

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

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Subj: April Hatchery and Natural Production Report

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Cc: Distribution list.

HATCHERY ACTIVITIES

All 2016 brood fish at Methow Hatchery were held on 100% surface water prior to release, and all 2017 brood fish were reared on 100% well water during the month. 2016 brood fish at acclimation sites (Twisp and Chewuch) were held on 100% surface water. At Wells Hatchery, the yearling Chinook in dirt-pond 1 were held on 100% surface water during April. The safety-net steelhead for Methow and Columbia River release, and the 2016 catchable rainbow were held on 100% surface water during the month. The 2016 brood Okanogan safety-net steelhead were held on a 50/50 surface/well water mix during the month and all other populations remained on 100% well water.

2016 Twisp Spring Chinook Salmon

A total of 30,566 fish were released from the Twisp Acclimation Pond (TAP) between 16 and 20 April. Prior to release, four mortalities were reported and 59 fish were estimated to have been lost to bird and mink predation. These fish had a mean fork length of 124.5 mm prior to transfer to the TAP and were at approximately 18.4 fish per pound (FPP; Table 1). The number of fish on-station that apply to Douglas PUD, Chelan PUD, and Grant PUD HCP mitigation obligations are listed in Appendix A.

2016 Methow Composite Spring Chinook Salmon

A total of 28,323 fish were released from the Goat Wall Acclimation Pond (GWAP) between 18 and 29 April. A total of 120 additional mortalities were reported prior to transfer which translated to a total of 589 lost to predation and mortalities. The release total will be revised in June after the PIT-tag estimate is completed. These fish had a mean fork length of 129.1 mm prior to transfer to the GWAP and were at approximately 19.0 FPP (Table 1). A total of 65,405 fish were released from the Chewuch Acclimation Pond (CAP) between 16 and 20 April. There were zero mortalities reported for the month of April and no estimates of predation were made. Prior to release, these fish had a mean fork length of 125.7 mm prior to transfer and were at approximately 18.8 FPP (Table 1). A total of 124,088 fish were released from Methow Hatchery

between 16 and 20 April. Prior to release, four mortalities were reported and 40 fish were estimated to have been lost to bird and mink predation. Prior to release, on-station fish had a mean fork length of 133.5 mm during the month and were at approximately 15 FPP (Table 1). 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. Results of pre-release length and weight sampling conducted at Wells Hatchery, Methow Hatchery, and Methow Valley acclimation ponds (AP) in April. Data from the Goat Wall Acclimation Pond was 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	2016	7050, 67	65,405	Chewuch AP	125.7	11.7	24.1	10.0	18.8	1.21
Sp. Chin	2016	7071	28,323	Goat Wall	129.1	8.0	23.9	6.6	19.0	1.11
Sp. Chin	2016	7178	124,088	Methow H.	133.5	8.4	30.3	8.4	15.0	1.27
Sp. Chin	2016	7070	30,566	Twisp AP	124.5	13.6	24.6	8.9	18.4	1.28
Su. Chin age-1	2016	6939, 7136, 7137, 6988	356,240	Wells DP-1	165.2	6.0	49.6	8.7	9.1	1.10
Su. Chin age-1	2016	7217	209,490	Carlton AP	130.7	8.0	26.7	6.2	17.0	1.20
Steelhead	2017	N/A	210,328	Columbia R.	177.1	11.8	65.9	23.1	7.0	1.19
Steelhead	2017	N/A	72,768	Methow R.	187.1	15.2	72.2	17.7	6.3	1.10
Steelhead	2017	7108	54,297	Wells (Twisp)	172.1	15.4	69.7	29.7	6.6	1.37

2017 Twisp Spring Chinook Salmon

A total of 28,658 fry were on-station at the end of the month with 18 additional fry reported as mortalities. These fish had a mean fork length of 65 mm during the month and were at approximately 148 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 223,437 fry were on-station at the end of the month with 96 additional fry reported as mortalities. These fish will support releases from the CAP (release target = 61,000), GWAP (release target = 25,000), and from Methow Hatchery (release target = 107,765). These fish had a mean fork length of 65 mm during the month and were at approximately 148 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.

2016 Wells Summer Chinook Salmon

Wells Hatchery released 356,240 yearling-program fish into the Columbia River below Wells Dam between 16 and 18 April. At release these fish had a mean fork length of approximately

165 mm and were at about nine FPP (see Table 1). Summer Chinook are being reared to fulfill HCP mitigation obligations (Appendix A).

2017 Wells Summer Chinook Salmon

Wells Hatchery had an estimated 332,000 fry for the yearling program and 419,498 fry for the subyearling program on-station at the end of the month. Mortality during April totaled an additional 187 subyearling fry. Summer Chinook are being reared to fulfill HCP mitigation obligations (Appendix A).

