

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Fish Program/Science Division/Methow Field Office

20268 Hwy 20, Twisp WA, 98856

Phone: (509) 997-0048 and 997-0066

Fax: (509) 997-0072

To: Shane Bickford and Greg Mackey

From: Charlie Snow, Charles Frady, and David Grundy

Subj: December Hatchery and Natural Production Report

Date: 9 January 2019

Cc: Distribution list.

HATCHERY ACTIVITIES

All 2017 brood fish at Methow Hatchery were reared on a mix of 7% well and 93% surface water beginning 3 December. All 2018 brood fish at Methow Hatchery remained on 100% well water. At Wells Hatchery, Columbia safety-net steelhead and yearling summer Chinook populations were switched to mixed surface and well water at a rate of about 60% surface water near the end of December. All other populations remained on 100% well water during the month.

2017 Twisp Spring Chinook Salmon

A total of 29,385 fish were on-station at the end of the month with 10 additional fish reported as mortalities. These fish had mean fork lengths between 113.4 and 116.6 mm during the month (Table 1) and were approximately 22-24 fish per pound (FPP). The number of fish on-station that apply to Douglas PUD, Chelan PUD, and Grant PUD HCP mitigation obligations are listed in Appendix A.

2017 Methow Composite Spring Chinook Salmon

A total of 227,528 fish were on-station at the end of the month with 37 additional fish reported as mortalities. These fish will support releases from the Chewuch Acclimation Pond (CAP; release target = 61,000), Goat Wall Acclimation Pond (GWAP; release target = 25,000), and from Methow Hatchery (release target = 107,765). These fish had mean fork lengths between 113.3 and 117.1 mm during the month (Table 1) and were approximately 22-25 FPP. The number of fish on-station that apply to Douglas PUD, Chelan PUD, and Grant PUD HCP mitigation obligations are listed in Appendix A.

Table 1. 2017 brood spring Chinook salmon length and weight sampling at Methow Hatchery during the month of December. MC = MetComp.

Raceway	Stock-release	Fork length (mm)				FPP
		Mean	N	SD	CV	
1	MC-Chewuch	113.6	100	8.5	7.5	24
2	MC-Chewuch	115.5	100	9.0	7.8	23
3	MC-Chewuch	115.3	107	8.4	7.2	23
4	MC-Goat Wall	115.1	100	8.9	7.8	23
5	Twisp	113.4	106	9.7	8.5	24
6	Twisp	116.6	100	8.6	7.4	22
7	MC-On Station	114.1	100	8.3	7.3	24
8	MC-On Station	117.1	101	7.6	6.5	22
10	MC-On Station	114.0	102	7.6	6.7	24
11	MC-On Station	113.3	100	7.5	6.6	25
12	MC-On Station	114.5	100	6.9	6.0	24

2018 Twisp Spring Chinook Salmon

A total of 31,086 fry were ponded by 5 January, 2019 with initial loss totaling 74 fry. The number of fish on-station that apply to Douglas PUD, Chelan PUD, and Grant PUD HCP mitigation obligations are listed in Appendix A.

2018 Methow Composite Spring Chinook Salmon

A total of 205,212 fry were ponded by 5 January, 2019 with initial loss totaling 935 fry. These fish will support releases from the Chewuch Acclimation Pond (CAP; release target = 61,000), Goat Wall Acclimation Pond (GWAP; release target = 25,000), and from Methow Hatchery (release target = 107,765). The number of fish on-station that apply to Douglas PUD, Chelan PUD, and Grant PUD HCP mitigation obligations are listed in Appendix A.

2017 Wells Summer Chinook Salmon

Wells Hatchery had an estimated 290,763 parr for the yearling program on-station at the end of November and an additional 4,600 fish were reported as mortalities during the month. Losses have subsided considerably since late October and early November when the initial spike in mortalities was observed. Numerous examinations and ancillary tests did not reveal the primary cause of the outbreak; it is likely multiple factors contributed to the fishes' decline in condition. Unconfirmed theories include (in no specific order): deficient nutrition (energy depletion/imbalance); poor water quality; prolonged adverse side-effects relating to formalin treatment (gill tissue damage); residual loss from previously treated parasite infestation (*Ichthyobodo necator* and *Ichthyophthirius multifiliis*); formalin toxicity (defective batch); herbicide/pesticide toxicity caused by leaching of products applied on the grounds in late

October (Esplanade 200 SC and Portfolio); and/or excessive stress from predation or hazing efforts. This population was at approximately 14 FPP. Summer Chinook are being reared to fulfill HCP mitigation obligations (Appendix A).

