

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

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To: Shane Bickford and Greg Mackey
From: Charlie Snow, Charles Frady, and David Grundy
Subj: October Hatchery and Natural Production Report
Date: 9 November 2018
Cc: Distribution list.

HATCHERY ACTIVITIES

All fish at the Methow and Wells hatcheries were reared on 100% well water during the month.

2017 Twisp Spring Chinook Salmon

A total of 29,396 fish were on-station at the end of the month with one additional fish reported as mortality. These fish had mean fork lengths between 110.5 and 110.8 mm during the month (Table 1) and were between 25 and 26 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 227,574 fish were on-station at the end of the month with 16 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 108.7 and 115.5 mm during the month (Table 1) and were between 23 and 27 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 October/early November. MC = MetComp.

| Raceway | Stock-release site | Fork length (mm) | | | | FPP |
|---------|--------------------|------------------|-----|------|-----|-----|
| | | Mean | N | SD | CV | |
| 1 | MC-Chewuch | 114.6 | 100 | 9.0 | 7.9 | 27 |
| 2 | MC-Chewuch | 115.5 | 98 | 10.4 | 9.0 | 23 |
| 3 | MC-Chewuch | 111.5 | 100 | 9.7 | 8.7 | 26 |
| 4 | MC-Goat Wall | 112.9 | 104 | 10.0 | 8.8 | 26 |
| 5 | Twisp | 110.5 | 101 | 10.1 | 9.2 | 26 |
| 6 | Twisp | 110.8 | 100 | 6.9 | 6.2 | 25 |
| 7 | MC-On Station | 110.0 | 100 | 7.8 | 7.1 | 27 |
| 8 | MC-On Station | 110.7 | 101 | 6.9 | 6.3 | 27 |
| 10 | MC-On Station | 111.0 | 101 | 9.3 | 8.4 | 25 |
| 11 | MC-On Station | 114.4 | 88 | 9.4 | 8.2 | 24 |
| 12 | MC-On Station | 108.7 | 82 | 6.2 | 6.0 | 27 |

2018 Brood Spring Chinook Salmon

By 12 October, all eggs from the 2018 brood females were picked, resulting in an estimated 233,010 MetComp and 31,779 Twisp eyed eggs on-station. Initial green-egg to eyed-egg loss totaled 5,396 MetComp eggs (2.3%) and 619 Twisp eggs (1.9%). Green-egg weight (g) fecundity estimates overestimated actual fecundities due to assumed ovarian fluid weight (10% of gonad weight). Data from all five spawn dates shows 16% ovarian fluid weight on average. After HxW transfers to WNFH in early October (21,467; corrected from last month's listing), a total of 206,147 MetComp and 31,160 Twisp eyed eggs/alevin were on-station at Methow Hatchery. 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 2. 2018 Methow Hatchery spring Chinook salmon broodstock spawning summary. Fish totals do not include one non-viable female (W) and two female pond morts (one H, one W).

| Date | Males | | Females | | Crosses (females) | | Egg take | | | |
|--------|-------|-----------------|---------|----|-------------------|-------|-----------|---------|-----------|--------|
| | | | | | | | MetComp | | Twisp | |
| | H | W | H | W | MetComp | Twisp | Estimated | Actual | Estimated | Actual |
| 8-Aug | 0 | 0 | 0 | 3 | 2 | 1 | 10,626 | 10,040 | 4,793 | 4,590 |
| 15-Aug | 0 | 0 | 2 | 13 | 13 | 2 | 55,961 | 53,201 | 8,189 | 7,851 |
| 22-Aug | 0 | 30 | 4 | 27 | 30 | 1 | 127,180 | 117,441 | 5,064 | 4,630 |
| 29-Aug | 0 | 15 | 0 | 15 | 12 | 3 | 48,795 | 118,632 | 11,973 | 10,998 |
| 5-Sep | 0 | 16 ^a | 0 | 3 | 2 | 1 | 7,618 | 44,492 | 4,070 | 3,710 |
| Total | 0 | 61 | 6 | 61 | 59 | 8 | 250,180 | 6,645 | 34,089 | 31,779 |

^a Six Twisp males and 10 MetComp males released back to their respective rivers on 5 September 2018.

2017 Wells Summer Chinook Salmon

Wells Hatchery had an estimated 297,228 parr for the yearling program on-station at the end of October and an additional 197 fish were reported as mortalities during the month. This population was at approximately 25 FPP during the month and had a mean fork length of 139 mm. Following a small spike in mortalities, a fish health examination in late October revealed moderate amounts of cutaneous protozoa (specifically *Ichthyobodo necator* or “costia”) and indications of precocial smoltification. A series of formalin treatments were initiated to control for additional loss. 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 began during October and continued weekly during the month. A total of 918 fish were spawned overall (Table 3) including fish for the Wells yearling and subyearling programs, the Yakima River reintroduction program, and for an incubation survival study. After spawning was completed, excess fish were released (4 wild) or euthanized as surplus (63 hatchery).

