2024 Annual Report for Term and Condition 2, 5, and 6 to the National Marine Fisheries Service (NMFS) on Specific Terms and Conditions included in the Mitchell Act Biological Opinion (MA BiOp)

Prepared by Bryce Glaser and Jeremy Wilson
Washington Department of Fish and Wildlife (WDFW)
January 31, 2025

Table of Contents

Introduction

The National Marine Fisheries Service (NMFS) developed a Biological Opinion related to operation of the Mitchell Act hatcheries (MA BiOp) (NMFS 2017). Included in the MA BiOp was a requirement for the Washington Department of Fish and Wildlife (WDFW) to report annually on certain Terms and Conditions in the MA BiOp. This report provides information to satisfy the requirements of the Terms and Conditions (T&C) 2a, 2c, 5b, 5c, and 6b, (summarized below). Additional information contained within the requirements of the Terms and Conditions were provided to NMFS in two semi-annual reports: in April and October of 2024.

Excerpts from Terms and Conditions

2. Ensure that interactions on the spawning grounds with natural-origin fish from hatchery-origin fish produced through Mitchell Act funded hatchery programs are kept to the lowest feasible levels):
    a. NMFS shall ensure that the funding grantee annually submits pHOS survey protocols, gene flow monitoring methods, and RM&E protocols and statements of work on or before January 1 of each year for NMFS concurrence on or before March 1 of each year.
    c. NMFS shall require, unless otherwise specified in the *U.S. v. Oregon* agreement (CRFMA), that all juvenile hatchery fish released from Mitchell Act funded hatchery programs be visually marked, or other method of identification, and that operators report annually on the proportion of unmarked fish released from each Mitchell Act program.
5. Limit the co-occurrence and any resulting competition and predation caused by hatchery fish to lowest feasible levels:
    b. NMFS shall require funding grantees to report to NMFS the estimated proportion of precocial male smolts released annually from each program.
    c. NMFS shall require funding grantees to notify NMFS when the situation may warrant the early release of hatchery fish and/or consideration of options for the handling of infected/diseased fish.
6. Ensure that take resulting from encounters and broodstock collection facilities and from the operation of weirs in each tributary basin is minimized:
    b. NMFS shall require funding grantees to provide, by April 30th prior to installation, annual operating plans for weirs described in the Proposed Action.

PHOS Survey Protocols, Gene Flow Monitoring Methods, RM&E Protocols and Statements of Work (T&C 2a)

This information is also included in a separate report dated December 2024.

Weir and Spawning Ground Survey Protocols

The information provided below is from Rawding et al. 2014 and uses the study design and statistical methods from that report. Detailed methods and estimates for Chinook salmon during 2013-2017 are provided in Wilson et al. (2020).

Washington's Lower Columbia River (LCR) tributaries are monitored to estimate Chinook and coho salmon abundance, productivity, diversity (including proportion of hatchery origin spawners and jacks), and spatial structure as part of Washington Department of Fish and Wildlife's (WDFW) LCR Viable Salmonid Population (VSP) monitoring program. These data are needed to assess stock status, conservation efforts, fishery impacts, and to evaluate hatchery programs and hatchery reform actions. The cost-effective approach used by WDFW is to concurrently sample Chinook and coho salmon for coded-wire tag (CWT) recoveries while gathering biological and observation data to estimate VSP parameters. Monitoring protocols and analysis methods have been developed to produce unbiased estimates with measurements of precision in an effort to meet NOAA monitoring guidelines described in Crawford and Rumsey (2011).

For LCR Chinook and coho salmon, a variety of methods are used to estimate abundance, assess productivity, document spatial distribution, and collect data on diversity metrics. These include dam and weir counts, mark-recapture estimates based on live and carcass tagging, redd counts, periodic counts of live spawners and biological sampling of fish handled. Rawding et al. (2014) provides a detailed description of all protocols and methodologies used to estimate VSP parameters for LCR Chinook and coho salmon populations.

Traps and Weirs – General Description of Methods

Data collection at weirs is similar to the standardized methods for collecting salmon data at weirs described in Zimmerman and Zubkar 2007.

Weirs are currently operated in the following tributaries related to Mitchell Act hatchery production; Grays River, Elochoman River, Coweeman River, Green River (Toutle), Kalama River, Washougal River, Cedar Creek (Lewis River) and SF Toutle River. The primary purpose of the weirs is to control the proportion of hatchery-origin spawners (pHOS) on the spawning grounds for fall Chinook salmon and coho salmon (Elochoman weir only), to gather information on natural-origin (NOR) population parameters, and to collect broodstock for hatchery programs. Coho salmon information and/or broodstock collection, along with pHOS control, may occur at the weirs as well. Four weirs are also operated in Lower Cowlitz tributaries focused on coho and steelhead management/monitoring as part of Tacoma Power funded activities (not associated with MA BiOp).

Weir protocols are specific to each tributary, but in general follow similar procedures. NOR Chinook and coho salmon are either passed upstream or collected for integrated hatchery programs. Hatchery-origin (HOR) Chinook salmon are either removed at the weir, passed upstream or downstream, or collected for broodstock. HOR coho salmon are either passed upstream or collected for broodstock or removed at the weir. Usually, all chum salmon and steelhead are passed upstream of the weirs.

Biological information is collected at the weirs and may include scale samples, sex determination, mark information (adipose and/or ventral fin clip, no clip), coded-wire-tag

(CWT) collection, Passive Integrated Transponder (PIT) tag information (collected only from steelhead at the Kalama River weir), length measurement, and genetic information. Fish may be scanned with a CWT or PIT wand to determine presence of an internal tag. Fish may be tagged at the weirs to identify them in subsequent sampling. Tags may consist of Floy® tags and operculum punches. Fish may be anesthetized prior to sampling.

Weir Operation and Sampling Protocols

Weirs and traps are staffed and monitored frequently while installed and the trap box is checked daily (multiple times per day when necessary). Close attention is paid to the recruitment of fish into trap boxes and the accumulation of fish below the trap. When the abundance of salmonids exceeds the ability of staff to efficiently work through fish, modifications are made to trapping protocols to facilitate passage without handling. This is accomplished by opening the upstream gate on the trap box and allowing fish to pass through without handling or submerging a panel section of the resistance weir to allow fish passage around the trap box.

Stream flow and weather forecasts are monitored closely to ensure the well-being of captured fish in the live box. The Washington Department of Ecology (WDOE) and United States Geological Survey (USGS) operate telemetry stream flow gauges that provide near real-time information on stream flows. Stream flow and weather forecast information, and ultimately direct observation, determines when flows begin to limit accessibility to the trap box. When these conditions are encountered, the trap box is opened on both the upstream and downstream end to allow direct passage through the trap. Marking/tagging of fish combined with stream surveys provide means for estimating abundance and weir efficiency when fish are allowed through the trap unsampled and/or when high flows compromise the ability to trap fish at the weir.

Adult fall Chinook salmon captured at each weir are sampled and marked/tagged prior to release above the weir to evaluate weir efficiency and generate population estimates. Marking/tagging is coordinated with spawning ground surveys to re-sight/recover these marks. Independent estimates of spawner abundance are made for fall Chinook via mark/recapture, redd count expansion and/or Area-Under-the Curve (AUC) methods for comparison to weir estimates. All adult salmonids that are bio-sampled, except those able to be retained in sport fisheries upstream of weir sites, are anaesthetized (MS-222) prior to handle/tagging at the weir. All anesthetized fish are allowed to fully recover before releasing upstream of the weir.

Spawning Ground Surveys

Chinook

Surveys consist of three components: 1) biological sampling, 2) fish tagging and tag recovery, and 3) periodic counts of live fish, carcasses and redds, which are used to estimate abundance. Data collection during scheduled weekly spawning ground surveys is similar to the standardized methods for collecting salmon data from carcass counts, foot-based visual counts, and redd surveys (Crawford et al. 2007a, Crawford et al. 2007b, and Gallagher et al. 2007c).

All carcasses that are not totally decomposed are sampled for external tags (Floy® T-bar anchor or operculum tags) and biologically sampled for fork length, sex, adipose fin presence, and condition (extent of decomposition). Sex is determined based on morphometric differences between males and females. If necessary, the abdominal cavity is cut open to confirm sex and determine spawning success. The spawning success is approximated based on visual inspection, ranging from 100% to 0% success. A fish with 0% spawning success or 100% egg retention is considered a pre-spawning mortality. Carcass condition and gill color are recorded to qualitatively rate the carcass (Sykes and Botsford 1986). Scale samples are collected by selecting scales from the preferred area as described in Crawford et al. (2007b). Preferred scales are samples in an area about 1-6 scale rows high, and about 15 scale rows wide, above the lateral line in a diagonal between the posterior insertion of the dorsal fin and anterior insertion of the anal fin. Scale samples are removed with forceps with special care to select scale samples that are of good quality (round shape, non-regenerated) and not adjacent to one another (to minimize the effects of regeneration) as described in a WDFW technical report (Cooper et al. 2011). Scales are placed on the gummed portion of WDFW scale cards with their exterior surfaces facing up. The scale card number, position number, date, and location create a unique code in the Traps, Weirs, Surveys (TWS) database. Due to a high number of carcasses on the Washougal and Kalama these fish may be systematically subsampled for scales.

For Chinook salmon carcasses, fish are enumerated by the following categories: unmarked, marked, and unknown. Unmarked fish have intact adipose fins and snout, marked fish have their snout but are missing their adipose fin, and unknown fish have either a damaged caudal peduncle (e.g., adipose fin area unexaminable) or missing snout. All unmarked and marked fish are sampled for a CWT following standard protocols (NWMT 2021). The surface of the CWT wand with radiating arrows is placed in contact with the snout and moved from the right to the left eye, and then up and over the snout area. If a CWT is detected, the indicator LEDs will light up and a beep is emitted from the wand. When a CWT is detected, the snout is severed by cutting across the head straight down 1 inch behind the eyes (Crawford et al. 2007b). The snout is placed in a plastic bag with a tag number linking the snout to biological data (length, sex, fin clips, spawning success for females, and scale sample number) recorded on the scale card, or other datasheet or iPad/tablet. Snouts are stored in a freezer and periodically delivered to the WDFW CWT lab in Olympia.

All carcasses are inspected for tags. Untagged carcasses may be tagged with uniquely numbered plastic tags (McIsaac 1977). Tags are placed on the inside of the opercula to limit predation and potential bias in recovery rates due to observation of brightly colored tags. Tagged carcasses are then placed into moving water to facilitate mixing with untagged carcasses (Sykes and Botsford 1986). When tagged carcasses are recovered, surveyors record the tag numbers, the tags are removed and fish are marked by removing the tail (denoted as loss on capture in the Jolly-Seber model).

In addition, all live adult and jack salmonids are identified to species based on physical characteristics unique to each species and recorded by species (Crawford et al. 2007a). A 60cm

cut off between adult and jack salmon is used, although this cut off is difficult to accurately determine during visual surveys. However, since few fish are near 60cm the misclassification errors are believed to be low. Salmon are identified as either spawning or holding. A fish is identified as holding if it is observed in an area not considered spawning habitat, such as pools or large cobble and boulder riffles (Parken et al. 2003). Salmon are classified as spawners if they are on redds or not classified as holders. Counts of live Chinook, coho, and chum salmon are recorded separately for each survey reach.

Redd surveys in the Grays, Elochoman, Coweeman, EF Lewis, Green (below the weir) and the SF Toutle rivers and Skamokawa, Mill, Abernathy, Germany creeks, follow the protocols of Gallagher et al. (2007). The start and end of each survey reach are geo-referenced and its coordinates are recorded on iPads. Surveyors typically locate the upper most point in the reach and walk downstream to the coordinates at the end of the reach. Surveys are scheduled weekly and follow methods in Rawding et al. (2006a, 2006b). All identifiable redds are flagged, and their location (latitudinal and longitudinal coordinates) are recorded. The iPads are allowed to acquire satellite locations until an accuracy of + 100 feet or less is obtained, most often accuracies average 5 to 50 feet. In subsequent surveys, previously flagged redds are inspected to determine if they should be classified as “still visible” or “not visible”. A redd is classified as “still visible” if it would have been observed and identified without the flagging present and is recorded as “not visible” if it does not meet these criteria. These data were collected to allow us to estimate the time period redds were visible to surveyors.

Experienced field personnel are employed for this project when possible; all personnel are trained in adult salmon identification, sampling/tagging protocols, and redd identification (Crawford et al. 2007a, Gallagher et al. 2007b, and Crawford et al. 2007c). Training takes place in orientation meetings and with field supervisors. When possible, field supervisors also walk behind surveyors to check on redd identification and enumeration, carcasses tagging, and live counts.

Monitoring Design

Coho

Dam counts and trapping, mark-recapture, and spawning ground surveys are used to estimate population parameters of Lower Columbia River (LCR) coho salmon. Field personnel are experienced and/or trained on adult salmon identification. Field data collection protocols varied but are based on the methods from the American Fisheries Society for salmon monitoring (Johnson et al. 2007). Coho salmon redd, live fish, and carcass counts along with environmental and header information collected during coho salmon surveys are stored in the WDFW Spawning Ground Survey (SGS) database. Biological data collected on spawning ground surveys is stored in the WDFW Traps, Weirs, and Surveys (TWS) database.

Spawning Ground Surveys

The monitoring design components for spawning ground surveys consist of basic elements (Stevens et al. 2007). These include: 1) the development of the sampling frame covering the entire spawning area, 2) a probabilistic sampling design to representatively survey the

spawning area, 3) a temporal component to ensure the entire spawning period was sampled, and 4) a decision on the metric (e.g., live fish, carcass, or redd counts) used to estimate escapement, the observer efficiency, and the relationship between the metric and the escapement.

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.

RM&E Protocols and Statements of Work

Washington Department of Fish & Wildlife – Mitchell Act Project Narrative – Statement of Work

This identifies tasks for annual 1) Hatchery Operations, 2) Missing Production Groups and Coded Wire Tag (CWT), 3) Monitoring, Evaluation & Reform, 4) Lower Columbia River Fishery Sampling and 5) Marking and Tagging for Washington State Mitchell Act facilities.
The Fiscal Year 2023-2027 Mitchell Act Project Narrative is attached in Appendix A.

Marking and Tagging of Smolts Released from WDFW hatcheries (T&C 2c)

WDFW provided numbers of smolts marked and tagged with MA funds in the two semi-annual MA reports, and the numbers for 2023 are summarized in Table 1. 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 B 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 Precocial Male Smolts Released from WDFW hatcheries (T&C 5b)

WDFW provides the precocity estimates to NMFS in the semi-annual Mitchell Act reports and those estimates are summarized in Table 2.

Table 2. Precocity estimates at Washington Department of Fish and Wildlife Mitchell Act Hatcheries.

Hatchery	Stock	Brood Year	Precocity %
Beaver Creek	Beaver Creek winter steelhead	2023	0.0%
Beaver Creek	Skamania summer steelhead	2023	0.0%
Beaver Creek	Elochoman coho	2022	0.0%
Beaver Creek / DRNP*	Elochoman coho	2022	0.0%
Beaver Creek / DRNP*	Beaver Creek spring Chinook Yearlings	2022	0.0%
Beaver Creek	Beaver Creek/Grays Chum	2022	0.0%
North Toutle	Toutle coho	2022	0.0%
North Toutle /SF Toutle Pond	Skamania summer steelhead	2023	0.0%
Fallert Creek	Kalama wild winter steelhead	2023	0.0%
Fallert Creek	Kalama wild summer steelhead	2023	0.0%
Fallert Creek	Kalama spring Chinook	2022	0.0%
Kalama Falls	KEW** winter steelhead	2023	0.4%
Kalama Falls	Kalama spring Chinook	2022	0.0%
Kalama Falls	Kalama coho	2022	0.0%
Skamania	Skamania winter steelhead	2023	0.6%
Skamania	Skamania summer steelhead	2023	0.0%
Skamania/ Salmon Ck.	KEWS** winter steelhead	2023	0.0%
Washougal	Washougal coho	2022	0.0%
Ringold	Ringold summer steelhead	2023	1.6%
Ringold	Kalama coho	2022	0.0%

* Deep River Net Pen release site

** Kalama Early Winter

Early release of hatchery fish and/or consideration of options for the handling of infected/diseased fish. (T&C 5c)

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

No additional information to report on this T&C.

Weir Operating Plans and Protocols (T&C 6b)

An overview of survey protocols are described in the section called "PHOS Survey Protocols, Gene Flow Monitoring Methods, RM&E Protocols and Statements of Work". Detailed weir protocols for the 2025 season are provided in this section. It is anticipated that minor updates may be made to the protocols prior to the 2025 season.

Grays River Weir Sampling Protocols

Hydraulic Project Approval Requirements

The weir shall be operated consistent with all applicable HPA requirements including the following:

- "Organic material that collects on the trap shall be removed and returned to state waters downstream of the project. Man-made trash shall be removed and disposed so that it does not reenter waters of the state."
- "Sediment flushing activities may take place throughout the year during high water events to reduce accumulated sediment in collection boxes. Sediment flushing to take place several times throughout the year during high water events to help reduce the accumulation of sediments in the collection boxes. Any additional flushing should take place during the normal work window between July 15 and September 15 for the life of the permit."
- "Stop all hydraulic project activities except those needed to control erosion and siltation, if flow conditions arise that will result in erosion or siltation of waters of the state."
- "Within one year of project completion, the banks shall be revegetated with native or other approved woody species as close to the affected area without impeding future construction of projects. Vegetative cuttings shall be planted at a maximum interval of three feet (on center) and maintained as necessary for three years to ensure 80 percent survival."
- "Restore bed and bank elevations and contours to pre-project condition."
- "All trap components, except river gravels, shall be immediately removed from waterward of the ordinary high water line (OHWL) upon project completion."

ESA Requirements

The weir shall be operated consistent with the requirements of all applicable biological opinions or other ESA authorizations. Handle and mortality limits for each listed species will be provided prior to initiating weir operations. Weir operation leads must monitor handle and mortality relative to these limits and notify supervisory staff when the need for an adaptive response is triggered.

General Procedures

Low water/poor recruitment:

- When water levels are low, or recruitment appears to be poor, the following measures will be implemented in coordination with the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead:
    - Monitor fish presence below weir daily by conducting short walking surveys in established index area downstream of weir to assess fish and/or redd presence and record this information in the header information on the tablet.
    - Notify the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead of poor recruitment issues.
    - Seine below weir.
    - Modify weir/holding pen design.
    - Upon approval from the Region 5 weir management lead, open trap and/or submerge resistance board panels to allow some fish to pass unimpeded.

High water:

- High water flows and associated debris can be dangerous and may cause damage to the weir. Safety procedures will continue to be updated in accordance with agency policy and safety requirements. It is important to monitor the weather forecast and Grays River flows (Grays Flows). If flows are high or begin rising rapidly:
    - Contact the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead.
    - 1st priority is always your safety.
        - If you are concerned about your or your co-worker's safety, stop and contact the weir crew lead for further direction.
        - Operating/cleaning the weir in higher flow conditions generally requires more than one staff person. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
        - Remember to always inspect and wear your PFD (personal floatation device) per WDFW policy!!
    - 2nd priority – fish health.
        - The goal is to avoid/reduce impacts to fish, particularly natural-origin fish, with special attention to ESA-listed fish!
            - Get trap box cleaned out by processing as many fish as possible prior to flows becoming unworkable. Contact the weir crew lead to request assistance and receive further direction if the situation is becoming unmanageable.
            - If flows are close to topping live box, staff may close downstream doors to prevent more fish from recruiting into box.
            - Upon approval of the Region 5 weir management lead, open door(s) on trap box to allow any fish remaining in trap box to swim out.
    - 3rd priority – structure security.
        - Clean the weir! Generally, working in pairs (or more) at higher flows is required for safety. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.

        - Stay in close contact with weir crew lead to determine when cleaning weir should be abandoned to allow weir to submerge.
        - Once cleaning the weir is abandoned and weir panels are topped, wait until flows begin to recede and weir crew lead directs cleaning of weir panels to resume fishing ASAP after the high-water event.

Water Temperature:

- It is critical to monitor water temperatures while handling fish in the trap when the weather is warm. WDFW will utilize a tiered approach to water temperature management at the weir.
    - If the water temperature is less than 18 C, the weir will operate under the standard protocol.
    - If temperatures are greater than 18 C but less than 21 C, a modified operational protocol will be implemented. The modified protocols will include but not be limited to:
        - Electrofishing will not be utilized.
        - Water temperature will be monitored continuously in sampling vessels.
        - Water will be changed frequently in sampling vessels to ensure water temperatures do not exceed 21 C.
    - If water temperatures are greater than 21 C, standard and modified protocols will be suspended. Depending on the situation, WDFW will consider a variety of options including submerging weir panels, opening trap boxes, or closing trap boxes. In the event of a prolonged stretch of elevated water temperatures, staff may shift their schedule to process fish in the cooler early morning hours.

Fish recruitment and large fish numbers in the trap box:

- When fish are moving, let them move. If fish are actively recruiting to the trap box, do NOT get in the trap box to start working fish. Wait until trap box is full or fish recruitment slows to begin working fish.
- Contact the weir crew lead to request assistance and receive further direction if the number of fish in the trap box is becoming unmanageable.
- Generally, the density of fish in the trap box is self-regulating. Fish will generally discontinue entering the trap box once it is full. However, if the trap box appears overcrowded or you begin to see trap mortalities, the number of fish in the trap box will need to be reduced.
    - If this occurs at the beginning of the daily shift or while working fish, close the entrance to the trap box until fish numbers can be thinned by regular processing.
    - If this occurs at a trap check late in the day or after the trap has already been worked for the day, additional effort may be needed to reduce fish numbers in the trap box. In this situation, contact the weir crew lead to request assistance and receive further direction and begin to surplus LV and/or AD-

clipped Chinook to reduce crowding until the trap can safely be left until the next morning. Surplused fish can be stockpiled for sampling the following day.

Identifying the origin of salmon and steelhead:

- Accurately identifying the origin (natural or hatchery) of salmon and steelhead captured at the weir is critically important to implementation of the protocol.
- The origin of Chinook salmon, Coho salmon, and steelhead can only be determined via the combination of their adipose fin clip status and CWT status.
- Therefore, all adult Chinook salmon, Coho salmon, and steelhead must be examined for all fin clips and scanned for CWTs regardless of adipose fin clip status.
- A fish should be deemed a hatchery-origin return (HOR) if it has either:
    - Adipose (AD) fin clip and no CWT (CWT-); or
    - Adipose (AD) fin clip and a CWT (CWT+); or
    - An intact adipose fin (UM) and a CWT (CWT+); or
    - Any left ventral (LV) fin clip (regardless of AD or CWT status).
- A fish should be deemed a natural-origin return (NOR) if it has:
    - An intact adipose fin (UM) no CWT (CWT-), and no left ventral (LV) fin clip.

Identifying whether a live salmon or steelhead is maiden or recapture:

- This section is most applicable to watersheds with two weirs but it is still applicable to all locations.
- Maiden: any fish with no left operculum punch (LOP) or Floy® tags.
    - Follow protocols as described for species/origin encountered.
- Recapture: any fish with a left operculum punch (LOP) or Floy® tags.
    - Use the recapture function in the tablet to look up a Floy® Tag number and find associated biodata and record:
        - LOP shape
        - Floy® tag information (color and tag #s)
        - Apply right operculum punch with proper shape based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.
    - Pass upstream.

Prioritization of species handling at trap and seining activities:

- As a general rule, NOR salmonids take priority over HOR salmonids. If a decision regarding handling priority at the trap is needed due to extenuating circumstances, the weir crew lead will make that determination.
- Seining may cause any fish holding directly below the weir to move downstream. It is important to coordinate with the weir crew lead to determine if seining should occur before or after working the trap box.

Overview of disposition by species and origin:

- Truck for broodstock:
    - NOR Chinook salmon (1 out of 3 per sex up to weekly collection goal)
- Remove:
    - HOR Chinook salmon with AD, LV, or AD+LV-clip
    - HOR Chinook salmon with CWT but AD intact (in 2025 and 2026)
    - HOR Coho salmon
- Pass upstream:
    - HOR Chinook salmon with CWT but AD intact (beginning in 2027)
    - NOR Chinook salmon (2 out of 3 per sex) plus all NOR Chinook in excess of weekly NOR broodstock goal
    - NOR Coho salmon
    - All Chum salmon (NOTE: the origin of Chum salmon cannot be determined using external characteristics though most should be natural-origin).
    - All steelhead
    - All Pink salmon
    - All Sockeye salmon
    - All Cutthroat and all other "non-target" species.
- Pass (back) downstream:
    - NA (no fish should be passed back downstream at this time).

Data management:

- Fill out a header in the tablet every day the trap is in operation even if no fish were caught.
- Make note of all trap alterations and any missed trapping periods in comment section of each individual day's header in the tablet.
- Every captured salmon and steelhead should have the following biological data recorded:
    - Species
    - Sex (M, F, or J); see species specific details below
    - Mark status (UM/AD)
    - CWT status via CWT status (Tablet field)/Sample Category (Scale card)
- NOTE: any fish that has a physical sample taken (i.e., scale, snout, DNA) must be recorded on a scale card as the scale number/position is how data from TWS & other labs (e.g., snout decodes) are linked.
- Use new scale cards each day.
- Certain biodata should also be handwritten on scale cards in addition to being captured in the tablet. This includes:
    - Date (back of scale card)
    - Position number
    - Fork length
    - Sex
    - Mark
    - Sample category

    - DNA vial # (if collected)
    - Snout ID (SNID) (if snout is collected)
- Clearly distinguish disposition on back of each scale card (i.e. weir wash-up, weir surplus, or fish passed upstream (Lives)) next to sample location or stream reach ID.
- Do NOT put any Floy® tag info or LOP info on scale cards. This will only be captured in the tablet.
- If a fish that should have been punched or tagged gets passed upstream without a punch and/or Floy® tags, it will be recorded in the tablet as "NP".
- Tablet data will be backed up daily to a thumb drive and uploaded weekly (at a minimum) to a shared drive location TBD.

Procedures for Sampling NOR Chinook Salmon Passed Upstream at Weir

- To confirm NOR status, wand UM fish for CWT presence and make sure the left ventral fin is not clipped. Many ventral clips will be partially regenerated, so compare left ventral to the right ventral fin.
- Anesthetize all NOR Chinook salmon prior to sampling/tagging. Take care to not place any AD -clipped Chinook salmon, Coho salmon, or steelhead into the anesthetic bath as they are then not eligible for human consumption and unavailable for donation to food banks.
- Tag NOR Chinook with two of the proper colored Floy® tags based on weekly tagging schedule; one on each side of the dorsal fin. Record tag color and numbers on tablet form.
- Apply Floy® tags using the following methods:
  Implement the study design by tagging the fish with the appropriate color and numbered Floy® tag. Prepare for tagging by placing tags into semi-automated continuous feed tagging gun with the appropriate needle (Guy et al. 1996). As with all numbered tags, tag should be attached in sequence to allow for ease of data checking. Secure fish on a safe firm flat surface, tagging boot, or in the water. Push needle through the posterior of the dorsal fin rays at a 45-degree angle, so when the fish swims the tag will lay next to the body. The tag needle must be inserted past the pterygiophores of the dorsal fin to ensure high retention (Waldman et al. 1990). The tagging gun is twisted 90 degrees to dislodge the tag from the plastic clip and then removed. Tagged fish can be treated with antibiotics. Complete the data form to link the tag(s) to biological, scale, otolith, tag, spatial, and temporal data. Enumerate the number of successfully marked fish released by mark location and their release location.
- Apply left operculum punch with a shape based on weekly marking schedule (rotate to new punch shape each Sunday).
- Retain the left operculum punch for DNA tissue or collect a punch from the upper lobe of caudal fin if the left operculum punch sample is lost.
- Collect the following biodata from every NOR Chinook (1 in 1 sample rate):
    - 3 scales
    - Fork length (to the nearest cm)
    - Sex (M, F, or J defined as ≤ 56 cm)
    - Mark (UM)

    - DNA sample. Place (DNA) tissue sample on pre-labeled blotter paper. Record DNA sample number on scale card on the tablet.
    - Stock ID (B or T)
        - B (Bright) or T (Tule) under "comments" in the tablet and on scale card in "Carcass Condition/Gill Color/Skin Color" row. Separate scale cards are needed for Brights and Tules.
- Allow fish to recover before release.

Procedures for Sampling HOR Chinook Salmon Removed at Weir

- Dispatch and set aside HOR Chinook salmon to be processed after the trap has been emptied. This prioritizes the processing of natural-origin fish and gets them released upstream more quickly, reducing the stress of being in the trap.
- Wand all marked fish to check for the presence of a coded-wire-tag (CWT).
- Sample rate of 1 in 1 for HOR Chinook salmon. All HOR Chinook salmon removed can be put on the same scale card for any one day. Use a new scale card each day.
- Collect the following data from each HOR Chinook salmon:
    - 3 scales
    - Fork length (to the nearest cm)
    - Sex (M, F, or J defined as ≤ 56 cm)
    - Mark (AD-clip, AD- and LV clip, or LV clip)
    - Sample category
        - Will be blank for Chinook salmon without a CWT.
        - Will be 0 Chinook salmon with a CWT. If a CWT is detected, bar-coded labels are used for snout identification tags.
- If wanding the fish indicates a CWT is present, take the snout and scan the bar-code of the snout label (follow number sequence if possible) using the built-in scanner on the tablet (A2 button). Record the snout identification and sample category on scale card.
- Note disposition of all surplus Chinook salmon by sex (M, F, J) and mark category and record on Form 3. Make sure the numbers on the scale cards for surplus match the number recorded on the Form 3. Provide carcasses to one of the food bank alternatives when possible and have the recipient at the food bank sign on the Form 3 to document the donation, leaving with them the center (yellow) page of the Form 3. If an HOR fish was accidentally placed in the anesthetic bath, or is otherwise unfit for human consumption, it must be used for nutrient enhancement as it is not eligible for human consumption.
- Remove the tail of all carcasses that are used for nutrient enhancement and return the fish to a stream outside of survey area. Typically, nutrient enhancement carcass transportation will be done by weir staff, with occasional help from stream survey staff.

Procedures for NOR Chinook Salmon Trucked for Brood

- Randomly collect 1 out of 3 NOR Chinook salmon by sex for broodstock based on collection curves.
- Collection curves will be provided prior to initiation of weir operations.
- It is OK if the weekly collection goal is exceeded, but cumulative NOR brood collection should not get more than one week ahead; if the cumulative brood collected gets one week ahead, all NOR Chinook will be passed upstream.
- Broodstock collection curves are targets and may be changed with input of hatchery staff and review by management/science staff based on weather events. Collection dates will be dependent on when fish show up.
- All fish collected for broodstock will be sampled later at the hatchery.
- At the time of transport from the weir site, they will only be enumerated by sex and mark. Record this information using the clicker form in the tablet.
- Transport of broodstock is the hatchery staff's responsibility.

