2024 Annual Report for Term and Condition 8 to the National Marine Fisheries Service (NMFS)
For the Mitchell Act Biological Opinion (MA BIOP)

Provided to James Archibald from Bryce Glaser, Jeremy Wilson, Kevin Young,
Brian Gale, Kris Warner, Todd Hillson, and Anja Huff.
January 31, 2025

This report provides information to address the requirements of the Terms and Conditions (T&C) 8a, 8b, 8c, 8d, 8f, 8g, and 8i (summarized below).

Excerpts from Terms and Conditions

8. NMFS shall annually provide one comprehensive annual report for all Mitchell Act funded programs to NMFS' SFD on or before January 31st for the previous fiscal year. The annual report will include:
    a. Numbers of fish released, release dates and locations, and tag/mark information for each program.
    b. Estimates of the natural spawning distribution, origin, survival and contribution to fisheries and escapements for fish released for each brood year, for each program.
    c. Estimates of pHOS and/or gene flow for all natural ESA-listed salmonid populations that are affected by straying from Mitchell Act funded hatchery programs.
    d. Provide tables for all Mitchell Act funded facilities combined, grouped by State Authority, that include the duration (in days) of each epizootic and magnitude (% of production lost).
    f. Compliance records with NPDES permitting requirements.
    g. The number of fish encountered and killed at each weir and broodstock collection location including the species, origin (hatchery or natural-origin), life-stage, and release condition (unharmed, injured, killed).
    i. Results of RM&E, including important findings, for:
        i. the Kalama River Research Program
        ii. Results of RM&E – Toutle Fish Collection Facility Activities
        iii. Evaluation of the benefits and risks of juvenile wild fish rescue programs

Numbers of fish released (T&C 8a)

Table 1 shows the numbers of fish released by mark and tag type and species at Mitchell Act facilities during 2023. After submittal to NOAA last year, several discrepancies were found in the January 2024 Mitchell Act annual reports in the tables reporting the number of smolts marked and tagged in 2022. Appendix A provides an updated table with the corrected 2022 numbers.

Table 1.Numbers of salmon and steelhead released by mark and tag group during calendar year 2023.

Hatchery Program	Release Location	Species/Run	Release Start Date	Brood Year	AD + CWT Marked	Ad Only Marked	CWT ONLY	Unmarked	Total Released
Beaver Creek Hatchery	Beaver Creek	Coho salmon	4/17/2023	2021	43,740	185,000	260	0	229,000
Beaver Creek Hatchery	Beaver Creek	Winter steelhead	4/17/2023	2022	0	132,001	0	0	132,001
Beaver Creek Hatchery	Beaver Creek	Summer steelhead	4/17/2023	2022	0	28,287	0	0	28,287
Beaver Creek Hatchery	Grays River	Chum salmon	4/6/2023	2022	0	0	0	154,754	154,754
Deep River Net Pens	Deep River Net Pens	Coho salmon	5/2/2023	2021	39,504	667,344	0	2,552	709,400
Deep River Net Pens	Deep River Net Pens	Spring Chinook salmon	5/22/2023	2022	123,283	994	2,503	20	126,800
Deep River Net Pens	Deep River Net Pens	Spring Chinook salmon	11/20/2023	2022	86,114	541	1,336	9	88,000
Fallert Creek Hatchery	Kalama River	Spring Chinook salmon	3/20/2023	2021	116,510	389,461	678	2,351	509,000
Fallert Creek Hatchery	Kalama River	Fall Chinook salmon	5/30/2023	2022	97,024	2,411,244	763	10,779	2,519,810
Fallert Creek Hatchery	Kalama River	Winter steelhead	3/8/2023	2022	0	45,058	0	272	45,330
Fallert Creek Hatchery	Kalama River	Summer steelhead	5/4/2023	2022	48,906	42,576	389	339	92,210
Kalama Falls Hatchery	Kalama River	Coho salmon	4/5/2023	2021	45,042	258,448	0	0	303,490
Kalama Falls Hatchery	Kalama River	Winter steelhead	5/3/2023	2022	85,212	2,644	2,645	82	90,583
Klineline Ponds	Salmon Creek	Winter steelhead	5/9/2023	2022	0	40,251	0	145	40,396
North Toutle River	Green River	Fall Chinook salmon	7/3/2023	2022	97,347	751,205	362	19,080	867,994
North Toutle River	Green River	Coho salmon	5/1/2023	2021	40,805	48,373	395	647	90,220
Ringold Springs Hatchery	Springs Creek	Fall Chinook salmon	6/9/2023	2022	397,320	3,724,963	1,104	11,580	4,134,967
Ringold Springs Hatchery	Springs Creek	Coho salmon	4/11/2023	2021	37,507	147,667	42	339	185,555
Ringold Springs Hatchery	Springs Creek	Summer steelhead	4/11/2023	2022	0	169,189	0	653	169,842
Skamania Hatchery	Klickitat River	Summer steelhead	4/24/2023	2022	0	90,694	0	0	90,694
Skamania Hatchery	Rock Creek	Winter steelhead	4/27/2023	2022	0	20,411	0	0	20,411
Skamania Hatchery	Washougal River	Winter steelhead	4/26/2023	2022	0	84,791	0	0	84,791
Skamania Hatchery	Washougal River	Summer steelhead	4/28/2023	2022	0	68,692	0	0	68,692
South Fork Toutle Ponds	South Fork Toutle	Summer steelhead	4/26/2023	2022	0	20,358	0	0	20,358
Washougal Hatchery	Washougal River	Fall Chinook salmon	7/1/2023	2022	97,193	1,086,329	293	3,159	1,186,974
Washougal Hatchery	Klickitat River	Coho salmon	4/3/2023	2021	69,589	2,378,744	188	7,158	2,455,679
Washougal Hatchery	Washougal River	Coho salmon	5/8/2023	2021	44,537	64,184	112	734	109,567

