

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

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To: Shane Bickford and Greg Mackey
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Subj: April Hatchery and Natural Production Report
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Cc: Distribution list.

HATCHERY ACTIVITIES

All 2017 brood spring Chinook at Methow Hatchery were reared on 100% surface water during the month of April. All 2018 brood fish at Methow Hatchery remained on 100% well water. At Wells Hatchery, 2018 brood steelhead were held on a mixed water source of between 37-50% surface water and the Twisp program steelhead were held on 100% well water prior to release. The yearling summer Chinook were held on 90% surface water prior to release, and the 2018 brood rainbow were held on a mixed water source containing 50% surface water. All other populations remained on 100% well water during the month.

2017 Twisp Spring Chinook Salmon

A total of 29,333 fish were released from the Twisp Acclimation Pond between 22 and 26 April with 13 additional fish reported as mortalities. Prior to release, these fish had a mean fork length of 134.9 mm (Table 1) and were approximately 15 fish per pound (FPP). A pre-release fish health examination during the month found this population healthy overall and no treatment recommendations were made. The number of fish on-station that apply to Douglas PUD, Chelan PUD, and Grant PUD HCP mitigation obligations is listed in Appendix A. The spring Chinook were co-acclimated with Coho salmon (Yakama Nation program). No adverse effects were observed on spring Chinook from the co-acclimation.

2017 Methow Composite Spring Chinook Salmon

Approximately 72,000 fish were released from the Chewuch Acclimation Pond beginning 22 April (Chelan PUD program – acclimation site operated by Chelan PUD; fish produced at Methow Hatchery). Prior to release, these fish had a mean fork length of 133.2 mm (Table 1) and were approximately 14 FPP. A total of 29,792 fish were released from the Goat Wall Pond between 22 and 27 April with 18 additional fish reported as mortalities (Yakama Nation acclimation site; fish produced at Methow Hatchery). Prior to release, these fish had a mean fork length of 137.0 mm (Table 1) and were approximately 16 FPP. A total of 124,514 fish were released from Methow Hatchery between 22 and 26 April. A pre-release fish health examination

during the month found this population healthy overall and no treatment recommendations were made. An additional 323 fish were reported as mortalities from this group, of which 309 were intentionally euthanized for precocity sampling. Prior to release, these fish had a mean fork length of 134.2 mm (Table 1) and were approximately 17 FPP. The number of fish on-station that apply to Douglas PUD, Chelan PUD, and Grant PUD HCP mitigation obligations is listed in Appendix A.

2018 Twisp Spring Chinook Salmon

A total of 30,838 fry were on-station at the end of the month with seven additional fry reported as mortalities. These fish had a mean fork length of 65.6 mm (Table 2) and were approximately 132 FPP. A fish health examination during the month found this population healthy overall and no treatment recommendations were made. The number of fish on-station that apply to Douglas PUD, Chelan PUD, and Grant PUD HCP mitigation obligations is listed in Appendix A.

2018 Methow Composite Spring Chinook Salmon

A total of 204,738 fry were on-station at the end of the month with 14 additional fry reported as mortalities. These fish had mean fork lengths between 65.5 and 71.9 mm (Table 2) and were approximately 108-139 FPP. 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). A fish health examination during the month found this population healthy overall and no treatment recommendations were made. The number of fish on-station that apply to Douglas PUD, Chelan PUD, and Grant PUD HCP mitigation obligations is listed in Appendix A.

Table 1. Results of pre-release length and weight sampling conducted at Wells Hatchery, Methow Hatchery, and Methow Valley acclimation ponds (AP) in April. Data from Chewuch and Carlton Acclimation Ponds were provided by Chelan PUD. Data from the Goat Wall Pond were provided by Yakama Nation Fisheries personnel.

