

Calculating Impacts from Washington’s 2022 Columbia River Commercial Gillnet License Buyback

The Washington Department of Fish and Wildlife

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I. Proviso language ESSB 5693 Sec. 308 Sub. 65(b)

“For all licenses purchased, the department shall calculate the reduced impacts to wild and endangered stocks based on the most recent five-year average of harvest and reserve those impacts for conservation through increased wild salmonid escapement or mark selective fisheries capable of harvesting surplus hatchery-reared salmon where needed to meet federal genetic protection requirements for wild salmon populations in a manner consistent with state-tribal fishery management agreements.”

II. Approach

What commercial fisheries are included in the calculation and why?

The calculation focuses on the fall commercial gillnet fishery that occurred in Zones 4 and 5 of the Columbia River mainstem over the most recent five years (2017-2021). As described below, the other commercial fisheries either did not occur during the time period, were conducted in off-channel areas, or already utilize mark-selective alternative gear (Figure 1).

Columbia River Commercial Fisheries by season from 2017-2021		
Spring	Summer	Fall
Mainstem tangle net (Mark-selective for Chinook)	Mainstem gillnet/alternative gear (Gear not concurrent between states)	Mainstem gillnet (Took place in zones 4 & 5 to target upriver fall Chinook)
Select area gillnet (Off-channel select areas encounter few ESA-listed species)	Select area gillnet (off-channel select areas encounter few ESA-listed species)	Select area gillnet (off-channel select areas encounter few ESA-listed species)
		Mainstem coho tangle net (Mark-selective for coho)

 Fishery did not occur from 2017-2021
 Fishery occurred, not included in calculation
 Fishery included in calculation

Figure 1. Summary depicting commercial fisheries included in the calculation of reserved impacts.

From 2017 to 2021, there were no mainstem Columbia River commercial salmon fisheries in the spring and summer fishing seasons. Although Select Area commercial fisheries did occur in these years, Select Area fisheries were an explicit part of the 2013 harvest reform initiative between the states of Oregon and Washington. These Select Areas allow for a commercial fishery that has very low impacts to ESA-

listed species and were developed to compensate for the economic losses to commercial fisheries from the shifting of harvest allocation from the commercial to recreational sectors as a result of harvest reform. Thus, our calculations of reserved impacts do not include any spring/summer commercial fisheries, nor do they include any Select Area fall commercial fisheries.

