2025 Deschutes River Spring Chinook Forecast

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-2025 Prediction Summary-

Preseason predictions were generated for three distinct stocks of adult spring chinook salmon returning to the Deschutes River; wild spring chinook, of which the majority return to spawn in the Warm Springs River (WSR); Warm Springs National Fish Hatchery (WSNFH) hatchery stock, and Round Butte Hatchery (RBH) stock. The predictions were modeled using 1) a standard regression with all year data, 2) a standard regression using just the last 10 years of data, 3) return ratio using all data, and 5) return ratio using the last 10 years of data. Also predicted for the WSR stock is a probability that more than 100 adults return. Predictions for jack returns (3-year old fish) are not developed. More detail on methods can be found in Hand and Haeseker, 2011.

For 2025, the predicted return is estimated to fall within a range of values (Table 1). These values represent the low and high prediction of all the models combined. A summary of the models is shown in Table 1; the results of the forecast models are presented in Table 2.

Table 1. Summary of Deschutes spring chinook prediction models for 2025. Estimates are for adult age fish (4 and 5 year old).

Stock	Range of Estimates	Probability of fish returning
WSR Wild Stock	223 - 378 fish	57 - 66% (>100)
WSNFH Hatchery Stock	344 – 788 fish	46 - 56% (>500)
RBH Hatchery Stock	823 – 1,209 fish	-
Hatchery Total	1,167 – 1,997 fish	N/A
Total Run Prediction	1,390 – 2,375 fish	N/A

Table 2. Forecast model predictions of spring chinook salmon returns to the Deschutes River in 2025.

	Std Reg (All data)	Std Reg (10 yr. Data)	Return Ratio (10 yr. Data)	% Age Model (10 yr. Data)
Wild Fish Age 4	374	221	370	225
Wild Fish Age 5	4	2	5	4
Wild Fish Total	**378**	**223**	**375**	**229**
Probability that >100 adults return	66%	57%	66%	59%
	Std Reg	LN Reg	Return Ratio (All Data)	% Age Model (All Data)
WSNFH Age 4	766	503	492	333
WSNFH Age 5	22	10	12	11
WSNFH Total	**788**	**513**	**504**	**344**
Probability that >500 adults return	56%	50%	49%	46%
	Std Reg	LN Reg	Return Ratio (All Data)	% Age Model (All Data)
RBH Age 4	1,202	1,200	1,079	812
RBH Age 5	7	6	10	11
RBH Total	**1,209**	**1,206**	**1,089**	**823**

2024 Review of Returns

The run reconstruction of spring chinook salmon to the Deschutes River includes returns to hatcheries and estimated harvest in the Sherars falls fishery. In 2024, the CTWS Tribal Council opened a limited subsistence fishery for tribal members from Thursday at dawn to Sunday at dusk. Again, due to hiring difficulties, creel surveys at Sherars were limited to approximately 8 weeks of the normal 12 week sample period. Another extended high water event occurred which limited gear efficiency near the average peak of the run. The Oregon Department of Fish and Wildlife did not open a recreational (non-tribal) fishery for spring chinook. Predicted returns are for adult fish (age 4 and age 5), and jacks (age 3) are recorded separately.

Wild Fish

In 2024, the actual return of wild fish was below the predicted range for wild fish. The predicted range of returns for 2024 was between 158 and 352 adults, and a total of 55 adults returned to the mouth of the Deschutes River which was well below the predicted range (Table 3). Of these wild adult returns, 24 were transported upstream of the hatchery, 24 were spawned at the hatchery, 5 were mortalities in the hatchery brood ponds and 2 were considered surplus. Sixteen age-3 fish returned, 7 of these were transported upstream, 7 were spawned at WSNFH and 2 were mortalities. No wild spring chinook were harvested by tribal fishers.

