). The two mortalities are due to handling and transport stress. Release location temperatures were higher than trapping location temperatures by a range of 1.2°C - 3.3°C. Average difference in release v. trap temperatures was 2.4°C (Figure 16). All fish were acclimated to within 1.0°C of release site water temperature in the transport tanks by introducing river water into the tanks.

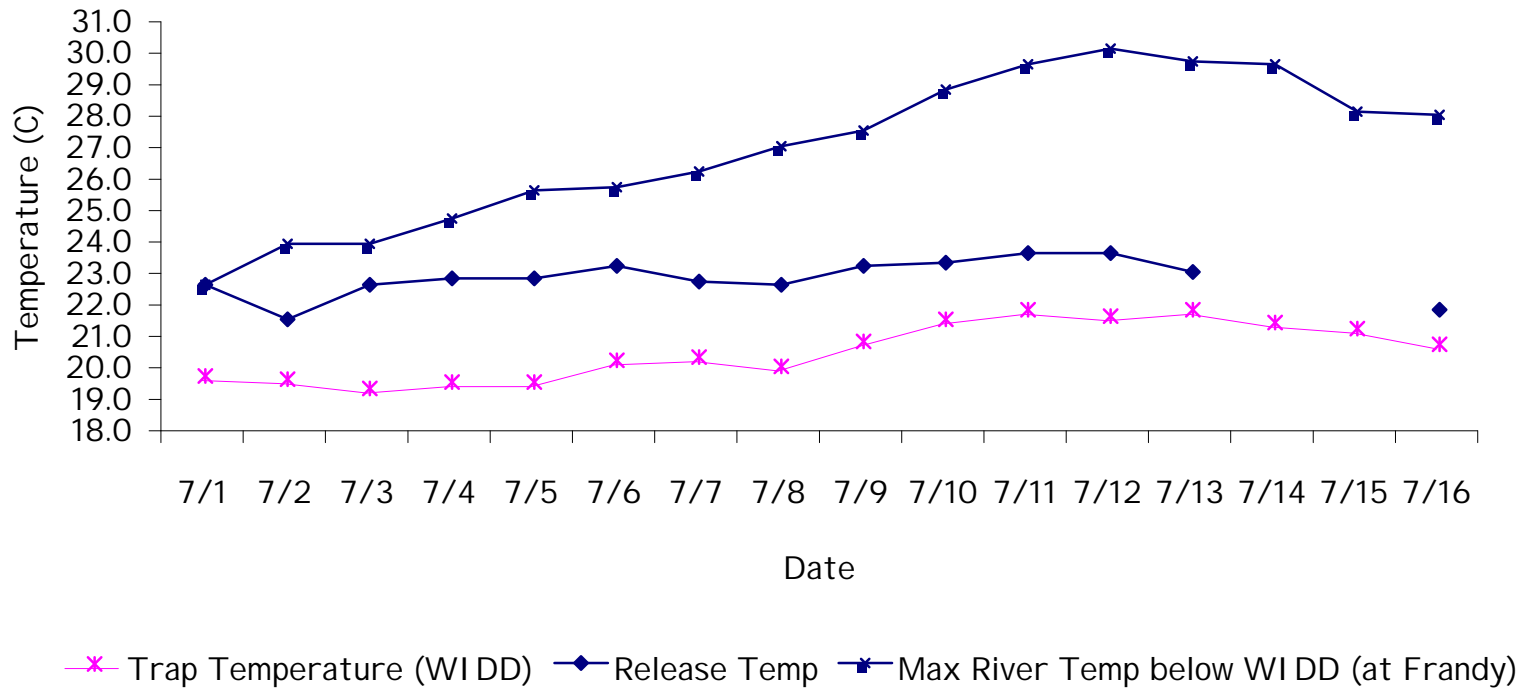


Figure 16. Water temperatures during trapping and trucking operations on the lower Mokelumne River, Ca. July 1, 2002- July 17, 2002.

Steelhead

Fifty-five young-of-year steelhead were captured in rotary screw traps from February 26, 2002 through July 13, 2002. In previous years young steelhead have not been captured until March (Marine 2000). The estimate for young-of-year steelhead during this period, based on Chinook calibrations, is 209 (95% C.I.: 169-289). Seven young-of-year steelhead were captured in the bypass trap from July 1, 2002 through July 13, 2002. Total estimate for 2002 young of year steelhead emigrating is 216 (Appendix B).

Juvenile steelhead were described to lifestage as fry, parr, silvery parr or smolt. Average fork length (FL) for fry was 27.1 mm (range:22-36 mm); parr averaged 71.4 mm (range:37-181 mm), silvery parr averaged 175.3 mm (range:53-249 mm) and smolts were 219.3 mm (range:106-319 mm) on average. The diel pattern of movement for YOY steelhead appeared to be mostly nocturnal during screw trap captures. Bypass trap checks were not based on sunrise and sunset, so diel patterns for July can not be accurately determined (Figures 17 and 18).

One hundred and fifty-one age 1+ steelhead also captured during monitoring. Of these, 10 had adipose fin clips. Two of these adipose clipped steelhead were adults.

Incidental Species

Twenty-six fish species were observed in rotary screw traps and the bypass trap. The most abundant fish observed was fall-run Chinook salmon, followed by unknown juvenile black bass, Pacific lamprey and prickly sculpin, in order of abundance (Table 4).

