

Oregon Lower Columbia River Recovery Plan Annual Report Card for 2019 and 2020

This annual report card is an abbreviated status report that reviews the most recent research, monitoring and evaluation data for Lower Columbia River (LCR) Salmon and Steelhead. The Oregon Department of Fish and Wildlife (ODFW) uses viable salmonid population (VSP) metrics, where they exist, to annually assess recent trends relative to plan objectives. This annual review serves as an early warning system regarding the need for potential adaptive management. The annual report card also documents formal adaptive management decisions, recommendations, and actions to assist in achieving plan goals under the delisting scenarios. The following web site <http://www.odfwrecoverytracker.org/> contains information on VSP metrics and plan goals.

The COVID-19 pandemic greatly affected ODFW's monitoring efforts for all species covered under the LCR Salmon and Steelhead Recovery Plan as well as Recovery Tracker maintenance. The lack of information did not allow for the finalization of the 2019 report card and limits analysis for the 2020 report.

Coho: (ESU wide)

A reduced level of effort occurred in 2020 for coho spawning surveys due to budget reductions and safety concerns associated with COVID-19. The reduction in effort led ODFW to only achieve 51 percent of the goal for randomly selected coho salmon spawning surveys. Reliable abundance estimates at the population level are not achievable with the reduced effort, so only strata and Evolutionarily Significant Unit (ESU) scale estimates are reported for 2020 except for the Clatskanie population.

Wild adult coho spawner abundance increased across the ESU from 2018 to 2019 and again from 2019 to 2020. The ESU realized a 37 percent increase in spawner abundance in 2019 and a 2.5-fold increase in 2020. Spawner abundance at the population level for 2020 increased in both the Clatskanie and Clackamas populations. The Clatskanie population showed an increase from 25 spawners in 2018 to 1,233 spawners in 2020. The Clackamas showed even a greater increase from 3,159 spawners in 2018 to an estimated 11000+ spawners in 2020, a new record since monitoring began in the 1950's. The 2020 Clackamas coho run is a minimum estimate based on North Fork Dam counts and is not a population estimate. The ESU increase in spawner abundance was similar to the increase in Columbia River "up-river" coho, which increased three-fold between 2018 and 2020. The Oregon Coast Coho ESU experienced a moderate increase of 32 percent during the same time. For Lower Columbia River (LCR) coho, marine survival was low for the 2019 cohort and moderate for the 2020 cohort.

Analysis of VSP metrics to the interim measurable criteria for biological viability was last conducted in 2018 for the abundance and productivity (A/P) and spatial structure metrics and 2019 for the diversity metric. The addition of the 2019 diversity data has not changed the attainment potential for any population's VSP goals. The Scappoose, Clatskanie, Sandy, and UG/Hood populations will not pass the A/P goals. The Clatskanie, Scappoose, Clackamas, Sandy, and Upper Gorge (UG)/Hood populations will not pass the spatial structure goals (percent occupancy of habitat) and the Clatskanie, Lower Gorge and Hood will not pass the diversity goals, percent hatchery fish on spawning grounds [pHOS]. While the Clatskanie 9-year average pHOS is above the 10 percent goal, the abundance of hatchery fish on the spawning grounds remains similar among the years and typically less than 10 percent. For 2017-2018, natural origin spawner abundance approached zero leading to an elevated pHOS value.

Examination of average coho abundance pre and post plan adoption (2002-2009 v. 2010-2019) shows all primary populations increasing. Due to sampling difficulties, ODFW is unable to detect, with accuracy, trends in the Lower Gorge and UG/Hood populations.

The 2019 LCR coho harvest for ocean and Columbia River fisheries (19.5 percent) and the 2020 LCR coho harvest (7 percent) both remained below the National Marine Fisheries Service (NMFS) harvest guidelines of 23 percent (2019) and 18 percent (2020) for all populations that are subject to the interim evaluation criteria. Combined ocean and Columbia River harvest remains below the LCR coho harvest matrix guidelines for nine of 10 years.

Fall Chinook: (ESU wide)

Abundance based surveys began across the ESU in 2012. Index counts go back further in the Clatskanie and Sandy populations. The average return of natural origin spawners over a nine-year period to the ESU is 2,636 spawners which includes a late fall Chinook population only occurring in the Sandy Basin. The combined Sandy River fall and late fall Chinook populations account for 76 percent of the ESU estimate. Currently, Sandy River fish abundance estimates are problematic because two populations (fall and late fall Chinook) overlap spatially and temporally and abundance for the two populations is reported as a fall Chinook abundance estimate. Staff collected otoliths and genetic material from carcasses on the spawning grounds to proportion spawners between the different runs. ODFW secured funding in 2018 to process these samples and analyzed the materials in 2019. In the 12-year plan assessment that begins in 2022, ODFW will use this information to investigate the potential to proportion Chinook spawners between the fall and late fall runs.