Procedures for Sampling HOR Coho Salmon Removed at Weir

- Wand all fish for CWT presence.
- Bio rate of 1:1
- If Coho wands. +, take snout and scan barcode snout label, drop label in bag and tie bag appropriately.
- The following data should be collected from CWT + Coho and recorded in in the tablet and on a scale card.
    - Fork length
    - Sex (M, F, or J defined as ≤ 46cm)
    - Mark
    - Sample category will be blank for Coho without a CWT or SC 0 if wand pos (+).
    - If wand pos (+), scan barcode or write down number (eight digits)
- All wand negative Coho need to be represented in tablet.
    - Enumerate by sex and clip in the tablet.
- Coordinate with food banks to donate as many fish as possible. On days when the food bank is unavailable, nutrient enhance surplus carcasses. Cut off tails on all nutrient enhanced carcasses and return to stream outside of survey area (bridge below the SF Grays).
- Record disposition of all surplus Coho by M/F/J and mark category on Form 3s. Make sure numbers of surplus Coho recorded in the tablet) matches what is recorded on Form 3s.

Procedures for Sampling Other Salmonids Passed Upstream at Weir

Weir crew lead will determine sampling intensity of these species.

- NOR Coho salmon, all Sockeye salmon, and Pink salmon:
    - These fish can be anesthetized prior to sampling if needed.

    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Allow to recover before release upstream.
- NOR steelhead:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - The following biodata should be collected from all NOR steelhead (and recorded on both the weir datasheet and scale card):
        - 6 scales
        - Fork length (to the nearest cm)
        - Sex (M, F)
        - Mark (UM)
    - Allow to recover before release upstream.
- HOR steelhead and all cutthroat:
    - Do NOT use anesthetic.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Pass upstream.
- Chum salmon:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. SAVE PUNCH FOR DNA SAMPLE!
    - Collect 3 scales.
    - The following biodata should be collected and recorded on the tablet:
        - Fork length (to the nearest cm)
        - Sex (M/F)
        - Mark (UM)
        - DNA sample number
        - Any other marks/damage (i.e. mammal marks, net marks, etc.)
    - Allow to recover before release upstream.

Procedures for Trap Mortalities

- Should be kept separate from any intentionally surplused fish.
- Record in tablet as mortality.
- Follow the same protocols as you would for intentionally surplused fish.
- Put any Coho trap mortalities on actual scale cards and record sex, mark, fork length and sample category but do not take scales.

Definition of Weir "Wash-Up"

A weir wash-up is any carcass that washes onto or against the weir, weir structure or live box on the upstream side. It does not include carcasses on the bank or on the river bottom further than 5 feet upstream of the weir, nor the dead fish in the trap.

Procedures for Weir Wash-Ups

- Record all weir wash-ups in the tablet form as dead, being sure to click weir wash-up button, and disposition downstream. Weir wash-up sampling data are captured in the same header as the day's "normal" weir header, but weir wash-ups must go on a separate scale card.
- Examine all fish for any external tags and/or marks (caudal and both opercula). Record any carcass tags, Floy® tags and/or caudal/opercula punch recovery information.
    - If you can examine a fish for tags and/or mark and it has none, record NP (for none present) in tablet form.
    - If you are unable to determine punch shape but can tell one is present, record P.
    - If you are unable to examine a fish for tags and/or mark for whatever reason, record U (for undeterminable) in tablet form.
- <u>For all weir washups</u>, the following guideline should be followed for all species:
    - If fish is a recapture (has a Floy® tag or LOP), do NOT wand for a CWT as it was already wanded as a live fish.
    - If fish is NOT a recapture (NO Floy® tag or caudal punch or LOP), wand for CWT.
    - Be sure to note CWT status in tablet (not wanded, CWT -, or CWT +).
- For Chinook salmon and Chum salmon, the following biodata should be collected and recorded in the tablet form:
    - 3 scales (except no need if deemed a recapture)
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 56 cm)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
            - Fill out spawning ground survey snout label and keep with spawning ground survey snouts.
            - Write weir wash-up in comments of snout label.
    - DNA sample
    - Otoliths (Chum salmon only)
- For Coho salmon and steelhead, the following biodata should be collected and recorded in the tablet form and on actual scale cards:
    - Do NOT take scales
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 46 cm for Coho salmon)

    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
    - SNID (if CWT+) and follow CWT collection procedures
- For other species of weir wash-ups (not listed above):
    - If fish wands negative for CWT (CWT-) enumerate by species, mark category, and sex in tablet being sure to note as weir wash-up.
- After sampling, remove any Floy® and/or carcass tags, cut tail, and pass downstream of weir**.**

Procedures for CWT Recoveries

- ALWAYS use a cut proof glove when collecting a snout.
- Cut one inch behind the eye when collecting a snout. To avoid false positive CWT detections, wand the removed snout to confirm the presence of the CWT in the collected snout. If the CWT is not detected in the snout, wand the cut head and try to determine if the wire is present there, or if there is an embedded hook or other source of metal causing the beep. Make a final determination on whether a CWT appears to be present (i.e., no other source of the detection beep can be located) and if so, extract and bag the head part that is the source of the detection. If a non-cwt source such as a hook is located, remove the hook or other metallic source and wand again. If negative, discard the snout and record the CWT status as negative for that fish.
- For confirmed CWT positive snouts, use the A2 button on the tablet to scan the bar-coded snout label into the database.
- All CWTs recovered need to be put on a CWT recovery sheet before going into the freezer at the Ridgefield office. Snouts need to be bagged separately by recovery type (weir surplus, weir wash-up, and stream survey) and recorded on separate CWT recovery sheets by recovery type.

Elochoman River (Foster Road) Weir Sampling Protocols

Hydraulic Project Approval Requirements

The weir shall be operated consistent with all applicable HPA requirements including the following:

- "Organic material that collects on the trap shall be removed and returned to state waters downstream of the project. Man-made trash shall be removed and disposed so that it does not reenter waters of the state."
- "Sediment flushing activities may take place throughout the year during high water events to reduce accumulated sediment in collection boxes. Sediment flushing to take place several times throughout the year during high water events to help reduce the accumulation of sediments in the collection boxes. Any additional flushing should take place during the normal work window between July 15 and September 15 for the life of the permit."

- "Stop all hydraulic project activities except those needed to control erosion and siltation, if flow conditions arise that will result in erosion or siltation of waters of the state."
- "Within one year of project completion, the banks shall be revegetated with native or other approved woody species as close to the affected area without impeding future construction of projects. Vegetative cuttings shall be planted at a maximum interval of three feet (on center) and maintained as necessary for three years to ensure 80 percent survival."
- "Restore bed and bank elevations and contours to pre-project condition."
- "All trap components, except river gravels, shall be immediately removed from waterward of the ordinary high water line (OHWL) upon project completion."

ESA Requirements

The weir shall be operated consistent with the requirements of all applicable biological opinions or other ESA authorizations. Handle and mortality limits for each listed species will be provided prior to initiating weir operations. Weir operation leads must monitor handle and mortality relative to these limits and notify supervisory staff when the need for an adaptive response is triggered.

General Procedures

Low water/poor recruitment:

- When water levels are low, or recruitment appears to be poor, the following measures will be implemented in coordination with the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead:
    - Monitor fish presence below weir daily by conducting short walking surveys in established index area downstream of weir to assess fish and/or redd presence and record this information in the header information on the tablet.
    - Notify the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead of poor recruitment issues.
    - Seine below weir.
    - Modify weir/holding pen design.
    - Upon approval from the Region 5 weir management lead, open trap and/or submerge resistance board panels to allow some fish to pass unimpeded.

High water:

- High water flows and associated debris can be dangerous and may cause damage to the weir. Safety procedures will continue to be updated in accordance with agency policy and safety requirements. It is important to monitor the weather forecast and Elochoman River flows (Elochoman Flows). If flows are high or begin rising rapidly:
    - Contact the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead.
    - 1st priority is always your safety.

        - If you are concerned about your or your co-worker's safety, stop and contact the weir crew lead for further direction.
        - Operating/cleaning the weir in higher flow conditions generally requires more than one staff person. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
        - Remember to always inspect and wear your PFD (personal floatation device) per WDFW policy!!
    - 2nd priority – fish health.
        - The goal is to avoid/reduce impacts to fish, particularly natural-origin fish, with special attention to ESA-listed fish!
            - Get trap box cleaned out by processing as many fish as possible prior to flows becoming unworkable. Contact the weir crew lead to request assistance and receive further direction if the situation is becoming unmanageable.
            - If flows are close to topping live box, staff may close downstream doors to prevent more fish from recruiting into box.
            - Upon approval of the Region 5 weir management lead, open door(s) on trap box to allow any fish remaining in trap box to swim out.
    - 3rd priority – structure security.
        - Clean the weir! Generally, working in pairs (or more) at higher flows is required for safety. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
        - Stay in close contact with weir crew lead to determine when cleaning weir should be abandoned to allow weir to submerge.
        - Once cleaning the weir is abandoned and weir panels are topped, wait until flows begin to recede and weir crew lead directs cleaning of weir panels to resume fishing ASAP after the high-water event.

Water temperature:

- It is critical to monitor water temperatures while handling fish in the trap when the weather is warm. WDFW will utilize a tiered approach to water temperature management at the weir.
    - If the water temperature is less than 18 C, the weir will operate under the standard protocol.
    - If temperatures are greater than 18 C but less than 21 C, a modified operational protocol will be implemented. The modified protocols will include but not be limited to:
        - Electrofishing will not be utilized.
        - Water temperature will be monitored continuously in sampling vessels.
        - Water will be changed frequently in sampling vessels to ensure water temperatures do not exceed 21 C.
    - If water temperatures are greater than 21 C, standard and modified protocols will be suspended. Depending on the situation, WDFW will

consider a variety of options including submerging weir panels, opening trap boxes, or closing trap boxes. In the event of a prolonged stretch of elevated water temperatures, staff may shift their schedule to process fish in the cooler early morning hours.

Fish recruitment and large fish numbers in the trap box:

- When fish are moving, let them move. If fish are actively recruiting to the trap box, do NOT get in the trap box to start working fish. Wait until trap box is full or fish recruitment slows to begin working fish.
- Contact the weir crew lead to request assistance and receive further direction if the number of fish in the trap box is becoming unmanageable.
- Generally, the density of fish in the trap box is self-regulating. Fish will generally discontinue entering the trap box once it is full. However, if the trap box appears overcrowded or you begin to see trap mortalities, the number of fish in the trap box will need to be reduced.
    - If this occurs at the beginning of the daily shift or while working fish, close the entrance to the trap box until fish numbers can be thinned by regular processing.
    - If this occurs at a trap check late in the day or after the trap has already been worked for the day, additional effort may be needed to reduce fish numbers in the trap box. In this situation, contact the weir crew lead to request assistance and receive further direction and begin to surplus LV and/or AD-clipped Chinook to reduce crowding until the trap can safely be left until the next morning. Surplused fish can be stockpiled for sampling the following day.

Identifying the origin of salmon and steelhead:

- Accurately identifying the origin (natural or hatchery) of salmon and steelhead captured at the weir is critically important to implementation of the protocol.
- The origin of Chinook salmon, Coho salmon, and steelhead can only be determined via the combination of their adipose fin clip status and CWT status.
- Therefore, all adult Chinook salmon, Coho salmon, and steelhead must be examined for all fin clips and scanned for CWTs regardless of adipose fin clip status.
- A fish should be deemed a hatchery-origin return (HOR) if it has either:
    - Adipose (AD) fin clip and no CWT (CWT-); or
    - Adipose (AD) fin clip and a CWT (CWT+); or
    - An intact adipose fin (UM) and a CWT (CWT+); or
    - Any left ventral (LV) fin clip (regardless of AD or CWT status).
- A fish should be deemed a natural-origin return (NOR) if it has:
    - An intact adipose fin (UM) no CWT (CWT-), and no left ventral (LV) fin clip.

Identifying whether a live salmon or steelhead is maiden or recapture:

- This section is most applicable to watersheds with two weirs but it is still applicable to all locations.
- Maiden: any fish with no left operculum punch (LOP) or Floy® tags.
    - Follow protocols as described for species/origin encountered.
- Recapture: any fish with a left operculum punch (LOP) or Floy® tags.
    - Use the recapture function in the tablet to look up a Floy® Tag number and find associated biodata and record:
        - LOP shape
        - Floy® tag information (color and tag #s)
        - Apply right operculum punch with proper shape based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.
    - Pass upstream.

Prioritization of species handling at trap and seining activities:

- As a general rule, NOR salmonids take priority over HOR salmonids. If a decision regarding handling priority at the trap is needed due to extenuating circumstances, the weir crew lead will make that determination.
- Seining may cause any fish holding directly below the weir to move downstream. It is important to coordinate with the weir crew lead to determine if seining should occur before or after working the trap box.

Overview of disposition by species and origin:

- Truck for broodstock:
    - NOR Chinook salmon (1 out of 3 per sex up to weekly collection goal)
    - NOR Coho salmon (1 out of 3 per sex may be collected up to weekly collection goal)
    - HOR Coho salmon (may be collected up to weekly broodstock need)
- Remove:
    - HOR Chinook salmon with AD, LV, or AD+LV-clip
    - HOR Chinook salmon with CWT but AD intact
- Pass upstream:
    - NOR Chinook salmon (2 out of 3 per sex)
    - NOR Coho salmon (2 out of 3 per sex while broodstock is being collected). If there are no collection goals in a particular week, all NOR Coho salmon should be passed upstream.
    - HOR Coho salmon in excess of brood needs.
    - All steelhead
    - All Chum salmon (NOTE: the origin of Chum salmon cannot be determined using external characteristics though most should be natural-origin).
    - All Pink salmon
    - All Sockeye salmon
    - All Cutthroat and all other “non-target” species.
- Pass (back) downstream:

- NA (no fish should be passed back downstream at this time)

Data management:

- Fill out a header in the tablet every day the trap is in operation even if no fish were caught.
- Make note of all trap alterations and any missed trapping periods in comment section of each individual day's header in the tablet.
- Every captured salmon and steelhead should have the following biological data recorded:
  - Species
  - Sex (M, F, or J); see species specific details below
  - Mark status (UM/AD)
  - CWT status via CWT status (Tablet field)/Sample Category (Scale card)
- NOTE: any fish that has a physical sample taken (i.e., scale, snout, DNA) must be recorded on a scale card as the scale number/position is how data from TWS & other labs (e.g., snout decodes) are linked.
- Use new scale cards each day.
- Certain biodata should also be handwritten on scale cards in addition to being captured in the tablet. This includes:
  - Date (back of scale card)
  - Position number
  - Fork length
  - Sex
  - Mark
  - Sample category
  - DNA vial # (if collected)
  - Snout ID (SNID) (if snout is collected)
- Clearly distinguish disposition on back of each scale card (i.e. weir wash-up, weir surplus, or fish passed upstream (Lives)) next to sample location or stream reach ID.
- Do NOT put any Floy® tag info or LOP info on scale cards. This will only be captured in the tablet.
- If a fish that should have been punched or tagged gets passed upstream without a punch and/or Floy® tags, it will be recorded in the tablet as "NP".
- Tablet data will be backed up daily to a thumb drive and uploaded weekly (at a minimum) to a shared drive location TBD.

Procedures for Sampling NOR Chinook Salmon Passed Upstream at Weir

- To confirm NOR status, wand UM fish for CWT presence and make sure the left ventral fin is not clipped. Many ventral clips will be partially regenerated, so compare left ventral to the right ventral fin.
- Anesthetize all NOR Chinook salmon prior to sampling/tagging. Take care to not place any AD -clipped Chinook salmon, Coho salmon, or steelhead into the anesthetic bath as

they are then not eligible for human consumption and unavailable for donation to food banks.

- Tag NOR Chinook with two of the proper colored Floy® tags based on weekly tagging schedule; one on each side of the dorsal fin. Record tag color and numbers on tablet form.
- Apply Floy® tags using the following methods:
  Implement the study design by tagging the fish with the appropriate color and numbered Floy® tag. Prepare for tagging by placing tags into semi-automated continuous feed tagging gun with the appropriate needle (Guy et al. 1996). As with all numbered tags, tag should be attached in sequence to allow for ease of data checking. Secure fish on a safe firm flat surface, tagging boot, or in the water. Push needle through the posterior of the dorsal fin rays at a 45-degree angle, so when the fish swims the tag will lay next to the body. The tag needle must be inserted past the pterygiophores of the dorsal fin to ensure high retention (Waldman et al. 1990). The tagging gun is twisted 90 degrees to dislodge the tag from the plastic clip and then removed. Tagged fish can be treated with antibiotics. Complete the data form to link the tag(s) to biological, scale, otolith, tag, spatial, and temporal data. Enumerate the number of successfully marked fish released by mark location and their release location.
- Apply left operculum punch with a shape based on weekly marking schedule (rotate to new punch shape each Sunday).
- Retain the left operculum punch for DNA tissue or collect a punch from the upper lobe of caudal fin if the left operculum punch sample is lost.
- Collect the following biodata from every NOR Chinook (1 in 1 sample rate):
  - 3 scales
  - Fork length (to the nearest cm)
  - Sex (M, F, or J defined as ≤ 56 cm)
  - Mark (UM)
  - DNA sample. Place (DNA) tissue sample on pre-labeled blotter paper. Record DNA sample number on scale card on the tablet.
  - Stock ID (B or T)
    - B (Bright) or T (Tule) under “comments” in the tablet and on scale card in “Carcass Condition/Gill Color/Skin Color” row.
- Allow fish to recover in before release.

Procedures for Sampling HOR Chinook Salmon Removed at Weir

- Dispatch and set aside HOR Chinook salmon to be processed after the trap has been emptied. This prioritizes the processing of natural-origin fish and gets them released upstream more quickly, reducing the stress of being in the trap.
- Wand all marked fish to check for the presence of a coded-wire-tag (CWT).
- Sample rate of 1 in 1 for HOR Chinook salmon. All HOR Chinook salmon removed can be put on the same scale card for any one day. Use a new scale card each day.
- Collect the following data from each HOR Chinook salmon:
  - 3 scales
  - Fork length (to the nearest cm),
  - Sex (M, F, or J defined as ≤ 56 cm)

    - Mark (AD-clip, AD- and LV clip, or LV clip)
    - Sample category
        - Will be blank for Chinook salmon without a CWT.
        - Will be 0 Chinook salmon with a CWT. If a CWT is detected, bar-coded labels are used for snout identification tags.
- If wanding the fish indicates a CWT is present, take the snout and scan the bar-code of the snout label (follow number sequence if possible) using the built-in scanner on the tablet (A2 button). Record the snout identification and sample category on scale card.
- Note disposition of all surplus Chinook salmon by sex (M, F, J) and mark category and record on Form 3. Make sure the numbers on the scale cards for surplus match the number recorded on the Form 3. Provide carcasses to one of the food bank alternatives when possible and have the recipient at the food bank sign on the Form 3 to document the donation, leaving with them the center (yellow) page of the Form 3. If an HOR fish was accidentally placed in the anesthetic bath, or is otherwise unfit for human consumption, it must be used for nutrient enhancement as it is not eligible for human consumption.
- Remove the tail of all carcasses that are used for nutrient enhancement and return the fish to a stream outside of survey area. Typically, nutrient enhancement carcass transportation will be done by weir staff, with occasional help from stream survey staff.

Procedures for NOR Chinook Salmon, NOR Coho Salmon, and HOR Coho Salmon Trucked for Brood

- Randomly collect 1 out of 3 NOR Chinook salmon by sex for broodstock based on collection curve.
- Randomly collect 1 out of 3 NOR Coho salmon by sex for broodstock based on collection curve.
- Randomly collect all HOR Coho salmon for broodstock up to weekly collection goal based on collection curve.
- Collection curves will be provided prior to initiation of weir operations.
- It is OK if the weekly collection goal is exceeded, but cumulative NOR brood collection should not get more than one week ahead; if the cumulative brood collected gets one week ahead, all NOR Chinook will be passed upstream.
- Broodstock collection curves are targets and may be changed with input of hatchery staff and review by management/science staff based on weather events. Collection dates will be dependent on when fish show up.
- All fish collected for broodstock will be sampled later at the hatchery.
- At the time of transport from the weir site, they will only be enumerated by sex and mark. Record this information using the clicker form in the tablet.
- Transport of broodstock is the hatchery staff's responsibility.

Procedures for Sampling Other Salmonids Passed Upstream at Weir

Weir crew lead will determine sampling intensity of these species.

- NOR Coho salmon, all Sockeye salmon, and Pink salmon:

    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Allow to recover before release upstream.
- NOR steelhead:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - The following biodata should be collected from all NOR steelhead (and recorded on both the weir datasheet and scale card):
        - 6 scales
        - Fork length (to the nearest cm)
        - Sex (M, F)
        - Mark (UM)
    - Allow to recover before release upstream.
- HOR Coho salmon, HOR steelhead and all cutthroat:
    - Do NOT use anesthetic.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Pass upstream.
- Chum salmon:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. SAVE PUNCH FOR DNA SAMPLE!
    - Collect 3 scales.
    - The following biodata should be collected and recorded on the tablet:
        - Fork length (to the nearest cm)
        - Sex (M/F)
        - Mark (UM)
        - DNA sample number
        - Any other marks/damage (i.e. mammal marks, net marks, etc.)
    - Allow to recover before release upstream.

Procedures for Trap Mortalities

- Should be kept separate from any intentionally surplused fish.
- Record in tablet as mortality.
- Follow the same protocols as you would for intentionally surplused fish.

- Put any Coho trap mortalities on actual scale cards and record sex, mark, fork length and sample category but do not take scales.

Definition of Weir "Wash-Up"

A weir wash-up is any carcass that washes onto or against the weir, weir structure or live box on the upstream side. It does not include carcasses on the bank or on the river bottom further than 5 feet upstream of the weir, nor the dead fish in the trap.

Procedures for Weir Wash-Ups

- Record all weir wash-ups in the tablet form as dead, being sure to click weir wash-up button, and disposition downstream. Weir wash-up sampling data are captured in the same header as the day's "normal" weir header, but weir wash-ups must go on a separate scale card.
- Examine all fish for any external tags and/or marks (caudal and both opercula). Record any carcass tags, Floy® tags and/or caudal/opercula punch recovery information.
    - If you can examine a fish for tags and/or mark and it has none, record NP (for none present) in tablet form.
    - If you are unable to determine punch shape but can tell one is present, record P.
    - If you are unable to examine a fish for tags and/or mark for whatever reason, record U (for undeterminable) in tablet form.
- <u>For all weir washups</u>, the following guideline should be followed for all species:
    - If fish is a recapture (has a Floy® tag or LOP), do NOT wand for a CWT as it was already wanded as a live fish.
    - If fish is NOT a recapture (NO Floy® tag or caudal punch or LOP), wand for CWT.
    - Be sure to note CWT status in tablet (not wanded, CWT -, or CWT +).
- For Chinook salmon and Chum salmon, the following biodata should be collected and recorded in the tablet form:
    - 3 scales (except no need if deemed a recapture)
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 56 cm)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
            - Fill out spawning ground survey snout label and keep with spawning ground survey snouts.
            - Write weir wash-up in comments of snout label.
    - DNA sample
    - Otoliths (Chum only)
- For Coho salmon and steelhead, the following biodata should be collected and recorded in the tablet form and on actual scale cards:

    - Do NOT take scales
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 46 cm for Coho salmon)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
    - SNID (if CWT+) and follow CWT collection procedures
- For other species of weir wash-ups (not listed above):
    - If fish wands negative for CWT (CWT-) enumerate by species, mark category, and sex in tablet being sure to note as weir wash-up.
- After sampling, remove any Floy® and/or carcass tags, cut tail, and pass downstream of weir**.**

Procedures for CWT Recoveries

- ALWAYS use a cut proof glove when collecting a snout.
- Cut one inch behind the eye when collecting a snout. To avoid false positive CWT detections, wand the removed snout to confirm the presence of the CWT in the collected snout. If the CWT is not detected in the snout, wand the cut head and try to determine if the wire is present there, or if there is an embedded hook or other source of metal causing the beep. Make a final determination on whether a CWT appears to be present (i.e., no other source of the detection beep can be located) and if so, extract and bag the head part that is the source of the detection. If a non-cwt source such as a hook is located, remove the hook or other metallic source and wand again. If negative, discard the snout and record the CWT status as negative for that fish.
- For confirmed CWT positive snouts, use the A2 button on the tablet to scan the bar-coded snout label into the database.
- All CWTs recovered need to be put on a CWT recovery sheet before going into the freezer at the Ridgefield office. Snouts need to be bagged separately by recovery type (weir surplus, weir wash-up, and stream survey) and recorded on separate CWT recovery sheets by recovery type.

Elochoman River (Beaver Creek Hatchery Sill) Weir Sampling Protocols

Hydraulic Project Approval Requirements

The weir shall be operated consistent with all applicable HPA requirements including the following:

- "Organic material that collects on the trap shall be removed and returned to state waters downstream of the project. Man-made trash shall be removed and disposed so that it does not reenter waters of the state."
- "Sediment flushing activities may take place throughout the year during high water events to reduce accumulated sediment in collection boxes. Sediment flushing to take place several times throughout the year during high water events to help reduce the

accumulation of sediments in the collection boxes. Any additional flushing should take place during the normal work window between July 15 and September 15 for the life of the permit."

- "Stop all hydraulic project activities except those needed to control erosion and siltation, if flow conditions arise that will result in erosion or siltation of waters of the state."
- "Within one year of project completion, the banks shall be revegetated with native or other approved woody species as close to the affected area without impeding future construction of projects. Vegetative cuttings shall be planted at a maximum interval of three feet (on center) and maintained as necessary for three years to ensure 80 percent survival."
- "Restore bed and bank elevations and contours to pre-project condition."
- "All trap components, except river gravels, shall be immediately removed from waterward of the ordinary high water line (OHWL) upon project completion."

ESA Requirements

The weir shall be operated consistent with the requirements of all applicable biological opinions or other ESA authorizations. Handle and mortality limits for each listed species will be provided prior to initiating weir operations. Weir operation leads must monitor handle and mortality relative to these limits and notify supervisory staff when the need for an adaptive response is triggered.

General Procedures

Low water/poor recruitment:

- When water levels are low, or recruitment appears to be poor, the following measures will be implemented in coordination with the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead:
    - Monitor fish presence below weir daily by conducting short walking surveys in established index area downstream of weir to assess fish and/or redd presence and record this information in the header information on the tablet.
    - Notify the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead of poor recruitment issues.
    - Seine below weir.
    - Modify weir/holding pen design.
    - Upon approval from the Region 5 weir management lead, open trap and/or submerge resistance board panels to allow some fish to pass unimpeded.

High water:

- High water flows and associated debris can be dangerous and may cause damage to the weir. Safety procedures will continue to be updated in accordance with agency policy and safety requirements. It is important to monitor the weather forecast and Elochoman River flows (Elochoman Flows). If flows are high or begin rising rapidly:
    - Contact the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead.
    - 1st priority is always your safety.
        - If you are concerned about your or your co-worker's safety, stop and contact the weir crew lead for further direction.
        - Operating/cleaning the weir in higher flow conditions generally requires more than one staff person. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
        - Remember to always inspect and wear your PFD (personal floatation device) per WDFW policy!!
    - 2nd priority – fish health.
        - The goal is to avoid/reduce impacts to fish, particularly natural-origin fish, with special attention to ESA-listed fish!
            - Get trap box cleaned out by processing as many fish as possible prior to flows becoming unworkable. Contact the weir crew lead to request assistance and receive further direction if the situation is becoming unmanageable.
            - If flows are close to topping live box, staff may close downstream doors to prevent more fish from recruiting into box.
            - Upon approval of the Region 5 weir management lead, open door(s) on trap box to allow any fish remaining in trap box to swim out.
    - 3rd priority – structure security.
        - Clean the weir! Generally, working in pairs (or more) at higher flows is required for safety. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
        - Stay in close contact with weir crew lead to determine when cleaning weir should be abandoned to allow weir to submerge.
        - Once cleaning the weir is abandoned and weir panels are topped, wait until flows begin to recede and weir crew lead directs cleaning of weir panels to resume fishing ASAP after the high-water event.

Water Temperature:

- It is critical to monitor water temperatures while handling fish in the trap when the weather is warm. WDFW will utilize a tiered approach to water temperature management at the weir.
    - If the water temperature is less than 18 C, the weir will operate under the standard protocol.
    - If temperatures are greater than 18 C but less than 21 C, a modified operational protocol will be implemented. The modified protocols will include but not be limited to:

        - Electrofishing will not be utilized.
        - Water temperature will be monitored continuously in sampling vessels.
        - Water will be changed frequently in sampling vessels to ensure water temperatures do not exceed 21 C.
    - If water temperatures are greater than 21 C, standard and modified protocols will be suspended. Depending on the situation, WDFW will consider a variety of options including submerging weir panels, opening trap boxes, or closing trap boxes. In the event of a prolonged stretch of elevated water temperatures, staff may shift their schedule to process fish in the cooler early morning hours.

Fish recruitment and large fish numbers in the trap box:

- When fish are moving, let them move. If fish are actively recruiting to the trap box, do NOT get in the trap box to start working fish. Wait until trap box is full or fish recruitment slows to begin working fish.
- Contact the weir crew lead to request assistance and receive further direction if the number of fish in the trap box is becoming unmanageable.
- Generally, the density of fish in the trap box is self-regulating. Fish will generally discontinue entering the trap box once it is full. However, if the trap box appears overcrowded or you begin to see trap mortalities, the number of fish in the trap box will need to be reduced.
    - If this occurs at the beginning of the daily shift or while working fish, close the entrance to the trap box until fish numbers can be thinned by regular processing.
    - If this occurs at a trap check late in the day or after the trap has already been worked for the day, additional effort may be needed to reduce fish numbers in the trap box. In this situation, contact the weir crew lead to request assistance and receive further direction and begin to surplus LV and/or AD-clipped Chinook to reduce crowding until the trap can safely be left until the next morning. Surplused fish can be stockpiled for sampling the following day.

Identifying the origin of salmon and steelhead:

- Accurately identifying the origin (natural or hatchery) of salmon and steelhead captured at the weir is critically important to implementation of the protocol.
- The origin of Chinook salmon, Coho salmon, and steelhead can only be determined via the combination of their adipose fin clip status and CWT status.
- Therefore, all adult Chinook salmon, Coho salmon, and steelhead must be examined for all fin clips and scanned for CWTs regardless of adipose fin clip status.
- A fish should be deemed a hatchery-origin return (HOR) if it has either:
    - Adipose (AD) fin clip and no CWT (CWT-); or
    - Adipose (AD) fin clip and a CWT (CWT+); or

    - An intact adipose fin (UM) and a CWT (CWT+); or
    - Any left ventral (LV) fin clip (regardless of AD or CWT status).
- A fish should be deemed a natural-origin return (NOR) if it has:
    - An intact adipose fin (UM) no CWT (CWT-), and no left ventral (LV) fin clip.

Identifying whether a live salmon or steelhead is maiden or recapture:

- This section is most applicable to watersheds with two weirs but it is still applicable to all locations.
- Maiden: any fish with no left or right operculum punch (LOP/ROP) or Floy® tags.
    - Follow protocols as described for species/origin encountered.
- Recapture: any fish with a left or right operculum punch (LOP/ROP) or Floy® tags.
    - Use the recapture function in the tablet to look up a Floy® Tag number and find associated biodata and record:
        - LOP or ROP shape
        - Floy® tag information (color and tag #s)
        - Apply right operculum punch with proper shape based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.
    - Pass upstream.