2017 Summer Steelhead

Wells Hatchery released a total of 427,589 steelhead progeny during the spring of 2018 including 210,328 Columbia River, 72,768 Methow River, and 67,975 Okanogan River safety-net fish. The hatchery also released 54,297 Twisp River and 22,225 Omak Creek conservation fish. In addition to these releases, the Winthrop National Fish Hatchery released 24,093 Methow conservation program progeny in the Twisp River during April. April mortality prior to release totaled an additional 23 Okanogan River fish, 17 Omak Creek fish, and 8 Twisp River fish. At release, steelhead for the Columbia, Methow, and Twisp sites had mean fork lengths between 172 and 187 mm (see Table 1). Steelhead progeny are being reared to fulfill Douglas PUD HCP and Grant PUD mitigation obligations (Appendix A).

2018 Summer Steelhead

Spawning of the 2018 brood was completed by 2 May for all programs except the Twisp WxW program being spawned at Winthrop National Fish Hatchery. A total of 129 females were spawned at Wells Hatchery and are expected to produce enough progeny to fulfill the release goals for the Methow safety-net, Columbia safety-net, Okanogan safety-net, and Omak conservation programs. Overall pre-spawn mortality has totaled 35 of the 300 fish (11.6%) held at Wells Hatchery, but most mortalities ($N = 29$) occurred during the Columnaris outbreak in the fall-collected broodstock. Steelhead progeny from the earliest spawn days have hatched and been ponded into incubation troughs. Fish health exams during April noted some increased losses in the incubation troughs; the elevated mortality was attributed to bacterial coldwater disease secondary to suboptimal stocking densities and nutritional deficits in the affected tanks. The recommendation was made to treat the infected troughs with salt to reduce stress and adjust feeding protocols as necessary to reduce stress. Follow-up exams were performed throughout the month to monitor the treatment and fish response, and losses generally decreased throughout the remainder of April following treatment. Steelhead progeny are being reared to fulfill Douglas PUD and Grant PUD HCP mitigation obligations.

2016 Spokane Rainbow Trout

Wells Hatchery had 5,700 Rainbow Trout from the 2016 brood on-station at the end of the month, of which, 381 are reared for a larger size (jumbo) at release. Nine additional catchable-sized, and five jumbo-sized fish were reported as mortalities during the month. Wells Hatchery planted an additional 28,800 catchable- and 1,725 jumbo-sized rainbow trout into Okanogan

County lakes during the month of April. These fish are reared to fulfill the Off-License Settlement Agreement (Appendix B).

2017 White Sturgeon

Wells Hatchery had 340 White Sturgeon progeny on-station at the end of the month and no mortality was reported during April. These fish were scute-marked during the month and 853 fish were transferred to the Colville Tribal Hatchery. An additional 36 fish were culled from the population during the month. White Sturgeon progeny were at approximately 2.5 FPP during the month and are reared at Wells Hatchery under the Aquatic Settlement Agreement (Appendix C).

2018 Kamloops Rainbow Trout

Wells Hatchery had 24,360 Kamloops Rainbow Trout on-station at the end of the month after removing five additional mortalities. The population was adjusted downwards by 9,438 fish during the month due to routine inventory monitoring. These progeny will support fall 2018 and spring 2019 plants and are reared under the Off-License Settlement Agreement (Appendix B).

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>

Steelhead Spawning Ground Surveys

Steelhead spawning ground surveys continued through April in reaches that remained surveyable. A total of 42 redds were found within mainstem Methow River index reaches between the Winthrop PIT tag array (MRW) and the river braids between Twisp and Carlton (end of the MRW6 reach). All reaches below Beaver Creek were unsurveyable after 3 April. Nine additional redds were found in the Methow Hatchery outfall (total of 10), and personnel from the USFWS found a total of 27 redds in the WNFH outfall during April (total of 31). Detections of PIT-tagged steelhead will be used at multiple sites throughout the Methow basin in conjunction with mainstem redd surveys to estimate overall spawning abundance and distribution of HOR and NOR steelhead.

2018 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 11 April, which operated in tandem with the 1.5m cone for the remainder of April. During the month, hatchery spring Chinook smolts and hatchery steelhead smolts were

the primary species captured at the Methow and Twisp trap sites, respectively (Table 2). Biological data collected from trapped fish is detailed in Table 3. Methow River discharge for the period operated ranged from 35.7 to 214.9 m³s, providing expected trap efficiencies between 1.1 and 1.4 percent for the period in which the 1.5m cone was operating in the low position, and between 1.1 and 4.2 percent for the period in which both cones were operating in the upper position. Twisp river discharge for the period operated ranged from 5.9 to 31.1 m³s, providing expected trap efficiencies between 5.7 and 15.3 percent.

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

Species/origin	Methow		Twisp		Basin total
	March	April	March	April	
Yearling Chin/wild	37	221	110	375	743
Yearling Chin/hatch	2	17,378	0	3,397	20,777
Sub Chin/wild-parr	0	26	0	0	26
Sub Chin/wild-fry	1,069	1,190	9	10	2,278
SHR/wild-transitional	1	418	0	282	701
SHR/wild-parr	0	18	24	80	122
Steelhead/hatchery	0	1,278	0	8,138	9,416
Coho/wild-smolt	0	12	0	0	12
Coho/wild-parr	0	4	0	0	4
Coho/wild-fry	47	148	10	3	208
Coho/hatchery	0	2,520	0	0	2,520
Bull trout	0	0	1	5	6
Sockeye/wild-fry	42	5	0	0	47
Total	1,198	23,218	154	12,290	36,860

Table 3. 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	<i>N</i>	Mean	SD	<i>N</i>	
Yearling Chin/wild	Methow	106.3	9.4	221	13.2	3.6	220	1.1
Yearling Chin/wild	Twisp	95.9	6.6	375	9.5	1.9	375	1.1
Yearling Chin/hatchery	Methow	132.4	9.5	805	26.9	6.9	548	1.1
Yearling Chin/hatchery	Twisp	128.3	10.7	764	25.5	6.9	536	1.1
Sub Chin/wild/parr	Methow	55.0	3.1	13	1.8	0.6	11	1.1
Sub Chin/wild/fry	Methow	39.4	2.9	302	--	--	--	--
Sub Chin/wild/fry	Twisp	35.7	1.4	10	--	--	--	--
Steel/wild/transitional	Methow	177.6	19.2	418	54.6	18.4	418	0.9
Steel/wild/transitional	Twisp	165.5	16.6	282	43.6	13.0	282	0.9
Steel/wild/parr	Methow	95.7	23.0	17	10.5	7.4	17	1.0
Steel/wild/parr	Twisp	83.5	14.0	80	6.7	3.5	80	1.1
Steel/hatchery/smolt	Methow	208.0	16.9	140	102.2	32.2	26	1.0
Steel/hatchery/smolt	Twisp	195.9	18.7	1,002	81.8	22.9	1,000	1.1
Coho/wild/smolt	Methow	119.4	12.0	12	20.5	11.0	12	1.1
Coho/wild/parr	Methow	51.0	0.8	4	1.6	0.2	3	1.2
Coho/wild/fry	Methow	39.3	4.9	67	--	--	--	--
Coho/wild/fry	Twisp	41.3	1.2	3	--	--	--	--
Coho/hatchery/smolt	Methow	131.8	8.4	36	25.3	5.2	23	1.1
Bull Trout	Twisp	154.3	3.0	4	32.6	3.2	4	0.9
Sockeye/wild/fry	Methow	32.3	5.0	3	--	--	--	--

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 '18	Feb	Mar	Apr			
2016	Spring Chinook	Yearling smolt	CCPUD NNI	60,516 <i>released</i>	67,814	67,806	67,792	67,783	67,765	67,700	67,628	67,546	67,437	67,400	67,333	--	67,173	67,173	
2016	Spring Chinook	Yearling smolt	GCPUD Priest Rapids NNI	134,126 <i>released</i>	150,302	150,284	150,253	150,234	150,192	150,049	149,890	149,707	149,464	149,384	149,236	--	148,882	148,882	
2016	Spring Chinook	Yearling smolt	DCPUD Wells NNI	29,123 <i>released</i>	32,635	32,631	32,625	32,620	32,611	32,580	32,546	32,506	32,454	32,436	32,404	--	32,327	32,327	
2017	Spring Chinook	Yearling smolt	CCPUD NNI	60,516 <i>released</i>	--	--	--	--	--	68,820	68,817	66,059	68,269	68,226	68,208	68,178	--	--	
2017	Spring Chinook	Yearling smolt	GCPUD Priest Rapids NNI	134,126 <i>released</i>	--	--	--	--	--	152,530	152,526	146,413	151,310	151,214	151,176	151,107	--	--	
2017	Spring Chinook	Yearling smolt	DCPUD Wells NNI	29,123 <i>released</i>	--	--	--	--	--	33,119	33,118	32,915	32,854	32,833	32,825	32,810	--	--	
2016	Summer Chinook	Sub-yearling	DCPUD Fixed Hatchery Compensation	484,000 <i>released</i>	234,710	--	--	--	--	--	--	--	--	--	--	--	--	469,420	
2016	Summer Chinook	Yearling smolt	DCPUD Fixed Hatchery Compensation	320,000 <i>released</i>	361,696	359,464	359,127	356,640	356,340	356,340	356,340	356,240	356,240	356,240	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	--	--	
2017	Summer Chinook	Yearling smolt	DCPUD Fixed Hatchery Compensation	320,000 <i>released</i>	--	--	--	--	--	--	--	--	332,000	332,000	332,000	332,000	--	--	
2016	Summer steelhead	Yearling smolt	DCPUD Fixed Hatchery Compensation ¹	300,000 <i>released</i>	206,362	--	--	--	--	--	--	--	--	--	--	--	--	297,041	
2016	Summer steelhead	Yearling smolt	DCPUD Wells NNI ¹	8,000 <i>released</i>	--	--	--	--	--	--	--	--	--	--	--	--	--	7,921	
2016	Summer steelhead	Yearling smolt	GCPUD Priest Rapids NNI	80,000 <i>released</i>	--	--	--	--	--	--	--	--	--	--	--	--	--	79,211	
2017	Summer steelhead	Yearling smolt	DCPUD Fixed Hatchery Compensation ¹	300,000 <i>released</i>	--	329,265	324,326	354,002	357,470	343,318	314,831	286,515	313,570	313,530	313,447	--	313,429	313,429	