Estimates of survival and contribution to fisheries and escapements (T&C 8b)

Estimates of survival and contribution to fisheries for natural-origin Chinook and coho salmon are not available for most populations, as these fish are not coded-wire tagged. Survival rates and contribution to fisheries for hatchery fish can be found in the "Report on the coded-wire tag program for Chinook and coho salmon produced by WDFW Columbia River basin hatcheries" (Harlan 2018). Updated information is not summarized at this time.

Rawding et al. (2014a) published a report with the first comprehensive natural- and hatchery-origin estimates of Fall Chinook salmon spawner abundance by population in the lower Columbia River. Wilson et al. (2020) followed with updated methods and estimates. These methods have continued to be used with estimates generated annually (WDFW; Table 2).

Table 2. Estimates of natural-origin fall Chinook salmon spawner abundance by population for Washington populations below Bonneville Dam.[1]

NOAA Population	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Grays/Chinook*	176	153	136	87	232	123	83	115	89	53	192
Elochoman/Skamokawa	69	167	221	76	73	33	38	83	97	115	218
Mill, Abernathy, Germany	120	47	98	69	13	1	15	26	23	40	71
Coweeman	1,464	774	1,331	361	759	229	312	879	596	443	440
Lower Cowlitz	7,154	5,648	7,941	5,652	5,652	5,701	8,579	8,886	6,368	8,475	12,326
Toutle	948	342	388	401	322	150	182	410	628	476	470
Kalama	1,054	844	2,939	2,605	1,782	1,534	1,454	2,530	1,982	2344	2,289
Lewis	3,983	3,376	3,370	2,081	1,909	1,450	1,748	3,136	2,124	3280	2,348
Washougal	1,204	839	1,169	740	655	862	1,302	2,709	1,435	909	1,577
Total	16,172	12,190	17,593	12,072	11,397	10,083	13,713	18,774	13,342	16,135	19,931

[1] Estimates are of natural-origin spawners (i.e., corrected for mis-clipped hatchery-origin fish and adjusted for pre-spawn mortality). All estimates subject to updates.

* Grays River subpopulation only.

Rawding et al. (2014b) published a report with the first comprehensive natural- and hatchery-origin estimates of Coho salmon spawner abundance by population in the lower Columbia River. Buehrens (2024) recently updated methods and estimates (WDFW; Table 3).

Table 3. Estimates of natural-origin Coho salmon spawner abundance by population for Washington populations below Bonneville Dam.[1]

NOAA Population	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Coweeman	4,068	7,871	1,366	3,312	2,661	2,817	3,566	4,593	4,792	4,377	3,433
East Fork Lewis	2,863	4,646	551	1,238	1,577	1,641	2,253	2,194	4,524	3,135	1,485
Elochoman/Skamokawa	874	3,684	374	862	1,036	1,259	1,909	2,000	1,774	1,001	1,658
Grays/Chinook	833	2,746	330	658	446	454	786	995	1,190	1,047	1,001
Kalama	49	128	26	64	58	76	129	235	227	245	255
Lower Cowlitz	6,343	25,388	2,619	4,652	2,961	2,892	3,306	4,730	5,859	4,543	5,619
Lower Gorge	701	1,786	377	780	554	617	1,174	1,140	1,368	1,339	908
Mill/Abernathy/Germany/Coal	919	3,201	790	1,367	1,029	1,143	1,773	1,802	1,749	2,424	2,774
North Fork Lewis	1,374	4,835	1,020	3,524	4,471	3,011	3,930	6,704	4,870	5,742	4,592
North Fork Toutle	2,536	5,359	911	1,937	972	1,002	2,170	2,076	2,298	2,422	1,835
Salmon Creek	1,145	3,104	643	1,426	1,300	1,327	1,702	1,654	1,527	1,196	750
South Fork Toutle	3,033	9,817	1,660	2,732	1,281	1,199	2,334	2,458	2,637	1,981	1,888
Tilton	2,652	8,912	1,359	2,625	5,192	1,318	1,558	2,399	6,391	7,255	1,338
Upper Cowlitz and Cispus	13	6,846	374	912	5,196	172	3,560	8,909	9,663	11,506	6,264
Washougal	464	883	147	314	277	298	559	858	752	782	500
Totals	27,867	89,206	12,547	26,403	29,011	19,226	30,709	42,747	49,621	48,995	34,300

[1] Natural-origin estimates are estimates of unclipped Coho salmon (i.e., not adjusted for mis-clipped hatchery-origin fish). All estimates subject to updates.