Table 3. Spawning of the 2018 brood Wells summer Chinook Salmon by date and fish origin.

| Spawn date | Wild | | Hatchery | | Grand total |
|-------------|------|--------|----------|--------|-------------|
| | Male | Female | Male | Female | |
| 10/3/2018 | 2 | 2 | 172 | 169 | 345 |
| 10/10/2018 | 5 | 3 | 105 | 108 | 221 |
| 10/11/2018 | 0 | 0 | 95 | 96 | 191 |
| 10/16/2018 | 3 | 5 | 75 | 78 | 161 |
| Spawn total | 10 | 10 | 447 | 451 | 918 |

2018 Summer Steelhead

Wells Hatchery had 474,673 steelhead progeny on-station at the end of the month. These progeny include 124,928 Methow safety-net, 199,407 Columbia safety-net, 28,579 Twisp Conservation, and 25,072 Methow Conservation program progeny. Okanogan Basin fish on-station included 77,828 HxH progeny from Omak Creek broodstock spawning, and 18,859 WxW progeny from Omak Creek broodstock spawning. Additionally, 42,116 excess HxH progeny from Wells broodstock spawning were released into Spectacle Lake on 12 October. These fish were at about 40 FPP at release. Mortality during the month totaled an additional 620 progeny over all programs, most of which were from the Methow ($N = 297$) and Columbia ($N = 155$) safety-net programs. Steelhead progeny are being reared to fulfill Douglas PUD and Grant PUD HCP mitigation obligations (Appendix A).

2019 Summer Steelhead

Run evaluation sampling of the 2019 brood summer steelhead return began in August, with the first fish retained for broodstock occurring in September. By the end of October, a total of 348 steelhead were sampled, of which, 45 hatchery origin fish were retained for broodstock. Mortality during trapping has totaled four of the fish sampled (1.1%), and wild steelhead (i.e., no marks or tags) are estimated to be about 25% of the run.

2018 Kamloops Rainbow Trout

Wells Hatchery had 42,050 Kamloops Rainbow Trout on-station at the end of the month with 262 mortalities reported in October. An additional 23,920 fish were planted into Conconully Lake ($N = 10,600$), and Conconully Reservoir ($N = 13,320$) during the month of October. Kamloops rainbow are reared under the Off-License Settlement Agreement (Appendix B).

2018 White Sturgeon

Wells Hatchery had 103 fish on-station at the end of the month after decreasing the population by 118 fish during routine population inventory monitoring and subtracting 40 mortalities. These fish were at approximately 86 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>

Spawning Ground Surveys

By the end of September, a total of 255 spring Chinook Salmon redds were found in the Methow River Basin, including 31 redds counted by USFWS in M8, M7, M6 and WN1. Of the basin-wide redd count, 140 (54.9%) were found in the upper Methow subbasin, 65 (25.5%) were found in Chewuch subbasin, and 50 (19.6%) were found in the Twisp subbasin.

2018 Smolt Trapping

River conditions were favorable for trapping at both the Methow and Twisp sites during the month of October. Increased debris loads caused the Twisp trap to stop briefly on two occasions, but the Methow trap operated every night of the month. During the month, sub yearling wild Chinook parr were the primary species captured at both the Methow and Twisp trap sites (Table 4). Biological data collected from trapped fish is detailed in Table 5. Methow River discharge for the period operated ranged from 10.3 to 13.0 m³s, providing expected trap efficiencies greater

than 1.5 percent. Twisp River discharge for the period operated ranged from 1.4 to 1.9 m³s, providing expected trap efficiencies greater than 19.4 percent.

Table 4. Monthly salmonid captures at Methow Basin smolt traps in 2018. SHR = wild steelhead/rainbow.

| Species/origin | Methow | | | Twisp | | | Basin total |
|-----------------------|---------|------|-----|---------|------|-----|-------------|
| | Mar-Aug | Sept | Oct | Mar-Aug | Sept | Oct | |
| Precocial Chin/wild | 0 | 0 | 0 | 5 | 1 | 0 | 6 |
| Precocial Chin/hat. | 0 | 0 | 0 | 2 | 1 | 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 | 848 | 1 | 3 | 39 | 30 | 52 | 973 |
| 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 | 30 | 1 | 1 | 217 | 23 | 7 | 279 |
| SHR/wild-fry | 4 | 0 | 0 | 10 | 0 | 0 | 14 |
| Steelhead/hatchery | 1,375 | 0 | 0 | 8,221 | 3 | 3 | 9,602 |
| Coho/wild-smolt | 13 | 0 | 0 | 0 | 0 | 0 | 13 |
| Coho/wild-parr | 49 | 0 | 0 | 1 | 1 | 3 | 54 |
| 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 | 17 | 3 | 2 | 23 |
| Cutthroat Trout | 0 | 0 | 0 | 7 | 1 | 0 | 8 |
| Resid. Rainbow Trout | 0 | 0 | 0 | 0 | 2 | 0 | 2 |
| Sockeye/wild-fry | 48 | 0 | 0 | 0 | 0 | 0 | 48 |
| Total | 26,763 | 2 | 4 | 12,776 | 65 | 67 | 39,677 |