Species	Brood	CWT (63...)	Number released	Location	Fork (mm)		Weight (g)			K-factor
					Mean	CV	Mean	SD	FPP	
Sp. Chin	2017	7288, 7318	72,000	Chewuch AP	133.3	13.2	31.9	13.4	14.2	1.35
Sp. Chin	2017	7285, 7302	29,792	Goat Wall AP	137.0	7.8	28.2	7.7	16.1	1.10
Sp. Chin	2017	7365	124,514	Methow H.	134.2	6.8	27.2	6.2	16.7	1.13
Sp. Chin	2017	7303	29,333	Twisp AP	134.9	8.9	31.4	9.0	14.5	1.28
Su. Chin age-1	2017	7241, 7345	289,159	Wells DP-1	162.0	9.4	46.9	12.0	9.7	1.10
Su. Chin age-1	2017	7367	143,594	Carlton AP	135.3	8.3	29.0	7.3	15.6	1.17
Steelhead	2018	N/A	172,899	Columbia R.	195.0	11.5	75.3	25.5	6.0	1.02
Steelhead	2018	N/A	109,643	Methow R.	192.3	12.2	78.4	26.8	5.8	1.10
Steelhead	2018	7290, 7301	28,856	Wells (Twisp)	185.5	13.5	81.0	29.8	5.6	1.27
Steelhead	2018	Blank	82,564	Wells (OK H-H)	181.8	12.6	67.5	22.5	6.7	1.12

Table 2. 2018 brood spring Chinook salmon length and weight sampling at Methow Hatchery during the month of April. MC = MetComp.

Raceway	BY	Stock-release	Fork length (mm)				FPP
			Mean	<i>N</i>	SD	CV	
8	18	MC-On-station	70.4	126	3.4	4.9	108
9	18	MC-On-station	71.9	100	4.6	6.4	111
10	18	MC-On-station	70.7	112	3.9	5.6	121
11	18	MC-Chewuch	67.1	111	4.0	5.9	131
12a	18	Twisp	65.6	100	3.5	5.3	132
12b	18	MC-Goat Wall	65.5	100	4.3	6.5	139

2017 Wells Summer Chinook Salmon

Wells Hatchery released the entire population of 289,159 yearling Chinook smolts into the Columbia River below Wells Dam between 15 and 17 April. An additional 1,453 mortalities were estimated to have occurred in the rearing pond over the winter-rearing period. A pre-release fish health examination during the month found this population healthy overall and no treatment recommendations were made. At release, this population had a mean fork length of 162 mm and was at approximately 10 FPP (see Table 1). Summer Chinook are being reared to fulfill HCP mitigation obligations (Appendix A).

2018 Wells Summer Chinook Salmon

Wells Hatchery had 544,149 subyearling program fry on-station at the end of the month after removing 727 mortalities. These fish were marked and tagged during the month and are scheduled for release in mid-May. An additional 398,353 sac fry for the yearling program remained in incubation during the month of April. Summer Chinook are being reared to fulfill HCP mitigation obligations (Appendix A).

2018 Summer Steelhead

Wells Hatchery completed releases of 2018 brood steelhead during the month of April. Releases included 109,643 Methow safety-net fish, 172,899 Columbia safety-net fish, 28,856 Twisp Conservation fish, and 82,564 Okanogan safety-net fish. Wells Hatchery also shipped 26,920 Methow Conservation program fish on 18 April to the Winthrop National Fish Hatchery for release from that facility. Additionally, 9,067 Omak Creek Conservation program fish were released by Wells Hatchery personnel into Omak Creek during the month of April. Size at release and coded-wire tag information for specific release groups is detailed in Table 1. Mortality during April prior to release totaled an additional 2,131 progeny over all programs, most of which was attributed to avian predation of the Columbia safety-net group ($N = 1,500$). A pre-release fish health examination during the month found this population healthy overall and no treatment recommendations were made. Steelhead progeny are being reared to fulfill Douglas PUD and Grant PUD HCP mitigation obligations (Appendix A).