WSNFH Fish

The return of 237 WSNFH hatchery stock adults to the Deschutes Basin in 2024 was well below the predicted return range of 319 to 790 adults (Table 3). Additionally, a total of 48 age-3 fish (jacks) were counted. There were 12 fish donated to the tribe from WSNFH in 2024. A total of 154 adult hatchery fish were spawned at the hatchery and another 61 adult hatchery fish and 13 jacks were brood pond mortalities. One jack, 11 four-year old and 1 five-year old fish were harvested by tribal fishers at Sherars Falls. No hatchery fish were transported upstream of the hatchery.

RBH Fish

A range of 266 – 835 adult RBH stock spring chinook were predicted to return to the Deschutes River in 2024. A total of 191 adult RBH stock were estimated to have returned to the mouth of the Deschutes River which was well below the predicted range. Additionally, a total of 383 age-3 fish (jacks) were counted. Six jacks, 10 four-year old and no five-year old fish were estimated to be harvested by tribal fishers. At the Pelton fish trap, 558 RBH hatchery stock fish (175 four-year old and 6 five-year old adults and 377 jacks) were captured, which was below the broodstock target goal of 810 fish (2 hatchery programs). Of the fish captured, 192 (mostly jacks) were donated to the Warm Springs tribes from RBH in 2024. Another 8 males, 18 females and 112 jacks were passed above the project for the re-introduction program (personal communication, Ryan Moon, ODFW).

Table 3. Review of 2024 Predicted vs. Actual returns.

	2024 Predicted Return	2024 Actual Return	2024 Jack Return*
Wild Fish	158 - 352	55	16
WSNFH	319 – 790	237	48
RBH Fish	266 – 835	191	383

*Jack returns are not included in predictions.

Management Implications

Wild Fish

The wild return prediction of 223 – 378 wild fish would be within the range of the average return based up the 10-year average (2015 – 2024) of 353 fish returning to WSNFH (Table 4). Figure 1 shows the data in Table 4 in a graphical representation with a longer time series. In 2020, CTWSRO and USFWS initiated a wild fish supplementation program, with the goal of collecting 100 wild fish (60 females, 40 males) for spawning and rearing at the hatchery. It will be likely wild escapement will not meet the target goal of 1,200 fish.

Table 4. 10-year average return of adult wild fish to WSNFH.

Return Year	Wild Adult Chinook to WSNFH
2015	1,340
2016	392
2017	179
2018	242
2019	201
2020	42
2021	127
2022	287
2023	154
2024	154
Average	353

