State of California
The Resources Agency
DEPARTMENT OF FISH AND GAME

FINAL REPORT
SHASTA AND SCOTT RIVER
JUVENILE SALMONID OUTMIGRATION MONITORING PROJECT
P0610354

Prepared by

William R. Chesney, Whitney B. Crombie and
Heather D. Langendorf

Anadromous Fisheries Resource Assessment and Monitoring Program
April 2009

Funded By the California Department of Fish and Game Fisheries Restoration Grants Program
Grant Administered by the Shasta Valley Resource Conservation District

Table of Contents

List of Charts

List of Tables

List of Appendices

Abstract
2008 was the ninth consecutive year of rotary trapping on the Shasta and Scott rivers. The goals of the project were to determine emigration abundance and timing of all age classes of juvenile salmonids leaving the Shasta and Scott rivers between early February and early July 2008 and to investigate the relationships between instream conditions and emigration patterns of juvenile salmonids.

We determined trap efficiencies for all age classes of Chinook (*Oncorhynchus tshawytscha*), coho (Oncorhynchus kisutch) and steelhead (*Oncorhynchus mykiss*) in the catch and calculated weekly production estimates for each age class. We estimated the weekly mean fork length at age of salmonids in the catch from a measured sub-sample. Due to low numbers of coho 1+ expected in 2008, we used the correlation between steelhead 2+ trap efficiencies and coho 1+ efficiencies observed in previous years to produce estimates of trap efficiency in 2008.

Background

2008 was the ninth consecutive year of rotary trapping on the Shasta and Scott rivers. The goals of the project were:

- To determine emigration abundance and timing of all age classes of juvenile salmonids exiting the Shasta and Scott rivers between early February and early July 2008.
- To investigate the relationships between instream conditions and emigration patterns of juvenile salmonids.

The specific objectives were:

- To estimate the weekly mean fork length at age of salmonids in the catch from a measured sub-sample.
- To estimate weekly rotary trap efficiencies for all age classes of Chinook, coho and steelhead in the catch and produce weekly production estimates for each age class.
- To monitor stream flow and temperature at the traps.

Shasta River Rotary Screw Trap Summary

Methods

We sampled the Shasta River with a modified five foot rotary screw trap manufactured by EG Solutions, Corvallis, Oregon. The trap was operated six days per week: Sunday afternoon through Saturday morning, directly downstream of the Shasta River Fish Counting Facility at 041º 49' 46.38" N, 122º 35' 35.38" W. The catch in the trap was processed daily at approximately 0800 hrs. We also checked the operation of the trap and removed debris from the live car at approximately 1700 hrs daily and at 2200 hrs as needed. We measured the velocity of the water entering the cone at the beginning and end of each set with a flow meter manufactured by General Oceanics, model 2030R and calculated the total volume sampled for each set. All vertebrates collected in the trap were identified and counted. Salmonids collected in

the trap were classified by species, age and life stage. Scale samples and fork length data were collected from a random sample of salmonids in the catch.

Age Determination

We used the same age–length cutoffs for salmonids that were used in 2007. These cutoffs were determined from fork length frequency distributions and by estimating the age of scales in the 2001-2007 collection. Individual scale samples were visually examined and categorized into brood years using scale age-estimation methods (Van Oosten 1957, Chilton and Beamish 1982, Casselman 1983). Fork length intervals for each age class were determined for appropriate time periods and updated throughout the season. We recognize that the intervals are not absolute and that as a result of variable growth, some individuals may be larger or smaller than the cutoff fork length. The fork length cutoffs and the number of scales examined to determine the cutoffs are shown in Appendices 30 and 31.

Trap Efficiency Determinations and Production Estimates

When sufficient fish were in the catch, we conducted multiple trap efficiency trials to determine the mean weekly trap efficiency for 0+ Chinook (*Oncorhynchus tshawytscha*), 0+ coho (*Oncorhynchus kisutch*), and 0+, 1+, 2+, and 3+ steelhead (*Oncorhynchus mykiss*). For each trial, a known number of marked fish from each age class were taken three quarters of a mile upstream from the trap and released. 0+ salmonids were dyed by placing them in a solution of 0.6 grams of Bismarck brown mixed with 19 liters of water for 40 to 50 minutes. The older age fish were marked with a caudal fin margin clip. Three different caudal fin margin clips were used in a weekly rotation allowing us to determine if marked fish were being recaptured outside of the week in which they were marked. Fish marked in the morning processing were held in live cars until the afternoon in order to assess their condition prior to release. For each species and age class, the number of fish recaptured during the week divided by the total number marked equals the estimated trap efficiency for the week. An estimate of the total number of outmigrants per week was determined using a stratified mark and recapture technique (Carlson 1998). We used zero for the lower confidence limit if the calculated lower confidence limit for the estimate was negative. In weeks when marked fish were released but none were recaptured, we used the average trap efficiency for the season or the seasonal trap efficiency to expand the number of fish trapped to develop an estimate of the total migrants for the week (ODFW Salmonid Lifecycle Monitoring Project).

Prior to 2007, we marked and released 1+ and 0+ coho upstream of the rotary trap to produce weekly estimates of trap efficiency. Due to the low number of 1+ coho projected for 2008, we chose to minimize our handling of the fish. We used the correlation between the trap efficiency for 2+ steelhead smolts and 1+ coho smolts observed in 2004 and 2005 to estimate the number of coho smolts produced in 2007.

Water temperature and flow monitoring

Hourly water temperatures were recorded with an Onset Optic StowAway® temperature logger attached to the downstream end of the trap. Stream flow measurements presented in this report are preliminary data from the United States

Geological Survey (USGS) stream gauge number 11517500, Shasta River, Yreka (SRY). This gauge is located approximately .75 miles upstream of the confluence with the Klamath River.

Results

Data in this report are preliminary. The Shasta River rotary trap began sampling six days per week on February 11, 2008. Trapping ended after 20 weeks on July 1, 2008. The trap fished 118 sets for a total of 2,659.2 hours. We estimate that 337,808,392.7 cubic feet of water was sampled. The number of salmonids trapped, marked and recaptured by week, and weekly population estimates with a 95% Confidence Interval (CI) are shown in Appendices 1 and 4-7. The number of 1+ coho trapped per week and the weekly estimates are shown in Appendices 2 and 3. Weekly mean fork lengths, sample size, minimum and maximum size and standard deviations for Chinook, coho, and steelhead are shown in Appendices 14-21.

Chinook 0+

We estimate a total of 938,503 0+ Chinook (95% CI, 872,905 – 1,004,102) left the Shasta River during the period sampled. The greatest number of Chinook emigrated during week 11 (190,444, 95% CI, 143,367 – 237,517). This is equal to 20.3% of the total estimate (Charts 1 and 2). The mean fork length for 0+ Chinook during week 11 was 40 mm (Appendix 14).

Chinook 1+

A total catch of 20 1+ Chinook emigrated from the Shasta River during weeks 10 through 19.

Coho 0+

An estimated 1,555 0+ coho (95% CI, 980 – 2,129) emigrated from the Shasta River during weeks 15, 18 through 21 and 23 through 26. The greatest number left during week 24 (417, 95% CI, 196 - 639) (Chart 4). This is equal to 28.6% of the total estimate (Chart 5). The mean fork length for 0+ coho during week 24 was 104 mm (Appendix 16).

Coho 1+

A total catch of 72 1+ coho emigrated from the Shasta River from weeks 9, 13 through 18 and 20. The mean fork length for 1+ coho during week 15 was 140 mm (Appendix17).

Coho 2+

Two 2+ coho emigrated from the Shasta River during weeks 15 and 16.

Steelhead 0+

An estimated 5,793 0+ steelhead (95% CI, 4,650 – 6,937) emigrated from the Shasta River during weeks 19 through 26. The greatest number left during week 26 (2,244, 95% CI, 1,344 – 3,144) (Chart 9). This is equal to 38.7% of the total estimate for the

period sampled (Chart 10). The mean fork length for 0+ steelhead during week 26 was 72 mm (Appendix 18).

Steelhead 1+

An estimated 778 1+ steelhead (95% CI, 564 – 991) emigrated from the Shasta River in weeks 9 – 23 and 25 - 26. The greatest number left during week 16 (153, 95% CI, 6 – 301) (Chart 11). This is equal to 19.7% of the total estimate for the period sampled (Chart 12). The mean fork length for 1+ steelhead during week 16 was 127 mm (Appendix 19).

Steelhead 2+

An estimated 12,386 2+ steelhead (95% CI, 11,142 – 13,631) emigrated from the Shasta River during weeks 7 through 23 and 26. The greatest number left during week 19 (2,017, 95% CI, 1,606 – 2,428) (Chart 14). This is equal to 16.3% of the total estimate for the period sampled (Chart 15). The mean fork length for 2+ steelhead during week 19 was 195 mm (Appendix 20).

Steelhead 3+

We estimated 1,822 3+ (95% CI, 1,233 – 2,410) emigrated from the Shasta River during weeks 7 and 10 - 20 (Chart 16). The greatest number left during week 16 (362, 95% CI, 7 – 717). The mean fork lengths for 3+ steelhead are shown by week in Appendix 21.