Most of the Pacific lamprey observed were eyed juveniles (99%) with a small number of ammocoetes and adult lamprey appearing in the catch. Thirteen adult lampreys were observed in screw traps from January through April.

Two juvenile redeye bass (*M. coosae*) were observed in the rotary screw traps this season, one in December and one in January. These were the first juvenile redeye bass recovered in screw trap operations to date. The first documented occurrence of juvenile redeye bass on the lower Mokelumne River was in July of 2000 at the mouth of the Cosumnes River during EBMUD fish community surveys. To date no observations above WIDD have been recorded. Redeye bass were introduced to California in the mid 1960s in various California waters including the Stanislaus River. They have successfully invaded the lower reaches of the Cosumnes River and are displacing the native minnows and suckers. The spread of this species has gone largely unnoticed due to misidentification as smallmouth bass (*M. dolomeiu*) (Moyle 2002).

Acknowledgements

I would like to thank the field staff of SP Cramer and Associates for their hard work and dedication to accurate data collection, data storage, and data retrieval. Thanks to Woodbridge Irrigation District for access to the site. I would also like to thank my coworkers in the EBMUD Fisheries and Wildlife Division for their assistance on the project as needed.

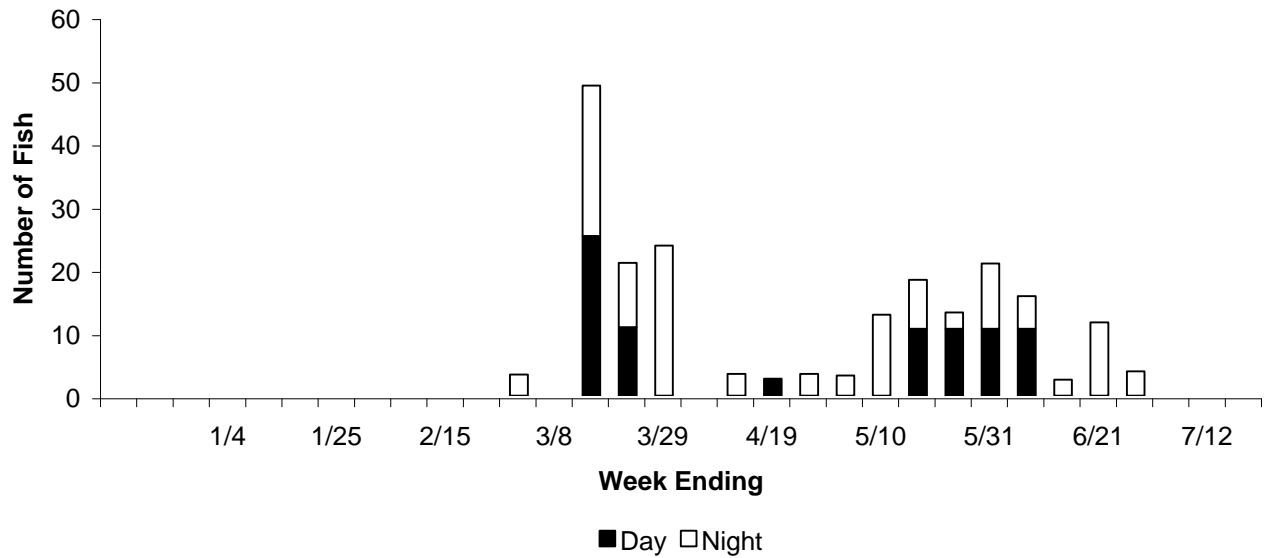


Figure 17. Weekly diel abundance of young of year steelhead emigrating past Woodbridge Dam from December 17, 2001 through July 17, 2002

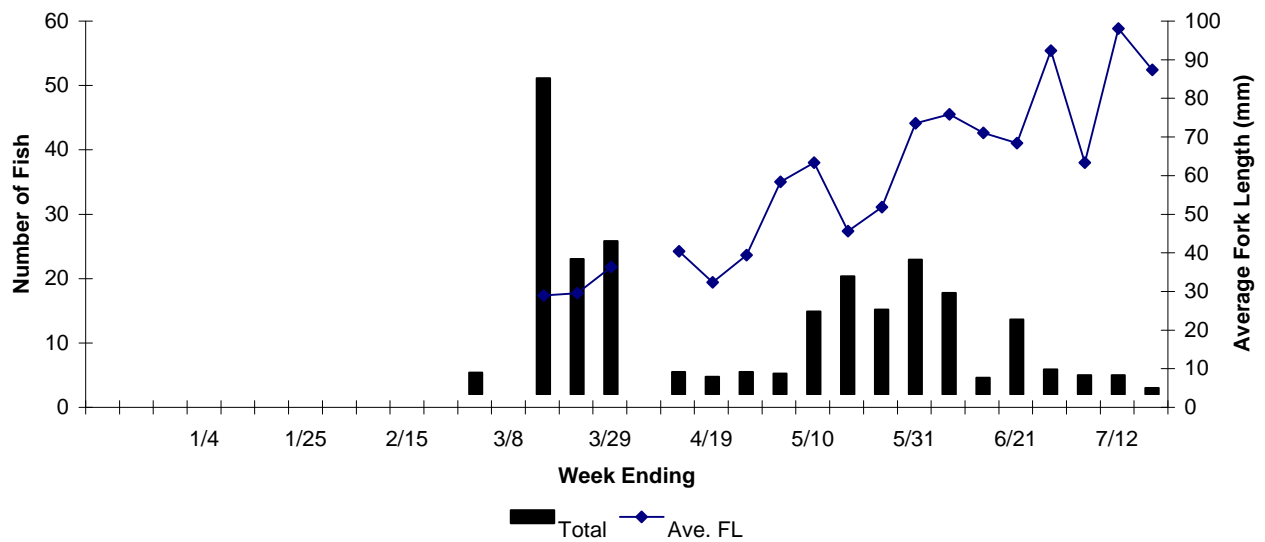


Figure 18. Weekly abundance of young of year steelhead and average fork length (mm) emigrating past Woodbridge Dam from December 17, 2001 through July 17, 2002.