2019 Summer Steelhead

Spawning of the 2019 brood began on 2 January and occurred weekly, as mature females were available, until the last fish from the Wells Dam fish ladder collections in 2018 were spawned on 6 March. Additional broodstock fish were collected in March through tributary hook-and-line angling, or as swim-ins to the Wells, Winthrop, or Methow hatcheries. Across all locations and methods, a total of 522 adult steelhead were collected, representing 150% of the broodstock requirement detailed in the 2019 broodstock collection protocols for all programs ($N = 346$). Surplus adult steelhead were removed to control the proportion of hatchery origin fish on the spawning grounds, many of which were donated to the Colville Tribe. As of the end of April, a total of 101 female steelhead had been spawned from all locations, primarily for the Columbia safety-net ($N = 38$ females), Methow safety-net ($N = 41$ females), and Okanogan safety-net ($N = 18$ females) programs. Additionally, four natural-origin females were spawned during April for the Omak Conservation program. Pre-spawn mortality across all programs has totaled eight of the fish held at Wells Hatchery (3.2%) by the end of April. Steelhead progeny from these collections are being reared to fulfill Douglas PUD and Grant PUD HCP mitigation obligations.

2018 Kamloops Rainbow Trout

Wells Hatchery had 4,983 Kamloops Rainbow Trout on-station at the end of April and 66 additional fish were reported as mortalities during the month. These fish were between one and two FPP depending on release goals to produce jumbo- and catchable-sized trout, respectively. A pre-release fish health examination during the month found this population healthy overall and no treatment recommendations were made. During April, Wells Hatchery personnel planted 28,120 catchable-sized and 1,650 jumbo-sized trout into Okanogan County lakes. Kamloops Rainbow Trout are reared under the Off-License Settlement Agreement (Appendix B).

2019 Kamloops Rainbow Trout

Wells Hatchery received 28,232 Kamloops Rainbow Trout fry from the 2019 brood from Troutlodge on 4 April and had 25,602 on-station at the end of the month after removing 2,630 mortalities. These fish will support fall plants into Okanogan County lakes and are reared under the Off-License Settlement Agreement (Appendix B).

2018 White Sturgeon

Wells Hatchery had 99 White Sturgeon progeny on-station at the end of the month and no additional fish were reported as mortalities in April. These fish were at approximately 1.3 FPP at the end of the month. White Sturgeon progeny were reared at Wells Hatchery under the Aquatic Settlement Agreement (Appendix C).

2018 Methow Coho

The new Douglas PUD Coho mitigation program began with brood year 2018. Wells Hatchery had 48,581 Methow Coho fry on-station at the end of April after removing 14 mortalities during

the month (Appendix A). These fish were at approximately 165 FPP and will be reared at Wells Hatchery until transfer to the Twisp Acclimation Pond as pre-smolts in spring 2020.

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>

Spawning Ground Surveys

Spawning ground surveys were initiated 12 March in mainstem Methow reaches, and continued through the month of April. A total of 65 redds were found in mainstem Methow reaches as of 3 May. A total of 11 redds were found in the Methow Hatchery outfall and 17 redds were found in Spring Creek by USFWS personnel. In the Twisp River, surveyors have documented a total of 44 steelhead redds from the 2019 brood; 32 redds upstream of the Twisp River weir, and 12 redds downstream of the weir. Surveys will continue through May in both areas as river conditions allow.

2019 Smolt Trapping

Traps at both the Methow and Twisp sites operated the entire month without interruptions. With increasing river discharge, the 2.4m cone was moved into the upper fishing position at the Methow site on 21 April, then operated in tandem with the 1.5m cone for the remainder of April. During the month, hatchery spring Chinook smolts were the primary species captured at both the Methow and Twisp trap sites (Table 3). Biological data collected from trapped fish is detailed in Table 4. Methow River discharge for the period operated ranged from 20.8 to 94.9 m³/s, providing expected trap efficiencies between 0.9 and 1.5 percent for the period in which the 1.5m cone was operating in the low position, and between 2.5 and 2.9 percent for the period in which both cones were operating in the upper position. Twisp River discharge during the operation period ranged from 3.9 to 16.7 m³/s, providing expected trap efficiencies between 5.7 and 17.4 percent.

Table 3. Monthly salmonid captures at Methow Basin smolt traps in 2019. SHR = wild steelhead/rainbow.