Chart 1

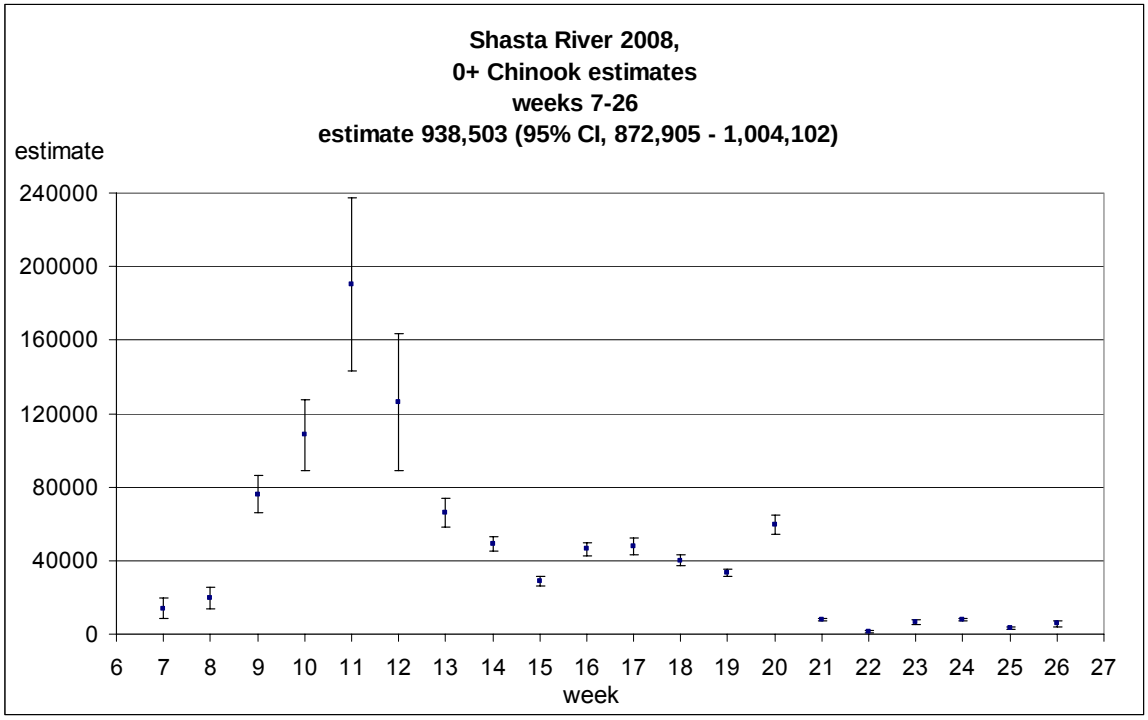


Chart 2

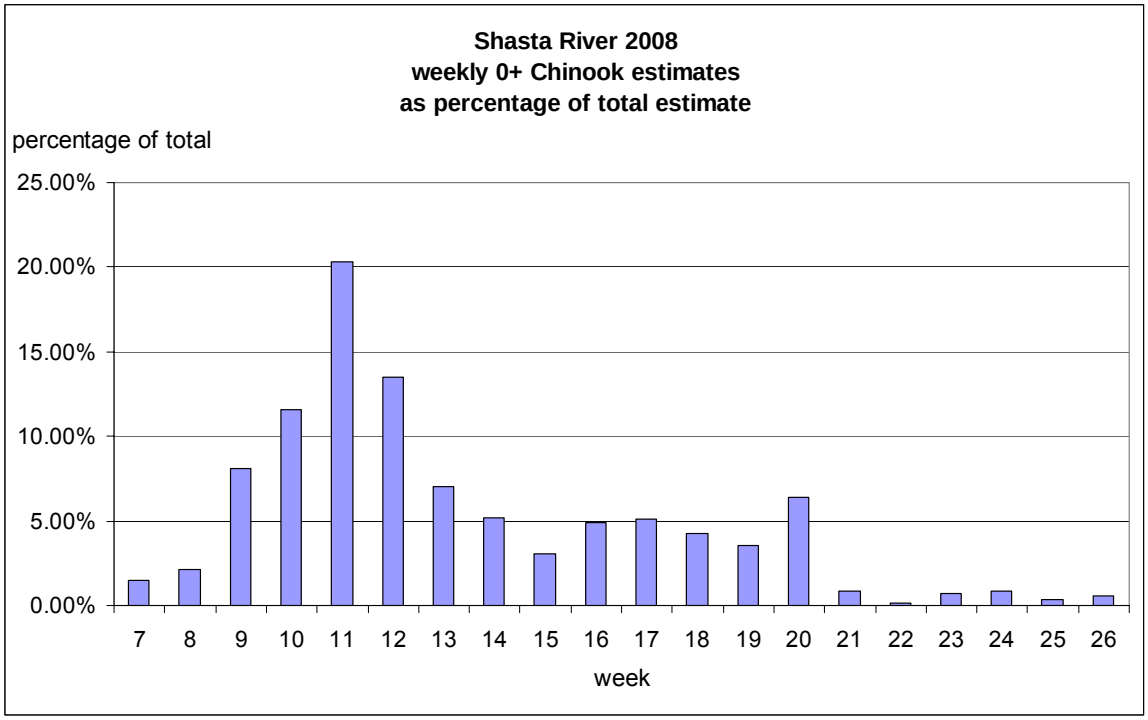


Chart 3

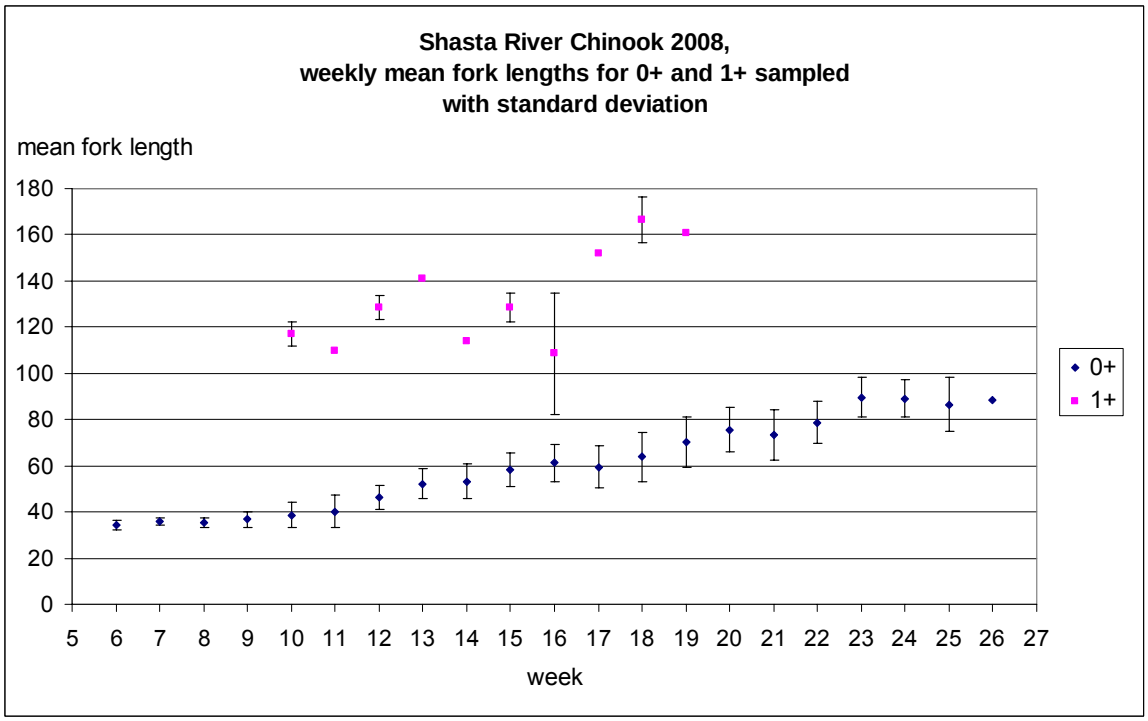


Chart 4

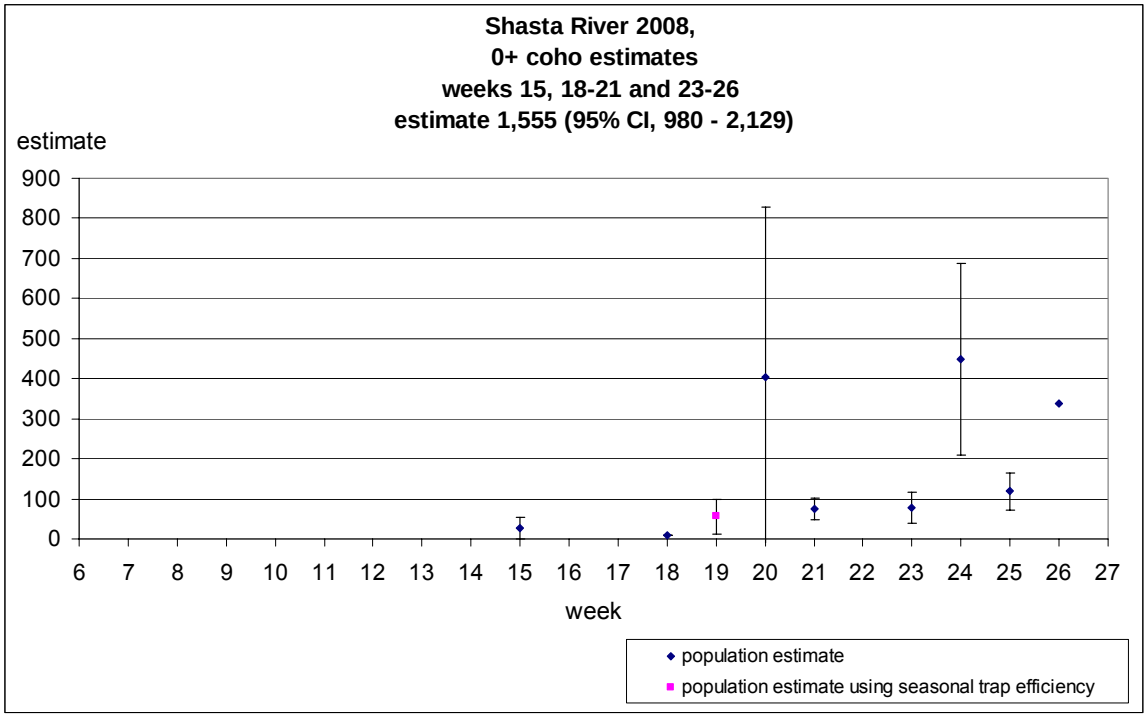


Chart 5

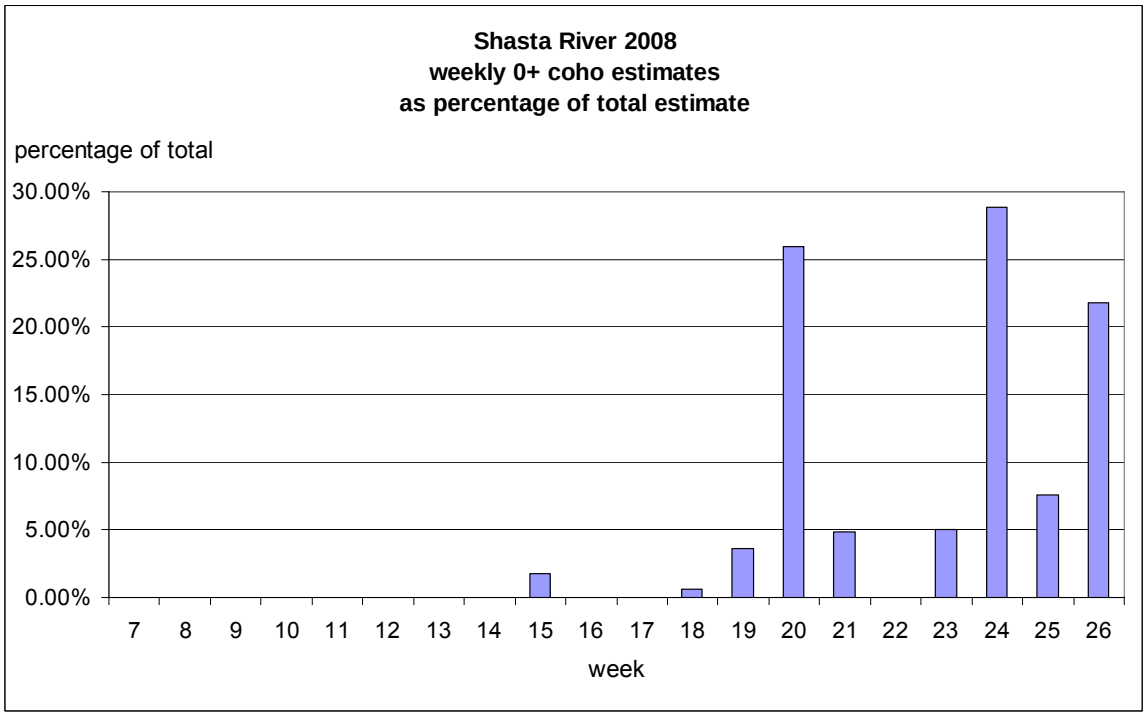


Chart 6

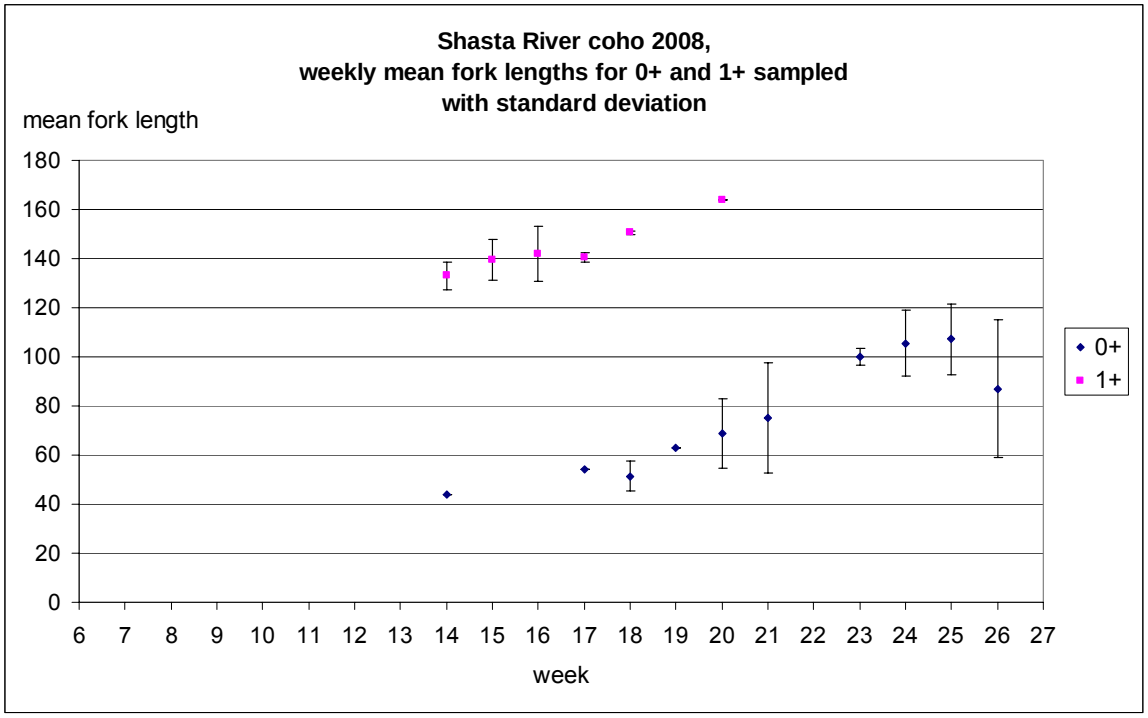


Chart 7

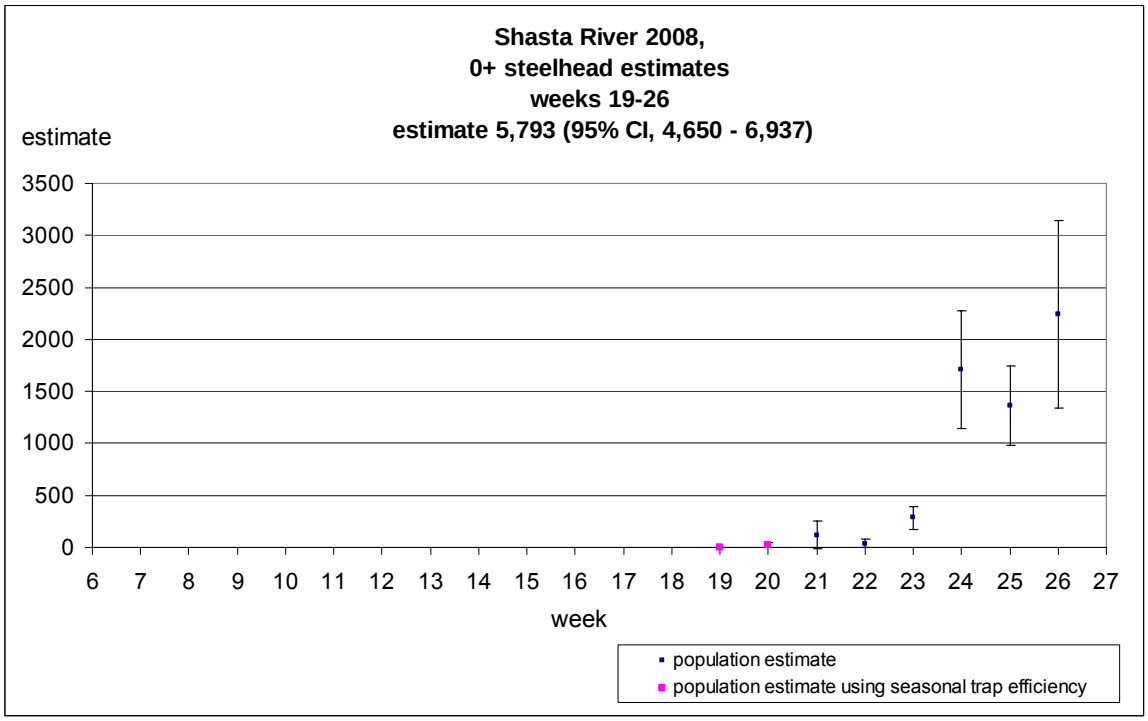


Chart 8

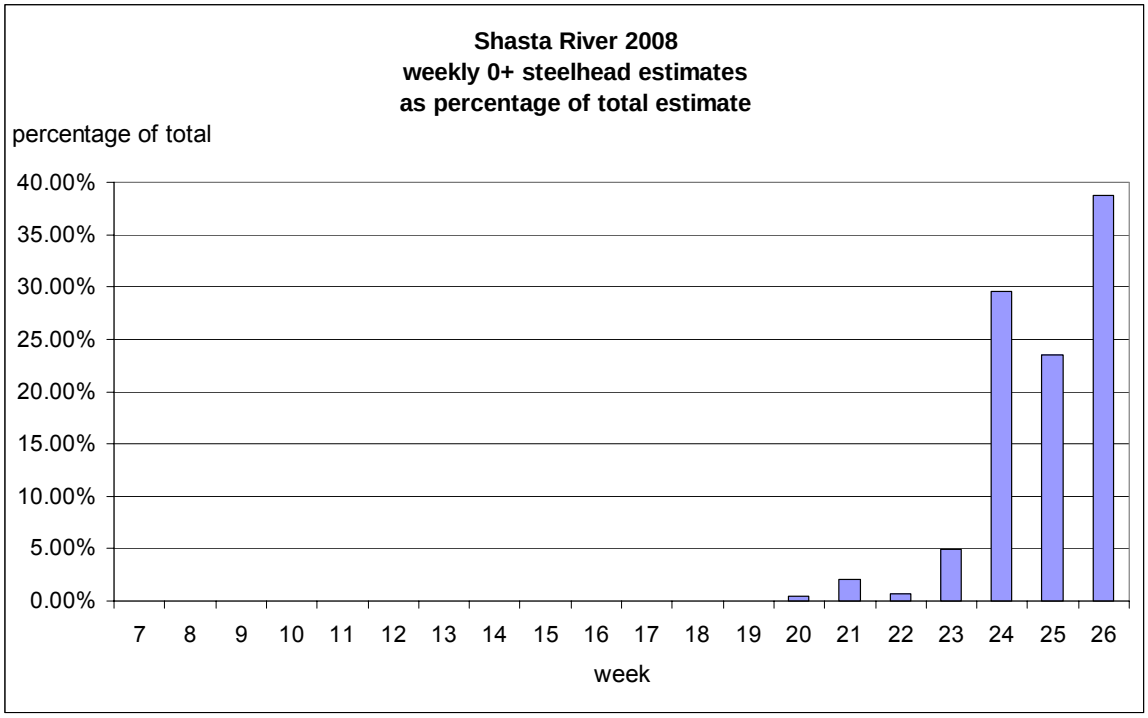


Chart 9

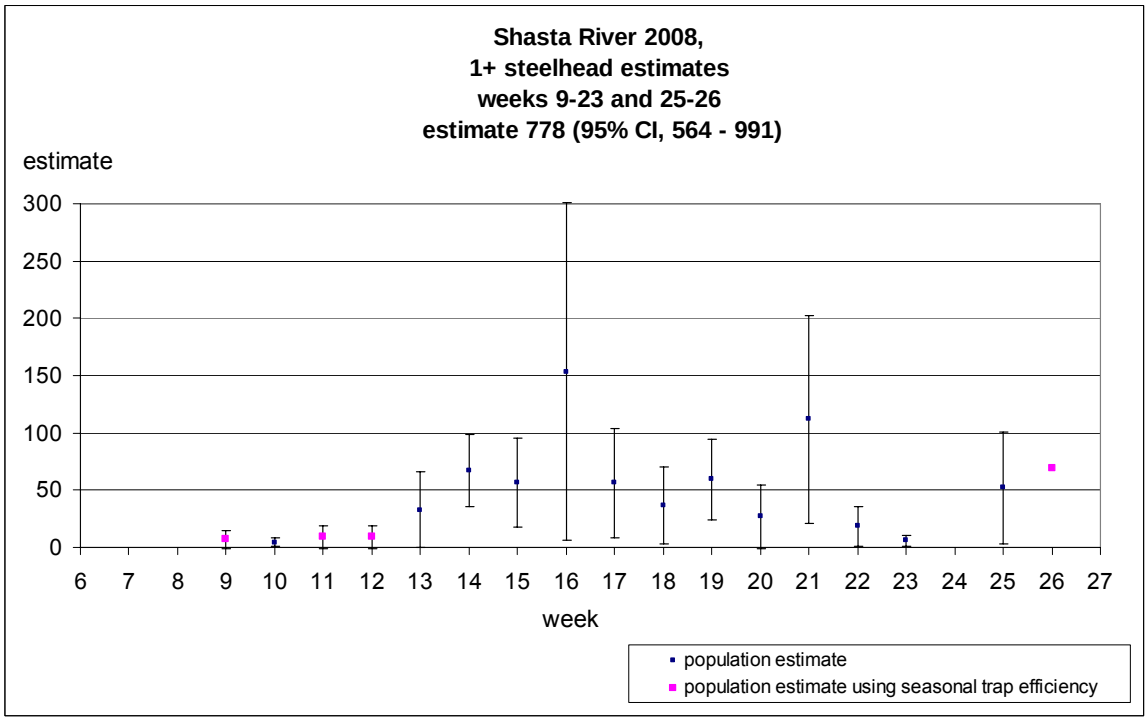


Chart 10

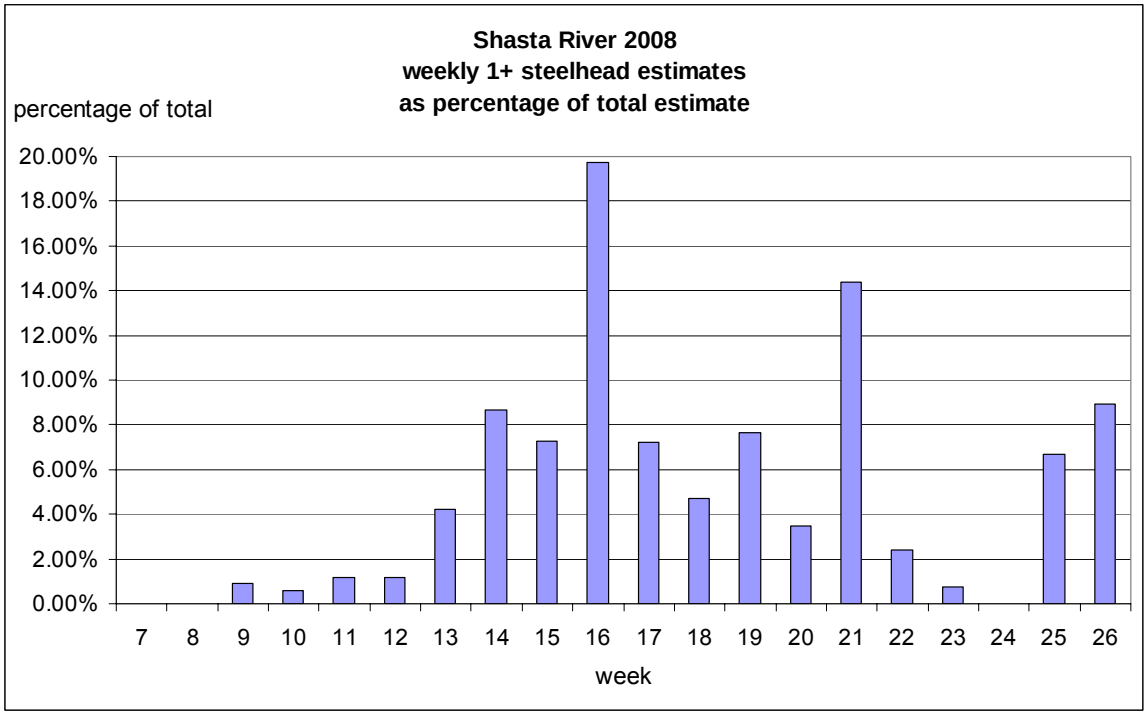


Chart 11

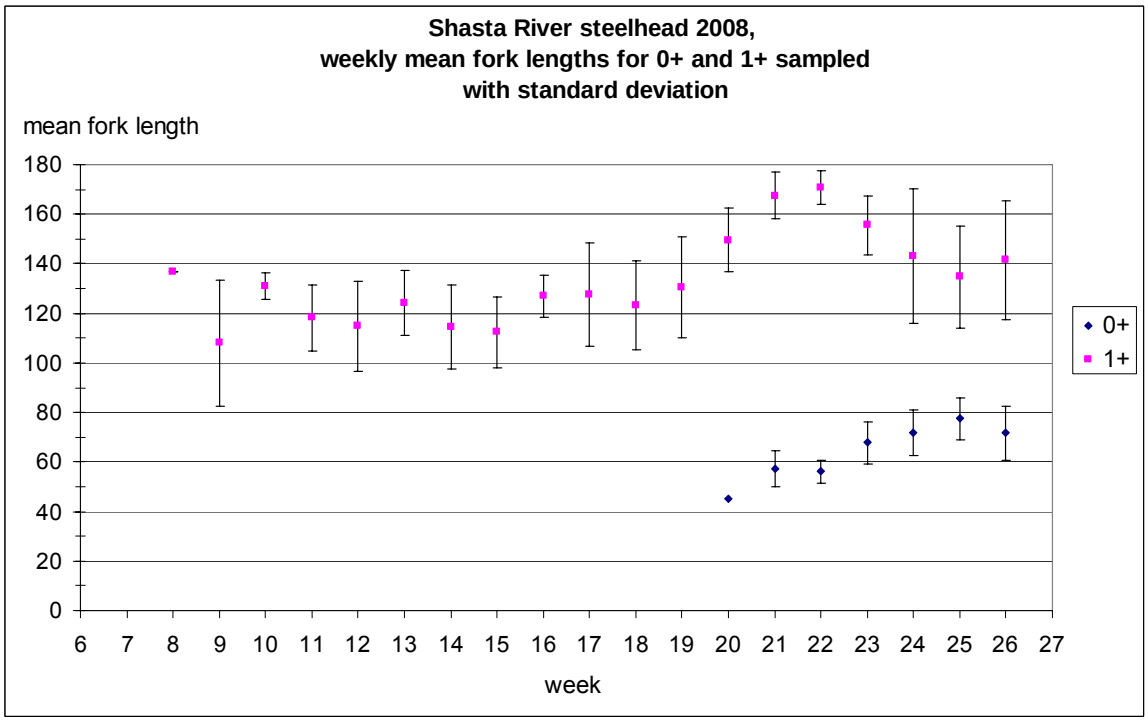


Chart 12

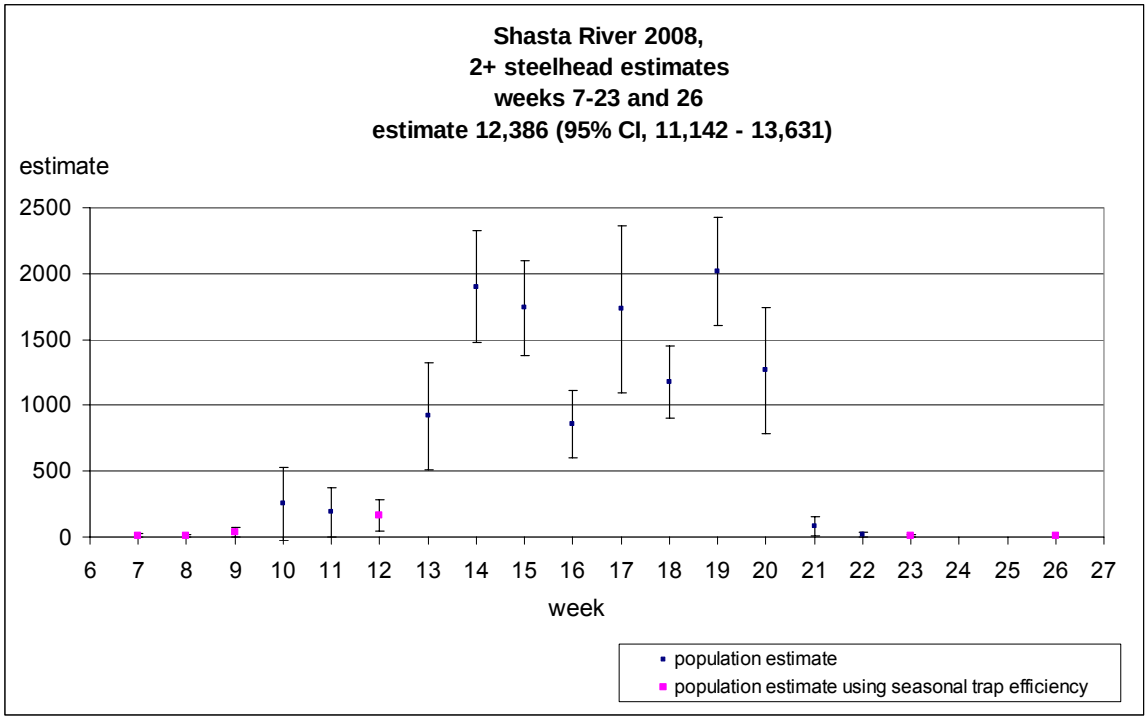


Chart 13

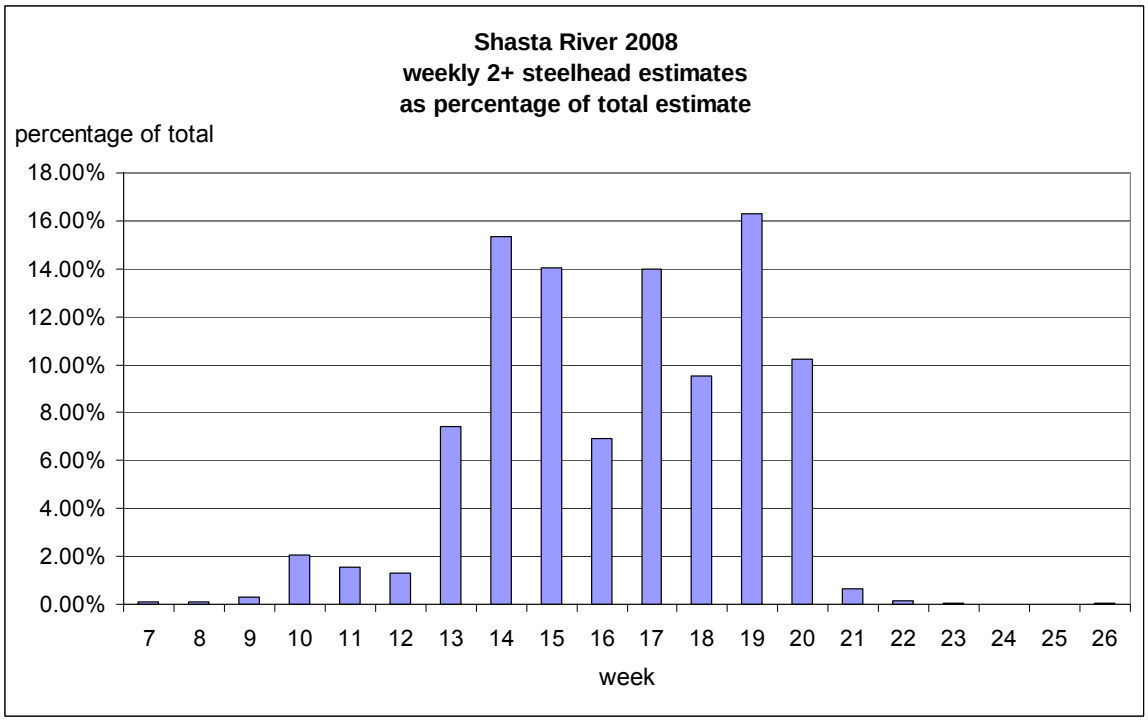


Chart 14

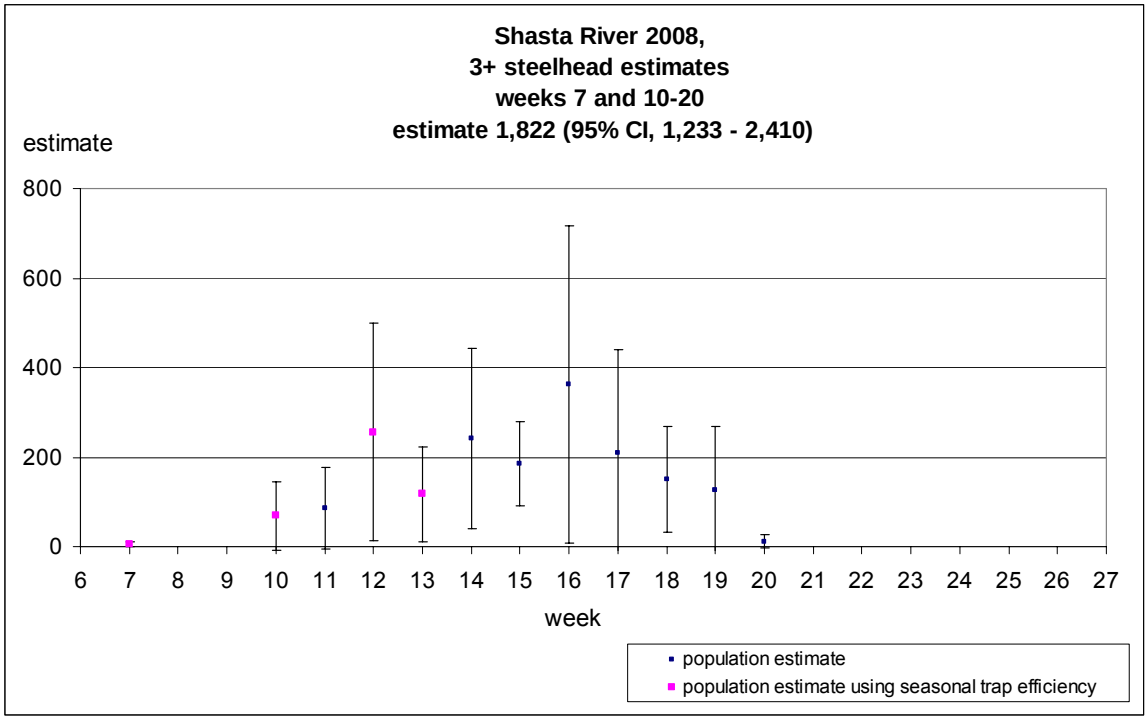


Chart 15

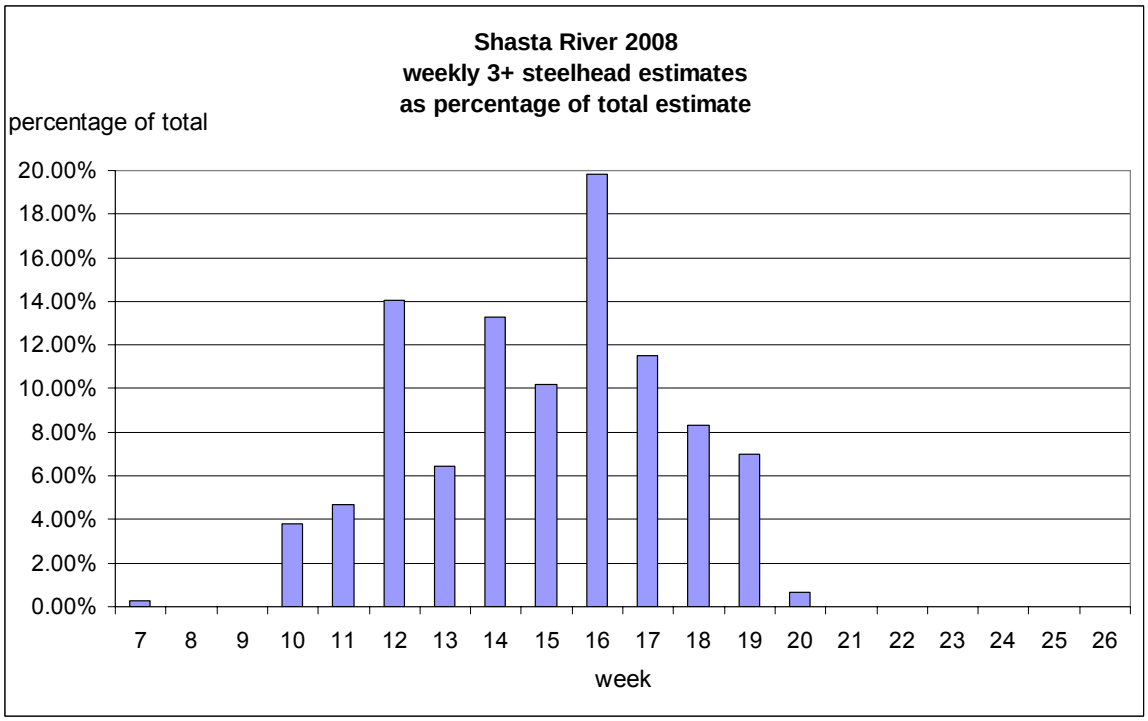
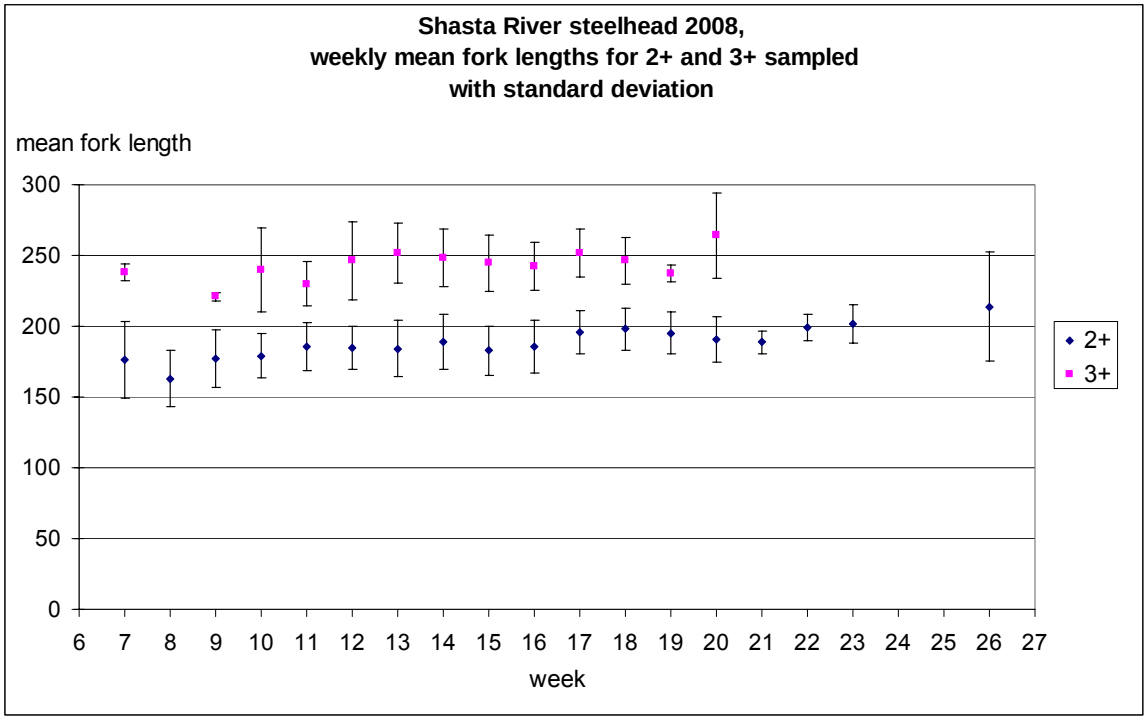


Chart 16



Discussion

Coho

Due to low numbers of 0+ and 1+ coho expected in 2008, we used the correlation between steelhead trap efficiencies and coho efficiencies observed in previous years to produce estimates of trap efficiency in 2008. The correlation between 2+ steelhead and 1+ coho observed in 2004 and 2005 for weeks 14–19 is expressed by the equation y = 1.1388x + 0.107 (Chart 18). We used the weekly efficiencies for 2+ steelhead from 2007 (2008?) for X and solved for Y to get weekly estimates for 1+ coho. The correlation between 0+ steelhead and 0+ coho in 2005 and 2006 is expressed by the equation y = 0.7625x + 0.0095 (Chart 19). The weekly efficiencies for 0+ steelhead from 2007? were equal to X and we solved for Y to estimate the trap efficiency for 0+ coho.

We believe that the trap efficiencies between coho and steelhead smolts are well correlated because both species are at the same life stage and are responding similarly to environmental conditions.

Chart 17

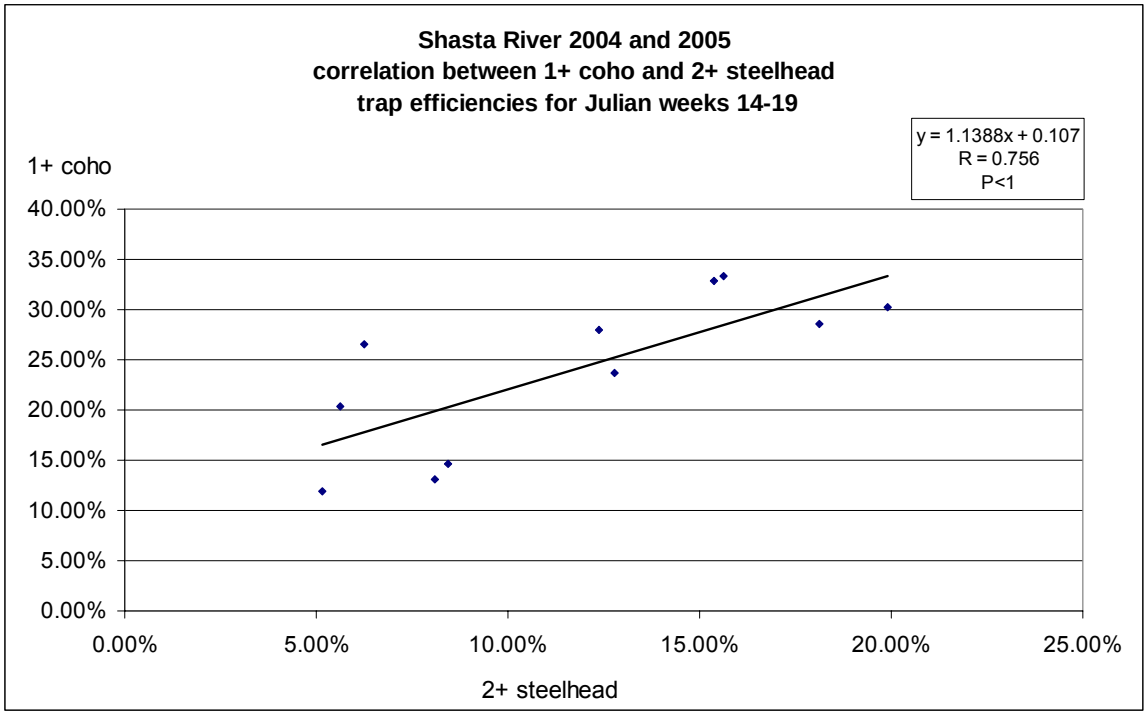
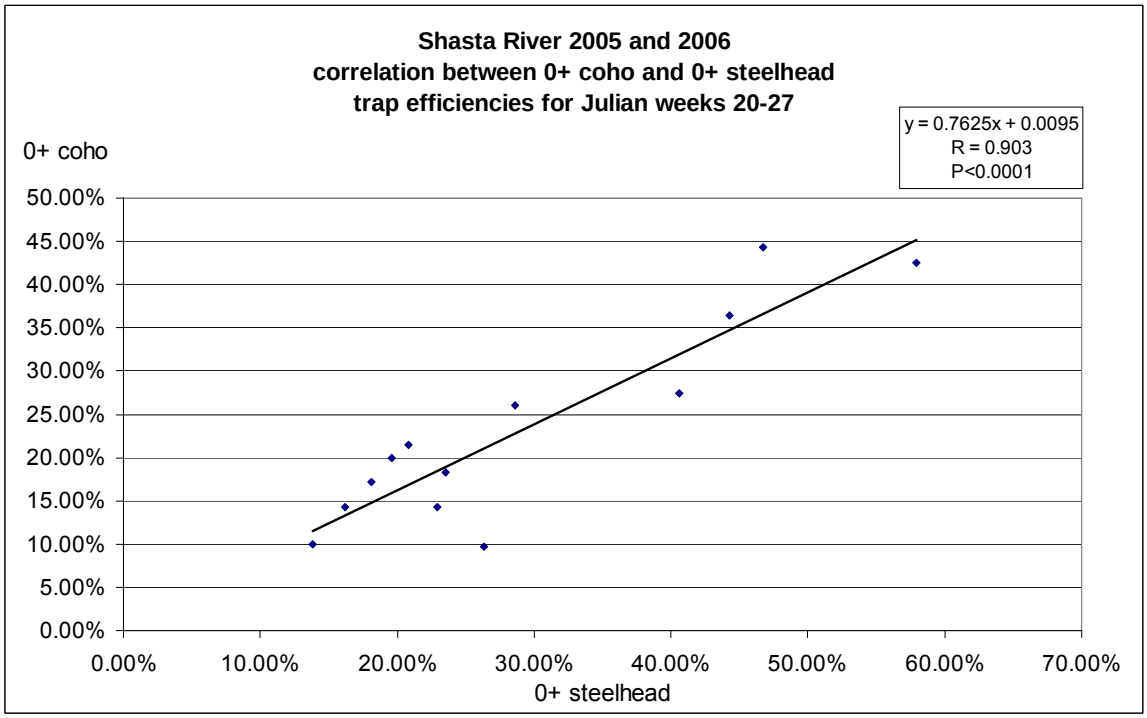


Chart 18



Coho smolt production and return rate

The estimate of the number of smolts produced in 2008 per returning adult in 2006 is shown in Table 1. The average number of smolts per adult produced has dropped to 23.2 smolts. The projected adult returns for 2008, 2009, and 2010 are shown in Table 2 using the average rate of return of 2.96%.