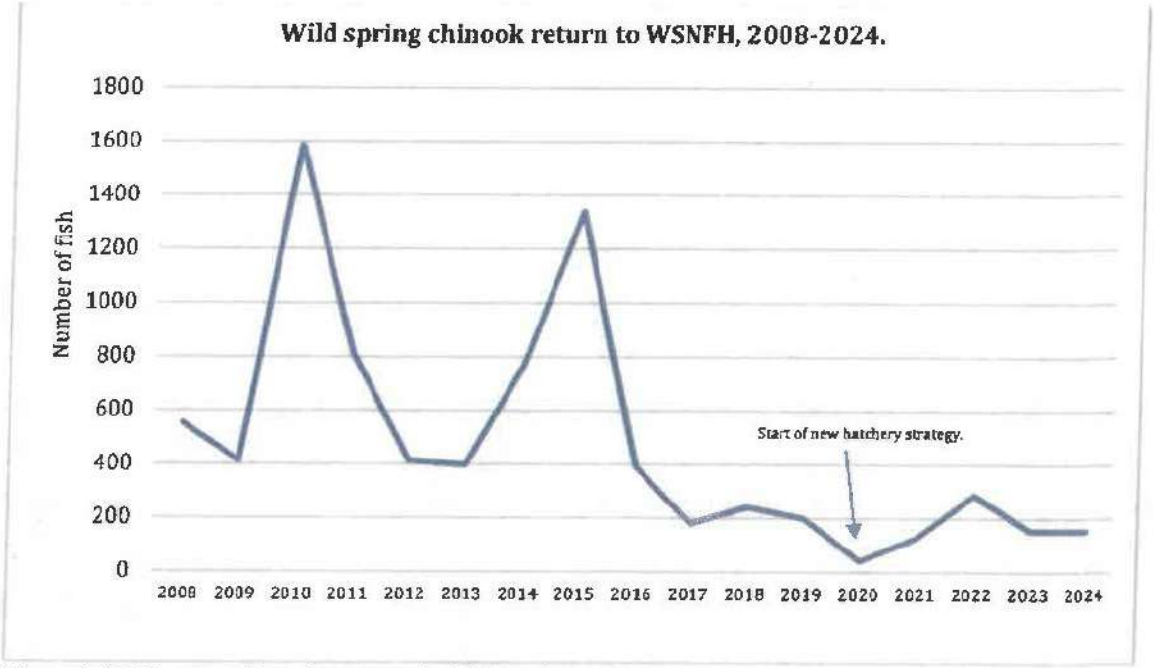


Figure 1. Wild spring chinook return to WSNFH, 2008 – 2024.

Hatchery Fish

The WSNFH hatchery fish broodstock collection goal is 560 fish (adults and jacks) and RBH needs approximately 810 (405 males, 405 females) or a total of 1,370 fish. The total predicted return of hatchery fish to the Deschutes in 2025 (1,167 – 1,997 adults) indicates that there may be 627 fish available for harvest if the combined return

meets or exceeds the upper predicted range. If actual returns are at the lower range the hatcheries returns there will not be any fish available for harvest and the hatcheries will fall short of brood by 203 fish.

Detailing predicted returns by hatchery, if actual returns are at the high end of the predicted range (WSNFH 788, RBH 1,209) WSNFH may have 228 fish available for harvest and RBH 399 fish. If actual returns are toward the low end of the predicted range (WSNFH 344, RBH 823) WSNFH will fall short of making brood by 216 fish and there will be no fish available for harvest; RBH will fall short of brood by 13 fish and there would be no fish available for harvest. Unfortunately, in a mixed stock fishery where one stock is weaker, fishers would be unable to distinguish between either stock if it was desired to release either WSNFH or RBH fish to support brood collection at the hatchery.

The decision to open or close spring chinook seasons will be made by the CTWS Tribal Council (for tribal subsistence harvest) and by ODFW (for non-tribal recreational harvest).