Table 5. Biological sampling of juvenile salmonids captured at Methow Basin smolt traps during October.

| Species/stage | Location | Length (mm) | | | Weight (g) | | | Mean K-factor |
|-------------------------|----------|-------------|------|----|------------|------|----|---------------|
| | | Mean | SD | N | Mean | SD | N | |
| Sub Chinook/wild/parr | Methow | 96.7 | 5.5 | 3 | 9.5 | 1.7 | 3 | 1.0 |
| Sub Chinook/wild/parr | Twisp | 94.0 | 7.0 | 52 | 9.5 | 2.0 | 52 | 1.1 |
| Steelhead/wild/parr | Methow | 75.0 | -- | 1 | 4.3 | -- | 1 | 1.0 |
| Steelhead/wild/parr | Twisp | 118.3 | 45.8 | 7 | 23.4 | 21.6 | 7 | 1.0 |
| Steelhead/hatchery/parr | Twisp | 253.3 | 27.6 | 3 | 167.6 | 52.5 | 3 | 1.0 |
| Coho/wild/parr | Twisp | 112.3 | 10.0 | 3 | 17.5 | 5.1 | 3 | 1.2 |
| Bull Trout | Twisp | 190.0 | 17.0 | 2 | 63.6 | 14.0 | 2 | 0.9 |

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 |
|------------|------------------|----------------|--|----------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------------|
| | | | | | Nov '17 | Dec | Jan '18 | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | |
| 2016 | Spring Chinook | Yearling smolt | CCPUD NNI | 60,516 <i>released</i> | 67,628 | 67,546 | 67,437 | 67,400 | 67,333 | -- | -- | -- | -- | -- | -- | -- | 67,075 |
| 2016 | Spring Chinook | Yearling smolt | GCPUD Priest Rapids NNI | 134,126 <i>released</i> | 149,890 | 149,707 | 149,464 | 149,384 | 149,236 | -- | -- | -- | -- | -- | -- | -- | 148,664 |
| 2016 | Spring Chinook | Yearling smolt | DCPUD Wells NNI | 29,123 <i>released</i> | 32,546 | 32,506 | 32,454 | 32,436 | 32,404 | -- | -- | -- | -- | -- | -- | -- | 32,280 |
| 2017 | Spring Chinook | Yearling smolt | CCPUD NNI | 60,516 <i>released</i> | 68,817 | 66,059 | 68,269 | 68,226 | 68,208 | 68,178 | 69,533 | 69,517 | 69,509 | 69,504 | 69,501 | 69,496 | -- |
| 2017 | Spring Chinook | Yearling smolt | GCPUD Priest Rapids NNI | 134,126 <i>released</i> | 152,526 | 146,413 | 151,310 | 151,214 | 151,176 | 151,107 | 154,112 | 154,077 | 154,058 | 154,046 | 154,039 | 154,029 | -- |
| 2017 | Spring Chinook | Yearling smolt | DCPUD Wells NNI | 29,123 <i>released</i> | 33,118 | 32,915 | 32,854 | 32,833 | 32,825 | 32,810 | 33,463 | 33,455 | 33,451 | 33,448 | 33,447 | 33,445 | -- |
| 2018 | Spring Chinook | Yearling smolt | CCPUD NNI | 60,516 <i>released</i> | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 64,178 | -- |
| 2018 | Spring Chinook | Yearling smolt | GCPUD Priest Rapids NNI | 134,126 <i>released</i> | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 142,243 | -- |
| 2018 | Spring Chinook | Yearling smolt | DCPUD Wells NNI | 29,123 <i>released</i> | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 30,886 | -- |
| 2016 | Summer Chinook | Yearling smolt | DCPUD Fixed Hatchery Compensation | 320,000 <i>released</i> | 356,340 | 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 | -- | -- | -- | -- | -- | -- | 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 | -- |
| 2017 | Summer steelhead | Yearling smolt | DCPUD Fixed Hatchery Compensation ¹ | 300,000 <i>released</i> | 314,831 | 286,515 | 313,570 | 313,530 | 313,447 | -- | -- | -- | -- | -- | -- | -- | 313,429 |

Appendix A. Continued.