Table 1
Coho 1+ produced per returning adult

Brood Year	Adults	1+ produced in	Year	smolts per adult
2001	291	11,052	2003	38.0
2002	86	1,799	2004	20.9
2003	187	2,054	2005	11.0
2004	373	10,833	2006	29.0
2005	69	1,178	2007	17.1
2006	47	208	2008	4.4
2007	255	***5118***	***2009***	***20.1***
2008	31	***622***	***2010***	***20.1***

Projected production in 2009 and 2010 based on average production of 20.1 1+ per adult observed for brood years 2001 - 2006

Table 2
Coho 1+ to adult survival

Brood Year	Adults	Emigration year	1+ produced	% return	Adults returning in	Brood Year
2001	291	2003	11,052	3.37%	373	2004
2002	86	2004	1,799	3.84%	69	2005
2003	187	2005	2,054	2.29%	47	2006
2004	373	2006	10,833	2.35%	255	2007
2005	69	2007	1,178	2.63%	31	2008
2006	47	2008	208	***2.90%***	***6***	***2009***
2007	255	2009	***5,118***	***2.90%***	***148***	***2010***
2008	31	2010	***702***	***2.90%***	***20***	***2011***

Projected 1+ estimates for 2009 and 2010 were made using the mean smolt per adult value (23.2) from 2001 through 2008.

Projected adult returns in 2009 - 2011 are based on the average1+ smolt to adult survival rate for 2004 - 2008 (2.90%).

Chart 19

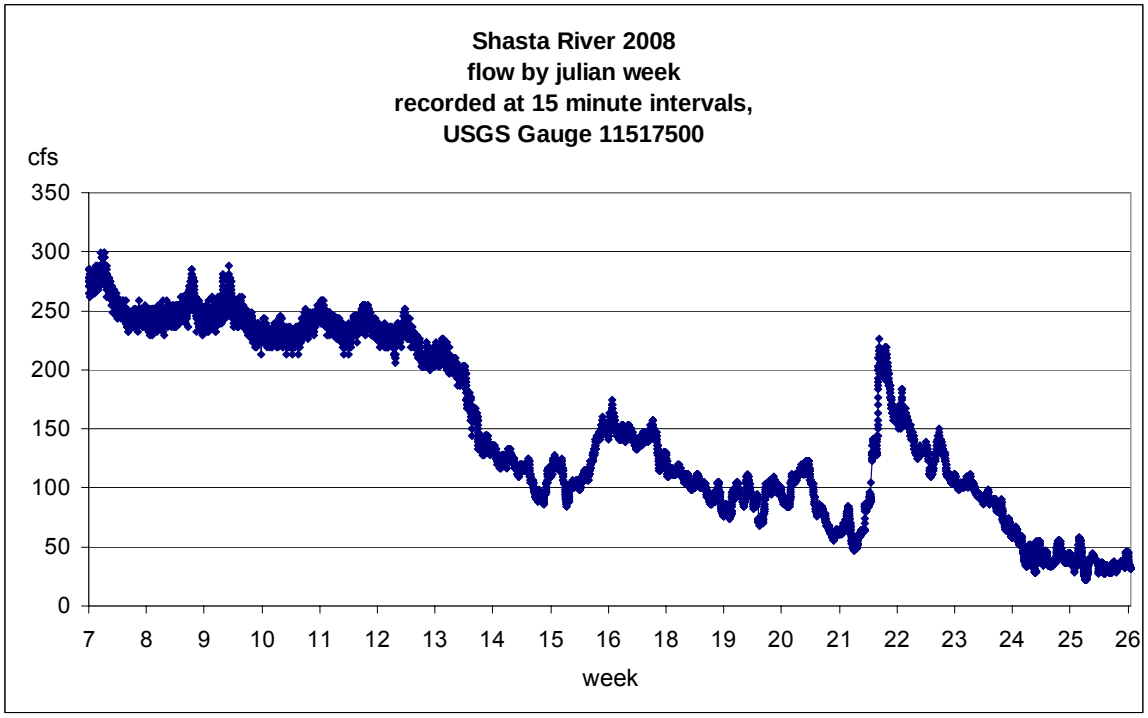


Chart 20

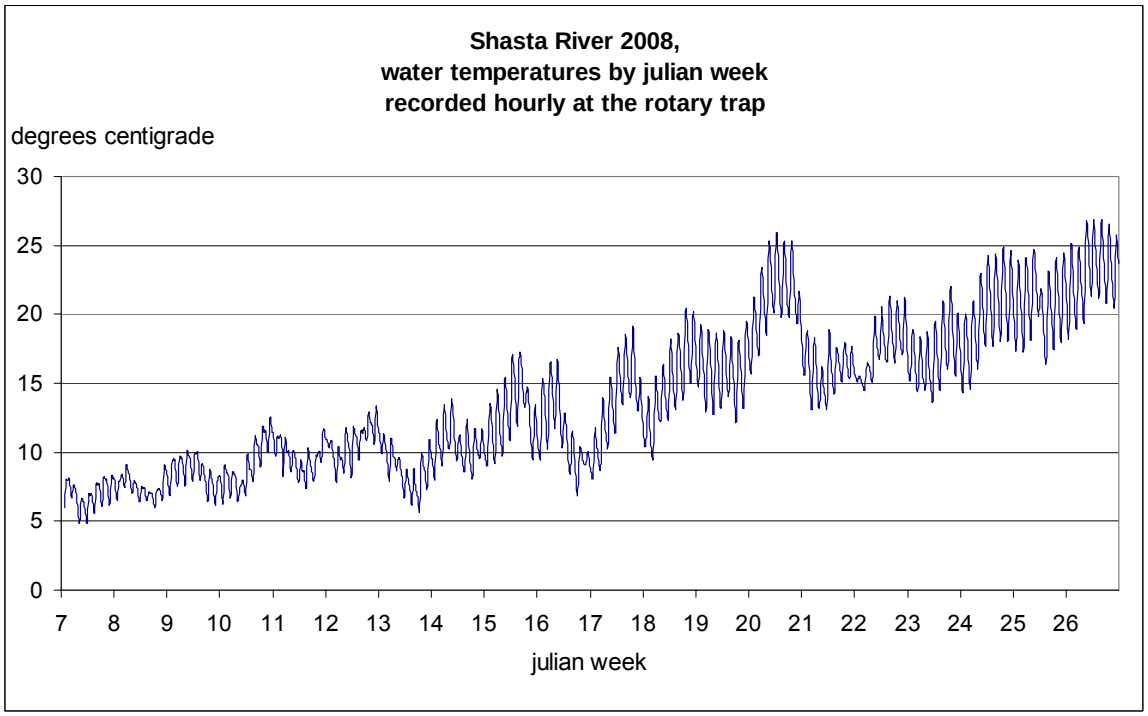
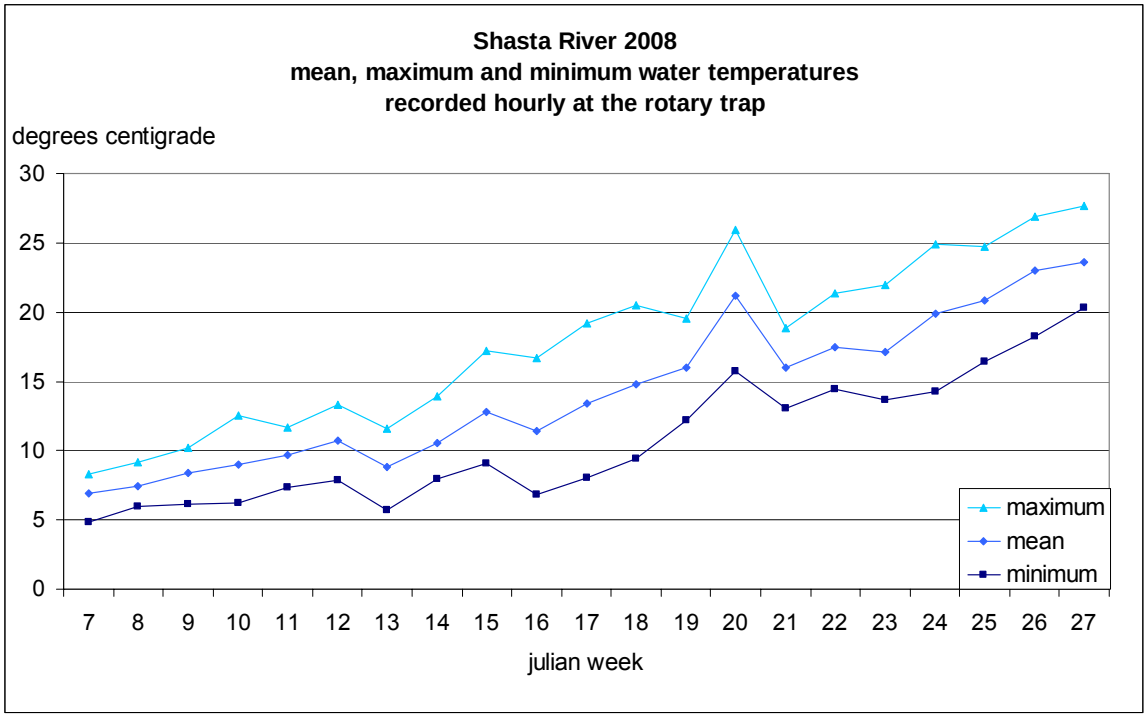


Chart 21



Scott River Rotary Screw Trap Summary

Methods

We sampled the Scott River with a five foot and an eight foot rotary screw trap manufactured by EG Solutions, Corvallis, Oregon. The traps were operated six days per week, Sunday afternoon through Saturday morning, at approximately 4.75 miles upstream of the confluence with the Klamath River at 041º 43' 34.87" N, 123º 00' 30.11" W. The catch in the trap was processed daily at approximately 0800 hrs. We measured the velocity of the water entering each cone at the beginning and end of each set with a flow meter manufactured by General Oceanics model 2030R and calculated the total volume sampled for each set. All vertebrates collected in the trap were identified and counted. Salmonids collected in the trap were classified by species, age and life stage. Scale samples and fork length data were collected from a random sample of salmonids in the catch.