WDFW recently developed estimates of pHOS for steelhead populations in the Washington State portion of the lower Columbia River (Buehrens et al. 2024). However, these pHOS estimates have not been applied to estimates of total spawner abundance for all populations yet. Natural-origin summer steelhead estimates reported below are not anticipated to change (Table 4); however, since we have not applied the pHOS estimates to winter steelhead, we report estimates of total spawner abundance (Table 5).

Table 4. Estimates of natural-origin summer steelhead spawner abundance by population for Washington populations within the LCR ESU.

Return Year	Spawn Year	Kalama	EF Lewis	Washougal	Wind
2012	2013	745	1,059	1,464	740
2013	2014	402	617	544	281
2014	2015	795	843	783	577
2015	2016	877	422	755	1,013
2016	2017	648	824	727	1,059
2017	2018	329	739	624	204
2018	2019	392	373	876	516
2019	2020	321	367	457	303
2020	2021	240	331	392	437
2021	2022	145	NA [1/]	145	208
2022	2023	447	866	479	814
2023	2024	376	[2/]	[2/]	[3/]

[1/] No estimate reported due to extreme lack of precision in estimate. Low return year and lowest number of tagged fish on record.

[2/] No snorkel was completed this year due to safety and L&I incident

3/ final 2024 brood year estimate will be completed in summer of 2024

Table 5. Estimates of total winter steelhead spawner abundance by population for Washington populations below Bonneville Dam.

Spawn Year	Grays/ Chinook	Elochoman/ Skamokawa*	Mill/Abernathy/ Germany	Coweeman	SF Toutle	NF Toutle/ Green	Kalama	EF Lewis**	Washougal***
2013	834	784	402	622	972	553	794	488	678
2014	386	502	310	496	708	587	903	414	388
2015	950	1,244	666	940	1,340	1,540	1,138	678	648
2016	1,020	754	436	886	1,532	1,142	1,144	984	636
2017	792	540	224	294	344	367	664	746	602
2018	426	432	184	474	624	652	572	538	438
2019	636	586	196	354	284	215	189	322	130
2020	272	370	232	352	148	322	459	728	258
2021	358	378	148	592	744	352	295	604	424
2022	476	606	234	234	270	555	777	234	370
2023	752	342	244	526	330	384	552	328	372

* Elochoman/Skamokawa - In 2009 severe flooding limited surveys/visibility = minimum estimate

**EF Lewis River - no surveys in 2000 - only mainstem flight counts in 2001

***Washougal River = 2001 &2004 estimates are based on mainstem counts only; no tributary surveys were conducted.

Note: Kalama 2023 brood year estimate of 609 is considered preliminary only.

Table 6 shows Columbia River chum population estimates.

Table 6. Estimates of chum salmon abundance in select Washington tributaries, 2013-2023.

Location	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Crazy Johnson Creek	1,925	1,541	4,193	5,987	3,681	899	72	2,863	6,279	3,318	2,755
WF Grays River	1,857	1,145	6,297	19,023	1,930	2,902	3,406	3,055	7,293	3,656	2,279
Mainstem Grays River	1,352	2,107	1,091	6,129	1,051	3,010	3,990	7,528	3,842	6,055	1,513
Grays R. broodstock take	250	246	128	128	118	250	222	195	192	194	187
I-205 area	1,364	1,387	4,694	5,155	1,570	2,518	1,339	2,242	3,783	4,077	6,263
Multnomah area	201	291	1,118	1,120	73	368	464	536	1,148	971	1,792
St Cloud area	77	79	345	239	88	121	89	90	460	158	308
Horsetail area	55	71	398	627	47	312	192	125	472	373	789
Ives area	483	786	1,307	1,911	347	1,639	2,940	879	3,543	3,536	2,703
Duncan Creek	27	24	151	206	7	129	76	78	488	255	90
Hardy Creek	56	108	350	354	14	193	64	104	166	17	6
Hamilton Creek	255	261	249	332	162	548	1,367	1,118	1,219	965	1,712
Hamilton Spring Channel	380	665	1,397	1,252	692	1,546	333	413	1,465	991	1,143
Grays return	5,384	5,039	11,709	31,267	6,780	7,061	7,690	13,641	17,606	13,223	6,734
I-205 to Bonneville return	2,898	3,672	10,009	11,196	3,000	7,374	6,864	5,585	12,744	11,343	14,806
Sum	**8,282**	**8,711**	**21,718**	**42,463**	**9,780**	**14,435**	**14,554**	**19,226**	**30,350**	**24,566**	**21,540**

PHOS Survey Results (T&C 8c)

Table 7 shows pHOS results for lower Columbia fall Chinook salmon populations that are monitored by WDFW. It should be noted that the management strategies for some of these areas have changed over the time frame identified here. For example, hatchery fish were intentionally released upstream to seed areas during some years, thus increasing pHOS levels.

Table 7. Estimates of fall Chinook salmon pHOS by population for Washington populations below Bonneville Dam.[1]

NOAA Population	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Grays/Chinook*	90%	76%	78%	70%	56%	76%	81%	74%	82%	85%	74%
Elochoman/Skamokawa	82%	75%	77%	79%	52%	40%	74%	56%	70%	55%	54%
Mill, Abernathy, Germany	82%	91%	90%	82%	86%	90%	96%	87%	80%	72%	77%
Coweeman	32%	4%	2%	2%	8%	5%	4%	4%	8%	10%	7%
Lower Cowlitz	16%	33%	30%	25%	19%	15%	10%	8%	15%	7%	6%
Toutle	48%	49%	37%	52%	50%	50%	63%	49%	32%	24%	26%
Kalama	89%	92%	55%	39%	42%	39%	44%	33%	45%	38%	24%
Lewis	32%	44%	55%	56%	48%	38%	25%	32%	46%	44%	45%
Washougal	64%	41%	58%	64%	46%	15%	21%	34%	26%	15%	13%
Mean	59%	56%	54%	52%	45%	41%	46%	42%	45%	39%	36%

[1] All estimates subject to updates. PHOS results include corrections for un-clipped hatchery fish.

