#### **Cowlitz River Basin Natural Origin Production**

Lower Cowlitz River: Fall Chinook, Coho, and Steelhead <u>Tilton River:</u> Fall Chinook, Coho, and Steelhead <u>Upper Cowlitz River:</u> Spring Chinook, Coho, and Steelhead

### **Objective/Purpose**

- Current status and trends
- Describe the dynamics within each basin (Lower Cowlitz, Tilton, and Upper Cowlitz)
- Summarize where we are at with each species



### Viable Salmonid Population Metrics

- "A viable salmonid populations is an independent population of any Pacific salmonid (genus Oncorhynchus) that has a negligible risk of extinction due to threats from demographic variation (random or directional), local environmental variation, and genetic diversity changes (random or directional) over a 100-year time frame."
- Four parameters for evaluating VSP:
  - Abundance
  - Population growth rate productivity
  - Spatial Structure
  - Diversity anadromy, morphology, timing, age, and behavior



#### Lower Columbia Salmon Recovery Plan

		Recovery Viability		Improve-	Abundance			
Species	Population	Priority <sup>1</sup>	Status <sup>2</sup>	Obj. <sup>3</sup>	ment <sup>4</sup>	Historic⁵	Current <sup>6</sup>	Target <sup>7</sup>
Fall Chinook (Tule)	L. Cowlitz	Contributing	VL	M+	50%	24,000	500	3,000
Chum (Fall)	L. Cowlitz	Contributing	VL	м	>500%	195,000	<300	900
Chum (Summer)	L. Cowlitz	Contributing	VL	м	>500%	n/a	n/a	900
Winter Steelhead	L. Cowlitz	Contributing	L	м	5%	1,400	350	400
Coho	L. Cowlitz	Primary	VL	н	100%	18,000	500	3,700

Table G-1. Status and goals of focal salmonid and steelhead populations in the lower Cowlitz basin

#### Table F-1. Status and goals of focal salmonid and steelhead populations in the Upper Cowlitz subbasin.

		Recovery	Viability		Improve-	Abundance		
Species	Population	Priority <sup>1</sup>	Status <sup>2</sup>	Obj. <sup>3</sup>	Ment <sup>4</sup>	Historic⁵	<b>Current</b> <sup>6</sup>	Target <sup>7</sup>
Fall Chinook (Tule)	U. Cowlitz	Stabilizing	VL	VL		28,000	0	
Spring Chinook	U. Cowlitz	Primary	VL	H+	>500%	22,000	300	1,800
Winter Steelhead	U. Cowlitz	Primary	VL	н	>500%	1,400	<50	500
Coho	U. Cowlitz	Primary	VL	н	>500%	18,000	<50	2,000
Spring Chinook	Cispus	Primary	VL	H+	>500%	7,800	150	1,800
Winter Steelhead	Cispus	Primary	VL	н	>500%	1,500	<50	500
Coho	Cispus	Primary	VL	н	>500%	8,000	<50	2,000
Spring Chinook	Tilton	Stabilizing	VL	VL	0%8	5,400	100	
Winter Steelhead	Tilton	Contributing	VL	L	>500%	1,700	<50	200
Coho	Tilton	Stabilizing	VL	VL	0% <sup>8</sup>	5,600	<50	

TACOMA **POWER** 

### Study area/Basin Overview





#### **Overview - Recent Status of Population in Basin**





### Natural Origin Fish in Broodstock







#### Lower Cowlitz Coho, Chinook, and Steelhead





#### Lower Cowlitz Coho, Chinook, and Steelhead



**Figure 1.** Weekly catches of NOR Chinook fry at the Cowlitz River screw trap. Displayed are catch totals from the previous season (2017-2018) and the current season (2018-2019).

			Na	Hatchery-origin <sup>1</sup>		
Species	Age Class	Fry	Parr	Transitional	Smolt	Smolt
Chinook	Subyearling	96,004	1,510	1,170	95	8,386
	Yearling+		2	0	21	4,733
Coho	Subyearling	341	1	0	4	0
	Yearling		24	1	205	5,705
Steelhead	Yearling	53	1	0	87	2,542
Chum	Subyearling	503				0
Cutthroat	Yearling		0	0	80	952

<sup>1</sup>Age of hatchery-origin smolts was assigned based on age at release per hatchery rearing protocols.





#### Tilton River Coho, Chinook, and Steelhead











### Tilton River Coho, Chinook, and Steelhead

#### • Mayfield Juveniles



#### Upper Cowlitz Basin Coho, Chinook, and Steelhead







#### Upper Cowlitz Basin Coho, Chinook, and Steelhead







## Productivity as function FCE



Median = 113 smolts / female spawner = 63 smolts / spawner



Korman and Tompkins (2014): 49 smolts/spawner Cowlitz =  $80^{th}$  percentile of productivity distribution

### Summary

- Coho Salmon have been the bright spot in the Cowlitz River Basin from an adult and juvenile perspective.
- Spring Chinook adults are still dominated by returning hatchery origin fish.
- Steelhead appear to be at stable, but low abundances (Adult & Juvenile).
- None of the basins/populations are showing signs of density dependence based on limited data.
- Consistently have higher HOR than NOR abundances which impacts pHOS.
- A large number of NOR adult fish are used in our hatchery broodstock.



### What are we working toward?

- Crediting Mechanism When do we start using this to improve management of stocks within the basin?
- Coho and fall Chinook salmon are performing well how do we consider what metrics as indicators to shift into next phase towards recovery?
- Responsibly integrated hatchery programs
- Better population differentiation



# Questions?