Trap Efficiency Determinations and Production Estimates

Trap efficiencies were calculated weekly using the same methods described in the Shasta River section of this report on page 2. Weekly efficiency trials for all age classes of all salmonids in the catch were conducted on the Scott River in 2008.

Water temperature and flow monitoring

Hourly water temperatures were recorded with an Onset Optic StowAway temperature logger attached to the downstream end of the trap. Stream flow

measurements presented in this report are made using preliminary data from the United States Geological Survey (USGS) recorded at stream gauge number 11519500. This gauge is located approximately 19.5 miles upstream of the trap. Several large, tributaries without stream gauges and numerous small streams enter the Scott River between the gauge and the trap and are not included in the flow measurements.

Results

Data in this report are preliminary. The eight-foot Scott River rotary trap began sampling six days per week on February 13, 2008. Trapping ended after 19 weeks on July 1, 2008. The trap fished 107 sets for a total of 2,477.2 hours. We estimate that 298,605,119.4 cubic feet of water was sampled. The number of fish trapped, marked and recaptured by week, and weekly estimates with 95% CI for all age classes of salmonids with population estimates are shown in Appendices 8 and 11-13. Weekly mean fork length, sample size, minimum and maximum size and standard deviation each species and age class are shown in Appendices 22-29. The five-foot Scott River rotary trap began sampling six days per week on February 14, 2008. After 20 weeks, trapping ended on June 30, 2008. The trap fished 73 sets for a total of 1,683.5 hours. We estimate that 204,560,418.9 cubic feet of water was sampled during the season.

Chinook 0+

An estimated 552,472 0+ Chinook (95% CI, 500,947 – 603,997) left the Scott River during the period sampled. The greatest number of Chinook emigrated during week 15 (79,632, 95% CI, 63,570 – 95,694) (Chart 22). This is equal to 14.4% of the total estimate (Chart 23). The mean fork length for 0+ Chinook during week 15 was 39 mm (Appendix 22).

Chinook 1+

A total of 66 1+ Chinook were trapped during weeks 7-15, 18, 20 and 21. The greatest number left during week 11. The mean fork length for 1+ Chinook during week 11 was 98 mm (Appendix 23).

Coho 0+

An estimated 6,645 0+ coho (95% CI, 5,205 – 8,086) emigrated from the Scott River during weeks 14 – 18 and 20 - 26. The greatest number left during week 26 (2,935, 95% CI, 1,777 – 4,093) (Chart 25). This is equal to 44.2% of the total estimate (Chart 26). The mean fork length for 0+ coho during week 26 was 61 mm (Appendix 24).

Coho 1+

An estimated 941 (95% CI, 569 – 1,313) 1+ coho emigrated from the Scott River during weeks 7 – 9, 11 – 20 and 22 - 25. The greatest number left during week 14 (179, 95% CI, 0 – 377) (Chart 27). This is equal to 19.0% of the total estimate (Chart 28). The mean fork length for 1+ coho during week 14 was 109 mm (Appendix 25).

Coho 2+

We trapped two 2+ coho emigrating from the Scott River, 1 in week 12 and 1 in week

22. The fork lengths for the 2+ coho were 155 mm and 183 mm, respectively.

Steelhead 0+
An estimated 5,474 0+ steelhead (95% CI, 3,249 – 7,699) emigrated from the Scott River during weeks 21 - 26. The greatest number left during week 22 (1,406, 95% CI, 109 – 2,703) (Chart 30). This is equal to 25.7% of the total estimate for the period sampled (Chart 31). The mean fork length for 0+ steelhead during week 22 was 58 mm (Appendix 26).

Steelhead 1+
An estimated 106,459 1+ steelhead (95% CI, 95,542 – 117,376) left the Scott River between weeks 7 through 26. The greatest number left during week 15 (15,305, 95% CI, 12,854 – 17,755) (Chart 32). This is equal to 14.4% of the total estimate for the period sampled (Chart 33). The mean fork length for 1+ steelhead during week 15 was 85 mm (Appendix 27).

Steelhead 2+
An estimated 13,678 2+ steelhead (95% CI, 8,861 – 18,495) left the Scott River in weeks 7 – 19 and 21 - 26. The greatest number left during week 14 (3,952, 95% CI, 511– 7,393) (Chart 35). This is equal to 28.9% of the total estimate for the period sampled (Chart 36). The mean fork length for 2+ steelhead during week 14 was 136 mm (Appendix 28).

Steelhead 3+
A total of four 3+ steelhead were trapped in the Scott River in weeks 8, 10, 13 and 18.