Prioritization of species handling at trap and seining activities:

- As a general rule, NOR salmonids take priority over HOR salmonids. If a decision regarding handling priority at the trap is needed due to extenuating circumstances, the weir crew lead will make that determination.
- Seining may cause any fish holding directly below the weir to move downstream. It is important to coordinate with the weir crew lead to determine if seining should occur before or after working the trap box.

Overview of disposition by species and origin:

- Trucked for broodstock:
    - NOR Coho salmon (1 out of 3 per sex may be collected up to weekly collection goal)
    - HOR Coho salmon (may be collected up to weekly broodstock need)
    - HOR steelhead up to broodstock collection goal
    - NOR Chinook salmon may be collected at this location if needed.
- Remove:
    - HOR Chinook salmon with AD, LV, or AD+LV-clip
    - HOR Chinook salmon with CWT but AD intact
    - HOR Coho salmon (AD, AD and CWT+, CWT+)
- Pass upstream:
    - All NOR Chinook salmon in excess of weekly broodstock needs will be passed upstream.
    - NOR Coho salmon (2 out of 3 per sex) until season total broodstock goals are met, then all NOR Coho will be passed upstream.

    - All Chum salmon (NOTE: the origin of Chum salmon cannot be determined using external characteristics though most should be natural-origin).
    - NOR steelhead
    - HOR steelhead in excess of brood needs
    - All Pink salmon
    - All Sockeye salmon
    - All Cutthroat and all other "non-target" species.
- Pass (back) downstream:
    - NA (no fish should be passed back downstream at this time).

Data management:

- Fill out a header in the tablet every day the trap is in operation even if no fish were caught.
- Make note of all trap alterations and any missed trapping periods in comment section of each individual day's header in the tablet.
- Every captured salmon and steelhead should have the following biological data recorded:
    - Species
    - Sex (M, F, or J); see species specific details below
    - Mark status (UM/AD)
    - CWT status via CWT status (Tablet field)/Sample Category (Scale card)
- NOTE: any fish that has a physical sample taken (i.e., scale, snout, DNA) must be recorded on a scale card as the scale number/position is how data from TWS & other labs (e.g., snout decodes) are linked.
- Use new scale cards each day.
- Certain biodata should also be handwritten on scale cards in addition to being captured in the tablet. This includes:
    - Date (back of scale card)
    - Position number
    - Fork length
    - Sex
    - Mark
    - Sample category
    - DNA vial # (if collected)
    - Snout ID (SNID) (if snout is collected)
- Clearly distinguish disposition on back of each scale card (i.e. weir wash-up, weir surplus, or fish passed upstream (Lives)) next to sample location or stream reach ID.
- Do NOT put any Floy® tag info or LOP info on scale cards. This will only be captured in the tablet.
- If a fish that should have been punched or tagged gets passed upstream without a punch and/or Floy® tags, it will be recorded in the tablet as "NP".
- Tablet data will be backed up daily to a thumb drive and uploaded weekly (at a minimum) to a shared drive location TBD.

Procedures for Sampling NOR Chinook Salmon Passed Upstream at Weir

- To confirm NOR status, wand UM fish for CWT presence and make sure the left ventral fin is not clipped. Many ventral clips will be partially regenerated, so compare left ventral to the right ventral fin.
- Anesthetize all NOR Chinook salmon prior to sampling/tagging. Take care to not place any AD -clipped Chinook salmon, Coho salmon, or steelhead into the anesthetic bath as they are then not eligible for human consumption and unavailable for donation to food banks.
- Apply right operculum punch with a shape based on weekly marking schedule (rotate to new punch shape each Sunday).
- Retain the right operculum punch for DNA tissue or collect a punch from the upper lobe of caudal fin if the right operculum punch sample is lost.
- The following biodata should be collected from maiden (fish does not have Floy® tags or a LOP present) NOR Chinook (and should be recorded on <u>both the scale card and in the tablet</u>):
    - 3 scales
    - Fork length (to the nearest cm)
    - Sex (M, F, or J defined as ≤ 56 cm)
    - Mark (UM)
    - DNA sample. Record DNA sample number on scale card on the tablet.
    - Stock ID (B or T)
        - B (Bright) or T (Tule) under "comments" in the tablet and on scale card in "Carcass Condition/Gill Color/Skin Color" row.
- Allow fish to recover before release.

Procedures for Sampling HOR Chinook Salmon Removed at Weir

- Dispatch and set aside HOR Chinook salmon to be processed after the trap has been emptied. This prioritizes the processing of natural-origin fish and gets them released upstream more quickly, reducing the stress of being in the trap.
- Wand all marked fish to check for the presence of a coded-wire-tag (CWT).
- Sample rate of 1 in 1 for HOR Chinook salmon. All HOR Chinook salmon removed can be put on the same scale card for any one day. Use a new scale card each day.
- Collect the following data from each HOR Chinook salmon:
    - 3 scales,
    - Fork length (to the nearest cm)
    - Sex (M, F, or J defined as ≤ 56 cm)
    - Mark (AD-clip, AD- and LV clip, or LV clip)
    - Sample category
        - Will be blank for Chinook salmon without a CWT.
        - Will be 0 Chinook salmon with a CWT. If a CWT is detected, bar-coded labels are used for snout identification tags.

- If wanding the fish indicates a CWT is present, take the snout and scan the bar-code of the snout label (follow number sequence if possible) using the built-in scanner on the tablet (A2 button). Record the snout identification and sample category on scale card.
- Note disposition of all surplus Chinook salmon by sex (M, F, J) and mark category and record on Form 3. Make sure the numbers on the scale cards for surplus match the number recorded on the Form 3. Provide carcasses to one of the food bank alternatives when possible and have the recipient at the food bank sign on the Form 3 to document the donation, leaving with them the center (yellow) page of the Form 3. If an HOR fish was accidentally placed in the anesthetic bath, or is otherwise unfit for human consumption, it must be used for nutrient enhancement as it is not eligible for human consumption.
- Remove the tail of all carcasses that are used for nutrient enhancement and return the fish to a stream outside of survey area. Typically, nutrient enhancement carcass transportation will be done by weir staff, with occasional help from stream survey staff.

Procedures for NOR Coho salmon, HOR Coho Salmon, and HOR Steelhead Trucked for Brood

- Randomly collect 1 out of 3 NOR Coho salmon by sex for broodstock based on collection curve.
- Randomly collect all HOR Coho salmon for broodstock up to weekly collection goal based on collection curve.
- Randomly collect all HOR steelhead for broodstock up to weekly collection goal based on collection curve.
- Collection curves will be provided prior to initiation of weir operations.
- It is OK if the weekly collection goal is exceeded, but cumulative NOR brood collection should not get more than one week ahead; if the cumulative brood collected gets one week ahead, all NOR Chinook will be passed upstream.
- Broodstock collection curves are targets and may be changed with input of hatchery staff and review by management/science staff based on weather events. Collection dates will be dependent on when fish show up.
- All fish collected for broodstock will be sampled later at the hatchery.
- At the time of transport from the weir site, they will only be enumerated by sex and mark. Record this information using the clicker form in the tablet.
- Transport of broodstock is the hatchery staff's responsibility.
- Once the water gets too high to sort at the weir, all fish will be trucked to the Beaver Creek Hatchery and sorted there. Keep trucked fish separate from broodstock pond and swim in pond fish. Tagged NOR Coho will be put back into hatchery tanker truck and released at the Beaver Creek Rd bridge. A chute may be needed if water is too shallow.

Procedures for NOR Coho Passed Upstream at Weir

- To confirm NOR status, wand UM fish for CWT presence and make sure the left ventral fin is not clipped. Many ventral clips will be partially regenerated, so compare left ventral to the right ventral fin.

- Anesthetize all NOR Coho salmon prior to sampling/tagging. Take care to not place any AD -clipped Chinook salmon, Coho salmon, or steelhead into the anesthetic bath as they are then not eligible for human consumption and unavailable for donation to food banks.
- Tag NOR Coho with two of the proper colored Floy® tags with two fluorescent green Floy® tags; one on each side of the dorsal fin. Record tag color and numbers on tablet form. We will use the same color Floy® tags all season for Coho.
- Apply Floy® tags using the following methods:
  Implement the study design by tagging the fish with the appropriate color and numbered Floy® tag. Prepare for tagging by placing tags into semi-automated continuous feed tagging gun with the appropriate needle (Guy et al. 1996). As with all numbered tags, tag should be attached in sequence to allow for ease of data checking. Secure fish on a safe firm flat surface, tagging boot, or in the water. Push needle through the posterior of the dorsal fin rays at a 45-degree angle, so when the fish swims the tag will lay next to the body. The tag needle must be inserted past the pterygiophores of the dorsal fin to ensure high retention (Waldman et al. 1990). The tagging gun is twisted 90 degrees to dislodge the tag from the plastic clip and then removed. Tagged fish can be treated with antibiotics. Complete the data form to link the tag(s) to biological, scale, otolith, tag, spatial, and temporal data. Enumerate the number of successfully marked fish released by mark location and their release location.
- Apply right operculum punch with a shape based on weekly marking schedule (rotate to new punch shape each Sunday). Punch schedule is the same rotation as Chinook.
- Collect the following biodata from every NOR Coho (1 in 1 sample rate):
  - No scales or DNA
  - Fork length (to the nearest cm)
  - Sex (M, F, or J defined as ≤ 46cm)
  - Mark (UM)
- Allow fish to recover in before release.

Procedures for Sampling HOR Coho Salmon Removed at Weir

- All HORs at the weir will either be collected for brood or removed for pHOS control.
- We will start off taking HORs at the weir for broodstock based on the collection curve. They will be trucked to the hatchery and put in the holding pond until the assigned broodstock collection days. Once the hatchery staff have determined that the broodstock goal has been achieved, the additional fish will be managed as surplus.
- All surplus HOR Coho will be sampled as follows:
  - Wand all fish for CWT presence.
  - All wand negative Coho will be enumerated by sex and mark in the tablet.
  - If Coho wands +, take snout and scan barcode snout label, drop label in bag and tie bag appropriately.
  - The following data should be collected from CWT + Coho and recorded in the tablet and on scale card:
    - No scales
    - Fork length
    - Sex (M, F, or J defined as ≤ 46cm)

        - Mark
        - Sample category
            - Will be blank for Coho without a CWT.
            - Will be SC 1 if CWT+. If wand pos (+), scan barcode or write down number.
    - Snouts from one day, one location, one species**,** need to be bagged in a single large bag with a big bag label attached with the following information:
        - The big bag label number is recorded for that day in the tablet located on the top right of the event header page for that day's event or sampling.
        - Number examined for marks/CWT by sex.
        - Bagged snouts will be stored at Beaver Creek Hatchery freezer or Beaver Creek Field Office.
- Coordinate with food banks to donate as many fish as possible. On days when the food bank is unavailable, nutrient enhance surplus carcasses. Cut off tails on all nutrient enhanced carcasses and return to stream outside of survey area (Bridge at WF Elochoman).
- Record disposition of all surplus Coho by M/F/J and mark category on Form 3s. Make sure numbers of surplus Coho recorded on the datasheet matches what is recorded on Form 3s.

Procedures for Sampling Other Salmonids Passed Upstream at Weir

Weir crew lead will determine sampling intensity of these species.

- All Sockeye salmon, and Pink salmon:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch right operculum with proper shape punch based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Allow to recover before release upstream.
- NOR steelhead:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch right operculum with proper shape punch based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.
    - The following biodata should be collected from all NOR steelhead (and recorded on both the weir datasheet and scale card):
        - 6 scales
        - Fork length (to the nearest cm)
        - Sex (M, F)
        - Mark (UM)
    - Allow to recover before release upstream.
- HOR steelhead and all cutthroat:
    - Do NOT use anesthetic.

    - Punch right operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Pass upstream.
- Chum salmon:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch right operculum with proper shape punch based on weekly marking schedule. SAVE PUNCH FOR DNA SAMPLE!
    - Collect 3 scales.
    - The following biodata should be collected and recorded on the tablet:
        - Fork length (to the nearest cm)
        - Sex (M/F)
        - Mark (UM)
        - DNA sample number
        - Any other marks/damage (i.e. mammal marks, net marks, etc.)
    - Allow to recover before release upstream.

Procedures for Trap Mortalities

- Should be kept separate from any intentionally surplused fish.
- Record in tablet as mortality.
- Follow the same protocols as you would for intentionally surplused fish.
- Put any Coho trap mortalities on actual scale cards and record sex, mark, fork length and sample category. Do not take scales.

Definition of "Weir Wash-Up"

A weir-wash-up is any carcass that washes onto or against the sill, sill structure or live box. It does not include carcasses on the bank or on the river bottom just upstream or downstream of the weir; these carcasses will be sampled and counted during stream surveys.

Procedures for Weir Wash-Ups

- Record all weir wash-ups in the tablet form as dead, being sure to click weir wash-up button, and disposition downstream. Weir wash-up sampling data are captured in the same header as the day's "normal" weir header, but weir wash-ups must go on a separate scale card.
- Examine all fish for any external tags and/or marks (caudal and both opercula). Record any carcass tags, Floy® tags and/or caudal/opercula punch recovery information.
    - If you can examine a fish for tags and/or mark and it has none, record NP (for none present) in tablet form.
    - If you are unable to determine punch shape but can tell one is present, record P.
    - If you are unable to examine a fish for tags and/or mark for whatever reason, record U (for undeterminable) in tablet form.
- <u>For all weir washups</u>, the following guideline should be followed for all species:

- If fish is a recapture (has a Floy® tag or LOP), do NOT wand for a CWT as it was already wanded as a live fish.
- If fish is NOT a recapture (NO Floy® tag or caudal punch or LOP), wand for CWT.
- Be sure to note CWT status in tablet (not wanded, CWT -, or CWT +).

- For Chinook salmon and Chum salmon, the following biodata should be collected and recorded in the tablet form:
  - 3 scales
  - Fork length (to the nearest cm)
  - Sex (M, F, J defined as ≤ 56 cm)
  - Mark (AD, UM, or LV)
  - Presence or absence of any tags/marks (as mentioned above)
  - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
  - Sample category
    - Blank without a CWT
    - 0 with a CWT
      - Fill out spawning ground survey snout label and keep with spawning ground survey snouts.
      - Write weir wash-up in comments of snout label.
  - DNA sample
  - Otoliths (Chum salmon only)
- For Coho salmon and steelhead, the following biodata should be collected and recorded in the tablet form and on actual scale cards:
  - Do NOT take scales
  - Fork length (to the nearest cm)
  - Sex (M, F, J defined as ≤ 56 cm)
  - Mark (AD, UM, or LV)
  - Presence or absence of any tags/marks (as mentioned above)
  - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
  - Sample category
    - Blank without a CWT
    - 0 with a CWT
  - SNID (if CWT+) and follow CWT collection procedures
- For other species of weir wash-ups (not listed above):
  - If fish wands negative for CWT (CWT-) enumerate by species, mark category, and sex in tablet being sure to note as weir wash-up.
- After sampling, remove any Floy® and/or carcass tags, <u>cut tail,</u> and pass downstream of weir**.**

Procedures for CWT Recoveries

- ALWAYS use a cut proof glove when collecting a snout.
- Cut one inch behind the eye when collecting a snout. To avoid false positive CWT detections, wand the removed snout to confirm the presence of the CWT in the collected snout. If the CWT is not detected in the snout, wand the cut head and try to

determine if the wire is present there, or if there is an embedded hook or other source of metal causing the beep. Make a final determination on whether a CWT appears to be present (i.e., no other source of the detection beep can be located) and if so, extract and bag the head part that is the source of the detection. If a non-cwt source such as a hook is located, remove the hook or other metallic source and wand again. If negative, discard the snout and record the CWT status as negative for that fish.

- For confirmed CWT positive snouts, use the A2 button on the tablet to scan the bar-coded snout label into the database.
- All CWTs recovered need to be put on a CWT recovery sheet before going into the freezer at the Ridgefield office. Snouts need to be bagged separately by recovery type (weir surplus, weir wash-up, and stream survey) and recorded on separate CWT recovery sheets by recovery type.

Germany Creek Weir Sampling Protocols

Hydraulic Project Approval Requirements

Initial implementation of the Germany Creek weir is planned to occur in 2025. WDFW will be seeking to secure a HPA and anticipates that the requirements will be similar to other weirs. However, revisions to this section may be necessary to incorporate any modifications to the requirements previously identified for other weirs and summarized below.

The weir shall be operated consistent with all applicable HPA requirements including the following:

- "Organic material that collects on the trap shall be removed and returned to state waters downstream of the project. Man-made trash shall be removed and disposed so that it does not reenter waters of the state."
- "Sediment flushing activities may take place throughout the year during high water events to reduce accumulated sediment in collection boxes. Sediment flushing to take place several times throughout the year during high water events to help reduce the accumulation of sediments in the collection boxes. Any additional flushing should take place during the normal work window between July 15 and September 15 for the life of the permit."
- "Stop all hydraulic project activities except those needed to control erosion and siltation, if flow conditions arise that will result in erosion or siltation of waters of the state."
- "Within one year of project completion, the banks shall be revegetated with native or other approved woody species as close to the affected area without impeding future construction of projects. Vegetative cuttings shall be planted at a maximum interval of three feet (on center) and maintained as necessary for three years to ensure 80 percent survival."
- "Restore bed and bank elevations and contours to pre-project condition."
- "All trap components, except river gravels, shall be immediately removed from waterward of the ordinary high water line (OHWL) upon project completion."

ESA Requirements

The weir shall be operated consistent with the requirements of all applicable biological opinions or other ESA authorizations. Handle and mortality limits for each listed species will be provided prior to initiating weir operations. Weir operation leads must monitor handle and mortality relative to these limits and notify supervisory staff when the need for an adaptive response is triggered.

General Procedures

Low water/poor recruitment:

- When water levels are low, or recruitment appears to be poor, the following measures will be implemented in coordination with the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead:
    - Monitor fish presence below weir daily by conducting short walking surveys in established index area downstream of weir to assess fish and/or redd presence and record this information in the header information on the tablet.
    - Notify the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead of poor recruitment issues.
    - Seine below weir.
    - Modify weir/holding pen design.
    - Upon approval from the Region 5 weir management lead, open trap and/or submerge resistance board panels to allow some fish to pass unimpeded.

High water:

- High water flows and associated debris can be dangerous and may cause damage to the weir. Safety procedures will continue to be updated in accordance with agency policy and safety requirements. It is important to monitor flows and the weather forecast. There are no stream flow gauges operating on Germany Creek currently; the best surrogate will be the Elochoman River (Elochoman Flows). If flows are high or begin rising rapidly:
    - Contact the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead.
    - 1st priority is always your safety.
        - If you are concerned about your or your co-worker's safety, stop and contact the weir crew lead for further direction.
        - Operating/cleaning the weir in higher flow conditions generally requires more than one staff person. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
        - Remember to always inspect and wear your PFD (personal floatation device) per WDFW policy!!
    - 2nd priority – fish health.
        - The goal is to avoid/reduce impacts to fish, particularly natural-origin fish, with special attention to ESA-listed fish!
            - Get trap box cleaned out by processing as many fish as possible prior to flows becoming unworkable. Contact the weir crew lead to request

assistance and receive further direction if the situation is becoming unmanageable.
        - If flows are close to topping live box, staff may close downstream doors to prevent more fish from recruiting into box.
        - Upon approval of the Region 5 weir management lead, open door(s) on trap box to allow any fish remaining in trap box to swim out.
    - 3rd priority – structure security.
        - Clean the weir! Generally, working in pairs (or more) at higher flows is required for safety. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
        - Stay in close contact with weir crew lead to determine when cleaning weir should be abandoned to allow weir to submerge.
        - Once cleaning the weir is abandoned and weir panels are topped, wait until flows begin to recede and weir crew lead directs cleaning of weir panels to resume fishing ASAP after the high-water event.

Water temperature:

- It is critical to monitor water temperatures while handling fish in the trap when the weather is warm. WDFW will utilize a tiered approach to water temperature management at the weir.
    - If the water temperature is less than 18 C, the weir will operate under the standard protocol.
    - If temperatures are greater than 18 C but less than 21 C, a modified operational protocol will be implemented. The modified protocols will include but not be limited to:
        - Electrofishing will not be utilized.
        - Water temperature will be monitored continuously in sampling vessels.
        - Water will be changed frequently in sampling vessels to ensure water temperatures do not exceed 21 C.
    - If water temperatures are greater than 21 C, standard and modified protocols will be suspended. Depending on the situation, WDFW will consider a variety of options including submerging weir panels, opening trap boxes, or closing trap boxes. In the event of a prolonged stretch of elevated water temperatures, staff may shift their schedule to process fish in the cooler early morning hours.

Fish recruitment and large fish numbers in the trap box:

- When fish are moving, let them move. If fish are actively recruiting to the trap box, do NOT get in the trap box to start working fish. Wait until trap box is full or fish recruitment slows to begin working fish.
- Contact the weir crew lead to request assistance and receive further direction if the number of fish in the trap box is becoming unmanageable.

- Generally, the density of fish in the trap box is self-regulating. Fish will generally discontinue entering the trap box once it is full. However, if the trap box appears overcrowded or you begin to see trap mortalities, the number of fish in the trap box will need to be reduced.
    - If this occurs at the beginning of the daily shift or while working fish, close the entrance to the trap box until fish numbers can be thinned by regular processing.
    - If this occurs at a trap check late in the day or after the trap has already been worked for the day, additional effort may be needed to reduce fish numbers in the trap box. In this situation, contact the weir crew lead to request assistance and receive further direction and begin to surplus LV and/or AD-clipped Chinook to reduce crowding until the trap can safely be left until the next morning. Surplused fish can be stockpiled for sampling the following day.

Identifying the origin of salmon and steelhead:

- Accurately identifying the origin (natural or hatchery) of salmon and steelhead captured at the weir is critically important to implementation of the protocol.
- The origin of Chinook salmon, Coho salmon, and steelhead can only be determined via the combination of their adipose fin clip status and CWT status.
- Therefore, all adult Chinook salmon, Coho salmon, and steelhead must be examined for all fin clips and scanned for CWTs regardless of adipose fin clip status.
- A fish should be deemed a hatchery-origin return (HOR) if it has either:
    - Adipose (AD) fin clip and no CWT (CWT-); or
    - Adipose (AD) fin clip and a CWT (CWT+); or
    - An intact adipose fin (UM) and a CWT (CWT+); or
    - Any left ventral (LV) fin clip (regardless of AD or CWT status).
- A fish should be deemed a natural-origin return (NOR) if it has:
    - An intact adipose fin (UM) no CWT (CWT-), and no left ventral (LV) fin clip.

Identifying whether a live salmon or steelhead is maiden or recapture:

- This section is most applicable to watersheds with two weirs but it is still applicable to all locations.
- Maiden: any fish with no left operculum punch (LOP) or Floy® tags.
    - Follow protocols as described for species/origin encountered.
- Recapture: any fish with a left operculum punch (LOP) or Floy® tags.
    - Use the recapture function in the tablet to look up a Floy® Tag number and find associated biodata and record:
        - LOP shape
        - Floy® tag information (color and tag #s)
        - Apply right operculum punch with proper shape based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.

- Pass upstream.

Prioritization of species handling at trap and seining activities:

- As a general rule, NOR salmonids take priority over HOR salmonids. If a decision regarding handling priority at the trap is needed due to extenuating circumstances, the weir crew lead will make that determination.
- Seining may cause any fish holding directly below the weir to move downstream. It is important to coordinate with the weir crew lead to determine if seining should occur before or after working the trap box.

Overview of disposition by species and origin:

- Remove:
  - HOR Chinook salmon with AD, LV, or AD+LV-clip
  - HOR Chinook salmon with CWT but AD intact
  - HOR Coho salmon
- Pass upstream:
  - NOR Chinook salmon
  - NOR Coho salmon
  - All Chum salmon (NOTE: the origin of Chum salmon cannot be determined using external characteristics though most should be natural-origin)
  - All steelhead
  - All Pink salmon
  - All Sockeye salmon
  - All Cutthroat and all other "non-target" species.
- Pass (back) downstream:
  - NA (no fish should be passed back downstream at this time)

Data management:

- Fill out a header in the tablet every day the trap is in operation even if no fish were caught.
- Make note of all trap alterations and any missed trapping periods in comment section of each individual day's header in the tablet.
- Every captured salmon and steelhead should have the following biological data recorded:
  - Species
  - Sex (M, F, or J); see species specific details below
  - Mark status (UM/AD)
  - CWT status via CWT status (Tablet field)/Sample Category (Scale card)
- NOTE: any fish that has a physical sample taken (i.e., scale, snout, DNA) must be recorded on a scale card as the scale number/position is how data from TWS & other labs (e.g., snout decodes) are linked.
- Use new scale cards each day.

- Certain biodata should also be handwritten on scale cards in addition to being captured in the tablet. This includes:
    - Date (back of scale card)
    - Position number
    - Fork length
    - Sex
    - Mark
    - Sample category
    - DNA vial # (if collected)
    - Snout ID (SNID) (if snout is collected)
- Clearly distinguish disposition on back of each scale card (i.e. weir wash-up, weir surplus, or fish passed upstream (Lives)) next to sample location or stream reach ID.
- Do NOT put any Floy® tag info or LOP info on scale cards. This will only be captured in the tablet.
- If a fish that should have been punched or tagged gets passed upstream without a punch and/or Floy® tags, it will be recorded in the tablet as "NP".
- Tablet data will be backed up daily to a thumb drive and uploaded weekly (at a minimum) to a shared drive location TBD.

Procedures for Sampling NOR Chinook Salmon Passed Upstream at Weir

- To confirm NOR status, wand UM fish for CWT presence and make sure the left ventral fin is not clipped. Many ventral clips will be partially regenerated, so compare left ventral to the right ventral fin.
- Anesthetize all NOR Chinook salmon prior to sampling/tagging. Take care to not place any AD -clipped Chinook salmon, Coho salmon, or steelhead into the anesthetic bath as they are then not eligible for human consumption and unavailable for donation to food banks.
- Tag NOR Chinook with two of the proper colored Floy® tags based on weekly tagging schedule; one on each side of the dorsal fin. Record tag color and numbers on tablet form.
- Apply Floy® tags using the following methods:
  Implement the study design by tagging the fish with the appropriate color and numbered Floy® tag. Prepare for tagging by placing tags into semi-automated continuous feed tagging gun with the appropriate needle (Guy et al. 1996). As with all numbered tags, tag should be attached in sequence to allow for ease of data checking. Secure fish on a safe firm flat surface, tagging boot, or in the water. Push needle through the posterior of the dorsal fin rays at a 45-degree angle, so when the fish swims the tag will lay next to the body. The tag needle must be inserted past the pterygiophores of the dorsal fin to ensure high retention (Waldman et al. 1990). The tagging gun is twisted 90 degrees to dislodge the tag from the plastic clip and then removed. Tagged fish can be treated with antibiotics. Complete the data form to link the tag(s) to biological, scale, otolith, tag, spatial, and temporal data. Enumerate the number of successfully marked fish released by mark location and their release location.
- Apply left operculum punch with a shape based on weekly marking schedule (rotate to new punch shape each Sunday).

- Retain the left operculum punch for DNA tissue or collect a punch from the upper lobe of caudal fin if the left operculum punch sample is lost.
- Collect the following biodata from every NOR Chinook (1 in 1 sample rate):
    - 3 scales
    - Fork length (to the nearest cm)
    - Sex (M, F, or J defined as ≤ 56 cm)
    - Mark (UM)
    - DNA sample. Place (DNA) tissue sample on pre-labeled blotter paper. Record DNA sample number on scale card on the tablet.
- Allow fish to recover before release.

Procedures for Sampling HOR Chinook Salmon Removed at Weir

- Dispatch and set aside HOR Chinook salmon to be processed after the trap has been emptied. This prioritizes the processing of natural-origin fish and gets them released upstream more quickly, reducing the stress of being in the trap.
- Wand all marked fish to check for the presence of a coded-wire-tag (CWT).
- Sample rate of 1 in 1 for HOR Chinook salmon. All HOR Chinook salmon removed can be put on the same scale card for any one day. Use a new scale card each day.
- Collect the following data from each HOR Chinook salmon:
    - 3 scales,
    - Fork length (to the nearest cm),
    - Sex (M, F, or J),
    - Mark (AD-clip, AD- and LV clip, or LV clip), and
    - Sample category
        - Will be blank for Chinook salmon without a CWT.
        - Will be 0 Chinook salmon with a CWT. If a CWT is detected, bar-coded labels are used for snout identification tags.
- If wanding the fish indicates a CWT is present, take the snout and scan the bar-code of the snout label (follow number sequence if possible) using the built-in scanner on the tablet (A2 button). Record the snout identification and sample category on scale card.
- Note disposition of all surplus Chinook salmon by sex (M, F, J) and mark category and record on Form 3. Make sure the numbers on the scale cards for surplus match the number recorded on the Form 3. Provide carcasses to one of the food bank alternatives when possible and have the recipient at the food bank sign on the Form 3 to document the donation, leaving with them the center (yellow) page of the Form 3. If an HOR fish was accidentally placed in the anesthetic bath, or is otherwise unfit for human consumption, it must be used for nutrient enhancement as it is not eligible for human consumption.
- Remove the tail of all carcasses that are used for nutrient enhancement and return the fish to a stream outside of survey area. Typically, nutrient enhancement carcass transportation will be done by weir staff, with occasional help from stream survey staff.

Procedures for Sampling HOR Coho Salmon Removed at the Weir

- Each surplus Coho removed will be recorded in the tablet. They do not need to go on a scale card unless wand CWT+. No scales for CWT – Coho.
- If Coho wands +, take snout and scan the bar code label into the tablet (see CWT recoveries section).
- The following data should be collected from CWT + Coho and recorded both in the tablet and on a scale card:
    - Fork length
    - Sex (M, F, or J defined as ≤ 46cm)
    - Mark
    - Record SNID (via scanner).
    - Sample category (1)
- Provide surplused Coho to local food banks when possible. As described above for Chinook, have the recipient at the food bank sign on the Form 3 to document the donation, and leave them with the center (yellow) page of the Form 3.
- If food bank options are not available, surplus carcasses can go to nutrient enhancement. Cut off tails on all nutrient enhanced carcasses and return to stream outside of the survey area. Coordinate nutrient enhancement with WDFW regional staff.
- Record disposition of all surplus Coho by M/F/J and mark category on Form 3s. Make sure numbers of surplus Coho recorded on the datasheet matches what is recorded on Form 3s.

Procedures for Sampling Other Salmonids Passed Upstream at Weir

Weir crew lead will determine sampling intensity of these species.

- NOR Coho salmon, all Sockeye salmon, and Pink salmon:
    - These fish can be anesthetized prior to sampling if needed.
    - Wand for PIT tag.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Allow to recover before release upstream.
- NOR steelhead:
    - These fish can be anesthetized prior to sampling if needed.
    - Wand for PIT tag.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - The following biodata should be collected from all NOR steelhead (and recorded on both the weir datasheet and scale card):
        - 6 scales
        - Fork length (to the nearest cm)
        - Sex (M, F)
        - Mark (UM)
    - Allow to recover before release upstream.
- HOR steelhead and all cutthroat:
    - Do NOT use anesthetic.

