

2018 Shasta and Scott River - Rotary Screw Trap Summary Report

Summary

The 2018 Rotary Screw Trap (RST) season marked the 18th year of trap operation on the Shasta and Scott rivers. Monitoring salmonid out migration is imperative to assess the population status of Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*; COHSAL), and steelhead trout (*O. mykiss*; RAITRO). The goals of the 2018 out migration monitoring are: (1) to determine abundance and timing of all age classes of juvenile salmonids between late January and early July, (2) estimate weekly mean fork lengths and age of salmonids from a measured sub-sample, (3) estimate trap efficiencies for the target species and extrapolate weekly production estimates, and (4) to monitor stream flow and temperature at the trap locations.

The following summary provides an update on the preliminary weekly catch and expanded estimates, flow, and temperature data on the Shasta (Julian Week; JW 5-16) and Scott (JW 6-16) rivers, and trap operation updates for JW 11-16. Table 1 highlights passive integrated transponder (PIT) tagged fish caught in the Scott and Shasta RSTs through JW 17 (complete catch data has only been processed through JW 16).

Table 1.

Species	Tagging Location - Date	Last Detection - Date	Trap Location / Date	Length(mm) PIT / RST	Weight(g) PIT / RST	PIT Tag Number
COHSAL	Sugar Ck BDA Pond 1 - 7/25/17	Sugar Ck BDA Pond 1 - 2/26/18	Scott 8 - 3/31/18	69 / 101	4.1 / 10.5	98900100 6086228
RAITRO	Sugar Ck/Scott R- 9/9/17	NA	Scott 8 - 4/3/18	70 / 100	3.7 / NA ²	98900100 6826168
COHSAL	Sugar Ck BDA Pond 1 – 7/25/2017	NA	Scott 8 - 4/16/18	68 / 100	3.3 / NA ²	98900100 6085511
COHSAL	HIG 5/17/17	Antenna RKM 56 - 5/26/17	Shasta - 4/16/18	69 / 151	NA ¹ / NA ²	98900100 1954837
COHSAL	TBD	TBD	Scott 8 – 4/23/18	TBD / 110	TBD / 14.2	98900100 6086683
COHSAL	RKM 55 - 5/9/17	TBD	Shasta – 4/24/18	69 / TBD	NA ¹ / NA ²	98900100 1950837

¹Not collected

²Scale was malfunctioning

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SHASTA RIVER

Operation

Flow on the Shasta River was within ~80% of normal (median) from JW 11-13. Levels of filamentous green algae were abnormally high through JW 14. Afternoon algae clearings were moved to 1700 and catchment cables were placed on a metal grate upstream from the trap in JW 13 to help alleviate algae levels entering the trap. Additionally, JW 14 and 15 had significant precipitation events, resulting in flows to increase to ~200% of normal. Anticipating these high flows, large algae loads, and minimal scouring events up to this point, the trap cone was raised for four days to reduce the likelihood of high mortality rates and trap damage.

JW 12 was the first catch of 1+ coho from the Iron Gate Hatchery. No PIT tagged salmonids were detected until JW 16. An additional PIT tagged fish was detected in JW 17 (complete catch data has only been processed through JW 16; Table 1)

Data – All data presented in this report are preliminary and subject to revision.

Table 2.a. Flow and temperature

Julian Week	Flow, USGS Mean, cfs (min/max)	Average Temperature (data sheets, °C)
5	198 (189/205)	8.21
6	192 (179/202)	7.98
7	173 (164/183)	6.58
8	176 (164/190)	5.63
9	191 (180/191)	6.15
10	185 (177/206)	5.45
11	208 (187/259)	8.78
12	199 (187/216)	9.12
13	189 (170/203)	9.90
14	146 (102/347)	11.68
15	193 (135/404)	10.43
16	132 (109/157)	10.3