Chart 22

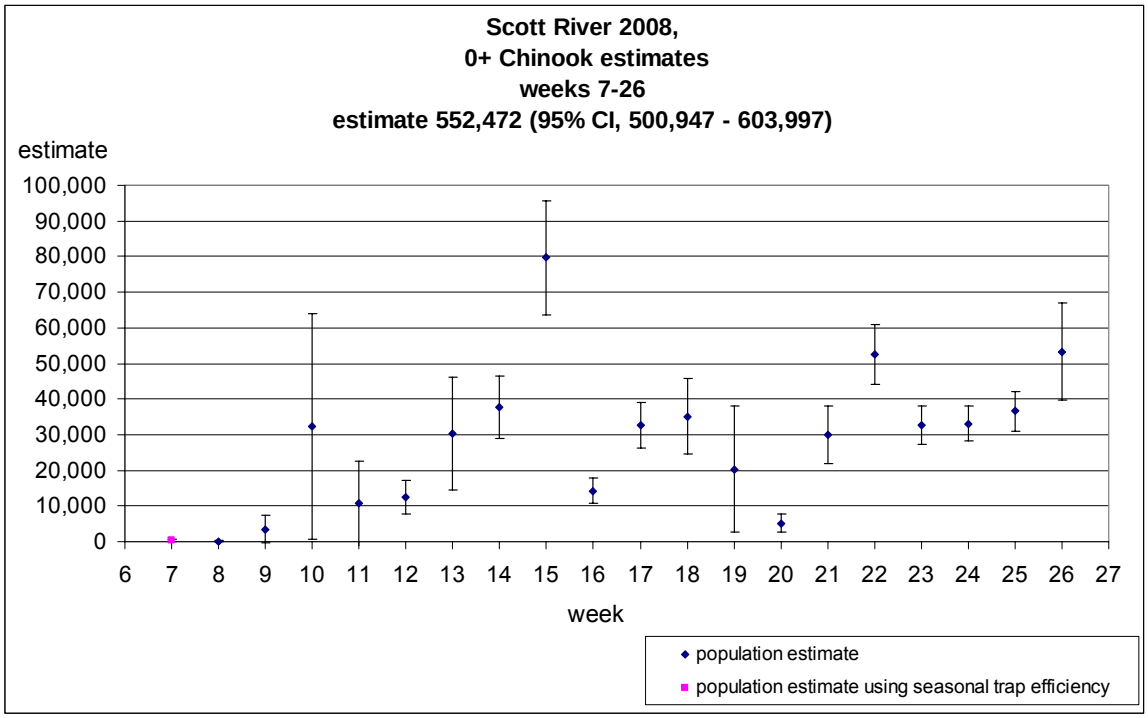


Chart 23

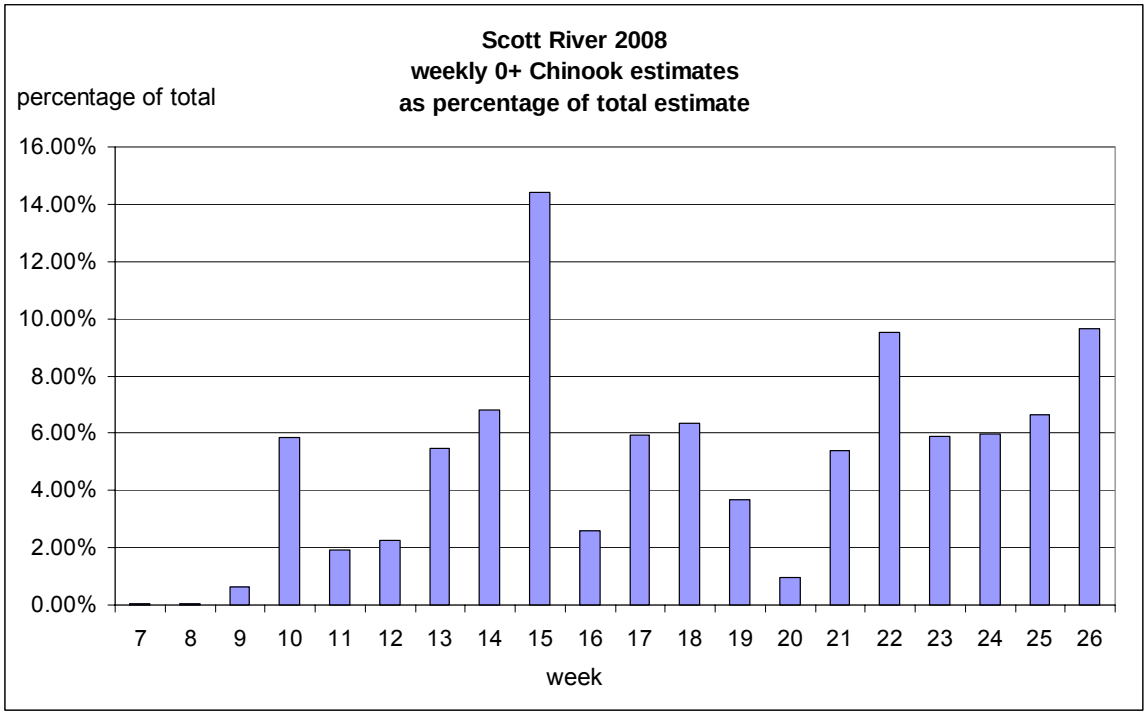


Chart 24

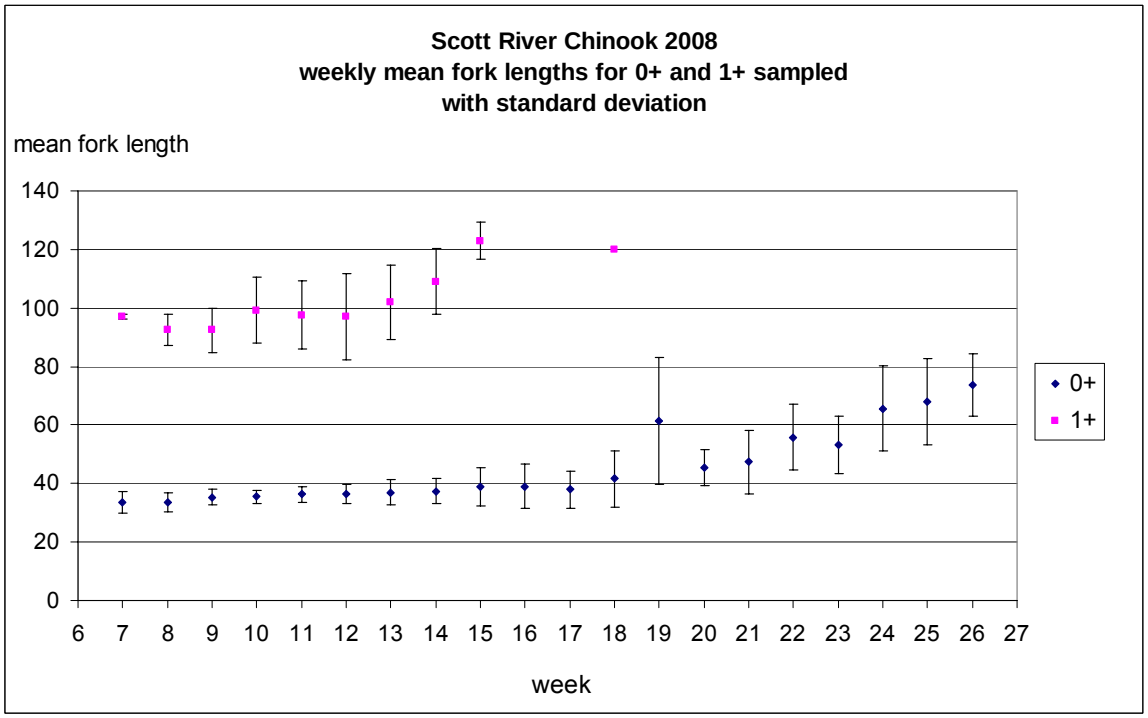


Chart 25

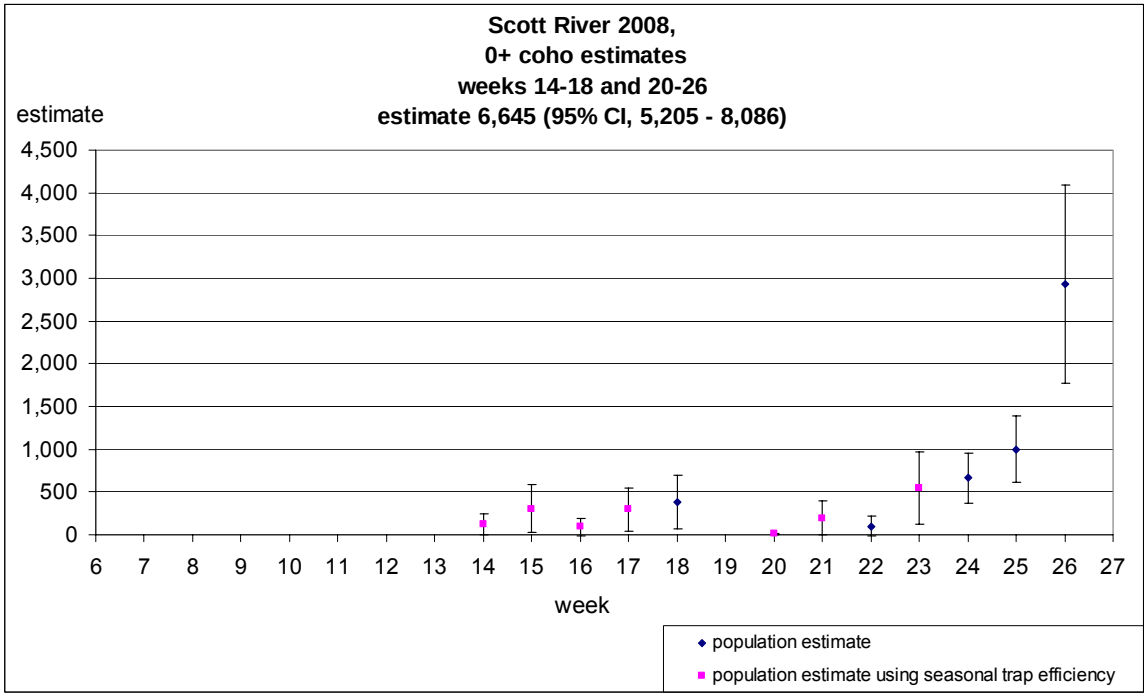


Chart 26

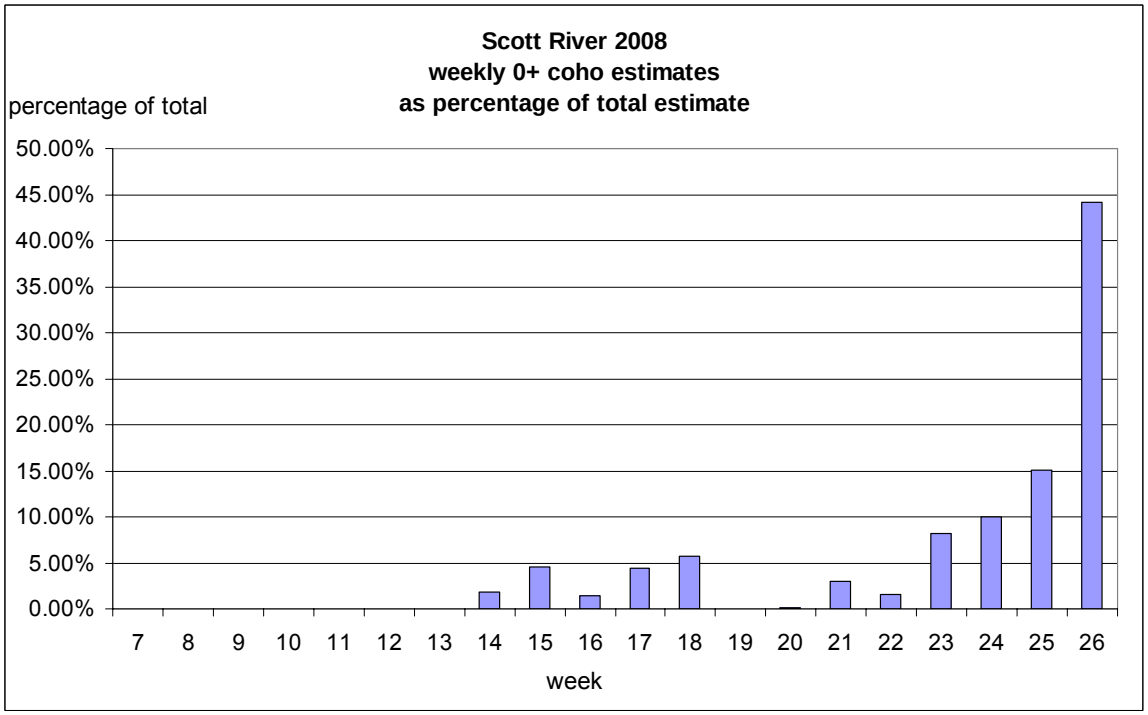


Chart 27

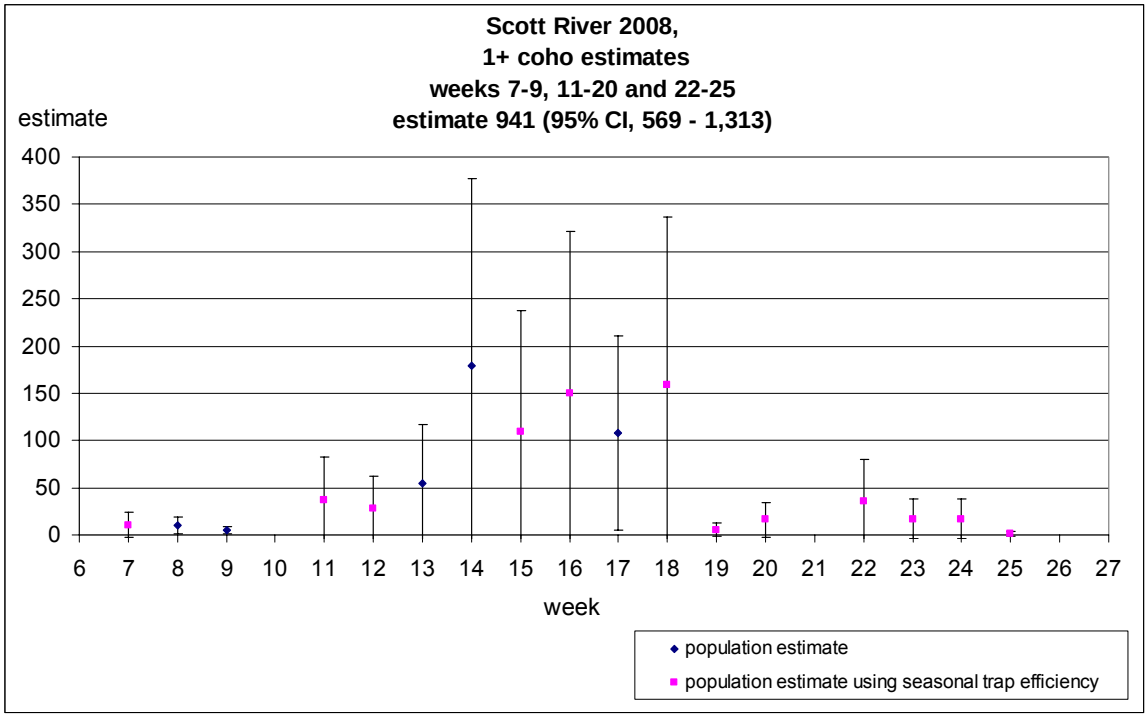


Chart 28

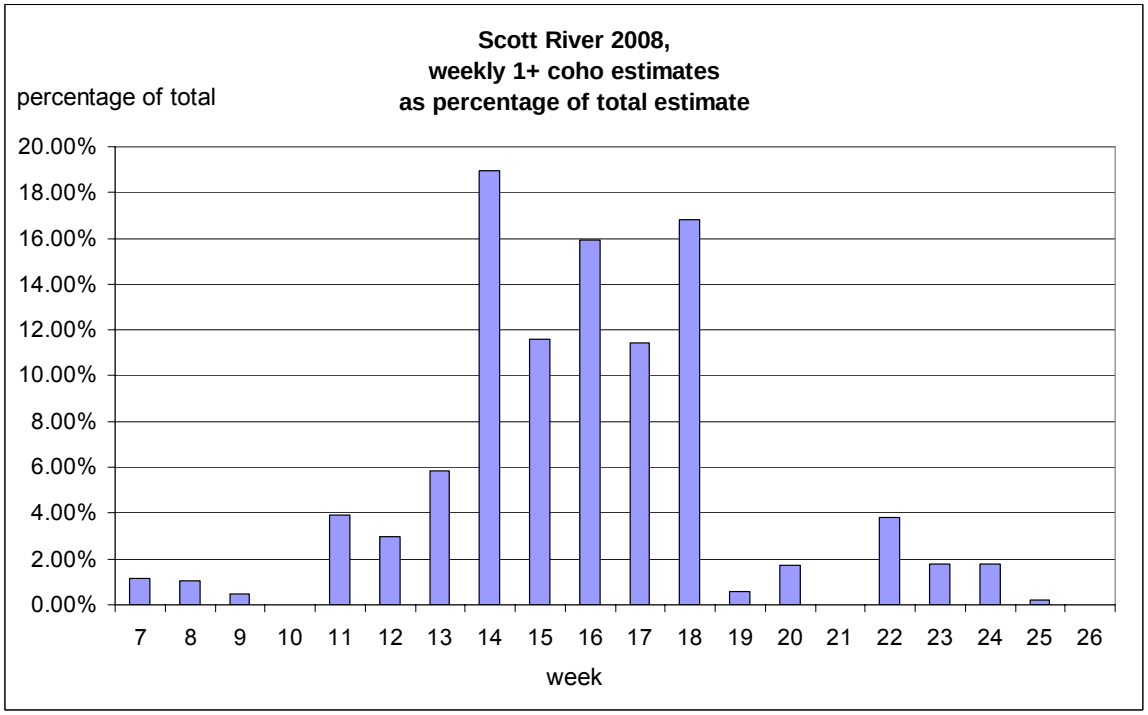


Chart 29

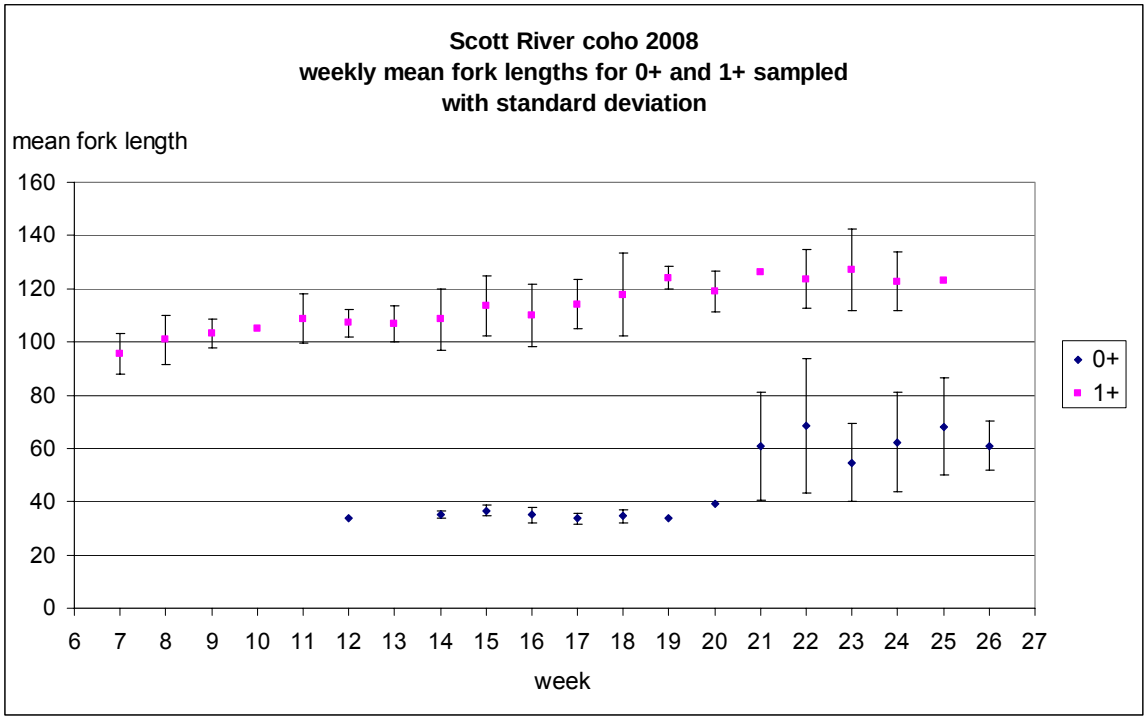


Chart 30

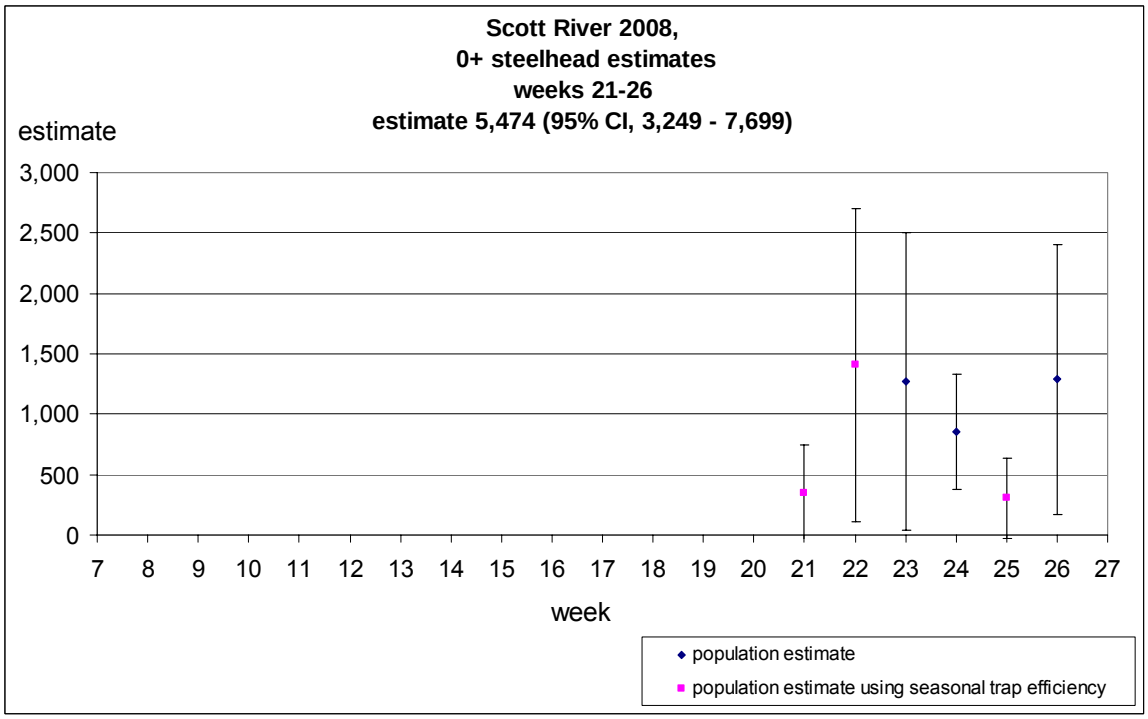


Chart 31

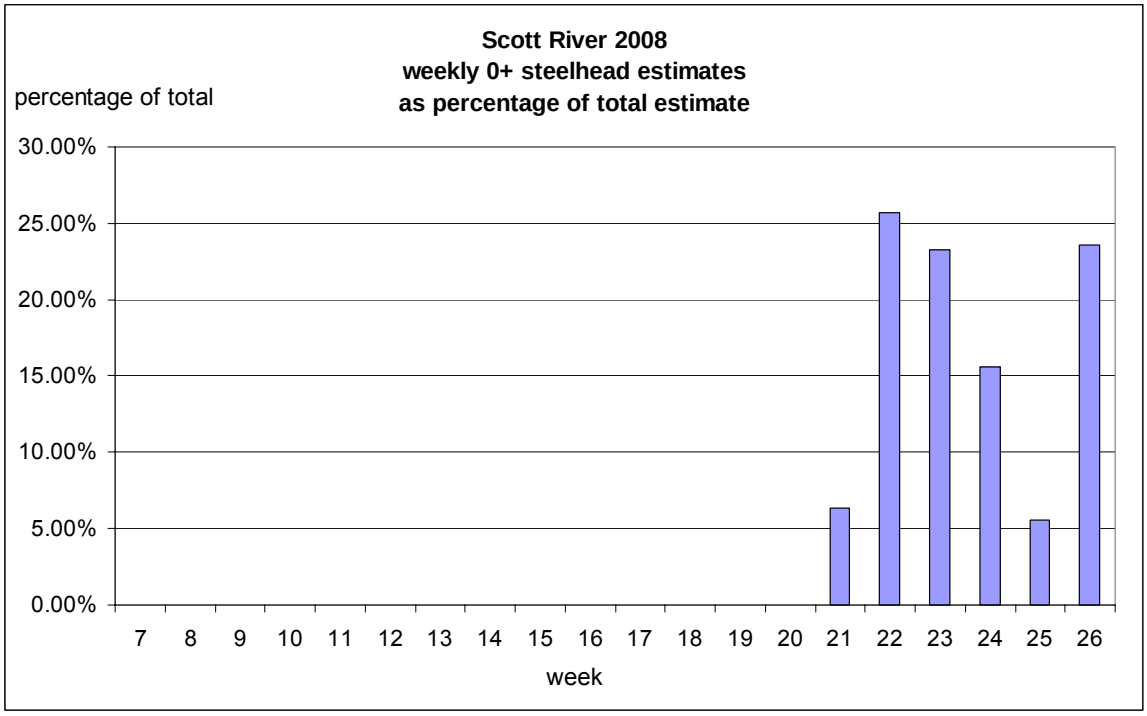


Chart 32

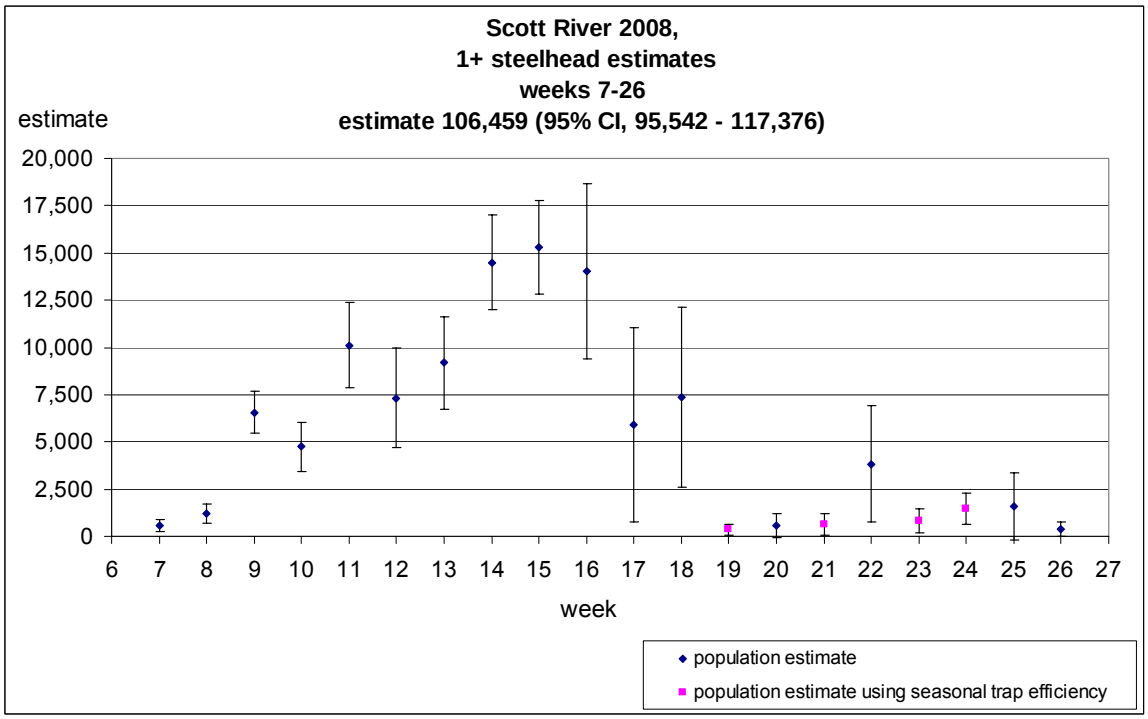


Chart 33

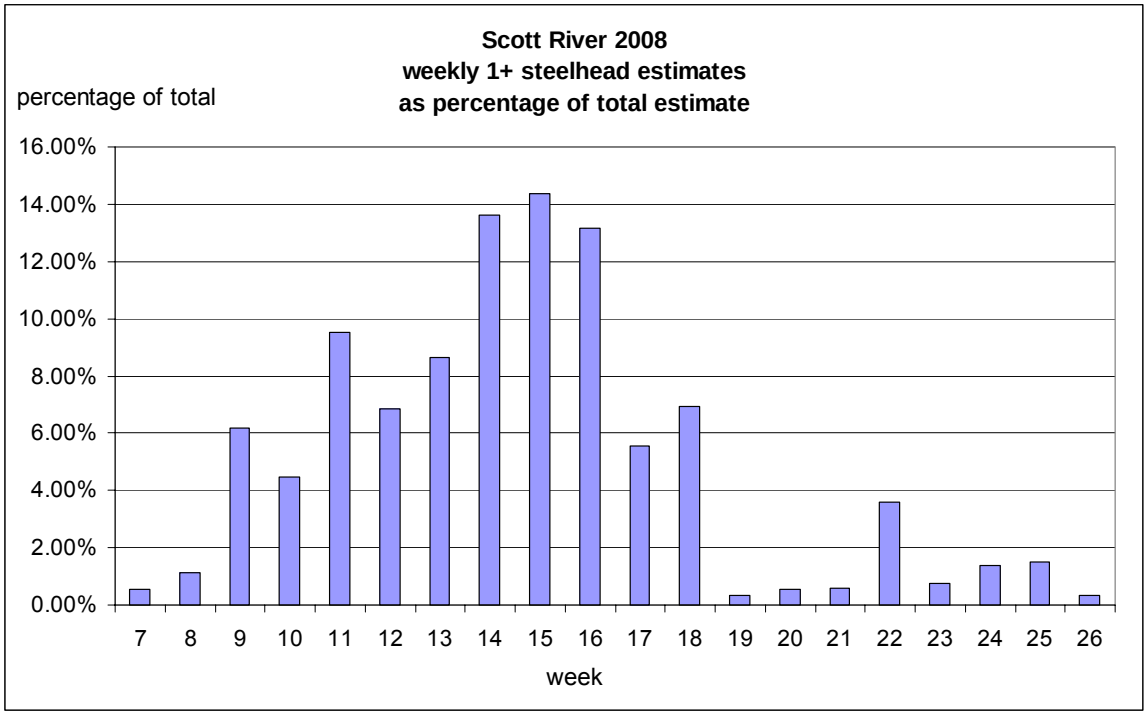


Chart 34

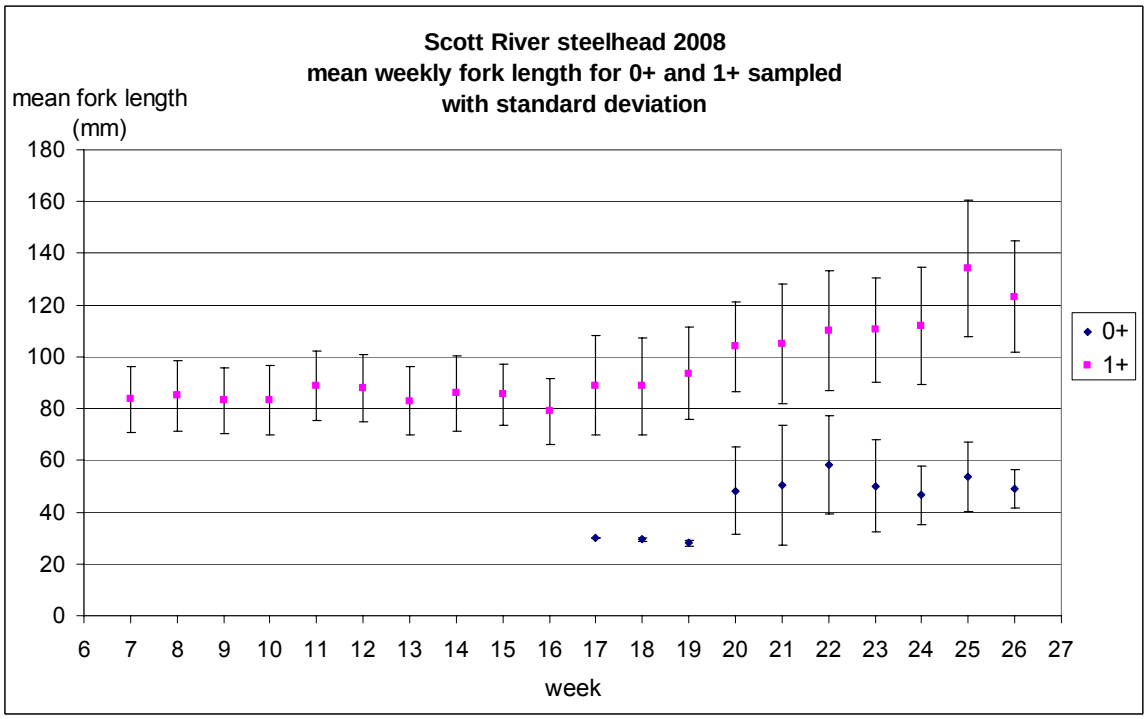


Chart 35

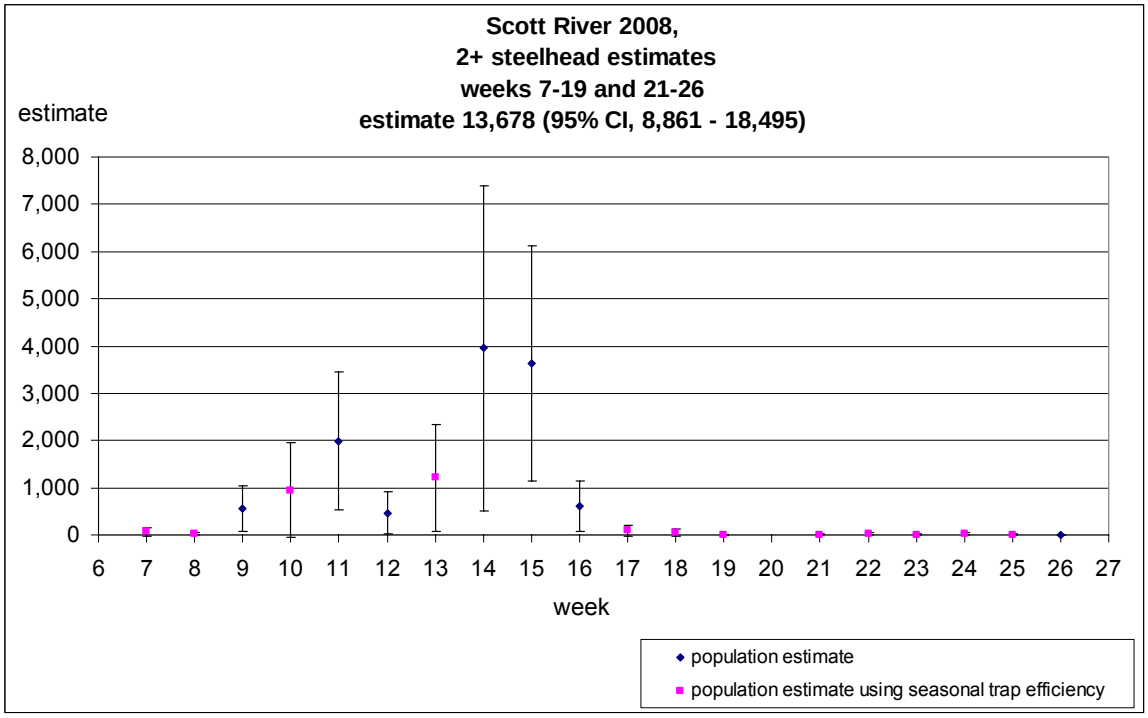


Chart 36

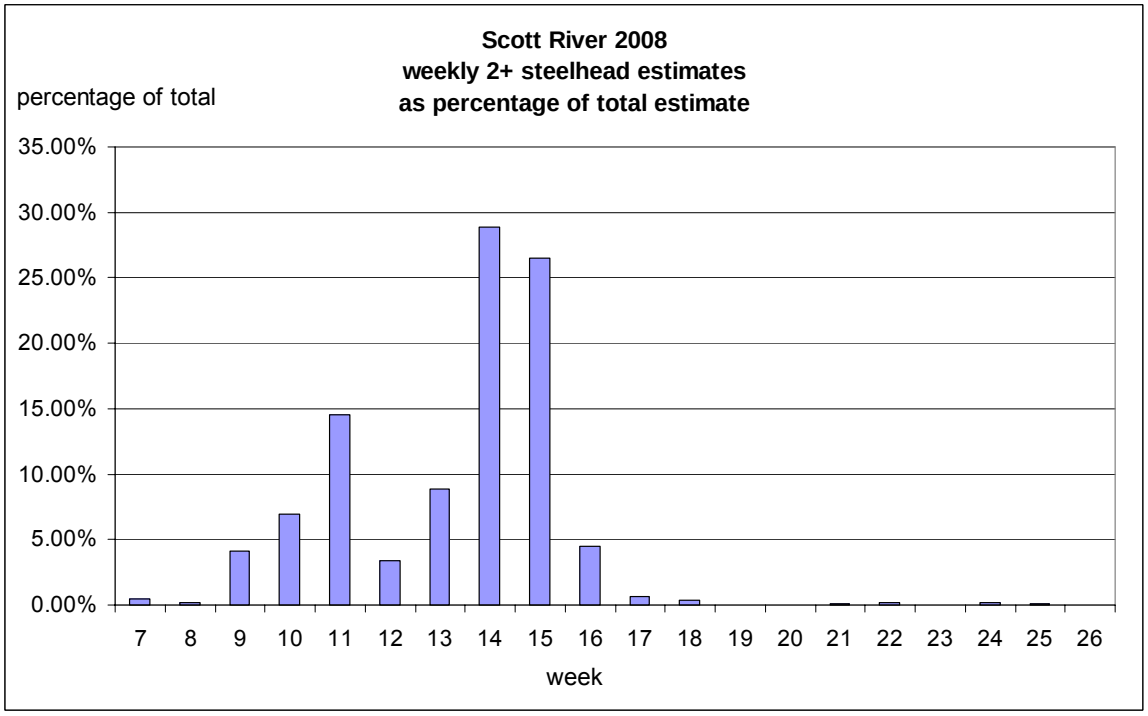


Chart 37

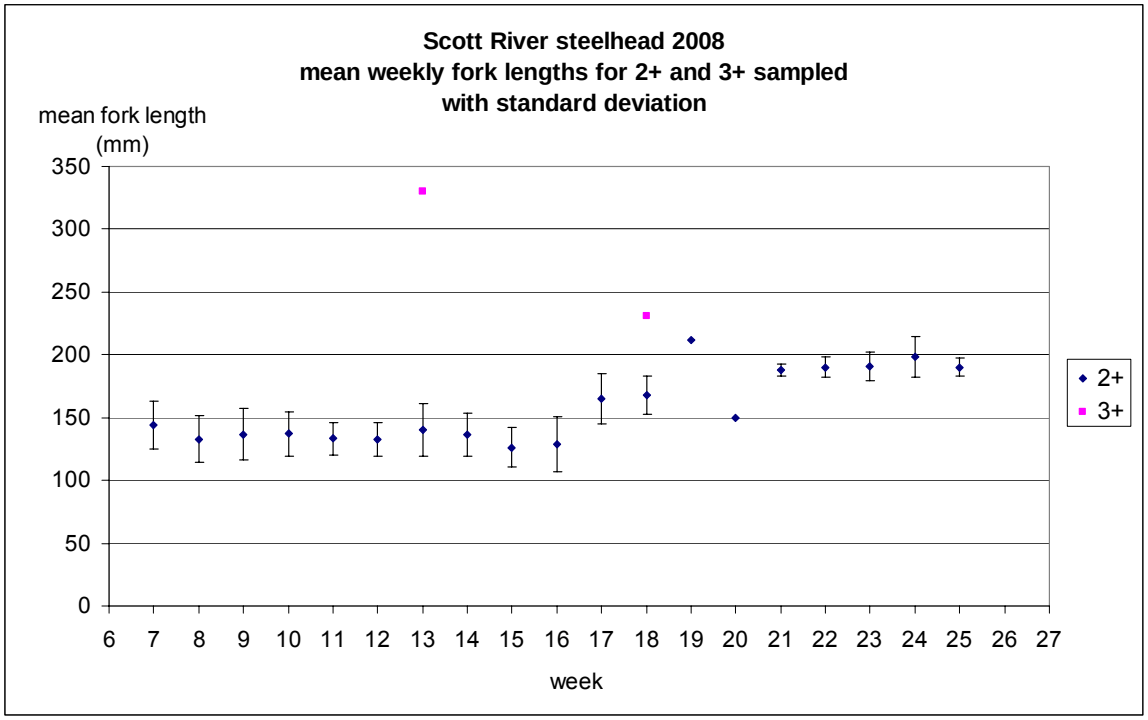


Chart 38

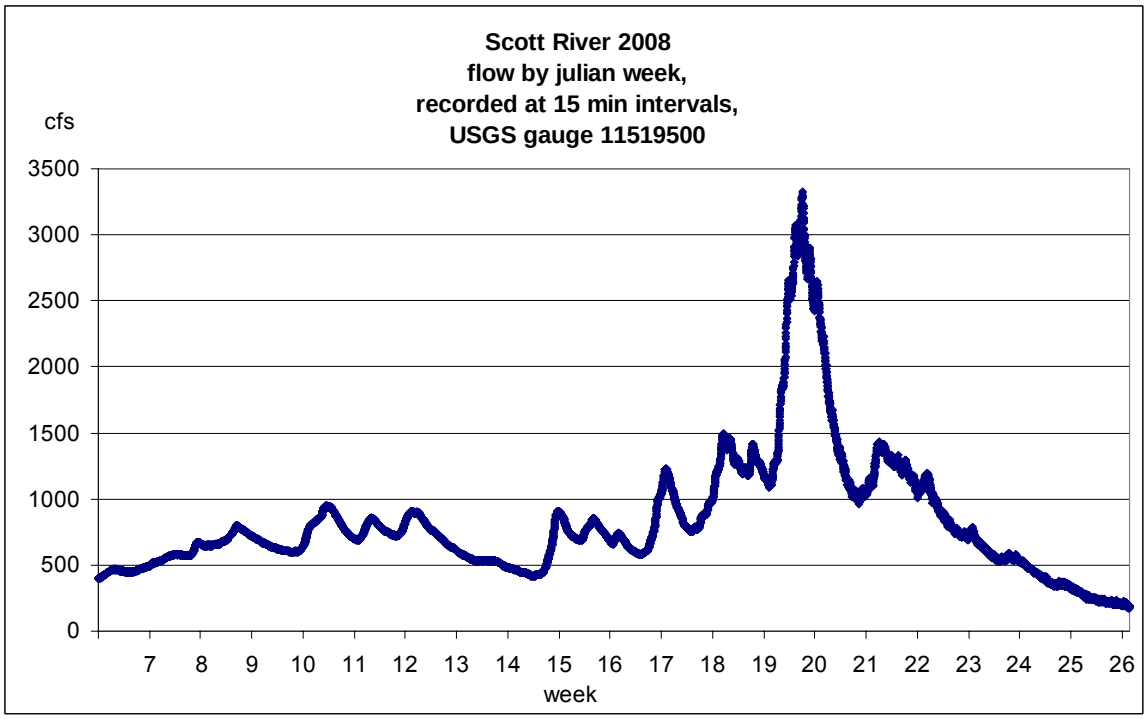


Chart 39

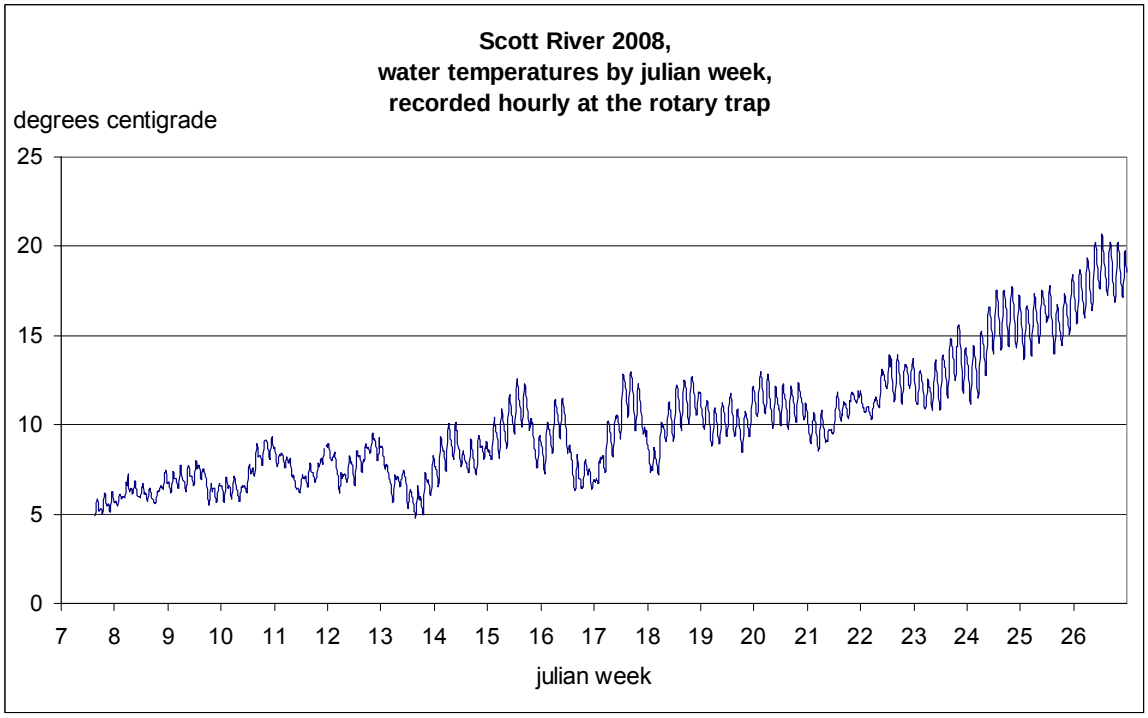
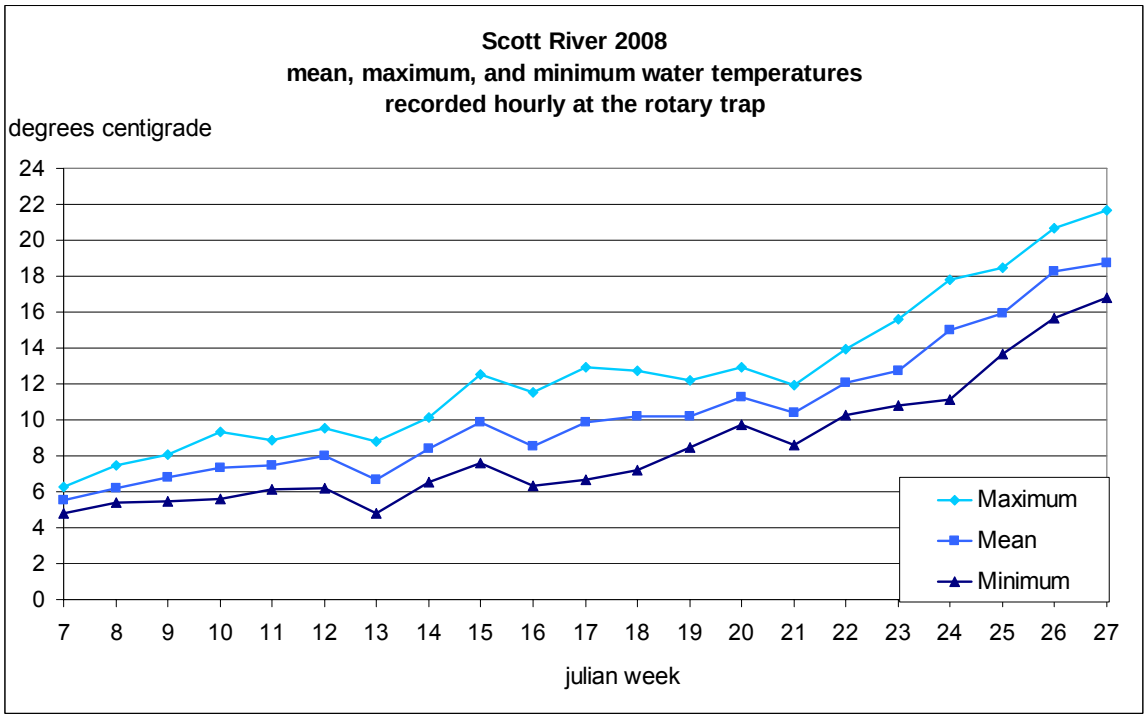


Chart 40



Acknowledgements

The Anadromous Fisheries Resource Assessment and Monitoring Program (AFRAMP) would like to acknowledge the people who contributed their efforts to a successful field season in 2008:

Christopher Adams
Kirsten Barbarick
Tara Blackman
Andrea Collins
Noah Ellis
Jack Herr
Michelle Jeffers
Brad Klosner
Denton Lopez
Steven Stenhouse
Joelle Vincent
Andrew Wentz

Thanks to the following agencies and organizations for their support:

Shasta River Resource Conservation District

AmeriCorp Watershed Steward Program

California Department of Fish and Game,
Fisheries Restoration Grants Program

Additional Thanks to:
Bob Noyes of Gravity Works, for his excellent river safety training program

Literature Cited

Carlson, S. R., L. G. Coggins Jr. and C. O. Swanton. 1998. A simple stratified design for mark-recapture estimation of salmon smolt abundance. Alaska Fishery Research Bulletin 5(2):88-102.

Casselman, J.M. 1983. Age and growth assessment of fish from their calcified structures – Techniques and tools. In proceedings of the international workshop on age determination of oceanic pelagic fishes: Tunas, billfishes, sharks, ed. E. Prince and L. Pulos, pp. 1-17. NOAA Technical Report/National Marine Fisheries Service 8.

Chilton, D.E., and Beamish, R.J. 1982. Age determination methods for fishes studied by the groundfish program at the Pacific Biological Station. 102 pp. Can. Spec. Publ. Fish. Aquat. Sci. no. 60.

Oregon Department of Fish and Wildlife. Sampling protocols for downstream migrant fish traps. Salmonid Life-Cycle Monitoring Project. [online] Available at http://oregonstate.edu/Dept/ODFW/life-cycle/TRPMETH3.HTM#trap%20efficiency

Van Oosten, J. 1957. The skin and scales. In The physiology of fishes, vol. 1, Metabolism, ed. M.E. Brown, pp. 207-244. New York: Academic Press.

Appendix 1. Catch Table Chinook 0+, Shasta River 2008.

Julian week	Live fish trapped[1]	Mortalities	Total	Volume sampled, MCF[2]	Adjusted total trapped[3]	Adjusted marked & released[4]	Recaptured	% trap efficiency[5]	Weekly population estimate*	Lower CI	Upper CI
6	159	0	159	2.30	159	0	0	-----	-----	-----	-----
7	510	36	546	20.79	546	560	21	3.75%	13923	8234	19612
8	1672	13	1685	20.01	1685	479	40	8.35%	19727	13952	25501
9	6601	142	6743	25.59	6743	2273	201	8.84%	75909	65793	86025
10	5908	662	6570	19.08	6570	1928	116	6.02%	108321	89210	127431
11	4782	153	4935	21.73	4935	2353	60	2.55%	190442	143367	237517
12	3714	1068	4782	20.52	4782	1110	41	3.69%	126495	89245	163745
13	6498	435	6933	14.80	6933	2350	245	10.43%	66258	58302	74214
14	9857	214	10071	14.77	10071	2383	490	20.56%	48899	44956	52842
15	5565	154	5719	16.60	5719	2504	496	19.81%	28825	26462	31188
16	9565	258	9823	15.62	9823	2296	488	21.25%	46142	42428	49856
17	7747	119	7866	24.10	7866	2018	331	16.40%	47836	43041	52630
18	11688	118	11806	17.48	11806	2042	600	29.38%	40133	37371	42894
19	15217	99	15316	15.86	15316	1468	670	45.64%	33531	31622	35440
20	17124	2372	19496	14.75	19496	1045	340	32.54%	59803	54554	65052
21	3944	12	3956	16.20	3956	897	457	50.95%	7757	7232	8281
22	9	127	136	3.52	136	95	10	10.53%	1187	530	1844
23	1673	11	1684	13.16	1684	328	81	24.70%	6757	5467	8046
24	3553	20	3573	19.39	3573	504	232	46.03%	7744	6992	8496
25	1244	12	1256	12.19	1256	451	175	38.80%	3226	2829	3622
26	630	30	660	9.34	660	287	33	11.50%	5591	3807	7374
Totals	**117660**	**6055**	**123715**	**337.81**	**123715**	**27371**	**5127**		**938503**	**872905**	**1004102**

[1] Does not include recaptured fish.
[2] Million cubic feet.
[3] Adjusted total trapped includes live fish, mortalities and marked fish. Does not include recaptured or marked fish caught after the end of the Julian week.
[4] Adjusted marked & released includes fish marked during the week minus marked fish caught after the end of the week.
[5] % trap efficiency equals # recaptured fish/# marked released.
* Estimates truncated in weeks 6 and 22, as the trap only fished for 1 out of 6 possible sets.

Appendix 2. Catch Table coho 0+, Shasta River 2008.

Julian week	Live fish trapped[1]	Mortalities	Total	Volume sampled, MCF[2]	Adjusted total trapped[3]	Adjusted marked & released[4]	Recaptured	% trap efficiency[5]	Weekly population estimate*	Lower CI	Upper CI