Table 4. Fish species captured below Woodbridge Dam on the Lower Mokelumne River, San Joaquin County, December 17, 2001 through July 17, 2002.

Species	Life Stage	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Total
Brown Bullhead <i>Ameiurus nebulosus</i>	Juvenile		2							2
	Adult									
Black Bullhead <i>Ameiurus melas</i>	Juvenile								1	1
	Adult									
Black Crappie <i>Pomoxis nigromaculatus</i>	Juvenile					2	3	2		7
	Adult			2		1				3
Bluegill <i>Lepomis macrochirus</i>	Juvenile	12	33	21	76	32	38	17		229
	Adult	4	7	3	12	22	23	12		83
Carp <i>Cyprinus carpio</i>	Juvenile	1		2			55	37	29	124
	Adult		2							2
Channel Catfish <i>Ictalurus punctatus</i>	Juvenile	1					1			2
	Adult									
Fall-chinook salmon <i>Oncorhynchus tshawytscha</i>	Juvenile		313	920	1,052	350	6,384	1,847	577	11,443
	1+	8	8	9	28	6	4			63
Goldfish <i>Carassius auratus</i>	Juvenile			1						1
	Adult									
Golden Shiner <i>Notemigonus crysoleucas</i>	Juvenile	2	5	2	2			7		18
	Adult	6	247	137	135	4	7	2		538
Green Sunfish <i>Lepomis cyanellus</i>	Juvenile				1	1	1			3
	Adult					2				2
Hitch <i>Lavinia exilicauda</i>	Juvenile	7	19	1	5	1	5	26	1	65
	Adult	2	1		3	1				7
Inland Silverside <i>Menidia beryllina</i>	Juvenile		1		2	3				6
	Adult			2	4	13	3	1		23
Lepomis hybrid <i>Lepomis sp.</i>	Juvenile				1	2	2	3		8
	Adult					1				1
Largemouth Bass <i>Micropterus salmoides</i>	Juvenile				1	1	2			4
	Adult									
Mosquitofish <i>Gambusia affinis</i>	Juvenile									
	Adult			1				1		2

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Appendix A. Daily abundance of juvenile fall-run Chinook migrating past Woodbridge Irrigation District Dam, December 17, 2001 through July 17, 2002. Data estimated from screw trap captures and bypass trap captures

Date	YOY Day	YOY Night	Trap Efficiency Day	Trap Efficiency Night	Estimated YOY Day	Estimated YOY Night	Estimated YOY Total	95% Confidence High	Interval Low	Bypass Catch Total
12/17/2001	0	0								
12/18/2001	0	0								
12/19/2001	0	0								
12/20/2001	0	0								
12/21/2001	0	0								
12/22/2001	0	0								
12/23/2001	0	0								
12/24/2001	0	0								
12/25/2001	0	0								
12/26/2001	0	0								
12/27/2001	0	0								
12/28/2001	0	0								
12/29/2001	0	0								
12/30/2001	0	0								
12/31/2001	0	0								
1/1/2002	0	0								
1/2/2002	0	0								
1/3/2002	0	1	0.221	0.536	0	2	2	2	2	2
1/4/2002	1	12	0.221	0.536	5	22	27	30	25	25
1/5/2002	1	8	0.221	0.536	5	15	19	22	18	18
1/6/2002	1	8	0.221	0.536	5	15	19	22	18	18
1/7/2002	0	8	0.221	0.536	0	15	15	16	14	14
1/8/2002	3	5	0.221	0.536	14	9	23	27	20	20
1/9/2002	0	13	0.221	0.536	0	24	24	26	23	23
1/10/2002	1	10	0.221	0.536	5	19	23	26	21	21
1/11/2002	0	13	0.221	0.536	0	24	24	26	23	23
1/12/2002	0	19	0.221	0.536	0	35	35	38	33	33
1/13/2002	0	19	0.221	0.536	0	35	35	38	33	33
1/14/2002	0	19	0.221	0.536	0	35	35	38	33	33
1/15/2002	0	18	0.221	0.536	0	34	34	36	31	31
1/16/2002	0	27	0.221	0.536	0	50	50	54	47	47

Appendix A. Daily abundance of juvenile fall-run Chinook migrating past Woodbridge Irrigation District Dam, December 17, 2001 through July 17, 2002. Data estimated from screw trap captures and bypass trap captures (continued)

