PUBLIC COMMENT TO TACOMA POWER BOARD TRANSCRIPT- APRIL 24,2024

Thank You for this opportunity to address the board, my name is Larry Pryor and I am a concerned sport angler and Cowlitz River fisheries advocate for over 3 decades.

I am here tonight to comment on the collapse of Cowlitz River Fisheries, TPU funded Hatchery mismanagement, and the Crisis of Tacoma Power's failure to uphold its fisheries mitigation responsibilities.

I'm concerned you may not be aware of the scope of the problems TPU is facing. My comments and those of others tonight, are to inform you of the problems and suggest ways to improve the efficiency and efficacy of the rate payer dollars you are wasting.

We've been making similar comments about our concerns through ADHOC, CRAG and Tacoma Power Fisheries Technical Committees and Annual Program Reviews for years now to little improvement. We hope by making you aware of these problems you can question staff and your WDFW partners to gain an understanding of the problem.

In a nutshell: **99% or greater of the fish released from TPU funded hatcheries Fail to Return to the Cowlitz River.**

99.94% of the Fall Chinook salmon released from TPU funded hatcheries Fail to Return to the Cowlitz river! SARs .00060 /.060%

99.76% of the Spring Chinook Salmon released from TPU funded hatcheries Fail to return to the Cowlitz river! SARs .002442 /.24%

98.4% of Coho salmon released from TPU funded hatcheries Fail to Return to the Cowlitz river! SARs .016 /1.6%

98.2% of Winter Steelhead released from TPU funded hatcheries Fail to Return to the Cowlitz river! SARs .0176 /1.76%

98.2% of Summer Steelhead released from TPU funded hatcheries Fail to Return to the Cowlitz river! SARs .018 /1.8%

These are Five-year averages 2019-2023 SARs= Smolt to Adult Returns

Tacoma Power funded Cowlitz fish hatcheries have some of the worst survival rates for hatchery fish we've seen, and the numbers in the report analysis I have provided in front of you support my assertions.

The problem has become so severe that it became an issue for 3rd district Congresswoman Jaimie Herrera Beutler who penned a letter to FERC reiterating many of our claims.

In TPU's Natural Resources manager Matt Bleich's April 7, 2021 response to FERC regarding the Congresswoman's letter regarding survival rates of hatchery fish he stated:

"One of the primary areas of interest for Tacoma Power and the FTC is to improve and maintain the highest survival rates possible for hatchery and natural origin fish".

Unfortunately, three years later we are still in crisis mode and no effective actions have been taken.

Actual actions so far are a fishery disaster.

Millions and Millions of Dollars are spent by Tacoma Power on the Cowlitz River project to meet mitigation responsibilities and you're failing. Shouldn't you be expecting more value for your ratepayer money? We do!

This Crisis may very well create future FERC licensure problems for your mitigated Cowlitz River Project, Dams, and power sales, if not corrected by you soon.

There are three primary problems I see in regards the Cowlitz River fisheries failures.

1 Tacoma Power, and its contractor WDFW, manage juvenile production goals and not to Adult Return Goals. The Original 1960's Cowlitz Hydro project plans called for adult return goals.

2 Poor antiquated hatcheries management practices result in diminishing adult returns and declining fisheries which limit wild fish recovery!

3 Cowlitz River anglers, businesses, and advocacy groups decades long discussions of these problems at such forums as ad hoc, CRAG and Fish Technical Committees, have not been communicated to this board regarding the failing fisheries and Tacoma Utilities Director has not recognized and acted to avoid these crises and concerns.

My comments and the attachments backing them up detail the critically poor returns to the Cowlitz River, unsuccessful hatchery practices, closed and curtailed sport fisheries, and failing wild fish recovery.

All Cowlitz River fisheries and Tacoma Power mitigated Recovery efforts are failing due to Hatchery operations mismanagement and basic policy failures.

Failing fisheries and recovery efforts, Poor hatchery management practices, Settlement Agreement requirements not met, and much more.

The Hatchery Science and Research Group /HSRG 2009 and 2015 Report to U.S. Congress declares: Make your Hatcheries Successful! Maximize Survival of Hatchery Fish;

In order for hatchery programs to effectively contribute to harvest and/or conservation, the reproductive success and survival of hatchery releases **must be high relative to those of naturally spawning** populations. The primary performance measurement for hatchery programs should be the total adults produced (harvest plus escapement) per adult spawned at the hatchery. **All too often in the past, hatcheries have been evaluated based on the number of smolts released.**

You will first hear that "we can't control ocean impact", But that's why we did comparatives following HSRG guidelines.

Within the report I include comparatives of Cowlitz River Wild fish **returns that are 3 to 13** times greater than your hatcheries and Mid-Columbia **returns that are 5 to 25** time greater than your Cowlitz River hatcheries with the same Ocean Impact as Cowlitz River fisheries!

This presentation is an analysis of publicly available data collected by WDFW, Tacoma Power, NOAA, Pacific States Marine Fisheries Commission, Bonneville Power, and other agencies. I wonder, however, if you have had it presented to you in this sort of format.

Your Immediate attention will be appreciated.

Thank you. I am available for any further questions at the end of this meeting or using the contact information I have provided.

Larry Pryor

LIST OF APPENDICES

Appendix #

1 LIST OF DEFINITIONS, ACRONYMS, AND RELATED ASSUMPTIONS
HSRG Guidelines- Make Your Hatcheries Successful

2 CURRENT TRENDS/FAILURES IN COWLITZ RIVER FISHERIES
- This is where you're at! Overview
Severe Decline presentation. WDFW 2023 Presentation- recent trends in Cowlitz River Salmon and Steelhead Harvest. SAR calculations by species both hatchery and natural origin

3 SETTLEMENT AGREEMENT RESPONSIBILITIES
Settlement Agreement Section 6.- Priorities for future action
6.1.1, 6.1.2, 6.1.5, 6.1.6,
Settlement Agreement Article 2. Downstream Passage-
Mayfield Fall Chinook Dam Collection
2014 study, 2015 Report of parasite infected fish, subsequent oral reports at FTC meetings greater than 90%.
No Possible Mayfield, Tilton recovery outcome will be achievable.
CFFF Cowlitz Falls Fish Facility Operations
Capture and Release Data
Failure of Tacoma Power Settlement Agreement Restoration and Recovery directives

4 HATCHERY OPERATION CURRENT MANAGEMENT PROBLEMS
Tacoma Power Hatcheries Releases, poundage calculations
Poundage practices that meet Settlement Agreement /S.A. poundage but poor fish culture practices, too large of fish released Spring Chinook (average 60+ grams) etc - Rising hatchery jack vs N.O. jacks concerns

5 RECOMMENDATIONS FOR IMPROVEMENT
Recommendations to improve hatchery operations and management.
Change from production policies to Adult Return Goal Policies- if not by policy by philosophy

6 CONSEQUENCES OF FAILURE TO IMPROVE
Complaint letter to FERC by Congresswoman Herrea-Beutler
Response by Matt Bleich TPU Natural Resources manager

7 HATCHERY SCIENCE RESEARCH GROUP- Make Your Hatcheries Successful

8 CURRICULUM VITAE- Larry Pryor
Fishing the Cowlitz River since early 90s for steelhead and salmon.
Cowlitz River fisheries Advocate

9 FURTHER RESOURCES AND REFERENCES

APPENDIX 1

Necessary Definitions, Abbreviations and Assumptions

Definitions

Smolt to Adult Returns (SARs) -Percentage of fish that return as adults compared to number of juveniles released

Failure to Return (FTR)- Percentage of juvenile fish that fail to return due to post release mortality

Hatchery Origin (H)-Fish spawned, reared and released from hatcheries

Natural Origin (N.O.)/ Wild- Fish spawning, hatching and rearing naturally on in river spawning grounds

Abbreviations

HSRG- Hatchery Science Research Group.

BPA- Bonneville Power Administration.

FPC- Fish Passage Center

CSH- Cowlitz Salmon Hatchery

CFFF- Cowlitz Falls Fish Facility

PRH- Priest Rapids Hatchery

Assumptions

Hatchery SAR reports are based on last 5 return years (5 year averages) for Fall Chinook Salmon, Spring Chinook Salmon, Coho salmon, Winter Steelhead, and Summer Steelhead/

HSRG – Hatchery Science Research Group, report to U.S. Congress, 2009, 2014- "Make your hatcheries Successful. The reproductive success and survival of hatchery releases **must be high relative to those of naturally spawning** populations"

Hatchery Science Research Group /HSRG report to Congress 2019, 2015 -Make your Hatcheries Successful!

1.1 Page 8, Summary Conclusions, 2015 report to U.S. Congress .

1.2 Maximize Survival of Hatchery Fish In order for hatchery programs to effectively contribute to harvest and/or conservation, the reproductive success and survival of hatchery releases **must be high relative to those of naturally spawning** populations. The primary performance measurement for hatchery programs should be the total adults produced (harvest plus escapement) per adult spawned at the hatchery. **All too often in the past, hatcheries have been evaluated based on the number of smolts released.**

https://www.streamnet.org/app/hsrg/docs/HSRG_Report-to-Congress_2015[1].pdf

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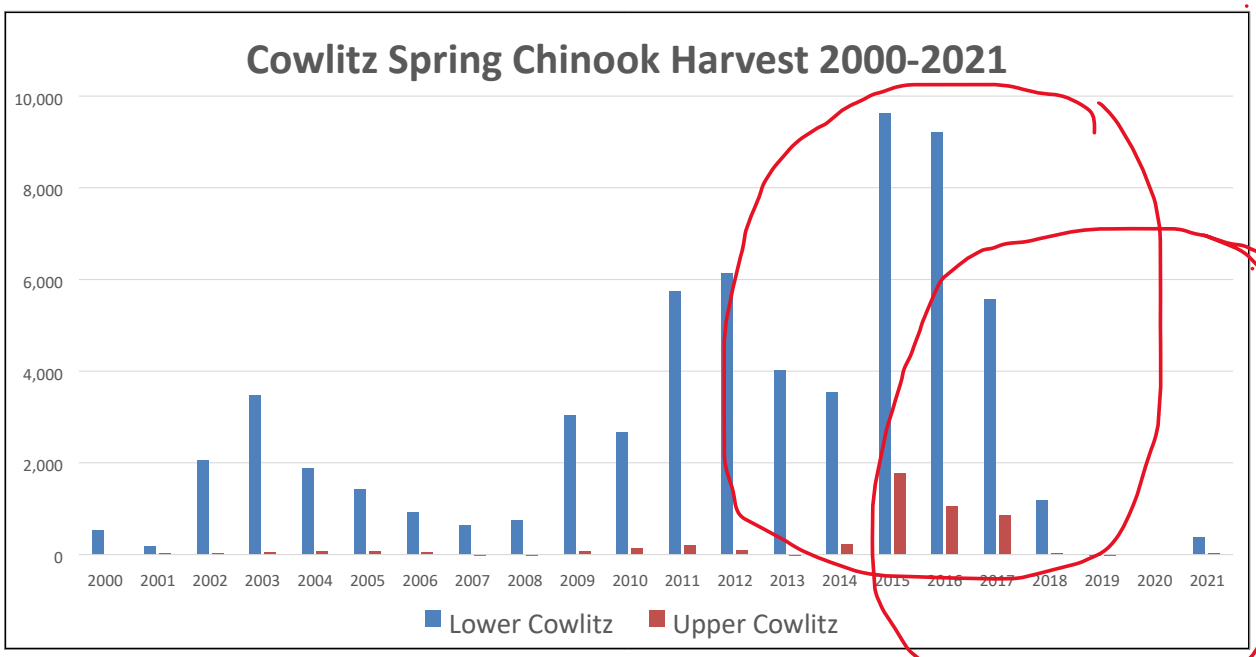
APPENDIX 2

CURRENT TRENDS/ FAILURES IN COWITZ RIVER FISHERIES

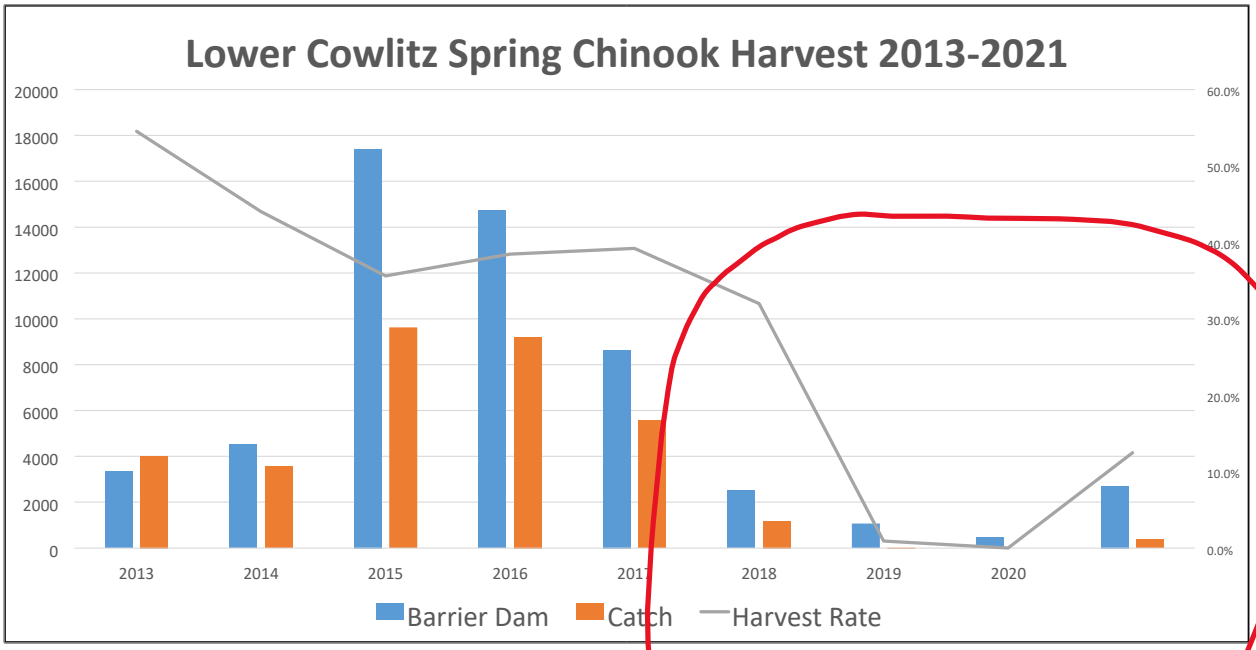
- The Severe Decline in Cowlitz River Fisheries
All fisheries began a Severe decline from 2016-17 to present.

THE FOLLOWING ARE EXCERPTS FROM WDFW HOLOWATZ AND SEARLS-presented at Tacoma Power APR, August 2023/ Recent Trends in Cowlitz River Salmon and Steelhead Harvest.
Cowlitz River Annual Program Review and Fisheries Science Conference Tacoma Power, August 22, 2023

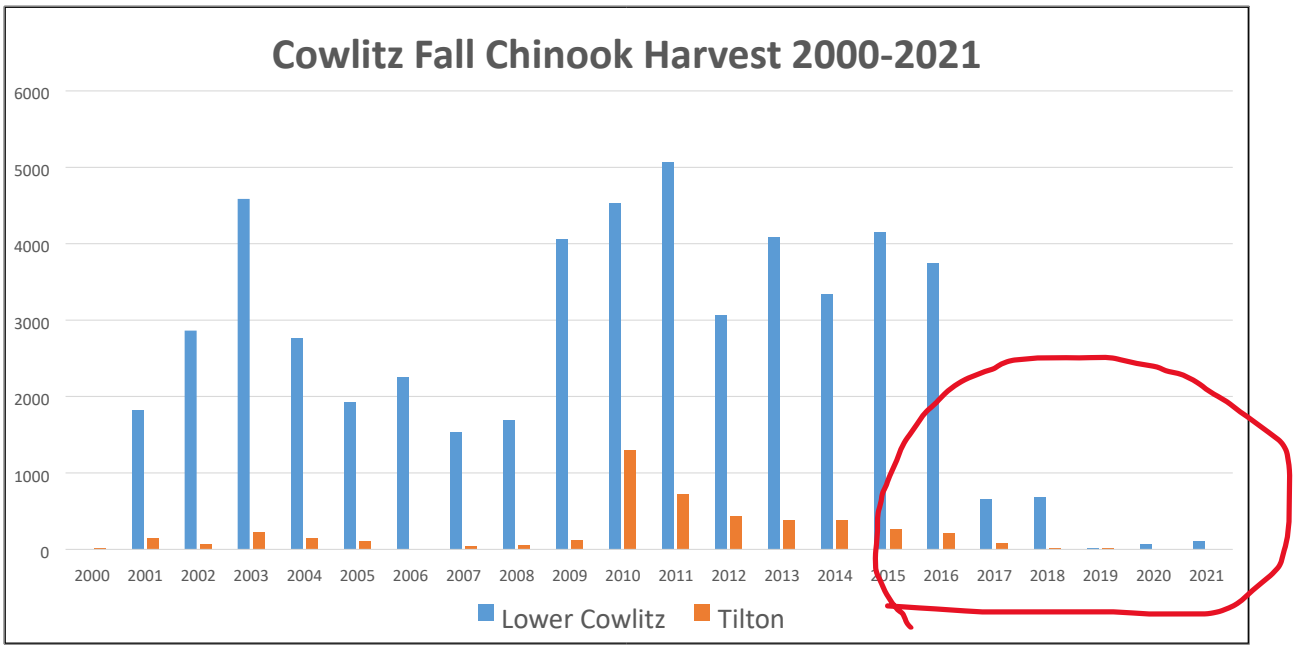
https://www.mytpu.org/wp-content/uploads/8_Holowatz-Cowlitz-Science-Harvest-Trends-82223.pdf (for clearer view