6	0	0	0	2.30	0	0	0	-----	-----	-----	-----
7	0	0	0	20.79	0	0	0	-----	-----	-----	-----
8	0	0	0	20.01	0	0	0	-----	-----	-----	-----
9	0	0	0	25.59	0	0	0	-----	-----	-----	-----
10	3	0	3	19.08	3	0	0	-----	-----	-----	-----
11	0	0	0	21.73	0	0	0	-----	-----	-----	-----
12	0	0	0	20.52	0	0	0	-----	-----	-----	-----
13	0	0	0	14.80	0	0	0	-----	-----	-----	-----
14	2	0	2	14.77	2	0	0	-----	-----	-----	-----
15	11	0	11	16.60	11	4	1	25.00%	28	1	54
16	0	0	0	15.62	0	0	0	-----	-----	-----	-----
17	3	0	3	24.10	3	0	0	-----	-----	-----	-----
18	9	0	9	17.48	9	1	1	100.00%	9	9	9
19	20	0	20	15.86	20	9	3	28.80%	56	11	100
20	58	4	62	14.75	62	12	1	8.33%	403	0	829
21	44	1	45	16.20	45	26	15	57.69%	76	49	103
22	0	0	0	3.52	0	0	0	-----	-----	-----	-----
23	37	2	39	13.16	39	15	7	46.67%	78	38	118
24	94	1	95	19.39	95	51	10	19.61%	449	211	687
25	54	0	54	12.19	54	34	15	44.12%	118	71	165
26	41	0	41	9.34	41	32	3	9.38%	338	47	629
Totals	**376**	**8**	**384**	**337.81**	**384**	**184**	**56**		**1555**	**980**	**2129**

[1] Does not include recaptured fish.
[2] Million cubic feet.
[3] Adjusted total trapped includes live fish, mortalities and marked fish. Does not include recaptured or marked fish caught after the end of the Julian week.
[4] Adjusted marked & released includes fish marked during the week minus marked fish caught after the end of the week.
[5] % trap efficiency equals # recaptured fish/# marked released.
* Estimates truncated in weeks 6 and 22, as the trap only fished for 1 out of 6 possible sets.
** Estimates based on a seasonal trap efficiency of 28.80%.

Appendix 3. Catch Table coho 1+, Shasta River 2008.

Julian week	Live fish trapped[1]	Mortalities	Total	Volume sampled, MCF[2]	Adjusted total trapped[3]	Adjusted marked & released[4]	Recaptured	% trap efficiency[5]	Weekly population estimate*	Lower CI	Upper CI
6	0	0	0	2.30	0	0	0	-----	-----	-----	-----
7	0	0	0	20.79	0	0	0	-----	-----	-----	-----
8	0	0	0	20.01	0	0	0	-----	-----	-----	-----
9	1	0	1	25.59	1	0	0	-----	-----	-----	-----
10	0	0	0	19.08	0	0	0	-----	-----	-----	-----
11	0	0	0	21.73	0	0	0	-----	-----	-----	-----
12	0	0	0	20.52	0	0	0	-----	-----	-----	-----
13	7	0	7	14.80	7	0	0	-----	-----	-----	-----
14	15	0	15	14.77	15	0	0	-----	-----	-----	-----
15	23	0	23	16.60	23	0	0	-----	-----	-----	-----
16	13	0	13	15.62	13	0	0	-----	-----	-----	-----
17	6	0	6	24.10	6	0	0	-----	-----	-----	-----
18	6	0	6	17.48	6	0	0	-----	-----	-----	-----
19	0	0	0	15.86	0	0	0	-----	-----	-----	-----
20	1	0	1	14.75	1	0	0	-----	-----	-----	-----
21	0	0	0	16.20	0	0	0	-----	-----	-----	-----
22	0	0	0	3.52	0	0	0	-----	-----	-----	-----
23	0	0	0	13.16	0	0	0	-----	-----	-----	-----
24	0	0	0	19.39	0	0	0	-----	-----	-----	-----
25	0	0	0	12.19	0	0	0	-----	-----	-----	-----
26	0	0	0	9.34	0	0	0	-----	-----	-----	-----
Totals	**72**	**0**	**72**	**337.81**	**72**	**0**	**0**		**-----**	**-----**	**-----**

[1] Does not include recaptured fish.
[2] Million cubic feet.
[3] Adjusted total trapped includes live fish, mortalities and marked fish. Does not include recaptured or marked fish caught after the end of the Julian week.
[4] No mark-recapture trials performed. We minimized handling of coho due to projected low numbers of 1+ coho production in 2008.
[5] Estimated percent trap efficiency.
* Estimates truncated in weeks 6 and 22, as the trap only fished for 1 out of 6 possible sets.

Appendix 4. Catch Table steelhead 0+, Shasta River 2008.

Julian week	Live fish trapped[1]	Mortalities	Total	Volume sampled, MCF[2]	Adjusted total trapped[3]	Adjusted marked & released[4]	Recaptured	% trap efficiency[5]	Weekly population estimate*	Lower CI	Upper CI
6	0	0	0	2.30	0	0	0	-----	-----	-----	-----
7	0	0	0	20.79	0	0	0	-----	-----	-----	-----
8	0	0	0	20.01	0	0	0	-----	-----	-----	-----
9	0	0	0	25.59	0	0	0	-----	-----	-----	-----
10	0	0	0	19.08	0	0	0	-----	-----	-----	-----
11	0	0	0	21.73	0	0	0	-----	-----	-----	-----
12	0	0	0	20.52	0	0	0	-----	-----	-----	-----
13	0	0	0	14.80	0	0	0	-----	-----	-----	-----
14	0	0	0	14.77	0	0	0	-----	-----	-----	-----
15	0	0	0	16.60	0	0	0	-----	-----	-----	-----
16	0	0	0	15.62	0	0	0	-----	-----	-----	-----
17	2	0	2	24.10	2	0	0	-----	-----	-----	-----
18	3	0	3	17.48	3	0	0	-----	-----	-----	-----
19	1	0	1	15.86	1	2	0	19.34%	2**	0	5
20	11	1	12	14.75	12	2	0	19.34%	26**	0	51
21	22	0	22	16.20	22	10	1	10.00%	121	0	250
22	0	10	10	3.52	10	7	1	14.29%	40	0	83
23	115	3	118	13.16	118	35	14	40.00%	283	171	396
24	333	3	336	19.39	336	152	29	19.08%	1714	1149	2278
25	297	6	303	12.19	303	188	41	21.81%	1364	980	1747
26	300	8	308	9.34	308	152	20	13.16%	2244	1344	3144
Totals	**1084**	**31**	**1115**	**337.81**	**1115**	**548**	**107**		**5793**	**4650**	**6937**

[1] Does not include recaptured fish.
[2] Million cubic feet.
[3] Adjusted total trapped includes live fish, mortalities and marked fish. Does not include recaptured or marked fish caught after the end of the Julian week.
[4] Adjusted marked & released includes fish marked during the week minus marked fish caught after the end of the week.
[5] % trap efficiency equals # recaptured fish/# marked released.
* Estimates truncated in weeks 6 and 22, as the trap only fished for 1 out of 6 possible sets.
** Estimates based on seasonal trap efficiency of 19.34%.