    - Wand for PIT tag.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Pass upstream.
- Chum salmon:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. SAVE PUNCH FOR DNA SAMPLE!
    - Collect 3 scales.
    - The following biodata should be collected and recorded on the tablet:
        - Fork length (to the nearest cm)
        - Sex (M/F)
        - Mark (UM)
        - DNA sample number
        - Any other marks/damage (i.e. mammal marks, net marks, etc.)
    - Allow to recover before release upstream.

Procedures for Trap Mortalities

- Should be kept separate from any intentionally surplused fish.
- Record in tablet as mortality.
- Follow the same protocols as you would for intentionally surplused fish.
- Put any Coho trap mortalities on actual scale cards and record sex, mark, fork length and sample category but do not take scales.

Definition of Weir "Wash-Up"

A weir wash-up is any carcass that washes onto or against the weir, weir structure or live box on the upstream side. It does not include carcasses on the bank or on the river bottom further than 5 feet upstream of the weir, nor the dead fish in the trap.

Procedures for Weir Wash-Ups

- Record all weir wash-ups in the tablet form as dead, being sure to click weir wash-up button, and disposition downstream. Weir wash-up sampling data are captured in the same header as the day's "normal" weir header, but weir wash-ups must go on a separate scale card.
- Examine all fish for any external tags and/or marks (caudal and both opercula). Record any carcass tags, Floy® tags and/or caudal/opercula punch recovery information.
    - If you can examine a fish for tags and/or mark and it has none, record NP (for none present) in tablet form.
    - If you are unable to determine punch shape but can tell one is present, record P.
    - If you are unable to examine a fish for tags and/or mark for whatever reason, record U (for undeterminable) in tablet form.

- For all weir washups, the following guideline should be followed for all species:
    - If fish is a recapture (has a Floy® tag or LOP), do NOT wand for a CWT or PIT tag as it was already wanded as a live fish.
    - If fish is NOT a recapture (NO Floy® tag or caudal punch or LOP), wand for CWT and PIT tag (for NOR Coho, NOR steelhead, and NOR Cutthroat).
    - Be sure to note CWT status in tablet (not wanded, CWT -, or CWT +).
- For Chinook salmon and Chum salmon, the following biodata should be collected and recorded in the tablet form:
    - 3 scales (except no need if deemed a recapture)
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 56 cm)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
            - Fill out spawning ground survey snout label and keep with spawning ground survey snouts.
            - Write weir wash-up in comments of snout label.
    - DNA sample
    - Otoliths (Chum salmon only)
- For Coho salmon and steelhead, the following biodata should be collected and recorded in the tablet form and on actual scale cards:
    - Do NOT take scales
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤46 cm for Coho salmon)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
    - SNID (if CWT+) and follow CWT collection procedures
- For other species of weir wash-ups (not listed above):
    - If fish wands negative for CWT (CWT-) enumerate by species, mark category, and sex in tablet being sure to note as weir wash-up.
- After sampling, remove any Floy® and/or carcass tags, cut tail, and pass downstream of weir**.**

Procedures for CWT Recoveries

- ALWAYS use a cut proof glove when collecting a snout.

- Cut one inch behind the eye when collecting a snout. To avoid false positive CWT detections, wand the removed snout to confirm the presence of the CWT in the collected snout. If the CWT is not detected in the snout, wand the cut head and try to determine if the wire is present there, or if there is an embedded hook or other source of metal causing the beep. Make a final determination on whether a CWT appears to be present (i.e., no other source of the detection beep can be located) and if so, extract and bag the head part that is the source of the detection. If a non-cwt source such as a hook is located, remove the hook or other metallic source and wand again. If negative, discard the snout and record the CWT status as negative for that fish.
- For confirmed CWT positive snouts, use the A2 button on the tablet to scan the bar-coded snout label into the database.
- All CWTs recovered need to be put on a CWT recovery sheet before going into the freezer at the Ridgefield office. Snouts need to be bagged separately by recovery type (weir surplus, weir wash-up, and stream survey) and recorded on separate CWT recovery sheets by recovery type.

Coweeman River Weir Sampling Protocols

Hydraulic Project Approval Requirements

The weir shall be operated consistent with all applicable HPA requirements including the following:

- "Organic material that collects on the trap shall be removed and returned to state waters downstream of the project. Man-made trash shall be removed and disposed so that it does not reenter waters of the state."
- "Sediment flushing activities may take place throughout the year during high water events to reduce accumulated sediment in collection boxes. Sediment flushing to take place several times throughout the year during high water events to help reduce the accumulation of sediments in the collection boxes. Any additional flushing should take place during the normal work window between July 15 and September 15 for the life of the permit."
- "Stop all hydraulic project activities except those needed to control erosion and siltation, if flow conditions arise that will result in erosion or siltation of waters of the state."
- "Within one year of project completion, the banks shall be revegetated with native or other approved woody species as close to the affected area without impeding future construction of projects. Vegetative cuttings shall be planted at a maximum interval of three feet (on center) and maintained as necessary for three years to ensure 80 percent survival."
- "Restore bed and bank elevations and contours to pre-project condition."
- "All trap components, except river gravels, shall be immediately removed from waterward of the ordinary high water line (OHWL) upon project completion."

ESA Requirements

The weir shall be operated consistent with the requirements of all applicable biological opinions or other ESA authorizations. Handle and mortality limits for each listed species will be provided

prior to initiating weir operations. Weir operation leads must monitor handle and mortality relative to these limits and notify supervisory staff when the need for an adaptive response is triggered.

General Procedures

Low water/poor recruitment

- When water levels are low, or recruitment appears to be poor, the following measures will be implemented in coordination with the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead:
    - Monitor fish presence below weir daily by conducting short walking surveys in established index area downstream of weir to assess fish and/or redd presence and record this information in the header information on the tablet.
    - Notify the weir crew lead, the Region 5 Chinook species lead and the Region 5 weir management lead of poor recruitment issues.
    - Seine below weir.
    - Modify weir/holding pen design.
    - Upon approval from Region 5 weir management lead, open trap and/or submerge resistance board panels to allow some fish to pass unimpeded.

High water

- High water flows and associated debris can be dangerous and may cause damage to the weir. Safety procedures will continue to be updated in accordance with agency policy and safety requirements. It is important to monitor flows and the weather forecast. There are no stream flow gauges operating on the Coweeman River currently; the best surrogate will be East Fork Lewis River (EF Lewis Flows). If flows are high or begin rising rapidly:
    - Contact the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead.
    - 1st priority is always your safety.
        - If you are concerned about your or your co-worker's safety, stop and contact the weir crew lead for further direction.
        - Operating/cleaning the weir in higher flow conditions generally requires more than one staff person. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
        - Remember to always inspect and wear your PFD (personal floatation device) per WDFW policy!!
    - 2nd priority – fish health.
        - The goal is to avoid/reduce impacts to fish, particularly natural-origin fish, with special attention to ESA-listed fish!
            - Get trap box cleaned out by processing as many fish as possible prior to flows becoming unworkable. Contact the weir crew lead to request assistance and receive further direction if the situation is becoming unmanageable.

- If flows are close to topping live box, staff may close downstream doors to prevent more fish from recruiting into box.
- Upon approval of the Region 5 weir management lead, open door(s) on trap box to allow any fish remaining in trap box to swim out.

- 3rd priority – structure security.
  - Clean the weir! Generally, working in pairs (or more) at higher flows is required for safety. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
  - Stay in close contact with weir crew lead to determine when cleaning weir should be abandoned to allow weir to submerge.
  - Once cleaning the weir is abandoned and weir panels are topped, wait until flows begin to recede and weir crew lead directs cleaning of weir panels to resume fishing ASAP after the high-water event.

Water temperature

- It is critical to monitor water temperatures while handling fish in the trap when the weather is warm. WDFW will utilize a tiered approach to water temperature management at the weir.
  - If the water temperature is less than 18 C, the weir will operate under the standard protocol.
  - If temperatures are greater than 18 C but less than 21 C, a modified operational protocol will be implemented. The modified protocols will include but not be limited to:
    - Electrofishing will not be utilized.
    - Water temperature will be monitored continuously in sampling vessels.
    - Water will be changed frequently in sampling vessels to ensure water temperatures do not exceed 21 C.
  - If water temperatures are greater than 21 C, standard and modified protocols will be suspended. Depending on the situation, WDFW will consider a variety of options including submerging weir panels, opening trap boxes, or closing trap boxes. In the event of a prolonged stretch of elevated water temperatures, staff may shift their schedule to process fish in the cooler early morning hours.

Fish recruitment and large fish numbers in the trap box

- When fish are moving, let them move. If fish are actively recruiting to the trap box, do NOT get in the trap box to start working fish. Wait until trap box is full or fish recruitment slows to begin working fish.
- Contact the weir crew lead to request assistance and receive further direction if the number of fish in the trap box is becoming unmanageable.
- Generally, the density of fish in the trap box is self-regulating. Fish will generally discontinue entering the trap box once it is full. However, if the trap box appears overcrowded or you begin to see trap mortalities, the number of fish in the trap box will need to be reduced.

- If this occurs at the beginning of the daily shift or while working fish, close the entrance to the trap box until fish numbers can be thinned by regular processing.
- If this occurs at a trap check late in the day or after the trap has already been worked for the day, additional effort may be needed to reduce fish numbers in the trap box. In this situation, contact the weir crew lead to request assistance and receive further direction and begin to surplus LV and/or adipose (AD)-clipped Chinook to reduce crowding until the trap can safely be left until the next morning. Surplused fish can be stockpiled for sampling the following day.

Identifying the origin of salmon and steelhead

- Accurately identifying the origin (natural or hatchery) of salmon and steelhead captured at the weir is critically important to implementation of the protocol.
- The origin of Chinook salmon, Coho salmon, and steelhead can only be determined via the combination of their fin clip status and coded-wire tag (CWT) status.
- Therefore, all adult Chinook salmon, Coho salmon, and steelhead must be examined for all fin clips and scanned for CWTs regardless of adipose fin clip status.
- A fish should be deemed a hatchery-origin return (HOR) if it has either:
  - Adipose (AD) fin clip and no CWT (CWT-); or
  - Adipose (AD) fin clip and a CWT (CWT+); or
  - An intact adipose fin (UM) and a CWT (CWT+); or
  - Any left ventral (LV) fin clip (regardless of AD or CWT status).
- A fish should be deemed a natural-origin return (NOR) if it has:
  - An intact adipose fin (UM), no CWT (CWT-) and no left ventral (LV) fin clip.

Identifying whether a live salmon or steelhead is maiden or recapture

- This section is most applicable to watersheds with two weirs but it is still applicable to all locations.
- Maiden: any fish with no left operculum punch (LOP) or Floy® tags.
  - Follow protocols as described for species/origin encountered.
- Recapture: any fish with a LOP or Floy® tags.
  - Use the recapture function in the tablet to look up a Floy® Tag number and find associated biodata and record:
    - LOP shape
    - Floy® tag information (color and tag #s)
    - Apply right operculum punch with proper shape based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.
  - Pass upstream.

Prioritization of species handling at trap and seining activities

- As a general rule, NOR salmonids take priority over HOR salmonids. If a decision regarding handling priority at the trap is needed due to extenuating circumstances, the weir crew lead will make that determination.

- Seining may cause any fish holding directly below the weir to move downstream. It is important to coordinate with the weir crew lead to determine if seining should occur before or after working the trap box.

Overview of disposition by species and origin

- Remove:
    - HOR Chinook salmon
    - HOR Coho salmon
- Pass upstream:
    - NOR Chinook salmon
    - NOR Coho salmon
    - All steelhead
    - All Chum salmon (NOTE: the origin of Chum salmon cannot be determined using external characteristics though most should be natural-origin).
    - All Pink salmon
    - All Sockeye salmon
    - All Cutthroat and all other "non-target" species
- Pass (back) downstream:
    - NA (no fish should be passed back downstream at this time)

Data management

- Fill out a header in the tablet every day the trap is in operation even if no fish were caught.
- Make note of all trap alterations and any missed trapping periods in comment section of each individual day's header in the tablet.
- <u>Every</u> captured salmon and steelhead should have the following biological data recorded:
    - Species
    - Sex (M, F, J); see species specific details below
    - Mark status (UM/AD)
    - CWT status via CWT status (Tablet field)/Sample Category (Scale card)
- NOTE: any fish that has a physical sample taken (i.e., scale, snout, deoxyribonucleic acid (DNA)) must be recorded on a scale card as the scale number/position is how data from TWS & other labs (e.g., snout decodes) are linked.
- Use new scale cards each day.
- Certain biodata should also be handwritten on scale cards in addition to being captured in the tablet. This includes:
    - Date (back of scale card)
    - Position number
    - Fork length
    - Sex
    - Mark
    - Sample category
    - DNA vial # (if collected)

    - Snout ID (SNID) (if snout is collected)
- Clearly distinguish disposition on back of each scale card (i.e. weir wash-up, weir surplus, or fish passed upstream (Lives)) next to sample location or stream reach ID.
- Do NOT put any Floy® tag info or LOP info on scale cards. This will only be captured in the tablet.
- If a fish that should have been punched or tagged gets passed upstream without a punch and/or Floy® tags, it will be recorded in the tablet as "NP".
- Tablet data will be backed up daily to a thumb drive and uploaded weekly (at a minimum) to a shared drive location TBD.

Procedures for Sampling NOR Chinook Salmon Passed Upstream at Weir

- To confirm NOR status, wand UM fish for CWT presence and make sure the left ventral fin is not clipped. Many ventral clips will be partially regenerated, so compare left ventral to the right ventral fin.
- Anesthetize all NOR Chinook salmon prior to sampling/tagging. Take care to not place any AD -clipped Chinook salmon, Coho salmon, or steelhead into the anesthetic bath as they are then not eligible for human consumption and unavailable for donation to food banks.
- Tag NOR Chinook salmon with two Floy® tags, one on each side just forward of the back edge of the dorsal fin. Record tag color, tag number, and note any lost or destroyed tag numbers in comments. Apply tags in numerical sequence when possible.
- Apply Floy® tags using the following methods. Insert tags into semi-automated continuous feed tagging gun with the appropriate needle (Guy et al. 1996). As with all numbered tags, tag should be attached in sequence to allow for ease of data checking. Secure fish on a safe firm flat surface, tagging boot, or in the water. Push the tag gun needle through the posterior of the dorsal fin rays at a 45-degree angle (downward and inward), so when the fish swims the tag will lay next to the body. The tag needle must be inserted past the pterygiophores of the dorsal fin to ensure high retention (Waldman 1990). Press and hold the tag gun trigger to insert the tag, and while still holding the trigger down, twist the tagging gun 90 degrees to dislodge the tag from the needle and then pull the tag gun away from the fish with the trigger still down. Check the inserted tags to confirm the tag numbers match the data recorded for that fish so the biological, scale, otolith, tag, spatial, and temporal data will all be linked to that fish.
- Apply left operculum punch with a shape based on weekly marking schedule (rotate to new punch shape each Sunday).
- Retain the left operculum punch for DNA tissue or collect a punch from the upper lobe of caudal fin if the left operculum punch sample is lost.
- Collect the following biodata from every NOR Chinook (1 in 1 sample rate): 3 scales, fork length (to the nearest cm), sex (M, F, or Jacks defined as ≤ 56 cm), mark (UM), and DNA tissue sample.
- Subsampling for DNA tissues (project goal is 100 samples from the weir) may occur if returns appear to be far above the forecast. However, begin with 100% sampling and subsample from the collection for lab analyses.

- Scale cards can include all sex categories of NOR Chinook salmon (M, F, or J) but not any other species or mark types (NOR and HOR Chinook salmon go on separate scale cards). Start a new scale card each day.
- Allow fish to recover before release.

Procedures for Sampling HOR Chinook Salmon Removed at Weir

- Typically dispatch and set aside HOR Chinook salmon to be processed after the trap has been emptied. This prioritizes the processing of natural-origin fish and gets them released upstream more quickly, reducing the stress of being in the trap.
- Wand all marked fish to check for the presence of a CWT.
- Sample rate of 1 in 1 for HOR Chinook salmon. All HOR Chinook salmon removed can be put on the same scale card for any one day. Use a new scale card each day.
- Collect the following data from each HOR Chinook salmon:
    - 3 scales
    - Fork length (to the nearest cm)
    - Sex (M, F, or J)
    - Mark (AD-clip, AD- and LV clip, or LV clip)
    - Sample category
        - Will be blank for Chinook salmon without a CWT.
        - Will be 0 Chinook salmon with a CWT. If a CWT is detected, bar-coded labels are used for snout identification tags.

- If wanding the fish indicates a CWT is present, take the snout and scan the bar-code of the snout label (follow number sequence if possible) using the built-in scanner on the tablet (A2 button). Record the snout identification and sample category on scale card. Sample category will be 0 for Chinook salmon with a CWT.
- Note disposition of all surplus Chinook salmon by sex (M, F, J) and mark category and record on Form 3. Make sure the numbers on the scale cards for surplus match the number recorded on the Form 3. Provide carcasses to one of the food bank alternatives when possible and have the recipient at the food bank sign on the Form 3 to document the donation, leaving with them the center (yellow) page of the Form 3. If an HOR fish was accidentally placed in the anesthetic bath, or is otherwise unfit for human consumption, it must be used for nutrient enhancement as it is not eligible for human consumption.
- Remove the tail of all carcasses that are used for nutrient enhancement and return the fish to a stream outside of survey area (e.g., upper Mulholland Creek or O'Neil Creek). Typically, nutrient enhancement carcass transportation will be done by weir staff, with occasional help from stream survey staff.

Procedures for Sampling HOR Coho Salmon Removed at Weir

- Wand all fish for CWT presence.
- Bio rate of 1:1

- If Coho wands. +, take snout and scan barcode snout label, drop label in bag and tie bag appropriately.
- The following data should be collected from CWT + Coho and recorded in in the tablet and on a scale card.
    - Fork length
    - Sex (M, F, or J defined as ≤ 46cm)
    - Mark
    - Sample category will be blank for Coho without a CWT or SC 0 if wand pos (+).
    - If wand pos (+), scan barcode or write down number (eight digits)
- All wand negative Coho need to be represented in tablet.
    - Enumerate by sex and clip in the tablet.
- Note disposition of all surplus Coho salmon by sex (M, F, J) and mark category and record on Form 3. Make sure the numbers on the scale cards for surplus match the number recorded on the Form 3. Provide excess Coho salmon to local food banks when possible. Have the recipient at the food bank sign on the Form 3 to document the donation and leave them with the center (yellow) page of the Form 3. If an HOR fish was accidentally placed in the anesthetic bath, or is otherwise unfit for human consumption, it must be used for nutrient enhancement as it is not eligible for human consumption.
- If food bank options are not available, surplus carcasses can be used for nutrient enhancement. Remove the tail of all fish used for nutrient enhancement and return the carcass to a stream outside of the survey area (e.g., upper Mulholland Creek or O'Neil Creek). Typically, nutrient enhancement carcass transportation will be done by weir staff, with occasional help from stream survey staff.

Procedures for Sampling Other Salmonids Passed Upstream at Weir

Weir crew lead will determine sampling intensity of these species.

- NOR Coho salmon, all Sockeye salmon, and Pink salmon:
    - Anesthetize prior to sampling.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Enumerate by sex and mark and record in tablet.
    - Allow to recover before release upstream.
- NOR steelhead:
    - Anesthetize prior to sampling.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - The following biodata should be collected from all NOR steelhead (and recorded on both the weir datasheet and scale card):
        - 6 scales
        - Fork length (to the nearest cm)

        - Sex (M, F)
        - Mark (UM)
    - Allow to recover before release upstream.

- HOR steelhead and all cutthroat:
    - Do NOT use anesthetic.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Pass upstream.

- Chum salmon:
    - Anesthetize all prior to sampling.
    - Punch left operculum with proper shape punch based on weekly marking schedule. SAVE PUNCH FOR DNA SAMPLE!
    - Collect 3 scales.
    - The following biodata should be collected and recorded on the tablet:
        - Fork length (to the nearest cm)
        - Sex (M/F)
        - Mark (UM)
        - DNA sample number
        - Any other marks/damage (i.e. mammal marks, net marks, etc.)
    - Allow to recover before release upstream.

Procedures for Trap Mortalities

- Should be kept separate from any intentionally surplused fish.
- Record in tablet as mortality.
- Follow the same protocols as you would for intentionally surplused fish.
- Put any Coho trap mortalities on actual scale cards and record sex, mark, fork length and sample category but do not take scales.

Definition of "Weir Wash-Up"

A weir wash-up is any carcass that washes onto or against the weir, weir structure or live box. It does not include carcasses on the bank or on the river bottom just upstream or downstream of the weir as these carcasses will be sampled and counted during stream surveys.

Procedures for Weir Wash-Ups

- Record all weir wash-ups in the tablet form as dead, being sure to click weir wash-up button, and disposition downstream. Weir wash-up sampling data are captured in the same header as the day's "normal" weir header, but weir wash-ups must go on a separate scale card.
- Examine all fish for any external tags and/or marks (caudal and both opercula). Record any carcass tags, Floy® tags and/or caudal/opercula punch recovery information.
    - If you can examine a fish for tags and/or mark and it has none, record NP (for none present) in tablet form.

    - If you are unable to determine punch shape but can tell one is present, record P.
    - If you are unable to examine a fish for tags and/or mark for whatever reason, record U (for undeterminable) in tablet form.
- For all weir washups, the following guideline should be followed for all species:
    - If fish is a recapture (has a Floy® tag or LOP), do NOT wand for a CWT or PIT tag as it was already wanded as a live fish.
    - If fish is NOT a recapture (NO Floy® tag or caudal punch or LOP), wand for CWT and PIT tag (for NOR Coho, NOR steelhead, and NOR Cutthroat).
    - Be sure to note CWT status in tablet (not wanded, CWT -, or CWT +).
- For Chinook salmon and Chum salmon, the following biodata should be collected and recorded in the tablet form:
    - 3 scales (except no need if deemed a recapture)
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 56 cm)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
            - Fill out spawning ground survey snout label and keep with spawning ground survey snouts.
            - Write weir wash-up in comments of snout label.
    - DNA sample
    - Otoliths (Chum salmon only)
- For Coho salmon and steelhead, the following biodata should be collected and recorded in the tablet form and on actual scale cards:
    - Do NOT take scales
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 46 cm for Coho salmon)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
    - SNID (if CWT+) and follow CWT collection procedures
- For other species of weir wash-ups (not listed above):
- If fish wands negative for CWT (CWT-) enumerate by species, mark category, and sex in tablet being sure to note as weir wash-up.
- After sampling, remove any Floy® and/or carcass tags, cut tail, and pass downstream of weir.

Procedures for CWT Recoveries

- Always use a cut proof glove when collecting a snout.
- Cut one inch behind the eye when collecting a snout. To avoid false positive CWT detections, wand the removed snout to confirm the presence of the CWT in the collected snout. If the CWT is not detected in the snout, wand the cut head and try to determine if the wire is present there, or if there is an embedded hook or other source of metal causing the beep. Make a final determination on whether a CWT appears to be present (i.e., no other source of the detection beep can be located) and if so, extract and bag the head part that is the source of the detection. If a non-cwt source such as a hook is located, remove the hook or other metallic source and wand again. If negative, discard the snout and record the CWT status as negative for that fish.
- For confirmed CWT positive snouts, use the A2 button on the tablet to scan the bar-coded snout label into the database.
- All CWTs recovered need to be put on a CWT recovery sheet before going into the freezer at the Kelso field office. Snouts need to be bagged separately by recovery type (weir surplus, weir wash-up, and stream survey) and recorded on separate CWT recovery sheets by recovery type.

South Fork Toutle River Weir Sampling Protocols

Hydraulic Project Approval Requirements

The weir shall be operated consistent with all applicable HPA requirements including the following:

- "Organic material that collects on the trap shall be removed and returned to state waters downstream of the project. Man-made trash shall be removed and disposed so that it does not reenter waters of the state."
- "Sediment flushing activities may take place throughout the year during high water events to reduce accumulated sediment in collection boxes. Sediment flushing to take place several times throughout the year during high water events to help reduce the accumulation of sediments in the collection boxes. Any additional flushing should take place during the normal work window between July 15 and September 15 for the life of the permit."
- "Stop all hydraulic project activities except those needed to control erosion and siltation, if flow conditions arise that will result in erosion or siltation of waters of the state."
- "Within one year of project completion, the banks shall be revegetated with native or other approved woody species as close to the affected area without impeding future construction of projects. Vegetative cuttings shall be planted at a maximum interval of three feet (on center) and maintained as necessary for three years to ensure 80 percent survival."
- "Restore bed and bank elevations and contours to pre-project condition."
- "All trap components, except river gravels, shall be immediately removed from waterward of the ordinary high water line (OHWL) upon project completion."

ESA Requirements

The weir shall be operated consistent with the requirements of all applicable biological opinions or other ESA authorizations. Handle and mortality limits for each listed species will be provided prior to initiating weir operations. Weir operation leads must monitor handle and mortality relative to these limits and notify supervisory staff when the need for an adaptive response is triggered.

General Procedures

Low water/poor recruitment:

- When water levels are low, or recruitment appears to be poor, the following measures will be implemented in coordination with the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead:
    - Monitor fish presence below weir daily by conducting short walking surveys in established index area downstream of weir to assess fish and/or redd presence and record this information in the header information on the tablet.
    - Notify the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead of poor recruitment issues.
    - Seine below weir.
    - Modify weir/holding pen design.
    - Upon approval from the Region 5 weir management lead, open trap and/or submerge resistance board panels to allow some fish to pass unimpeded.

High water:

- High water flows and associated debris can be dangerous and may cause damage to the weir. Safety procedures will continue to be updated in accordance with agency policy and safety requirements. It is important to monitor flows and the weather forecast. There are no stream flow gauges operating on the SF Toutle River currently; the best surrogate will be the North Fork Toutle River (NF Toutle Flows). If flows are high or begin rising rapidly:
    - Contact the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead.
    - 1st priority is always your safety.
        - If you are concerned about your or your co-worker's safety, stop and contact the weir crew lead for further direction.
        - Operating/cleaning the weir in higher flow conditions generally requires more than one staff person. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
        - Remember to always inspect and wear your PFD (personal floatation device) per WDFW policy!!
    - 2nd priority – fish health.
        - The goal is to avoid/reduce impacts to fish, particularly natural-origin fish, with special attention to ESA-listed fish!

- Get trap box cleaned out by processing as many fish as possible prior to flows becoming unworkable. Contact the weir crew lead to request assistance and receive further direction if the situation is becoming unmanageable.
- If flows are close to topping live box, staff may close downstream doors to prevent more fish from recruiting into box.
- Upon approval of the Region 5 weir management lead, open door(s) on trap box to allow any fish remaining in trap box to swim out.

- 3rd priority – structure security.
  - Clean the weir! Generally, working in pairs (or more) at higher flows is required for safety. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
  - Stay in close contact with weir crew lead to determine when cleaning weir should be abandoned to allow weir to submerge.
  - Once cleaning the weir is abandoned and weir panels are topped, wait until flows begin to recede and weir crew lead directs cleaning of weir panels to resume fishing ASAP after the high-water event.

Water temperature:

- It is critical to monitor water temperatures while handling fish in the trap when the weather is warm. WDFW will utilize a tiered approach to water temperature management at the weir.
  - If the water temperature is less than 18 C, the weir will operate under the standard protocol.
  - If temperatures are greater than 18 C but less than 21 C, a modified operational protocol will be implemented. The modified protocols will include but not be limited to:
    - Electrofishing will not be utilized.
    - Water temperature will be monitored continuously in sampling vessels.
    - Water will be changed frequently in sampling vessels to ensure water temperatures do not exceed 21 C.
  - If water temperatures are greater than 21 C, standard and modified protocols will be suspended. Depending on the situation, WDFW will consider a variety of options including submerging weir panels, opening trap boxes, or closing trap boxes. In the event of a prolonged stretch of elevated water temperatures, staff may shift their schedule to process fish in the cooler early morning hours.

Fish recruitment and large fish numbers in the trap box:

- When fish are moving, let them move. If fish are actively recruiting to the trap box, do NOT get in the trap box to start working fish. Wait until trap box is full or fish recruitment slows to begin working fish.

- Contact the weir crew lead to request assistance and receive further direction if the number of fish in the trap box is becoming unmanageable.
- Generally, the density of fish in the trap box is self-regulating. Fish will generally discontinue entering the trap box once it is full. However, if the trap box appears overcrowded or you begin to see trap mortalities, the number of fish in the trap box will need to be reduced.
    - If this occurs at the beginning of the daily shift or while working fish, close the entrance to the trap box until fish numbers can be thinned by regular processing.
    - If this occurs at a trap check late in the day or after the trap has already been worked for the day, additional effort may be needed to reduce fish numbers in the trap box. In this situation, contact the weir crew lead to request assistance and receive further direction and begin to surplus LV and/or AD-clipped Chinook to reduce crowding until the trap can safely be left until the next morning. Surplused fish can be stockpiled for sampling the following day.

Large fish numbers in the trap box:

- Contact your supervisor.
- When fish are moving, let them move. Do NOT get in the trap box to start working fish.
- If you begin to see trap mortalities, the fish in the trap box may have to be thinned out at dark. In this situation, surplus LV and/or AD-clipped Chinook – just enough to reduce crowding until the morning.

Identifying the origin of salmon and steelhead:

- Accurately identifying the origin (natural or hatchery) of salmon and steelhead captured at the weir is critically important to implementation of the protocol.
- The origin of Chinook salmon, Coho salmon, and steelhead can only be determined via the combination of their adipose fin clip status and CWT status.
- Therefore, all adult Chinook salmon, Coho salmon, and steelhead must be examined for all fin clips and scanned for CWTs regardless of adipose fin clip status.
- A fish should be deemed a hatchery-origin return (HOR) if it has either:
    - Adipose (AD) fin clip and no CWT (CWT-); or
    - Adipose (AD) fin clip and a CWT (CWT+); or
    - An intact adipose fin (UM) and a CWT (CWT+); or
    - Any left ventral (LV) fin clip (regardless of AD or CWT status).
- A fish should be deemed a natural-origin return (NOR) if it has:
    - An intact adipose fin (UM) no CWT (CWT-), and no left ventral (LV) fin clip.

Identifying whether a live salmon or steelhead is maiden or recapture:

- This section is most applicable to watersheds with two weirs but it is still applicable to all locations.
- Maiden: any fish with no left operculum punch (LOP) or Floy® tags.
    - Follow protocols as described for species/origin encountered.
- Recapture: any fish with a left operculum punch (LOP) or Floy® tags.
    - Use the recapture function in the tablet to look up a Floy® Tag number and find associated biodata and record:
        - LOP shape
        - Floy® tag information (color and tag #s)
        - Apply right operculum punch with proper shape based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.
    - Pass upstream.