Species/origin	Methow		Twisp		Basin total
	March	April	March	April	
Yearling Chin/wild	30	135	84	259	508
Yearling Chin/hatch	0	18,778	0	3,508	22,286
Sub Chin/wild-parr	0	74	0	0	74
Sub Chin/wild-fry	588	587	2	51	1,228
SHR/wild-transitional	0	284	4	357	645
SHR/wild-parr	2	22	12	144	180
Steelhead/hatchery	0	2,632	0	3,335	5,967
Coho/wild-smolt	4	75	1	13	93
Coho/wild-parr	0	2	0	0	2
Coho/wild-fry	1	7	1	2	11
Coho/hatchery	0	1,957	0	1,961	3,918
Bull Trout	1	1	0	12	14
Cutthroat Trout	0	1	0	1	2
Sockeye/wild-fry	13	13	0	0	26
Total	639	24,568	104	9,643	34,954

Table 4. Biological sampling of juvenile salmonids captured at Methow Basin smolt traps during April.

Species/stage	Location	Length (mm)			Weight (g)			Mean K-factor
		Mean	SD	N	Mean	SD	N	
Yearling Chinook/wild	Methow	104.4	10.0	135	12.8	3.8	135	1.1
Yearling Chinook/wild	Twisp	97.1	8.5	259	10.1	2.7	259	1.1
Yearling Chinook/hatchery	Methow	136.1	9.9	823	29.1	7.2	397	1.1
Yearling Chinook/hatchery	Twisp	135.4	11.0	543	29.3	8.0	542	1.2
Sub Chinook/wild/parr	Methow	54.1	4.7	19	1.8	0.6	17	1.1
Sub Chinook/wild/fry	Methow	40.7	3.4	189	--	--	--	--
Sub Chinook/wild/fry	Twisp	35.4	1.3	41	--	--	--	--
Steelhead/wild/transitional	Methow	178.2	19.6	284	57.9	19.2	284	1.0
Steelhead/wild/transitional	Twisp	167.2	17.6	356	45.2	13.9	356	0.9
Steelhead/wild/parr	Methow	102.3	18.6	22	12.7	7.2	22	1.1
Steelhead/wild/parr	Twisp	81.4	13.2	144	6.1	3.3	144	1.1
Steelhead/hatchery/smolt	Methow	197.8	17.0	648	83.9	22.4	465	1.1
Steelhead/hatchery/smolt	Twisp	192.0	14.9	405	75.6	19.3	405	1.0
Coho/wild/smolt	Methow	119.1	9.9	75	19.2	5.0	75	1.1
Coho/wild/smolt	Twisp	109.5	9.0	13	14.1	3.5	13	1.1
Coho/wild/parr	Methow	53.0	--	1	1.4	--	1	0.9
Coho/wild/fry	Methow	38.8	7.2	5	--	--	--	--
Coho/wild/fry	Twisp	42.0	1.4	2	--	--	--	--
Coho/hatchery/smolt	Methow	133.3	8.1	39	25.4	5.5	15	1.1
Coho/hatchery/smolt	Twisp	127.9	6.0	59	24.0	3.3	59	1.1
Bull Trout	Methow	243.0	--	1	142.3	--	1	1.0
Bull Trout	Twisp	161.6	23.8	12	37.9	14.9	12	0.9
Cutthroat Trout	Methow	204.0	--	1	75.6	--	1	0.9
Cutthroat Trout	Twisp	177.0	--	1	53.4	--	1	1.0
Sockeye/wild/fry	Methow	28.8	3.1	13	--	--	--	--