Appendix 5. Catch Table steelhead 1+, Shasta River 2008.

Julian week	Live fish trapped[1]	Mortalities	Total	Volume sampled, MCF[2]	Adjusted total trapped[3]	Adjusted marked & released[4]	Recaptured	% trap efficiency[5]	Weekly population estimate*	Lower CI	Upper CI
6	0	0	0	2.30	0	0	0	-----	-----	-----	-----
7	0	0	0	20.79	0	0	0	-----	-----	-----	-----
8	2	0	2	20.01	2	0	0	-----	-----	-----	-----
9	3	0	3	25.59	3	3	1	24.69%	7**	0	15
10	3	0	3	19.08	3	2	1	50.00%	5	1	8
11	4	0	4	21.73	4	3	1	24.69%	9**	0	19
12	4	0	4	20.52	4	3	1	24.69%	9**	0	19
13	11	0	11	14.80	11	5	1	20.00%	33	0	66
14	31	0	31	14.77	31	25	11	44.00%	67	36	99
15	20	0	20	16.60	20	16	5	31.25%	57	18	95
16	23	0	23	15.62	23	19	2	10.53%	153	6	301
17	15	0	15	24.10	15	14	3	21.43%	56	9	104
18	11	0	11	17.48	11	9	2	22.22%	37	3	71
19	26	0	26	15.86	26	15	6	40.00%	59	25	94
20	9	0	9	14.75	9	5	1	20.00%	27	0	55
21	28	0	28	16.20	28	15	3	20.00%	112	21	203
22	1	6	7	3.52	7	7	2	28.57%	19	1	36
23	4	0	4	13.16	4	2	1	50.00%	6	1	11
24	7	2	9	19.39	9	0	0	-----	-----	-----	-----
25	13	0	13	12.19	13	11	2	18.18%	52	3	101
26	23	0	23	9.34	23	8	2	24.69%	70**	10	129
Totals	**238**	**8**	**246**	**337.81**	**246**	**162**	**44**		**778**	**564**	**991**

[1] Does not include recaptured fish.
[2] Million cubic feet.
[3] Adjusted total trapped includes live fish, mortalities and marked fish. Does not include recaptured or marked fish caught after the end of the Julian week.
[4] Adjusted marked & released includes fish marked during the week minus marked fish caught after the end of the week.
[5] % trap efficiency equals # recaptured fish/# marked released.
* Estimates truncated in weeks 6 and 22, as the trap only fished for 1 out of 6 possible sets.
** Estimates based on seasonal trap efficiency of 24.69%.

Appendix 6. Catch Table steelhead 2+, Shasta River 2008.

Julian week	Live fish trapped[1]	Mortalities	Total	Volume sampled, MCF[2]	Adjusted total trapped[3]	Adjusted marked & released[4]	Recaptured	% trap efficiency[5]	Weekly population Estimate*	Lower CI	Upper CI
6	0	0	0	2.30	0	0	0	-----	-----	-----	-----
7	5	0	5	20.79	5	4	1	20.90%	14**	0	28
8	4	0	4	20.01	4	3	1	20.90%	10**	0	21
9	14	0	14	25.59	14	4	1	20.90%	38**	1	76
10	28	0	28	19.08	28	17	1	5.88%	252	0	530
11	24	0	24	21.73	22	25	2	8.00%	191	3	378
12	43	0	43	20.52	41	18	4	20.90%	164**	41	286
13	169	0	169	14.80	158	98	16	16.33%	920	513	1327
14	468	1	469	14.77	455	279	66	23.66%	1901	1479	2324
15	397	5	402	16.60	399	365	83	22.74%	1739	1382	2095
16	173	0	173	15.62	173	202	40	19.80%	857	599	1114
17	282	1	283	24.10	281	153	24	15.69%	1731	1095	2366
18	327	0	327	17.48	322	222	60	27.03%	1177	905	1450
19	496	0	496	15.86	495	325	79	24.31%	2017	1606	2428
20	182	5	187	14.75	187	168	24	14.29%	1264	787	1742
21	19	0	19	16.20	19	12	2	16.67%	82	6	158
22	1	5	6	3.52	6	5	1	20.00%	18	0	37
23	3	0	3	13.16	3	3	1	20.90%	7**	0	16
24	0	0	0	19.39	0	0	0	-----	-----	-----	-----
25	0	0	0	12.19	0	0	0	-----	-----	-----	-----
26	3	0	3	9.34	3	1	0	20.90%	5**	0	10
Totals	**2638**	**17**	**2655**	**337.81**	**2615**	**1904**	**405**		**12386**	**11142**	**13631**

[1] Does not include recaptured fish.
[2] Million cubic feet.
[3] Adjusted total trapped includes live fish, mortalities and marked fish. Does not include recaptured or marked fish caught after the end of the Julian week.
[4] Adjusted marked & released includes fish marked during the week minus marked fish caught after the end of the week.
[5] % trap efficiency equals # recaptured fish/# marked released.
* Estimates truncated in weeks 6 and 22, as the trap only fished for 1 out of 6 possible sets.
** Estimates based on seasonal trap efficiency of 20.90%.

Appendix 7. Catch Table steelhead 3+, Shasta River 2008.

Julian week	Live fish trapped[1]	Mortalities	Total	Volume sampled, MCF[2]	Adjusted total trapped[3]	Adjusted marked & released[4]	Recaptured	% trap efficiency[5]	Weekly population estimate*	Lower CI	Upper CI
6	0	0	0	2.30	0	0	0	-----	-----	-----	-----
7	3	0	3	20.79	3	1	0	11.22%	5**	0	11
8	0	0	0	20.01	0	0	0	-----	-----	-----	-----
9	3	0	3	25.59	3	0	0	-----	-----	-----	-----
10	18	0	18	19.08	18	5	1	11.22%	69**	0	145
11	17	0	17	21.73	17	9	1	11.11%	85	0	176
12	44	0	44	20.52	42	16	2	11.22%	255**	13	498
13	17	0	17	14.80	17	26	3	11.22%	117**	11	223
14	44	0	44	14.77	42	22	3	13.64%	242	40	443
15	59	2	61	16.60	60	33	10	30.30%	185	92	279
16	31	0	31	15.62	31	34	2	5.88%	362	7	717
17	29	0	29	24.10	28	14	1	7.14%	210	0	439
18	28	0	28	17.48	28	26	4	15.38%	151	33	270
19	17	0	17	15.86	17	14	1	7.14%	128	0	269
20	4	0	4	14.75	4	5	1	20.00%	12	0	26
21	0	0	0	16.20	0	0	0	-----	-----	-----	-----
22	0	0	0	3.52	0	0	0	-----	-----	-----	-----
23	0	0	0	13.16	0	0	0	-----	-----	-----	-----
24	0	0	0	19.39	0	0	0	-----	-----	-----	-----
25	0	0	0	12.19	0	0	0	-----	-----	-----	-----
26	0	0	0	9.34	0	0	0	-----	-----	-----	-----
Totals	**314**	**2**	**316**	**337.81**	**310**	**205**	**28**		**1822**	**1233**	**2410**

[1] Does not include recaptured fish.
[2] Million cubic feet.
[3] Adjusted total trapped includes live fish, mortalities and marked fish. Does not include recaptured or marked fish caught after the end of the Julian week.
[4] Adjusted marked & released includes fish marked during the week minus marked fish caught after the end of the week.
[5] % trap efficiency equals # recaptured fish/# marked released.
* Estimates truncated in weeks 6 and 22, as the trap only fished for 1 out of 6 possible sets.
** Estimates based on seasonal trap efficiency of 11.22%.

Appendix 8. Catch Table Chinook 0+, Scott River 2008.

Julian week	Live fish trapped[1]	Mortalities	Total	Volume sampled, MCF[2]	Adjusted total trapped[3]	Adjusted marked & released[4]	Recaptured	% trap efficiency[5]	Weekly population estimate*	Lower CI	Upper CI
7	34	1	35	24.74	35	11	1	6.70%	242**	0	513
8	39	3	42	41.31	42	24	6	25.00%	150	55	245
9	93	29	122	48.74	122	56	1	1.79%	3477	0	7374
10	437	12	449	32.11	449	215	2	0.93%	32328	762	63894
11	61	78	139	24.33	139	152	1	0.66%	10634	0	22673
12	557	277	834	26.05	834	355	23	6.48%	12371	7621	17121
13	848	156	1004	38.45	1004	391	12	3.07%	30274	14580	45969
14	2131	51	2182	37.35	2182	1189	68	5.72%	37632	28941	46322
15	2847	471	3318	28.24	3318	2207	91	4.12%	79632	63570	95694
16	1248	82	1330	24.66	1330	655	60	9.16%	14303	10835	17771
17	2073	70	2143	19.50	2143	1497	97	6.48%	32757	26378	39136
18	1694	350	2044	17.66	2044	670	38	5.67%	35167	24490	45845
19	244	93	337	1.93	337	240	3	1.25%	20304	2551	38058
20	171	169	340	3.58	340	213	13	6.10%	5197	2603	7792
21	1847	81	1928	11.03	1928	757	48	6.34%	29825	21729	37921
22	2953	755	3708	13.93	3708	2025	142	7.01%	52534	44104	60965
23	2827	39	2866	25.42	2866	1537	134	8.72%	32651	27288	38014
24	3456	13	3469	23.44	3469	1562	163	10.44%	33061	28177	37945
25	3578	52	3630	34.81	3630	1593	157	9.86%	36622	31102	42141
26	2291	56	2347	25.88	2347	1271	55	4.33%	53310	39618	67003
Totals:	**29429**	**2838**	**32267**	**503.17**	**32267**	**16620**	**1115**		**552472**	**500947**	**603997**

[1] Does not include recaptured fish.
[2] Million cubic feet. (Note: In week 18, five-foot trap not in operation due to high flow.)
[3] Adjusted total trapped includes live fish, mortalities and marked fish. Does not include recaptured or marked fish caught after the end of the Julian week.
[4] Adjusted marked & released includes fish marked during the week minus marked fish caught after the end of the week.
[5] % trap efficiency equals # recaptured fish/# marked released.
* Estimates truncated in weeks 19 and 20, as traps only fished for 2 out of 6 possible sets.
** Estimates based on seasonal trap efficiency of 6.70%.

Appendix 9. Catch Table coho 0+, Scott River 2008.

Julian week	Live fish trapped[1]	Mortalities	Total	Volume sampled, MCF[2]	Adjusted total trapped[3]	Adjusted marked & released[4]	Recaptured	% trap efficiency[5]	Weekly population estimate*	Lower CI	Upper CI
7	0	0	0	24.74	0	0	0	-----	-----	-----	-----
8	0	0	0	41.31	0	0	0	-----	-----	-----	-----
9	0	0	0	48.74	0	0	0	-----	-----	-----	-----
10	0	0	0	32.11	0	0	0	-----	-----	-----	-----
11	0	0	0	24.33	0	0	0	-----	-----	-----	-----
12	1	1	2	26.05	2	0	0	-----	-----	-----	-----
13	6	0	6	38.45	6	0	0	-----	-----	-----	-----
14	22	0	22	37.35	22	11	1	10.64%	122**	0	249
15	43	1	44	28.24	44	23	2	10.64%	306**	33	580
16	20	2	22	24.66	22	6	1	10.64%	94**	0	197
17	38	3	41	19.50	41	27	3	10.64%	296**	41	552
18	40	23	63	17.66	63	23	3	13.04%	378	66	690
19	0	1	1	1.93	1	0	0	-----	-----	-----	-----
20	2	1	3	3.58	3	2	0	10.64%	7**	0	16
21	31	1	32	11.03	32	15	2	10.64%	197**	3	391
22	16	1	17	13.93	17	11	1	9.09%	102	0	213
23	70	1	71	25.42	71	36	4	10.64%	544**	118	969
24	129	1	130	23.44	130	86	16	18.60%	665	372	958
25	180	0	180	34.81	180	121	21	17.36%	998	607	1389
26	289	2	291	25.88	291	231	22	9.52%	2935	1777	4093
TOTALS	**887**	**38**	**925**	**503.17**	**925**	**592**	**76**		**6645**	**5205**	**8086**

[1] Does not include recaptured fish.
[2] Million cubic feet. (Note: In week 18, five-foot trap not in operation due to high flow.)
[3] Adjusted total trapped includes live fish, mortalities and marked fish. Does not include recaptured or marked fish caught after the end of the Julian week.
[4] Adjusted marked & released includes fish marked during the week minus marked fish caught after the end of the week.
[5] % trap efficiency equals # recaptured fish/# marked released.
* Estimates truncated in weeks 19 and 20, as traps only fished for 2 out of 6 possible sets.
** Estimates based on seasonal trap efficiency of 10.64%.

Appendix 10. Catch Table coho 1+, Scott River 2008.

Julian week	Live fish trapped[1]	Mortalities	Total	Volume sampled, MCF[2]	Adjusted total trapped[3]	Adjusted marked & released[4]	Recaptured	Estimated % trap efficiency[5]	Weekly Population estimate*	Lower CI	Upper CI
7	4	0	4	24.74	4	2	0	6.14%	11**	0	24
8	5	0	5	41.31	5	5	2	40.00%	10	1	19
9	3	0	3	48.74	3	2	1	50.00%	5	1	8
10	1	0	1	32.11	1	0	0	-----	-----	-----	-----
11	8	0	8	24.33	8	5	0	6.14%	37**	0	82
12	7	0	7	26.05	7	4	0	6.14%	28**	0	63
13	10	0	10	38.45	10	10	1	10.00%	55	0	117
14	21	0	21	37.35	21	16	1	6.25%	179	0	377
15	16	0	16	28.24	16	10	1	6.14%	109**	0	237
16	20	0	20	24.66	20	12	1	6.14%	150**	0	322
17	19	0	19	19.50	19	16	2	12.50%	108	5	211
18	19	0	19	17.66	19	15	1	6.14%	158**	0	337
19	2	0	2	1.93	2	2	0	6.14%	5**	0	12
20	6	0	6	3.58	6	2	0	6.14%	16**	0	35
21	1	0	1	11.03	1	0	0	-----	-----	-----	-----
22	7	0	7	13.93	7	6	0	6.14%	36**	0	81
23	5	0	5	25.42	5	3	0	6.14%	17**	0	38
24	5	0	5	23.44	5	3	0	6.14%	17**	0	38
25	1	0	1	34.81	1	1	0	6.14%	2**	0	4
26	0	0	0	25.88	0	0	0	-----	0	0	0
Totals:	**160**	**0**	**160**	**503.17**	**160**	**114**	**11**		**941**	**569**	**1313**

[1] Does not include recaptured fish.
[2] Million cubic feet. (Note: In week 18, five-foot trap not in operation due to high flow.)
[3] Adjusted total trapped includes live fish, mortalities and marked fish. Does not include recaptured or marked fish caught after the end of the Julian week.
[4] Adjusted marked & released includes fish marked during the week minus marked fish caught after the end of the week.
[5] % trap efficiency equals # recaptured fish/# marked released.
* Estimates truncated in weeks 19 and 20, as traps only fished for 2 out of 6 possible sets.
** Estimates based on seasonal trap efficiency of 6.14%.

Appendix 11. Catch Table steelhead 0+, Scott River 2008.

Julian week	Live fish trapped[1]	Mortalities	Total	Volume sampled, MCF[2]	Adjusted total trapped[3]	Adjusted marked & released[4]	Recaptured	% trap efficiency[5]	Weekly population estimate*	Lower CI	Upper CI
7	0	0	0	24.74	0	0	0	-----	-----	-----	-----
8	0	0	0	41.31	0	0	0	-----	-----	-----	-----
9	0	0	0	48.74	0	0	0	-----	-----	-----	-----
10	0	0	0	32.11	0	0	0	-----	-----	-----	-----
11	0	0	0	24.33	0	0	0	-----	-----	-----	-----
12	0	0	0	26.05	0	0	0	-----	-----	-----	-----
13	0	0	0	38.45	0	0	0	-----	-----	-----	-----
14	0	0	0	37.35	0	0	0	-----	-----	-----	-----
15	0	0	0	28.24	0	0	0	-----	-----	-----	-----
16	0	0	0	24.66	0	0	0	-----	-----	-----	-----
17	1	0	1	19.50	1	0	0	-----	-----	-----	-----
18	0	2	2	17.66	2	0	0	-----	-----	-----	-----
19	0	4	4	1.93	4	0	0	-----	-----	-----	-----
20	1	2	3	3.58	3	0	0	-----	-----	-----	-----
21	45	4	49	11.03	49	10	1	5.58%	346**	0	745
22	68	42	110	13.93	110	41	2	5.58%	1406**	109	2703
23	74	4	78	25.42	78	48	2	4.17%	1274	41	2507
24	99	1	100	23.44	100	93	10	10.75%	855	376	1333
25	32	0	32	34.81	32	18	1	5.58%	303**	0	638
26	84	2	86	25.88	86	59	3	5.08%	1290	172	2408
Totals:	**404**	**61**	**465**	**503.17**	**465**	**269**	**19**		**5474**	**3249**	**7699**

[1] Does not include recaptured fish.
[2] Million cubic feet. (Note: In week 18, five-foot trap not in operation due to high flow.)
[3] Adjusted total trapped includes live fish, mortalities and marked fish. Does not include recaptured or marked fish caught after the end of the Julian week.
[4] Adjusted marked & released includes fish marked during the week minus marked fish caught after the end of the week.
[5] % trap efficiency equals # recaptured fish/# marked released.
* Estimates truncated in weeks 19 and 20, as traps only fished for 2 out of 6 possible sets.
** Estimates based on seasonal trap efficiency of 5.58%.

Appendix 12. Catch Table steelhead 1+, Scott River 2008.

Julian week	Live fish trapped[1]	Mortalities	Total	Volume sampled, MCF[2]	Adjusted total trapped[3]	Adjusted marked & released[4]	Recaptured	% trap efficiency[5]	Weekly population estimate*	Lower CI	Upper CI
7	99	2	101	24.74	93	69	10	14.49%	592	267	917
8	211	1	212	41.31	210	97	16	16.49%	1211	682	1739
9	1035	8	1043	48.74	1041	750	118	15.73%	6570	5431	7708
10	584	3	587	32.11	586	371	45	12.13%	4739	3422	6056
11	863	8	871	24.33	870	872	74	8.49%	10127	7858	12395
12	642	15	657	26.05	656	300	26	8.67%	7313	4676	9950
13	735	10	745	38.45	739	658	52	7.90%	9189	6756	11622
14	1669	4	1673	37.35	1673	1047	120	11.46%	14490	11986	16994
15	1710	16	1726	28.24	1726	1267	142	11.21%	15305	12854	17755
16	743	2	745	24.66	745	639	33	5.16%	14024	9401	18646
17	180	2	182	19.50	182	129	3	2.33%	5915	755	11075
18	277	1	278	17.66	278	211	7	3.32%	7367	2578	12156
19	41	0	41	1.93	40	48	5	9.54%	351**	82	621
20	37	6	43	3.58	43	25	1	4.00%	559	0	1181
21	78	2	80	11.03	80	29	3	9.54%	637**	90	1185
22	146	4	150	13.93	150	127	4	3.15%	3840	778	6902
23	92	2	94	25.42	94	45	4	9.54%	817**	200	1434
24	153	1	154	23.44	154	98	9	9.54%	1473**	635	2311
25	61	5	66	34.81	66	47	1	2.13%	1584	0	3365
26	39	3	42	25.88	42	16	1	6.25%	357	0	745
Totals:	**9395**	**95**	**9490**	**503.17**	**9468**	**6845**	**674**		**106459**	**95542**	**117376**

[1] Does not include recaptured fish.
[2] Million cubic feet. (Note: In week 18, five-foot trap not in operation due to high flow.)
[3] Adjusted total trapped includes live fish, mortalities and marked fish. Does not include recaptured or marked fish caught after the end of the Julian week.
[4] Adjusted marked & released includes fish marked during the week minus marked fish caught after the end of the week.
[5] % trap efficiency equals # recaptured fish/# marked released.
* Estimates truncated in weeks 19 and 20, as traps only fished for 2 out of 6 possible sets.
** Estimates based on seasonal trap efficiency of 9.54%.

Appendix 13. Catch Table steelhead 2+, Scott River 2008.

Julian week	Live fish trapped[1]	Mortalities	Total	Volume sampled, MCF[2]	Adjusted total trapped[3]	Adjusted marked & released[4]	Recaptured	% trap efficiency[5]	Weekly population estimate*	Lower CI	Upper CI
7	12	0	12	24.74	12	6	0	3.91%	68**	0	153
8	7	0	7	41.31	7	2	0	3.91%	19**	0	42
9	63	1	64	48.74	64	34	3	8.82%	560	84	1036
10	64	0	64	32.11	64	33	1	3.91%	949**	0	1958
11	126	1	127	24.33	127	93	5	5.38%	1990	530	3449
12	53	1	54	26.05	54	25	2	8.00%	468	25	911
13	65	1	66	38.45	66	62	2	3.91%	1213**	86	2341
14	153	2	155	37.35	152	103	3	2.91%	3952	511	7393
15	194	0	194	28.24	194	130	6	4.62%	3631	1139	6122
16	56	0	56	24.66	56	43	3	6.98%	616	83	1149
17	12	1	13	19.50	13	8	0	3.91%	89**	0	200
18	8	0	8	17.66	8	8	0	3.91%	55**	0	125
19	1	0	1	1.93	1	2	0	3.91%	3**	0	7
20	4	0	4	3.58	4	0	0	-----	-----	-----	-----
21	3	0	3	11.03	3	2	0	3.91%	8**	0	19
22	5	0	5	13.93	5	4	0	3.91%	22**	0	50
23	2	0	2	25.42	2	2	0	3.91%	6**	0	13
24	5	0	5	23.44	5	4	0	3.91%	22**	0	50
25	4	0	4	34.81	4	1	0	3.91%	8**	0	16
26	0	0	0	25.88	0	0	0	-----	-----	-----	-----
Totals:	**837**	**7**	**844**	**503.17**	**841**	**562**	**27**		**13678**	**8861**	**18495**

[1] Does not include recaptured fish.
[2] Million cubic feet. (Note: In week 18, five-foot trap not in operation due to high flow.)
[3] Adjusted total trapped includes live fish, mortalities and marked fish. Does not include recaptured or marked fish caught after the end of the Julian week.
[4] Adjusted marked & released includes fish marked during the week minus marked fish caught after the end of the week.
[5] % trap efficiency equals # recaptured fish/# marked released.
* Estimates truncated in weeks 19 and 20, as traps only fished for 2 out of 6 possible sets.
** Estimates based on seasonal trap efficiency of 3.91%.