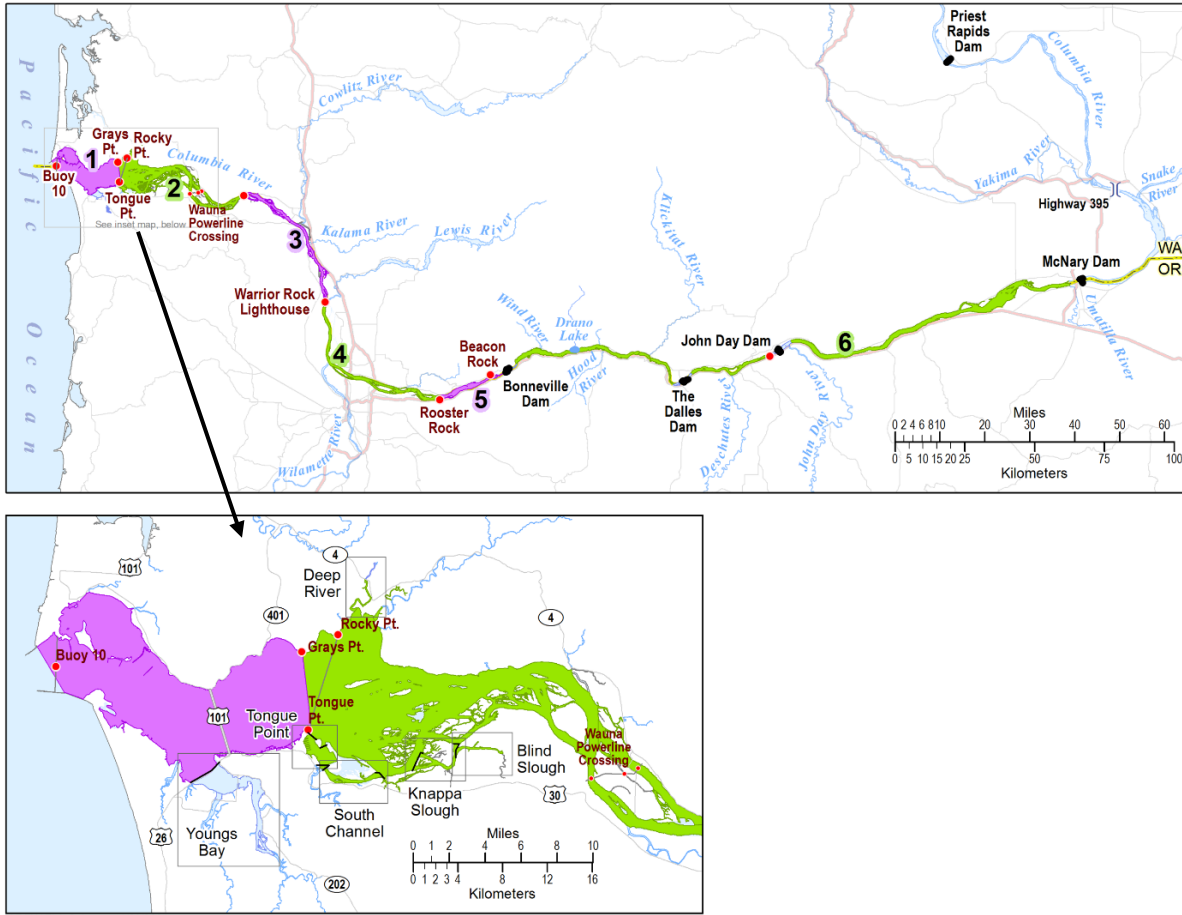


Figure 2. Top: A map of the five commercial fishing zones in the Lower Columbia River from the mouth of the river to Bonneville Dam. Bottom: Zoomed in portion of the map depicting the five select areas in Oregon and the one Select area in Washington.

Harvest reform also called for the transition from gillnets to alternative gear, which are gears that could be utilized mark-selectively to target and remove hatchery fish with fewer impacts to listed species than gillnets. To meet this objective, the states developed mainstem commercial fisheries using tangle nets as an alternative to gillnets. The states provided a fall commercial mainstem fishing opportunity using tangle nets to target hatchery coho salmon during most years over the 2017-2021 period. This fishery is operated mark-selectively in line with the 2013 harvest reform, the Washington Fish and Wildlife Commission’s policy (C-3630), and the proviso for “reserving those impacts for conservation through increased wild salmonid escapement or **mark selective fisheries capable of harvesting surplus hatchery-reared salmon.**” As a result, fall tangle net commercial fisheries are not included in the calculation.

What wild and ESA-listed stocks were assessed?

Because our calculation focuses on the zone 4/5 commercial fishery, the assessment of reserved impacts focuses on wild and ESA-listed stocks that are encountered during fall fisheries. Another facet of fisheries that informs impact assessment is the concept of a “constraining stock.” Constraining stocks are those salmon and steelhead that limit the fishery due to low forecasted abundance. Given the mixed stock nature of Columbia River fisheries, there can be multiple constraining stocks over the course of the season. Because fisheries are managed to the most constraining stocks, the full amount of allowable impacts to ESA-listed stocks are typically not utilized. Thus, the calculation of reserved impacts is focused on the key ESA-listed fall stocks that typically constrain fisheries in the Columbia River for each year. Harvest/impact rates to other wild salmonid stocks are expected to be relatively proportional to the primary ESA constraining stocks. For example, fisheries shaped to remain within the Lower Columbia River (LCR) Natural Tule fall Chinook ESA-impact rates would have a similar effect on the Lower River Wild Bright fall Chinook stock (which returns primarily to the Lewis River).