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	
					May '18	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan '19	Feb	Mar	Apr		
2017	Spring Chinook	Yearling smolt	CCPUD NNI	60,516 <i>released</i>	69,533	69,517	69,509	69,504	69,501	69,496	69,493	69,481	69,456	69,272	69,248	--	69,136	69,136
2017	Spring Chinook	Yearling smolt	GCPUD Priest Rapids NNI	134,126 <i>released</i>	154,112	154,077	154,058	154,046	154,039	154,029	154,023	153,995	153,941	153,532	153,480	--	153,232	153,232
2017	Spring Chinook	Yearling smolt	DCPUD Wells NNI	29,123 <i>released</i>	33,463	33,455	33,451	33,448	33,447	33,445	33,443	33,437	33,425	33,337	33,325	--	33,271	33,271
2018	Spring Chinook	Yearling smolt	CCPUD NNI	60,516 <i>released</i>	--	--	--	--	--	64,178	64,178	63,905	63,761	63,724	63,716	63,710	--	--
2018	Spring Chinook	Yearling smolt	GCPUD Priest Rapids NNI	134,126 <i>released</i>	--	--	--	--	--	142,243	142,243	141,639	141,317	141,237	141,218	141,206	--	--
2018	Spring Chinook	Yearling smolt	DCPUD Wells NNI	29,123 <i>released</i>	--	--	--	--	--	30,886	30,886	30,754	30,685	30,667	30,663	30,660	--	--
2017	Summer Chinook	Sub-yearling	DCPUD Fixed Hatchery Compensation	484,000 <i>released</i>	--	--	--	--	--	--	--	--	--	--	--	--	--	417,000
2017	Summer Chinook	Yearling smolt	DCPUD Fixed Hatchery Compensation	320,000 <i>released</i>	332,000	317,168	315,852	297,425	297,425	297,228	295,363	290,763	290,763	290,763	290,612	--	289,159	289,159
2018	Summer Chinook	Sub-yearling	DCPUD Fixed Hatchery Compensation	484,000 <i>released</i>	--	--	--	--	--	--	--	--	551,505	547,189	544,876	544,149	--	--
2018	Summer Chinook	Yearling smolt	DCPUD Fixed Hatchery Compensation	320,000 <i>released</i>	--	--	--	--	--	--	--	--	398,353	398,353	398,353	398,353	--	--
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	346,916	334,926	327,063	--	304,610	304,610
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	9,251	8,931	8,722	--	8,123	8,123

Appendix A. Continued.

Brood year	Species	Life stage	Program	Target release No.	Month												Total released /transfer		
					May '18	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan '19	Feb	Mar	Apr			
2018	Summer steelhead	Yearling smolt	GCPUD Priest Rapids NNI	80,000	--	105,303	109,585	109,123	102,790	93,982	93,079	92,563	92,511	89,314	87,217	--	81,229	81,229	
				<i>released</i>	--	--	--	--	--	--	--	--	--	--	--	--			--
2018	Summer steelhead	Yearling smolt	GCPUD Priest Rapids NNI	20,000	--	42,336	19,018	18,930	18,876	18,859	18,269	18,249	18,189	18,219	9,096	--	9,173	9,067	18,240
				<i>transferred</i>	--	--	--	--	--	--	--	--	--	--	--	--			
2018	Methow Coho	Yearling smolt	DCPUD Mitigation	37,000	--	--	--	--	--	--	--	43,493	43,170	48,648	48,595	48,581	--	--	--
				<i>released</i>	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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		
					May '18	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan '19	Feb	Mar	Apr			
2016	Rainbow trout	Juv	WDFW sport fish	Number (pounds) released	1,085	--	--	--	--	--	--	--	--	--	--	--	--	61,461	
					(1,850)	(1,955)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)		
					3,875	1,760	--	--	--	--	--	--	--	--	--	--	--		(28,630)
2018	Kamloops Rainbow trout	Juv.	WDFW sport fish	Goal is 20,000 pounds annual combined	24,360	64,734	63,664	66,408	66,348	42,050	41,663	41,640	31,429	31,411	31,384	4,983	29,770	25,602	53,690
					(312)	(617)	(984)	(1,794)	(3,606)	(539)	(1,042)	(2,449)	(4,135)	(7,479)	(11,012)	(3,322)			
					--	--	--	--	--	--	--	--	--	--	--	--			
2019	Kamloops Rainbow trout	Juv.	WDFW sport fish	Goal is 20,000 pounds annual combined	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
					(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(7)	

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			
					May '18	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan '19	Feb	Mar	Apr				
2018	White Sturgeon	Juvenile rearing	Wells White Sturgeon Supplementation	<i>Up to 325</i>	--	--	969	794	261	103	102	101	101	99	99	99	--	--		
				<i>Culled</i>	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
				<i>Transferred</i>	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
				<i>Wells reservoir</i>	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--