2018 Wells Summer Chinook Salmon

Spawning of the 2018 Wells summer Chinook Salmon broodstock was completed in October with an estimated 461 females spawned for the Wells yearling and subyearling programs, the Yakima River reintroduction program, and for an incubation survival study. Progeny for the Wells yearling and subyearling programs were in incubation trays during the month of December and will be reported by program after the eyed-egg stage.

2018 Summer Steelhead

Wells Hatchery had 467,181 steelhead progeny on-station at the end of the month. These progeny include 110,344 Methow safety-net, 199,399 Columbia safety-net, 28,964 Twisp Conservation, and 27,011 Methow Conservation program progeny. Okanogan Basin fish on-station included 83,214 HxH progeny from Omak Creek broodstock spawning, and 18,249 WxW progeny from Omak Creek broodstock spawning. Mortality during the month totaled an additional 519 progeny over all programs, most of which were from the Twisp ($N = 136$) and Methow Conservation ($N = 48$) programs. A fish health examination on December 3, 2018 revealed moderate amounts of protozoa (*Tetrahymena* sp.) on skin scrapes from fish in Dirt Pond 2. Given the low amount of total mortality, this was determined to be a negligible finding and no treatments were pursued. Steelhead progeny are being reared to fulfill Douglas PUD and Grant PUD HCP mitigation obligations (Appendix A).

2018 Kamloops Rainbow Trout

Wells Hatchery had 41,640 Kamloops Rainbow Trout on-station at the end of the month with 23 mortalities reported in December. These fish were at approximately 17 FPP. Kamloops rainbow are reared under the Off-License Settlement Agreement (Appendix B).

2018 White Sturgeon

Wells Hatchery had 101 White Sturgeon progeny on-station at the end of the month after subtracting a single mortality in December. These fish were at approximately 13 FPP at the end of the month. White Sturgeon progeny were reared at Wells Hatchery under the Aquatic Settlement Agreement (Appendix C).

NATURAL PRODUCTION ACTIVITIES

PIT Tag Antenna Arrays

Data collected at all Methow basin PIT tag interrogation sites operated under this program, including Twisp (TWR), lower Methow (LMR), Lower Chewuch (CRW), Gold Creek (GLC),

Libby Creek (LBC), and Wolf Creek (WFC) are uploaded to the PTAGIS database regularly, and can be viewed at the following website: <http://www.ptagis.org/data/quick-reports/small-scale-site-detections>

2018 Smolt Trapping

Freezing temperatures and ice accumulation necessitated the removal of the Twisp and Methow smolt traps on 4 and 5 December, respectively. During the month, subyearling wild Chinook parr were the primary species captured at both the Methow and Twisp trap sites (Table 2). Biological data collected from trapped fish is detailed in Table 3. Methow River discharge for the period operated ranged from 10.9 to 12.0 m³s, providing expected trap efficiencies greater than 1.5 percent. Twisp River discharge for the period operated ranged from 1.5 to 1.6 m³s, providing expected trap efficiencies greater than 18.7 percent.

Table 2. Monthly salmonid captures at Methow Basin smolt traps in 2018. SHR = wild steelhead/rainbow.

Species/origin	Methow			Twisp			Basin total
	Mar-Oct	Nov	Dec	Mar-Oct	Nov	Dec	
Precocial Chin/wild	0	0	0	6	0	0	6
Precocial Chin/hat.	0	0	0	3	0	0	3
Yearling Chin/wild	265	0	0	492	0	0	757
Yearling Chin/hatch	17,426	0	0	3,401	0	0	20,827
Sub Chin/wild-parr	852	14	2	121	82	2	1,073
Sub Chin/wild-fry	3,135	0	0	44	0	0	3,179
SHR/wild-transitional	436	0	0	305	0	0	741
SHR/wild-parr	32	0	0	247	4	0	283
SHR/wild-fry	4	0	0	10	0	0	14
Steelhead/hatchery	1,375	0	0	8,227	3	0	9,605
Coho/wild-smolt	13	0	0	0	0	0	13
Coho/wild-parr	49	1	0	5	3	0	58
Coho/wild-fry	211	0	0	15	0	0	226
Coho/hatchery	2,922	0	0	0	0	0	2,922
Bull Trout	1	0	0	22	4	1	28
Cutthroat Trout	0	1	0	8	0	0	9
Resid. Rainbow Trout	0	0	0	2	0	0	2
Eastern Brook Trout	0	0	0	0	1	0	1
Sockeye/wild-fry	48	0	0	0	0	0	48
Total	26,769	16	2	12,908	97	3	39,795