Prioritization of species handling at trap and seining activities:

- As a general rule, NOR salmonids take priority over HOR salmonids. If a decision regarding handling priority at the trap is needed due to extenuating circumstances, the weir crew lead will make that determination.
- Seining may cause any fish holding directly below the weir to move downstream. It is important to coordinate with the weir crew lead to determine if seining should occur before or after working the trap box.

Overview of disposition by species and origin:

- Truck for broodstock:
    - HOR Chinook salmon (up to weekly collection goal); only if North Toutle Hatchery is short is on broodstock
- Remove:
    - HOR Chinook salmon in excess of weekly broodstock needs.
    - HOR Coho salmon
- Pass upstream:
    - NOR Chinook salmon
    - NOR Coho salmon
    - All Chum salmon (NOTE: the origin of Chum salmon cannot be determined using external characteristics though most should be natural-origin).
    - All steelhead
    - All Pink salmon
    - All Sockeye salmon
    - All Cutthroat and all other “non-target” species
- Pass (back) downstream:
    - NA (no fish should be passed back downstream at this time).

Data management:

- Fill out a header in the tablet every day the trap is in operation even if no fish were caught.

- Make note of all trap alterations and any missed trapping periods in comment section of each individual day's header in the tablet.
- Every captured salmon and steelhead should have the following biological data recorded:
    - Species
    - Sex (M, F, or J); see species specific details below
    - Mark status (UM/AD)
    - CWT status via CWT status (Tablet field)/Sample Category (Scale card)
- NOTE: any fish that has a physical sample taken (i.e., scale, snout, DNA) must be recorded on a scale card as the scale number/position is how data from TWS & other labs (e.g., snout decodes) are linked.
- Use new scale cards each day.
- Certain biodata should also be handwritten on scale cards in addition to being captured in the tablet. This includes:
    - Date (back of scale card)
    - Position number
    - Fork length
    - Sex
    - Mark
    - Sample category
    - DNA vial # (if collected)
    - Snout ID (SNID) (if snout is collected)
- Clearly distinguish disposition on back of each scale card (i.e. weir wash-up, weir surplus, or fish passed upstream (Lives)) next to sample location or stream reach ID.
- Do NOT put any Floy® tag info or LOP info on scale cards. This will only be captured in the tablet.
- If a fish that should have been punched or tagged gets passed upstream without a punch and/or Floy® tags, it will be recorded in the tablet as "NP".
- Tablet data will be backed up daily to a thumb drive and uploaded weekly (at a minimum) to a shared drive location TBD.

Procedures for Sampling Chinook Salmon Held for Broodstock at the North Toutle Hatchery

- HOR Chinook may be collected for broodstock for the North Toutle Hatchery Chinook salmon program.
- Brood will only be collected from this site upon prior approval from Regional Fish Program Manager.
- Randomly collect all HOR Chinook salmon for broodstock up to weekly collection goal based on collection curve.
- Broodstock collection curves are targets and may be changed with input of hatchery staff and review by management/science staff based on weather events. Collection dates will be dependent on when fish show up.
- All fish collected for broodstock will be sampled later.

- At the time of trucking to North Toutle Hatchery, they will only be enumerated by sex and mark. Record this information using the clicker form in the tablet.

Procedures for Sampling NOR Chinook Salmon Passed Upstream at Weir

- To confirm NOR status, wand UM fish for CWT presence and make sure the left ventral fin is not clipped. Many ventral clips will be partially regenerated, so compare left ventral to the right ventral fin.
- Anesthetize all NOR Chinook salmon prior to sampling/tagging. Take care to not place any AD -clipped Chinook salmon, Coho salmon, or steelhead into the anesthetic bath as they are then not eligible for human consumption and unavailable for donation to food banks.
- Tag NOR Chinook with two of the proper colored Floy® tags based on weekly tagging schedule; one on each side of the dorsal fin. Record tag color and numbers on tablet form.
- Apply Floy® tags using the following methods:
  Implement the study design by tagging the fish with the appropriate color and numbered Floy® tag. Prepare for tagging by placing tags into semi-automated continuous feed tagging gun with the appropriate needle (Guy et al. 1996). As with all numbered tags, tag should be attached in sequence to allow for ease of data checking. Secure fish on a safe firm flat surface, tagging boot, or in the water. Push needle through the posterior of the dorsal fin rays at a 45-degree angle, so when the fish swims the tag will lay next to the body. The tag needle must be inserted past the pterygiophores of the dorsal fin to ensure high retention (Waldman et al. 1990). The tagging gun is twisted 90 degrees to dislodge the tag from the plastic clip and then removed. Tagged fish can be treated with antibiotics. Complete the data form to link the tag(s) to biological, scale, otolith, tag, spatial, and temporal data. Enumerate the number of successfully marked fish released by mark location and their release location.
- Apply left operculum punch with a shape based on weekly marking schedule (rotate to new punch shape each Sunday).
- Retain the left operculum punch for DNA tissue or collect a punch from the upper lobe of caudal fin if the left operculum punch sample is lost.
- Collect the following biodata from every NOR Chinook (1 in 1 sample rate):
  - 3 scales
  - Fork length (to the nearest cm)
  - Sex (M, F, or J defined as ≤ 56 cm)
  - Mark (UM)
  - DNA sample. Place (DNA) tissue sample on pre-labeled blotter paper. Record DNA sample number on scale card on the tablet.
- Allow fish to recover before release.

Procedures for Sampling HOR Chinook Salmon Removed at Weir

- Dispatch and set aside HOR Chinook salmon to be processed after the trap has been emptied. This prioritizes the processing of natural-origin fish and gets them released upstream more quickly, reducing the stress of being in the trap.
- Wand all marked fish to check for the presence of a coded-wire-tag (CWT).

- Sample rate of 1 in 1 for HOR Chinook salmon. All HOR Chinook salmon removed can be put on the same scale card for any one day. Use a new scale card each day.
- Collect the following data from each HOR Chinook salmon:
    - 3 scales,
    - Fork length (to the nearest cm),
    - Sex (M, F, or J defined as ≤ 56 cm),
    - Mark (AD-clip, AD- and LV clip, or LV clip), and
    - Sample category
        - Will be blank for Chinook salmon without a CWT.
        - Will be 0 Chinook salmon with a CWT. If a CWT is detected, bar-coded labels are used for snout identification tags.
- If wanding the fish indicates a CWT is present, take the snout and scan the bar-code of the snout label (follow number sequence if possible) using the built-in scanner on the tablet (A2 button). Record the snout identification and sample category on scale card.
- Note disposition of all surplus Chinook salmon by sex (M, F, J) and mark category and record on Form 3. Make sure the numbers on the scale cards for surplus match the number recorded on the Form 3. Provide carcasses to one of the food bank alternatives when possible and have the recipient at the food bank sign on the Form 3 to document the donation, leaving with them the center (yellow) page of the Form 3. If an HOR fish was accidentally placed in the anesthetic bath, or is otherwise unfit for human consumption, it must be used for nutrient enhancement as it is not eligible for human consumption.
- Remove the tail of all carcasses that are used for nutrient enhancement and return the fish to a stream outside of survey area. Typically, nutrient enhancement carcass transportation will be done by weir staff, with occasional help from stream survey staff.

Procedures for Sampling HOR Coho Salmon Removed at the Weir

- Wand all fish for CWT presence
- Each surplus Coho removed will be recorded in the tablet. They do not need to go on a scale card unless wand CWT+. <u>No scales for CWT – Coho.</u>
- If Coho wands +, take snout and scan the bar code label into the tablet (see CWT recoveries section).
- The following data should be collected from CWT + Coho and recorded in the tablet.
    - Fork length
    - Sex (M, F, or J defined as ≤ 46 cm)
    - Mark
    - Record SNID (via scanner)
    - Sample category (0)
- Provide surplused Coho to local food banks when possible. If food bank options are not available, nutrient enhance surplus carcasses. Cut off tails on all nutrient enhanced carcasses and return to stream outside of survey area. Coordinate nutrient enhancement with WDFW regional staff.

- Record disposition of all surplus Coho by M/F/J and mark category on Form 3s. Make sure numbers of surplus Coho recorded on the datasheet matches what is recorded on Form 3s.

Procedures for Sampling Other Salmonids Passed Upstream at Weir

Weir crew lead will determine sampling intensity of these species.

- NOR Coho salmon, all Sockeye salmon, and Pink salmon:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Allow to recover before release upstream.
- NOR steelhead:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - The following biodata should be collected from all NOR steelhead (and recorded on both the weir datasheet and scale card):
        - 6 scales
        - Fork length (to the nearest cm)
        - Sex (M, F)
        - Mark (UM)
    - Allow to recover before release
- HOR steelhead and all cutthroat:
    - Do NOT use anesthetic.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Pass upstream.
- Chum salmon:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. SAVE PUNCH FOR DNA SAMPLE!
    - Collect 3 scales.
    - The following biodata should be collected and recorded on the tablet:
        - Fork length (to the nearest cm)
        - Sex (M/F)
        - Mark (UM)
        - DNA sample number
        - Any other marks/damage (i.e. mammal marks, net marks, etc.)
    - Allow to recover before release.

Procedures for Trap Mortalities

- Should be kept separate from any intentionally surplused fish.
- Record in tablet as mortality.
- Follow the same protocols as you would for intentionally surplused fish.
- Put any Coho trap mortalities on actual scale cards and record sex, mark, fork length and sample category but do not take scales.

Definition of Weir "Wash-Up"

A weir wash-up is any carcass that washes onto or against the weir, weir structure or live box on the upstream side. It does not include carcasses on the bank or on the river bottom further than 5 feet upstream of the weir, nor the dead fish in the trap.

Procedures for Weir Wash-Ups

- Record all weir wash-ups in the tablet form as dead, being sure to click weir wash-up button, and disposition downstream. Weir wash-up sampling data are captured in the same header as the day's "normal" weir header, but weir wash-ups must go on a separate scale card.
- Examine all fish for any external tags and/or marks (caudal and both opercula). Record any carcass tags, Floy® tags and/or caudal/opercula punch recovery information.
    - If you can examine a fish for tags and/or mark and it has none, record NP (for none present) in tablet form.
    - If you are unable to determine punch shape but can tell one is present, record P.
    - If you are unable to examine a fish for tags and/or mark for whatever reason, record U (for undeterminable) in tablet form.
- <u>For all weir washups</u>, the following guideline should be followed for all species:
    - If fish is a recapture (has a Floy® tag or LOP), do NOT wand for a CWT as it was already wanded as a live fish.
    - If fish is NOT a recapture (NO Floy® tag or caudal punch or LOP), wand for CWT.
    - Be sure to note CWT status in tablet (not wanded, CWT -, or CWT +).
- For Chinook salmon and Chum salmon, the following biodata should be collected and recorded in the tablet form:
    - 3 scales (except no need if deemed a recapture)
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 56 cm)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
            - Fill out spawning ground survey snout label and keep with spawning ground survey snouts.

        - Write weir wash-up in comments of snout label.
    - DNA sample
    - Otoliths (Chum salmon only)
- For Coho salmon and steelhead, the following biodata should be collected and recorded in the tablet form and on actual scale cards:
    - Do NOT take scales
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 46 cm for Coho salmon)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
    - SNID (if CWT+) and follow CWT collection procedures
- For other species of weir wash-ups (not listed above):
    - If fish wands negative for CWT (CWT-) enumerate by species, mark category, and sex in tablet being sure to note as weir wash-up.
- After sampling, remove any Floy® and/or carcass tags, cut tail, and pass downstream of weir**.**

Procedures for CWT Recoveries

- ALWAYS use a cut proof glove when collecting a snout.
- Cut one inch behind the eye when collecting a snout. To avoid false positive CWT detections, wand the removed snout to confirm the presence of the CWT in the collected snout. If the CWT is not detected in the snout, wand the cut head and try to determine if the wire is present there, or if there is an embedded hook or other source of metal causing the beep. Make a final determination on whether a CWT appears to be present (i.e., no other source of the detection beep can be located) and if so, extract and bag the head part that is the source of the detection. If a non-cwt source such as a hook is located, remove the hook or other metallic source and wand again. If negative, discard the snout and record the CWT status as negative for that fish.
- For confirmed CWT positive snouts, use the A2 button on the tablet to scan the bar-coded snout label into the database.
- All CWTs recovered need to be put on a CWT recovery sheet before going into the freezer at the Ridgefield office. Snouts need to be bagged separately by recovery type (weir surplus, weir wash-up, and stream survey) and recorded on separate CWT recovery sheets by recovery type.

Green River Weir Sampling Protocols

Hydraulic Project Approval Requirements

The weir shall be operated consistent with all applicable HPA requirements including the following:

- "Organic material that collects on the trap shall be removed and returned to state waters downstream of the project. Man-made trash shall be removed and disposed so that it does not reenter waters of the state."
- "Sediment flushing activities may take place throughout the year during high water events to reduce accumulated sediment in collection boxes. Sediment flushing to take place several times throughout the year during high water events to help reduce the accumulation of sediments in the collection boxes. Any additional flushing should take place during the normal work window between July 15 and September 15 for the life of the permit."
- "Stop all hydraulic project activities except those needed to control erosion and siltation, if flow conditions arise that will result in erosion or siltation of waters of the state."
- "Within one year of project completion, the banks shall be revegetated with native or other approved woody species as close to the affected area without impeding future construction of projects. Vegetative cuttings shall be planted at a maximum interval of three feet (on center) and maintained as necessary for three years to ensure 80 percent survival."
- "Restore bed and bank elevations and contours to pre-project condition."
- "All trap components, except river gravels, shall be immediately removed from waterward of the ordinary high water line (OHWL) upon project completion."

ESA Requirements

The weir shall be operated consistent with the requirements of all applicable biological opinions or other ESA authorizations. Handle and mortality limits for each listed species will be provided prior to initiating weir operations. Weir operation leads must monitor handle and mortality relative to these limits and notify supervisory staff when the need for an adaptive response is triggered.

General Procedures

Low water/poor recruitment:

- When water levels are low, or recruitment appears to be poor, the following measures will be implemented in coordination with the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead:
    - Monitor fish presence below weir daily by conducting short walking surveys in established index area downstream of weir to assess fish and/or redd presence and record this information in the header information on the tablet.
    - Notify the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead of poor recruitment issues.
    - Seine below weir.
    - Modify weir/holding pen design.

- Upon approval from the Region 5 weir management lead, submerge resistance board panels to allow some fish to pass unimpeded.

High water:

- High water flows and associated debris can be dangerous and may cause damage to the weir. Safety procedures will continue to be updated in accordance with agency policy and safety requirements. It is important to monitor flows and the weather forecast. There are no stream flow gauges operating on the Green River currently; the best surrogate will be the North Fork Toutle River (NF Toutle Flows). If flows are high or begin rising rapidly:
  - Contact the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead.
  - 1st priority is always your safety.
    - If you are concerned about your or your co-worker's safety, stop and contact the weir crew lead for further direction.
    - Operating/cleaning the weir in higher flow conditions generally requires more than one staff person. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
    - Remember to always inspect and wear your PFD (personal floatation device) per WDFW policy!!
  - 2nd priority – fish health.
    - The goal is to avoid/reduce impacts to fish, particularly natural-origin fish, with special attention to ESA-listed fish!
  - 3rd priority – structure security.
    - Clean the weir! Generally, working in pairs (or more) at higher flows is required for safety. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
    - Stay in close contact with weir crew lead to determine when cleaning weir should be abandoned to allow weir to submerge.
    - Once cleaning the weir is abandoned and weir panels are topped, wait until flows begin to recede and weir crew lead directs cleaning of weir panels to resume fishing ASAP after the high-water event.

Water Temperature:

- It is critical to monitor water temperatures while handling fish in the holding pond when the weather is warm. WDFW will utilize a tiered approach to water temperature management at the weir.
  - If the water temperature is less than 18 C, the weir will operate under the standard protocol.
  - If temperatures are greater than 18 C but less than 21 C, a modified operational protocol will be implemented. The modified protocols will include but not be limited to:
    - Electrofishing will not be utilized.

        - Water temperature will be monitored continuously in sampling vessels.
        - Water will be changed frequently in sampling vessels to ensure water temperatures do not exceed 21 C.
    - If water temperatures are greater than 21 C, WDFW will consider a variety of options to reduced stress including: 1) staff may shift their schedule to process fish in the cooler early morning hours; and 2) sample and process fish in pond more frequently.

Fish recruitment and large fish numbers in the trap box:

- The North Toutle weir and fish ladder lead into the North Toutle hatchery swim-in pond. Hatchery staff will monitor fish recruitment and loadings in the hatchery ladder and swim-in pond.

Identifying the origin of salmon and steelhead:

- Accurately identifying the origin (natural or hatchery) of salmon and steelhead captured at the weir is critically important to implementation of the protocol.
- The origin of Chinook salmon, Coho salmon, and steelhead can only be determined via the combination of their adipose fin clip status and CWT status.
- Therefore, all adult Chinook salmon, Coho salmon, and steelhead must be examined for all fin clips and scanned for CWTs regardless of adipose fin clip status.
- A fish should be deemed a hatchery-origin return (HOR) if it has either:
    - Adipose (AD) fin clip and no CWT (CWT-); or
    - Adipose (AD) fin clip and a CWT (CWT+); or
    - An intact adipose fin (UM) and a CWT (CWT+); or
    - Any left ventral (LV) fin clip (regardless of AD or CWT status).
- A fish should be deemed a natural-origin return (NOR) if it has:
    - An intact adipose fin (UM) no CWT (CWT-), and no left ventral (LV) fin clip.

Identifying whether a live salmon or steelhead is maiden or recapture:

- This section is most applicable to watersheds with two weirs but it is still applicable to all locations.
- Maiden: any fish with no left operculum punch (LOP) or Floy® tags.
    - Follow protocols as described for species/origin encountered.
- Recapture: any fish with a left operculum punch (LOP) or Floy® tags.
    - Use the recapture function in the tablet to look up a Floy® Tag number and find associated biodata and record:
        - LOP shape
        - Floy® tag information (color and tag #s)

        - Apply right operculum punch with proper shape based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.
    - Pass upstream.

Prioritization of species handling at trap and seining activities:

- As a general rule, NOR salmonids take priority over HOR salmonids. If a decision regarding handling priority at the trap is needed due to extenuating circumstances, the weir crew lead will make that determination.
- Seining may cause any fish holding directly below the weir to move downstream. It is important to coordinate with the weir crew lead to determine if seining should occur before or after working the trap box.

Overview of disposition by species and origin:

- Hold for broodstock:
    - NOR Chinook salmon (1 out of 3 per sex up to weekly collection goal)
    - HOR Chinook salmon (up to weekly collection goal)
    - NOR Coho salmon (1 out of 3 per sex may be collected up to weekly collection goal)
    - HOR Coho salmon (up to weekly collection goal)
- Remove:
    - HOR Chinook salmon in excess of weekly broodstock needs
    - HOR Coho salmon in excess of weekly broodstock needs
    - HOR steelhead
- Pass upstream:
    - NOR Chinook salmon (2 out of 3 per sex) plus all NOR Chinook in excess of weekly NOR broodstock goal.
    - NOR Coho salmon (2 out of 3 per sex) plus any in excess of weekly broodstock collection goal.
    - All Chum salmon (NOTE: the origin of Chum salmon cannot be determined using external characteristics though most should be natural-origin).
    - NOR steelhead
    - All Pink salmon
    - All Sockeye salmon
    - All Cutthroat and all other “non-target” species
- Pass (back) downstream:
    - NA (no fish should be passed back downstream at this time).

Data management:

- Fill out a header in the tablet every day the trap is in operation even if no fish were caught.
- Make note of all trap alterations and any missed trapping periods in comment section of each individual day’s header in the tablet.

- Every captured salmon and steelhead should have the following biological data recorded:
    - Species
    - Sex (M, F, or J); see species specific details below
    - Mark status (UM/AD)
    - CWT status via CWT status (Tablet field)/Sample Category (Scale card)
- NOTE: any fish that has a physical sample taken (i.e., scale, snout, DNA) must be recorded on a scale card as the scale number/position is how data from TWS & other labs (e.g., snout decodes) are linked.
- Use new scale cards each day.
- Certain biodata should also be handwritten on scale cards in addition to being captured in the tablet. This includes:
    - Date (back of scale card)
    - Position number
    - Fork length
    - Sex
    - Mark
    - Sample category
    - DNA vial # (if collected)
    - Snout ID (SNID) (if snout is collected)
- Clearly distinguish disposition on back of each scale card (i.e. weir wash-up, weir surplus, or fish passed upstream (Lives)) next to sample location or stream reach ID.
- Do NOT put any Floy® tag info or LOP info on scale cards. This will only be captured in the tablet.
- If a fish that should have been punched or tagged gets passed upstream without a punch and/or Floy® tags, it will be recorded in the tablet as "NP".
- Tablet data will be backed up daily to a thumb drive and uploaded weekly (at a minimum) to a shared drive location TBD.

Procedures for NOR Chinook salmon, HOR Chinook salmon, NOR Coho salmon, and HOR Coho Salmon Held for Brood

- Randomly collect 1 out of 3 NOR (unclipped and no CWT) Chinook salmon by sex for broodstock based on collection curve.
- Randomly collect 1 out of 3 NOR (unclipped and no CWT) Coho salmon by sex for broodstock based on collection curve.
- Randomly collect all HOR Chinook salmon for broodstock up to weekly collection goal based on collection curve.
- Randomly collect all HOR Coho salmon for broodstock up to weekly collection goal based on collection curve.
- Collection curves will be provided prior to initiation of weir operations.
- It is OK if the weekly collection goal is exceeded, but cumulative brood collection should not get more than one week ahead; if the cumulative brood collected gets one week

ahead, all NOR Chinook salmon and Coho salmon will be passed upstream and HOR Chinook salmon and Coho salmon will be removed.

- Broodstock collection curves are targets and may be changed with input of hatchery staff and review by management/science staff based on weather events. Collection dates will be dependent on when fish show up.
- All fish collected for broodstock will be sampled later.
- At the time of move from swim-in to brood pond, they will only be enumerated by sex and mark. Record this information using the clicker form in the tablet.

Procedures for Sampling NOR Chinook Salmon Passed Upstream at Weir

- To confirm NOR status, wand UM fish for CWT presence and make sure the left ventral fin is not clipped. Many ventral clips will be partially regenerated, so compare left ventral to the right ventral fin.
- Anesthetize all NOR Chinook salmon prior to sampling/tagging. Take care to not place any AD -clipped Chinook salmon, Coho salmon, or steelhead into the anesthetic bath as they are then not eligible for human consumption and unavailable for donation to food banks.
- Tag NOR Chinook with two of the proper colored Floy® tags based on weekly tagging schedule; one on each side of the dorsal fin. Record tag color and numbers on tablet form.
- Apply Floy® tags using the following methods:
  Implement the study design by tagging the fish with the appropriate color and numbered Floy® tag. Prepare for tagging by placing tags into semi-automated continuous feed tagging gun with the appropriate needle (Guy et al. 1996). As with all numbered tags, tag should be attached in sequence to allow for ease of data checking. Secure fish on a safe firm flat surface, tagging boot, or in the water. Push needle through the posterior of the dorsal fin rays at a 45-degree angle, so when the fish swims the tag will lay next to the body. The tag needle must be inserted past the pterygiophores of the dorsal fin to ensure high retention (Waldman et al. 1990). The tagging gun is twisted 90 degrees to dislodge the tag from the plastic clip and then removed. Tagged fish can be treated with antibiotics. Complete the data form to link the tag(s) to biological, scale, otolith, tag, spatial, and temporal data. Enumerate the number of successfully marked fish released by mark location and their release location.
- Apply left operculum punch with a shape based on weekly marking schedule (rotate to new punch shape each Sunday).
- Retain the left operculum punch for DNA tissue or collect a punch from the upper lobe of caudal fin if the left operculum punch sample is lost.
- Collect the following biodata from every NOR Chinook (1 in 1 sample rate):
  - 3 scales
  - Fork length (to the nearest cm)
  - Sex (M, F, or J defined as ≤ 56 cm)
  - Mark (UM)
  - DNA sample. Place (DNA) tissue sample on pre-labeled blotter paper. Record DNA sample number on scale card on the tablet.
- Allow fish to recover before release.

Procedures for Sampling HOR Chinook Salmon Removed at Weir

- Dispatch and set aside HOR Chinook salmon to be processed after the trap has been emptied. This prioritizes the processing of natural-origin fish and gets them released upstream more quickly, reducing the stress of being in the trap.
- Wand all marked fish to check for the presence of a coded-wire-tag (CWT).
- Sample rate of 1 in 1 for HOR Chinook salmon. Each sex needs to be on a separate scale card. Use a new scale card each day. Clearly distinguish disposition of fish on back of each scale card (i.e. N. Toutle swim-in surplus, N. Toutle brood pond surplus) next to sample location or stream reach ID.
- Collect the following data from each HOR Chinook salmon:
    - 3 scales,
    - Fork length (to the nearest cm),
    - Sex (M, F, or J defined as ≤ 56 cm)
    - Mark (AD-clip, AD- and LV clip, or LV clip), and
    - Sample category
        - Will be blank for Chinook salmon without a CWT.
        - Will be 0 Chinook salmon with a CWT. If a CWT is detected, bar-coded labels are used for snout identification tags.
- If wanding the fish indicates a CWT is present, take the snout and scan the bar-code of the snout label (follow number sequence if possible) using the built-in scanner on the tablet (A2 button). Record the snout identification and sample category on scale card.
- The big bag label number is recorded for that day in the tablet located on the top right of the event header page for that day's event or sampling. The big bag label is applicable to surplus and trap mortalities for fall Chinook and Coho only per location. It takes at least 1 CWT recovery to initiate a big bag label. A separate big bag label is used for Chinook salmon and Coho salmon. Include total number of Chinook salmon examined for CWTs by sex. This includes surplus and mortalities. Weir wash-ups are not included.
- One bag tag label should be used per day even when a double shift occurs. Snouts from one day, one location, one species, need to be bagged in a single large bag with a big bag label attached with the following information:
    - The big bag label number is recorded for that day in the tablet located on the top right of the event header page for that day's event or sampling.
    - Number examined for marks/CWT by sex.
    - Bagged snouts will be stored at N. Toutle Hatchery freezer.

1. Surplus Chinook need to be tallied by M/F/J for hatchery Form 3. Make sure the numbers on the scale cards for surplus match the number recorded on the Form 3. Hatchery staff will fill out the form 3.
2. Output queries have been installed on the tablet to allow for summary data transposing for hatchery form 3 records, big bag labels and other records.

Procedures for Sampling NOR Coho Salmon Passed Upstream at Weir

- Wand all UM Coho before passing upstream. If Coho is UM and CWT positive, tag with Floy® tag and retain for broodstock (helps hatchery staff identify), replace with unmarked CWT negative Coho to put upstream.
- Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
- Enumerate by species, sex, and mark category. Record on weir datasheet.
- No bio-data are collected.

Procedures for Sampling HOR Coho Salmon Removed at Weir

- Wand all fish for CWT presence.
- If Coho wands +, take snout and scan barcode snout label, drop label in bag and tie bag appropriately.
- The following data should be collected from CWT + Coho and recorded on both the tablet and a scale card:
    - Fork length
    - Sex (M, F, or J defined as ≤ 46cm)
    - Mark (UM, AD, ADRV, ADLV)
    - Sample category will be blank for Coho without a CWT. Or SC 1 if wand positive (+).
    - If wand positive (+), scan barcode or write down number.
- All wand – (negative) and + (positive) Coho need to be represented in tablet.
- Surplus Coho snouts will be stored in hatchery freezer.

Procedures for Sampling Other Salmonids Passed Upstream at Weir

Weir crew lead will determine sampling intensity of these species.

- All Sockeye salmon and Pink salmon:
    - These fish can be anesthetized prior to sampling if needed.
    - Enumerate by sex and mark and record in tablet.
    - Allow to recover before release upstream.
- NOR steelhead:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - The following biodata should be collected from all NOR steelhead (and recorded on both the weir datasheet and scale card):
        - 6 scales
        - Fork length (to the nearest cm)
        - Sex (M, F)
        - Mark (UM)
    - Allow to recover before release upstream.
- HOR steelhead and all cutthroat:
    - Do NOT use anesthetic.

    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Pass upstream.
- Chum salmon:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. SAVE PUNCH FOR DNA SAMPLE!
    - Collect 3 scales.
    - The following biodata should be collected and recorded on the tablet:
        - Fork length (to the nearest cm)
        - Sex (M/F)
        - Mark (UM)
        - DNA sample number
        - Any other marks/damage (i.e. mammal marks, net marks, etc.)
    - Allow to recover before release upstream.

Procedures for Trap Mortalities

- Should be kept separate from any intentionally surplused fish.
- Record in tablet as mortality.
- Follow the same protocols as you would for intentionally surplused fish.
- Put any Coho trap mortalities on actual scale cards and record sex, mark, fork length and sample category but do not take scales.

Definition of Weir "Wash-Up"

A weir wash-up is any carcass that washes onto or against the weir, weir structure or live box on the upstream side. It does not include carcasses on the bank or on the river bottom further than 5 feet upstream of the weir, nor the dead fish in the trap.

Procedures for Weir Wash-Ups

- Record all weir wash-ups in the tablet form as dead, being sure to click weir wash-up button, and disposition downstream. Weir wash-up sampling data are captured in the same header as the day's "normal" weir header, but weir wash-ups must go on a separate scale card.
- Examine all fish for any external tags and/or marks (caudal and both opercula). Record any carcass tags, Floy® tags and/or caudal/opercula punch recovery information.
    - If you can examine a fish for tags and/or mark and it has none, record NP (for none present) in tablet form.
    - If you are unable to determine punch shape but can tell one is present, record P.
    - If you are unable to examine a fish for tags and/or mark for whatever reason, record U (for undeterminable) in tablet form.
- <u>For all weir washups</u>, the following guideline should be followed for all species:

    - If fish is a recapture (has a Floy® tag or LOP), do NOT wand for a CWT as it was already wanded as a live fish.
    - If fish is NOT a recapture (NO Floy® tag or caudal punch or LOP), wand for CWT.
    - Be sure to note CWT status in tablet (not wanded, CWT -, or CWT +).
- For Chinook salmon and Chum salmon, the following biodata should be collected and recorded in the tablet form:
    - 3 scales (except no need if deemed a recapture)
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 56 cm)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
            - Fill out spawning ground survey snout label and keep with spawning ground survey snouts.
            - Write weir wash-up in comments of snout label.
    - DNA sample
    - Otoliths (Chum salmon only)
- For Coho salmon and steelhead, the following biodata should be collected and recorded in the tablet form and on actual scale cards:
    - Do NOT take scales
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 46 cm for Coho salmon)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
    - SNID (if CWT+) and follow CWT collection procedures
- For other species of weir wash-ups (not listed above):
    - If fish wands negative for CWT (CWT-) enumerate by species, mark category, and sex in tablet being sure to note as weir wash-up.
- After sampling, remove any Floy® and/or carcass tags, <u>cut tail,</u> and pass downstream of weir**.**

Procedures for CWT Recoveries

- ALWAYS use a cut proof glove when collecting a snout.
- Cut one inch behind the eye when collecting a snout. To avoid false positive CWT detections, wand the removed snout to confirm the presence of the CWT in the collected snout. If the CWT is not detected in the snout, wand the cut head and try to

determine if the wire is present there, or if there is an embedded hook or other source of metal causing the beep. Make a final determination on whether a CWT appears to be present (i.e., no other source of the detection beep can be located) and if so, extract and bag the head part that is the source of the detection. If a non-cwt source such as a hook is located, remove the hook or other metallic source and wand again. If negative, discard the snout and record the CWT status as negative for that fish.