Assessment of A/P goal occurs during a comparison of interim measurable criteria to yearly abundance goals. Yearly A/P goals only exist for the Clatskanie population. The Young's Bay, Big Creek, Clatskanie, and Scappoose populations continued to return at extremely low numbers (0-50) over both years. The Clackamas population experienced an increase of 24 percent to 880 spawners in 2019 but decreased by 88 percent to 102 spawners in 2020. The combined fall

Chinook and late fall Chinook abundance estimate in the Sandy decreased by 48 percent to 2,449 spawners in 2019 and had a slight increase by 16 percent to 2,921 spawners in 2020. ODFW is not producing VSP estimates for gorge strata populations.

Under the interim measurable criteria for assessing biological viability, the Clatskanie is the only population with A/P goals and is failing. While no A/P goals exist for any other population in the ESU, yearly abundance levels are near zero for all coastal strata populations and are a concern. The department echoed this concern during the current NMFS five-year status review. The Youngs Bay, Big Creek, and Clatskanie, populations will not be able to attain pHOS goals under the diversity metric.

Estimates of harvest data for LCR fall Chinook are made yearly at the ESU level for ocean and mainstem Columbia River fisheries (below Bonneville Dam). The ESU is subject to a yearly harvest rate under an abundance-based management harvest matrix. The 2019 & 2020 calculated harvest rates, for ocean and Columbia River fisheries (31.1 percent and 25.7 percent respectively) are below the allowable harvest rate of 38 percent, except possibly for the Hood River population. Harvest upstream of Bonneville Dam is not calculated and the total harvest rate is unknown for the Hood River population. Combined ocean and Columbia River harvest remains below the yearly allowable rate for 10 of 12 years. The last exceedance of the harvest matrix occurred in 2012.

Late-Fall Chinook: (Sandy)

VSP information is not available until ODFW uses the results from genetic sampling to proportion spawner estimates among fall and late fall Chinook. This population received a designation as a low risk of extinction, but finalization of the methodology to assess VSP metrics is incomplete (see explanation under Sandy fall Chinook).

Spring Chinook: (Clackamas, Sandy, and Hood)

Analysis of spring Chinook at the ESU level is not fully available due to a lack of complete data for the 2020 return year. Wild spring Chinook in the ESU decreased by 10 percent to 4,648 spawners in 2019. Based on 2020 Clackamas spring chinook counts at North Fork Dam (4,127 wild adults passed) it is presumed that the ESU rebounded in 2020.

Clackamas spring Chinook population abundance remained essentially the same between 2018 and 2019 and likely nearly doubled in 2020. The Sandy population decreased in abundance by 15 percent from 2018 to 2019 to 2,348 spawners. No A/P goals exist post 2017, but both populations continue to remain above the Conservation and Assessment Tool for Anadromous Salmonids (CATAS) 100-year average delisting goals and are the healthiest populations within the entire ESU. Since the removal of Powerdale Dam in 2010, estimates of naturally produced spring Chinook in the Hood population have been unavailable due to limited Passive Integrated Transponders (PIT) tag interrogation data. Natural origin spring Chinook passed at Moving Falls

on the West Fork Hood River remain at low numbers (21-36 spawners) during years 2018-2020. Yearly A/P goals do not exist for Hood River spring Chinook.

ODFW calculates harvest for LCR spring Chinook at the ESU level for ocean, mainstem Columbia River and tributary fisheries. The LCR ESU populations are subject to a yearly combined ocean and freshwater harvest rate of 25 percent. Sandy spring Chinook passed this metric every year since plan adoption. Harvest on Hood River spring Chinook is not currently available as no methodology exists to estimate harvest impacts occurring upstream of Bonneville Dam (the average impact rate to Bonneville Dam is 15.0 percent). Clackamas spring Chinook are part of the Upper Willamette ESU recovery domain and harvest remains below the evaluation threshold of 15 percent for freshwater fisheries for all years since plan adoption.

Winter Steelhead: (Clatskanie, Scappoose, Clackamas, Sandy, Hood)

Winter steelhead in the LCR Distinct Population Segment (DPS) return to the Clackamas, Sandy, and Hood Rivers. Winter steelhead in the Southwest (SW) Washington DPS return to the Youngs Bay, Big Creek, Clatskanie, and Scappoose populations. Winter steelhead in the LCR DPS followed similar return trends as the Oregon Coast DPS. The LCR DPS experienced a 61 percent decline from 2018 to 2019 at 3,694 spawners and realized a 25 percent increase between 2019 and 2020 at 4,958 spawners. SW Washington winter steelhead redd surveys are only conducted in the Clatskanie and Scappoose populations so a SW Washington DPS analysis is unavailable for this unlisted population.

Analysis of VSP metrics to the interim measurable criteria for biological viability was last conducted in 2018 for the abundance and productivity metric and 2020 for the diversity metric. Adult abundance in the Clackamas, Sandy and Hood all decreased from 2018 to 2019 (49, 68 and 35 percent respectively). The Clackamas, Sandy and Hood populations all saw a rebound between 2019 and 2020 (39, 25, and 7 percent, respectively). Under the interim measurable criteria for biological viability, the Hood River population will not meet the diversity goal (pHOS). The Hood River winter steelhead hatchery program addressed this issue in 2018 through a revised Hatchery Genetic Management Plan. The Sandy population remains above long-term broad sense recovery goals.

The Clatskanie and Scappoose returns remained nearly static from 2018 to 2019 and both saw increases from 2019 to 2020. These populations do not have delisting goals since this DPS is not listed, but each population has broad sense recovery goals. The A/P goal for adult spawners is 4,100-5,200 adults. The three-year average for adult returns to the Clatskanie is 423 spawners and 25 spawners in the Scappoose. During the writing of the recovery plan, abundance estimates for this DPS ranged from 2,000-3,500 spawners for each population. While both populations rebounded in 2020, they are both far from the abundance estimates modeled during recovery plan development.

Summer Steelhead: (Hood)

Adult returns of summer steelhead to the Hood population in 2018 and 2019 remained the same at 150 spawners and dropped to 29 spawners in 2020. Analysis of VSP metrics to the interim measurable criteria for biological viability was last conducted in 2018 for the abundance and productivity metric and 2020 for the diversity metric. Percent hatchery stray rates have been zero since 2015.

Chum Salmon: ESU

Lower Columbia River chum populations on the Oregon side of the river exist at a fraction of their historical abundance, with seven of eight populations considered functionally extirpated. Origin of returns come from local production, strays from Washington and returns from the Big Creek Hatchery (BCH) brood stock program. Currently there is no ESU-wide monitoring program for chum salmon.

Returns of chum salmon to BCH were very low from 2016 through 2019. In the spring of 2017 and 2018, only 32,745 and 84,958 fry, respectively were released from BCH which failed to meet the program's minimum release goal (110,000 fry). Consequently, ODFW secured an agreement with Washington Department of Fish and Wildlife (WDFW) to reestablish egg transfers to supplement the BCH brood stock for the 2018 brood year (BY), resulting in a release of 171,649 fry. Adult returns improved slightly in 2019 but still required broodstock supplementation from Grays River, WA to achieve the release goal of 110,000 fry. The highest adult return to BCH in the last 40 years occurred in 2020. This unexpected large return of adults to BCH made egg transfers from Grays River, WA brood stock unnecessary and no eggs were transferred in 2020. The large return allowed ODFW to meet the fry release goal at BCH (351,358 annual fry released in 2021) and to out-plant adults into Bear and Little Bear Creeks in the Big Creek population to spawn volitionally.

Monitoring conducted by ODFW and WDFW has demonstrated that Columbia basin chum salmon average marine survival rate is significantly lower than from Coastal populations, Puget Sound, British Columbia, or Alaska. Due to this difference, identification of potential limiting factors associated with marine survival drove research efforts. Beginning in 2018, the Chum project, in partnership with Oregon State University (OSU), initiated research to understand whether the endemic parasite *Ceratonova shasta* causes mortality in juvenile chum salmon. Staff collected and processed water samples throughout the lower Columbia River and tributaries to identify the distribution and density of the parasite. In 2018 and 2019, sampling efforts detected the parasite in water samples from locations historically occupied by chum salmon where they are currently extirpated. The parasite was generally not found in locations where chum salmon currently spawn. Moreover, water samples contained spores during the time of year when chum fry occupy freshwater habitat in the Columbia River estuary.