| Brood year | Species | Life stage | Program | Target release No. | Month | | | | | | | | | | | | Total released /transfer |
|------------|------------------|----------------|--|------------------------------|---------|--------|---------|--------|--------|-----|-----|---------|---------|---------|---------|---------|--------------------------|
| | | | | | Nov '17 | Dec | Jan '18 | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | |
| 2017 | Summer steelhead | Yearling smolt | DCPUD Wells NNI ¹ | 8,000 <i>released</i> | 8,395 | 7,640 | 8,362 | 8,316 | 8,359 | -- | -- | -- | -- | -- | -- | -- | 8,358 |
| 2017 | Summer steelhead | Yearling smolt | GCPUD Priest Rapids NNI | 80,000 <i>released</i> | 83,955 | 76,404 | 83,619 | 83,608 | 83,586 | -- | -- | -- | -- | -- | -- | -- | 83,581 |
| 2017 | Summer steelhead | Yearling smolt | GCPUD Priest Rapids NNI | 20,000 <i>transferred</i> | 33,962 | 33,426 | 33,415 | 33,396 | 22,242 | -- | -- | -- | -- | -- | -- | -- | 11,320 22,225 |
| 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 | -- |
| 2018 | Summer steelhead | Yearling smolt | DCPUD Wells NNI ¹ | 8,000 <i>released</i> | -- | -- | -- | -- | -- | -- | -- | 10,530 | 10,958 | 10,912 | 10,279 | 9,398 | -- |
| 2018 | Summer steelhead | Yearling smolt | GCPUD Priest Rapids NNI | 80,000 <i>released</i> | -- | -- | -- | -- | -- | -- | -- | 105,303 | 109,585 | 109,123 | 102,790 | 93,982 | -- |
| 2018 | Summer steelhead | Yearling smolt | GCPUD Priest Rapids NNI | 20,000 <i>transferred</i> | -- | -- | -- | -- | -- | -- | -- | 42,336 | 19,018 | 18,930 | 18,876 | 18,859 | -- |

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 |
|------------|------------------------|------------|-----------------|---------------------------------------|---------|---------|----------|----------|----------|---------|---------|---------|--------|---------|---------|--------|--------------------------|
| | | | | | Nov '17 | Dec | Jan '18 | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | |
| 2016 | Rainbow trout | Juv | WDFW sport fish | Number (pounds) released | 35,951 | 35,784 | 35,566 | 35,511 | 35,475 | 5,700 | 1,085 | -- | -- | -- | -- | -- | 61,461 |
| | | | | | (8,988) | (8,750) | (12,454) | (14,869) | (14,853) | (2,509) | (1,850) | (1,955) | (--) | (--) | (--) | (--) | |
| 2017 | Lahontan cutthroat | Juv | WDFW sport fish | Goal is 20,000 pounds annual combined | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 177,288 |
| | | | | | (64) | (--) | (--) | (--) | (--) | (--) | (--) | (--) | (--) | (--) | (--) | (--) | |
| 2018 | Kamloops Rainbow trout | Juv. | WDFW sport fish | Goal is 20,000 pounds annual combined | 5,541 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 23,920 |
| | | | | | -- | -- | 26,199 | 24,819 | 33,803 | 24,360 | 24,360 | 64,734 | 63,664 | 66,408 | 66,348 | 42,050 | |
| | | | | | (--) | (--) | (26) | (11) | (66) | (115) | (312) | (617) | (984) | (1,794) | (3,606) | (539) | (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 | |
|------------|----------------|------------------|---------------------------------------|------------------------------------|---------|-------|---------|-------|-------|-----|-----|-----|-----|-----|-----|------------------------------------|-----|
| | | | | | Nov '17 | Dec | Jan '18 | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | | Oct |
| 2017 | White Sturgeon | Juvenile rearing | Wells White Sturgeon Supple-mentation | <i>Up to 325</i> | 1,299 | 1,262 | 1,182 | 1,175 | 1,135 | 340 | -- | -- | -- | -- | -- | -- | |
| | | | | <i>Culled</i> | -- | -- | -- | -- | -- | 36 | -- | -- | -- | -- | -- | -- | |
| | | | | <i>Transferred Wells reservoir</i> | -- | -- | -- | -- | -- | 853 | -- | -- | -- | -- | -- | -- | |
| | | | | | -- | -- | -- | -- | -- | -- | 338 | -- | -- | -- | -- | -- | 338 |
| 2018 | White Sturgeon | Juvenile rearing | Wells White Sturgeon Supple-mentation | <i>Up to 325</i> | -- | -- | -- | -- | -- | -- | -- | -- | 969 | 794 | 261 | 103 | |
| | | | | <i>Culled</i> | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| | | | | <i>Transferred Wells reservoir</i> | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| | | | | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |