2022 Annual Report to the National Marine Fisheries Service (NMFS) on Specific Terms and Conditions 2a included in the Mitchell Act Biological Opinion (MA BIOP)

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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, (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 2022.

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.

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

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 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, and Washougal River. The primary purpose of the weirs is to control the proportion of hatchery - origin spawners (pHOS) on the spawning grounds for fall Chinook, to gather information on natural-origin (NOR) population parameters, and to collect broodstock for hatchery programs. Coho information and/or broodstock collection 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 Mitchell Act BiOp).

Weir protocols are specific to each tributary, but in general follow similar procedures. NORs Chinook and coho are either passed upstream or collected for integrated hatchery programs. Hatchery-origin (HOR) Chinook are either removed at the weir, passed upstream or downstream, or collected for broodstock. HOR coho are either passed upstream or collected for broodstock. Usually all chum 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 or ventral fin clip, no clip), coded-wire tag (CWT) collection, PIT tag information (not currently being collected), 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 opercle 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) operates 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 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, redd surveys, and foot-based visual counts (Crawford et al. 2007a, Gallagher et al. 2007, and Crawford et al. 2007b).

All carcasses that are not totally decomposed are sampled for external tags (Floy T-bar or opercle 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 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 Trap, Weir, Survey (TWS) database. Due to a high number of carcasses on the Washougal and Kalama these fish may be systematically sampled for scales.

For Chinook salmon carcasses, fish are enumerated by the following categories: unmarked, marked, and unknown. Unmarked fish are Chinook with intact adipose fins and snout, marked fish have their snout but are missing their adipose fin, and unknown fish are salmon with either a damaged caudal peduncle (e.g. adipose fin area unexaminable) or missing snout. All unmarked and marked fish are sampled for CWT following standard protocols (NWMT 2001). 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. The wand is also inserted into the mouth with the radiating arrows rubbed against the roof of the mouth in vertical strokes. If a CWT is detected, the red LED 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 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. 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 opercle 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, Skamokawa, Coweeman, EF Lewis, Green (below the weir) and the SF Toutle, 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. (2006, 2006b). All identifiable redds are flagged, and their location (latitudinal and longitudinal coordinates) are recorded. 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 this

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, redd identification, and sampling/tagging protocols (Crawford et al. 2007a, Gallagher et al. 2007, and Crawford et al. 2007b). 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. Final reporting is now anticipated to be complete in 2023.

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 is being propagated on the Washougal (at Skamania Hatchery) for use in the Washougal and Rock Creek. 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 interim segregated programs (i.e., Eagle Creek stock) and the eventual transition to KEWS programs in the Washougal River and Rock Creek. 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. Preliminarily, these data show promise for developing estimates of pHOS throughout the lower Columbia DPS. WDFW has recently requested continued discussions with NMFS staff to facilitate final review of data collection and analytical methods for this approach. WDFW anticipates submitting a technical report summarizing analytical methods and results to date in the spring of 2023.

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 2019-2023 Mitchell Act Project Narrative is attached in Appendix A.

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Appendix A: Mitchell Act Project Narrative

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE (WDFW)
MITCHELL ACT PROJECT NARRATIVE
Fiscal Year 2019-2023

Columbia River Fisheries Development Program Budget
Fiscal Year 2019-FY2022 – October 1, 2018 – September 30, 2023

NOAA-NMFS-WCRO-2019-2006030

This project narrative covers all of the activities described below for the time frame of October 1, 2019 through September 30, 2023. 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 1: Washington Department of Fish and Wildlife Columbia River Fisheries Development Program Hatchery Production Goals

Hatchery	Species	Program Goals
Grays River Hatchery	Late Coho	75,000*
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***

*Coho program at Grays River will be transferred to Beaver Creek Hatchery. Releases in 2019 expected to be the last.

**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 covers all 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 projects, and produces an annual 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 need 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.

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, spawning ground surveys and weir operations. Additional activities include in-season management of broodstock collection activities at Mitchell Act hatcheries to implement hatchery reform actions. Deliverables include development of hatchery management plans that will contribute to HGMP updates; HGMP review; estimation of performance metrics for Mitchell Act hatchery programs; Mitchell Act BIOP implementation monitoring; assist 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, Green, Coweeman, Kalama, East Fork Lewis, and Washougal. Surveys will provide data regarding abundance and spatial distribution, which are two 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 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 and EF Lewis river basins on these primary populations. 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; evaluate effectiveness of habitat improvement projects; 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/Fastrack 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 28.78% for all allowable costs that occur prior to June 30, 2019. During July 1, 2019 through June 30, 2020, WDFW is estimating the federal indirect rate at 30.29%. For the remainder of the contract (July 1, 2020 through September 30, 2023), WDFW is estimating the federal indirect rate at 30.00%.