The Washington Fish and Wildlife Commission’s Columbia River Policy (C-3630) establishes quantitative commercial and recreational sector allocations for the most constraining fall Chinook stocks. The policy does not establish quantitative sector allocations for any other species. The two fall Chinook stocks of focus are Snake River Wild (SRW) Fall Chinook, which is an ESA component of the Upriver Bright stock, and the LCR Natural Tule Fall Chinook, which is an ESA component of the Lower River Hatchery tule stock. Thus, the tables below use bold text to indicate which fall Chinook stock was constraining and thus subject to the allocation formula (i.e., no less than 30% of the most constraining fall Chinook stocks for the commercial sector). In the years where the stock is not constraining there is no commercial sector allocation constraint and thus impacts can be more than 30% of the non-treaty component.

Co-management of ESA Impacts

The overall ESA impact limits for fisheries that could potentially impacts ESA-listed stocks are decided by the Federal government, specifically the National Marine Fisheries Service (NMFS), and the U.S. Fish and Wildlife Service (USFWS) depending on the species being impacted. For Columbia River mainstem non-treaty fisheries, the state of Washington does not have its own ESA impacts, and thus cannot make decisions about mainstem non-treaty fisheries alone. For some species of listed fish, those limits are decided at the geographic scale of the Columbia River, with the non-treaty share of those ESA impacts being under the joint jurisdiction of the States of Washington and Oregon (e.g., Snake River wild fall Chinook).

For other species (e.g., LCR fall Chinook salmon), the ESA impact limits are decided at the geographic scale of the Columbia River in combination with ocean fisheries. The ocean fisheries include both the United States and Canada, with the non-treaty southern US portion of those ocean fisheries managed by the states of California, Oregon, and Washington. As a result of our various co-manager fishery agreements, in no mainstem Columbia River fishery does the State of Washington have its own share of ESA impacts. This is why any changes to how ESA impacts for mainstem Columbia River fisheries are utilized requires concurrency on that change with our co-managers.