- For confirmed CWT positive snouts, use the A2 button on the tablet to scan the bar-coded snout label into the database.
- All CWTs recovered need to be put on a CWT recovery sheet before going into the freezer at the Ridgefield office. Snouts need to be bagged separately by recovery type (weir surplus, weir wash-up, and stream survey) and recorded on separate CWT recovery sheets by recovery type.

Kalama River (Modrow) Weir Sampling Protocols

Hydraulic Project Approval Requirements

The weir shall be operated consistent with all applicable HPA requirements including the following:

- "Organic material that collects on the trap shall be removed and returned to state waters downstream of the project. Man-made trash shall be removed and disposed so that it does not reenter waters of the state."
- "Sediment flushing activities may take place throughout the year during high water events to reduce accumulated sediment in collection boxes. Sediment flushing to take place several times throughout the year during high water events to help reduce the accumulation of sediments in the collection boxes. Any additional flushing should take place during the normal work window between July 15 and September 15 for the life of the permit."
- "Stop all hydraulic project activities except those needed to control erosion and siltation, if flow conditions arise that will result in erosion or siltation of waters of the state."
- "Within one year of project completion, the banks shall be revegetated with native or other approved woody species as close to the affected area without impeding future construction of projects. Vegetative cuttings shall be planted at a maximum interval of three feet (on center) and maintained as necessary for three years to ensure 80 percent survival."
- "Restore bed and bank elevations and contours to pre-project condition."
- "All trap components, except river gravels, shall be immediately removed from waterward of the ordinary high water line (OHWL) upon project completion."

ESA Requirements

The weir shall be operated consistent with the requirements of all applicable biological opinions or other ESA authorizations. Handle and mortality limits for each listed species will be provided prior to initiating weir operations. Weir operation leads must monitor handle and mortality relative to these limits and notify supervisory staff when the need for an adaptive response is triggered.

General Procedures

Low water/poor recruitment:

- When water levels are low, or recruitment appears to be poor, the following measures will be implemented in coordination with the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead:
    - Monitor fish presence below weir daily by conducting short walking surveys in established index area downstream of weir to assess fish and/or redd presence and record this information in the header information on the tablet.
    - Notify the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead of poor recruitment issues.
    - Seine below weir.
    - Modify weir/holding pen design.
    - Upon approval from the Region 5 weir management lead, open trap and/or submerge resistance board panels to allow some fish to pass unimpeded.

High water:

- High water flows and associated debris can be dangerous and may cause damage to the weir. Safety procedures will continue to be updated in accordance with agency policy and safety requirements. It is important to monitor flows and the weather forecast. There are no stream flow gauges operating on the Kalama River currently; the best surrogate will be the East Fork Lewis River (EF Lewis Flows). If flows are high or begin rising rapidly:
    - Contact the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead.
    - 1st priority is always your safety.
        - If you are concerned about your or your co-worker's safety, stop and contact the weir crew lead for further direction.
        - Operating/cleaning the weir in higher flow conditions generally requires more than one staff person. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
        - Remember to always inspect and wear your PFD (personal floatation device) per WDFW policy!!
    - 2nd priority – fish health.
        - The goal is to avoid/reduce impacts to fish, particularly natural-origin fish, with special attention to ESA-listed fish!
    - 3rd priority – structure security.
        - Clean the weir! Generally, working in pairs (or more) at higher flows is required for safety. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.

        - Stay in close contact with weir crew lead to determine when cleaning weir should be abandoned to allow weir to submerge.
        - Once cleaning the weir is abandoned and weir panels are topped, wait until flows begin to recede and weir crew lead directs cleaning of weir panels to resume fishing ASAP after the high-water event.

Water Temperature:

- It is critical to monitor water temperatures while handling fish in the trap when the weather is warm. WDFW will utilize a tiered approach to water temperature management at the weir.
    - If the water temperature is less than 18 C, the weir will operate under the standard protocol.
    - If temperatures are greater than 18 C but less than 21 C, a modified operational protocol will be implemented. The modified protocols will include but not be limited to:
        - Electrofishing will not be utilized.
        - Water temperature will be monitored continuously in sampling vessels.
        - Water will be changed frequently in sampling vessels to ensure water temperatures do not exceed 21 C.
    - If water temperatures are greater than 21 C, standard and modified protocols will be suspended. Depending on the situation, WDFW will consider a variety of options including submerging weir panels, opening trap boxes, or closing trap boxes. In the event of a prolonged stretch of elevated water temperatures, staff may shift their schedule to process fish in the cooler early morning hours.

Fish recruitment and large fish numbers in the trap box:

- Contact the weir crew lead to request assistance and receive further direction if the number of fish in the trap box is becoming unmanageable.
- The Modrow Trap has a large fish capacity and is unlikely to become overcrowded. Generally, the density of fish in the trap box is self-regulating. Fish will generally discontinue entering the trap box once it is full. However, if the trap box appears overcrowded or you begin to see trap mortalities, the number of fish in the trap box will need to be reduced.
    - If this occurs at the beginning of the daily shift or while working fish, close the entrance to the trap box until fish numbers can be thinned by regular processing.
    - If this occurs at a trap check late in the day or after the trap has already been worked for the day, additional effort may be needed to reduce fish numbers in the trap box. In this situation, contact the weir crew lead to request assistance and receive further direction.

Identifying the origin of salmon and steelhead:

- To implement this protocol properly, the origin (natural vs. hatchery) of all salmon and steelhead must be identified.
- The origin of a salmon or steelhead captured at this weir will be determined based upon the presence or absence of an adipose fin.
- A fish should be deemed a hatchery-origin return (HOR) if it has an adipose (AD) fin clip or a left ventral (LV) fin clip.
- A fish should be deemed a natural-origin return (NOR) if it has an intact adipose fin (UM) and no left ventral (LV) fin clip.

Identifying whether a live salmon or steelhead is maiden or recapture:

- This section is most applicable to watersheds with two weirs but it is still applicable to all locations.
- Maiden: any fish with no left operculum punch (LOP
    - Follow protocols as described for species/origin encountered.
- Recapture: any fish with a left operculum punch (LOP).
    - Record:
        - LOP shape
        - Apply right operculum punch with proper shape based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.
    - Pass upstream.

Prioritization of species handling at trap and seining activities:

- As a general rule, NOR salmonids take priority over HOR salmonids. If a decision regarding handling priority at the trap is needed due to extenuating circumstances, the weir crew lead will make that determination.
- Seining may cause any fish holding directly below the weir to move downstream. It is important to coordinate with the weir crew lead to determine if seining should occur before or after working the trap box.

Overview of disposition by species and origin:

- Truck for broodstock:
    - Randomly collect HOR Chinook salmon (AD-clip) for broodstock early in the week based on weekly collection goal. Collection curves will be provided prior to initiation of weir operations.
- Remove:
    - HOR Chinook salmon with a LV or AD+LV
    - HOR Chinook salmon (AD-clip) in excess of weekly broodstock needs
- Pass upstream:
    - NOR Chinook salmon
    - All Coho salmon

    - All steelhead
    - All Chum salmon (NOTE: the origin of Chum salmon cannot be determined using external characteristics though most should be natural-origin).
    - All Pink salmon
    - All Sockeye salmon
    - All Cutthroat and all other "non-target" species
- Pass (back) downstream:
    - NA (no fish should be passed back downstream at this time)

Data management:

- Fill out a header in the tablet every day the trap is in operation even if no fish were caught.
- Make note of all trap alterations and any missed trapping periods in comment section of each individual day's header in the tablet.
- Every captured salmon and steelhead should have the following biological data recorded:
    - Species
    - Sex (M, F, or J); see species specific details below
    - Mark status (UM/AD)
    - CWT status via CWT status (Tablet field)/Sample Category (Scale card)
- NOTE: any fish that has a physical sample taken (i.e., scale, snout, DNA) must be recorded on a scale card as the scale number/position is how data from TWS & other labs (e.g., snout decodes) are linked.
- Use new scale cards each day.
- Certain biodata should also be handwritten on scale cards in addition to being captured in the tablet. This includes:
    - Date (back of scale card)
    - Position number
    - Fork length
    - Sex
    - Mark
    - Sample category
    - DNA Vial # (if collected)
    - Snout ID (SNID) (if snout is collected)
- Clearly distinguish disposition on back of each scale card (i.e. weir wash-up, weir surplus, or fish passed upstream (Lives)) next to sample location or stream reach ID.
- Do NOT put any Floy® tag info or LOP info on scale cards. This will only be captured in the tablet.
- If a fish that should have been punched or tagged gets passed upstream without a punch and/or Floy® tags, it will be recorded in the tablet as "NP".
- Before leaving for the day, data collected on tablet needs to be shared with hatchery staff and their paperwork filled out completely (Form 3, Big Bag Labels etc.). Use the Modrow trap summary form spreadsheet daily to provide hatchery staff with trap

summary numbers. Write legibly and be sure to completely fill out summary spreadsheet including 0's or Xs for no entries.

- Tablet data will be downloaded several times a week at the Region 5 office and shared with hatchery staff for QA/QC as needed.

Sampling NOR Chinook Salmon Passed Upstream at Weir

- Many ventral clips will be partially regenerated, so compare left ventral to the right ventral fin.
- Apply left operculum punch with a shape based on weekly marking schedule (rotate to new punch shape each Sunday).
- Collect the following biodata from every NOR Chinook (1 in 1 sample rate):
    - Sex (M, F, or J defined as ≤ 56 cm)
    - Mark (UM)
- Allow fish to recover before release.

Procedures for HOR Chinook Salmon Broodstock Trucked to Kalama Falls Hatchery

- Randomly collect all HOR Coho salmon for broodstock up to weekly collection goal based on collection curve.
- Collection curves will be provided prior to initiation of weir operations.
- It is OK if the weekly collection goal is exceeded, but cumulative NOR brood collection should not get more than one week ahead; if the cumulative brood collected gets one week ahead, all NOR Chinook will be passed upstream.
- Broodstock collection curves are targets and may be changed with input of hatchery staff and review by management/science staff based on weather events. Collection dates will be dependent on when fish show up.
- All fish collected for broodstock will be sampled later at the hatchery.
- At the time of transport from the weir site, they will only be enumerated by sex and mark. Record this information using the clicker form in the tablet.
- Transport of broodstock is the hatchery staff's responsibility.

Procedures for Sampling HOR Chinook Salmon Removed at Weir

- Dispatch and set aside HOR Chinook salmon to be processed after the trap has been emptied. This prioritizes the processing of natural-origin fish and gets them released upstream more quickly, reducing the stress of being in the trap.
- Wand all marked fish to check for the presence of a coded-wire-tag (CWT).
- Bio-sample rate of 1:20 for AD-clipped HOR Chinook salmon. <u>Keep separate bio-sample rate counts for males, females, and jacks.</u> Each sex needs to be on a separate scale card. Use a new scale card each day. Clearly distinguish disposition of fish on back of each scale card (i.e. Modrow surplus) next to sample location or stream reach ID.
- Bio-sample rate of 1:1 for LV-clipped HOR Chinook salmon. <u>Keep separate from AD-clipped scale cards.</u> Use a new scale card each day.
- Collect the following data from in-sample fish ("bios") and any Chinook that is CWT+ (SC 0 & 1) (data must be recorded both on scale cards and in the tablet form):

    - 3 scales,
    - Fork length (to the nearest cm),
    - Sex (M, F, or J defined as ≤ 56 cm),
    - Mark (AD-clip, AD- and LV clip, or LV clip), and
    - Sample category
        - Will be blank for Chinook salmon without a CWT.
        - Will be 1 for Chinook salmon that are out of sample (AD-clip Chinook #1-19) with a CWT.
        - Will be 0 for Chinook salmon that are in sample (AD clip Chinook #20) with a CWT.
- If wanding the fish indicates a CWT is present, take the snout and scan the bar-code of the snout label (follow number sequence if possible) using the built-in scanner on the tablet (A2 button). Record the snout identification and sample category on scale card.
- If an HOR fish was accidentally placed in the anesthetic bath, or is otherwise unfit for human consumption, it must be used for nutrient enhancement as it is not eligible for human consumption.
- The big bag label number is recorded for that day in the tablet located on the top right of the event header page for that day's event or sampling. The big bag label is applicable to surplus and trap mortalities for fall Chinook and Coho only per location. It takes at least 1 CWT recovery to initiate a Big Bag Label. A separate big bag label is used for Chinook and Coho. Include total number of Chinook examined for CWTs by sex. This includes surplus and mortalities. Weir wash-ups are not included.
- One bag tag label should be used per day even when a double shift occurs. Snouts from one day, one location, one species, need to be bagged in a single large bag with a big bag label attached with the following information:
    - The big bag label number is recorded for that day in the tablet located on the top right of the event header page for that day's event or sampling.
    - Number examined for marks/CWT by sex.
    - Bagged snouts will be stored at Kalama Falls Hatchery freezer.
3. Surplus Chinook need to be tallied by M/F/J for hatchery Form 3. Make sure the numbers on the scale cards for surplus match the number recorded on the Form 3. Hatchery staff will fill out the form 3.
4. Output queries have been installed on the tablet to allow for summary data transposing for hatchery form 3 records, big bag labels and other records.

Procedures for Sampling Coho Salmon Passed Upstream at Weir

- All live Coho are passed upstream.
    - Enumerate by sex and fin mark.
    - All live Coho enumeration data goes into the tablet using the datasheet function. Typically, S (early) Coho will be selected as the species through late September and then N (late) Coho will be selected as the species through the end of October. It is possible to have both in the trap during this overlap period. Hatchery staff will assist with the appropriate species call.

Procedures for Sampling Other Salmonids Passed Upstream at Weir

- All Sockeye salmon, and Pink salmon:
    - Enumerate by sex and mark and record in tablet.
    - Pass upstream.
- NOR steelhead, HOR steelhead, and all cutthroat:
    - Wand for PIT tag.
    - Enumerate by sex and mark and record in tablet.
    - Pass upstream.
- Chum salmon:
    - Punch left operculum with proper shape punch based on weekly marking schedule. SAVE PUNCH FOR DNA SAMPLE!
    - Collect 3 scales.
    - The following biodata should be collected and recorded on the tablet:
        - Fork length (to the nearest cm)
        - Sex (M/F)
        - Mark (UM)
        - DNA sample number
        - Any other marks/damage (i.e. mammal marks, net marks, etc.)
    - Pass upstream.

Procedures for Trap Mortalities

- Trap mortalities are dead fish located in the trap channel only. Also include mortalities from handling such as dropped fish etc.
- Should be kept separate from any intentionally surplused fish.
- Record in tablet as mortality; use the datasheet function for data collection and enumeration in tablet.
- Follow the same protocols as you would for intentionally surplused fish.

Definition of Weir "Wash-Up"

A weir wash-up is any carcass that washes onto or against the weir, weir structure or live box on the upstream side. It does not include carcasses on the bank or on the river bottom further than 5 feet upstream of the weir, nor the dead fish in the trap.

Procedures for Procedures for Weir Wash-Ups

- Record all weir wash-ups in the tablet form as dead, being sure to click weir wash-up button, and disposition downstream. Weir wash-up sampling data are captured in the same header as the day's "normal" weir header, but weir wash-ups must go on a separate scale card.
- Examine all fish for any external tags and/or marks (caudal and both opercula). Record any carcass tags, Floy® tags and/or caudal/opercula punch recovery information.
    - If you can examine a fish for tags and/or mark and it has none, record NP (for none present) in tablet form.
    - If you are unable to determine punch shape but can tell one is present, record P.

    - If you are unable to examine a fish for tags and/or mark for whatever reason, record U (for undeterminable) in tablet form.
- <u>For all weir washups</u>, the following guideline should be followed for all species:
    - If fish is a recapture (has a LOP), wand for a CWT
    - If fish is NOT a recapture (No LOP), wand for CWT and PIT tag (only for steelhead and Cutthroat).
    - Be sure to note CWT status in tablet (CWT -, or CWT +).
- For Chinook salmon and Chum salmon, the following biodata should be collected and recorded in the tablet form:
    - Use visual stock identification (VSI) and right operculum punch (lg circle) to run of Chinook (spring or fall).
    - 3 scales (fall Chinook and Chum salmon) or 6 scales for spring Chinook
        - Anytime the VSI is not obvious, take 3 scales and record them under the "best guess race" species/sub run scale card at a 1:1 recording length, sex, fin mark and SNID if wand positive.
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 56 cm)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
            - Fill out spawning ground survey snout label and keep with spawning ground survey snouts.
            - Write weir wash-up in comments of snout label.
    - DNA sample (Chum salmon only)
    - Otoliths (Chum salmon only)
- For Coho salmon and steelhead, the following biodata should be collected and recorded in the tablet form and on actual scale cards:
    - Do NOT take scales.
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 46 cm for Coho salmon)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
    - SNID (if CWT+) and follow CWT collection procedures
- For other species of weir wash-ups (not listed above):
    - If fish wands negative for CWT (CWT-) enumerate by species, mark category, and sex in tablet being sure to note as weir wash-up.

- These weir wash-up fish are not included on the surplus Big Bag Label enumerations, a separate BBL is used. Store snouts and record CWT+ weir wash-ups on the CWT recovery summary sheet, both are located at Fallert Creek Hatchery.
- After sampling, remove any Floy® and/or carcass tags, cut tail, and pass downstream of weir**.**
  of weir**.**

Procedures for CWT Recoveries

- ALWAYS use a cut proof glove when collecting a snout.
- Cut one inch behind the eye when collecting a snout. To avoid false positive CWT detections, wand the removed snout to confirm the presence of the CWT in the collected snout. If the CWT is not detected in the snout, wand the cut head and try to determine if the wire is present there, or if there is an embedded hook or other source of metal causing the beep. Make a final determination on whether a CWT appears to be present (i.e., no other source of the detection beep can be located) and if so, extract and bag the head part that is the source of the detection. If a non-cwt source such as a hook is located, remove the hook or other metallic source and wand again. If negative, discard the snout and record the CWT status as negative for that fish.
- For confirmed CWT positive snouts, use the A2 button on the tablet to scan the bar-coded snout label into the database.
- All CWTs recovered need to be put on a CWT recovery sheet before going into the freezer at the Ridgefield office. Snouts need to be bagged separately by recovery type (weir surplus, weir wash-up, and stream survey) and recorded on separate CWT recovery sheets by recovery type.

Cedar Creek Weir Sampling Protocols

Hydraulic Project Approval Requirements

The weir shall be operated consistent with all applicable HPA requirements including the following:

- “Organic material that collects on the trap shall be removed and returned to state waters downstream of the project. Man-made trash shall be removed and disposed so that it does not reenter waters of the state.”
- “Sediment flushing activities may take place throughout the year during high water events to reduce accumulated sediment in collection boxes. Sediment flushing to take place several times throughout the year during high water events to help reduce the accumulation of sediments in the collection boxes. Any additional flushing should take place during the normal work window between July 15 and September 15 for the life of the permit.”
- “Stop all hydraulic project activities except those needed to control erosion and siltation, if flow conditions arise that will result in erosion or siltation of waters of the state.”
- “Within one year of project completion, the banks shall be revegetated with native or other approved woody species as close to the affected area without impeding future construction of projects. Vegetative cuttings shall be planted at a maximum interval of

three feet (on center) and maintained as necessary for three years to ensure 80 percent survival."

- "Restore bed and bank elevations and contours to pre-project condition."
- "All trap components, except river gravels, shall be immediately removed from waterward of the ordinary high water line (OHWL) upon project completion."

ESA Requirements

The weir shall be operated consistent with the requirements of all applicable biological opinions or other ESA authorizations. Handle and mortality limits for each listed species will be provided prior to initiating weir operations. Weir operation leads must monitor handle and mortality relative to these limits and notify supervisory staff when the need for an adaptive response is triggered.

General Procedures

Low water/poor recruitment:

- When water levels are low, or recruitment appears to be poor, the following measures will be implemented in coordination with the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead:
    - Monitor fish presence below weir daily by conducting short walking surveys in established index area downstream of weir to assess fish and/or redd presence and record this information in the header information on the tablet.
    - Notify the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead of poor recruitment issues.
    - Seine below weir.
    - Modify weir/holding pen design.
    - Upon approval from the Region 5 weir management lead, open trap and/or submerge resistance board panels to allow some fish to pass unimpeded.

High water:

- High water flows and associated debris can be dangerous and may cause damage to the weir. Safety procedures will continue to be updated in accordance with agency policy and safety requirements. It is important to monitor flows and the weather forecast. There are no stream flow gauges operating on Cedar Creek currently; the best surrogate will be the East Fork Lewis River (EF Lewis Flows). If flows are high or begin rising rapidly:
    - Contact the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead.
    - 1st priority is always your safety.
        - If you are concerned about your or your co-worker's safety, stop and contact the weir crew lead for further direction.
        - Operating/cleaning the weir in higher flow conditions generally requires more than one staff person. If you are working alone and flows are rising

rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
        - Remember to always inspect and wear your PFD (personal floatation device) per WDFW policy!!
    - 2nd priority – fish health.
        - The goal is to avoid/reduce impacts to fish, particularly natural-origin fish, with special attention to ESA-listed fish!
            - Get trap box cleaned out by processing as many fish as possible prior to flows becoming unworkable. Contact the weir crew lead to request assistance and receive further direction if the situation is becoming unmanageable.
            - If flows are close to topping live box, staff may close downstream doors to prevent more fish from recruiting into box.
            - Upon approval of the Region 5 weir management lead, open door(s) on trap box to allow any fish remaining in trap box to swim out.
    - 3rd priority – structure security.
        - Clean the weir! Generally, working in pairs (or more) at higher flows is required for safety. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
        - Stay in close contact with weir crew lead to determine when cleaning weir should be abandoned to allow weir to submerge.
        - Once cleaning the weir is abandoned and weir panels are topped, wait until flows begin to recede and weir crew lead directs cleaning of weir panels to resume fishing ASAP after the high-water event.

Water temperature:

- It is critical to monitor water temperatures while handling fish in the trap when the weather is warm. WDFW will utilize a tiered approach to water temperature management at the weir.
    - If the water temperature is less than 18 C, the weir will operate under the standard protocol.
    - If temperatures are greater than 18 C but less than 21 C, a modified operational protocol will be implemented. The modified protocols will include but not be limited to:
        - Electrofishing will not be utilized.
        - Water temperature will be monitored continuously in sampling vessels.
        - Water will be changed frequently in sampling vessels to ensure water temperatures do not exceed 21 C.
    - If water temperatures are greater than 21 C, standard and modified protocols will be suspended. Depending on the situation, WDFW will consider a variety of options including submerging weir panels, opening trap boxes, or closing trap boxes. In the event of a prolonged stretch of elevated water temperatures, staff may shift their schedule to process fish in the cooler early morning hours.

Fish recruitment and large fish numbers in the trap box:

- When fish are moving, let them move. If fish are actively recruiting to the trap box, do NOT get in the trap box to start working fish. Wait until trap box is full or fish recruitment slows to begin working fish.
- Contact the weir crew lead to request assistance and receive further direction if the number of fish in the trap box is becoming unmanageable.
- Generally, the density of fish in the trap box is self-regulating. Fish will generally discontinue entering the trap box once it is full. However, if the trap box appears overcrowded or you begin to see trap mortalities, the number of fish in the trap box will need to be reduced.
    - If this occurs at the beginning of the daily shift or while working fish, close the entrance to the trap box until fish numbers can be thinned by regular processing.
    - If this occurs at a trap check late in the day or after the trap has already been worked for the day, additional effort may be needed to reduce fish numbers in the trap box. In this situation, contact the weir crew lead to request assistance and receive further direction and begin to surplus LV and/or AD-clipped Chinook to reduce crowding until the trap can safely be left until the next morning. Surplused fish can be stockpiled for sampling the following day.

Identifying the origin of salmon and steelhead:

- Accurately identifying the origin (natural or hatchery) of salmon and steelhead captured at the weir is critically important to implementation of the protocol.
- The origin of Chinook salmon, Coho salmon, and steelhead can only be determined via the combination of their adipose fin clip status and CWT status.
- Therefore, all adult Chinook salmon, Coho salmon, and steelhead must be examined for all fin clips and scanned for CWTs regardless of adipose fin clip status.
- A fish should be deemed a hatchery-origin return (HOR) if it has either:
    - Adipose (AD) fin clip and no CWT (CWT-); or
    - Adipose (AD) fin clip and a CWT (CWT+); or
    - An intact adipose fin (UM) and a CWT (CWT+); or
    - Any left ventral (LV) fin clip (regardless of AD or CWT status).
- A fish should be deemed a natural-origin return (NOR) if it has:
    - An intact adipose fin (UM) no CWT (CWT-), and no left ventral (LV) fin clip.

Identifying whether a live salmon or steelhead is maiden or recapture:

- This section is most applicable to watersheds with two weirs but it is still applicable to all locations.
- Maiden: any fish with no left operculum punch (LOP) or Floy® tags.
    - Follow protocols as described for species/origin encountered.
- Recapture: any fish with a left operculum punch (LOP) or Floy® tags.

- Use the recapture function in the tablet to look up a Floy® Tag number and find associated biodata and record:
  - LOP shape
  - Floy® tag information (color and tag #s)
  - Apply right operculum punch with proper shape based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.
- Pass upstream.

Prioritization of species handling at trap and seining activities:

- As a general rule, NOR salmonids take priority over HOR salmonids. If a decision regarding handling priority at the trap is needed due to extenuating circumstances, the weir crew lead will make that determination.
- Seining may cause any fish holding directly below the weir to move downstream. It is important to coordinate with the weir crew lead to determine if seining should occur before or after working the trap box.

Overview of disposition by species and origin:

- Remove/Surplus:
  - HOR Chinook salmon
  - HOR Coho salmon
  - HOR steelhead
- Pass upstream:
  - NOR Chinook salmon
  - NOR Coho salmon
  - NOR steelhead
  - All Pink salmon
  - All Sockeye salmon
  - Chum salmon (NOTE: the origin of Chum salmon cannot be determined using external characteristics though most should be natural-origin)
  - Cutthroat and all other "non-target" species
- Pass (back) downstream:
  - NA (no fish should be passed back downstream at this time).

Data management:

- Fill out a header in the tablet every day the trap is in operation even if no fish were caught.
- Make note of all trap alterations and any missed trapping periods in comment section of each individual day's header in the tablet.
- Every captured salmon and steelhead should have the following biological data recorded:
  - Species
  - Sex (M, F, or J); see species specific details below
  - Mark status (UM/AD)

    - CWT status via CWT status (Tablet field)/Sample Category (Scale card)
- NOTE: any fish that has a physical sample taken (i.e., scale, snout, DNA) must be recorded on a scale card as the scale number/position is how data from TWS & other labs (e.g., snout decodes) are linked.
- Use new scale cards each day.
- Certain biodata should also be handwritten on scale cards in addition to being captured in the tablet. This includes:
    - Date (back of scale card)
    - Position number
    - Fork length
    - Sex
    - Mark
    - Sample category
    - DNA vial # (if collected)
    - Snout ID (SNID) (if snout is collected)
- Clearly distinguish disposition on back of each scale card (i.e. weir wash-up, weir surplus, or fish passed upstream (Lives)) next to sample location or stream reach ID.
- Do NOT put any Floy® tag info or LOP info on scale cards. This will only be captured in the tablet.
- If a fish that should have been punched or tagged gets passed upstream without a punch and/or Floy® tags, it will be recorded in the tablet as "NP".
- Tablet data will be backed up daily to a thumb drive and uploaded weekly (at a minimum) to a shared drive location TBD.

Procedures for Sampling NOR Chinook Salmon Passed Upstream at Weir

- To confirm NOR status, wand UM fish for CWT presence and make sure the left ventral fin is not clipped. Many ventral clips will be partially regenerated, so compare left ventral to the right ventral fin.
    - These fish can be anesthetized prior to sampling if needed. Take care to not place any AD -clipped Chinook salmon, Coho salmon, or steelhead into the anesthetic bath as they are then not eligible for human consumption and unavailable for donation to food banks.
- Apply left operculum punch.
- Collect the following biodata from every NOR Chinook (1 in 1 sample rate):
    - Sex (M, F, or J defined as ≤ 56 cm)
    - Mark (UM)
- Allow fish to recover in before release.

Procedures for Sampling for HOR Chinook Salmon Removed at Weir

- Dispatch and set aside HOR Chinook salmon to be processed after the trap has been emptied. This prioritizes the processing of natural-origin fish and gets them released upstream more quickly, reducing the stress of being in the trap.
- Wand all marked fish to check for the presence of a coded-wire-tag (CWT).

- Sample rate of 1 in 1 for HOR Chinook salmon. All HOR Chinook salmon removed can be put on the same scale card for any one day. Use a new scale card each day.
- Collect the following data from each HOR Chinook salmon:
    - 3 scales
    - Fork length (to the nearest cm)
    - Sex (M, F, or J defined as ≤ 56 cm)
    - Mark (AD-clip, AD- and LV clip, or LV clip)
    - Sample category
        - Will be blank for Chinook salmon without a CWT.
        - Will be 0 Chinook salmon with a CWT. If a CWT is detected, bar-coded labels are used for snout identification tags.
- If wanding the fish indicates a CWT is present, take the snout and scan the bar-code of the snout label (follow number sequence if possible) using the built-in scanner on the tablet (A2 button). Record the snout identification and sample category on scale card.
- These are considered "Surplus fish" and should have a 'fish status' of 'dead' recorded in the tablet.
- Disposition for surplus Chinook salmon is downstream.
- If any surplus fish are transported away from the weir site, the following needs to occur:
    - The destination of surplus fish should be coordinated with regional staff.
    - A Form 3 (Fish and egg disposition ticket) needs to be completed and the following information denoted:
        - Disposition location by M/F/J and mark status.
        - Verify the recorded numbers on the scale card and Form 3 match.

Procedures for Sampling for HOR Coho Salmon Removed at Weir

- Each surplus Coho removed will be recorded in the tablet. They do not need to go on a scale card unless wand CWT+. No scales for CWT – Coho.
- If Coho wands +, take snout and scan the bar code label into the tablet (see CWT recoveries section).
- The following data should be collected from CWT + Coho and recorded both in the tablet and on a scale card:
    - Fork length
    - Sex (M, F, or J defined as ≤ 46cm)
    - Mark
    - Record SNID (via scanner)
    - Sample category (1)
- These are considered "Surplus fish" and should have a 'fish status' of 'dead' recorded in the tablet.
- Disposition for surplus Coho is downstream.
- If any surplus fish are transported away from the weir site, the following needs to occur:
    - The destination of surplus fish should be coordinated with regional staff.
    - A Form 3 (Fish and egg disposition ticket) needs to be completed and the following information denoted:
        - Disposition location by M/F/J and mark status.

        - Verify the recorded numbers on the scale card and Form 3 match.