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 '18	Feb	Mar	Apr			
2017	Summer steelhead	Yearling smolt	DCPUD Wells NNI ¹	8,000 <i>released</i>	--	8,780	8,649	9,440	9,533	9,155	8,395	7,640	8,362	8,316	8,359	--	8,358	8,358	
2017	Summer steelhead	Yearling smolt	GCPUD Priest Rapids NNI	80,000 <i>released</i>	--	87,840	86,487	94,400	95,325	91,551	83,955	76,404	83,619	83,608	83,586	--	83,581	83,581	
2017	Summer steelhead	Yearling smolt	GCPUD Priest Rapids NNI	20,000 <i>transferred</i>	--	--	33,977	31,787	31,787	31,755	33,962	33,426	33,415	33,396	22,242	--	11,320	22,225	33,545

¹40,000 Inundation steelhead to be released in the Twisp 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 '18	Feb	Mar	Apr			
2015	Rainbow trout	Juv	WDFW sport fish		5,398	--	--	--	--	--	--	--	--	--	--	--	--	--	
					(2,720)	(1,854)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	51,384
					14,890	3,594	--	--	--	--	--	--	--	--	--	--	--	--	(11,117)
2016	Rainbow trout	Juv	WDFW sport fish	Number (pounds) released	61,612	59,120	57,374	57,001	57,001	37,001	35,951	35,784	35,566	35,511	35,475	5,700			
					(692)	(1,056)	(1,739)	(3,563)	(6,333)	(7,400)	(8,988)	(8,750)	(12,454)	(14,869)	(14,853)	(2,509)			55,826
					--	--	--	--	--	--	--	--	--	--	--	--	--	30,525	(20,572)
2017	Lahontan cutthroat	Juv	WDFW sport fish	Goal is 20,000 pounds annual combined	178,526	169,589	169,589	3,768	5,541	5,533	--	--	--	--	--	--			
					(178)	(169)	(242)	(5)	(32)	(56)	(64)	(--)	(--)	(--)	(--)	(--)	(--)		177,288
					--	--	--	171,747	--	--	5,541	--	--	--	--	--	--	--	--
2018	Kamloops Rainbow trout	Juv.	WDFW sport fish		--	--	--	--	--	--	--	--	26,199	24,819	33,803	24,360			
					(--)	(--)	(--)	(--)	(--)	(--)	(--)	(--)	(26)	(11)	(66)	(115)			
					--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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 '18	Feb	Mar	Apr			
2016	White sturgeon	Juvenile rearing	Wells White Sturgeon Supplementation	<i>Up to 5,000</i>	5,090	--	--	--	--	--	--	--	--	--	--	--	--	3,655	
				<i>Culled</i>	--	--	--	--	--	--	--	--	--	--	--	--	--		5,125
				<i>Transferred</i>	1,362	--	--	--	--	--	--	--	--	--	--	--	--		
				<i>Wells reservoir</i>	--	5,125	--	--	--	--	--	--	--	--	--	--	--		--
2017	White sturgeon	Juvenile rearing	Wells White Sturgeon Supplementation	<i>Up to 325</i>	--	--	2,053	1,581	1,461	1,440	1,299	1,262	1,182	1,175	1,135	340	853		
				<i>Culled</i>	--	--	--	--	--	--	--	--	--	--	--	--		36	
				<i>Transferred</i>	--	--	--	--	--	--	--	--	--	--	--	--		--	
				<i>Wells reservoir</i>	--	--	--	--	--	--	--	--	--	--	--	--		--	--