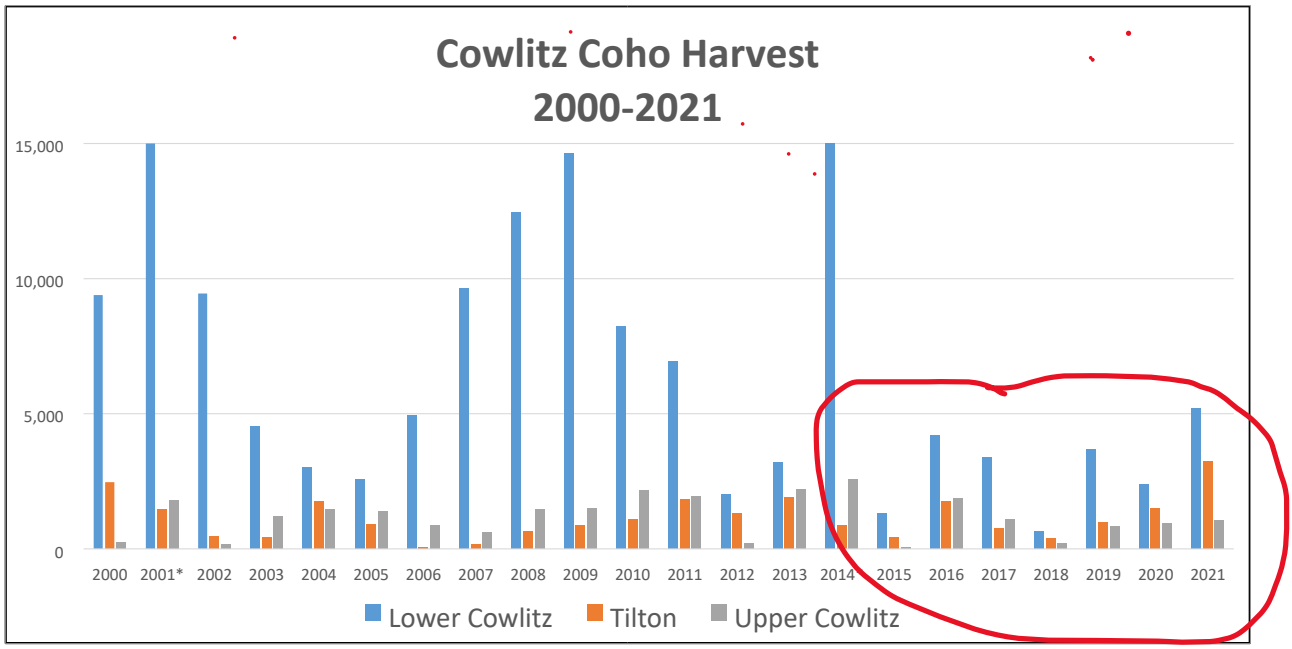
Blue= Lower Cowlitz,
Red= Upper Cowlitz



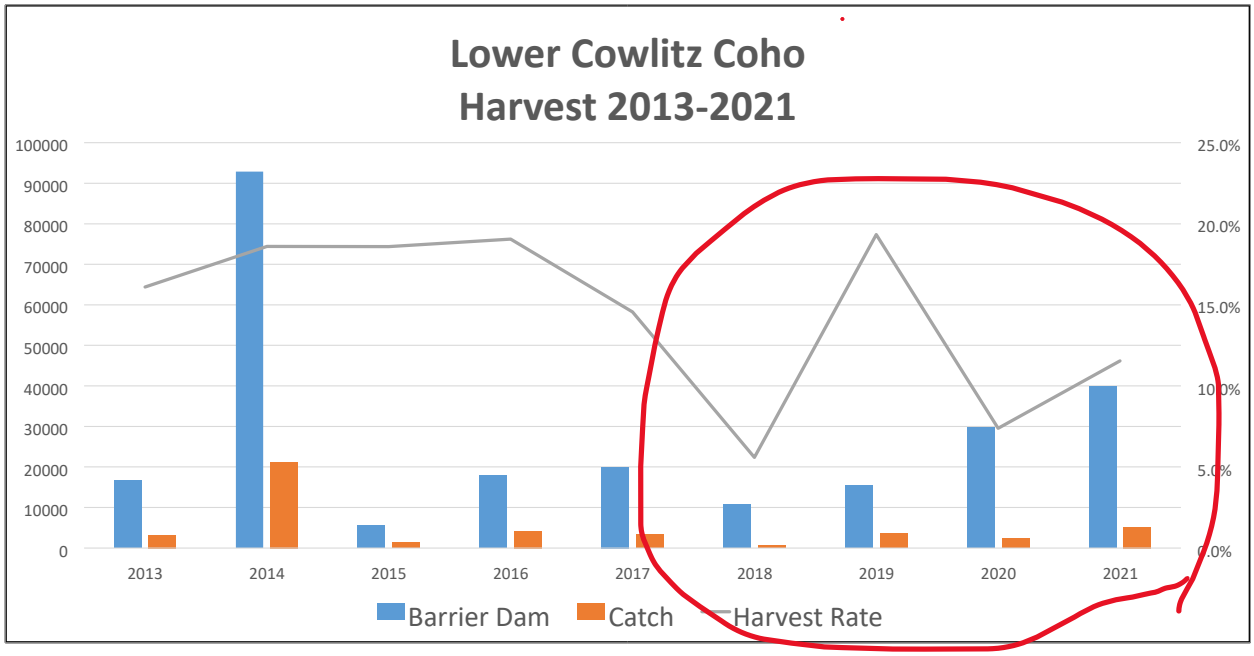
Blue= fish returns to Salmon Hatchery/ Barrier Dam,
Orange= Catch/ Harvest
Gray line= Harvest Rate %



Blue= Lower Cowlitz harvest
Orange= Tilton River harvest
2022 Fall chinook returns to Salmon hatchery= 949 Adults total, 2023 returns to hatchery= 885 Total Adults

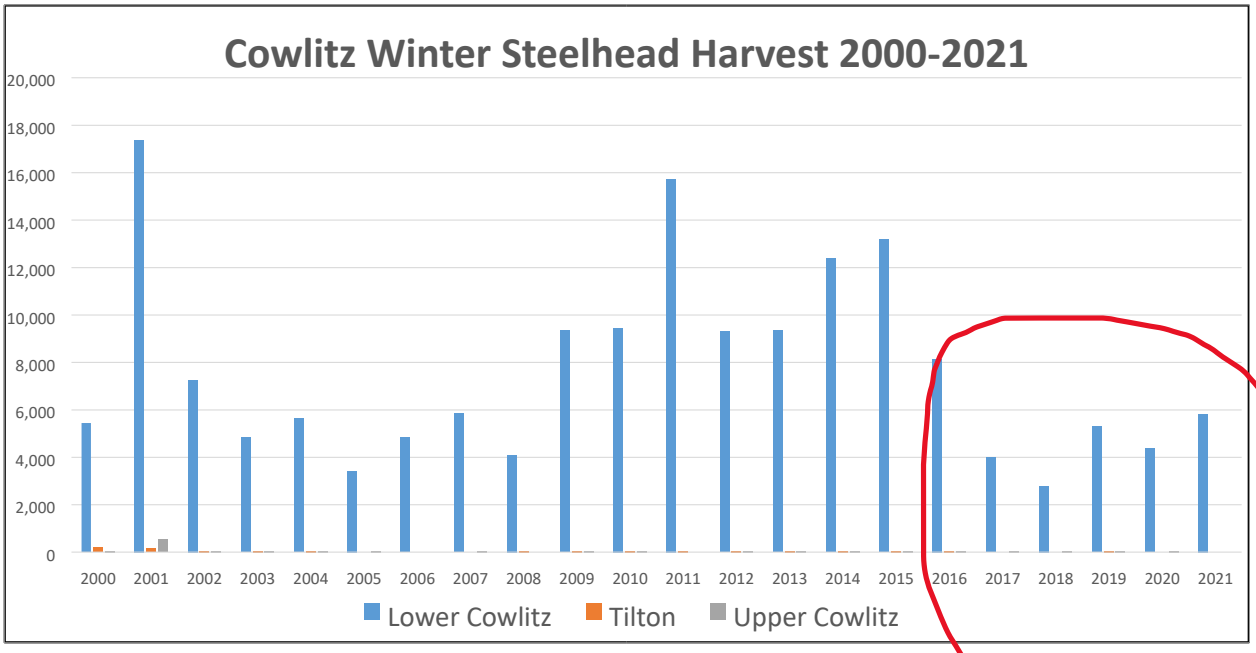


Blue bar= Lower Cowlitz Harvest, Orange= Harvest, Gray line= Harvest Rate 6-18% of return to hatchery, Gray line = Harvest Rate

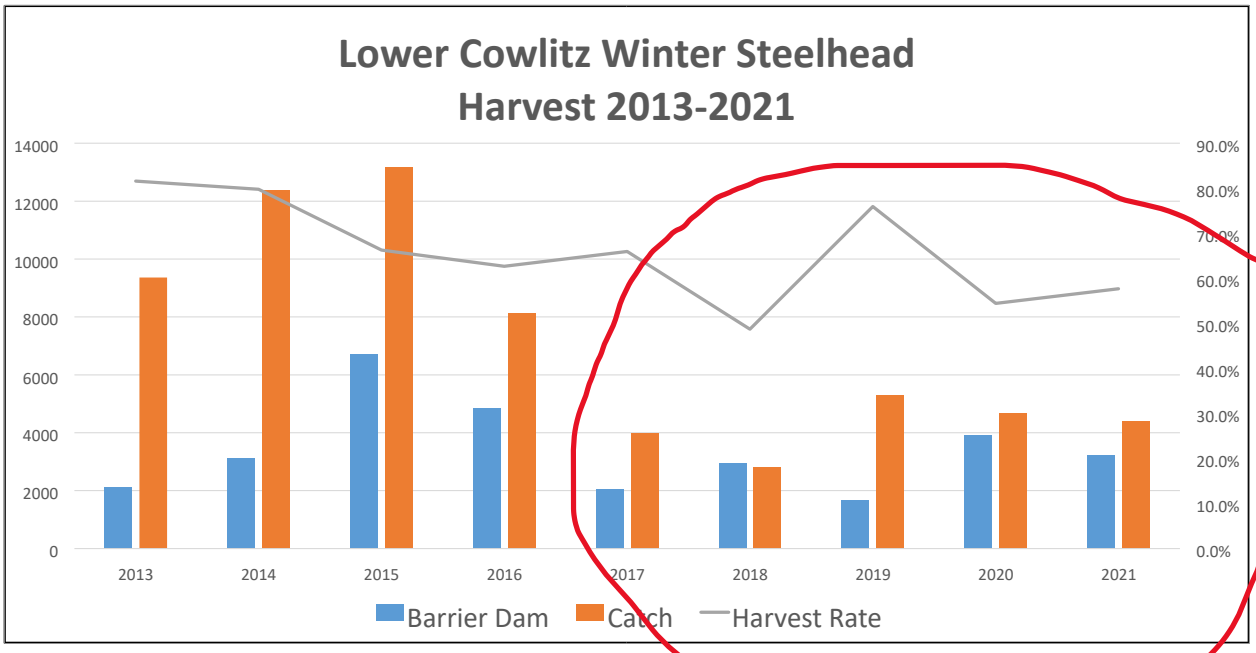


Blue= Lower Cowlitz, Orange= Tilton, Gray= Upper Cowlitz,

Gray line+ Harvest Rate 6-18%, 13% avg. Coho harvest rates only 13% avg compared to summer steelhead

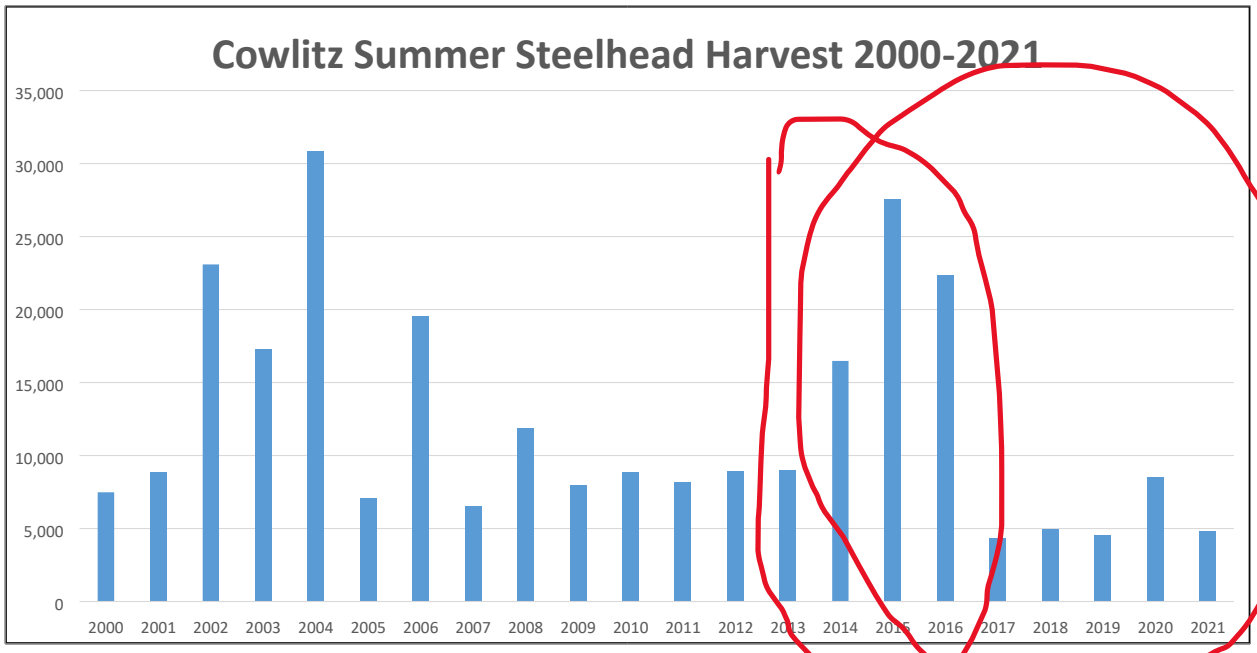


Blue= Fish returns to Salmon Hatchery/ Barrier Dam, Orange= Catch, Gray line= Harvest % of return to hatchery. 48-82%



Blue= return to Barrier Dam fish collector, Summer Steelhead Harvest, Gray line= Harvest rate

Declines continue into 2022 and 2023



Blue= fish return to Salmon Hatchery/ Barrier Dam, Orange= Lower Cowlitz harvest, Gray line= harvest rate 60-80% of return.

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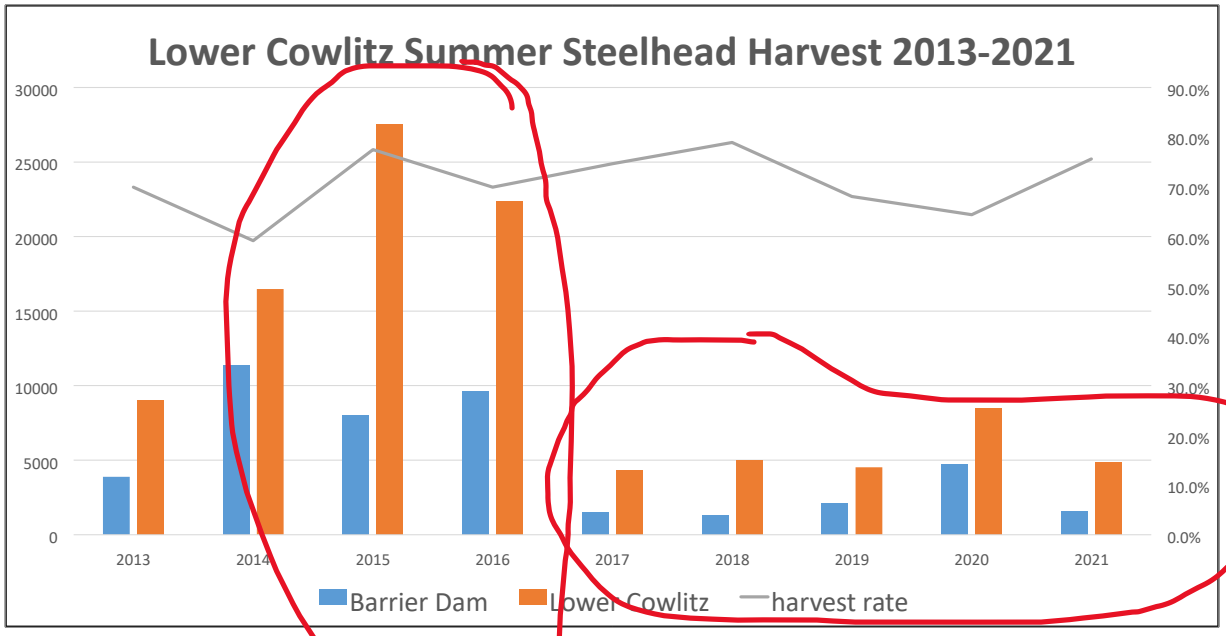


Blue= return to barrier dam fish collector, Orange= Lower Cowlitz harvest, Gray line= Harvest rate > 60-75%

Declines continued into 2022 and 2023

Cowlitz Harvest 2021 Year in Review

- Spring Chinook Harvest Rates • Lower Cowlitz = 15%, Upper Cowlitz = >1%
- Fall Chinook • Lower Cowlitz = 5%, Tilton = 0% Truncated Season
- Coho
- Lower Cowlitz = 11%, Tilton = 21%, U Cowlitz = 5%
- Winter Steelhead • Lower Cowlitz = 57% • Summer Steelhead
- Lower Cowlitz = 76%

Comparatives.

Comparative reports for Fall Chinook, Cowlitz river Wild Spring Chinook, Wild Coho Salmon and Wild Steelhead that are **3 to 25** times greater than Tacoma Power Funded Cowlitz Hatcheries.

Comparative SARs for Natural Origin Cowlitz River Salmon and Steelhead Returns for the last 5 years and 5 year averages.

Cowlitz River Natural Origin /N.O. returns to Barrier Dam fish collector.

N.O. Spring Chinook	SARs .032 /3.2%	13 times greater than hatchery
Cowlitz River N.O. Coho	SARs .0628 /6.8%	4 time greater than hatchery
Cowlitz River N.O. Winter Steelhead	SARs .0508 /5.1%	3 times greater than hatchery

Bonneville Power's Fish Passage Center CSS reports for Mid-Columbia, the worst is 5 times greater than Cowlitz Fall Chinook, others are 27 times greater.

HSRG – Hatchery Science Research Group, report to U.S. Congress, 2009, 2014- Make your hatcheries Successful. The reproductive success and survival of hatchery releases **must be high relative to those of naturally spawning** populations.

Spring Chinook Jack /Adult Ratios- Mini Jacks and Jack returns exceed Adult returns which is concerning and suggest poor hatchery fish cultures practices. Coho Jack/adult ratios are also increasing.

In this chapter we calculate Smolt to Adult Returns ratios (SARs) for the Cowlitz Salmon and Trout Hatcheries, as Failure to returns, 5 year averages. Over the past 5 years and the Millions and Millions of Dollars spent, 99% of the fish released by Tacoma Power Do Not Return to the Cowlitz River and Fishery!

**And Comparatives SARs -Priest Rapids Salmon Hatchery Fall Chinook returns
**Cowlitz River Natural Origin returns and SARs for Spring Chinook, Coho and Winter Steelhead
Fish Passage Center Mid Columbia

COMPARISONS OF COWLITZ RIVER HATCHERY STOCKS COMPARED TO COWLITZ RIVER NATURAL ORIGIN AND OTHER HATCHERY STOCKS.

99.94% of the Fall Chinook released Fail to Return to the river! **SARs .00060 /.060%**

99.76% of the Spring Salmon released Fail to return to the river!	**SARs .002442 /.24%**
98.4% of Coho released Fail to Return to the river!	**SARs .016 /1.6%**
98.2% of Winter Steelhead released Fail to Return to the river!	**SARs .0176 /1.76%**
98.2% of Summer Steelhead releases Fail to Return to the river!	**SARs .018 /1.8%**
These are Five-year averages 2019-2023 Returns	**SARs= Smolt to Adult**

Cowlitz River Natural Origin /N.O. returns to Barrier Dam fish collector.

N.O. Spring Chinook	SARs .032 /3.2%	**13 times greater than hatchery**
Cowlitz River N.O. Coho	SARs .0628 /6.8%	**4 time greater than hatchery**
Cowlitz River N.O. Winter Steelhead	SARs .0508 /5.1%	**3 times greater than hatchery**

Five-year average, Fish captured at the Cowlitz Falls Fish Facility, transported, and released at Salmon hatchery, returning to the salmon hatchery fish separator.

Priest Rapids Hatchery Fall Chinook Escapement to Hatchery

2019	16,783
2020	34,694
2021	31,331
2022	32,927
2023	**51,447**

We cannot do SARs for PRH as escapement does not include the Tens and Tens of Thousands of Fall Chinook captured from the mouth of the Columbia up to the hatchery by Recreational fisherman, Commercial Gillnet, Tribal pole, and Gillnet fisherman we cannot calculate.
** unclipped / Natural Origin Fall Chinook can be retained in most of the Columbia due to the Hanford reach N.O. counts, efforts by G.C.PUD to reestablish N.O. in the Hanford reach has been successful.

Priest Rapids Hatchery 2020 Fall Chinook releases 7,618,105

Cowlitz Salmon Hatchery 2020 Fall Chinook releases- 2,233,145 29.3%% of PRH

2023 returns to Cowlitz if PRH SARs and practices should have been – 15,074 Adults returning to the Cowlitz Salmon Hatchery Plus Cowlitz river Sports catch/ Harvest.

2023 Cowlitz Salmon Hatchery Fall Chinook returns- 885 Adults

Cowlitz Falls Fish Facility – year end Primary Smolt Collection Data, 2016- 2023,

Not presented in these reports- N.O. Spring Chinook releases primarily are 0+ smolts at approximately 10 grams +-, per conversations with CFFF staff over the years. CFFF Spring Chinook SARs are 13 times more than hatchery Spring Chinook

2016

Chinook-	fry 24, parr 0, Chinook 0+ smolts 3,602, Chinook 1+ smolts 523
Steelhead-	fry 1, parr 34, smolts 6,091
Coho-	fry 11, parr 27, 0+smolts 7,673, 1+ smolt 146,170
Cutthroat-	parr 40, smolt 1,139

2017

Chinook-	fry 618, parr 2,269, 0+ 56,049, 1+ 296
Steelhead-	fry 1, parr 34, smolts 6,091
Coho- fry	11, parr 27, 0+ smolts 7,673, 1+ smolts 146,170
Cutthroat-	parr 40, smolts 1,139

2018

Chinook-	fry 7,708, parr 479, 0+ 25,920, 1+ 1,150
Steelhead-	fry 103, parr 238, smolts 14,450,
Coho-	fry 9,350, parr 16,751, 0+ smolts 3,768, 1+ smolt 157,761
Cutthroat-	parr 106, smolts 1,070

2019

Chinook-	Fry 4,230, Parr 1,835, 0+ smolt 60,153, 1+ smolt 2,691
Steelhead-	Fry 28, Parr 373, Smolt 11,890
Coho-	Fry 6,621, Parr 11,138, 0+ smolt 7,067, 1+ smolt 177,158
Cutthroat-	parr 195, Smolt 686, Kelt 26

2020

Chinook-	Fry 697, Parr 107, 0+ smolt 6,541, 1+ smolt 784,
Steelhead-	Fry 95, Parr 258, Smolt 8,287, Kelt 657
Coho-	Fry 2,868, Parr 10,134, 0+smolt 4,123, 1+ smolt 123,421
Cutthroat-	Parr 341, Smolt 1,171, Kelt 29

2021

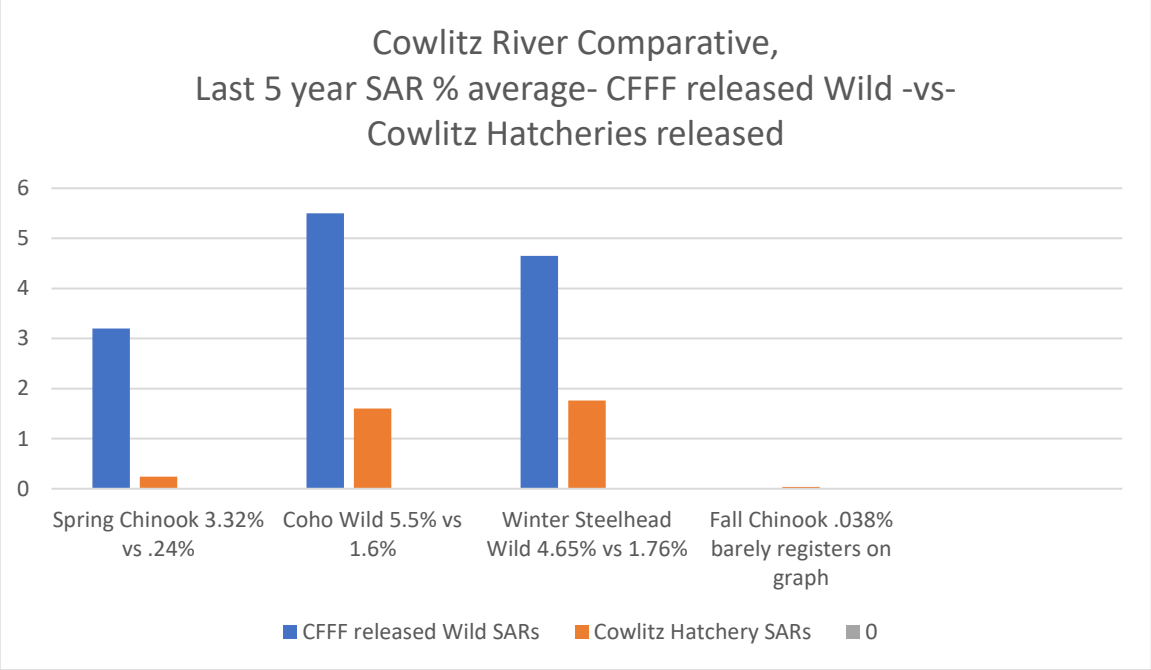
Chinook-	Fry 313, Parr 203, 0+ smolt 12,810, 1+ smolt 300
Steelhead-	Fry 313, Parr 874, Smolt 9,975, Kelt 340
Coho-	Fry 57,515, Parr 58,743, 0+ smolt 7,308, 1+ smolt 150,788
Cutthroat-	Parr 271, Smolt 1,528, Kelt 63

2022

Chinook	Fry 1,003, Parr 340, 0+ smolt 6,420, 1+ smolt 236
Coho-	Fry 87,853, Parr 17,766, 0+ smolt 6,898, 1+ smolt 95,196
Cutthroat-	Parr 206, Smolt 1,081, Kelt 54

2023

Chinook-	Fry 6,788, Parr 2,102, 0+ smolt 42,724, 1+ smolt 366
Steelhead-	Fry 231, Parr 851, Smolt 9,539, Adult 374,
Coho-	Fry 63,707, 20,397, 0+ smolt 4,486, 1+ smolt 167,415
Cutthroat-	Parr 210, Smolt 847, Kelt 50



2023 Fall Chinook returns to the Cowlitz Salmon hatchery= 885 Adults from 2,233,145 released in 2020, No Harvest /closed
2023 Fall Chinook returns to the Priest Rapids Hatchery= 51,447 Adults from 7,618,105 released- no complete SARs available as Harvest from mouth of the Columbia up 400 river miles to PRH unavailable to us, Tens, and tens of thousands.

CFFF =Cowlitz Falls Fish Facility
Cowlitz Hatchery =Cowlitz River Salmon Hatchery, Salkum Wa , Cowlitz River Trout Hatchery, Toledo Wa

SARS / Smolt to Adult Returns FTR / Failure To Return
Cowlitz River SARs

Cowlitz Salmon Hatchery

Fall Chinook	SARs	FTR
2019	.00038 / .038%	99.96 %
2020	.00087 / .087%	99.91 %

2021	.00073 / .073%	99.93 %
2022*	.00059 / .059%	99.94 %
2023*	.00043 / .043%	99.96 %
5 years released	13,833,176	
5 years returned	8,241	
5 year average SAR .00060	/ .060 %	99.94 %

Fall Chinook Salmon Hatchery Jacks to Adult ratio

5-year average	10.78 %
2019	22 %
2020	6.4 %
2021	2.5 %
2022	13 %
2023	10 %

Cowlitz Salmon Hatchery

Spring Chinook	SAR	FTR
2019	.00059 / .059 %	99.94 %
2020	.00021 / .021 %	99.98 %
2021	.00152 / .152 %	99.85 %
2022*	.004 / .4%	99.60 %
2023*	.004 / .4%	99.60%
5-year average SAR .002442 /	.24 %	99.76

****Spring Chinook Hatchery Adults to Jacks ratio.

	Adults	Jacks	Jack to Adult return %
2019	1,076	910	85 %
2020	471	2,005	426 %
2021	2,669	2,544	95 %
2022	4,925	4,854	98 %
2023	3,585	3,869	108 %
5 years	12,726	14,182	163 %

Cowlitz Salmon Hatchery

Coho	SAR	FTR
2019	.016 / 1.6%	98.4 %
2020	.012 / 1.2%	98.8 %
2021	.018 / 1.8%	98.2 %

2022*	.022 / 2.2%	97.8 %
2023*	.013 / 1.3%	98.7 %
5 Year	.016 / 1.6%	98.4 %

*Sports catch estimate 13.8% for SARs calculations

Coho	escapement	Sports catch	% of SC to esc.
2019	15,354	1,735	11.3%
2020	26,826	18,673	69.6%
2021	39,858	10,793	27%
2022	43,009	6,114 *	14%
2023	23,485	17,863*	76%
5 yeas	148,532	55,178	39.6%

Coho Sport Catch % of Hatchery Escapement

2017	17%
2018	6%
2019	24%
2020	9%
2021	13%
5 year average	13.8%

Coho Adult to Jack return Ratio, Wild vs Hatchery (returns to Barrier fish collector)

	Wild	Hatchery
2019	3%	11.3%
2020	6%	69.6%
2021	4.5%	27%
2022	1.5%	14%
2023	3.0%	76%
5 year avg.	3.6%	39.6%

Cowlitz Trout Hatchery

Late Winter Steelhead	SAR	FTR
2019	.015 / 1.5%	98.5 %
2020	.014 / 1.4%	98.6 %
2021	.019 / 1.9%	98.1 %
2022*	.026 / 2.6%	97.4 %

2023*	.014 / 1.4%	98.6 %

*Sports Catch estimate = 124.5% of Salmon Hatchery escapement

5 year average	1.76%	98.2 %

Late Winter Steelhead Sports catch

2015	13,017
2016	13,327
2017	5,354
2018	2,416
2019	2,492
2020	4,267
2021	5,831

Last 5-year average 4,078

Cowlitz Trout Hatchery

Summer Steelhead	SAR	FTR
2019	.011 / 1.1%	98.9 %
2020	.022 / 2.2%	97.8 %
2021	.010 / 1 %	99.0 %
2022*	.034 / 3.4%	96.6 %
2023*	.017 / 1.7%	98.3 %
5-year average	1.8%	98.2 %

*Sports Catch estimate 242.6% of Cowlitz salmon hatchery escapement

Sports Catch of Summer Run Steelhead

2015	**27,565**
2016	**22,349**
2017	4,518
2018	8,424
2019	4,770
2020	13,044
2021	7,700
2022*	13,076
2023*	7,700

*sports catch estimate

Comparatives

Naturals Smolt to Adult Returns / SARs
Fish collected at Cowlitz Falls Fish Facility, transported by truck downstream and released from acclimation ponds at Salmon Hatchery.
Returning to fish ladder and fish collector at Cowlitz Salmon Hatchery, Barrier Dam

Spring Chinook

2019	.047 / 4.7%
2020	.006 / .6%
2021	.020 / 2.0%
2022	.015 / 1.5%
2023	.073 / 7.3%
5 Year average	.032 / 3.2%

Natural Origin Jack % of Return to Salmon Hatchery fish collector

Spring Chinook Natural Origin 5 year average	13.6%
Cowlitz Salmon Hatchery 5 year average	163%

2019	15. %
2020	18. %
2021	11. %
2022	11. %
2023	13. %

0+ 5 years captured 2016-2020 10grams +-	152,265
1+ 5 years captured 2016-2020	5,444

Naturals Smolt to Adult Returns / SARs
Fish collected at Cowlitz Falls Fish Facility, transported by truck downstream and released from acclimation ponds at Salmon Hatchery.
Returning to fish ladder and fish collector at Cowlitz Salmon Hatchery, Barrier Dam

Coho

2017	4.2%
2018	3.0 %
2019	2.6 %
2020	3.0 %
2021	8.1 %

2022	8.0 %		
2023	7.3 %		
5 Year average	6.28%		
Cowlitz Salmon Hatchery 5 Year SAR average		.016 / 1.6%	FTR 98.4 %

Jack % of Return
Coho
5 year average 3.6%

2019	3. %
2020	6.%
2021	4.5%
2022	1.5%
2023%	3. %

CFFF
Steelhead (Late Winter) Natural Origin

2018	2.8 %		
2019	12.7 %		
2020	2.1 %		
2021	3.1 %		
2022	4.4 %		
2023	3.1 %		
5 year average	4.7 %		
Cowlitz hatchery 5 year average	1.76 %		FTR 98.2 %

Natural Origin Fall Chinook returns to Salmon Hatchery

	Adults	Jacks	% jacks to adults
2019	924	34	3.7 %
2020	2,579	87	3.4 %
2021	949	53	5.6 %
2022	712	115	16 %
2023	512	98	19 %

Priest Rapids Hatchery Fall Chinook returns –
7,500,000 releases
Escapement back to Hatchery

2019	16,783
2020	34,694

2021	31,331
2022	32,927
2023	51,447

Does not include the Tens of Thousands of Fall Chinook captured from the mouth of the Columbia up to the hatchery by Recreational fisherman, Commercial Gillnet, Tribal pole and Gillnet fisherman.
** unclipped / Natural Origin Fall Chinook can be retained in most of the Columbia due to the Hanford reach N.O. counts, efforts by G.C.PUD to reestablish N.O. in the Hanford reach has been successful.

Priest Rapids Hatchery, Grant Co. PUD, Yakama, WDFW
400 river miles up Columbia, 4 major barriers/ dams

https://www.grantpud.org/templates/galaxy/images/images/Downloads/ResourceCommittees/OtherDocuments/2022_12_15_Grant_-_Priest_Rapids_Hatchery_Monitoring_and_Evaluation_Annual_Report_for_2021-2022_Final.pdf

References

Pacific States Marine Fisheries Commission, Regional Mark Processing Center.

Resources & References:

Releases, numbers, dates sizes: Pacific States Marine Fisheries Commission / Regional Mark Processing Center
https://www.psmfc.org/ https://www.rmpc.org/

NOAA Fisheries; Salmon Life Cycle and Seasonal Fishery Planning for the management of seasonal fisheries.
https://www.fisheries.noaa.gov/west-coast/sustainable-fisheries/salmon-life-cycle-and-seasonal-fishery-planning

Hatcheries Escapement reports (returns to the hatchery):
https://wdfw.wa.gov/fishing/management/hatcheries/escapement
Harvest/ State Sport Catch Reports: https://wdfw.wa.gov/publications?title=&category=26269&author=

Harvest and Catch reports (Sports catch/ harvest)
https://wdfw.wa.gov/fishing/management/hatcheries/escapement

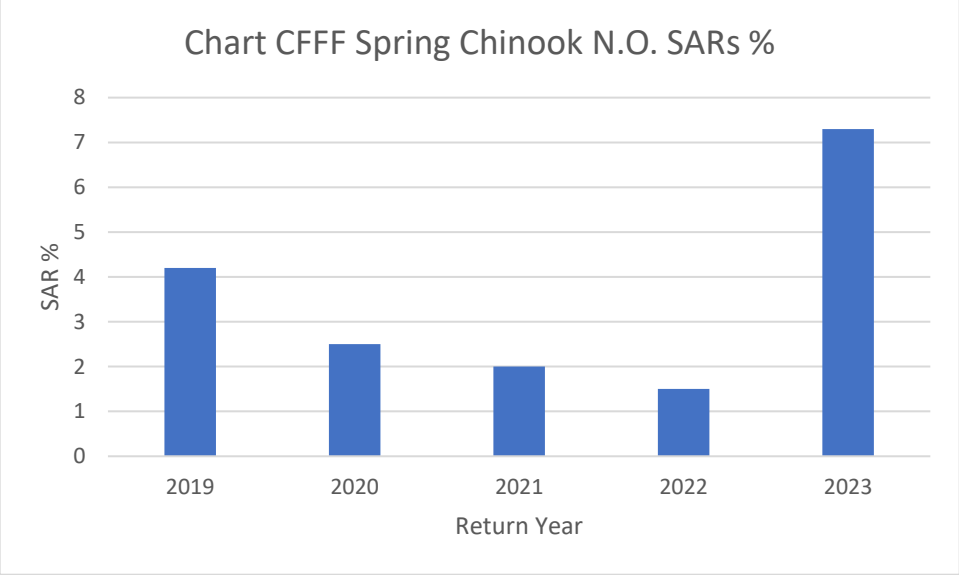
Cowlitz Falls Fish Facility release reports 2016-2023 provided by Tacoma Power, Cowlitz Falls Fish Facility end of year reports

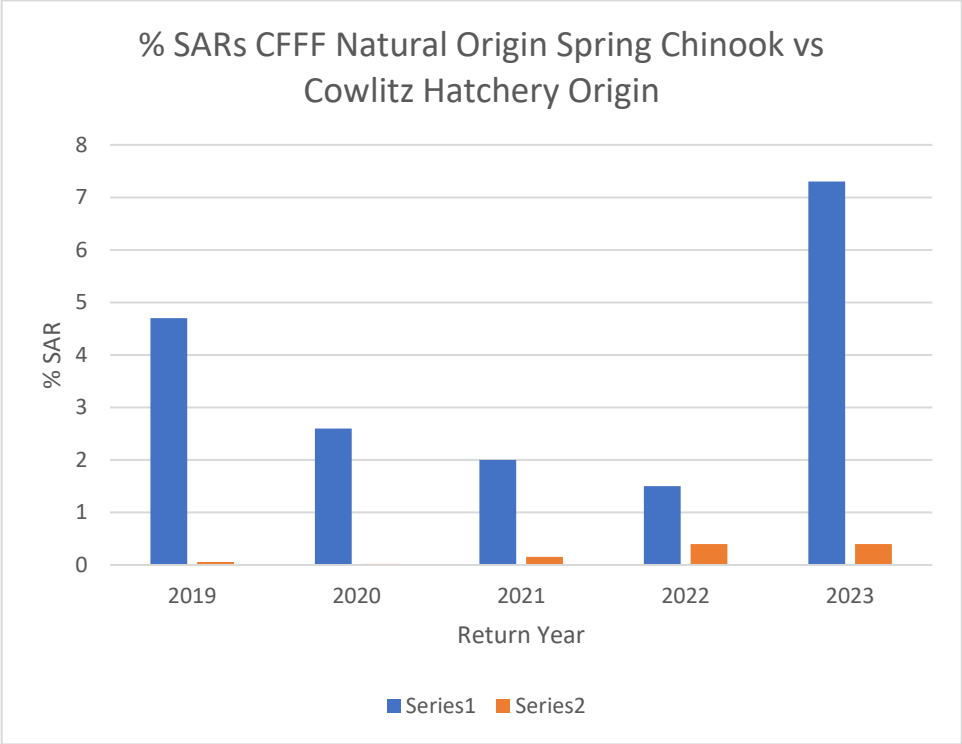
Other Comparatives
Fish Passage Center https://FPC.org https://www.fpc.org/documents/Q_fpc_cssreports.php

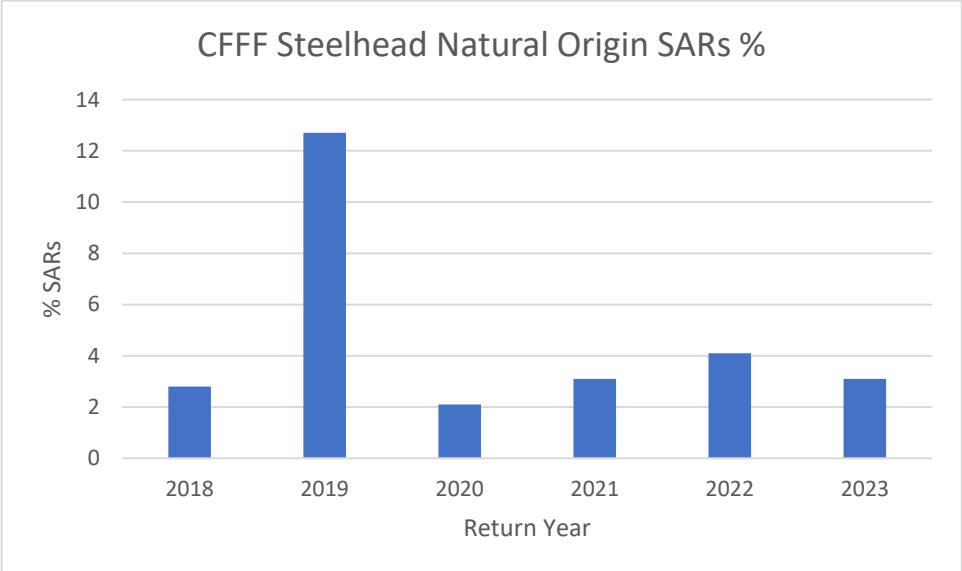
Comparative Survival Study /CSS
https://www.fpc.org/documents/CSS/CSS%20Annual%20Report%202023.pdf

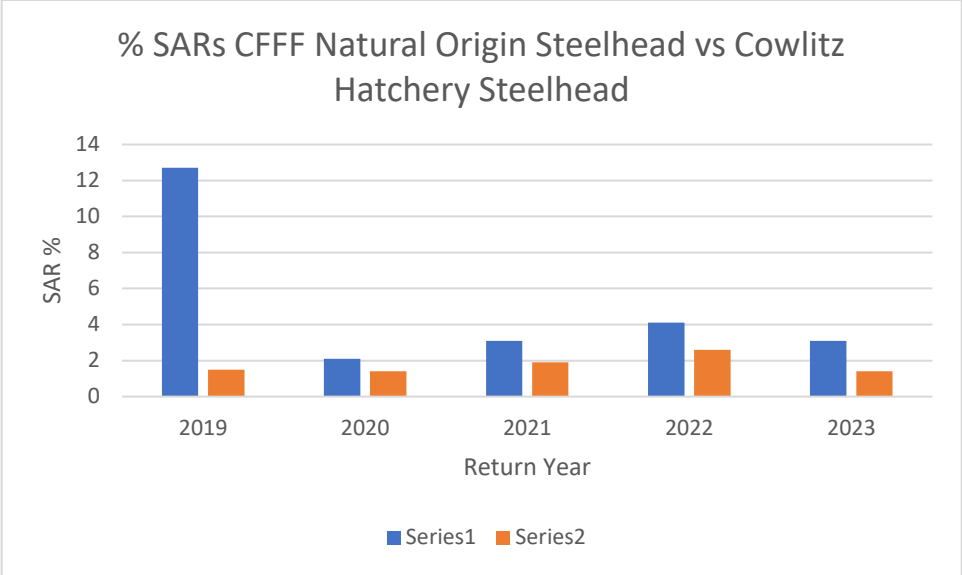
CSS comparative- Mid-Columbia River Overall SARs -page 126,
Hanford Reach Wild Fall Chinook page 156-157 PIT-tag SAR estimates (MCN-to-BOA, including jacks) for wild Hanford Reach fall Chinook have ranged from 0.05% (2015) to 3.46% (2011), with a geometric mean of 0.80% (Table B.89, Figure 4.24).
2023 should exceed, PRH hatchery escapement for 2023 = 51,447 plus jacks 3,249
https://wdfw.wa.gov/sites/default/files/2023-12/weekly-escapement-12-28-2023.pdf

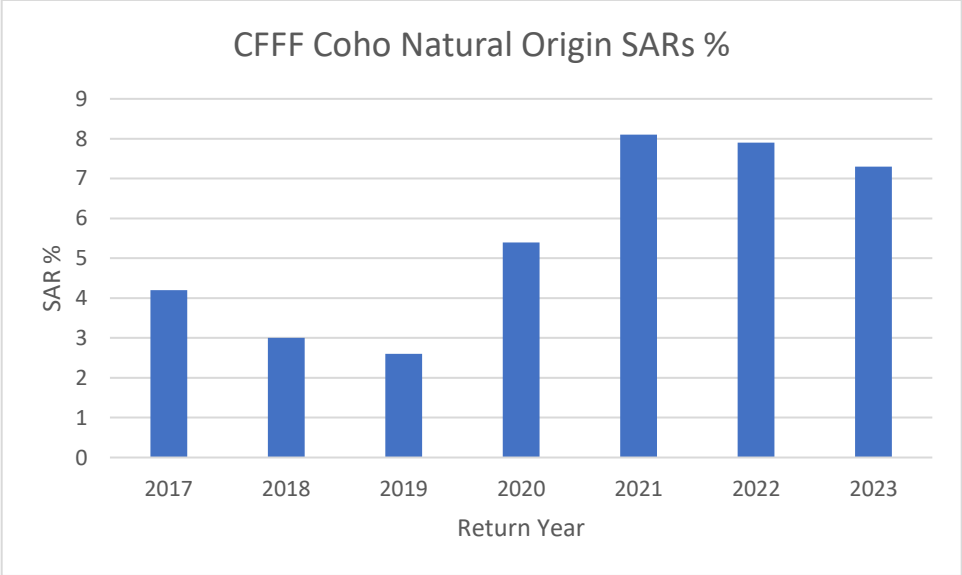
CFFF = Cowlitz Falls Fish Facility captured at CFFF and released at Cowlitz Salmon hatchery

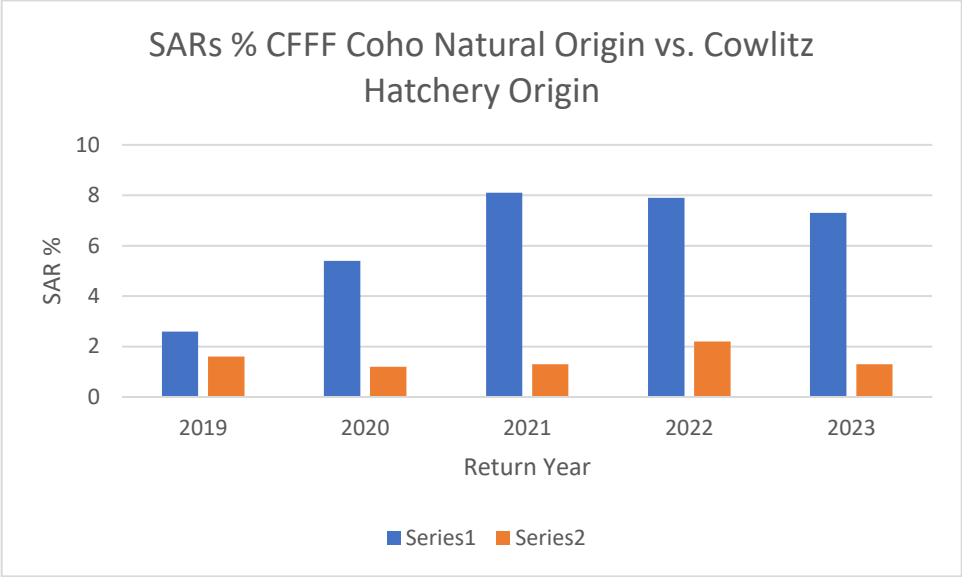


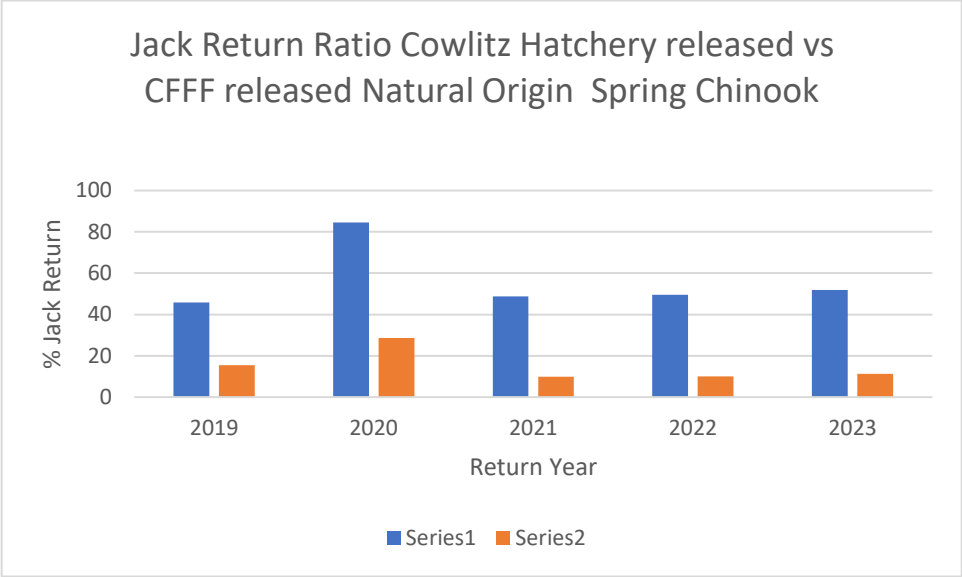

% SARs CFFF Natural Origin Spring Chinook vs Cowlitz Hatchery Origin
8
7
6
5
4
3
2
1
0
% SAR
2019
2020
2021
2022
2023
Return Year
Series1
Series2


CFFF Steelhead Natural Origin SARs %
14
12
10
8
6
4
2
0
% SARs
2018
2019
2020
2021
2022
2023
Return Year


% SARs CFFF Natural Origin Steelhead vs Cowlitz Hatchery Steelhead
SAR %
14
12
10
8
6
4
2
0
2019
2020
2021
2022
2023
Return Year
Series1
Series2


CFFF Coho Natural Origin SARs %
SAR %
9
8
7
6
5
4
3
2
1
0
2017
2018
2019
2020
2021
2022
2023
Return Year





Blue bar = Cowlitz hatchery Spring Chinook Jack returns

Orange bar= CFFF N.O. Spring Chinook Jack Returns

Spring Chinook

****Spring Chinook Hatchery Adults to Jacks ratio.

Adults Jacks/ Mini-Jacks Jack % of total returns

2019	1,076	910	46 %
2020***	471	2,005***	81 %
2021	2,669	2,544	49 %
2022	4,925	4,854	50 %
2023*	3,585	3,869*	52 %
5 years	12,726	14,182	53 %

Two out of 5 years Jacks exceeded Adult returns, the 5 year average Jacks exceeded Adult returns.
2020 nearly 5 times as many jacks returned as adults, 2023 more jacks than Adults return

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APPPENDIX 3

SETTLEMENT AGREEMENT RESPONSIBILITIES

Excerpt from Future Guidance Section of the Cowlitz Settlement Agreement August 2000

6 Guidance for Future Interpretation and Decision-Making

6.1 To the extent that the plain language of this Agreement is insufficient, the following general principles may be used by the Parties to aid understanding and implementation. In taking independent action outside the scope of this Agreement that may affect the resources of the Cowlitz River basin, the Parties shall also take into consideration the consistency of their actions with these principles.

6.1.1 The emphasis of this Agreement is ecosystem integrity and the restoration and recovery of wild, indigenous salmonid runs, including ESA-listed and unlisted stocks, **to harvestable levels**.

6.1.2 Fisheries obligations will be met through a combination of effective upstream and downstream passage, habitat restoration and improvement, an adaptive management program to restore natural production coupled with continued artificial production to compensate for unavoidable impacts at levels consistent with ESA recovery and providing fish production for sustainable fisheries.

6.1.3 Collection and passage of juvenile fish migrating from the upper basin above Mossyrock Dam is the joint responsibility of the Bonneville Power Administration ("BPA"), Lewis County Public Utility District ("LCPUD") and Tacoma.

6.1.4 ESA constraints will be a factor in determining the upper bound of production at the remodeled hatchery complex. Hatchery production numbers are expected to be adjusted downward as wild stocks recover.

6.1.5 Fisheries management and hatchery production will be consistent with the overall goal of restoring and recovering wild stocks in the Cowlitz River basin. The hatchery complex will be designed with flexibility so managers can employ innovative rearing practices, low densities, **and replication of historic fish out-migration size and timing**. At a minimum, WDFW will be the primary contractor for the operation of the hatchery complex through the year 2008 and could

continue as such through the term of the license, based upon the results of the annual reviews. Annual reviews of contract

operations will include criteria for success including, but not limited to, fish health, operational efficiency, collaborative relationships, mutual expectations, effective implementation of the Fisheries and Hatcheries Management Plan, and public relations. At any time after 2008, WDFW may be contracted to operate the fish counting and fish separation activities in connection with the operation of the hatchery separator facility.

6.1.6 **Maintenance of a recreational fishery is important**. **Implementation of wild salmonid recovery measures shall allow for the continued support of a recreational fishery on the Cowlitz River, including the production of non-indigenous stocks,** provided this is consistent with the priority objective to maximize the recovery of wild, indigenous salmonid stocks.

6.1.7 If hatchery production is decreased in conjunction with wild stock recovery, there will be excess capacity over time at the hatchery. Uses for this excess capacity will be, in order of priority: 1) to reduce rearing densities of listed indigenous stocks which have not yet recovered; 2) to reduce rearing densities of indigenous stocks which have not yet recovered; 3) to provide space for increasing the production of listed indigenous stocks which have not yet recovered; 4) to provide space for increasing the production of indigenous stocks which have not yet recovered; and 5) to produce fish unrelated to Tacoma's protection, mitigation and enhancement responsibilities for the Project, pursuant to future agreements.

6.1.8 Habitat enhancement measures can be combined and coordinated with other habitat efforts throughout the watershed. The habitat component is meant to augment other protective measures, strengthen the overriding goal of wild, indigenous salmon recovery, achieve ESA objectives, and mitigate for the loss of riverine habitat due to project impoundments.

In implementing components of this Agreement that require the Parties to make decisions based on future conditions, the Parties will refer to the following environmental and recreational management plans, among others, for relevant resource goals, operating principles and best practices to inform their decisions

Fall Chinook upper Cowlitz program failure- due to 90% parasites infection collected at Mayfield fish collector- page 37-38 this report- By HTI- Hydroacoustic Technologies for Tacoma Power and subsequent reports at FTC when inquiries

Settlement Agreement

APPENDIX A

PROPOSED LICENSE ARTICLES

Article 2. Downstream Fish Passage: Mayfield.

a) Within six (6) months of license issuance, the Licensee shall develop and file with the Commission, a study plan or study results evaluating turbine mortality and the effectiveness of the existing louver system at Mayfield Dam. The studies shall be designed, and results reviewed in consultation with the Fisheries Technical Committee provided for in the August 2000 Settlement Agreement, or if the Settlement Agreement has become void, with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, Washington Department of Fish and Wildlife and Washington Department of Ecology (referred to as "the FTC or agencies"). The Licensee shall include with the study plan and results documentation of consultation and copies of comments and recommendations on the plan and descriptions of how the FTC's or agencies' comments are accommodated by the plan. The Licensee shall submit the final plan to the National Marine Fisheries Service and U.S. Fish and Wildlife Service for approval prior to filing with the Commission. Upon approval by NMFS and USFWS and filing with the

Commission, the Licensee shall conduct the studies.

Within three (3) years of license issuance, the Licensee shall develop and file with the Commission, a plan for improvements to downstream fish passage at Mayfield Dam. The plan shall be developed in consultation with the FTC or agencies and shall be based upon, but not limited to, the 90% Fish Passage Report (filed as supplemental information by the Licensee in February 2000). It shall include: 1) the results of studies of turbine mortality and effectiveness of the existing louvers; 2) plans for debris handling modifications; 3) plans for changes to the bypass system; 4) a comparison of the proposed improvements with those identified in the 90% Fish Passage Report along with a justification for any proposed improvements not included in the 90% Fish Passage Report; 5) a statement of how the proppsed improvements will achieve increased Fish Guidance Efficiency ("FGE"), as defined in the August 2000 Settlement

Agreement, and survival at Mayfield Dam to a level of downstream fish passage survival rate, also as defined in the August 2000 Settlement Agreement, of greater than or equal to 95% for anadromous stocks; 6) a construction and implementation schedule not to exceed one year from the date of plan approval, unless there is good cause for extending the period beyond one year; and 7) plans to evaluate the effectiveness of downstream fish passage, including FGE and the downstream passage survival rate at Mayfield Dam, upon completion of the proposed improvements. The Licensee shall include with the plan documentation of consultation and copies of comments and recommendations on the plan, and specific descriptions of how the FTC's or agencies' comments are accommodated by the plan. The Licensee shall submit the final plan to the National Marine Fisheries Service and U.S. Fish and Wildlife Service for approval prior to filing with the Commission. Upon approval by NMFS and USFWS and filing with the Commission, the Licensee shall implement the plan.

a) Within eighteen months of the completion of construction of the improvements to downstream fish passage at Mayfield Dam as provided in the approved schedule, the Licensee shall file a report on the effectiveness of the modifications, including a calculation of the downstream fish passage survival rate and FGE achieved by the facility. If the downstream fish passage survival rate at Mayfield Dam has not achieved 95%, the report shall also include plans to further improve the effectiveness of the facilities and measures or to substitute other measures as described in paragraph (d) below, and to continue monitoring their effectiveness, including continued monitoring of FGE and the downstream fish passage survival rate. The Licensee shall prepare and file the plan for further improvements accordance the consultation, review and approval procedures set forth above. Upon approval by NMFS and USN/S and filing with the Commission, the Licensee shall implement the further improvements provided for in the plan.

b) Tacoma shall implement additional downstream passage facility modifications or measures and file additional reports at 18 month intervals in accordance with the preceding paragraph until either: 1) a 95% downstream fish passage survival rate is achieved; or 2) the National Marine Fisheries Service and U.S. Fish and Wildlife Service, in consultation with the FTC or agencies, determine that passage effectiveness and survival are high enough to support self-sustaining populations of anadromous fish stocks; that protection of anadromous fish migrating downstream at Mayfield Dam has been maximized by all reasonable measures and that adjustments to hatchery production (using then-existing facilities) and/or habitat measures will be required in lieu of further attempts to improve downstream passage at Mayfield Dam. If NWfFS and USFWS elect to pursue other measures in lieu of further downstream passage improvements,

the Licensee, in consultation with the FTC or agencies, shall prepare a draft plan for other actions designed to mitigate for continued juvenile mortality at Mayfield Dam.

The draft plan shall be submitted to the FTC or agencies for 30-day review and comment. The Licensee shall include with the plan documentation of consultation and copies of comments and recommendations on the plan, and specific descriptions of how the FTC's or agencies' comments are accommodated by the plan. The Commission reserves the right to require changes to the plan. Upon Cornmission approval, the Licensee shall implement the plan.

c) Tacoma shall monitor proper operation of passage facilities and evaluate effects of changed conditions on FGE and downstream fish passage survival, with a summary of results to be submitted annually to the FTC or agencies. Tacoma shall immediately report to the FTC or agencies any results indicating a significant reduction in passage effectiveness or survival and consult with the FTC or agencies on any further improvements that may be required to maintain consistently high levels of passage effectiveness and survival accordance the above performance standards.

Limited to, the 90% Fish Passage Report (filed as supplemental information by the Licensee in February 2000). It shall include: 1) the results of studies of turbine mortality and effectiveness of the existing louvers; 2) plans for debris handling modifications; 3) plans for changes to the bypass system; 4) a comparison of the proposed improvements with those identified in the 90% Fish Passage Report along with a justification for any proposed improvements not included in the 90% Fish Passage Report; 5) a statement of how the proppsed improvements will achieve increased Fish Guidance Efficiency ("FGE"), as defined in the August 2000 Settlement

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approval prior to filing with the Commission. Upon approval by NMFS and USFWS and filing with the Commission, the Licensee shall implement the plan.

d) Within eighteen months of the completion of construction of the improvements to downstream fish passage at Mayfield Dam as provided in the approved schedule, the Licensee shall file a report on the effectiveness of the modifications, including a calculation of the downstream fish passage survival rate and FGE achieved by the facility. If the downstream fish passage survival rate at Mayfield Dam has not achieved 95%, the report shall also include plans to further improve the effectiveness of the facilities and measures or to substitute other measures as described in paragraph (d) below, and to continue monitoring their effectiveness, including continued monitoring of FGE and the downstream fish passage survival rate. The Licensee shall prepare and file the plan for further improvements accordance the consultation, review and approval procedures set forth above. Upon approval by NMFS and

USN/S and filing with the Commission, the Licensee shall implement the further improvements provided for in the plan.

e) Tacoma shall implement additional downstream passage facility modifications or measures and file additional reports at 18 month intervals in accordance with the preceding paragraph until either: 1) a 95% downstream fish passage survival rate is achieved; or 2) the National Marine Fisheries Service and U.S. Fish and Wildlife Service, in consultation with the FTC or agencies, determine that passage effectiveness and survival are high enough to support self sustaining populations of anadromous fish stocks; that protection of anadromous fish migrating downstream at Mayfield Dam has been maximized by all reasonable measures and that adjustments to hatchery production (using then-existing facilities) and/or habitat measures will be required in lieu of further attempts to improve downstream passage at Mayfield Dam. If NWFFS and USFWS elect to pursue other measures in lieu of further downstream passage improvements, the Licensee, in consultation with the FTC or agencies, shall prepare a draft plan for other actions designed to mitigate for continued juvenile mortality at Mayfield Dam.

The draft plan shall be submitted to the FTC or agencies for 30-day review and cornment. The Licensee shall include with the plan documentation of consultation and copies of comments and recomrnendations on the plan, and specific descriptions of how the FTC's or agencies' comments are accommodated by the plan. The Commission reserves the right to require changes to the plan. Upon Cornmission approval, the Licensee shall implement the plan.

f) Tacoma shall monitor proper operation of passage facilities and evaluate effects of changed conditions on FGE and downstream fish passage survival, with a summary of results to be submitted annually to the FTC or agencies. Tacoma shall immediately report to the FTC or agencies any results indicating a significant reduction in passage effectiveness or survival and consult with the FTC or agencies on any further improvements that may be required to maintain consistently high levels of passage effectiveness and survival accordance the above performance standards.

Limited to, the 90% Fish Passage Report (filed as supplemental information by the Licensee in February 2000). It shall include: 1) the results of studies of turbine mortality and effectiveness of the existing louvers; 2) plans for debris handling modifications; 3) plans for changes to the bypass system; 4) a comparison of the proposed improvements with those identified in the 90% Fish Passage Report along with a justification for any proposed improvements not included in the 90% Fish Passage Report; 5) a statement of how the proposed improvements will achieve increased Fish Guidance Efficiency ("FGE"), as defined in the August 2000 Settlement

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g) Within eighteen months of the completion of construction of the improvements to downstream fish passage at Mayfield Dam as provided in the approved schedule, the Licensee shall file a report on the effectiveness of the modifications, including a calculation of the downstream fish passage survival rate and FGE achieved by the facility. If the downstream fish passage survival rate at Mayfield Dam has not achieved 95%, the report shall also include plans to further improve the effectiveness of the facilities and measures or to substitute other measures as described in paragraph (d) below, and to continue monitoring their

effectiveness, including continued monitoring of FGE and the downstream fish passage survival rate. The Licensee shall prepare and file the plan for further improvements accordance the consultation, review and approval procedures set forth above. Upon approval by NMFS and

USN/S and filing with the Commission, the Licensee shall implement the further improvements provided for in the plan.

h) Tacoma shall implement additional downstream passage facility modifications or measures and file additional reports at 18 month intervals in accordance with the preceding paragraph until either: 1) a 95% downstream fish passage survival rate is achieved; or 2) the National Marine Fisheries Service and U.S. Fish and Wildlife Service, in consultation with the FTC or agencies, determine that passage effectiveness and survival are high enough to support selfsustaining populations of anadromous fish stocks; that protection of anadromous fish migrating downstream at Mayfield Dam has been maximized by all reasonable measures and that adjustments to hatchery production (using then-existing facilities) and/or habitat measures will be required in lieu of further attempts to improve downstream passage at Mayfield Dam. If NWfFS and USFWS elect to pursue other measures in lieu of further downstream passage improvements, the Licensee, in consultation with the FTC or agencies, shall prepare a draft plan for other actions designed to mitigate for continued juvenile mortality at Mayfield Dam.

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i) Tacoma shall monitor proper operation of passage facilities and evaluate effects of changed conditions on FGE and downstream fish passage survival, with a summary of results to be submitted annually to the FTC or agencies. Tacoma shall immediately report to the FTC or agencies any results indicating a significant reduction in passage effectiveness or survival, and consult with the FTC or agencies on any further improvements that may be required to maintain consistently high levels of passage effectiveness and survival accordance the above performance standards.

j)

APPENDIX 4

CURRENT HATCHERY MANAGEMENT PROBLEMS

The data presented in the Current Trends section are signs of bad hatchery management practices, fish held to large sizes before release, fish Jacks residualizing in the river, never going out to the ocean.

Appendix 2, also demonstrates poor hatchery practices, creating these large jack returns, to meet release poundage rather than good fish culture practices,

These practices are also contrary to Cowlitz Settlement Agreement Section 6.1.5

Hatchery Science Research Group /HSRG report to Congress 2019, 2015 -Make your Hatcheries Successful!

1.1 Page 8, Summary Conclusions, 2015 report to U.S. Congress .

1.2 Maximize Survival of Hatchery Fish In order for hatchery programs to effectively contribute to harvest and/or conservation, the reproductive success and survival of hatchery releases **must be high relative to those of naturally spawning** populations. The primary performance measurement for hatchery programs should be the total adults produced (harvest plus escapement) per adult spawned at the hatchery. **All too often in the past, hatcheries have been evaluated based on the number of smolts released.**

https://www.streamnet.org/app/hsrg/docs/HSRG_Report-to-Congress_2015[1].pdf

Excerpt from Hydroacoustic Technology 2014 study, 2015 report-

MAYFIELD DAM DOWNSTREAM MIGRANT
SMOLT SURVIVAL STUDY USING ACOUSTIC TAG METHODOLOGIES IN 2014

By HTI- Hydroacoustic Technologies for Tacoma Power

https://www.mytpu.org/wp-content/uploads/6-2014-mayfield-downstream-survival-final-report.pdf

Page 11

3.5 Juvenile Salmonid Handling

3.5.1 Juvenile Salmonid Collection

All juvenile salmonids used for the acoustic tag and VIE marking studies during 2014 were of natural origin (NOR) fish collected at the Mayfield Dam downstream fish migrant facility (counting house). On each tagging/marking day, juvenile salmon and steelhead were moved from the raceway into holding tanks at the counting house for processing, and individuals of suitable tagging size were selected and segregated for tag implantation and marking.

During the fall outmigration, a large proportion of Chinook smolts were found to be unhealthy. The majority of the unhealthy Chinook smolts were infested with internal parasites. All of the Chinook smolts may have had compromised immune systems. For this reason, an attempt was made to tag and mark the healthier Chinook smolts.

Page 21- 22
2014 Study, 2015 Report by

As previously mentioned, a large proportion of Chinook smolts were found to be unhealthy. The majority of the unhealthy Chinook smolts were infested with external and internal parasites. Figure 12 shows a picture of a Chinook smolt with parasites in its gills. Evidence of internal parasites in a Chinook smolt are shown in Figure 13. All of the Chinook smolts may have had compromised immune systems. For this reason, an attempt was made to tag and mark the healthier Chinook smolts. The 2014 study results were most likely affected by the unhealthy Chinook smolts.

Comparative Survival Study of PIT-tagged Spring/Summer/Fall Chinook, Summer Steelhead, and Sockeye 2023 Annual Report, BPA Contract #19960200 Contract #78040 REL 53 (12-1-2022 to 11-30-2023)

https://www.fpc.org/documents/CSS/CSS%20Annual%20Report%202023.pdf

Page 126, 127, 130, 134

Mid-Columbia River Overall SARs In contrast to Snake River spring/summer Chinook and steelhead and Upper Columbia River spring Chinook (Raymond 1988), no historical SAR data sets exist for the mid-Columbia Region extending back to pre-FCRPS completion. The Yakama Nation fisheries staff have estimated SARs of Yakima River natural origin spring Chinook based on run reconstruction of smolts at Chandler Dam to adults to the Yakima River mouth, beginning in smolt migration year 1983. Subbasin-to-subbasin, SARs for Yakima River wild spring Chinook had a geometric mean **of 2.4%, ranging from 0.6% to 13.4% during 1983–2001 (**Berg 2001, Yakima Subbasin Fish and Wildlife Planning Board 2004). In addition, the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO) began operating a smolt trap on the Warm Springs River in the late 1970s, from which it may be possible to calculate wild spring Chinook SARs using run reconstruction methods. These longer-time series run reconstruction SAR estimates for mid-Columbia spring Chinook would be useful in future analyses in conjunction with more recent time series of PIT tag-based SAR estimates. Mid-Columbia River Spring Chinook The geometric mean SAR (JDA-to-BOA, including jacks) of PIT-tagged **John Day River wild spring Chinook was 3.48%** during the 22-year period 2000–2021 (Table B.76; Figure 4.18). Annual SAR point estimates met the NPCC 4% SAR objective in 10 of 22 years. John Day wild spring Chinook SAR point estimates exceeded the NPCC's minimum SAR objective of 2% in all migration years except 2011 and 2017 and were significantly greater

than 2% in all but six years (2005, 2006, 2011, 2017, 2019, and 2021). The PIT-tagged John Day River spring Chinook group represents an aggregate of three wild populations: North Fork, Middle Fork, and upper mainstem John Day rivers. As mentioned earlier, this year's report added a new release site (Chandler Canal) to the Yakima River wild spring Chinook group for smolt migration years 2000-2021. Therefore, point estimates of SARs (MCN-to-MCA and MCN-to-BOA) reported in this year's report differ from past year's reports. In addition, the additional release site resulted in overall increased sample sizes, more narrow confidence intervals, and the addition of SAR estimates for a few years where estimates were previously not possible or unreliable due to lack of PIT-tagging at Roza Diversion Dam or small sample sizes. The geometric mean SAR (MCN-to-MCA) of Yakima River wild spring Chinook was 1.82% during 2000–2021 (Table B.78). Point estimates of annual SARs for Yakima River wild spring Chinook met the NPCC 4% SAR objective in three of 18 years. Yakima wild spring Chinook SAR point estimates exceeded the minimum 2% objective in 10 of 18 migration years and were significantly greater than 2% in five years (Table B.78). Based on the geometric means, Yakima River wild Chinook SARs based on BOA returns were approximately 10% greater than those based on MCA returns (Tables B.77 and B.78). SARs of John Day and Yakima River wild spring Chinook averaged (geometric mean of ratio; based on BOA returns) 3.7 times and 2.1 times, respectively, those of Snake River wild spring/summer Chinook (Table B.2), and the wild SARs were correlated (average r = 0.70) between regions during the period 2000–2021 (Figure 4.19).

Mid-Columbia River Fall Chinook In the Mid-Columbia, the CSS estimates SARs for four fall Chinook groups: wild fall Chinook from the Hanford Reach (2000-2019), wild fall Chinook from the Deschutes River (2011-2017), hatchery fall Chinook from Spring Creek National Fish Hatchery (2008-2019), and hatchery fall Chinook from Little White Salmon National Fish Hatchery (2008-2020). Due to COVID, there was no PIT-tagging of wild fall Chinook from the Hanford Reach or hatchery fall Chinook from Spring Creek NFH in 2020. PIT-tag SAR estimates (MCN-to-BOA, including jacks) for **wild Hanford Reach fall Chinook have ranged from 0.05% (2015) to 3.46% (2011), with a geometric mean of 0.80%** (Table B.89, Figure 4.24). **Deschutes River wild fall Chinook SARs (BON-to-BOA including jacks) have ranged from 0.24% (2015) to 3.06% (2011), with a geometric mean of 0.99%** (Table B.91, Figure 4.24). PIT-tagging of wild fall Chinook from the Deschutes River appears to have been discontinued after 2017. Spring Creek NFH releases have shown the lowest SARs for the fall Chinook release groups in the Mid-Columbia River, with SARs (Rel-to-BOA, excluding jacks) below 1% in all years (Figure 4.24, Table B.94). It should be noted that the Rel-to-BOA SARs with jacks included were also all below 1% for the Spring Creek NFH groups. **The average (geometric mean) SARs (Rel-to-BOA excluding jacks) for Spring Creek NFH fall Chinook (2008-2020) are 0.20%** for the April release and 0.19% for the May Release (Table B.94). Finally, SARs (Rel-toBOA excluding jacks) for Little White Salmon NFH releases have been as low as 0.01% (2015) and as high as 2.44% (2011), with a geometric mean of 0.49% (Figure 4.24, Table B.96).

Page 130; Mid-Columbia River Steelhead The CSS estimated SARs and confidence intervals for mid-Columbia wild steelhead from the Umatilla River beginning with juvenile migration year 2011, the John Day River beginning with migration year 2004, from Deschutes River tributaries (Trout, Buckhollow and Bakeoven creeks) beginning with migration year 2006, and from the Yakima River beginning with migration year 2002 (Tables B.85–B.88; Figure 4.22). The geometric mean SAR (JDA-to-BOA) 130 of Umatilla wild steelhead was 1.81% during 2011-2020. Point estimates of annual SARs met the NPCC 4% SAR objective in

three of 10 years and significantly exceeded the 2% minimum SAR objective in five of 10 years (Table B.85; Figure 4.22). The geometric mean SAR (JDABOA) of John Day River wild steelhead was 3.88% during 2004-2020. Point estimates for annual SARs met the NPCC 4% SAR objective in 10 of 17 years. SAR estimates of John Day wild steelhead (JDA-BOA) significantly exceeded the NPCC's minimum SAR objective of 2% in 12 out of 17 years (Table B.86; Figure 4.23). The 2011, 2015, 2017, 2019, and 2020 SARs were the exceptions. The PIT-tagged John Day River steelhead group represents the five wild populations of the John Day MPG: North Fork, Middle Fork, South Fork, upper mainstem, and lower mainstem John Day rivers. However, fish in the lower mainstem John Day population from tributaries downstream of the ODFW juvenile seining site are not trapped and PIT-tagged and that population is not fully represented. The geometric mean SAR (BOA-to-BOA) of Deschutes wild steelhead was 5.14% during 2006-2019 (Table B.87). It should be noted that this geometric mean does not include the point estimate of 0.0% for migration year 2019. Furthermore, no PIT-tags were released in 2020 so the CSS was unable to estimate SARs for that year. Point estimates of annual SARs met the NPCC 4% SAR objective in nine of 14 years of available estimates. Deschutes River wild steelhead SARs (BON-to-BOA) significantly exceeded the NPCC's minimum SAR objective of 2% in 10 of 14 years (Table B.87; Figure 4.22). The geometric mean SAR (MCN-to-MCA) of Yakima River wild steelhead was 3.17% during 2002-2020 (Table B.88). Point estimates of annual SARs met the NPCC 4% SAR objective in 10 of 19 years. Yakima River wild steelhead SARs significantly exceeded the NPCC's minimum SAR objective of 2% in nine out of 19 years (Table B.88; Figure 4.22). The MCN-to-BOA SARs were 22% higher than MCN-to-MCA SARs. SAR confidence intervals for the Yakima wild steelhead population were relatively wide due to limited sample size. Wild steelhead SARs from the mid-Columbia River were correlated with one another (average r = 0.62, Figure 4.23). In addition, wild steelhead SARs from the mid-Columbia River were correlated with those from the Snake River (average r = 0.76, Figure 4.23) and exceeded them by 1.42-2.78 times. Common among these populations (as well as Chinook PIT tag groups in other regions), SARs were high in 2008 and low in 2011, 2015, and 2019.

RECENT INCREASES IN JACK RETURNS IN COWLITZ RIVER HATCHERY SALMON

Tacoma Power Hatchery production goals are determined by pounds of smolts released. Cowlitz salmon hatchery rears Spring Chinook salmon to much larger sizes than the natural origin smolts captured at the Cowlitz Falls Fish Collection Facility.

It stands out that the large release sizes of Spring Chinook Salmon cause unnatural Jack returns to the Cowlitz River.

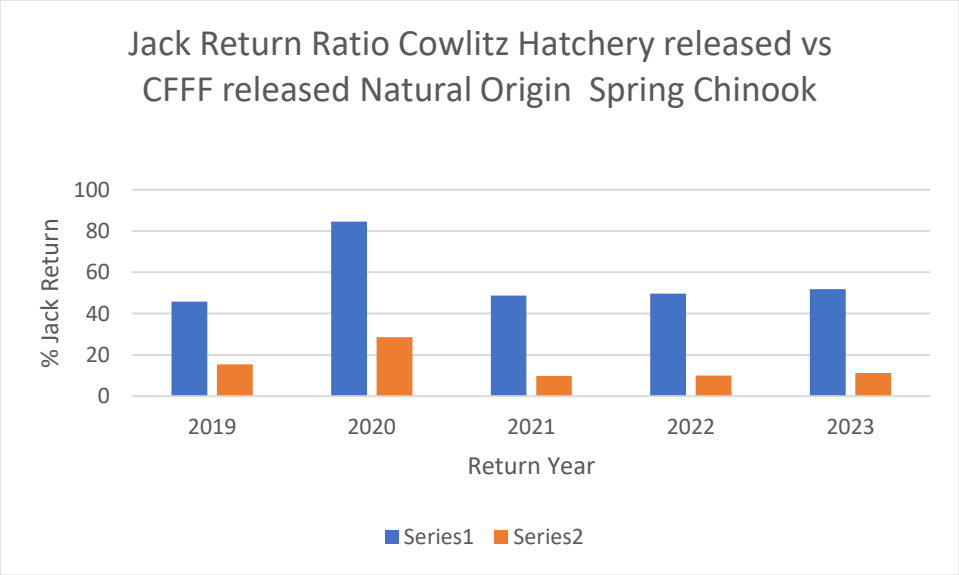
Cowlitz River Hatchery Spring Chinook release size (average 60+ grams release size, many up to 90 grams) with extreme low SARs.

30-40% of the last 5 years releases poundage are Spring Chinook, this jumped out at us and appears that poundage is being met by poor fish culture practices, growing fish too large to meet poundage and releases rather than best Adult returns, and the numbers of returns demonstrated this. Spring Chinook from CFFF releases 0+ / 10gram sizes have 13 times the SARs

These large size releases to meet poundage are Counter to Cowlitz River Hydroelectric Settlement Agreement, 6.1.5. I've been to a large number of Springer Hatcheries and have not found others with this large of springers at release.

Fisheries Management and hatchery production will be consistent with the overall goal of restoring and recovering wild stocks in the Cowlitz River basin. The hatchery complex will be designed with flexibility so managers can employ innovative rearing practices, low densities, and replication of historic fish out-migration size and timing.

Jack returns near or exceed Adult Returns year after year,



Series1 is Cowlitz Salmon Hatchery Series2 is Natural Origin

Tacoma Power Hatchery Releases by poundage and releases by species

	Species	Pounds per release	% of annual release	# of Releases	lbs less than 650,000
2019	Fall Chinook	22,641.7		1,755,813	
	Spring Chinook	239,151.9	39%	1,842,556	
	Coho	151,581.0	24%	2,520,089	
	Late Winter Steelhead	66,107.0		489,181	
	Summer Steelhead	115,489.2		641,046	
	Cutthroat	21,827.1		121,091	
2019 Total		**616,797.9**			-33,202.1 Lbs
2020	Fall Chinook	29,070.7		2,311,145	
	Spring Chinook	203,785.4	38.3%	2,013,944	
	Coho	134,660.0	25.3%	2,234,882	
	Late Winter Steelhead	61,788.9		460,266	
	Summer Steelhead	80,947.1		547,468	
	Cutthroat	21,827.1		90,483	
2020 Total		**532,079.2**			-117,920.8 Lbs
2021	Fall Chinook	45,270.7		3,596,659	
	Springer Chinook	193,874.8	32%	1,290,014	
	Coho	140,001.3	23%	2,186,662	
	Late Winter Steelhead	79,133.1		595,804	
	Summer Steelhead	111,582.7		644,696	
	Cutthroat	19,722.9		116,321	
2021 Total		**589,585.5**			-60,414.5 Lbs
2022	Fall Chinook	44,033.4		3,503,839	
	Spring Chinook	220,512.2	34.5%	1,539,010	
	Coho	132,476.9	20.7%	2,365,418	
	Late Winter Steelhead	94,153.5		639,618	
	Summer Steelhead	116,631.9		661,289	
	Cutthroat	30,807.5		108,596	
2022 Total		**638,614.4**			-11,384.5
2023	Fall Chinook	15,134.4		1,187,707	

Springers	224,816.8	35.4%	1,673,505
Coho	146,624.0	23.1%	2,203,208
Late Winter Steelhead	101,261.0		687,738
Summer Steelhead	121,723.0		596,504
Cutthroat	25,080.1		85,227
2023 Total	**634,639.3**		-15,360.7 Lbs

This is a repeat of Appendix 2, page 15 and demonstrated the very poor upper Cowlitz Recovery mitigated to Tacoma Utilities, with these very poor Chinook and Steelhead collection numbers at the CFFF there is no likelihood of any harvest for years, these poor numbers are directly relevant to poor hatchery results and management.

6.3.7 The emphasis of this Agreement is ecosystem integrity and the restoration and recovery of wild, indigenous salmonid runs, including ESA-listed and unlisted stocks, **to harvestable levels**.

2016
Chinook- fry 24, parr 0, Chinook 0+ smolts 3,602, Chinook 1+ smolts 523
Steelhead- fry 1, parr 34, smolts 6,091
Coho- fry 11, parr 27, 0+smolts 7,673, 1+ smolt 146,170
Cutthroat- parr 40, smolt 1,139

2017
Chinook- fry 618, parr 2,269, 0+ 56,049, 1+ 296
Steelhead- fry 1, parr 34, smolts 6,091
Coho- fry 11, parr 27, 0+ smolts 7,673, 1+ smolts 146,170
Cutthroat- parr 40, smolts 1,139

2018
Chinook- fry 7,708, parr 479, 0+ 25,920, 1+ 1,150
Steelhead- fry 103, parr 238, smolts 14,450,
Coho- fry 9,350, parr 16,751, 0+ smolts 3,768, 1+ smolt 157,761

Cutthroat- parr 106, smolts 1,070

2019
Chinook- Fry 4,230, Parr 1,835, 0+ smolt 60,153, 1+ smolt 2,691
Steelhead- Fry 28, Parr 373, Smolt 11,890
Coho- Fry 6,621, Parr 11,138, 0+ smolt 7,067, 1+ smolt 177,158
Cutthroat- parr 195, Smolt 686, Kelt 26

2020
Chinook- Fry 697, Parr 107, 0+ smolt 6,541, 1+ smolt 784,
Steelhead- Fry 95, Parr 258, Smolt 8,287, Kelt 657
Coho- Fry 2,868, Parr 10,134, 0+smolt 4,123, 1+ smolt 123,421
Cutthroat- Parr 341, Smolt 1,171, Kelt 29

2021
Chinook- Fry 313, Parr 203, 0+ smolt 12,810, 1+ smolt 300
Steelhead- Fry 313, Parr 874, Smolt 9,975, Kelt 340
Coho- Fry 57,515, Parr 58,743, 0+ smolt 7,308, 1+ smolt 150,788
Cutthroat- Parr 271, Smolt 1,528, Kelt 63

2022
Chinook Fry 1,003, Parr 340, 0+ smolt 6,420, 1+ smolt 236
Steelhead Fry 48, Parr 262, Smolt 8,387, Adult 582
Coho- Fry 87,853, Parr 17,766, 0+ smolt 6,898, 1+ smolt 95,196
Cutthroat- Parr 206, Smolt 1,081, Kelt 54

2023
Chinook- Fry 6,788, Parr 2,102, 0+ smolt 42,724, 1+ smolt 366
Steelhead- Fry 231, Parr 851, Smolt 9,539, Adult 374,
Coho- Fry 63,707, 20,397, 0+ smolt 4,486, 1+ smolt 167,415
Cutthroat- Parr 210, Smolt 847, Kelt 50

APPENDIX 5

RECOMMENDATIONS TO IMPROVE COWLITZ RIVER FISHERIES/ HATCHERY MANAGEMENT

Here's a few points: **Change from production policies (pounds of juveniles released) to Adult Return goals (number of adults that return to the river) , If not by Policy, by Philosophy!**

Set Adult Return Goals rather than production numbers (HSRG 2009)

Raise strong fish, more likely to survive.

A few starting points;

- Water Quality, Chemistry changes assessment and effects to fish, influent bio dangers to fish health, growth and disease impacts-

- Disease prevention This can/should include biosecurity measures to reduce pathogen exposure, rearing fish in a manner that reduces stress/mechanical injuries to make them more resilient to the pathogens that are omnipresent, and vaccination. Vaccines are not a routine part of most hatcheries' operations but could be a game changer for some facilities.

- Facilities challenge

- Brood stock management to directives; Modern Spawn, matrices, husbandry Most facilities have HGMP and other spawning plans in place, but it is important to recognize that not applying any sort of selective pressure/intentional breeding goals (i.e., keeping all the genetics and letting nature sort 'em out) tends to reduce population fitness over time. The concepts of 'prescriptive evolution' or light selection pressure to produce offspring that are more likely to survive in the wild is a growing area of conservation science that is not on the radar yet for many facilities (but should be).

- Feed, quality & feed strategies targeted for each species. I would really emphasize the feeding strategies part of this. There are programs that have to push their fish to reach an appropriate size for marking, but then greatly reduce the feed rates to avoid overshooting the target release size. This boom-and-bust approach is not good for the fish and leads to increased aggression, fin nipping, etc., during feed restriction periods. It also goes against the biological signals they are likely to be receiving from the environment (i.e., warming temperatures mean I should be eating more).

- Rearing strategies, grow out techniques and imprinting strategies. Don't forget smoltification! For programs that are releasing smolts intended for seawater entry immediately/shortly after release, there should be monitoring to ensure these fish have actually smoltified and are ready to migrate. If not, controlled smoltification methods (photoperiod manipulation or SSFO) should be considered to make sure the fish are ready when the transport trucks roll or the plug is pulled on volitional releases.

- Growth and Strength strategies

- Disease management Disease prevention

- Feed strategies for survival after release.

- Release strategies for survival. Anti predation! Cover Events and more

- Modern Fish Culture Training and Continued Education support Making sure that fish culturists continue to get CE is important. Most staff get OTJ training that may or may not reflect the best available science and practices.

Hatcheries can play a role in fish conservation. Ask yourself this:

Are Your Salmon Hatcheries Successful?

Are your Salmonid Hatcheries successful? Too often this question is overlooked or not asked- the HSRG (Hatchery Science Research Group) published reports to US Congress in 2004, 2009 and 2014, that say make your Hatcheries Successful!

Hatcheries should be judged on Adult Returns not numbers produced and how they can complement and improve wild fish Adult returns in conservation roles.

The basic judge is SARs- (Smolts to Adult Returns) – it's a basic formula- the number of fish escapement back to the hatchery plus harvest within the terminal fishery (recreational & commercial) divided by the number of fish released by a hatchery by type.

Hatcheries have to often been judged solely on production numbers, many times I've met with hatchery staff, when I ask what are your Adult Return Goals, we don't have any but we produce XXX amount of fish.

HSRG says this is like judging a farmer on how many seeds they planted rather than the crop produced!

I'm not sure why this question is not asked- there are some exceptions, in recent conversations and letters to WDFW Commissioners I ask them to ask- are our hatcheries successful – I've not heard them ask yet or WDFW report on SARs – From the SARs I've done- especially for fall Chinook programs they are terribly unsuccessful, some Coho programs have been superior, but still few ask.

If you're a fisherman you need to ask, are our hatcheries successful?

We are dependent on Hatcheries success!

Sincerely Larry Pryor,
Chairman NWFE

APPENDIX 6

CONSEQUENCES OF FAILURE TO IMPROVE

Letter to FERC from then Congresswoman Jaime Herrera Beutler:

P-2016

JAIME HERRERA BEUTLER
3RD DISTRICT, SOUTHWEST WASHINGTON

COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON LABOR, HEALTH AND HUMAN SERVICES, EDUCATION AND RELATED AGENCIES
SUBCOMMITTEE ON LEGISLATIVE BRANCH

U.S. JOINT ECONOMIC COMMITTEE

Congress of the United States
House of Representatives
Washington, DC 20515-1602

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WASHINGTON D.C. 2
(202) 225-353

GENERAL O.O. HOWARD
750 ANDERSON STREET,
VANCOUVER, WA 98
(360) 695-629

WWW.JHB.HOUSE.G

January 15, 2021

Kimberly D. Bose, Secretary
Federal Energy Regulatory
Commission 888 First
Street, N.E.
Washington, DC 20426

Secretary Bose,

I am writing to seek clarification on key fishery mitigation requirements of the Federal Energy
Regulatory Commission (FERC) license issued in 2002 for the Cowlitz River Hydroelectric Project operated by Tacoma Power. Communities in my district have long relied on the socioeconomic benefits Cowlitz River fisheries provide and are eager to see meaningful progress towards reversing the significant declines in salmon and steelhead returns and the associated impacts to the local economy.

The Cowlitz River was once home to some of the most abundant salmon and steelhead fisheries in western Washington, drawing anglers from Lewis County and beyond for the benefit of local, rural economies and our region's broader sportfishing industry. I am eager to see these fishing opportunities restored as we also make progress to recover species listed under the Endangered Species Act (ESA).

After several years of delay, Tacoma Power submitted a required Fisheries and Hatchery Management Plan (FHMP) to FERC on October 2, 2020. As FERC reviews

the FHMP, I respectfully ask that it set clear deadlines and expectations regarding compliance with the 2002 Cowlitz River Project license and the associated Settlement Agreement. I would appreciate receiving clarification from FERC on the following issues.

Satellite Rearing Facilities

Constituents have alerted me that the original agreement requires Tacoma Power to construct three satellite rearing facilities to complement the operation and maintenance of the Cowlitz Hatchery Complex. After nearly 20 years, only one of these facilities has been constructed as a part of the Cowlitz Falls Dam juvenile fish collection facility. The FHMP recently submitted to FERC includes no firm timeline for complying with this requirement. The lack of satellite rearing facilities constrains the effectiveness of hatchery mitigation programs for salmon and steelhead, as well as non-anadromous stocks. These facilities could also help support fishing opportunities for anglers in the area.

2021-00020

Document Accession #: 20210121-4019 Filed Date: 01/21/2021

Considering that we are over half-way through the 35-year license for the Cowlitz River Hydroelectric Project, what deadline has FERC set for Tacoma Power to complete the construction of these facilities?

Hatchery Production Requirements

I have also been informed that License Article 5 calls for increasing hatchery production levels from 650,000 pounds to 771,000 pounds if Tacoma Power abandons efforts to restore volitional fish passage around dams. I understand that in early 2018, Tacoma Power announced that it had indeed abandoned efforts to restore volitional upstream fish passage. However, the draft FHMP does not appear to include a plan for increasing hatchery production levels to 771,000 pounds.

If volitional fish passage has been abandoned, does the FERC license require hatchery production levels be increased to 771,000 pounds, assuming this can be accomplished within constraints posted by the ESA? And, if so, can you clarify which entity is responsible for the funding of this increased hatchery production?

Improving Survival Rates of Hatchery Fish

Stakeholders have submitted extensive recommendations for modest, low-cost modifications to hatchery operations to increase the survival of hatchery fish, which

would result in improved returns of adult fish and provide sorely needed additional fishing opportunities. These recommendations included changes to the species of salmon produced and increased rearing time for smolts before release. Some of these recommendations are dependent on sufficient rearing space, which has been limited to the failure to construct the three satellite rearing facilities.

Stakeholder recommendations were summarized in Appendix E of the FHMP, but the document only commits to "future dialogue" on these issues and the development of "Transition Plans." While the terms of the license explicitly require Tacoma Power to meet specific hatchery production levels measured in pounds, I believe it is vital to ensure that as many hatchery fish as possible can return as adults to help mitigate for fishery reductions associated with the Cowlitz River Hydroelectric Project.

I urge FERC to provide the needed oversight and direction to ensure that the FHMP not only meets the hatchery production mitigation requirements, but also incorporates widely-supported practices that will result in healthy returns of adult hatchery fish across a range of salmon and steelhead species.

Thank you for your consideration and I look forward to your response.

Sincerely,

Jaime Herrera Beutler
Member of Congress

CC: Kelly Susewind, Director, Washington Department of Fish and Wildlife

Document Accession #: 20210121-4019 Filed Date: 01/21/2021

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Letter to FERC in response to Congresswoman Herrera-Beutler

3628 South 35th Street

Tacoma, Washington 98409-3192

TACOMA PUBLIC UTILITIES

April 7, 2021

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

SUBJECT: Response to Representative Herrera-Beutler Letter Dated January 15, 2021 Dear

Ms. Bose:

The City of Tacoma (Tacoma Power) is submitting this letter in response to the letter submitted to FERC by Representative Herrera-Beutler dated January 15, 2021 and filed January 21, 2021 (Congresswoman's letter). Tacoma Power seeks to provide its perspective on the following three topics: 1) Satellite Rearing Facilities, 2) Hatchery Production Requirements; and 3) Improving Survival Rates of Hatchery Fish.

In recent years, Tacoma Power has worked diligently in partnership with the Fisheries Technical Committee and the public culminating in a Fisheries and Hatchery Management Plan (FHMP), which addresses many of these topics. The FHMP is designed to achieve the Federal Energy Regulatory Commission (FERC) license goals of restoration and recovery of native stocks in the Cowlitz River basin while continuing to produce fish for harvest. As was described in detail within the FHMP, Tacoma Power is eager to continue working with the public to achieve these goals and specifically looks forward to future engagement at the Annual Program Review (APR) public meetings and during development of the FHMP Transition Plans where Cowlitz fishery program implementation strategies will be determined.

Satellite Rearing Facilities

Tacoma Power solicited public comments on the Satellite Rearing Facility Plan and we received comments between November 16, 2020 and January 19, 2021. Comments were received from five members of the public, Lewis County Public Utility District, the Lower Columbia Fish Recovery Board, and Washington Department of Fish and Wildlife. These comments were discussed at the Fisheries Technical Committee (FTC) on February 2, 2021. Next steps identified at the meeting included: 1) an assessment of the current Cowlitz Hatchery Complex to evaluate if modifications to facilities for similar costs can meet similar recovery and harvest outcomes as Satellite Rearing Facilities; 2) an assessment of how satellite facilities support recovery by conducting a status review of Upper Cowlitz populations; 3) an upper basin satellite site assessment; and 4) the development of a schedule for public participation that would inform the development of plans and land use agreements.

Hatchery Production Requirements

Tacoma Power's perspective of hatchery production requirements is based on the Settlement Agreement, which states:

> "*The remodeled hatchery complex will accommodate a range of possible production levels, up to 800,000 pounds, and the current upper bound permitted by the ESA of*

> *771,500 pounds. The total production level within the remodeled hatchery complex will not exceed 650,000 pounds per year for all stocks unless a decision has been made pursuant to Article 3…*"

The FERC order pursuant to Settlement Article 3 indicates that increased hatchery production from 650,000 pounds to 771,500 pounds *may be considered* as part of the plan to expend funds in the escrow account for the purposes of protecting and promoting recovery of listed stocks. This order also states:

> *"Although Article 5 contemplates possibly expending escrow funds toward hatchery production, we note that this is not specifically required, and furthermore, hatchery production is also subject to the FHMP required by SA Article 6. Nonetheless we note that hatchery production could be increased or decreased by the FTC in the future based on mechanisms contained in the FHMP under Article 6 to protect and promote the recovery of ESA-listed fish species."*

The FTC's recommendations on this topic were summarized in an issue paper dated March 3, 2016, stating,

> *"Production at the Cowlitz Hatchery Complex in excess of the 650,000 pound cap that is paid for by the Cowlitz Restoration and Recovery (CRR) fund needs to benefit recovery of ESA listed populations. The CRR Plan will determine if and how the escrow fund could be used for additional production. Refined FHMP goals and objectives… should be used to define likely future recovery programs and the facilities needed to implement these programs.*
>
> *Evaluate alternative rearing strategies that would increase production in excess of the 650,000 pound cap. Explore collaborative strategies for funding increased production.*
>
> *Consider suggestions provided by constituents in determining implementable solutions to increase production, such as altering fish rearing practices at the Salmon and Trout Hatcheries to improve efficiency. This could include rearing salmon species at the trout hatchery and vice versa."*

To date a CRR plan has been established, which includes consideration for both habitat and hatchery production projects. However, as of this writing only a single funding round has been implemented, and during that funding round the FTC elected to proceed with one habitat project and zero hatchery production projects based on their assessment of programmatic needs. To date the FTC has not elected to dedicate a specific allocation of CRR funds to current or future habitat or hatchery production projects. However, allocation of CRR funds could be modified, if desired by the FTC in the future.

Improving Survival Rates of Hatchery Fish

One of the primary areas of interest for Tacoma Power and the FTC is to improve and maintain the highest survival rates possible for hatchery and natural origin fish. The most direct means to

achieve recovery goals while maintaining harvest opportunity is through understanding survival rates, when and where there are challenges, and understanding the factors creating problems, in order to adaptively manage the resource. The FHMP describes Tacoma Power's extensive initiatives to understand programmatic challenges and modify fisheries programs to achieve success. Tacoma Power is fully committed to this need and we encourage all members of the public to engage in the APR process to learn about progress, challenges, opportunities, and

recommended solutions as we collaborate to deliver successful salmon and steelhead fisheries to the Cowlitz River. The next APR meeting has been tentatively planned for May 19, 2021 and will be held on a virtual platform over Microsoft Teams.

Consistent with the Congresswoman's letter, Tacoma Power and the FTC encourage continuing dialogue with the public during development of the FHMP Transition Plans. As described in the FHMP, it is during development of Transition Plans that recommendations, including those suggested by the public, will be considered.

If you have any questions regarding this response, please do not hesitate to contact me at mbleich@cityoftacoma.org or to contact Travis Nelson, Relicensing Coordinator, at tnelson1@cityoftacoma.org.

Sincerely,

Matt Bleich
Interim Natural Resources Manager

Attachment: Cowlitz River Project Hatchery Production Cap 5/13/16

cc: Federal Energy Regulatory Commission, Portland Regional Office Fisheries Technical Committee

6 Issue / Problem Statement

The Settlement Agreement (SA) has an annual production cap of 650,000 pounds at the Cowlitz Hatchery Complex. There is a clause that allows for an increase in the cap, however, there are confounding issues of juvenile natural production credits and when/how and to what level a hatchery production increase beyond 650,000 pounds could occur. The Cowlitz Complex was designed to accommodate 800,000 pounds based on a certain species mix that has since been modified, including changes resulting from ESA listings that impact hatchery production levels. Generally, the public is interested in increased adult returns for the purpose of increasing catch in fisheries.

6 FERC Requirements

FERC requirements and clarifying language are found in several documents. These provisions are based upon the license articles proposed in the SA. Excerpts from the following FERC Orders are provided below: 2002 FERC License Order; 2002 FERC Order Approving the Settlement Agreement; 2004 Order Amending the FERC License; and the 2006 Order Modifying and Approving the FHMP.

2.1 2002 FERC Order Issuing License

Commission Ordering Paragraph (D):

> This license is subject to the Settlement Agreement conditions set forth in Appendix A to this order.

2.2 2002 FERC Order Approving Settlement Agreement

Article 5: Fish Production and Hatcheries

> **a)** The Licensee shall be responsible for funding the operation and maintenance of the Cowlitz Hatchery Complex consisting of the remodeled Cowlitz Salmon Hatchery, the remodeled Cowlitz Trout Hatchery, and three satellite rearing facilities, for the duration of this license. The principal stocks of fish to be produced are the indigenous stocks of spring chinook, fall chinook, coho, sea-run cutthroat trout, and late winter-run steelhead. Nonindigenous stocks, such as early winter and summer steelhead, may be produced, provided that production shall emphasize the recovery of indigenous stocks, and production and management of all stocks shall be consistent with that goal. The remodeled hatchery complex will accommodate a range of possible production levels, up to 800,000 pounds, and the current upper bound permitted by the ESA of 771,500 pounds. The total production level within the remodeled hatchery complex will not exceed 650,000 pounds per year for all stocks until and unless a decision has been made pursuant to Article 3 to not construct volitional upstream passage during the remaining term of the license, at which time hatchery production may be considered as part of the plan to expend the funds in the escrow account for the purposes of protecting and promoting recovery of listed stocks.

The 650,000 pound limit does not includeincludee upper basin pre-smolts that are reared and ponded in the hatchery complex to avoid conflicts with listed stocks…….

b) Through 2004, the Licensee will provide funding for 50,000 pounds of trout production. Subsequent to 2004, future trout production will be based upon a review by the FTC of the success or failure of the program and any impacts to listed stocks.

Article 6: Fisheries and Hatchery Management Plan

Within 9 months of license issuance, the Licensee shall submit a Fisheries and Hatchery Management Plan. The plan shall be updated every 6 years, starting in year 7, of the license. The plan shall identify: a) the quantity and size of fish to be produced at the Cowlitz Hatchery Complex; b) rearing and release strategies for each stock, including upward and downward production adjustments to accommodate recovery of indigenous stocks; c) credit mechanisms for production of high quality natural stocks; d) plans for Licensee-funded on-going monitoring and evaluation; and e) a fisheries management strategy consistent with the priority objective of maximizing the natural production of wild indigenous fish stocks and species in the basin…..

Section 6: Guidance for Future Interpretation and Decision-Making

6.1.1 The emphasis of the SA is ecosystem integrity and the restoration and recovery of wild, indigenous salmonid runs, including ESA-listed and unlisted stocks, to harvestable levels.

6.1.4 ESA constraints will be a factor in determining the upper bound of production at the remodeled hatchery complex. Hatchery production numbers are expected to be adjusted downward as wild stocks recover.

6.1.5 Fisheries management and hatchery production will be consistent with the overall goal of restoring and recovering wild stocks in the Cowlitz River Basin. The hatchery complex will be designed with the flexibility so managers can employ innovative rearing practices, low densities, and replication of historic fish out-migration size and timing. At a minimum, WDFW will be the primary contractor for the operation of the hatchery complex through the year 2008 and could continue as such through the term of the license, based upon the results of the annual reviews. Annual reviews of contract operations will include criteria for success including, but not limited to, fish health, operational efficiency, collaborative relationships, mutual expectations, effective implementation of the FHMP, and public relations. At any time after 2008, WDFW may be contracted to operate the fish counting and fish separation activities in conjunction with the operation of the hatchery separator facility.

6.1.6 Maintenance of a recreational fishery is important. Implementation of wild salmonid recovery measures shall allow for the continued support of a recreational fishery on the Cowlitz River, including the production of non-indigenous stocks, provided this is consistent with the priority objective to maximize the recovery of wild, indigenous salmonid stocks.

6.1.7 If hatchery production is decreased in conjunction with wild stock recovery, there will be excess capacity over time at the hatchery. Uses for this excess capacity will be, in order of priority: 1) to reduce rearing densities of ESA-listed indigenous stocks which have not

yet recovered; 2) to reduce rearing densities of indigenous stocks which have not yet recovered; 3) to provide space for increasing the production of ESA-listed indigenous stocks which have not yet recovered; 4) to provide space for increasing the production of indigenous stocks which have not yet recovered; and 5) to produce fish unrelated to the licensee's protection, mitigation and enhancement responsibilities for the Project, pursuant to future agreements.

Section 6: Licensee's Strategies to Satisfy Requirements of License Article 6

4. Credit Mechanism for Natural Production: The credit mechanism would be based on the number of juveniles (by species) collected at Mayfield and Cowlitz Falls Dams and their survival rate to adulthood. Until data on Cowlitz River survival rates are available, for each naturally produced juvenile released alive below Barrier Dam, hatchery production would decrease by two fish. The licensee states that the number was arrived at from survival rates determined for other Pacific Northwest rivers, where the average ranged from 4.5 to 22.8. The credit would be based on a 5-year rolling average.

2.3 2004 FERC Order Amending New License

Article 414

As required by condition 4(a) of the incidental take statement, the licensee shall implement adaptive management, described in the analysis of effects of the proposed action in section 6 of the biological opinion as setting objectives, defining management actions designed to achieve those objectives, implementing those actions, monitoring and evaluating the outcomes, and making changes in management actions in response to new information. **2.4 2006 FERC Order Modifying and Approving FHMP, Article 6**

The Director orders:

(B) In addition to upper basin hatchery adult supplementation, the licensee shall continue hatchery juvenile supplementation (excluding coho salmon), at a level to be recommended by the Fisheries Technical Committee, to assist in contributing to increasing production and the potential for recovery of ESA-listed salmon and steelhead in the upper basin. If the FTC determines (as recommended in accordance with the provision of the SA) that a juvenile supplementation program is no longer necessary for a particular species due to realized impacts on natural populations or the determined carrying capacity has been reached, the licensee shall file, for Commission approval, a plan to discontinue such supplementation……

(H) Decisions regarding hatchery production levels, the implementation of integrated and segregated systems, juvenile release timing and size at release, the credit mechanism and the triggers and benchmarks that would determine future hatchery production and other applicable elements, shall be as recommended by the Fisheries Technical Committee in accordance with the provisions of the Settlement Agreement.

3 FTC Interpretation of FERC Requirement

The Cowlitz Hatchery Complex is defined as the trout hatchery, the salmon hatchery and three satellite rearing facilities. As constructed, the current Hatchery Complex may accommodate a range of possible

productions up to 800,000 pounds depending on which stocks are reared. The 800,000 pound production maximum was derived from a steelhead-only regime (with higher densities and lower rearing flows); not criteria for spring Chinook, which are the highest priority species in the Cowlitz watershed. Another production consideration is found in the SA. Because of ESA requirements at the time the SA was completed in 2000, a maximum production of 771,500 pounds was allowed from the Hatchery Complex. This cap is based on a set of release constraints for the entire Cowlitz watershed, not just the Cowlitz Hatchery Complex. In 2016, this number is estimated to be 841,000 pounds based on current knowledge of the ESA listed populations. The number is derived from AHA modeling, current natural origin population sizes, and in the case of spring Chinook, best professional judgement of WDFW and NMFS biologists.

SA Article 5 states the total production level in the current Hatchery Complex is not to exceed 650,000 pounds per year for all stocks unless a decision is made to abandon volitional upstream passage, at which time an increase in hatchery production may be considered. The mechanism for this increase is the activation of an "in lieu of" escrow fund that is earmarked for production associated with the protection and recovery of listed stocks. When the decision to abandon volitional adult passage was made by the FTC, Tacoma Power submitted documentation of this decision to NMFS, and the 'in lieu of' escrow fund was made available for use. This escrow fund may be used for production above the current Tacoma Power-funded 650,000 pound cap if this production is used to benefit recovery of ESA listed populations. To address how the escrow funds will be used, the FTC has formed a CRR subcommittee to make recommendations for expenditures in keeping with the fund's purpose to protect and recover listed stocks. We note that under SA Article 5, the 650,000 pound production limit does not include upper basin smolts that are reared and ponded in the Hatchery Complex to avoid conflicts with listed stocks.

Tacoma Power can produce less than 650,000 pounds from the Cowlitz Complex on an annual basis due to the crediting system. The crediting system is based on the number of natural-origin juveniles (by species) collected at Mayfield and Cowlitz Falls dams and their survival rate to adulthood. For each naturally produced juvenile released alive below Barrier Dam, hatchery production would decrease by a credit ratio of NOR smolt-to-adult survival divided by HOR smolt-to-adult survival. Currently, the applied credit would be based on a 5-year rolling average of these calculations. Where smolt-to-adult survival values are not available, a fixed ratio of 2:1 for yearling and 0.5:1 for subyearlings will be used.

4 Current Implementation Status or Situation

Continue observing the 650,000 production cap in the Cowlitz hatchery complex, including the crediting mechanism. Satellite facilities have not been defined or constructed.

Increasing production beyond the 650,000 cap may not achieve the goal of increasing adult returns unless specific issues are addressed, such as increasing juvenile hatchery fish survival, providing more opportunities to harvest hatchery adults, or developing and implementing an equitable sharing program for surplus HOR adults. Aspects of this issue to consider incorporating include:

- Need an understanding of how production is limited by NOR population size

- Understand SARs and how they could be increased ○ Increased SARs would reduce numbers released with same adult returns ○ Could increase production of other species
- New fish culture methods – using integrated fish
- How to optimize distribution of the HORs ○ Fishing, nutrient enhancement, food bank donation Documentation of the decision to abandon volitional passage has been submitted to NMFS, which needs to provide Section 18 approval of the decision before it can be filed with FERC.

5 Approach to Resolve Issue

The FHMP should be revised to:

- Reflect the FTC interpretation of the 650,000 production cap
- Define what constitutes a satellite facility
- Determine if it is appropriate to use additional facilities, including whether or not the facilities benefit recovery of ESA populations
- Include a process for evaluating the role of satellite facilities in increasing production over the 650,000 cap

6 FTC Recommendations

Production at the Cowlitz Hatchery Complex in excess of the 650,000 pound cap that is paid for by the CRR fund needs to benefit recovery of ESA listed populations. The CRR Plan will determine if and how the escrow fund could be used for additional production. Refined FHMP goals and objectives (Issue Paper #6) should be used to define likely future recovery programs and the facilities needed to implement these programs.

Evaluate alternative rearing strategies that would increase production in excess of the 650,000 pound cap. Explore collaborative strategies for funding increased production.

Consider suggestions provided by constituents in determining implementable solutions to increase production, such as altering fish rearing practices at the Salmon and Trout Hatcheries to improve efficiency. This could include rearing salmon species at the trout hatchery and vice versa.

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APPENDIX 7

HATCHERY SCIENCE RESEARCH GROUP
Make your Hatcheries Successful

Page 2, 11, Summary Conclusions, 2009 report to Congress.

The HSRG has reached several critical, summary conclusions regarding areas where current hatchery practices need to be reformed. Each of these conclusions (described in more detail later in this report) must be addressed through policy, management, research and monitoring:

- Manage hatchery broodstocks to achieve proper genetic integration
- with, or segregation from, natural populations; Promote local adaptation of natural and hatchery populations.
- Minimize adverse ecological interactions between hatchery- and
- natural-origin fish; Minimize effects of hatchery facilities on the ecosystem; and
- Maximize survival of hatchery fish.

Page 11

Maximize Survival of Hatchery Fish

In order for hatchery programs to effectively contribute to harvest and/or conservation, the reproductive success and survival of hatchery releases **must be high relative to those of naturally spawning** populations. The primary performance measurement for hatchery programs should be the total adults produced (harvest plus escapement) per adult spawned at the hatchery. **All too often in the past, hatcheries have been evaluated based on the number of smolts released** (which is like evaluating a farm based on the pounds of seed planted, rather than the size and quality of the crop produced).

Recommendation 13: Maximize survival of hatchery fish consistent with conservation goals

Maximizing the survival of hatchery fish enables conservation programs to accelerate their rebuilding efforts. It allows production hatcheries to reduce their ecological impacts on natural populations. Conservation hatcheries producing juveniles with high survival generate more spawners on the spawning grounds. This, in turn, accelerates the rate at which recovery programs move toward meeting their goals. Production programs may have to reduce release numbers to decrease negative ecological impacts on natural populations. Increasing post-release survival can offset this reduction and enable managers to meet their harvest goals. There are many approaches to increasing fish survival. The release of fish at the appropriate time, size, age and location can significantly increase their recruitment to fisheries and natural escapement. Releasing rapidly migrating smolts rather than fry increases survival and reduces negative ecological interactions in the freshwater environment. Similarly, the release of healthy fish produces more fish for harvest and less opportunity to spread disease to natural populations. Improving water quality and reducing loading and density during rearing are also proven tools used by fish

culturists to enhance fish survival. Adoption of volitional release (allowing smolts to outmigrate when they are ready, rather than "forcing" them out at a preset date) with removal of residuals (fish that do not outmigrate) may increase the long-term survival of released fish, while decreasing negative ecological interactions with natural populations. Proper acclimation and imprinting of hatchery juveniles can reduce straying and enhance survival to the desired location for their harvest or artificial spawning.18 Developing and adopting these and other culture and release practices that maximize fish survival and minimize negative ecological interactions by reducing production release numbers, can aid conservation programs in rebuilding runs and reducing the conflict between harvest programs and conservation goals for natural population

Principle: Monitor, Evaluate and Adaptively Manage Hatchery Programs In addition to establishing resource goals (the first principle) and a defensible scientific rationale for a hatchery program (the second principle), the HSRG recommends that the managers' decisions be informed and modified by continuous evaluation of existing programs, changing circumstances and new scientific information. Systems affected by hatchery programs are dynamic and complex; therefore, uncertainty is unavoidable. The only thing certain is that the unexpected will occur. Managing hatchery programs is an ongoing and dynamic process. Hatchery managers' decision-making processes must include provisions to monitor the results of their programs and identify when environmental conditions or scientific knowledge has changed. Climate change and human population growth are examples of the factors that must be taken into consideration in the future. New data will change our understanding of the ecological and genetic impacts of hatchery programs. Recognizing these changes should lead directly to changes in hatchery operations. This approach will require a substantial increase in scientific oversight of hatchery operations, particularly in the areas of genetic and ecological monitoring. The process should be structured to allow directed research, innovation and experimentation, so hatchery programs may be effectively modified to better contribute to new goals and incorporate new concepts in fish culture practice. Recommendation 14: Regularly review goals and performance of hatchery programs in a transparent, regional, "all-H" context The HSRG recommends that the managers' decisions be informed and modified by periodic evaluations of existing programs in light of new scientific information. This evaluation process should be on-going to allow incorporation of new knowledge as soon as possible. Comprehensive reviews of hatchery programs should be conducted at regularly scheduled intervals. The 2008 Federal Columbia River Power System Biological Opinion (NMFS 2008e) requires periodic reviews at five and ten year intervals, to monitor progress toward implementing actions and assessing progress towards achieving expected benefits. These types of periodic reviews assess the region's implementation progress and allow consideration of new information and adjustment of plans to achieve managers' objectives. Hatcheries should also be subject to comprehensive review every five years. This review should include hatchery operation and performance, as well as hatchery program performance standards, to ensure continued consistency with overall population goals.19 For many programs, this approach will require a substantial increase in scientific oversight of hatchery operations, particularly in the areas of genetic and ecological monitoring. Well-defined, responsive decision-making processes will need to be in place to accommodate new information and recommendations resulting from these hatchery reviews. These periodic reviews will help keep the region focused on hatchery reform implementation and will help monitor benefits and risks over time. 19 To facilitate these regional reviews, all HSRG data sets and reports, as well as the AHA tools, are available through the publically accessible Hatchery Reform web site, www.hatcheryreform.us. Columbia River Hatchery Reform Project Page 25 Final Systemwide Report- Part 2 The HSRG believes that hatcheries can be managed in a more

flexible and dynamic manner in response to changing environmental conditions, new scientific information, and the changing economic value of the resource. Decisions about hatcheries must also be made in a broader, integrated context and hatchery solutions must meet the test of being better, in a benefit-risk sense, than alternative available means to meet similar goals. Results of monitoring and evaluation must be brought into the decision-making process in a clear and concise way, so needed changes can be implemented. This responsive process should be structured to allow for innovation and experimentation, so hatchery programs may incorporate new goals and concepts in fish culture practice. The HSRG has concluded that certain information is critical to operating hatchery programs in a responsible manner. Hatchery fish should not be released unless the contribution of those fish to natural spawning escapement can and will be estimated with reasonable accuracy on an annual basis. Contribution from each hatchery program to fisheries should also be monitored annually. Increased tagging rates and improved sampling of fisheries and spawning escapement will be needed to assure sufficient accuracy in estimating contributions of specific hatchery programs to harvest and natural spawning. Natural spawner abundance of populations affected by hatchery fish should be estimated each year, with the highest priority placed on Primary populations.20 Recommendation 15: Place a priority on research that develops solutions to potential problems and quantifies factors affecting relative reproductive success and long-term fitness of populations influenced by hatcheries Hatcheries have demonstrated that they can successfully provide fish for harvest. Scientific uncertainty remains about the reproductive success of hatchery-origin fish in the wild. A growing body of research has shown that traditional hatchery practices produce adults that may exhibit lower reproductive success in nature than locally adapted natural fish. In addition, it appears that a number of natural populations continue to have low productivity and are at risk of going extinct. Hatcheries have played a role in preserving some at-risk populations in the short term, but the longer-term effects are unknown. Hatcheries will continue to be used to preserve natural populations in the foreseeable future. Current research is focused on quantifying the relative reproductive success between hatchery- and natural-origin fish using traditional practices, but has not attempted to identify factors or test solutions to improve upon this performance. The environmental phenotypic component (i.e., the reproductive success of first generation hatchery-origin fish) needs further investigation for different species and culture conditions. Also, long-term fitness loss as a function of the proportion of hatchery fish in natural spawning populations and the proportion of natural fish in the hatchery broodstock must be addressed, among other factors. Future research should be prioritized to identify factors causing reduced fitness and reproductive success of hatchery fish and investigate whether changes to fish culture practices can overcome these problems. 20 Specific monitoring recommendations are provided in the population reports (Appendix E). A proposed framework for monitoring is outlined in Appendix A (Framework for Monitoring and Evaluating Hatchery Programs). Columbia River Hatchery Reform Project Page 26 Final Systemwide Report- Part 2 Recommendation 16: Design and operate hatcheries and hatchery programs with the flexibility to respond to changing conditions The concept of adaptive management is well established in the Columbia River Basin. Adaptive management is a structured, iterative process of optimal decision-making in the face of uncertainty, aimed at reducing uncertainty over time through system monitoring and evaluation. The HSRG developed its recommendations using analyses based on best available scientific knowledge, reasonable assumptions where information was lacking, and management goals (as understood by the group). The HSRG's recommendations are based on the interactions among and between hydropower and hatchery operations, as well as harvest and habitat variables. The analytical methods used to develop those recommendations will need to be updated, and management decisions adapted

accordingly as new knowledge is gained through the implementation, monitoring and evaluation of hatchery reform. It will be important for hatchery managers to design and operate hatchery programs with the flexibility to respond to both new knowledge and changing conditions. This is likely to be increasingly important in light of changing climate conditions (Appendix A, Global Climate Change and its Effects on the Columbia River Basin). Recommendation 17: Discontinue or modify programs if risks outweigh the benefits Many of the Columbia River Basin hatchery programs were initiated in the 1950s and 1960s and were designed to support high levels of harvest. The importance of maintaining viable natural populations was not well understood and was not a priority during the development of hatchery infrastructure, especially in much of the Columbia River Basin. Scientific information since then has shown that hatchery fish can pose significant risks to natural populations if managed improperly. In addition, recent Endangered Species Act (ESA) listings of salmon and steelhead have elevated conservation of viable natural populations to a management priority. Many of the hatchery programs designed to support a single harvest objective must be modified to also achieve conservation goals for natural populations. Both conservation and harvest goals can be achieved if resources are provided to modify these hatchery programs. Without these investments, programs will have to be reduced or discontinued, in order to achieve the conservation goals. This will result in loss of harvest benefits.

https://www.streamnet.org/app/hsrg/docs/01_HSRG-CRB_Final-Systemwide-Report[1].pd

NOAA guide to managers

https://www.fisheries.noaa.gov/west-coast/sustainable-fisheries/salmon-life-cycle-and-seasonal-fishery-planning

https://www.fisheries.noaa.gov/west-coast/sustainable-fisheries/salmon-life-cycle-and-seasonal-fishery-planning

NOAA Fisheries- Salmon Life Cycle and Seasonal Fishery Planning

The life cycles of salmon and steelhead along the West Coast are amazingly intricate. Understanding these complexities is important for predicting and reconstructing salmon and steelhead populations, and is vital for the management of seasonal fisheries.

https://www.fisheries.noaa.gov/west-coast/sustainable-fisheries/salmon-life-cycle-and-seasonal-fishery-planning

APPENDIX 8
CURRICULUM VITAE- LARRY PRYOR

Chair of Northwest Fisheries Enhancement, www.nwfe.org, a Fish advocacy non-profit located in Yakima, Washington. I am an avid Sport Angler and have fished extensively on the Cowlitz River since the early nineties.
I have been a strong advocate for Cowlitz River anglers for years by serving on the Friends of the Cowlitz executive board, as a member of WDFW's ad hoc committee and later the Cowlitz River Advisory Group (CRAG) and attending many Fish Technical Committee meetings and Annual Program reviews as a public commentor.
I was instrumental in transferring Cooke Aquaculture 420,000 rainbow trout to be donated and stocked in Riffe Lake in 2021
Introduced new feed products and presentations by Dr Trushenski PhD on SSFO feed and smoltification to Tacoma Power and WDFW.
Arranged tours of Riverence/ Americas leading commercial RAS and contained Salmonid Broodstock hatcheries for Tacoma Power hatcheries key personnel and more.
I have toured and met with managers of over 60 Salmon and Steelhead Hatcheries, Labs and Hatchery Research facilities in Washington, Oregon and Idaho of WDFW, ODFW, IDFG, USFWS, OSU and various Tribal hatcheries, with many networks and contacts.
Conducted and provided Hatchery assessments for PacificCorp Utilities Corporation Lewis River project and hatcheries.
Attended NOOA Managing National Fisheries Conference, Washington DC
Attended World Aquaculture Conference, Las Vegas NV
Attended American Fisheries NW Fish Culture Conferences, 2018, 2019, 2023
Presented to Northwest Power & Conservation Council
Presented to National Hydro Association Waterpower week, Washington DC
Presented to Hydro Vision Portland OR
Presented to Northwest Power Association /NWPA Seattle WA
Past member of NWPA and the Natural Resources Committee
VP Friends of the Cowlitz, long term member

Developed Northwest Fisheries Enhancement /www.NWFE.org,
https://www.facebook.com/northwestfisheriesenhancement
My advisory is NWFE Advisory Board Members – Leading World, National and Regional Fisheries and Fish Culture Specialist with PhD, MSc, BS, JD, DVM backgrounds. Two are also recognized as Hatchery International Top 10, https://nwfe.org/advisory-board/

CEO of Yakima Emergency Services/ Yakima Medic 1 awarded Washingtons EMS provider of the Year.
Paramedic, Paramedic Supervisor
Drove and team owner in NASCAR Top West coast series, Top ten driver.
Team manager for NASCAR National Series, Craftsman Series, Mooresville NC
Owner National Power Supply
Owner Allied Power Solution, sales of Industrial Diesel Engines and Power Generators Domestic and International

Central Washington University Paramedic Program, degree, and accreditation

NWFE.Org/blog/ facebook.com/northwestfisheriesenhancement

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https://nwfe.org

APPENDIX 9
REFERENCES AND OTHER RESOURCES

Resources and References:

Releases, numbers, dates sizes: Pacific States Marine Fisheries Commission / Regional Mark Processing Center
https://www.psmfc.org/ https://www.rmpc.org/
https://www.rmis.org/cgi-bin/queryfrm.mpl?Table=all_releases&Version=4.2

NOAA Fisheries; Salmon Life Cycle and Seasonal Fishery Planning for the management of seasonal fisheries.
https://www.fisheries.noaa.gov/west-coast/sustainable-fisheries/salmon-life-cycle-and-seasonal-fishery-planning

Hatcheries Escapement reports (returns to the hatchery):
https://wdfw.wa.gov/fishing/management/hatcheries/escapement
Harvest/ State Sport Catch Reports: https://wdfw.wa.gov/publications?title=&category=26269&author=

Harvest and Catch reports (Sports catch/ harvest)
https://wdfw.wa.gov/fishing/management/hatcheries/escapement

HSRG report to US Congress, 2004, 2009, 2015
https://www.streamnet.org (Previously www.hatcheryreform.us)

Fish Passage Center https://FPC.org https://www.fpc.org/documents/Q_fpc_cssreports.php
Comparative Survival Study /CSS
https://www.fpc.org/documents/CSS/CSS%20Annual%20Report%202023.pdf

Priest Rapids Hatchery Monitoring & Evaluation 2021-2022
https://www.grantpud.org/templates/galaxy/images/images/Downloads/ResourceCommittees/OtherDocuments/2022_12_15_Grant_-_Priest_Rapids_Hatchery_Monitoring_and_Evaluation_Annual_Report_for_2021-2022_Final.pdf

Cowlitz Falls Fish Facility release reports 2016-2023 provided by Tacoma Power, Cowlitz Falls Fish Facility end of year reports, email chain to lpryor@nwfe.org, provided on request

FERC.gov
https://elibrary.ferc.gov/eLibrary/search Docket Number P-2016
herrea beutler

MYTPU.org
https://www.mytpu.org/about-tpu/services/power/about-tacoma-power/dams-power-sources/cowlitz-river-project/cowlitz-license-documents/

mytpu.org MAYFIELD DAM DOWNSTREAM MIGRANT SMOLT SURVIVAL STUDY USING ACOUSTIC TAG METHODOLOGIES IN 2014 By HTI- Hydroacoustic Technologies for Tacoma Power
https://www.mytpu.org/wp-content/uploads/6-2014-mayfield-downstream-survival-final-report.pdf

https://www.mytpu.org/about-tpu/services/power/about-tacoma-power/dams-power-sources/cowlitz-river-project/cowlitz-license-documents/

https://www.mytpu.org/wp-content/uploads/cowlitz-settlement-agreement.pdf

https://www.mytpu.org/wp-content/uploads/8_Holowatz-Cowlitz-Science-Harvest-Trends-82223.pdf

https://www.mytpu.org/about-tpu/services/power/about-tacoma-power/dams-power-sources/cowlitz-river-project/#pattern_5