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Table 2.b Catch

2018 Data preliminary, subject to revision

Julian Week	5	6	7	8	9	10	11	12	13	14*	15	16	Total to Date
Chinook													
0+													
Total trapped in week	8,420	59,377	19,908	15,156	4,793	18,651	9,533	7,981	6,746	15,160	11,440	6,839	184,004
Number marked/released in week	2,258	2,499	2,498	2,500	1,920	2,495	2,499	1,999	2,498	1,752	898	1,499	25,315
Number recaptured in week	484	702	698	492	315	542	361	350	405	544	295	384	5,572
Efficiency (Recap/Marked)	21%	28%	28%	20%	16%	22%	14%	18%	16%	31%	33%	26%	----
Catch expanded by estimated trap efficiency	39,218	211,156	71,295	76,887	29,137	85,733	65,836	45,476	41,523	49,954	36,677	27,140	780,031
Estimate for the same period in 2017	16,662	9,432	38,449	57,962	102,025	50,464	53,042	19,673	54,016	83,127	50,304	65,862	601,018
Chinook													
1+													
Total trapped in week	0	0	0	0	3	3	3	10	1	0	0	5	25
Number marked/released in week	0	0	0	0	3	3	2	9	1	0	0	0	18
Number recaptured in week	0	0	0	0	1	1	1	1	0	0	0	0	4
Efficiency (Recap/Marked)	0%	0%	0%	0%	33%	33%	50%	11%	0%	0%	0%	0%	----
Catch expanded by estimated trap efficiency	0	0	0	0	5	6	6	50	2	0	0	5	74
Estimate for the same period in 2017	2	1	0	0	0	2	0	1	1	2	16	24	49

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Julian Week	5	6	7	8	9	10	11	12	13	14	15	16	Total to Date
Steelhead													
0+													
Total trapped in week	0	0	0	0	0	0	0	0	0	5	2	1	8
Number marked in week	0	0	0	0	0	0	0	0	0	0	0	1	1
Number recaptured in week	0	0	0	0	0	0	0	0	0	0	0	0	0
Efficiency (Recap/Marked)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	----
Catch expanded by estimated trap efficiency	0	0	0	0	0	0	0	0	0	0	5	2	7
Estimate for same period in 2017	----	----	----	----	----	----	----	----	----	----	----	----	----
1+													
Total trapped in week	0	2	0	3	5	19	19	4	1	1	2	2	58
Number marked in week	0	0	0	3	5	5	17	2	1	1	2	2	38
Number recaptured in week	0	0	0	0	1	0	1	0	0	1	0	0	3
Efficiency (Recap/Marked)	0%	0%	0%	0%	20%	0%	6%	0%	0%	100%	0%	0%	----
Catch expanded by estimated trap efficiency	0	0	0	3	12	114	171	12	2	1	6	6	327
Estimate for same period in 2017	42	----	2	----	2	----	----	----	----	1	----	2	49
2+													
Total trapped in week	11	10	32	96	55	45	48	119	66	57	95	243	877
Number marked in week	2	5	26	75	52	41	40	60	55	40	77	186	659
Number recaptured in week	0	1	5	7	3	5	0	2	1	2	5	11	42
Efficiency (Recap/Marked)	0%	20%	19%	9%	6%	12%	0%	3%	2%	5%	6%	6%	----
Catch expanded by estimated trap efficiency	51	42	144	912	728	315	2,050	2,440	1,848	779	1,235	3,911	14,455
Estimate for same period in 2017	32	----	1	----	2	20	30	----	2	12	9	525	633
3+													
Total trapped in week	0	1	0	8	11	12	19	9	3	15	28	57	163
Number marked in week	0	0	0	5	11	10	14	4	0	9	20	46	119
Number recaptured in week	0	0	0	0	1	0	0	0	0	0	0	0	1
Efficiency (Recap/Marked)	0%	0%	0%	0%	9%	0%	0%	0%	0%	0%	0%	0%	----
Catch expanded by estimated trap efficiency	0	2	0	18	60	132	315	45	3	150	588	2,679	3,992
Estimate for same period in 2017	1	----	----	----	1	1	----	----	----	2	6	20	31

