WDFW Fisheries Monitoring

Report to the Legislature

Washington Department of FISH & WILDLIFE

Dec.1, 2023

State of Washington
DEPARTMENT OF FISH AND WILDLIFE
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December 1, 2023

The Honorable June Robinson
Chair, Senate Ways and Means
303 John A. Cherberg Building
Post Office Box 40466
Olympia, WA 98504-0466

The Honorable Timm Ormsby
Chair, House Appropriations
315 John L. O'Brien Building
Post Office Box 40600
Olympia, WA 98504-0600

The Honorable Kevin Van De Wege
Chair, Senate Agriculture, Water
Natural Resources, and Parks
212 John A. Cherberg Building
Post Office Box 40424
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The Honorable Mike Chapman
Chair, House Rural Development,
Natural Resources, and Parks
437A Legislative Building
Post Office Box 40600
Olympia, WA 98504-0600

Dear Chairs Robinson, Ormsby, Van De Wege, and Chapman:

I am writing to provide you with the Washington Department of Fish and Wildlife's report to the legislature regarding proviso (71) funding in our 2022 supplemental operating budget for various fisheries monitoring provisos. Funding and the proviso language requires a report to the relevant committees of the legislature per language that reads as follows:

> (71) The legislature intends to fund the monitoring items contained in subsections (43) through (45) and (50) through (53) of this section through fiscal year 2025. A brief status report of the data collected and findings from each monitoring item funded in this section is due to the appropriate committees of the legislature by December 1st of each fiscal year through 2025.

This investment in monitoring has allowed the Department to expand monitoring of fish and shellfish across the state in marine and freshwater systems. Our new sampling crews are helping the agency better understand the effectiveness of our hatchery programs at meeting conservation and harvest goals, the impacts of habitat restoration activities on fish productivity and salmon recovery, and the efficiency of our recreational and commercial fisheries. Please find a summary of our implementation approach across each of these monitoring programs attached.

The agency appreciates this critical investment and looks forward to sharing results of enhanced monitoring in the years to come. If you have any questions or concerns about this report, please feel free to contact Tom McBride, WDFW's Legislative Director, at (360) 480-1472.

Sincerely,

Kelly Susewind
Director

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Cover photo by Chase Gunnell

Background

Provisos:

(43) $3,802,000 of the general fund—state appropriation for fiscal year 2023 is provided solely to monitor recreational salmon and steelhead harvest in freshwater streams and rivers in Puget Sound and along the Washington coast.

(44) $2,116,000 of the general fund—state appropriation for fiscal year 2023 is provided solely to monitor salmon harvest from the ocean and Puget Sound.

(45) $994,000 of the general fund—state appropriation for fiscal year 2023 is provided solely to monitor salmon harvest from commercial fisheries.

(50) $4,283,000 of the general fund—state appropriation for fiscal year 2023 is provided solely to develop a monitoring and evaluation program for salmon and steelhead hatcheries in western Washington with the goal to improve survival of hatchery fish to adult returns and adaptively manage hatchery programs to better achieve management goals, including rebuilding natural populations for conservation purposes and increasing fishing opportunities.

(51) $2,392,000 of the general fund—state appropriation for fiscal year 2023 is provided solely to conduct fish in/fish out monitoring for the purposes of measuring freshwater systems salmon productivity for purposes of salmon recovery.

(52) $1,040,000 of the general fund—state appropriation for fiscal year 2023 and $295,000 of the limited fish and wildlife account are provided solely to monitor recreational shellfish harvest in Puget Sound.

(53) $710,000 of the general fund—state appropriation for fiscal year 2023 is provided solely to monitor recreational Dungeness crab harvest along the Washington coast.

To fulfill requirements of a 2022 operating budget proviso (SB 5693, 2022 p. 553), which reads as follows:

(71) The legislature intends to fund the monitoring items contained in subsections (43) through (45) and (50) through (53) of this section through fiscal year 2025. A brief status report of the data collected and findings from each monitoring item funded in this section is due to the appropriate committees of the legislature by December 1st of each fiscal year through 2025.

Freshwater Salmon Harvest

Proviso Language (SB 5693, 2022 p. 548):

(43) $3,802,000 of the general fund—state appropriation for fiscal year 2023 is provided solely to monitor recreational salmon and steelhead harvest in freshwater streams and rivers in Puget Sound and along the Washington coast.

Budget Overview

This proviso provided $3,802,00 in FY23 and $3,271,000 annually to enhance freshwater monitoring activities including fisheries sampling, as well as juvenile and adult trapping activities to enhance productivity estimates in targeted Western Washington rivers. This investment will enhance the agency's fisheries sampling and monitoring in several rivers and strengthen our understanding of fisheries impacts in real time and of the productivity of freshwater environments.