Procedures for Sampling HOR Steelhead Removed at Weir

- Check/wand for CWT.
- Do not need to collect scales.
- Record the following data either directly into the table or on the whiteboard (does not need to be on a scale card) and enter on tablet later:
    - Species
    - Sex: M, F
    - Mark status (NOTE: record adipose fin clip status – UM/AD – and any other clip e.g., LV)
    - Fork length (to the nearest cm)
    - CWT status (Beep = CWT+, No Beep = CWT-; a Not Scanned option exists but should not be used)
- For CWT+ fish, collect the snout and create/scan a snout barcode; record barcode in the SNID data field; place snout/barcode in bag.
- These are considered "Surplus fish" and should have a 'fish status' of 'dead' recorded in the tablet.
- Disposition for surplus steelhead is either food bank or mort pit. They cannot be used for nutrient enhancement due to disease.
- If any surplus fish are transported away from the weir site, the following needs to occur:
    - The destination of surplus fish should be coordinated with regional staff.
    - A Form 3 (Fish and egg disposition ticket) needs to be completed and the following information denoted:
        - Disposition location by M/F/J and mark status.
        - Verify the recorded numbers on the scale card and Form 3 match.

Procedures for Sampling Other Salmonids Passed Upstream at Weir

Weir crew lead will determine sampling intensity of these species.

- NOR Coho salmon, all Sockeye salmon, and Pink salmon:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Allow to recover before release upstream.
- NOR steelhead:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - The following biodata should be collected from all NOR steelhead (and recorded on both the weir datasheet and scale card):

        - 6 scales
        - Fork length (to the nearest cm)
        - Sex (M, F)
        - Mark (UM)
    - Allow to recover before release upstream.
- Cutthroat:
    - Do NOT use anesthetic.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Pass upstream.
- Chum salmon:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. SAVE PUNCH FOR DNA SAMPLE!
    - Collect 3 scales.
    - The following biodata should be collected and recorded on the tablet:
        - Fork length (to the nearest cm)
        - Sex (M/F)
        - Mark (UM)
        - DNA sample number
        - Any other marks/damage (i.e. mammal marks, net marks, etc.)
    - Allow to recover before release upstream.

Procedures for Trap Mortalities

- Should be kept separate from any intentionally surplused fish.
- Record in tablet as mortality.
- Follow the same protocols as you would for intentionally surplused fish.
- Put any Coho trap mortalities on actual scale cards and record sex, mark, fork length and sample category but do not take scales.

Definition of Weir "Wash-Up"

A weir wash-up is any carcass that washes onto or against the weir, weir structure or live box on the upstream side. It does not include carcasses on the bank or on the river bottom further than 5 feet upstream of the weir, nor the dead fish in the trap.

Procedures for Weir Wash-Ups

- Record all weir wash-ups in the tablet form as dead, being sure to click weir wash-up button, and disposition downstream. Weir wash-up sampling data are captured in the same header as the day's "normal" weir header, but weir wash-ups must go on a separate scale card.

- Examine all fish for any external tags and/or marks (caudal and both opercula). Record any carcass tags, Floy® tags and/or caudal/opercula punch recovery information.
    - If you can examine a fish for tags and/or mark and it has none, record NP (for none present) in tablet form.
    - If you are unable to determine punch shape but can tell one is present, record P.
    - If you are unable to examine a fish for tags and/or mark for whatever reason, record U (for undeterminable) in tablet form.
- <u>For all weir washups</u>, the following guideline should be followed for all species:
    - If fish is a recapture (has a Floy® tag or LOP), do NOT wand for a CWT as it was already wanded as a live fish.
    - If fish is NOT a recapture (NO Floy® tag or caudal punch or LOP), wand for CWT.
    - Be sure to note CWT status in tablet (not wanded, CWT -, or CWT +).
- For Chinook salmon and Chum salmon, the following biodata should be collected and recorded in the tablet form:
    - 3 scales (except no need if deemed a recapture)
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 56 cm)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
            - Fill out spawning ground survey snout label and keep with spawning ground survey snouts.
            - Write weir wash-up in comments of snout label.
    - DNA sample
    - Otoliths (Chum salmon only)
- For Coho salmon and steelhead, the following biodata should be collected and recorded in the tablet form and on actual scale cards:
    - Do NOT take scales
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 46 cm for Coho salmon)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
    - SNID (if CWT+) and follow CWT collection procedures
- For other species of weir wash-ups (not listed above):
    - If fish wands negative for CWT (CWT-) enumerate by species, mark category, and sex in tablet being sure to note as weir wash-up.

- After sampling, remove any Floy® and/or carcass tags, cut tail, and pass downstream of weir**.**

Procedures for CWT Recoveries

- ALWAYS use a cut proof glove when collecting a snout.
- Cut one inch behind the eye when collecting a snout. To avoid false positive CWT detections, wand the removed snout to confirm the presence of the CWT in the collected snout. If the CWT is not detected in the snout, wand the cut head and try to determine if the wire is present there, or if there is an embedded hook or other source of metal causing the beep. Make a final determination on whether a CWT appears to be present (i.e., no other source of the detection beep can be located) and if so, extract and bag the head part that is the source of the detection. If a non-cwt source such as a hook is located, remove the hook or other metallic source and wand again. If negative, discard the snout and record the CWT status as negative for that fish.
- For confirmed CWT positive snouts, use the A2 button on the tablet to scan the bar-coded snout label into the database. All CWTs recovered need to be put on a CWT recovery sheet before going into the freezer at the Ridgefield office. Snouts need to be bagged separately by recovery type (weir surplus, weir wash-up, and stream survey) and recorded on separate CWT recovery sheets by recovery type.

Cedar Creek Ladder Trap (Grist Mill) Sampling Protocols

Hydraulic Project Approval Requirements

The ladder shall be operated consistent with all applicable HPA requirements including the following:

- "Organic material that collects on the trap shall be removed and returned to state waters downstream of the project. Man-made trash shall be removed and disposed so that it does not reenter waters of the state."
- "Traps shall be installed to remain in place during all expected flows, shall not result in flow of water outside the banks, and shall be secured to prevent loss of parts downstream in the events of trap failure. Trap parts shall be removed when necessary to prevent high flows from damaging the bed or banks of the stream, or trap components. These parts shall not be reinstalled until flows subside sufficiently to allow trap operation and prevent damage to the stream bed, banks, or redds."
- "Aquatic vegetation shall not be removed or disturbed. Alteration of bank vegetation shall be limited to that necessary to install the traps. Trees with a breast heigh diameter greater than 4 inches shall not be disturbed."
- "All woody plants on the banks or in the bed of state waters removed or damaged by the work beyond their capability to regenerate shall be replaced. Replacement shall be by replanting or natural recruitment with woody plants native to the area. Woody plants shall be replaced and maintained at a ratio of at least 1:1 by the end of the first growing season after impact. If replacement plants fail, additional plantings, or natural recruitment is required prior to the next growing season to achieve and maintain at least 1:1 replacement."

- "Traps shall be inspected and maintained daily during the period when they are in place."

ESA Requirements

The weir shall be operated consistent with the requirements of all applicable biological opinions or other ESA authorizations. Handle and mortality limits for each listed species will be provided prior to initiating weir operations. Weir operation leads must monitor handle and mortality relative to these limits and notify supervisory staff when the need for an adaptive response is triggered.

General Procedures

Low water/poor recruitment:

Not applicable, fish ladder

High water:

Not applicable, fish ladder

Water temperature:

- It is critical to monitor water temperatures while handling fish in the trap when the weather is warm. WDFW will utilize a tiered approach to water temperature management at the weir.
    - If the water temperature is less than 18 C, the weir will operate under the standard protocol.
    - If temperatures are greater than 18 C but less than 21 C, a modified operational protocol will be implemented. The modified protocols will include but not be limited to:
        - Electrofishing will not be utilized.
        - Water temperature will be monitored continuously in sampling vessels.
        - Water will be changed frequently in sampling vessels to ensure water temperatures do not exceed 21 C.
    - If water temperatures are greater than 21 C, standard and modified protocols will be suspended. Depending on the situation, WDFW will consider a variety of options including submerging weir panels, opening trap boxes, or closing trap boxes. In the event of a prolonged stretch of elevated water temperatures, staff may shift their schedule to process fish in the cooler early morning hours.

Fish recruitment and large fish numbers in the trap box:

- When fish are moving, let them move. If fish are actively recruiting to the trap box, do NOT get in the trap box to start working fish. Wait until trap box is full or fish recruitment slows to begin working fish.

- Contact the weir crew lead to request assistance and receive further direction if the number of fish in the trap box is becoming unmanageable.
- Generally, the density of fish in the trap box is self-regulating. Fish will generally discontinue entering the trap box once it is full. However, if the trap box appears overcrowded or you begin to see trap mortalities, the number of fish in the trap box will need to be reduced.
    - If this occurs at the beginning of the daily shift or while working fish, close the entrance to the trap box until fish numbers can be thinned by regular processing.
    - If this occurs at a trap check late in the day or after the trap has already been worked for the day, additional effort may be needed to reduce fish numbers in the trap box. In this situation, contact the weir crew lead to request assistance and receive further direction and begin to surplus LV and/or AD-clipped Chinook to reduce crowding until the trap can safely be left until the next morning. Surplused fish can be stockpiled for sampling the following day.

Identifying the origin of salmon and steelhead:

- Accurately identifying the origin (natural or hatchery) of salmon and steelhead captured at the weir is critically important to implementation of the protocol.
- The origin of Chinook salmon, Coho salmon, and steelhead can only be determined via the combination of their adipose fin clip status and CWT status.
- Therefore, all adult Chinook salmon, Coho salmon, and steelhead must be examined for all fin clips and scanned for CWTs regardless of adipose fin clip status.
- A fish should be deemed a hatchery-origin return (HOR) if it has either:
    - Adipose (AD) fin clip and no CWT (CWT-); or
    - Adipose (AD) fin clip and a CWT (CWT+); or
    - An intact adipose fin (UM) and a CWT (CWT+); or
    - Any left ventral (LV) fin clip (regardless of AD or CWT status).
- A fish should be deemed a natural-origin return (NOR) if it has:
    - An intact adipose fin (UM) no CWT (CWT-), and no left ventral (LV) fin clip.

Identifying whether a live salmon or steelhead is maiden or recapture:

- This section is most applicable to watersheds with two weirs but it is still applicable to all locations.
- Maiden: any fish with no left or right operculum punch (LOP/ROP) or Floy® tags.
    - Follow protocols as described for species/origin encountered.
- Recapture: any fish with a left or right operculum punch (LOP/ROP) or Floy® tags.
    - Use the recapture function in the tablet to look up a Floy® Tag number and find associated biodata and record:
        - LOP or ROP shape
        - Floy® tag information (color and tag #s)

        - Apply right operculum punch with proper shape based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.
    - Pass upstream.

Prioritization of species handling at trap and seining activities:

- As a general rule, NOR salmonids take priority over HOR salmonids. If a decision regarding handling priority at the trap is needed due to extenuating circumstances, the weir crew lead will make that determination.
- Seining is not anticipated to occur below this location.

Overview of disposition by species and origin:

- Remove:
    - HOR Chinook salmon
    - HOR Coho salmon
    - HOR steelhead
- Pass upstream:
    - NOR Chinook salmon
    - NOR Coho salmon
    - NOR steelhead
    - All Chum salmon (NOTE: the origin of Chum salmon cannot be determined using external characteristics though most should be natural-origin).
    - All Pink salmon
    - All Sockeye salmon
    - All Cutthroat and all other "non-target" species.
- Pass (back) downstream:
    - NA (no fish should be passed back downstream at this time).

Data management:

- Fill out a header in the tablet every day the trap is in operation even if no fish were caught.
- Make note of all trap alterations and any missed trapping periods in comment section of each individual day's header in the tablet.
- Every captured salmon and steelhead should have the following biological data recorded:
    - Species
    - Sex (M, F, or J); see species specific details below
    - Mark status (UM/AD)
    - CWT status via CWT status (Tablet field)/Sample Category (Scale card)
- NOTE: any fish that has a physical sample taken (i.e., scale, snout, DNA) must be recorded on a scale card as the scale number/position is how data from TWS & other labs (e.g., snout decodes) are linked.
- Use new scale cards each day.

- Certain biodata should also be handwritten on scale cards in addition to being captured in the tablet. This includes:
    - Date (back of scale card)
    - Position number
    - Fork length
    - Sex
    - Mark
    - Sample category
    - DNA vial # (if collected)
    - Snout ID (SNID) (if snout is collected)
- Clearly distinguish disposition on back of each scale card (i.e. weir wash-up, weir surplus, or fish passed upstream (Lives)) next to sample location or stream reach ID.
- Do NOT put any Floy® tag info or LOP info on scale cards. This will only be captured in the tablet.
- If a fish that should have been punched or tagged gets passed upstream without a punch and/or Floy® tags, it will be recorded in the tablet as "NP".
- Tablet data will be backed up daily to a thumb drive and uploaded weekly (at a minimum) to a shared drive location TBD.

Procedures for Sampling NOR Chinook Salmon Passed Upstream at Ladder

- To confirm NOR status, wand UM fish for CWT presence and make sure the left ventral fin is not clipped. Many ventral clips will be partially regenerated, so compare left ventral to the right ventral fin.
- Anesthetize all NOR Chinook salmon prior to sampling/tagging. Take care to not place any AD -clipped Chinook salmon, Coho salmon, or steelhead into the anesthetic bath as they are then not eligible for human consumption and unavailable for donation to food banks.
- Apply right operculum punch with a shape based on weekly marking schedule (rotate to new punch shape each Sunday).
- Record the following biodata should be collected from maiden (fish does not have Floy® tags or a LOP present) NOR Chinook (either directly into the tablet or on the whiteboard and enter on tablet later:
    - 3 scales
    - Fork length (to the nearest cm)
    - Sex (M, F, or J defined as ≤ 56 cm)
    - Mark (UM)
- Allow fish to recover in before release.

Procedures for Sampling HOR Chinook Salmon Removed at Ladder

- Dispatch and set aside HOR Chinook salmon to be processed after the trap has been emptied. This prioritizes the processing of natural-origin fish and gets them released upstream more quickly, reducing the stress of being in the trap.
- Wand all marked fish to check for the presence of a coded-wire-tag (CWT).

- Sample rate of 1 in 1 for HOR Chinook salmon. All HOR Chinook salmon removed can be put on the same scale card for any one day. Use a new scale card each day.
- Collect the following data from each HOR Chinook salmon:
    - 3 scales
    - Fork length (to the nearest cm)
    - Sex (M, F, or J defined as ≤ 56 cm)
    - Mark (AD-clip, AD- and LV clip, or LV clip)
    - Sample category
        - Will be blank for Chinook salmon without a CWT.
        - Will be 0 Chinook salmon with a CWT. If a CWT is detected, bar-coded labels are used for snout identification tags.
- If wanding the fish indicates a CWT is present, take the snout and scan the bar-code of the snout label (follow number sequence if possible) using the built-in scanner on the tablet (A2 button). Record the snout identification and sample category on scale card.
- Note disposition of all surplus Chinook salmon by sex (M, F, J) and mark category and record on Form 3. Make sure the numbers on the scale cards for surplus match the number recorded on the Form 3. Provide carcasses to one of the food bank alternatives when possible and have the recipient at the food bank sign on the Form 3 to document the donation, leaving with them the center (yellow) page of the Form 3. If an HOR fish was accidentally placed in the anesthetic bath, or is otherwise unfit for human consumption, it must be used for nutrient enhancement as it is not eligible for human consumption.
- Remove the tail of all carcasses that are used for nutrient enhancement and return the fish to a stream outside of survey area. Typically, nutrient enhancement carcass transportation will be done by weir staff, with occasional help from stream survey staff.

Procedures for Sampling for HOR Coho Salmon Removed at Ladder

- Each surplus Coho removed will be recorded in the tablet. They do not need to go on a scale card unless wand CWT+. No scales for CWT – Coho.
- If Coho wands +, take snout and scan the bar code label into the tablet (see CWT recoveries section).
- The following data should be collected from CWT + Coho and recorded both in the tablet and on a scale card:
    - Fork length
    - Sex (M, F, or J defined as ≤ 46cm)
    - Mark
    - Record SNID (via scanner)
    - Sample category (1)
- These are considered “Surplus fish” and should have a ‘fish status’ of ‘dead’ recorded in the tablet.
- Disposition for surplus Coho is downstream.
- If any surplus fish are transported away from the weir site, the following needs to occur:
    - The destination of surplus fish should be coordinated with regional staff.

- A Form 3 (Fish and egg disposition ticket) needs to be completed and the following information denoted:
  - Disposition location by M/F/J and mark status.
  - Verify the recorded numbers on the scale card and Form 3 match.

Procedures for Sampling HOR Steelhead Removed at Ladder

- Check/wand for CWT.
- Do not need to collect scales.
- Record the following data either directly into the table or on the whiteboard (does not need to be on a scale card) and enter on tablet later:
  - Species
  - Sex: M, F
  - Mark status (NOTE: record adipose fin clip status – UM/AD – and any other clip e.g., LV)
  - Fork length (to the nearest cm)
  - CWT status (Beep = CWT+, No Beep = CWT-; a Not Scanned option exists but should not be used)
- For CWT+ fish, collect the snout and create/scan a snout barcode; record barcode in the SNID data field; place snout/barcode in bag.
- These are considered "Surplus fish" and should have a 'fish status' of 'dead' recorded in the tablet.
- Disposition for surplus steelhead is either food bank or mort pit. They cannot be used for nutrient enhancement due to disease.
- If any surplus fish are transported away from the weir site, the following needs to occur:
  - The destination of surplus fish should be coordinated with regional staff.
  - A Form 3 (Fish and egg disposition ticket) needs to be completed and the following information denoted:
    - Disposition location by M/F/J and mark status.
    - Verify the recorded numbers on the scale card and Form 3 match.

Procedures for Sampling Other Salmonids Passed Upstream at Ladder

- NOR Coho salmon, all Sockeye salmon, and all Pink salmon:
  - Punch right operculum with proper shape punch based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.
  - Enumerate by sex and mark and record in tablet.
- NOR steelhead:
  - Wand for PIT tag
  - Punch right operculum with proper shape punch based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.
  - The following biodata should be collected from all NOR steelhead (and recorded on both the weir datasheet and scale card):

        - 6 scales
        - Fork length (to the nearest cm)
        - Sex (M, F)
        - Mark (UM)
- Cutthroat:
    - Check for left operculum punch (which is applied at the Cedar Creek weir) and record if present.
    - Apply a right operculum punch before being released upstream.
    - Record the following data either directly into the table or on the whiteboard (does not need to be on a scale card) and enter on tablet later:
        - Sex: M, F (NOTE: only record if sex can be determined accurately)
        - Mark status (NOTE: most should be UM)
        - Any tags, if present
    - Pass upstream
- Chum salmon:
    - Punch right operculum with proper shape punch based on weekly marking schedule. SAVE PUNCH FOR DNA SAMPLE!
    - Collect 3 scales.
    - The following biodata should be collected and recorded on the tablet:
        - Fork length (to the nearest cm)
        - Sex (M/F)
        - Mark (UM)
        - DNA sample number
        - Any other marks/damage (i.e. mammal marks, net marks, etc.)

Procedures for Trap Mortalities

- Should be kept separate from any intentionally surplused fish.
- Record in tablet as mortality.
- Follow the same protocols as you would for intentionally surplused fish.
- Put any Coho trap mortalities on actual scale cards and record sex, mark, fork length and sample category but do not take scales.

Definition of Weir "Wash-Up"

A weir wash-up is any carcass that washes onto or against the weir, weir structure or live box on the upstream side. It does not include carcasses on the bank or on the river bottom further than 5 feet upstream of the weir, nor the dead fish in the trap.

Procedures for Weir Wash-Ups

- Not applicable.

Procedures for CWT Recoveries

- ALWAYS use a cut proof glove when collecting a snout.

- Cut one inch behind the eye when collecting a snout. To avoid false positive CWT detections, wand the removed snout to confirm the presence of the CWT in the collected snout. If the CWT is not detected in the snout, wand the cut head and try to determine if the wire is present there, or if there is an embedded hook or other source of metal causing the beep. Make a final determination on whether a CWT appears to be present (i.e., no other source of the detection beep can be located) and if so, extract and bag the head part that is the source of the detection. If a non-cwt source such as a hook is located, remove the hook or other metallic source and wand again. If negative, discard the snout and record the CWT status as negative for that fish.
- For confirmed CWT positive snouts, use the A2 button on the tablet to scan the bar-coded snout label into the database.
- All CWTs recovered need to be put on a CWT recovery sheet before going into the freezer at the Ridgefield office. Snouts need to be bagged separately by recovery type (weir surplus, weir wash-up, and stream survey) and recorded on separate CWT recovery sheets by recovery type.

Washougal River Weir Sampling Protocols

Hydraulic Project Approval Requirements

The weir shall be operated consistent with all applicable HPA requirements including the following:

- "Organic material that collects on the trap shall be removed and returned to state waters downstream of the project. Man-made trash shall be removed and disposed so that it does not reenter waters of the state."
- "Sediment flushing activities may take place throughout the year during high water events to reduce accumulated sediment in collection boxes. Sediment flushing to take place several times throughout the year during high water events to help reduce the accumulation of sediments in the collection boxes. Any additional flushing should take place during the normal work window between July 15 and September 15 for the life of the permit."
- "Stop all hydraulic project activities except those needed to control erosion and siltation, if flow conditions arise that will result in erosion or siltation of waters of the state."
- "Within one year of project completion, the banks shall be revegetated with native or other approved woody species as close to the affected area without impeding future construction of projects. Vegetative cuttings shall be planted at a maximum interval of three feet (on center) and maintained as necessary for three years to ensure 80 percent survival."
- "Restore bed and bank elevations and contours to pre-project condition."
- "All trap components, except river gravels, shall be immediately removed from waterward of the ordinary high water line (OHWL) upon project completion."

ESA Requirements

The weir shall be operated consistent with the requirements of all applicable biological opinions or other ESA authorizations. Handle and mortality limits for each listed species will be provided

prior to initiating weir operations. Weir operation leads must monitor handle and mortality relative to these limits and notify supervisory staff when the need for an adaptive response is triggered.

General Procedures

Low water/poor recruitment:

- When water levels are low, or recruitment appears to be poor, the following measures will be implemented in coordination with the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead:
    - Monitor fish presence below weir daily by conducting short walking surveys in established index area downstream of weir to assess fish and/or redd presence and record this information in the header information on the tablet.
    - Notify the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead of poor recruitment issues.
    - Seine below weir.
    - Modify weir/holding pen design.
    - Upon approval from the Region 5 weir management lead, open trap and/or submerge resistance board panels to allow some fish to pass unimpeded.

High water:

- High water flows and associated debris can be dangerous and may cause damage to the weir. Safety procedures will continue to be updated in accordance with agency policy and safety requirements. It is important to monitor the weather forecast and Washougal River flows (Washougal Flows). If flows are high or begin rising rapidly:
    - Contact the weir crew lead, the Region 5 Chinook species lead, and the Region 5 weir management lead.
    - 1st priority is always your safety.
        - If you are concerned about your or your co-worker's safety, stop and contact the weir crew lead for further direction.
        - Operating/cleaning the weir in higher flow conditions generally requires more than one staff person. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
        - Remember to always inspect and wear your PFD (personal floatation device) per WDFW policy!!
    - 2nd priority – fish health.
        - The goal is to avoid/reduce impacts to fish, particularly natural-origin fish, with special attention to ESA-listed fish!
            - Get trap box cleaned out by processing as many fish as possible prior to flows becoming unworkable. Contact the weir crew lead to request assistance and receive further direction if the situation is becoming unmanageable.

- If flows are close to topping live box, staff may close downstream knife gate to prevent more fish from recruiting into box.
- Upon approval of the Region 5 weir management lead, open side door on upstream trap box to allow any fish remaining in trap box to swim out.

- 3rd priority – structure security
  - Clean the weir! Generally, working in pairs (or more) at higher flows is required for safety. If you are working alone and flows are rising rapidly, stop and contact the weir crew lead to request assistance and receive further direction.
  - Ensure the Whooshh system is disconnected and the section that attaches to the trap box is taken to high ground.
  - Stay in close contact with weir crew lead to determine when cleaning weir should be abandoned to allow weir to submerge.
  - Once cleaning the weir is abandoned and weir panels are topped, wait until flows begin to recede and weir crew lead directs cleaning of weir panels to resume fishing ASAP after the high-water event.

Water Temperature:

- It is critical to monitor water temperatures while handling fish in the trap when the weather is warm. WDFW will utilize a tiered approach to water temperature management at the weir.
  - If the water temperature is less than 18 C, the weir will operate under the standard protocol.
  - If temperatures are greater than 18 C but less than 21 C, a modified operational protocol will be implemented. The modified protocols will include but not be limited to:
    - Electrofishing will not be utilized.
    - Water temperature will be monitored continuously in sampling vessels.
    - Water will be changed frequently in sampling vessels to ensure water temperatures do not exceed 21 C.
  - If water temperatures are greater than 21 C, standard and modified protocols will be suspended. Depending on the situation, WDFW will consider a variety of options including submerging weir panels, opening trap boxes, or closing trap boxes. In the event of a prolonged stretch of elevated water temperatures, staff may shift their schedule to process fish in the cooler early morning hours.

Fish recruitment and large fish numbers in the trap box:

- When fish are moving, let them move. If fish are actively recruiting to the trap box, do NOT get in the trap box to start working fish. Wait until trap box is full or fish recruitment slows to begin working fish.

- Contact the weir crew lead to request assistance and receive further direction if the number of fish in the trap box is becoming unmanageable.
- Generally, the density of fish in the trap box is self-regulating. Fish will generally discontinue entering the trap box once it is full. However, if the trap box appears overcrowded or you begin to see trap mortalities, the number of fish in the trap box will need to be reduced.
    - If this occurs at the beginning of the daily shift or while working fish, close the entrance to the trap box until fish numbers can be thinned by regular processing.
    - If this occurs at a trap check late in the day or after the trap has already been worked for the day, additional effort may be needed to reduce fish numbers in the trap box. In this situation, contact the weir crew lead to request assistance and receive further direction and begin to surplus LV and/or AD-clipped Chinook to reduce crowding until the trap can safely be left until the next morning. Surplused fish can be stockpiled for sampling the following day.

Identifying the origin of salmon and steelhead:

- To implement this protocol properly, the origin (natural vs. hatchery) of all salmon and steelhead must be identified.
- The origin of a salmon or steelhead captured at this weir will be determined based upon the presence or absence of an adipose fin.
- A fish should be deemed a hatchery-origin return (HOR) if it has an adipose (AD) fin clip or a left ventral (LV) fin clip.
- A fish should be deemed a natural-origin return (NOR) if it has an intact adipose fin (UM) and no left ventral (LV) fin clip.

Identifying whether a live salmon or steelhead is maiden or recapture:

- This section is most applicable to watersheds with two weirs but it is still applicable to all locations.
- Maiden: any fish with no left operculum punch (LOP) or Floy® tags.
    - Follow protocols as described for species/origin encountered.
- Recapture: any fish with a left operculum punch (LOP) or Floy® tags.
    - Use the recapture function in the tablet to look up a Floy® Tag number and find associated biodata and record:
        - LOP shape
        - Floy® tag information (color and tag #s)
        - Apply right operculum punch with proper shape based on weekly marking schedule. Make sure ROP punch shape is correct for the day in the tablet form header.
    - Pass upstream.

Prioritization of species handling at trap and seining activities:

- As a general rule, NOR salmonids take priority over HOR salmonids. If a decision regarding handling priority at the trap is needed due to extenuating circumstances, the weir crew lead will make that determination.
- Seining may cause any fish holding directly below the weir to move downstream. It is important to coordinate with the weir crew lead to determine if seining should occur before or after working the trap box.

Overview of disposition by species and origin:

- Truck for broodstock:
    - NOR Chinook salmon (1 out of 3 per sex up to weekly collection goal)
    - HOR Chinook salmon (up to weekly collection goal)
    - NOR Coho salmon (1 out of 3 per sex may be collected up to weekly collection goal)
    - HOR Coho salmon (up to weekly collection goal)
- Remove:
    - HOR Chinook in excess of weekly broodstock needs.
    - HOR Coho in excess of weekly broodstock needs.
- Pass upstream:
    - NOR Chinook (2 out of 3 per sex) upstream plus all NOR Chinook in excess of weekly NOR broodstock goal
    - NOR Coho (2 out of 3 per sex) upstream plus all NOR Coho in excess of weekly NOR broodstock goal
    - All Chum salmon (NOTE: the origin of Chum salmon cannot be determined using external characteristics though most should be natural-origin).
    - All steelhead
    - All Pink salmon
    - All Sockeye salmon
    - All Cutthroat and all other "non-target" species.
- Pass (back) downstream:
    - NA (no fish should be passed back downstream at this time).

Data management:

- Fill out a header in the tablet every day the trap is in operation even if no fish were caught.
- Make note of all trap alterations and any missed trapping periods in comment section of each individual day's header in the tablet.
- Every captured salmon and steelhead should have the following biological data recorded:
    - Species
    - Sex (M, F, or J); see species specific details below
    - Mark status (UM/AD)
    - CWT status via CWT status (Tablet field)/Sample Category (Scale card)

- NOTE: any fish that has a physical sample taken (i.e., scale, snout, DNA) must be recorded on a scale card as the scale number/position is how data from TWS & other labs (e.g., snout decodes) are linked.
- Use new scale cards each day.
- Certain biodata should also be handwritten on scale cards in addition to being captured in the tablet. This includes:
    - Date (back of scale card)
    - Position number
    - Fork length
    - Sex
    - Mark
    - Sample category
    - DNA vial # (if collected)
    - Snout ID (SNID) (if snout is collected)
- Clearly distinguish disposition on back of each scale card (i.e. weir wash-up, weir surplus, or fish passed upstream (Lives)) next to sample location or stream reach ID.
- Do NOT put any Floy® tag info or LOP info on scale cards. This will only be captured in the tablet.
- If a fish that should have been punched or tagged gets passed upstream without a punch and/or Floy® tags, it will be recorded in the tablet as "NP".
- Tablet data will be backed up daily to a thumb drive and uploaded weekly (at a minimum) to a shared drive location TBD.

Procedures for NOR Chinook Salmon, NOR Coho Salmon, and HOR Coho Salmon Trucked for Brood

- Randomly collect 1 out of 3 NOR Chinook salmon by sex for broodstock based on collection curve.
- Randomly collect all HOR Chinook salmon for broodstock up to weekly collection goal based on collection curve.
- Randomly collect 1 out of 3 NOR Coho salmon by sex for broodstock based on collection curve.
- Randomly collect all HOR Coho salmon for broodstock up to weekly collection goal based on collection curve.
- Collection curves will be provided prior to initiation of weir operations.
- It is OK if the weekly collection goal is exceeded, but cumulative brood collection should not get more than one week ahead; if the cumulative brood collected gets one week ahead, all NOR Chinook will be passed upstream and HOR Chinook removed.
- Broodstock collection curves are targets and may be changed with input of hatchery staff and review by management/science staff based on weather events. Collection dates will be dependent on when fish show up.
- All fish collected for broodstock will be sampled later at the hatchery.
- At the time of transport from the weir site, they will only be enumerated by sex and mark. Record this information using the clicker form in the tablet.