Appendix 14. Shasta River 2008 average fork length by Julian week for Chinook 0+.

Julian week	average	s.d.	n	min	max
6	34	1.83	8	32	38
7	36	2.04	49	31	41
8	35	1.60	107	32	39
9	37	1.94	258	32	44
10	39	3.52	150	33	49
11	40	5.27	203	33	53
12	46	7.05	156	33	66
13	52	5.37	255	34	70
14	53	6.33	300	36	72
15	58	7.41	308	34	81
16	61	7.15	305	44	80
17	60	8.00	250	43	86
18	64	9.19	302	43	87
19	70	10.73	299	47	98
20	76	10.91	258	43	101
21	73	9.65	294	48	104
22	79	11.04	44	53	99
23	90	9.14	133	62	108
24	89	8.47	284	66	116
25	86	8.20	158	53	105
26	88	11.77	79	58	117

Appendix 15. Shasta River 2008 average fork length by Julian week for Chinook 1+.

Julian week	average	s.d.	n	min	max
6	-----	-----	-----	-----	-----
7	-----	-----	-----	-----	-----
8	-----	-----	-----	-----	-----
9	-----	-----	-----	-----	-----
10	117	5.29	3	111	121
11	110	-----	1	110	110
12	129	4.95	2	125	132
13	141	-----	1	141	141
14	114	-----	1	114	114
15	129	6.36	2	124	133
16	109	26.16	2	90	127
17	152	-----	1	152	152
18	166	9.88	4	160	181
19	161	-----	1	161	161
20	-----	-----	-----	-----	-----
21	-----	-----	-----	-----	-----
22	-----	-----	-----	-----	-----
23	-----	-----	-----	-----	-----
24	-----	-----	-----	-----	-----
25	-----	-----	-----	-----	-----
26	-----	-----	-----	-----	-----

Appendix 16. Shasta River 2008 average fork length by Julian week for coho 0+.

Julian week	average	s.d.	n	min	max
7	-----	-----	-----	-----	-----
8	-----	-----	-----	-----	-----
9	-----	-----	-----	-----	-----
10	-----	-----	-----	-----	-----
11	-----	-----	-----	-----	-----
12	-----	-----	-----	-----	-----
13	-----	-----	-----	-----	-----
14	44	-----	1	44	44
15	-----	-----	-----	-----	-----
16	-----	-----	-----	-----	-----
17	54	-----	1	54	54
18	51	6.11	3	46	58
19	63	-----	1	63	63
20	69	14.20	11	48	90
21	75	22.36	16	45	105
22	-----	-----	-----	-----	-----
23	100	3.46	3	96	102
24	105	13.35	84	58	122
25	107	14.27	35	61	124
26	87	27.85	18	53	122

Appendix 17. Shasta River 2008 average fork length by Julian week for coho 1+.

Julian week	average	s.d.	n	min	max
7	-----	-----	-----	-----	-----
8	-----	-----	-----	-----	-----
9	-----	-----	-----	-----	-----
10	-----	-----	-----	-----	-----
11	-----	-----	-----	-----	-----
12	-----	-----	-----	-----	-----
13	-----	-----	-----	-----	-----
14	133	5.66	2	129	137
15	140	8.50	8	126	150
16	142	11.19	8	119	156
17	141	2.12	2	139	142
18	151	0.71	2	150	151
19	-----	-----	-----	-----	-----
20	164	-----	1	164	164
21	-----	-----	-----	-----	-----
22	-----	-----	-----	-----	-----
23	-----	-----	-----	-----	-----
24	-----	-----	-----	-----	-----
25	-----	-----	-----	-----	-----
26	-----	-----	-----	-----	-----

Appendix 18. Shasta River 2008 average fork length by Julian week for steelhead 0+.

Julian week	average	s.d.	n	min	max
6	-----	-----	-----	-----	-----
7	-----	-----	-----	-----	-----
8	-----	-----	-----	-----	-----
9	-----	-----	-----	-----	-----
10	-----	-----	-----	-----	-----
11	-----	-----	-----	-----	-----
12	-----	-----	-----	-----	-----
13	-----	-----	-----	-----	-----
14	-----	-----	-----	-----	-----
15	-----	-----	-----	-----	-----
16	-----	-----	-----	-----	-----
17	-----	-----	-----	-----	-----
18	-----	-----	-----	-----	-----
19	-----	-----	-----	-----	-----
20	45	-----	1	45	45
21	57	7.36	7	44	65
22	56	4.64	10	49	64
23	68	8.39	28	53	90
24	72	9.32	93	49	109
25	77	8.69	51	61	99
26	72	11.00	54	37	91

Appendix 19. Shasta River 2008 average fork length by Julian week for steelhead 1+.

Julian week	average	s.d.	n	min	max
6	-----	-----	-----	-----	-----
7	-----	-----	-----	-----	-----
8	137	0.00	2	137	137
9	108	25.51	3	79	127
10	131	5.29	3	125	135
11	118	13.23	4	106	137
12	115	18.03	4	100	138
13	124	13.08	10	102	139
14	114	16.85	30	78	137
15	112	14.32	20	79	139
16	127	8.60	21	110	139
17	128	20.67	14	90	157
18	123	18.08	10	89	148
19	130	20.37	13	94	155
20	150	12.66	6	124	156
21	168	9.35	28	148	179
22	171	6.68	6	163	178
23	156	11.70	4	141	165
24	143	27.03	8	110	177
25	135	20.71	11	110	168
26	141	23.83	19	111	182

Appendix 20. Shasta River 2008 average fork length by Julian week for steelhead 2+.

Julian week	average	s.d.	n	min	max
6	-----	-----	-----	-----	-----
7	176	27.41	5	144	212
8	163	19.82	4	145	190
9	177	20.71	14	141	205
10	179	15.83	28	145	206
11	186	16.73	24	143	209
12	185	15.14	43	146	205
13	184	20.04	109	141	228
14	189	19.61	130	141	229
15	183	17.10	135	140	219
16	186	18.85	109	142	219
17	196	15.20	120	160	228
18	198	15.17	150	163	228
19	195	15.16	144	160	228
20	191	16.12	95	162	228
21	189	7.93	19	180	203
22	199	9.19	5	188	211
23	202	13.58	3	186	210
24	-----	-----	-----	-----	-----
25	-----	-----	-----	-----	-----
26	214	38.66	3	187	258

Appendix 21. Shasta River 2008 average fork length by Julian week for steelhead 3+.

Julian week	average	s.d.	n	min	max
6	-----	-----	-----	-----	-----
7	238	5.66	2	234	242
8	-----	-----	-----	-----	-----
9	221	3.00	3	218	224
10	240	29.43	16	211	316
11	230	15.86	17	210	268
12	246	27.48	44	210	306
13	251	21.24	17	231	294
14	248	20.65	44	230	340
15	245	19.95	59	220	295
16	243	16.78	31	220	295
17	251	17.03	29	230	307
18	246	16.44	28	230	303
19	237	6.16	17	230	256
20	264	30.19	4	230	303
21	-----	-----	-----	-----	-----
22	-----	-----	-----	-----	-----
23	-----	-----	-----	-----	-----
24	-----	-----	-----	-----	-----
25	-----	-----	-----	-----	-----
26	-----	-----	-----	-----	-----

Appendix 22. Scott River 2008 average fork length by Julian week for Chinook 0+.

Julian week	average	s.d.	n	min	max
7	34	3.61	9	25	38
8	34	3.27	14	27	38
9	35	2.86	27	25	41
10	36	2.30	39	29	42
11	36	2.63	4	34	40
12	37	3.26	54	32	51
13	37	4.18	133	33	53
14	37	4.31	101	32	56
15	39	6.57	200	28	62
16	39	7.68	101	31	85
17	38	6.52	154	32	70
18	42	9.74	148	29	112
19	61	21.73	3	45	86
20	45	6.14	51	36	61
21	47	10.76	53	34	89
22	56	11.15	154	41	126
23	53	9.80	251	36	106
24	66	14.59	100	41	98
25	68	14.73	446	39	109
26	74	10.79	182	45	96

Appendix 23. Scott River 2008 average fork length by Julian week for Chinook 1+.

Julian week	average	s.d.	n	min	max
7	97	1.00	3	96	98
8	93	5.41	5	89	102
9	92	7.61	12	76	105
10	99	11.34	5	81	110
11	98	11.72	18	82	124
12	97	14.80	3	87	114
13	102	12.60	7	89	120
14	109	11.31	2	101	117
15	123	6.44	5	112	128
16	-----	-----	-----	-----	-----
17	-----	-----	-----	-----	-----
18	120	-----	1	120	120
19	-----	-----	-----	-----	-----
20	-----	-----	-----	-----	-----
21	-----	-----	-----	-----	-----
22	-----	-----	-----	-----	-----
23	-----	-----	-----	-----	-----
24	-----	-----	-----	-----	-----
25	-----	-----	-----	-----	-----
26	-----	-----	-----	-----	-----

Appendix 24. Scott River 2008 average fork length by Julian week for coho 0+.

Julian week	average	s.d.	n	min	max
7	-----	-----	-----	-----	-----
8	-----	-----	-----	-----	-----
9	-----	-----	-----	-----	-----
10	-----	-----	-----	-----	-----
11	-----	-----	-----	-----	-----
12	34	-----	1	34	34
13	-----	-----	-----	-----	-----
14	35	1.26	4	34	37
15	37	1.95	5	34	39
16	35	2.89	12	31	41
17	34	2.16	11	31	38
18	35	2.55	31	31	47
19	34	-----	1	34	34
20	39	-----	1	39	39
21	61	20.21	8	40	104
22	69	25.27	5	36	106
23	55	14.73	20	42	108
24	62	18.80	32	36	109
25	68	18.10	15	42	106
26	61	9.24	63	36	85

Appendix 25. Scott River 2008 average fork length by Julian week for coho 1+.

Julian week	average	s.d.	n	min	max
7	96	7.64	3	89	104
8	101	9.28	5	91	111
9	103	5.51	3	98	109
10	105	-----	1	105	105
11	109	9.29	8	95	119
12	107	5.15	7	98	113
13	107	6.72	8	99	120
14	108	11.52	19	85	131
15	114	11.37	16	91	137
16	110	11.74	20	95	128
17	114	9.25	19	97	134
18	118	15.71	18	94	149
19	124	4.24	2	121	127
20	119	7.55	3	112	127
21	126	-----	1	126	126
22	124	11.06	7	115	145
23	127	15.36	5	112	148
24	123	11.09	4	113	137
25	123	-----	1	123	123
26	-----	-----	-----	-----	-----

Appendix 26. Scott River 2008 average fork length by Julian week for steelhead 0+.

Julian week	average	s.d.	n	min	max
7	----	----	----	----	----
8	----	----	----	----	----
9	----	----	----	----	----
10	----	----	----	----	----
11	----	----	----	----	----
12	----	----	----	----	----
13	----	----	----	----	----
14	----	----	----	----	----
15	----	----	----	----	----
16	----	----	----	----	----
17	30	----	1	30	30
18	30	0.71	2	29	30
19	28	1.00	3	27	29
20	48	16.77	3	29	59
21	50	23.05	16	25	78
22	58	19.00	19	29	79
23	50	17.86	14	23	79
24	47	11.18	11	34	78
25	54	13.44	2	44	63
26	49	7.57	12	36	63

Appendix 27. Scott River 2008 average fork length by Julian week for steelhead 1+.

Julian week	average	s.d.	n	min	max
7	84	12.70	101	59	119
8	85	13.70	163	56	118
9	83	12.76	321	57	118
10	83	13.42	235	55	118
11	89	13.33	161	59	119
12	88	13.04	210	61	119
13	83	13.13	195	56	118
14	86	14.52	246	54	119
15	85	11.93	286	54	109
16	79	12.72	239	52	108
17	89	19.32	126	58	149
18	89	18.65	157	52	149
19	94	17.88	39	66	136
20	104	17.53	20	79	146
21	105	23.24	66	80	175
22	110	23.14	127	81	179
23	110	20.08	85	81	176
24	112	22.66	137	80	178
25	134	26.33	59	85	179
26	123	21.48	38	92	168

Appendix 28. Scott River 2008 average fork length by Julian week for steelhead 2+.

Julian week	average	s.d.	n	min	max
7	144	19.05	12	122	181
8	133	18.69	7	120	174
9	137	20.19	64	120	221
10	137	17.41	62	120	198
11	133	12.68	105	120	190
12	133	13.12	48	120	187
13	140	21.43	56	120	216
14	136	17.12	144	120	210
15	126	15.69	173	110	176
16	129	22.01	54	110	216
17	165	20.29	12	120	192
18	168	15.48	8	150	186
19	212	-----	1	212	212
20	150	-----	1	150	150
21	188	4.73	3	184	193
22	190	8.41	5	180	203
23	191	11.31	2	183	199
24	198	16.35	5	184	225
25	190	7.37	4	185	201
26	-----	-----	0	-----	-----

Appendix 29. Scott River 2008 average fork length by Julian week for steelhead 3+.

Julian week	average	s.d.	n	min	max
7	-----	-----	-----	-----	-----
8	-----	-----	-----	-----	-----
9	-----	-----	-----	-----	-----
10	645	-----	1	645	645
11	-----	-----	-----	-----	-----
12	-----	-----	-----	-----	-----
13	330	-----	1	339	339
14	-----	-----	-----	-----	-----
15	-----	-----	-----	-----	-----
16	-----	-----	-----	-----	-----
17	-----	-----	-----	-----	-----
18	231	-----	1	231	231
19	-----	-----	-----	-----	-----
20	-----	-----	-----	-----	-----
21	-----	-----	-----	-----	-----
22	-----	-----	-----	-----	-----
23	-----	-----	-----	-----	-----
24	-----	-----	-----	-----	-----
25	-----	-----	-----	-----	-----
26	-----	-----	-----	-----	-----

Appendix 30. Age Length cut-offs for Shasta River juvenile salmonids

Shasta River Steelhead age-length cut-offs for Julian weeks 7-28 based on 2006 scale ageing data

	Age-Length Cut-offs				
Julian Weeks	Age 0+	Age 1+	Age 2+	Age 3+	n
7 - 8	≤ 49	50 - 139	140 - 259	≥ 260	13
9 - 10	≤ 49	50 - 169	170 - 209	≥ 210	16
11 - 12	≤ 49	50 - 149	150 - 189	≥ 190	6
13 - 14	≤ 49	50 - 149	150 - 259	≥ 260	7
15 - 16	≤ 49	50 - 129	130 - 219	≥ 220	13
17 - 18	≤ 79	80 - 149	150 - 229	≥ 230	28
19 - 20	≤ 79	80 - 119	120 - 229	≥ 230	26
21 - 22	≤ 89	90 - 189	190 - 219	≥ 220	22
23 - 24	≤ 119	120 - 179	180 - 239	≥ 240	28
25 - 26	≤ 99	100 - 169	170 - 259	≥ 260	30
27 - 28	≤ 109	110 - 169	170 - 269	≥ 270	17

Shasta River Coho salmon age-length cut-offs for Julian weeks 7-28 based on 2006 scale ageing data

	Age-Length Cut-offs			
Julian Weeks	Age 0+	Age 1+	Age 2+	n
7 - 8	≤ 79	80 - 149	≥ 150	14
9 - 12	≤ 99	100 - 159	≥ 160	34
13 - 14	≤ 59	60 - 189	≥ 170	33
15 - 16	≤ 99	100 - 159	≥ 160	14
17 - 20	≤ 89	90 - 169	≥ 170	35
21 - 28	≤ 119	120 - 149	≥ 150	49

Shasta River Chinook salmon age-length cut-offs for Julian weeks 7-28 based on 2006 scale ageing data

	Age-Length Cut-offs		
Julian Weeks	Age 0+	Age 1+	n
7 - 8	≤ 50	≥ 110	1
9 - 12	≤ 79	≥ 80	16
13 - 14	≤ 79	≥ 80	14
15 - 16	≤ 89	≥ 90	18
17 - 20	≤ 119	≥ 120	20
21 - 28	≤ 159	≥ 160	36

Appendix 31. Age Length cut-offs for Scott River juvenile salmonids

Scott River Steelhead age-length cut-offs for Julian weeks 7-28 based on 2000 - 2006 scale ageing data

	Age-Length Cut-offs				
Julian Weeks	Age 0+	Age 1+	Age 2+	Age 3+	n
7 - 8	≤ 59	60 - 119	120 - 189	≥ 190	61
9 - 12	≤ 49	50 - 119	120 - 229	≥ 230	162
13 - 14	≤ 49	50 - 119	120 - 259	≥ 260	86
15 - 16	≤ 59	60 - 109	110 - 219	≥ 220	70
17 - 20	≤ 59	60 - 149	150 - 229	≥ 230	199
21 - 28	≤ 79	80 - 179	180 - 229	≥ 230	224

Scott River Coho salmon age-length cut-offs for Julian weeks 7-28 based on 2000 - 2006 scale ageing data

	Age-Length Cut-offs			
Julian Weeks	Age 0+	Age 1+	Age 2+	n
7 - 8	≤ 49	50 - 119	≥ 120	24
9 - 12	≤ 49	50 - 149	≥ 150	49
13 - 14	≤ 59	60 - 149	≥ 150	20
15 - 16	≤ 69	70 - 149	≥ 150	22
17 - 20	≤ 69	70 - 159	≥ 160	31
21 - 28	≤ 109	110 - 159	≥ 160	96

Scott River Chinook salmon age-length cut-offs for Julian weeks 7-28 based on 2000 - 2006 scale ageing data

	Age-Length Cut-offs		
Julian Weeks	Age 0+	Age 1+	n
7 - 8	≤ 99	≥ 100	0
9 - 12	≤ 129	≥ 130	1
13 - 14	≤ 99	≥ 100	0
15 - 16	≤ 69	≥ 70	1
17 - 20	≤ 119	≥ 120	4
21 - 28	≤ 129	≥ 130	27

Appendix 32. Additional fish species collected in the Shasta and Scott River rotary traps in 2008.

Additional fish species collected in the Shasta River rotary trap, 2008.

Common Names	Scientific Names	Number trapped
ammocoete	family Petromyzontidae	11
bluegill	*Lepomis macrochirus*	4
brown bullhead	*Ameiurus nebulosus*	13
fathead minnow	*Pimephales promelas*	4
golden shiner	*Notemigonus crysoleucas*	6
green sunfish	*Lepomis cyanellus*	41
Japanese pond smelt	*Hypomesus nipponensis*	4
Klamath River lamprey	*Lampetra similis*	119
Klamath small scale sucker	*Catostomus rimiculus*	1,212
large mouth bass	*Micropterus salmoides*	2
Miller Lake lamprey	*Lampetra (Entosphenus) minima*	1
Pacific Lamprey	*Lampetra tridentata*	7,349
pumpkinseed	*Lepomis gibbosus*	17
sculpin	*Cottus spp.*	93
speckled dace	*Rhinichthys osculus*	421
tui chub	*Gila bicolor*	4
yellow bullhead	*Ameiurus natalis*	221

Additional fish species collected in the Scott River rotary traps, 2008.

Common Names	Scientific Names	Number trapped
ammocoete	family Petromyzontidae	11,610
brook stickleback	*Culaea inconstans*	11
brown bullhead	*Ameiurus nebulosus*	1
fathead minnow	*Pimephales promelas*	43
green sunfish	*Lepomis cyanellus*	3
Japanese pond smelt	*Hypomesus nipponensis*	2
Klamath small scale sucker	*Catostomus rimiculus*	3,677
marbled sculpin	*Cottus klamathensis*	32
Miller Lake lamprey	*Lampetra (Entosphenus) minima*	11
Pacific Lamprey	*Lampetra tridentata*	6,549
Klamath River lamprey	*Lampetra similis*	67
speckled dace	*Rhinichthys osculus*	637
tui chub	*Gila bicolor*	4

Appendix 33. List of julian weeks and calendar equivalents

Julian Week #	Inclusive Dates	Julian Week #	Inclusive Dates
1	1/1 - 1/7	27	7/2 - 7/8
2	1/8 - 1/14	28	7/9 - 7/15
3	1/15 - 1/21	29	7/16 - 7/22
4	1/22 - 1/28	30	7/23 - 7/29
5	1/29 - 2/4	31	7/30 - 8/5
6	2/5 - 2/11	32	8/6 - 8/12
7	2/12 - 2/18	33	8/13 - 8/19
8	2/19 - 2/25	34	8/20 - 8/26
9	2/26 - 3/4*	35	8/27 - 9/2
10	3/5 - 3/11	36	9/3 - 9/9
11	3/12 - 3/18	37	9/10 - 9/16
12	3/19 - 3/25	38	9/17 - 9/23
13	3/26 - 4/1	39	9/24 - 9/30
14	4/2 - 4/8	40	10/1 - 10/7
15	4/9 - 4/15	41	10/8 - 10/14
16	4/16 - 4/22	42	10/15 - 10/21
17	4/23 - 4/29	43	10/22 - 10/28
18	4/30 - 5/6	44	10/29 - 11/4
19	5/7 - 5/13	45	11/5 - 11/11
20	5/14 - 5/20	46	11/12 - 11/18
21	5/21 - 5/27	47	11/19 - 11/25
22	5/28 - 6/3	48	11/26 - 12/02
23	6/4 - 6/10	49	12/03 - 12/09
24	6/11 - 6/17	50	12/10 - 12/16
25	6/18 - 6/24	51	12/17 - 12/23
26	6/25 - 7/1	52	12/24 - 12/31**

*** = eight days only during leap years**
**** = eight day julian week**