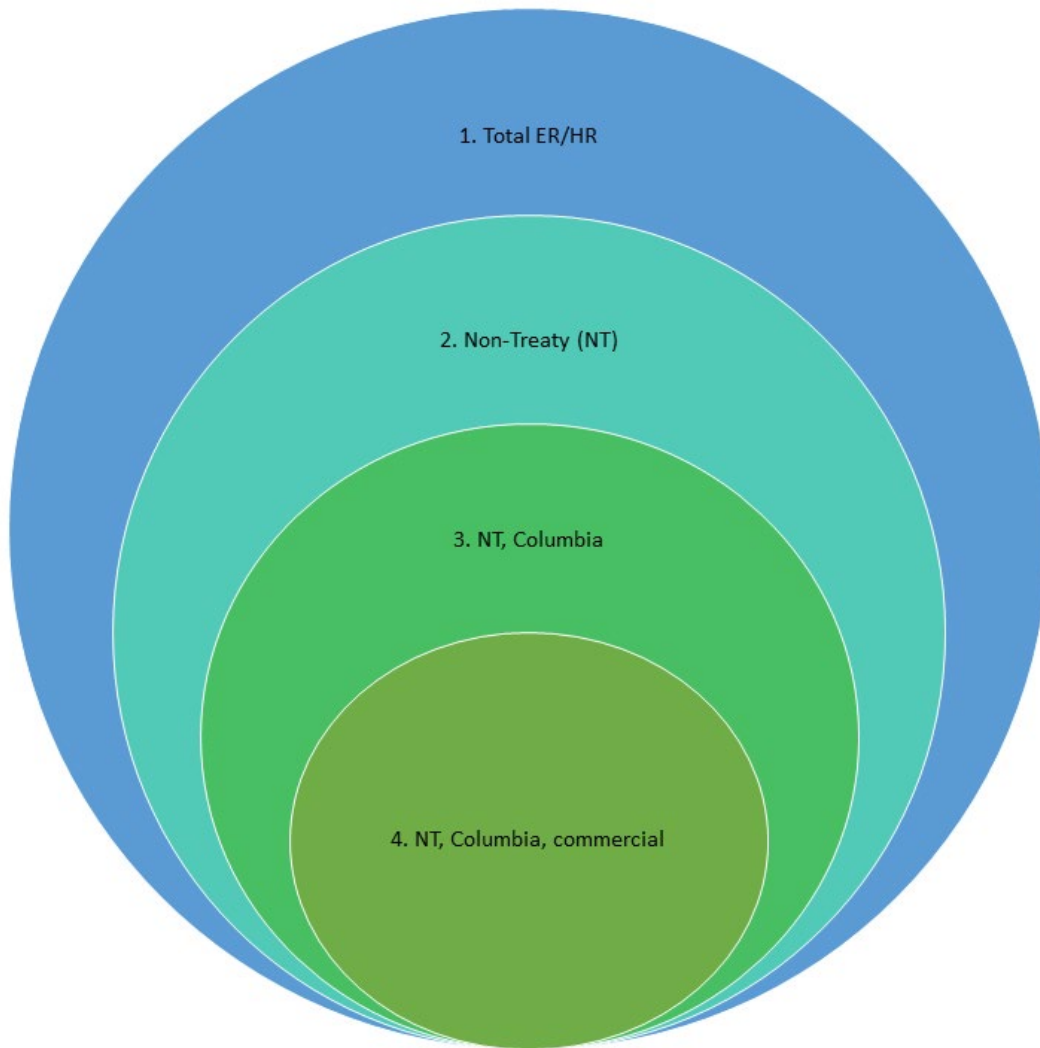


Figure 3. This schematic shows the nesting of ESA impacts from total exploitation rate (ER)/harvest rate (HR) to the impacts used by the non-treaty Columbia River commercial sector (level 4); the latter is the finest level of policy guidance.

III. Methodology

To perform this calculation, we need to be able to translate individual landings/released fish into individual impacts; prior to this assignment, calculations of impact rates were at the fishery scale (OR & WA combined). Dialing in our data to the individual was particularly important because a fisher's catch/handle varies due to differences in fishing location, the specific time a fisher fishes within the open period, how many periods a fisher fishes, the number and quality of drifts a fisher makes (i.e., effort, as well as variables outside of a fisher's control such as weather). Thus, we cannot assume all fishers use an equal share of the allowable impacts. Lastly, different calculation methods are required for landed catch versus released fish as further describe below.

Landed Catch (Chinook and coho)

1. Gather data for all WA fishers with Columbia River landings from both OR and WA

2. Convert weights to numbers of fish at the finest scale (e.g., weekly)
3. Sum each fisher's landings for those that retired their license by the finest scale for each year
4. Multiply aggregate fine scale landings by species/ stock component ESA impact rate by week for every year
5. Sum impacts for each fishery within a year
6. Average over five years

Released Fish (chum and steelhead)

1. Gather data for all WA fishers with CR landings from both OR and WA
2. Convert weights to numbers of fish at the finest scale and fish tickets to landings (effort)
3. Chum: Multiply Chinook landed catch proportion from retired licenses by the total chum impact rate for each year
4. Steelhead: Use fishing periods, fish abundance, and landings relationship per fisher to determine encounters at the finest scale to estimate impacts, and sum impacts for each fishery within a year
5. Average over five years

IV. Results

Table 1. Fall Columbia River mainstem zone 4/5 commercial fishery landings and Endangered Species Act (ESA) exploitation rates (ER)/harvest rates (HR) for Washington fishers that retired their license in the 2022 Washington buyback program; SRW = Snake River Wild Fall Chinook, LCR = Lower Columbia River Natural Tule Fall Chinook, LCN = Lower Columbia River Natural coho. Constraining Fall Chinook stocks for each year are shown in bold.

Year	Landings		ESA ER/HR					
			Chinook		Coho	Chum	Steelhead	
	Chinook	Coho	SRW	LCR	LCN		Wild A	Wild B
2017	7,284	385	1.55%	0.24%	0.42%	0.00%	0.07%	0.10%
2018	2,974	150	0.80%	0.39%	0.32%	0.00%	0.03%	0.03%
2019	3,066	78	0.63%	0.43%	0.04%	0.00%	0.03%	0.02%
2020	13,546	1,141	1.53%	1.49%	0.39%	0.00%	0.04%	0.11%
2021	9,001	1,772	0.96%	0.66%	0.33%	0.00%	0.13%	0.13%
5-year Average	7,174	705	1.09%	0.64%	0.30%	0.00%	0.06%	0.08%

Table 2. Fall Columbia River post-season estimates for **non-treaty commercial fishery (combined WA/OR including Select Areas, zone 4/5, and fall tangle net fisheries)** landings and Endangered Species Act (ESA) exploitation rates (ER)/harvest rates (HR); SRW = Snake River Wild Fall Chinook, LCR = Lower Columbia River Natural Tule Fall Chinook, LCN = Lower Columbia River Natural coho. Constraining Fall Chinook stocks for each year are shown in bold. Estimates provided in this table are not the allowable rate for the commercial fishery.

Year	Landings		ESA ER/HR					
			Chinook		Coho	Chum	Steelhead	
	Chinook	Coho	SRW	LCR	LCN		Wild A	Wild B
2017	31,432	38,910	4.26%	1.10%	1.13%	0.01%	0.25%	0.87%
2018	14,924	12,491	2.24%	2.17%	0.44%	0.04%	0.14%	0.13%
2019	12,195	22,003	1.80%	2.04%	0.55%	0.20%	0.08%	0.17%
2020	36,642	51,287	3.83%	3.70%	0.98%	1.52%	0.11%	0.34%
2021	31,665	112,116	3.09%	2.59%	1.21%	1.09%	0.28%	0.27%
5-year Average	25,372	47,361	3.05%	2.32%	0.86%	0.57%	0.17%	0.36%

As noted previously, the constraining fall Chinook stock can change annually, and/or within a season. Because of this, calculating a five-year average of the impacts utilized masks the year-to-year variability and does not account for annual harvest constraint limits (e.g., 15.0% or 8.25% SRW HR for non-treaty fisheries). Thus, Table 3 below shows how the allowable ESA ER/HR are allocated to the commercial sector when applicable. Values in bold indicate the most constraining fall Chinook stock for each year and the corresponding commercial sector allowable allocation, based on the various abundance-based HR/ER frameworks Columbia River fisheries are managed within.

Table 3. Fall Chinook and coho stock ESA ER/HR Totals (for all co-managers), the non-treaty proportion, and the commercial sector. NA = not applicable and is used to indicate when OR/WA policy guidance does not apply. Bold indicates most constraining stock for that given year. Coho salmon, chum salmon and steelhead allowable non-treaty impact rates do not have prescribed quantitative sector allocations. The steelhead impact rates are 2% of the Columbia River run size for wild-A and wild B steelhead in the fall season and is 5% of the Columbia River run size for chum salmon annually.

Fall Chinook and coho stocks ESA ER/HR									
Year	SRW HR (Columbia River only)			LCR ER (Ocean and Columbia River)			LCN Coho ER (Ocean and Columbia River)		
	Allowable Total	Allowable Non-treaty	Allowable Non-treaty Commercial	Allowable Total	Post-season, Non-treaty Columbia River	Post-season, Columbia River Non-treaty Commercial	Allowable Total	Post-season Columbia River Non-treaty	Post-season Columbia River Non-treaty Commercial
2017	45.0%	15.0%	4.50%	41.0%	7.73%	NA	18.0%	4.0%	NA
2018	31.25%	8.25%	2.48%	38.0%	8.87%	NA	18.0%	1.7%	NA
2019	45.0%	15.0%	4.50%	38.0%	10.30%	NA	23.0%	3.6%	NA
2020	45.0%	15.0%	4.50%	38.0%	11.38%	NA	18.0%	2.1%	NA
2021	45.0%	15.0%	NA	38.0%	13.52%	4.06%	30.0%	2.8%	NA