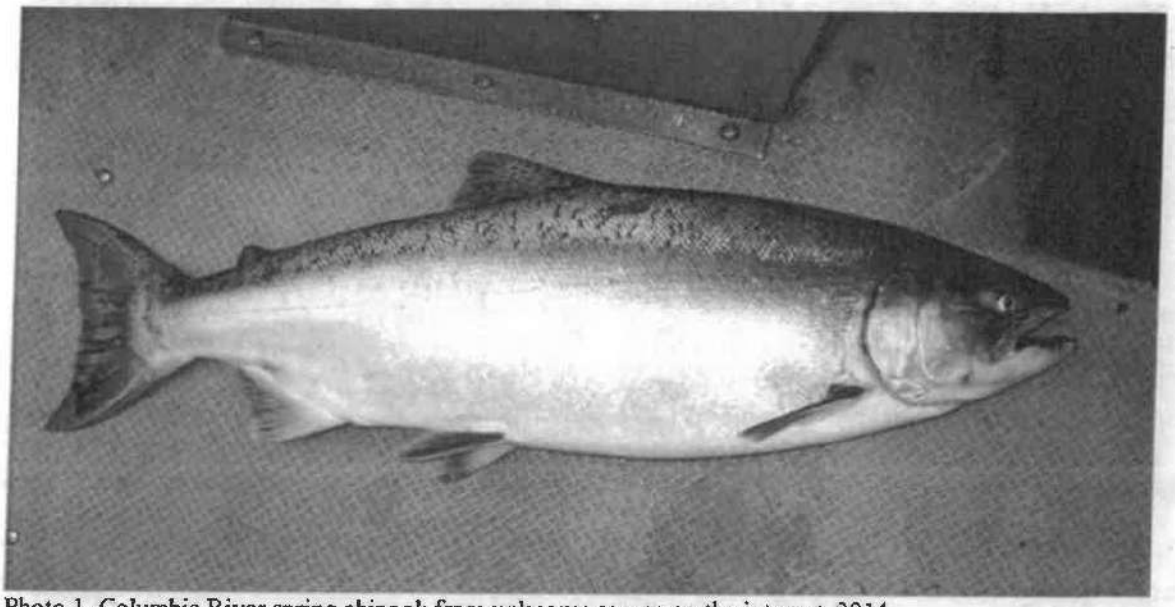
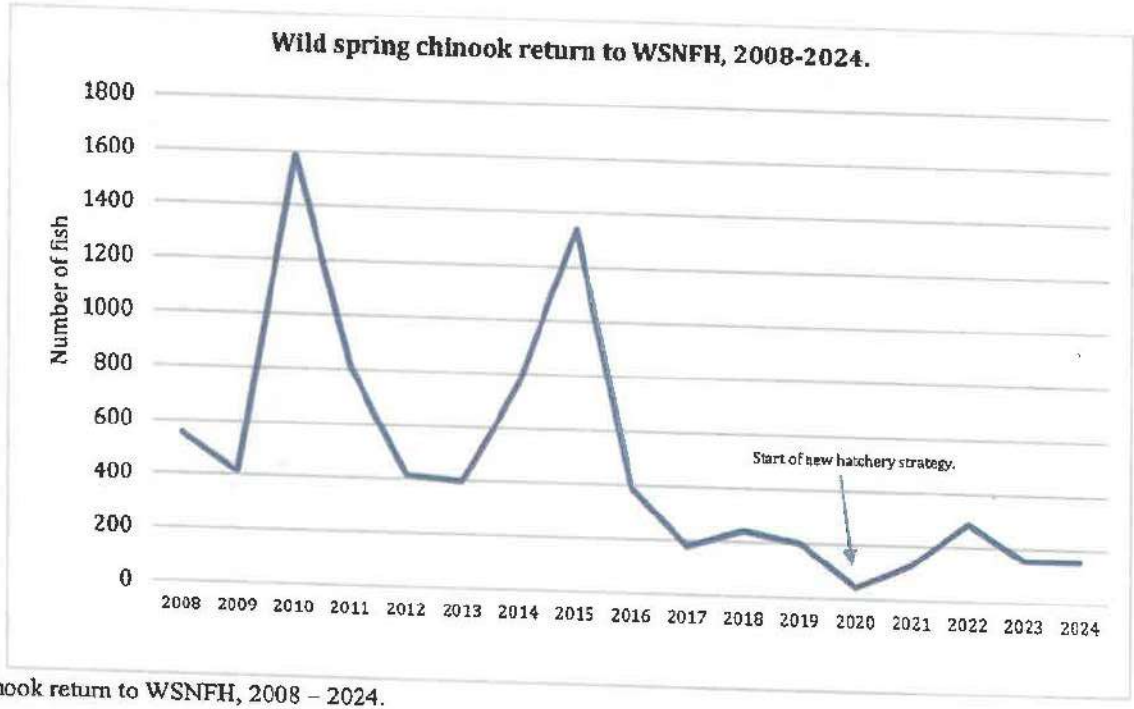


Photo 1. Columbia River spring chinook from unknown source on the internet, 2014.