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Julian Week	5	6	7	8	9	10	11	12	13	14	15	16	Total to Date
Coho													
0+													
Total trapped in week	0	0	0	0	0	5	3	20	0	0	0	0	28
Number marked in week	0	0	0	0	0	2	0	0	0	0	0	0	2
Number recaptured in week	----	----	----	----	----	----	----	----	----	----	----	----	----
Efficiency (Recap/Marked)	----	----	----	----	----	----	----	----	----	----	----	----	----
Catch expanded by estimated trap efficiency	----	----	----	----	----	30	3	20	0	0	0	0	53
Estimate for the same period in 2017	----	----	----	----	----	----	----	8	5	72	1	23	109
1+													
Total trapped in week	2	0	4	0	0	0	0	3	4	6	15	52	86
Number marked in week	0	0	2	0	0	0	0	3	4	3	13	38	63
Number recaptured in week	0	0	0	1	0	0	0	0	0	0	1	2	4
Efficiency (Recap/Marked)	----	----	----	----	----	----	----	----	----	----	----	5%	----
Catch expanded by estimated trap efficiency	0	0	12	0	0	0	0	16	20	24	105	676	853
Estimate for the same period in 2017	1	----	----	----	1	----	----	----	2	2	----	----	6

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SCOTT RIVER

Operation

Flow on the Scott River was ~20% of normal (median) in JW 10. Trap placement for the 5' and 8' were adjusted to improve cone revolutions (revs). Revs were suboptimal, however catch numbers for 0+ Chinook were increasing. Precipitation events in JW 11 and 12 improved revs and smolt catch numbers for steelhead, Chinook, and coho increased. During the precipitation events, the 5' cone was raised, because of concerns over debris loads in the smaller live car. Both traps were pulled into shore and cones raised at the end of JW 14 due to flows peaking at ~400% of normal from precipitation events. The 5' trap was not set for JW 15, due to debris loads and safety for the crew to cross the river. A total of four PIT tagged salmonids were detected through JW 17 (complete catch data has only been processed through JW 16; Table 1).

Data – All data presented in this report are preliminary and subject to revision.

Table 2.a. Flow and temperature

Julian Week	Flow USGS Mean, cfs (min/max)	Average Temperature (from data sheets, °C)
6	444 (409/480)	7.15
7	332 (284/396)	6.11
8	255 (228/286)	5.15
9	234 (220/253)	5.45
10	232 (307/208)	7.78
11	451 (297/662)	8.38
12	456 (374/581)	8.42
13	463 (426/523)	9.53
14	936 (500/3790)	10.45
15	1427 (835/3610)	8.55
16	709 (596/852)	9.36

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Julian Week	6	7	8	9	10	11	12	13	14	15	16	Total to Date
Coho												
0+												0
Total trapped in week	0	0	0	0	1	8	28	0	0	1	55	93
Number marked in week	0	0	0	0	0	2	0	0	0	1	45	48
Number recaptured in week	0	0	0	0	0	0	0	0	0	0	1	1
Efficiency (Recap/Marked)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2%	0
Catch expanded by estimated trap efficiency	0	0	0	0	1	30	28	0	0	2	1,288	1,349
Estimate for the same period in 2016	0	0	0	0	0	0	0	0	0	0	0	0
1+												
Total trapped in week	3	1	7	9	2	39	41	26	68	50	83	329
Number marked in week	2	0	6	6	2	16	18	24	64	31	72	241
Number recaptured in week	0	0	1	2	1	0	0	2	3	2	3	14
Efficiency (Recap/Marked)	0.00%	0	16.67	33.33	50.00%	0.00%	0.00%	8.33%	4.69%	6.45	4.17	61
Catch expanded by estimated trap efficiency	9	1	25	21	3	663	779	217	1,105	533	1,515	4,871
Estimate for the same period in 2016	0	0	72	0	0	0	0	1107	0	0	0	1,179