Table 3. Biological sampling of juvenile salmonids captured at Methow Basin smolt traps during December.

Species/stage	Location	Length (mm)			Weight (g)			Mean K-factor
		Mean	SD	<i>N</i>	Mean	SD	<i>N</i>	
Sub Chinook/wild/parr	Methow	111.0	4.2	2	14.3	1.3	2	1.0
Sub Chinook/wild/parr	Twisp	90.0	4.2	2	7.6	0.8	2	1.0
Bull Trout	Twisp	299.0	--	1	--	--	-	--

Appendix A. Number of fish reared at Wells and Methow hatcheries to meet Douglas County PUD Habitat Conservation Plan mitigation objectives and other hatchery rearing agreements. Values are derived by applying fixed mitigation levels to the entire population on-station, and do not necessarily reflect separate rearing or release strategies.

Brood year	Species	Life stage	Program	Target release No.	Month												Total released /transfer
					Jan '18	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2016	Spring Chinook	Yearling smolt	CCPUD NNI	60,516 <i>released</i>	67,437	67,400	67,333	--	--	--	--	--	--	--	--	--	67,075
2016	Spring Chinook	Yearling smolt	GCPUD Priest Rapids NNI	134,126 <i>released</i>	149,464	149,384	149,236	--	--	--	--	--	--	--	--	--	148,664
2016	Spring Chinook	Yearling smolt	DCPUD Wells NNI	29,123 <i>released</i>	32,454	32,436	32,404	--	--	--	--	--	--	--	--	--	32,280
2017	Spring Chinook	Yearling smolt	CCPUD NNI	60,516 <i>released</i>	68,269	68,226	68,208	68,178	69,533	69,517	69,509	69,504	69,501	69,496	69,493	69,481	--
2017	Spring Chinook	Yearling smolt	GCPUD Priest Rapids NNI	134,126 <i>released</i>	151,310	151,214	151,176	151,107	154,112	154,077	154,058	154,046	154,039	154,029	154,023	153,995	--
2017	Spring Chinook	Yearling smolt	DCPUD Wells NNI	29,123 <i>released</i>	32,854	32,833	32,825	32,810	33,463	33,455	33,451	33,448	33,447	33,445	33,443	33,437	--
2018	Spring Chinook	Yearling smolt	CCPUD NNI	60,516 <i>released</i>	--	--	--	--	--	--	--	--	--	64,178	64,178	63,905	--
2018	Spring Chinook	Yearling smolt	GCPUD Priest Rapids NNI	134,126 <i>released</i>	--	--	--	--	--	--	--	--	--	142,243	142,243	141,639	--
2018	Spring Chinook	Yearling smolt	DCPUD Wells NNI	29,123 <i>released</i>	--	--	--	--	--	--	--	--	--	30,886	30,886	30,754	--
2016	Summer Chinook	Yearling smolt	DCPUD Fixed Hatchery Compensation	320,000 <i>released</i>	356,240	356,240	356,240	--	--	--	--	--	--	--	--	--	356,240
2017	Summer Chinook	Sub-yearling	DCPUD Fixed Hatchery Compensation	484,000 <i>released</i>	468,729	447,267	431,642	419,498	--	--	--	--	--	--	--	--	417,000
2017	Summer Chinook	Yearling smolt	DCPUD Fixed Hatchery Compensation	320,000 <i>released</i>	332,000	332,000	332,000	332,000	332,000	317,168	315,852	297,425	297,425	297,228	295,363	290,763	--
2017	Summer steelhead	Yearling smolt	DCPUD Fixed Hatchery Compensation ¹	300,000 <i>released</i>	313,570	313,530	313,447	--	--	--	--	--	--	--	--	--	313,429

Appendix A. Continued.