Date	YOY Day	YOY Night	Trap Efficiency Day	Trap Efficiency Night	Estimated YOY Day	Estimated YOY Night	Estimated YOY Total	95% Confidence Interval High	95% Confidence Interval Low	Bypass Catch Total
1/17/2002	2	30	0.221	0.536	9	56	65	71	60	
1/18/2002	0	12	0.221	0.536	0	22	22	24	21	
1/19/2002	1	21	0.221	0.536	5	39	44	48	40	
1/20/2002	1	21	0.221	0.536	5	39	44	48	40	
1/21/2002	0	21	0.221	0.536	0	39	39	42	37	
1/22/2002	4	6	0.221	0.536	18	11	29	34	26	
1/23/2002	1	18	0.221	0.536	5	34	38	42	35	
1/24/2002	2	36	0.221	0.536	9	67	76	83	70	
1/25/2002	3	10	0.221	0.536	14	19	32	37	29	
1/26/2002	2	24	0.221	0.536	9	45	54	59	50	
1/27/2002	2	24	0.221	0.536	9	45	54	59	50	
1/28/2002	0	24	0.221	0.536	0	45	45	48	42	
1/29/2002	2	2	0.221	0.536	9	4	13	15	11	
1/30/2002	1	34	0.221	0.536	5	63	68	74	63	
1/31/2002	6	40	0.221	0.536	27	75	102	113	93	
2/1/2002	5	39	0.221	0.536	23	73	95	106	87	
2/2/2002	7	40	0.221	0.536	32	75	106	119	97	
2/3/2002	7	40	0.221	0.536	32	75	106	119	97	
2/4/2002	29	40	0.221	0.536	131	75	206	242	180	
2/5/2002	0	70	0.221	0.536	0	131	131	140	122	
2/6/2002	1	46	0.221	0.536	5	86	90	98	84	
2/7/2002	0	11	0.221	0.536	0	21	21	22	19	
2/8/2002	9	164	0.221	0.536	41	306	347	378	321	
2/9/2002	2	42	0.221	0.536	9	78	87	95	81	
2/10/2002	2	42	0.221	0.536	9	78	87	95	81	
2/11/2002	0	42	0.221	0.536	0	78	78	84	73	
2/12/2002	2	14	0.221	0.536	9	26	35	39	32	
2/13/2002	2	15	0.221	0.536	9	28	37	41	34	
2/14/2002	1	4	0.277	0.294	4	14	17	21	15	
2/15/2002	13	55	0.277	0.294	47	187	234	288	197	

Appendix A. Daily abundance of juvenile fall-run Chinook migrating past Woodbridge Irrigation District Dam, December 17, 2001 through July 17, 2002. Data estimated from screw trap captures and bypass trap captures (continued)

Date	YOY Day	YOY Night	Trap Efficiency Day	Trap Efficiency Night	Estimated YOY Day	Estimated YOY Night	Estimated YOY Total	95% Confidence High	95% Confidence Low	Bypass Catch Total
2/16/2002	4	24	0.277	0.294	14	82	96	118	81	
2/17/2002	4	24	0.277	0.294	14	82	96	118	81	
2/18/2002	3	24	0.277	0.294	11	82	92	113	78	
2/19/2002	1	7	0.277	0.294	4	24	27	34	23	
2/20/2002	4	21	0.277	0.294	14	71	86	105	72	
2/21/2002	1	41	0.277	0.294	4	139	143	174	122	
2/22/2002	4	30	0.277	0.294	14	102	117	143	99	
2/23/2002	6	44	0.277	0.294	22	150	171	210	145	
2/24/2002	6	44	0.277	0.294	22	150	171	210	145	
2/25/2002	5	44	0.277	0.294	18	150	168	205	142	
2/26/2002	11	66	0.277	0.294	40	225	264	324	223	
2/27/2002	9	44	0.277	0.294	33	150	182	224	154	
2/28/2002	93	65	0.277	0.294	336	221	557	703	462	
3/1/2002	7	122	0.277	0.294	25	415	440	537	373	
3/2/2002	38	105	0.277	0.294	137	357	494	611	415	
3/3/2002	38	105	0.277	0.294	137	357	494	611	415	
3/4/2002	9	105	0.277	0.294	33	357	390	476	330	
3/5/2002	5	108	0.277	0.294	18	367	386	470	327	
3/6/2002	104	58	0.277	0.294	376	197	573	725	474	
3/7/2002	20	233	0.277	0.294	72	793	865	1056	733	
3/8/2002	26	42	0.277	0.294	94	143	237	295	198	
3/9/2002	29	78	0.277	0.294	105	265	370	458	311	
3/10/2002	29	78	0.277	0.294	105	265	370	458	311	
3/11/2002	5	78	0.277	0.294	18	265	283	346	240	
3/12/2002	8	25	0.277	0.294	29	85	114	141	96	
3/13/2002	9	71	0.277	0.294	33	242	274	335	232	
3/14/2002	6	39	0.277	0.294	22	133	154	189	130	
3/15/2002	13	24	0.277	0.294	47	82	129	160	108	
3/16/2002	6	42	0.277	0.294	22	143	165	202	139	
3/17/2002	6	42	0.277	0.294	22	143	165	202	139	
3/18/2002	1	42	0.277	0.294	4	143	147	178	124	

Appendix A. Daily abundance of juvenile fall-run Chinook migrating past Woodbridge Irrigation District Dam, December 17, 2001 through July 17, 2002. Data estimated from screw trap captures and bypass trap captures (continued)