* Grays population only.

Table 8 shows pHOS results for lower Columbia coho populations that are monitored by WDFW.

Table 8. Estimates of Coho salmon pHOS by population for Washington populations below Bonneville Dam.[1]

NOAA Population	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Coweeman	12.6%	15.9%	18.9%	15.4%	10.8%	24.0%	24.7%	15.3%	20.6%	10.0%	11.3%
East Fork Lewis	8.9%	17.4%	19.0%	38.2%	36.8%	12.6%	8.5%	9.0%	7.1%	9.5%	17.0%
Elochoman/Skamokawa	38.9%	35.7%	36.7%	34.5%	24.6%	40.1%	36.1%	21.1%	45.6%	16.0%	15.4%
Grays/Chinook	64.6%	40.8%	46.8%	57.6%	66.2%	68.5%	56.6%	41.3%	56.6%	40.1%	31.7%
Kalama	86.8%	89.7%	88.1%	67.2%	61.3%	68.4%	52.6%	74.1%	74.1%	58.6%	53.2%
Lower Cowlitz	19.3%	4.6%	7.5%	8.4%	21.5%	8.5%	6.7%	6.8%	15.2%	14.1%	17.6%
Lower Gorge	22.3%	26.3%	12.8%	7.5%	14.0%	19.8%	25.9%	9.2%	6.3%	17.2%	7.6%
Mill/Abernathy/Germany/Coal	7.3%	12.0%	7.2%	12.9%	8.3%	15.2%	26.7%	12.2%	14.2%	23.1%	13.9%
North Fork Lewis	84.5%	65.4%	78.6%	63.5%	53.2%	71.1%	55.4%	54.6%	60.5%	58.8%	64.2%
North Fork Toutle	20.1%	32.4%	56.2%	61.7%	26.6%	26.9%	16.8%	16.0%	14.2%	15.0%	19.8%
Salmon Creek	2.3%	1.7%	2.7%	4.6%	10.6%	10.8%	9.9%	10.4%	5.0%	6.3%	14.4%
South Fork Toutle	14.2%	19.2%	49.2%	22.6%	9.0%	7.7%	10.3%	5.7%	11.0%	12.7%	19.8%
Tilton	58.6%	35.4%	53.0%	61.9%	50.1%	70.1%	78.3%	81.8%	57.3%	55.4%	83.8%
Upper Cowlitz and Cispus	99.8%	76.7%	71.2%	90.6%	55.3%	97.1%	63.3%	58.0%	67.1%	50.8%	52.3%
Washougal	34.5%	68.5%	62.6%	72.6%	75.4%	70.3%	55.2%	61.4%	18.2%	37.9%	26.8%
Mean	38.3%	36.1%	40.7%	41.3%	34.9%	40.7%	35.1%	31.8%	31.5%	28.4%	29.9%

[1] All estimates subject to updates.

Gene Flow and pHOS Monitoring Methods for Steelhead

WDFW submitted a report to NMFS on steelhead monitoring (Buehrens et al. 2017) that described on-going hatchery reform efforts by WDFW for segregated hatchery steelhead programs in the lower Columbia Distinct Population Segment (DPS). The gene flow introgression study described in the report is still in progress. Genotyping has been completed but final analysis and reporting has taken substantially longer than anticipated due to a lack of resources and unanticipated disruptions caused by the global Covid-19 pandemic and recent re-consultation of the MA BIOP. Final reporting is now anticipated to be complete in 2025.

Additionally, implementing actions identified in the MA BIOP, WDFW has eliminated and/or changed the broodstock source for early-timed segregated programs that historically used Chamber's Creek stock in basins with ESA listed steelhead populations. WDFW continues to work on development of a new early-timed segregated stock utilizing a locally derived (within DPS) stock on the Kalama River; this program is referred to as the Kalama Early Winter Steelhead (KEWS) program. The KEWS program is intended to replace programs that had been using the Chamber's Creek stock. In the interim, a segregated program generated from Eagle Creek (Clackamas)/Big Creek stock has been propagated on the Washougal (at Skamania Hatchery) for use in the Washougal and Rock Creek; however, this program will be discontinued in 2025. Additionally, integrated summer and winter steelhead programs continue on the Kalama River alongside KEWS. These changes to broodstock sources, which affect both the spawn timing of returning hatchery fish and their genetic relatedness to designated wild populations, may affect the applicability of introgression study results to these programs as well as the efficacy of previously proposed geneflow/pHOS monitoring. WDFW is planning to review results of the introgression study to determine their applicability for monitoring gene flow for segregated programs (i.e., KEWS and Eagle Creek stock) now that the Washougal segregated program is being discontinued. Potential use for monitoring the KEWS program may be limited due to genetic similarity of the KEWS program to other within DPS natural-origin winter steelhead populations. WDFW will provide results and recommendations for methodologies to NMFS when the introgression study information is complete.

In addition to the introgression study and evaluation of options to monitor gene flow, WDFW has also implemented methods to collect data on steelhead pHOS via snorkel survey counts of adipose fin-clipped and unclipped summer steelhead, and spawning survey counts of live and dead (carcass) clipped and unclipped steelhead. New analytical methods using these data were developed in 2023. A final report with detailed methods and results has recently been published under agency cover on the WDFW website (Buehrens et al. 2024; Estimates of Lower Columbia River Steelhead pHOS: A Report to NOAA Fisheries | Washington Department of Fish & Wildlife). Based on the results from these analyses, a new gene flow introgression study was implemented in the summer of 2023 on the Washougal River to corroborate results. This study was focused on winter steelhead following the same general study design as described in Buehrens et al. (2017). The results of this study will be reported in 2025. Take associated with this project can be found in Table 9.

Table 9. Washougal River Introgression Study, 2023

	Handled		Mortalities	
	Permitted	Actual	Permitted	Actual
Steelhead	7,400	1,748	104	30
Fall Chinook salmon	10,000	12	400	1
Coho salmon	10,000	423	400	5
Chum salmon	10,000	0	400	0

Duration of epizootic episodes (T&C 8d)

Fish health reports are included in the two semi-annual reports. Any additional information will be provided in the next semi-annual report.

Compliance records with NPDES permitting requirements (T&C 8f)

NPDES Compliance records for WDFW Mitchell Act (MA) Facilities: Grays, Beaver Creek, Kalama Falls, Fallert Creek, North Toutle, Skamania, Washougal, and Ringold
Records as of September 30, 2024
Produced by Ann Leroux, WDFW

For the monitoring period October 2023 through September 2024. WDFW MA facilities had zero exceedance and three non-compliance violations with the NPDES Permit (Upland Fin-fish Hatching and Rearing General Permit) effective date October 1, 2021, expiration date September 30, 2026.

MA facilities completed all requirements under the NPDES, which includes quarterly monitoring reporting, annual chemical reporting, and any/all actions required by WA Dept of Ecology.
MA facilities exceeded permit limits on a few occasions and those exceedances were reported to Ecology as required under the NPDES permit.

Table 10. List of exceedances and non-compliance violations for the period October 2023 through September 2024.

Permit Number	Facility	Monitoring Period
WAG13-1027	Beaver Creek	No exceedances
WAG13-1039	Kalama Falls	No exceedances
WAG13-1053	Fallert Creek	No exceedances
WAG13-1010	North Toutle	No exceedance
WAG13-1026	Skamania	No exceedance
WAG13-1044	Washougal	No exceedance
WAG13-7009	Ringold Springs	No exceedance and three non-compliance

Table 11. Non-compliance events reported to Washington State Department of Ecology.

Facility	Date	Parameter	Sample Type	Result	Unit	Comment
Ringold	Apr-23	TSS	TSS sample	Lost in Mail		
Ringold	Apr-23	TSS	Avg Net Composite	Lost in Mail		
Ringold	Jun-23	TSS	Max Composite	Lost in Mail		June 1-13 logger error

NPDES MONITORING FOR WDFW FACILITIES.

Sampling at facilities covered under the current NPDES General Permit include the following parameters:

FLOW	Measured in millions of gallons per day (MGD) discharge.
SS EFF	Average net settleable solids in the hatchery effluent, measured in ml/L.
TSS COMP	Average net total suspended solids, composite sample (6 x/day) of the hatchery effluent, measured in mg/L.
TSS MAX	Maximum daily net total suspended solids, composite sample (6 x/day) of the hatchery effluent, measured in mg/L.
FLOW PA	Average gallons per day into the pollution abatement (PA) pond.
SS PA	Maximum settleable solids in the PA pond discharge, measured in ml/L.
TSS PA	Maximum total suspended solids in the PA pond discharge, effluent grab measured in mg/L.
TSS DD	Maximum total suspended solids during a drawdown for fish releases. One sample per pond drawdown, measured in mg/L.
SS DD	Settleable solids discharged during drawdown for fish release. One sample per pond drawdown, measured in ml/L.
TEMP	Continuous (24/7) monitoring reporting daily maximum in Celsius.

Numbers of fish encountered at hatchery facilities and weirs (T&C 8g)

Table 12 shows handle and mortalities associated with hatchery operations in 2023. The authorized numbers are from Table 121 in the MA BIOP. The Grays River hatchery facility has been closed (in accordance with BiOp requirements) and the hatchery coho and chum programs have been transferred to Beaver Creek hatchery on the Elochoman River. Take authorizations for the Grays and Elochoman programs need to be updated to reflect these changes.

Table 12. Natural-Origin adults and jacks handled at hatchery facilities in calendar year 2023 and associated mortalities.

Watershed	Hatchery	NOR Species	Number Authorized Handled	Number Authorized Mortalities	Number [1/] Handled	Number [1/] Mortalities	Comments
Columbia River	Ringold Springs	Steelhead	1	0	1	0	
North Fork Toutle River	Toutle Hatchery	Fall Chinook salmon	2,000	<60	444	14	
		Coho salmon	10,000	<100	1265	7	
		Chum salmon	0	0	0	0	
	BY23 Summer	Steelhead	10	1	2	0	
Grays River	Grays River	Fall Chinook salmon	25	1	---	---	Facility Closed
		Coho salmon	150	<3	---	---	
		Chum salmon	50	1	---	---	
Elochoman River	Beaver Creek	Fall Chinook salmon	20	1	0	0	
		Early coho salmon					
		Late coho salmon	20	1	185	23	
		Chum salmon	20	1	198	0	Includes 187 Grays R.
		Winter steelhead	NA	NA	8	0	
Kalama River *Allowed handle/mortality combined for Fallert Creek and Kalama Falls	Fallert Creek	Fall Chinook salmon					
		Spring Chinook salmon					
		Coho salmon					
		Chum salmon					
		Steelhead					
	Kalama Falls	Fall Chinook salmon	6,000	<60	683	0	
		Spring Chinook salmon	500	<5	79	0	
		Early coho salmon					
		Late coho salmon	3,000	<90	424	1	
		Chum salmon	25	1	0	0	
		Summer/Winter steelhead	3,400	<34			
	BY23 Summer	Summer steelhead			11	5	
	BY24 Summer	Summer steelhead			275	6	
	BY23 Winter	Winter steelhead			503	1	
	BY24 Winter	Winter steelhead			34	0	

Table 12. (continued) Natural-Origin adults and jacks handled at hatchery facilities in calendar year 2023 and associated mortality.

Watershed	Hatchery	NOR Species	Number Authorized		Number [1/]		Comments
			Handled	Mortalities	Handled	Mortalities	
Washougal River	Washougal	Fall Chinook salmon	3,000	<30	283	93	
		Coho salmon	1,000	<10	104	17	
		Chum salmon	25	<1	84	0	
	Skamania	Fall Chinook salmon			1	0	
	Skamania	Coho salmon			6	0	
Washougal River	Skamania	Summer/winter steelhead	400	<5			
BY24		Summer steelhead			29	0	
2023 BY		Winter steelhead			13	0	
	Washougal						
2024 BY		Summer steelhead			52	0	

1/ Direct take (handle/mortality) is not included in this table. Handled/mortality numbers in 2023 are only for fish returning to the hatchery and does not include fish transported from the weir.

Table 13 shows handle and mortalities associated with weirs in 2023. The authorized numbers are from Table 122 in the MA BIOP.

Table 13. Natural-Origin adults and jacks handled at weirs in calendar year 2023 and associated mortality.

Watershed	Species Encountered	Number Authorized Handled	Number Authorized Mortalities	Number Handled	Number Mortalities	Comments
NF Toutle	Fall Chinook salmon		<21	---	---	All numbers are reported on the hatchery table
	Coho salmon		<70	---	---	
	Chum salmon		<8	---	---	
	Summer steelhead	50	<2	---	---	
Grays River	Fall Chinook salmon	750	<23	44	0	
	Coho salmon	800	<24	11	0	
	Chum salmon		<225	0	0	
Elochoman River	Fall Chinook salmon		<23	126	0	
	Coho salmon		<24	624	3	
	Chum salmon		<30	108	0	Take included in HGMP for broodstock program
Kalama River	Fall Chinook salmon		<96	2030	9	
	Coho salmon		<5	370	2	
	Chum salmon		<8	3	1	
2024 BY	Summer steelhead		<6	301	1	
Washougal River	Fall Chinook salmon		<36	422	8	
	Coho salmon	80	<3	53	1	
	Chum salmon		<8	0	0	
2024 BY	Summer steelhead		<3	67	1	
Coweeman River	Fall Chinook salmon		<48	289	0	
	Coho salmon		<24	288	1	
	Chum salmon		<3	0	0	
	Winter steelhead		<9	0	0	
Cedar Creek	Fall Chinook salmon		<12	434	1	Additional 25 Spring Chinook handled with 3 mortalities
	Coho salmon		<30	534	0	
	Chum salmon		<8	0	0	
2024 BY	Summer steelhead	50	<2	0	0	

Table 14 shows handle and mortalities associated with hatchery operations and weirs combined in 2023. The authorized numbers are based on adding the authorized numbers from Table 121 and Table 122 in the MA BIOP.

Table 14. Natural-Origin adults and jacks handled at hatcheries and weirs combined in calendar year 2023 and associated mortality.

Watershed	Species Encountered	Number Authorized Handled	Number Authorized Mortalities	Number Handled	Number Mortalities	Comments
Ringold Springs	Steelhead	1	0	1	0	
NF Toutle	Fall Chinook salmon	2,700	<81	444	14	
	Coho salmon	12,300	<170	1,265	7	
	Chum salmon	250	<8	0	0	
	Summer steelhead	50	<2	2	0	
	Winter steelhead	10	1	0	0	
Grays River	Fall Chinook salmon	775	<24	44	0	Hatchery Facility Closed
	Coho salmon	950	<27	11	0	
	Chum salmon	8,550	<226	0	0	
Elochoman River	Fall Chinook salmon	770	<24	126	0	
	Coho salmon	820	<25	809	26	
	Chum salmon	1,020	<31	306	0	
Kalama River	Fall Chinook salmon	9,200	<156	2,713	9	
	Spring Chinook salmon	500	<5	79	0	
	Coho salmon	3,150	<95	794	3	
	Chum salmon	275	<9	3	1	
BY23	Summer steelhead	200	<6	11	5	
BY23	Winter steelhead			503	1	
BY24	Summer steelhead			576	7	
BY24	Winter steelhead			34	0	
	Summer and winter steelhead	3,400	<34	1,124	13	
Washougal River	Fall Chinook salmon	4,200	<66	706	101	
	Coho salmon	1,080	<13	163	18	
	Chum salmon	275	<9	0	0	
BY23	Winter steelhead			13	0	
BY24	Summer steelhead	100	<3	148	1	
	Summer and winter steelhead	400	<5	161	1	

Table 14. (continued) Natural-Origin adults and jacks handled at hatcheries and weirs combined in 2023 and associated mortality.

Watershed	Species Encountered	Number Authorized Handled	Number Authorized Mortalities	Number Handled	Number Mortalities	Comments
Coweeman River	Fall Chinook salmon	1,600	<48	289	0	
	Coho salmon	800	<24	288	1	
	Chum salmon	100	<3	0	0	
	Winter steelhead	300	<9	0	0	
Cedar Creek	Fall Chinook salmon	400	<12	434	1	
	Coho salmon	1,000	<30	534	0	
	Chum salmon	250	<8	0	0	
BY24	Summer steelhead	50	<2	0	0	
SF Toutle River	Fall Chinook salmon	350	<11	23	4	
	Coho salmon	5,500	<165	6	0	
	Chum salmon	250	<8	0	0	
BY24	Summer steelhead	50	<2	1	0	

Results of RM&E – Kalama Research Program (T&C 8ii)

Kalama Research Evaluations

TASK DESCRIPTION: The Kalama Research Team monitors and evaluates viable salmonid population (VSP) criteria of summer and winter steelhead populations and conducts research to better understand how fisheries management practices (e.g. hatchery introduction and wild spawner redistribution) have affected the population structure and ecology of natural-origin summer-run and winter-run steelhead in the Kalama River.

Project objectives include:

- Adult Fish Passage: conduct year round sorting and passage of adult steelhead trapped in the Kalama Falls Hatchery fishway trap; identify stock origin and collect biological data from all adult steelhead including a subsample to determine age composition; collect DNA tissue samples from a proportion of wild and hatchery (integrated and segregated programs) steelhead; pass upstream all wild summer and winter-run steelhead; depending on run type, stock, physical condition, maturity status, and capture date, release hatchery steelhead not needed for broodstock either in the lower Kalama River or Kress Lake for additional harvest opportunity or surplus excess hatchery steelhead; as necessary for accomplishing sampling of steelhead, assist with handling of all salmon during adult fish processing (principally coho, spring Chinook and fall Chinook salmon).
- Steelhead Population Monitoring: juvenile and adult steelhead abundance and composition are monitored using protocols designed to meet NOAA's Monitoring Guidance recommendations; estimate escapement and run sizes for returning hatchery and wild steelhead based on trap counts and mark-resight surveys; determine run timing and estimate age structure of each stock at adult and smolt life stages; estimate numbers of outmigrant wild Kalama steelhead smolts via operation of a rotary screw trap above Kalama Falls Hatchery (KFH); provide estimates of adult abundance and proportion hatchery spawners and estimates of smolt abundance to various management agencies and regional entities for consideration regarding population trends, status assessments, and recovery planning.

Adult fish passage monitoring for steelhead occurs at the Kalama Falls Hatchery trap. These operations occur concurrently with the hatchery operations for broodstock collection. The numbers of fish that were tagged or samples for genetic tissues is shown below. The take associated with these activities is included in the Kalama Falls Hatchery take tables.

NOR Summers Spawn Year 2024:

Floy tagged and returned to stream: 102
Genetic tissue sample from fish returned to stream: 225

NOR Winters Spawn Year 2023:

Floy tagged and returned to stream: 0
Genetic tissue sample from fish returned to stream: 268

Table 15 shows the number of steelhead smolts handled and associated handling mortalities at the Kalama smolt trap in 2023.

Table 15. Kalama River Smolt Trapping, 2023

	Handled		Mortalities	
	Permitted	Actual	Permitted	Actual
Spring Chinook salmon[1]	1,330	178	67	2
Coho salmon	1,300	300	65	1
Steelhead (summer) [2]	8,000	NA	Up to 550	NA
Steelhead (winter) [2]	8,000	NA	Up to 550	NA
Steelhead [2]	16,000	2,057	Up to 1,100	2

[1] All Chinook salmon upstream of KFH are assumed to be spring Chinook salmon.
[2] Juvenile steelhead are a combination of summer and winter steelhead. It is not possible to parse out at juvenile life stage without genetic analysis.

Results of RM&E – Toutle Fish Collection Facility Activities (T&C 8iii)

The Toutle Fish Collection Facility (TFCF) is operated from September through the end of May with occasional trapping into June. During this timeframe the TFCF is open and trapping up to 24 hours per day 7 days per week, conditions permitting, to recruit fish and is operated Monday, Wednesday, and Friday to remove, process and haul fish upstream. TFCF staff collect biological data from all salmonids (both natural and hatchery origin) that are captured. Species encountered are primarily steelhead and coho, however, Chinook salmon and cutthroat trout are occasionally captured. Biological data collected from individual fish includes fork length, sex, fin-clips, other marks, scale samples (for age analysis) and tissue samples (caudal fin hole punches from natural-origin steelhead and coho only) for genetic analysis. Natural origin steelhead are also tagged with T-bar anchor Floy Tags. Natural origin winter-run steelhead, coho, and cutthroat are transported by tanker truck above the Toutle Sediment Retention Structure to either Alder, Bear, or Pullen creeks. All hatchery origin fish are placed immediately downstream of TFCF with a right opercle hole punch for enumeration purposes. Table 16 shows the results of operations conducted at the TFCF in 2023. Toutle FCF has ESA coverage under the MA BIOP, the COE BIOP for the SRS and WDFW's Section 10 permit.

Table 16. Toutle Fish Collection Facility, 2023*.

	Number Handled	Number Mortalities
NOR Winter steelhead	126	0
NOR Coho salmon	324	0
NOR Fall Chinook salmon	0	0
NOR Summer steelhead	0	0

*Steelhead returns from Nov 2022-June 2023.
Coho salmon returns during fall of 2023

Evaluation of Juvenile Wild Fish Rescue Program (T&C 8iv)

As it pertains to the MA BIOP, this project has been completed. Please review past reports for a summary of this project.

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Appendix A

Several discrepancies were found in one table in the January 2024 Mitchell Act annual reports. Here we provide an updated table with the corrected numbers (in italicized bold font).

Table A2.Numbers of salmon and steelhead released by mark and tag group during calendar year 2022.

Project	Release Location	Species/Run	Release Start Date	Brood Year	AD + CWT Marked	Ad Only Marked	CWT ONLY	Unmarked	Total Released
Beaver Creek Hatchery	Beaver Creek	Coho	4/19/2022	2020	44,408	120,591	268	5	165,272
Beaver Creek Hatchery	Beaver Creek	Winter Steelhead	4/19/2022	2021	0	134,676	0	1,636	136,312
Beaver Creek Hatchery	Beaver Creek	Summer Steelhead	4/19/2022	2021	0	29,545	0	148	29,693
Beaver Creek Hatchery	Grays River	Chum	3/23/2022	2021	0	0	0	166,562	166,562
Deep River Net Pens	Deep River Net Pens	Coho	4/29/2022	2020	40,984	112,124	247	645	154,000
Deep River Net Pens	Deep River Net Pens	Spring Chinook	2/18/2022	2020	18,700	343	658	12	19,713
Deep River Net Pens	Deep River Net Pens	Spring Chinook	5/25/2022	2021	218,617	384,440	2,076	3,867	609,000
Fallert Creek Hatchery	Kalama River	Spring Chinook	3/1/2022	2020	126,115	393,461	1,026	2,100	522,702
Fallert Creek Hatchery	Kalama River	Fall Chinook	5/23/2022	2021	92,473	2,530,816	3,453	2,911	2,629,653
Fallert Creek Hatchery	Kalama River	Winter Steelhead	5/15/2022	2021	0	***46,855***	0	***636***	47,491
Fallert Creek Hatchery	Kalama River	Summer Steelhead	3/1/2022	2021	***48,924***	***44,290***	***558***	***436***	***94,208***
Kalama Falls Hatchery	Kalama River	Coho	4/1/2022	2020	44,115	258,152	159	1,557	303,983
Kalama Falls Hatchery	Kalama River	Winter Steelhead	4/15/2022	2021	***90,908***	***558***	***505***	***2***	91,973
Klineline Ponds	***Salmon Creek***	***Winter Steelhead***	***4/19/2022***	***2021***	***0***	***39,517***	***0***	***71***	***39,588***
North Toutle River	Green River	Fall Chinook	6/26/2022	2021	99,818	966,582	755	7,794	1,074,949
North Toutle River	Green River	Coho	5/2/2022	2020	33,131	56,417	274	500	90,322
Ringold Springs Hatchery	Springs Creek	Fall Chinook	6/13/2022	2021	338,852	3,779,399	4,012	44,741	4,167,004
Ringold Springs Hatchery	Springs Creek	Coho	4/11/2022	2020	39,198	178,302	114	518	218,132
Ringold Springs Hatchery	Springs Creek	Summer Steelhead	3/25/2022	2021	0	144,343	0	813	145,156
Skamania Hatchery	Klickitat River	Summer Steelhead	4/25/2022	2021	0	90,883	0	0	90,883
Skamania Hatchery	Rock Creek	Winter Steelhead	4/15/2022	2021	0	20,018	0	0	20,018
Skamania Hatchery	Washougal River	Winter Steelhead	4/18/2022	2021	0	85,364	0	162	85,526
Skamania Hatchery	Washougal River	Summer Steelhead	4/18/2022	2021	0	70,454	0	397	70,851
South Fork Toutle Ponds	South Fork Toutle	Summer Steelhead	4/15/2022	2021	0	20,369	0	82	20,451
Washougal Hatchery	Washougal River	Fall Chinook	6/22/2022	2021	101,038	1,124,872	406	4,518	1,230,834
Washougal Hatchery	Klickitat River	Coho	3/28/2022	2020	67,036	2,377,082	541	19,170	2,463,829
Washougal Hatchery	Washougal River	Coho	5/2/2022	2020	44,129	58,133	173	345	102,780