To determine lethality of *C. Shasta*, lab and sentinel cage studies occurred in 2019 with fish from two hatchery stocks, BCH and Washougal Hatchery (WH). In the first lab trial, fish experienced exposure to *C. shasta* at a density of five spores/L between two and 13 days. All exposed fish

died. In the second lab trial, fish experienced exposure to five individual spores/L over a six-hour period; 80.5 percent of BCH fry and 83.3 percent of WH fry became infected with *C. shasta* and died. For the sentinel trial, evaluation occurred at three locations and staff placed fish from both hatcheries in separate cages at each site. Mortality did not differ among hatchery stocks but differed significantly among sites. At the Willamette River, 100 percent of fish died. At Tongue Point on the Columbia River, 98 percent of fish died. At the Lewis and Clark River, 11.1 percent of BCH fish and 12.9 percent of WH fish died.

The Chum Love work group worked with a consultant to finalize a strategic action plan and landowner outreach plan. These plans are comprised of prioritized restoration actions that deliver the highest ecological impacts for chum salmon in the Young’s Bay and Big Creek populations. The work group re-branded Chum Love to Return of the Redds (<https://www.returnoftheredds.com>) in 2020 and proceeded with public outreach. Also in 2020, ODFW developed a Chum Salmon Reintroduction Project website (<https://odfwchum.forestry.oregonstate.edu/>) to inform the public of recent projects, ongoing research, and updates about reintroduction efforts of chum salmon in the LCR.

Habitat Restoration and Effectiveness Monitoring-

The department created a modification of plan ESU-wide restoration goals in 2014 as a more reasonable target for restoration practioners. The revised goal setting occurred based on best available science and modeled in threat reduction scenarios to reduce tributary habitat mortality to a level that is consistent with plan mortality rates for each population, under the delisting scenario. The habitat restoration targets are useful as a starting point to visualize the relative amount and types of restoration work needed in tributaries. When practioners meet these goals, all implementers are encouraged to continue to implement additional projects until biological viability occurs and achievement of habitat restoration goals under the broad sense recovery also occur. Table 1 lists habitat restoration accomplishments by population for 2019 and 2020.

Table 1. Habitat Restoration Projects Completed within the ESU during 2019 and 2020*

Population	Culverts Replaced (#)	Water Conserved(cfs)	LWD placed (mile)	Irrigation Improvement Projects (#)	Side Channel Creation (mile)	Alcove Creation (m2)	Riparian Planting (mile)
Young’s Bay	1						3.0
Big Creek							.1
Clatskanie	1						.2
Scappoose	1/1		.3/.65				3.66/.78
Clackamas	5		.02/1.89		.27	21,372	10.35/5.01
Sandy	1/8		4.17/1.6		2.37/.23	1602	2.42
Lower Gorge			.5				.5
Upper Gorge							

Hood	2/2	0.5	1.0	3/3			.94
Total	22	0.5	10.13	6	2.87	23,334	26.96

*Information from OWEB and BPA databases as well as annual and restoration practitioners reports

The recovery plan gives a schedule for completing habitat restoration goals as within 15 years. Eleven in-water work periods have passed since plan adoption. If practitioners were on track to meet restoration goals, under the delisting scenario and over this 15-year period, then 73 percent of the goals need completed in each population. The Young's Bay and Sandy populations are on track to meet all the restoration goals under the delisting scenario. The Clackamas and Scappoose populations achieved restoration goals for riparian and off-channel habitat. The remaining populations vary from 0-42 percent of the goals.

Key accomplishments from local restoration practitioners:

- Metro secures and protects 163 acres and 1.22 miles of salmon and steelhead spawning streams in the Clackamas and Sandy populations.
- The States of Oregon, Washington, Idaho, and Columbia River Tribes submit application for removal of California and Stealer Sea Lions to NMFS under section 120 of the Marine Mammal Protection Act and receive approval.
- The Clackamas Partnership implements their first-year suite of projects under an OWEB six-year Focused Investment Partnership (FIP) grant.

Adaptive management:

Revision to the Hood River Hatchery Genetic Management Plan (HGMP) occurred to incorporate 100 percent wild broodstock into the winter steelhead hatchery program.

Research Monitoring and Evaluations Addendums:

While not adaptive management per se, monitoring of fish populations is critical to a yearly assessment of the effectiveness of plan actions and prioritization of limited monitoring funds.

Staff recommend the following actions for implementation:

- With the analysis of Sandy basin chinook genetic samples complete, ODFW staff needs to take the results and investigate the possibility of proportioning Chinook counts into fall, late fall, and spring run types to define population estimates for Sandy chinook runs.
- Start process for conducting 12-year ESU assessment.
- Resume annual implementation team meetings.

The web site http://www.dfw.state.or.us/fish/CRP/lower_columbia_plan.asp contains past reports as well as presentations and a host of LCR Recovery Plan information.

Recovery Plan Adopted: August 2010

Date Reviewed: December 2021