Date	YOY Day	YOY Night	Trap Efficiency Day	Trap Efficiency Night	Estimated YOY Day	Estimated YOY Night	Estimated YOY Total	95% Confidence Interval High	95% Confidence Interval Low	Bypass Catch Total
3/19/2002	6	33	0.277	0.294	22	112	134	164	113	
3/20/2002	0	41	0.277	0.294	0	139	139	169	119	
3/21/2002	3	20	0.277	0.294	11	68	79	97	67	
3/22/2002	4	20	0.277	0.294	14	68	82	101	70	
3/23/2002	4	2	0.277	0.294	14	7	21	27	18	
3/24/2002	7	7	0.277	0.294	25	24	49	62	41	
3/25/2002	1	14	0.277	0.294	4	48	51	63	43	
3/26/2002	1	4	0.277	0.294	4	14	17	21	15	
3/27/2002	1	7	0.277	0.294	4	24	27	34	23	
3/28/2002	3	13	0.277	0.294	11	44	55	68	46	
3/29/2002	1	3	0.277	0.294	4	10	14	17	12	
3/30/2002	1	5	0.277	0.294	4	17	21	25	17	
3/31/2002	1	5	0.277	0.294	4	17	21	25	17	
4/1/2002	0	5	0.277	0.294	0	17	17	21	14	
4/2/2002	1	1	0.277	0.294	4	3	7	9	6	
4/3/2002	2	6	0.277	0.294	7	20	28	34	23	
4/4/2002	1	1	0.368	0.287	3	3	6	8	5	
4/5/2002	0	2	0.368	0.287	0	7	7	9	6	
4/6/2002	0	2	0.368	0.287	0	7	7	9	6	
4/7/2002	0	2	0.368	0.287	0	7	7	9	6	
4/8/2002	1	2	0.368	0.287	3	7	10	12	8	
4/9/2002	1	3	0.368	0.287	3	10	13	16	11	
4/10/2002	0	2	0.368	0.287	0	7	7	9	6	
4/11/2002	1	1	0.368	0.287	3	3	6	8	5	
4/12/2002	2	5	0.368	0.287	5	17	23	28	19	
4/13/2002	3	6	0.368	0.287	8	21	29	36	24	
4/14/2002	3	6	0.368	0.287	8	21	29	36	24	
4/15/2002	6	6	0.368	0.287	16	21	37	46	31	
4/16/2002	3	8	0.368	0.287	8	28	36	45	30	
4/17/2002	6	7	0.368	0.287	16	24	41	51	34	

Appendix A. Daily abundance of juvenile fall-run Chinook migrating past Woodbridge Irrigation District Dam, December 17, 2001 through July 17, 2002. Data estimated from screw trap captures and bypass trap captures (continued)

Date	YOY Day	YOY Night	Trap Efficiency Day	Trap Efficiency Night	Estimated YOY Day	Estimated YOY Night	Estimated YOY Total	95% Confidence High	95% Confidence Low	Bypass Catch Total
4/18/2002	3	15	0.368	0.287	8	52	60	75	51	
4/19/2002	13	12	0.368	0.287	35	42	77	96	64	
4/20/2002	12	13	0.368	0.287	33	45	78	97	65	
4/21/2002	12	13	0.368	0.287	33	45	78	97	65	
4/22/2002	15	13	0.368	0.287	41	45	86	107	72	
4/23/2002	28	16	0.368	0.287	76	56	132	165	110	
4/24/2002	10	14	0.368	0.287	27	49	76	94	63	
4/25/2002	6	17	0.124	0.311	48	55	103	143	82	
4/26/2002	2	11	0.124	0.311	16	35	51	68	42	
4/27/2002	33	79	0.124	0.311	265	254	519	730	410	
4/28/2002	33	79	0.124	0.311	265	254	519	730	410	
4/29/2002	13	79	0.124	0.311	105	254	359	473	293	
4/30/2002	29	86	0.124	0.311	233	277	510	706	406	
5/1/2002	143	154	0.124	0.311	1150	495	1645	2435	1260	
5/2/2002	115	191	0.124	0.311	925	614	1539	2218	1198	
5/3/2002	120	223	0.124	0.311	965	717	1682	2406	1315	
5/4/2002	109	203	0.124	0.311	877	653	1529	2187	1196	
5/5/2002	109	203	0.124	0.311	877	653	1529	2187	1196	
5/6/2002	97	203	0.124	0.311	780	653	1433	2033	1126	
5/7/2002	101	206	0.124	0.311	812	663	1475	2096	1157	
5/8/2002	83	243	0.124	0.311	667	782	1449	2008	1154	
5/9/2002	28	204	0.094	0.387	297	527	824	1226	642	
5/10/2002	69	85	0.094	0.387	732	220	951	1684	678	
5/11/2002	68	263	0.094	0.387	721	679	1401	2234	1056	
5/12/2002	68	263	0.094	0.387	721	679	1401	2234	1056	
5/13/2002	46	263	0.094	0.387	488	679	1167	1783	899	
5/14/2002	90	237	0.094	0.387	955	612	1567	2600	1157	
5/15/2002	95	447	0.094	0.387	1008	1155	2162	3375	1648	
5/16/2002	41	359	0.094	0.387	435	927	1362	1989	1071	
5/17/2002	41	164	0.094	0.387	435	424	859	1364	649	
5/18/2002	81	394	0.094	0.387	859	1018	1877	2919	1433	

Appendix A. Daily abundance of juvenile fall-run Chinook migrating past Woodbridge Irrigation District Dam, December 17, 2001 through July 17, 2002. Data estimated from screw trap captures and bypass trap captures (continued)

Date	YOY Day	YOY Night	Trap Efficiency Day	Trap Efficiency Night	Estimated YOY Day	Estimated YOY Night	Estimated YOY Total	95% Confidence High	95% Confidence Low	Bypass Catch Total
5/19/2002	81	394	0.094	0.387	859	1018	1877	2919	1433	
5/20/2002	23	394	0.094	0.387	244	1018	1262	1732	1018	
5/21/2002	158	630	0.094	0.387	1676	1627	3303	5250	2495	
5/22/2002	126	447	0.094	0.387	1336	1155	2491	4010	1870	
5/23/2002	91	316	0.094	0.387	965	816	1782	2874	1336	
5/24/2002	40	270	0.094	0.387	424	697	1122	1683	871	
5/25/2002	74	231	0.094	0.387	785	597	1382	2254	1030	
5/26/2002	74	231	0.094	0.387	785	597	1382	2254	1030	
5/27/2002	83	231	0.094	0.387	880	597	1477	2438	1094	
5/28/2002	62	129	0.094	0.387	658	333	991	1682	723	
5/29/2002	46	129	0.094	0.387	488	333	821	1354	609	
5/30/2002	21	96	0.094	0.387	223	248	471	737	358	
5/31/2002	41	94	0.094	0.387	435	243	678	1140	497	
6/1/2002	68	101	0.094	0.387	721	261	982	1715	705	
6/2/2002	68	101	0.094	0.387	721	261	982	1715	705	
6/3/2002	104	101	0.094	0.387	1103	261	1364	2451	963	
6/4/2002	104	124	0.094	0.387	1103	320	1423	2525	1013	
6/5/2002	88	93	0.094	0.387	933	240	1174	2098	831	
6/6/2002	103	69	0.094	0.387	1092	178	1271	2328	887	
6/7/2002	103	124	0.094	0.387	1092	320	1413	2505	1006	
6/8/2002	77	95	0.094	0.387	817	245	1062	1880	757	
6/9/2002	77	95	0.094	0.387	817	245	1062	1880	757	
6/10/2002	73	95	0.094	0.387	774	245	1020	1798	728	
6/11/2002	54	124	0.094	0.387	573	320	893	1502	655	
6/12/2002	46	88	0.094	0.387	488	227	715	1223	520	
6/13/2002	53	70	0.156	0.258	339	271	610	795	496	
6/14/2002	43	61	0.156	0.258	275	236	511	665	416	
6/15/2002	32	55	0.156	0.258	205	213	418	541	341	
6/16/2002	32	55	0.156	0.258	205	213	418	541	341	
6/17/2002	22	55	0.156	0.258	141	213	354	454	291	
6/18/2002	12	31	0.156	0.258	77	120	197	252	162	

Appendix A. Daily abundance of juvenile fall-run Chinook migrating past Woodbridge Irrigation District Dam, December 17, 2001 through July 17, 2002. Data estimated from screw trap captures and bypass trap captures (continued)

Date	YOY Day	YOY Night	Trap Efficiency Day	Trap Efficiency Night	Estimated YOY Day	Estimated YOY Night	Estimated YOY Total	95% Confidence Interval High	95% Confidence Interval Low	Bypass Catch Total
6/19/2002	18	48	0.156	0.258	115	186	301	386	248	
6/20/2002	12	29	0.156	0.258	77	112	189	243	155	
6/21/2002	11	26	0.156	0.258	70	101	171	220	140	
6/22/2002	12	28	0.156	0.258	77	109	185	238	152	
6/23/2002	12	28	0.156	0.258	77	109	185	238	152	
6/24/2002	6	28	0.156	0.258	38	109	147	186	122	
6/25/2002	16	30	0.156	0.258	102	116	219	282	179	
6/26/2002	11	13	0.156	0.258	70	50	121	158	98	
6/27/2002	8	20	0.156	0.258	51	78	129	165	106	
6/28/2002	0	10	0.156	0.258	0	39	39	48	33	
6/29/2002	8	18	0.156	0.258	51	70	121	155	99	
6/30/2002	8	18	0.156	0.258	51	70	121	155	99	
7/1/2002										50
7/2/2002										31
7/3/2002										98
7/4/2002										94
7/5/2002										37
7/6/2002										31
7/7/2002										27
7/8/2002										13
7/9/2002										78
7/10/2002										21
7/11/2002										19
7/12/2002										20
7/13/2002										10
7/14/2002										1
7/15/2002										9
7/16/2002										38
7/17/2002										0
Total	4601	13458			39450	37896	77346	116698	59854	577

Appendix B. Daily abundance of juvenile steelhead migrating past Woodbridge Irrigation District Dam, February 26,2002 through July 17, 2002. Data estimated from screw trap captures and bypass trap captures

Date	YOY Day	YOY Night	Trap Efficiency Day	Trap Efficiency Night	Estimated YOY Day	Estimated YOY Night	Estimated YOY Total	95% Confidence Interval High	95% Confidence Interval Low	Bypass Catch Total
2/26/2002		1	0.277	0.294	0	3	3	3	4	
2/27/2002			0.277	0.294	0	0	0	0	0	
2/28/2002			0.277	0.294	0	0	0	0	0	
3/1/2002			0.277	0.294	0	0	0	0	0	
3/2/2002			0.277	0.294	0	0	0	0	0	
3/3/2002			0.277	0.294	0	0	0	0	0	
3/4/2002			0.277	0.294	0	0	0	0	0	
3/5/2002			0.277	0.294	0	0	0	0	0	
3/6/2002			0.277	0.294	0	0	0	0	0	
3/7/2002			0.277	0.294	0	0	0	0	0	
3/8/2002			0.277	0.294	0	0	0	0	0	
3/9/2002			0.277	0.294	0	0	0	0	0	
3/10/2002			0.277	0.294	0	0	0	0	0	
3/11/2002			0.277	0.294	0	0	0	0	0	
3/12/2002	5	2	0.277	0.294	18	7	25	43	7	
3/13/2002	1	3	0.277	0.294	4	10	14	17	11	
3/14/2002	1	2	0.277	0.294	4	7	10	14	7	
3/15/2002			0.277	0.294	0	0	0	0	0	
3/16/2002			0.277	0.294	0	0	0	0	0	
3/17/2002			0.277	0.294	0	0	0	0	0	
3/18/2002	2		0.277	0.294	7	0	7	14	0	
3/19/2002	1	2	0.277	0.294	4	7	10	14	7	
3/20/2002		1	0.277	0.294	0	3	3	3	4	
3/21/2002			0.277	0.294	0	0	0	0	0	
3/22/2002			0.277	0.294	0	0	0	0	0	
3/23/2002			0.277	0.294	0	0	0	0	0	
3/24/2002		5	0.277	0.294	0	17	17	17	17	
3/25/2002			0.277	0.294	0	0	0	0	0	

Appendix B. Daily abundance of juvenile steelhead migrating past Woodbridge Irrigation District Dam, February 26,2002 through July 17, 2002. Data estimated from screw trap captures and bypass trap captures (continued)

Date	YOY Day	YOY Night	Trap Efficiency Day	Trap Efficiency Night	Estimated YOY Day	Estimated YOY Night	Estimated YOY Total	95% Confidence Interval High	95% Confidence Interval Low	Bypass Catch Total
3/26/2002			0.277	0.294	0	0	0	0	0	0
3/27/2002		2	0.277	0.294	0	7	7	7	7	7
3/28/2002			0.277	0.294	0	0	0	0	0	0
3/29/2002			0.277	0.294	0	0	0	0	0	0
3/30/2002			0.277	0.294	0	0	0	0	0	0
3/31/2002			0.277	0.294	0	0	0	0	0	0
4/1/2002			0.277	0.294	0	0	0	0	0	0
4/2/2002			0.277	0.294	0	0	0	0	0	0
4/3/2002			0.277	0.294	0	0	0	0	0	0
4/4/2002			0.368	0.287	0	0	0	0	0	0
4/5/2002			0.368	0.287	0	0	0	0	0	0
4/6/2002			0.368	0.287	0	0	0	0	0	0
4/7/2002			0.368	0.287	0	0	0	0	0	0
4/8/2002			0.368	0.287	0	0	0	0	0	0
4/9/2002			0.368	0.287	0	0	0	0	0	0
4/10/2002			0.368	0.287	0	0	0	0	0	0
4/11/2002			0.368	0.287	0	0	0	0	0	0
4/12/2002		1	0.368	0.287	0	3	3	3	4	4
4/13/2002			0.368	0.287	0	0	0	0	0	0
4/14/2002			0.368	0.287	0	0	0	0	0	0
4/15/2002			0.368	0.287	0	0	0	0	0	0
4/16/2002	1		0.368	0.287	3	0	3	5	0	0
4/17/2002			0.368	0.287	0	0	0	0	0	0
4/18/2002			0.368	0.287	0	0	0	0	0	0
4/19/2002			0.368	0.287	0	0	0	0	0	0
4/20/2002			0.368	0.287	0	0	0	0	0	0
4/21/2002			0.368	0.287	0	0	0	0	0	0
4/22/2002			0.368	0.287	0	0	0	0	0	0
4/23/2002		1	0.368	0.287	0	3	3	3	4	4
4/24/2002			0.368	0.287	0	0	0	0	0	0

Appendix B. Daily abundance of juvenile steelhead migrating past Woodbridge Irrigation District Dam, February 26,2002 through July 17, 2002. Data estimated from screw trap captures and bypass trap captures (continued)

Date	YOY Day	YOY Night	Trap Efficiency Day	Trap Efficiency Night	Estimated YOY Day	Estimated YOY Night	Estimated YOY Total	95% Confidence Interval High	95% Confidence Interval Low	Bypass Catch Total
4/25/2002			0.124	0.311	0	0	0	0	0	0
4/26/2002			0.124	0.311	0	0	0	0	0	0
4/27/2002			0.124	0.311	0	0	0	0	0	0
4/28/2002			0.124	0.311	0	0	0	0	0	0
4/29/2002			0.124	0.311	0	0	0	0	0	0
4/30/2002			0.124	0.311	0	0	0	0	0	0
5/1/2002			0.124	0.311	0	0	0	0	0	0
5/2/2002			0.124	0.311	0	0	0	0	0	0
5/3/2002		1	0.124	0.311	0	3	3	3	4	4
5/4/2002			0.124	0.311	0	0	0	0	0	0
5/5/2002			0.124	0.311	0	0	0	0	0	0
5/6/2002			0.124	0.311	0	0	0	0	0	0
5/7/2002		4	0.124	0.311	0	13	13	13	13	13
5/8/2002			0.124	0.311	0	0	0	0	0	0
5/9/2002			0.094	0.387	0	0	0	0	0	0
5/10/2002			0.094	0.387	0	0	0	0	0	0
5/11/2002			0.094	0.387	0	0	0	0	0	0
5/12/2002			0.094	0.387	0	0	0	0	0	0
5/13/2002			0.094	0.387	0	0	0	0	0	0
5/14/2002		2	0.094	0.387	0	5	5	5	6	6
5/15/2002	1	1	0.094	0.387	11	3	13	24	3	3
5/16/2002			0.094	0.387	0	0	0	0	0	0
5/17/2002			0.094	0.387	0	0	0	0	0	0
5/18/2002			0.094	0.387	0	0	0	0	0	0
5/19/2002			0.094	0.387	0	0	0	0	0	0
5/20/2002			0.094	0.387	0	0	0	0	0	0
5/21/2002			0.094	0.387	0	0	0	0	0	0
5/22/2002			0.094	0.387	0	0	0	0	0	0
5/23/2002		1	0.094	0.387	0	3	3	3	3	3
5/24/2002	1		0.094	0.387	11	0	11	21	0	0

Appendix B. Daily abundance of juvenile steelhead migrating past Woodbridge Irrigation District Dam, February 26,2002 through July 17, 2002. Data estimated from screw trap captures and bypass trap captures (continued)

Date	YOY Day	YOY Night	Trap Efficiency Day	Trap Efficiency Night	Estimated YOY Day	Estimated YOY Night	Estimated YOY Total	95% Confidence Interval		Bypass Catch Total
								High	Low	
5/25/2002			0.094	0.387	0	0	0	0	0	0
5/26/2002			0.094	0.387	0	0	0	0	0	0
5/27/2002	1		0.094	0.387	11	0	11	21	0	0
5/28/2002			0.094	0.387	0	0	0	0	0	0
5/29/2002		1	0.094	0.387	0	3	3	3	3	3
5/30/2002		2	0.094	0.387	0	5	5	5	5	6
5/31/2002		1	0.094	0.387	0	3	3	3	3	3
6/1/2002			0.094	0.387	0	0	0	0	0	0
6/2/2002			0.094	0.387	0	0	0	0	0	0
6/3/2002			0.094	0.387	0	0	0	0	0	0
6/4/2002			0.094	0.387	0	0	0	0	0	0
6/5/2002	1		0.094	0.387	11	0	11	21	0	0
6/6/2002		1	0.094	0.387	0	3	3	3	3	3
6/7/2002		1	0.094	0.387	0	3	3	3	3	3
6/8/2002			0.094	0.387	0	0	0	0	0	0
6/9/2002			0.094	0.387	0	0	0	0	0	0
6/10/2002			0.094	0.387	0	0	0	0	0	0
6/11/2002			0.094	0.387	0	0	0	0	0	0
6/12/2002		1	0.094	0.387	0	3	3	3	3	3
6/13/2002			0.156	0.258	0	0	0	0	0	0
6/14/2002			0.156	0.258	0	0	0	0	0	0
6/15/2002			0.156	0.258	0	0	0	0	0	0
6/16/2002			0.156	0.258	0	0	0	0	0	0
6/17/2002			0.156	0.258	0	0	0	0	0	0
6/18/2002		1	0.156	0.258	0	4	4	4	4	4
6/19/2002		1	0.156	0.258	0	4	4	4	4	4
6/20/2002			0.156	0.258	0	0	0	0	0	0
6/21/2002		1	0.156	0.258	0	4	4	4	4	4
6/22/2002			0.156	0.258	0	0	0	0	0	0
6/23/2002			0.156	0.258	0	0	0	0	0	0

Appendix B. Daily abundance of juvenile steelhead migrating past Woodbridge Irrigation District Dam, February 26,2002 through July 17, 2002. Data estimated from screw trap captures and bypass trap captures (continued)

Date	YOY Day	YOY Night	Trap Efficiency Day	Trap Efficiency Night	Estimated YOY Day	Estimated YOY Night	Estimated YOY Total	95% Confidence Interval		Bypass Catch Total
								High	Low	
6/24/2002			0.156	0.258	0	0	0	0	0	0
6/25/2002			0.156	0.258	0	0	0	0	0	0
6/26/2002			0.156	0.258	0	0	0	0	0	0
6/27/2002			0.156	0.258	0	0	0	0	0	0
6/28/2002		1	0.156	0.258	0	4	4	4	4	4
6/29/2002			0.156	0.258	0	0	0	0	0	0
6/30/2002			0.156	0.258	0	0	0	0	0	0
7/1/2002										0
7/2/2002										2
7/3/2002										1
7/4/2002										0
7/5/2002										0
7/6/2002										1
7/7/2002										1
7/8/2002										1
7/9/2002										0
7/10/2002										0
7/11/2002										0
7/12/2002										0
7/13/2002										1
7/14/2002										
7/15/2002										
7/16/2002										
7/17/2002										
Total	15	40	26	39	81	128	209	291	168	7