Brood year	Species	Life stage	Program	Target release No.	Month												Total released /transfer
					Jan '18	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2017	Summer steelhead	Yearling smolt	DCPUD Wells NNI ¹	8,000 <i>released</i>	8,362	8,316	8,359	--	--	--	--	--	--	--	--	--	8,358
2017	Summer steelhead	Yearling smolt	GCPUD Priest Rapids NNI	80,000 <i>released</i>	83,619	83,608	83,586	--	--	--	--	--	--	--	--	--	83,581
2017	Summer steelhead	Yearling smolt	GCPUD Priest Rapids NNI	20,000 <i>transferred</i>	33,415	33,396	22,242	--	--	--	--	--	--	--	--	--	33,545
2018	Summer steelhead	Yearling smolt	DCPUD Fixed Hatchery Compensation ¹	300,000 <i>released</i>	--	--	--	--	--	394,887	410,943	409,210	385,464	352,434	349,045	347,112	--
2018	Summer steelhead	Yearling smolt	DCPUD Wells NNI ¹	8,000 <i>released</i>	--	--	--	--	--	10,530	10,958	10,912	10,279	9,398	9,308	9,256	--
2018	Summer steelhead	Yearling smolt	GCPUD Priest Rapids NNI	80,000 <i>released</i>	--	--	--	--	--	105,303	109,585	109,123	102,790	93,982	93,079	92,563	--
2018	Summer steelhead	Yearling smolt	GCPUD Priest Rapids NNI	20,000 <i>transferred</i>	--	--	--	--	--	42,336	19,018	18,930	18,876	18,859	18,269	18,249	--

¹40,000 Inundation steelhead to be released in the Twisp or Methow with 8,000 NNI fish to total 48,000. 100,000 inundation steelhead to be released in the Methow as a safety net program. 160,000 inundation steelhead to be released directly to the Columbia.

Appendix B. Fish reared at Wells or Methow hatcheries under the Off-License Settlement Agreement.

Brood year	Species	Life stage	Program	Target (pounds) disposition	Month												Total released /transfer
					Jan '18	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2016	Rainbow trout	Juv	WDFW sport fish	Number (pounds) released	35,566 (12,454)	35,511 (14,869)	35,475 (14,853)	5,700 (2,509)	1,085 (1,850)	-- (1,955)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	61,461
				Goal is 20,000 pounds annual combined	--	--	--	30,525	3,875	1,760	--	--	--	--	--	--	--
2018	Kamloops Rainbow trout	Juv.	WDFW sport fish	Goal is 20,000 pounds annual combined	26,199 (26)	24,819 (11)	33,803 (66)	24,360 (115)	24,360 (312)	64,734 (617)	63,664 (984)	66,408 (1,794)	66,348 (3,606)	42,050 (539)	41,663 (1,042)	41,640 (2,449)	23,920
					--	--	--	--	--	--	--	--	--	--	--	--	(5,420)

Appendix C. Fish reared at Wells Hatchery pursuant to the Aquatic Settlement Agreement – White Sturgeon Management Plan.

Brood year	Species	Life stage	Program	Target disposition	Month												Total released/culled /transferred
					Jan '18	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2017	White Sturgeon	Juvenile rearing	Wells White Sturgeon Supplementation	<i>Up to 325</i>	1,182	1,175	1,135	340	--	--	--	--	--	--	--	--	--
				<i>Culled</i>	--	--	--	36	--	--	--	--	--	--	--	--	--
				<i>Transferred</i>	--	--	--	853	--	--	--	--	--	--	--	--	--
				<i>Wells reservoir</i>	--	--	--	--	338	--	--	--	--	--	--	--	--
2018	White Sturgeon	Juvenile rearing	Wells White Sturgeon Supplementation	<i>Up to 325</i>	--	--	--	--	--	--	969	794	261	103	102	101	
				<i>Culled</i>	--	--	--	--	--	--	--	--	--	--	--	--	--
				<i>Transferred</i>	--	--	--	--	--	--	--	--	--	--	--	--	--
				<i>Wells reservoir</i>	--	--	--	--	--	--	--	--	--	--	--	--	--