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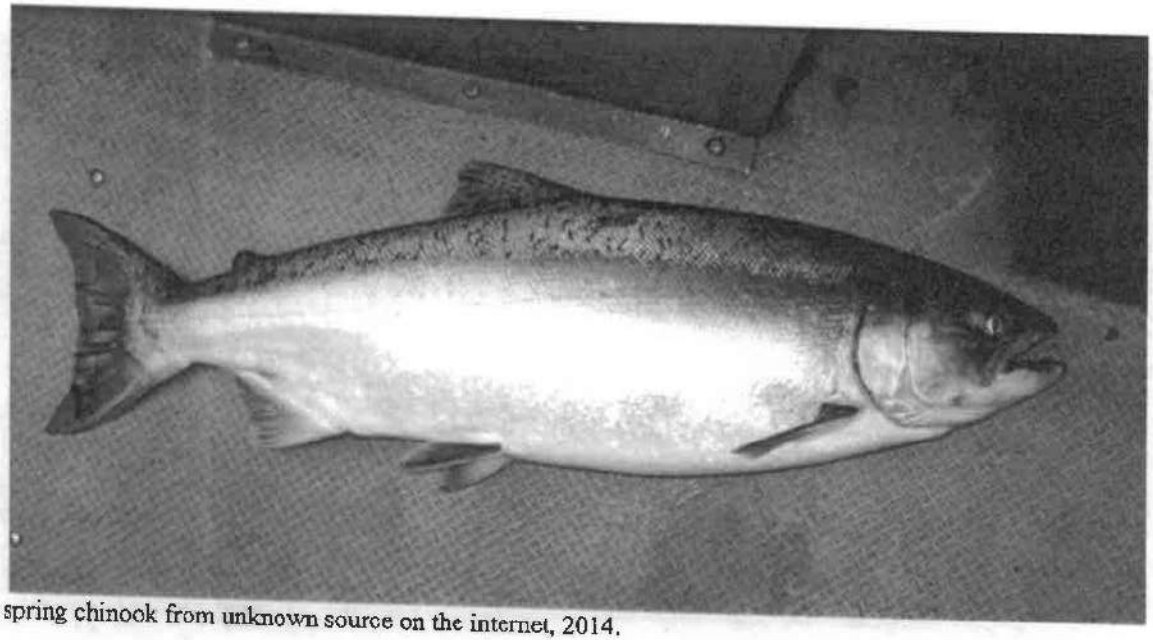

Photo 1. Columbia River spring chinook from unknown source on the internet, 2014.

Appendix: 2024 Run Reconstruction Tables

Appendix Table 1. Run reconstruction of **wild** spring chinook salmon from the Warm Springs River, 2024 a/.

Wild Stock Disposition	"Jacks" Age Three	"Adults" Age Four	Age Five	Total 4 + 5	Total
Upstream of WSNFH*	7	23	1	24	31
Spawned at WSNFH	7	23	1	24	31
Mortality at WSNFH	2	5	0	5	7
Surplus	0	2	0	2	2
Total to WSNFH	16	53	2	55	71
Harvest: Sport b/	0	0	0	0	0
Harvest: Tribal b/	0	0	0	0	0
Harvest: Total b/	0	0	0	0	0
Spawn below WSNFH	0	0	0	0	0
Total Estimated Return	16	53	2	55	71

a/Ages based on scale samples (23.0% age 3, 74% age 4, 3% age 5)
b/ No recreational fishery in 2024.
Data from wsscs25.dbf
*WSNFH trapped all wild fish. Some were transported upstream.

Appendix Table 2. Run reconstruction of **WSNFH** spring chinook salmon from the Warm Springs River, 2024.

Hatchery Stock Disposition	Age Three	Age Four	Age Five	Total 4 + 5	Total

Passed upstream of WSNFH	0	0	0	0	0
Surplus	2	9	1	10	12
Strays (not included in total)	-	-	-	-	1
Mortality at WSNFH	13	58	3	61	74
Spawned/Green at WSNFH	32	146	8	154	186
Total to WSNFH	47	213	12	225	272
Harvest: Sport b/	0	0	0	0	0
Harvest: Tribal c/	1	11	1	12	13
Total Harvest*	1	11	1	12	13
Total Estimated Return	48	224	13	237	285

Return data from wsfr25.dbf on 1/7/2025
Age data from WSSCS24.dbf 12/23/24
Age 3= 17.4%, Age 4= 78.4%, Age 5= 4.2%
b/ No recreational harvest in 2024.
c/ Limited tribal harvest in 2024.

Appendix Table 3. Run reconstruction of **RBH** spring chinook salmon from the Deschutes River, 2024.

Hatchery Stock	"Jacks"	"Adults"			
Disposition	Age Three	Age Four	Age Five	Total 4 + 5	Total
To Pelton Trap a/	377	175	6	181	558
Harvest: Sport b/	0	0	0	0	0