- Transport of broodstock is the hatchery staff's responsibility.

Procedures for Sampling NOR Chinook Salmon Passed Upstream at Weir

- To confirm NOR status, wand UM fish for CWT presence and make sure the left ventral fin is not clipped. Many ventral clips will be partially regenerated, so compare left ventral to the right ventral fin.
- Anesthetize all NOR Chinook salmon prior to sampling/tagging. Take care to not place any AD -clipped Chinook salmon, Coho salmon, or steelhead into the anesthetic bath as they are then not eligible for human consumption and unavailable for donation to food banks.
- Tag NOR Chinook with two of the proper colored Floy® tags based on weekly tagging schedule; one on each side of the dorsal fin. Record tag color and numbers on tablet form.
- Apply Floy® tags using the following methods:
  Implement the study design by tagging the fish with the appropriate color and numbered Floy® tag. Prepare for tagging by placing tags into semi-automated continuous feed tagging gun with the appropriate needle (Guy et al. 1996). As with all numbered tags, tag should be attached in sequence to allow for ease of data checking. Secure fish on a safe firm flat surface, tagging boot, or in the water. Push needle through the posterior of the dorsal fin rays at a 45-degree angle, so when the fish swims the tag will lay next to the body. The tag needle must be inserted past the pterygiophores of the dorsal fin to ensure high retention (Waldman et al. 1990). The tagging gun is twisted 90 degrees to dislodge the tag from the plastic clip and then removed. Tagged fish can be treated with antibiotics. Complete the data form to link the tag(s) to biological, scale, otolith, tag, spatial, and temporal data. Enumerate the number of successfully marked fish released by mark location and their release location.
- Apply left operculum punch with a shape based on weekly marking schedule (rotate to new punch shape each Sunday).
- Retain the left operculum punch for DNA tissue or collect a punch from the upper lobe of caudal fin if the left operculum punch sample is lost.
- Collect the following biodata from every NOR Chinook (1 in 1 sample rate):
  - Fork length (to the nearest cm)
  - Sex (M, F, or J defined as ≤ 56 cm)
  - Mark (UM)
  - DNA sample. Place (DNA) tissue sample on pre-labeled blotter paper. Record DNA sample number on scale card on the tablet. DNA may be taken at subsampled rate.
- Allow fish to recover before release.

Procedures for Sampling HOR Chinook Salmon Removed at Weir

- Dispatch and set aside HOR Chinook salmon to be processed after the trap has been emptied. This prioritizes the processing of natural-origin fish and gets them released upstream more quickly, reducing the stress of being in the trap.
- Wand all marked fish to check for the presence of a coded-wire-tag (CWT).

- Bio-sample rate of 1:5 for AD-clipped HOR Chinook salmon. Keep separate bio-sample rate counts for males, females, and jacks. Each sex needs to be on a separate scale card. Use a new scale card each day. Clearly distinguish disposition of fish on back of each scale card (i.e. Washougal Weir surplus) next to sample location or stream reach ID.
- Bio-sample rate of 1:1 for LV-clipped HOR Chinook salmon. Keep separate from AD-clipped scale cards. Use a new scale card each day.
- Collect the following data from in-sample fish ("bios") and any Chinook that is CWT+ (SC 0 & 1) (data must be recorded both on scale cards and in the tablet form):
    - 3 scales
    - Fork length (to the nearest cm)
    - Sex (M, F, or J defined as ≤ 56 cm)
    - Mark (AD-clip, AD- and LV clip, or LV clip)
    - Sample category
        - Will be blank for Chinook salmon without a CWT.
        - Will be 1 for Chinook salmon that are out of sample (AD-clip Chinook #1-4) with a CWT.
        - Will be 0 for Chinook salmon that are in sample (AD clip Chinook #5) with a CWT.
- If wanding the fish indicates a CWT is present, take the snout and scan the bar-code of the snout label (follow number sequence if possible) using the built-in scanner on the tablet (A2 button). Record the snout identification and sample category on scale card.
- If an HOR fish was accidentally placed in the anesthetic bath, or is otherwise unfit for human consumption, it must be used for nutrient enhancement as it is not eligible for human consumption.
- The big bag label number is recorded for that day in the tablet located on the top right of the event header page for that day's event or sampling. The big bag label is applicable to surplus and trap mortalities for fall Chinook and Coho only per location. It takes at least 1 CWT recovery to initiate a big bag label. A separate big bag label is used for Chinook salmon and Coho salmon. Include total number of Chinook salmon examined for CWTs by sex. This includes surplus and mortalities. Weir wash-ups are not included.
- One bag tag label should be used per day even when a double shift occurs. Snouts from one day, one location, one species, need to be bagged in a single large bag with a big bag label attached with the following information:
    - The big bag label number is recorded for that day in the tablet located on the top right of the event header page for that day's event or sampling.
    - Number examined for marks/CWT by sex.
    - Bagged snouts will be stored at the Washougal Salmon Hatchery freezer.
    - Location on the bag tag label should read "Washougal Weir" it is important to have "weir" on the label.
    - Keep snouts collected from surplus fish at the weir separate from snouts collected at the hatchery.

5. Surplus Chinook will be transported to Washougal Hatchery after sampling and refrigerated until LCFEG takes them for nutrient enhancement. Make sure the numbers

on the scale cards for surplus match the number recorded on the Form 3. Hatchery staff will fill out the form 3.

6. Output queries have been installed on the tablet to allow for summary data transposing for hatchery form 3 records, big bag labels and other records.

Procedures for Sampling for HOR Coho Salmon Removed at Weir

- Each surplus Coho removed will be recorded in the tablet. They do not need to go on a scale card unless wand CWT+. No scales for CWT – Coho.
- If Coho wands +, take snout and scan the bar code label into the tablet (see CWT recoveries section).
- The following data should be collected from CWT + Coho and recorded both in the tablet and on a scale card:
    - Fork length
    - Sex (M, F, or J defined as ≤ 46cm)
    - Mark
    - Record SNID (via scanner)
    - Sample category (1)
- These are considered "Surplus fish" and should have a 'fish status' of 'dead' recorded in the tablet.
- The big bag label number is recorded for that day in the tablet located on the top right of the event header page for that day's event or sampling. The big bag label is applicable to surplus and trap mortalities for fall Chinook and Coho only per location. It takes at least 1 CWT recovery to initiate a big bag label. A separate big bag label is used for Chinook salmon and Coho salmon. Include total number of Coho salmon examined for CWTs by sex. This includes surplus and mortalities. Weir wash-ups are not included.
- One bag tag label should be used per day even when a double shift occurs. Snouts from one day, one location, one species, need to be bagged in a single large bag with a big bag label attached with the following information:
    - The big bag label number is recorded for that day in the tablet located on the top right of the event header page for that day's event or sampling.
    - Number examined for marks/CWT by sex.
    - Bagged snouts will be stored at the Washougal Salmon Hatchery freezer.
    - Location on the bag tag label should read "Washougal Weir" it is important to have "weir" on the label.
    - Keep snouts collected from surplus fish at the weir separate from snouts collected at the hatchery.

7. Surplus Coho salmon will be transported to Washougal Hatchery after sampling and refrigerated until LCFEG takes them for nutrient enhancement. Make sure the numbers on the scale cards for surplus match the number recorded on the Form 3. Hatchery staff will fill out the form 3.
8. Output queries have been installed on the tablet to allow for summary data transposing for hatchery form 3 records, big bag labels and other records.

Procedures for Sampling Other Salmonids Passed Upstream at Weir

Weir crew lead will determine sampling intensity of these species.

- NOR Coho salmon, all Sockeye salmon, and Pink salmon:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - Enumerate by sex and mark and record in tablet.
    - Allow to recover before release upstream.
- NOR steelhead:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. Make sure LOP punch shape is correct for the day in the tablet form header.
    - The following biodata should be collected from all NOR steelhead (and recorded on both the weir datasheet and scale card):
        - 6 scales
        - Fork length (to the nearest cm)
        - Sex (M, F)
        - Mark (UM)
    - Allow to recover before release upstream.
- HOR steelhead and all cutthroat:
    - Do NOT use anesthetic.
    - Use black transport tubes.
    - Apply upper caudal punch using the same punch rotation as Chinook salmon.
    - Enumerate by sex and mark and record in tablet.
    - Pass upstream.
- Chum salmon:
    - These fish can be anesthetized prior to sampling if needed.
    - Punch left operculum with proper shape punch based on weekly marking schedule. SAVE PUNCH FOR DNA SAMPLE!
    - Collect 3 scales.
    - The following biodata should be collected and recorded on the tablet:
        - Fork length (to the nearest cm)
        - Sex (M/F)
        - Mark (UM)
        - DNA sample number
        - Any other marks/damage (i.e. mammal marks, net marks, etc.)
    - Allow to recover before release upstream.

Procedures for Trap Mortalities

- Should be kept separate from any intentionally surplused fish.
- Record in tablet as mortality.
- Follow the same protocols as you would for intentionally surplused fish.

- Put any Coho trap mortalities on actual scale cards and record sex, mark, fork length and sample category but do not take scales.

Definition of Weir "Wash-Up"

A weir wash-up is any carcass that washes onto or against the weir, weir structure or live box on the upstream side. It does not include carcasses on the bank or on the river bottom further than 5 feet upstream of the weir, nor the dead fish in the trap.

Procedures for Weir Wash-Ups

- Record all weir wash-ups in the tablet form as dead, being sure to click weir wash-up button, and disposition downstream. Weir wash-up sampling data are captured in the same header as the day's "normal" weir header, but weir wash-ups must go on a separate scale card.
- Examine all fish for any external tags and/or marks (caudal and both opercula). Record any carcass tags, Floy® tags and/or caudal/opercula punch recovery information.
    - If you can examine a fish for tags and/or mark and it has none, record NP (for none present) in tablet form.
    - If you are unable to determine punch shape but can tell one is present, record P.
    - If you are unable to examine a fish for tags and/or mark for whatever reason, record U (for undeterminable) in tablet form.
- <u>For all weir washups</u>, the following guideline should be followed for all species:
    - If fish is a recapture (has a Floy® tag or LOP), do NOT wand for a CWT as it was already wanded as a live fish.
    - If fish is NOT a recapture (NO Floy® tag or caudal punch or LOP), wand for CWT.
    - Be sure to note CWT status in tablet (not wanded, CWT -, or CWT +).
- For Chinook salmon and Chum salmon, the following biodata should be collected and recorded in the tablet form:
    - 3 scales
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 56 cm)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
            - Fill out spawning ground survey snout label and keep with spawning ground survey snouts.
            - Write weir wash-up in comments of snout label.
    - DNA sample
    - Otoliths (Chum only)
- For Coho salmon and steelhead, the following biodata should be collected and recorded in the tablet form and on actual scale cards:

    - Do NOT take scales
    - Fork length (to the nearest cm)
    - Sex (M, F, J defined as ≤ 46 cm for Coho salmon)
    - Mark (AD, UM, or LV)
    - Presence or absence of any tags/marks (as mentioned above)
    - Spawn success for females (Yes or No) (Yes = greater than 75% eggs retained)
    - Sample category
        - Blank without a CWT
        - 0 with a CWT
    - SNID (if CWT+) and follow CWT collection procedures
- For other species of weir wash-ups (not listed above):
    - If fish wands negative for CWT (CWT-) enumerate by species, mark category, and sex in tablet being sure to note as weir wash-up.
- After sampling, pass downstream of weir**.**

Procedures for CWT Recoveries

- ALWAYS use a cut proof glove when collecting a snout.
- Cut one inch behind the eye when collecting a snout. To avoid false positive CWT detections, wand the removed snout to confirm the presence of the CWT in the collected snout. If the CWT is not detected in the snout, wand the cut head and try to determine if the wire is present there, or if there is an embedded hook or other source of metal causing the beep. Make a final determination on whether a CWT appears to be present (i.e., no other source of the detection beep can be located) and if so, extract and bag the head part that is the source of the detection. If a non-cwt source such as a hook is located, remove the hook or other metallic source and wand again. If negative, discard the snout and record the CWT status as negative for that fish.
- For confirmed CWT positive snouts, use the A2 button on the tablet to scan the bar-coded snout label into the database.
- All CWTs recovered need to be put on a CWT recovery sheet before going into the freezer at the Ridgefield office. Snouts need to be bagged separately by recovery type (weir surplus, weir wash-up, and stream survey) and recorded on separate CWT recovery sheets by recovery type.

References

Buehrens, T. W., T. Seamons, and C. LeFleur. 2017. Mitchell Act Steelhead Hatchery Monitoring Progress Report. Washington Department of Fish and Wildlife. Olympia, WA. 34pp.

Buehrens, T., J. Wilson, S. Gray, and J. Scott. 2024. Estimates of Lower Columbia River Steelhead pHOS: A Report to NOAA Fisheries. Washington Department of Fish and Wildlife Publication # FPT 24-03. 33pp.

NMFS (National Marine Fisheries Service). 2017. Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation. NOAA's National Marine Fisheries Service's implementation of the Mitchell Act Final Environmental Impact Statement preferred alternative and administration of Mitchell Act hatchery funding. January 15, 2017. NMFS Consultation No.: WCR-2014-697. 535p.

Cooper R., L.A. Campbell, J. P. Sneva. 2011. Salmonid Scale Sampling Manual. WDFW Technical Report. Working Draft. Olympia, WA. Draft.

Crawford, B. A., and S. M. Rumsey. 2011. Guidance for the monitoring recovery of Pacific Northwest salmon and steelhead listed under the Federal Endangered Species Act. NOAA's National Marine Fisheries Service, Northwest Region.

Crawford, B., T.R. Mosey, and D.H. Johnson. 2007a. Foot-based Visual Surveys for Spawning Salmon. Pages 435-442 in D. H. Johnson, B. M. Shrier, J. S. O'Neal, J. A. Knutzen, X. Augerot, T. A. O-Neil, and T. N. Pearsons, editors. Salmonid field protocols handbook: techniques for assessing status and trends in salmon and trout populations. American Fisheries Society, Bethesda, Maryland.

Crawford, B., T.R. Mosey, and D.H. Johnson. 2007b. Carcass Counts. Pages 59-86 in D. H. Johnson, B. M. Shrier, J. S. O'Neal, J. A. Knutzen, X. Augerot, T. A. O-Neil, and T. N. Pearsons, editors. Salmonid field protocols handbook: techniques for assessing status and trends in salmon and trout populations. American Fisheries Society, Bethesda, Maryland.

Gallagher, S.P., P.K.J. Hahn, and D.H. Johnson. 2007c. Redd Counts. Pages 197-234 in D. H. Johnson, B. M. Shrier, J. S. O'Neal, J. A. Knutzen, X. Augerot, T. A. O-Neil, and T. N. Pearsons, editors. Salmonid field protocols handbook: techniques for assessing status and trends in salmon and trout populations. American Fisheries Society, Bethesda, Maryland.

Johnson D.H., B.M. Shrier, L.S. O'Neal, J.A. Knutzen, X. Augerot, T. A. O'Neil, and T.N. Pearsons. 2007. Salmonid Protocols Handbook: Techniques for assessing status and trends in salmon and trout populations. American Fisheries Society. Bethesda MD. p. 478.McIsaac 1977

NWMT. 2021. Northwest Marine Technologies T-Wand User's Guide. Northwest Marine Technology. WA.

Parken, C. K., R. E. Bailey, and J. R. Irvine. 2003. Incorporating uncertainty into area under the curve and peak count salmon escapement estimation. North American Journal of Fisheries Management 23:78-90.

Rawding, D., B. Glaser, and S. Vanderploeg. 2006a. Germany, Abernathy, and Mill creeks - 2005 adult winter steelhead distribution and abundance. Washington Department of Fish and Wildlife, Olympia, WA.

Rawding, D., T. Hillson, B. Glaser, K. Jenkins, and S. Vanderploeg. 2006b. Abundance and spawning distribution of Chinook salmon in Mill, Abernathy, and Germany creeks during 2005. Washington Department of Fish and Wildlife, Vancouver, Washington.

Rawding, D., J. Wilson, B. Glaser, S. VanderPloeg, J. Holowatz, T. Buehrens, S. Gray, & C. Gleizes. 2014. Fall Chinook Salmon abundance estimates and coded-wire-tag recoveries in Washington's lower Columbia River tributaries in 2010. In D. Rawding, B. Glaser, & T. Buehrens (Eds.), Lower Columbia River fisheries and escapement evaluation in southwest Washington, 2010 (FPT 14-10). Washington Department of Fish and Wildlife, Southwest Region. Report available at Rawding et al. 2014.

Stevens, D. L., D. P. Larsen, and A. R. Olsen. 2007. The role of sample surveys: why should practitioners consider using a statistical sampling design? Pages 11–23 in D. H. Johnson, B. M.

Sykes, S. D., and L. W. Botsford. 1986. Chinook salmon, Oncorhynchus tshawytscha, spawning escapement based on multiple mark-recaptures of carcasses. Fisheries Bulletin 84:261-270.

Wilson, J., T. Buehrens, D. Rawding, and E. Olk. 2020. Estimates of adult fall Chinook salmon spawner abundance and viable salmonid population parameters in the Washington portion of the Lower Columbia River Evolutionarily Significant Unit, 2013-2017. Washington Department of Fish and Wildlife Report FPT 20-09. Report available at Wilson et al. 2020.

Zimmerman, C.E., and L.M. Zubkar. 2007.Weirs. Pages 385-398 in D. H. Johnson, B. M. Shrier, J. S. O'Neal, J. A. Knutzen, X. Augerot, T. A. O-Neil, and T. N. Pearsons, editors. Salmonid field protocols handbook: techniques for assessing status and trends in salmon and trout populations. American Fisheries Society, Bethesda, Maryland.

Appendix A: Mitchell Act Project Narrative

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE (WDFW)
MITCHELL ACT PROJECT NARRATIVE
Fiscal Year 2023-2027

Columbia River Fisheries Development Program Budget
Fiscal Year 2023-FY2026 – October 1, 2022 – September 30, 2026

NOAA-NMFS-WCRO-2019-2006030

This project narrative covers all of the activities described below for the time frame of October 1, 2022 through September 30, 2026. The activities described below are planned to continue annually and do not differ from year to year, thus the narrative description is accurate for all years of the project. The tasks described below assume adequate funding to accomplish the objectives, and activities will be dependent on available funding through the Mitchell Act or other funding sources, if necessary.

This proposed budget identifies funding allotments for annual Hatchery Operation & Maintenance, Missing Production Groups project, Monitoring, Evaluation & Reform, Lower Columbia River Fishery Sampling, and Marking and Tagging for Washington State Mitchell Act facilities. It is broken into the following five (5) separate tasks:

1) Hatcheries Operations
    a. Facilities Operations
    b. Pathology/Virology (Fish Health)
    c. Maintenance

2) Missing Production Groups – Coded Wire Tag (CWT)
    a. Project Management/Report
    b. CWT Applications
    c. CWT Recovery and Reading

3) Monitoring, Evaluation, and Reform
    a. Kalama Research Evaluations
    b. Regional Evaluations/Hatchery Reform Implementation
        i. Monitoring Winter Steelhead Populations
        ii. Monitoring Summer Steelhead Populations
    c. Lower Columbia River Weir Operations

4) Lower Columbia River (LCR) Fishery Sampling
    a. Sport and Commercial fishery sampling

5) Marking and Tagging
    a. Fin Clipping
    b. CWT Application

1. HATCHERY OPERATIONS

Hatchery Operations consists of the oversight, coordination, operation, fish health, and maintenance at seven (7) Mitchell Act facilities and short term rearing/acclimation at the Deep River Net Pens. Properly integrated hatchery operations are critical to rear fish consistent with recovery and fisheries needs. Oversight and coordination is critical to not only hatchery operations but all Mitchell Act related activities. Fish Health is vital to these facilities and their operations. Maintenance is the cost of repair and maintenance of the hatchery facilities.

1. (a) Facilities Operations

Hatchery Operations includes the costs of the annual operations of the Grays River Hatchery (partial funding), Beaver Creek Hatchery, North Toutle Hatchery, Fallert Creek Hatchery (Wild Steelhead Brood Development or WSBD), Kalama Falls Hatchery, Skamania Hatchery, Washougal Hatchery, Ringold Hatchery, and the Deep River Net Pens (partial funding).

The species and numbers of fish anticipated to be released from these facilities based on the Mitchell Act Biological Opinion (MA BiOp) by release year 2021 are indicated in Table 1. All production released from Mitchell Act facilities, regardless of species, will be mass marked.

Table A1: Washington Department of Fish and Wildlife Columbia River Fisheries Development Program Hatchery Production Goals

Hatchery	Species	Program Goals
Beaver Creek Hatchery	Late Coho	300,000
	Winter Steelhead	130,000
	Summer Steelhead	30,000
North Toutle Hatchery	Fall Chinook	1,100,000
	Coho	90,000
Fallert Creek Hatchery (WSBM)/Kalama Falls Hatchery	Spring Chinook	500,000
	Fall Chinook	2,600,000
	Late Coho	300,000
	Winter Steelhead	135,000
	Summer Steelhead	90,000
Skamania Hatchery	Winter Steelhead – Salmon Creek	40,000
	Winter Steelhead – Washougal River	85,000
	Winter Steelhead – Rock Creek	20,000
	Summer Steelhead	70,000
Washougal Hatchery	Fall Chinook	1,200,000
	Late Coho	108,000
Ringold Hatchery	Summer Steelhead	180,000
	Late Coho	250,000**
Deep River Net Pens	Late Coho	700,000***

**MA BiOp allows for up to 750,000 coho to be released but WDFW does not currently have the ability to do that many at this time
***MA budget pays for 300,000 smolts and the rest are from other fund sources

1. (b) Pathology/Virology (Fish Health)
TASK DESCRIPTION: Pathology provides fish health support to all of the hatchery operations. In concert with the hatchery staff, Fish Health Specialists/Epidemiologists develop and implement a fish health/quality control program to ensure that quality salmon and steelhead smolts are produced. This includes routine monitoring (at least monthly) of the fish and visiting hatcheries on emergency basis when an epizootics event occurs. The Fish Health Specialist determines cause of disease and mortality and prescribes therapeutant (s) and actions necessary to control event and prevent future events. This task also includes monitoring the pathogen status of adult and juvenile fish stocks (as prescribed by rules and policies) and submitting samples to WDFW laboratory for pathogen tests to include virology, bacteriology, and parasitology. Fish Health Specialists sample adult broodstocks at a minimum of 60 fish (5% Assumed Pathogen Prevalence Level or APPL) for specific fish pathogens of concern. Some high risk broodstocks are sampled at 150 fish (2% APPL) or 100% of the broodstock may be sampled if warranted.

1. (c) Maintenance
TASK DESCRIPTION: Mitchell Act maintenance funding contributes to construction and maintenance activities at Mitchell Act facilities. This work includes but is not limited to the following: bridge inspection and repair, hatchery intake and outfall maintenance, building and infrastructure maintenance, pump, hi-capacity, and domestic water system repairs/ renovation, maintenance of emergency generators, maintenance of back-up emergency alarm systems, electrical systems, adult collection rack installation and removal, fish hauling between hatchery facilities and acclimation sites, and installation and removal of weirs.

2. MISSING PRODUCTION GROUPS – Coded-Wire Tag (CWT)

2. (a) Project Management/Report
TASK DESCRIPTION: This project provides oversight and budget management for all three project components, and produces a recurring report on survival rates, stray rates and contribution to sport, commercial, and tribal fisheries by complete brood year, hatchery, and sub-species (spring, summer and fall Chinook, and early and late coho) for Washington hatcheries in the Columbia River basin.

2. (b) CWT Applications
TASK DESCRIPTION: This project inserts coded-wire tags into a representative portion of each production group of Columbia basin WDFW hatchery facilities that were not historically covered by alternate funding sources. The coded-wire tagging of each production group enables evaluation of survival and catch distribution over time by brood year for each hatchery and sub-species.

2. (c) CWT Recovery and Reading
TASK DESCRIPTION: This project recovers and reads coded-wire tags from snouts of fish tagged under 2.b.

3. MONITORING, EVALUATION, AND REFORM (MER)

3. (a) 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).
- 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.
- KEWS Development: development of a Kalama Early Winter Steelhead (KEWS) stock as part of MA BiOp implementation. Including establishing broodstock collection curves, evaluating in-season program returns, and evaluating overall stock return timing and performance.

3. (b) Regional Evaluations/Hatchery Reform Implementation
TASK DESCRIPTION: This project focuses on the implementation of hatchery reform actions called for by the Mitchell Act Biological Opinion and the WDFW's Conservation and Sustainable Fisheries (C&SF) Plan. Activities include oversight and implementation of Mitchell Act MER

funded projects, including spawning ground surveys and weir operations. Additional activities include in-season management of broodstock collection activities at Mitchell Act hatcheries and implementation of hatchery reform actions. Deliverables include development of hatchery management plans as needed; estimation of performance metrics for Mitchell Act hatchery programs; Mitchell Act BiOp implementation monitoring; assisting with reporting metrics development, and reporting for MER projects via the semi-annual report.

3. (bi) Monitoring Winter Steelhead Populations

TASK DESCRIPTION**:** This project will implement spawning ground (redd) surveys in Washington tributaries to the lower Columbia River that support primary populations of winter steelhead. Streams surveyed include the Grays, Skamokawa, Elochoman, South Fork Toutle, Toutle/Green, Coweeman, Kalama, East Fork Lewis, and Washougal. The Grays, Toutle/Green and East Fork Lewis basins are designated as steelhead gene banks in alignment with WDFW's Statewide Steelhead Management Plan. Surveys will provide data regarding abundance, spatial distribution, pHOS and productivity, which are key VSP parameters. Deliverables include abundance estimates and mapping of redd locations using GPS technology. Data can be used to track annual trends in abundance and spatial distribution.

3. (bii) Monitoring Summer Steelhead Populations

TASK DESCRIPTION: This project will monitor summer steelhead populations in the East Fork Lewis and Washougal rivers and assist with monitoring of the Kalama River population. EF Lewis and Kalama populations are classified as primary for recovery purposes, while Washougal is classified as a contributing population. The East Fork Lewis basin is designated as a steelhead gene bank in alignment with WDFW's Statewide Steelhead Management Plan. The study design for this project is a two-sample mark-resight experiment seining event, which includes capture, tagging, bio-sampling, and release of adult steelhead. The second event is a snorkel survey in which fish are resighted. Data provided by this project will allow Washington Department of Fish and Wildlife to evaluate the impact of summer steelhead hatchery programs in the Washougal basin and discontinuance of hatchery steelhead programs in the EF Lewis River basin. Deliverables will include estimates of key VSP parameters including abundance and diversity.

3. (c) Lower Columbia River Weir Operations

TASK DESCRIPTION: This project involves the placement of temporary weirs in key lower Columbia River tributaries (e.g., Grays, Coweeman, Washougal and Elochoman Rivers) to collect returning adults and remove hatchery-origin adults, and funds staff necessary to maintain and operate these weirs. The project has dual objectives: 1) to complement existing adult salmonid monitoring efforts in these areas in developing accurate and precise estimates of total abundance, especially for fall Chinook salmon and 2) to promote recovery of fall Chinook salmon populations in these tributaries by meeting management guidelines/objectives for control of hatchery-origin Chinook allowed to spawn naturally, and, in some cases, for collection of hatchery broodstock (e.g., Chinook at the Washougal River and coho at the Elochoman weirs). Data collected from this project contributes to a comprehensive Viable Salmonid Population (VSP) parameter monitoring program that has been implemented in

WDFW's Region 5 (multiple funding sources) and will be summarized and analyzed to estimate annual abundance of hatchery and naturally produced fall Chinook; determine age and stock composition of fall Chinook returning to these rivers and to determine weir efficiency.

4. LOWER COLUMBIA RIVER (LCR) FISHERY SAMPLING

4. (a) Sport and Commercial Fishery Sampling

TASK DESCRIPTION: This project contributes field staff for sampling of sport and commercial fisheries in the Lower Columbia River (LCR) as part of WDFW's comprehensive fishery monitoring program. Staff will randomly sample salmonids and other aquatic species caught in Washington's LCR mainstem and tributary sport fisheries for the purpose of recovering CWTs, PIT tags, biological data (including scales) and estimating effort and catch.

Data collected will funnel to the broader WDFW fishery monitoring program where it is summarized and analyzed for the purpose of monitoring the status of all major Columbia River salmonid stocks, including stocks listed under the ESA. Information will be provided to the scientific community to determine the status of ESA-listed salmonid stocks and other wild salmonid stocks; evaluate hatchery production and release strategies; determine survival rates of hatchery-produced salmonids; and manage fisheries to protect ESA-listed and other wild salmonid stocks and achieve escapement goals.

5. MARKING AND TAGGING

2. (a) Fin Clipping

Mass mark by adipose fin clipping up to about 0.98 million juvenile and yearling spring Chinook, 10.8 million juvenile Fall Chinook, 4.07 million coho, 0.80 million steelhead, 2.0 million Klickitat Fall Chinook, 0.955 Klickitat coho and a double index tag up to 0.20 million Lower Columbia Tule Chinook.

2. (b) Coded Wire Tagging Application

Application of coded wire tag of approximately 0.25 million juvenile Spring Chinook, 0.20 million juvenile Fall Chinook, 0.05 million coho, 0.10 million steelhead and 0.45 million Klickitat URB Chinook.

BUDGET

Detailed budgets for the five tasks above are included on the attached budget sheet. Budget assumptions for indirect costs are presented below.

Indirect – Indirect costs are those; (a) incurred for a common or joint purpose benefiting more than one project, and (b) not readily assignable to the cost objectives specifically benefitted without effort disproportional to the results achieved. These include but are not limited to:

1. Accounting: AFRS/Enterprise Reports, keeping track of Accounts Payable/Receivable-contracts, processing travel expense reimbursements, processing payments to vendors,

processing billing to federal/local and interagency contracts, processing periodical reports as required by IRS, Federal/Local and State guidelines, etc.

2. Budget: Budget process, fiscal notes, periodical status report, inventory activities, performance measure, and revenue forecasting.
3. Contract: Process federal, local, interagency, and personal services receivable and payable contracts.
4. Payroll: Process payroll, health insurance, garnishment, and periodical reports as required by IRS and the state.
5. Personnel: Monitor personnel process, safety, training, risk management, and conduct negotiation with Labor Relation Unions, etc.
6. Purchasing and Inventory.
7. Information System: Provide support for internet, website and computers, coordinate in the development of the Cost Allocation and Contract Management Systems, etc.
8. Facility operational costs such as lease payments, heat, lights, water, etc.

The indirect rate is negotiated and approved on a state fiscal year. WDFW indirect costs will be billed at the federally approved indirect rate that is in effect when costs were incurred.

WDFW will charge the federally approved indirect rate of 33.5% for all allowable costs that occur prior to June 30, 2023. During July 1, 2023 through June 30, 2026, WDFW is estimating the federal indirect rate at 33.5%.

Appendix B: Updated Calendar Year 2022 Releases from WDFW Mitchell Act Facilities.

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 B1. 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