Progress Update

This brief summarizes WDFW's work to develop a freshwater sport fishery monitoring program for directed salmon and steelhead fisheries in the Puget Sound and Washington Coast regions from 12/2/2022 through 12/1/2023. This monitoring program was the result of annual fishery planning discussions with the Washington Treaty Tribes to better understand fishery impacts (i.e., both incidental and directed catch) and angler effort dynamics of freshwater fisheries.

A key impact of this work is that fishery monitoring, where implemented through legal requirements and co-manager agreements, enables fishing opportunity. During the reporting period, WDFW monitored 17 fisheries for salmon and steelhead harvest impacts within nine major river basins (Table 1). The information collected from this work is vital to in-season implementation and future planning of salmon fisheries, to ensure they stay consistent with allowable Endangered Species Act (ESA) and conservation objectives.

Table 1. Freshwater fisheries prosecuted and monitored by the Washington Department of Fish and Wildlife during the 12/2/2022 - 12/1/2023 reporting period.

Region	River Basin	Target Species	Start Date	End Date
North Puget Sound	Skagit	Hatchery spring Chinook (lower river)	5/1/2023	5/31/2023
North Puget Sound	Snohomish	Hatchery summer Chinook	5/27/2023	5/29/2023
North Puget Sound	Snohomish	Summer gamefish (Hatchery steelhead)	5/27/2023	8/31/2023
North Puget Sound	Skagit	Spring Chinook (upper river)	6/1/2023	7/15/2023
North Puget Sound	Skagit	Sockeye	6/15/2023	7/31/2023
North Puget Sound	Baker Lake	Sockeye	7/8/2023	8/31/2023

Region	River Basin	Target Species	Start Date	End Date
South Sound and Washington Coast	Puyallup	Hatchery Chinook, coho, pink	8/16/2023	9/30/2023
North Puget Sound	Snohomish	Coho, pink	9/16/2023	11/9/2023
North Puget Sound	Stillaguamish	Coho, pink	9/16/2023	9/25/2023
North Puget Sound	Skagit	Coho, pink	8/14/2023	10/31/2023
South Sound and Washington Coast	Nisqually	Hatchery Chinook, coho, pink	7/1/2023	11/15/2023
North Puget Sound	Nooksack	Chum	11/1/2023	11/30/2023
North Puget Sound	Green	Hatchery Chinook, coho, pink	8/20/2023	12/31/2023
South Sound and Washington Coast	Quillayute	Hatchery Chinook, coho, pink	9/1/2023	12/15/2023
South Sound and Washington Coast	Chehalis (Humptulips)	Hatchery Chinook, coho, pink	9/1/2023	12/16/2023
South Sound and Washington Coast	Chehalis	Hatchery Chinook, coho, pink	9/16/2023	12/16/2023
South Sound and Washington Coast	Chehalis (Satsop)	Hatchery Chinook, coho, pink	10/1/2023	12/16/2023

To implement this work, WDFW hired new staff, including both permanent biologist and support positions (Table 2) and non-permanent scientific technicians (Table 3), with job duties directly supporting freshwater salmon harvest monitoring. The Agency purchased essential equipment to support this work, including computer tablets for electronic data collection, “T-Wand” coded wire detectors for salmon stock identification, and a new jet boat for angler census counts. Additional angler census counts were completed with aerial helicopter surveys to monitor effort in fisheries, where boat-based counts were logistically infeasible.

Table 2. Permanent positions with the Washington Department of Fish and Wildlife with dedicated duties towards monitoring freshwater salmon harvest hired during the 12/2/2022 - 12/1/2023 reporting period.

Region	WDFW District	Position
4 - North Puget Sound	District 13 – Snohomish/Stillaguamish	Fish and Wildlife Biologist 3
4 - North Puget Sound	District 14 – Nooksack/Skagit	Fish and Wildlife Biologist 3
6 – South Sound and Washington Coast	District 16 – North Washington Coast	Fish and Wildlife Biologist 2
Headquarters	Statewide – Puget Sound/Washington Coast	Research Scientist 1

Table 3. Non-permanent positions with the Washington Department of Fish and Wildlife with dedicated duties towards monitoring freshwater salmon harvest hired during the 12/2/2022 - 12/1/2023 reporting period.

Region	Non-permanent Positions Hired	Total Staff Months
4 - North Puget Sound	District 13 – Snohomish/Stillaguamish	Fish and Wildlife Biologist 3
4 - North Puget Sound	District 14 – Nooksack/Skagit	Fish and Wildlife Biologist 3

Angler survey interview data from freshwater salmon creels show the seasonal and spatial extent of WDFW's monitoring efforts in Puget Sound and Washington Coast Rivers, as demonstrated by monthly tallies of completed creel angler survey interviews (Figure 1). By monitoring for all species encountered, we are improving our understanding of fishery impacts across a range of water bodies and fishery stocks of management concern.

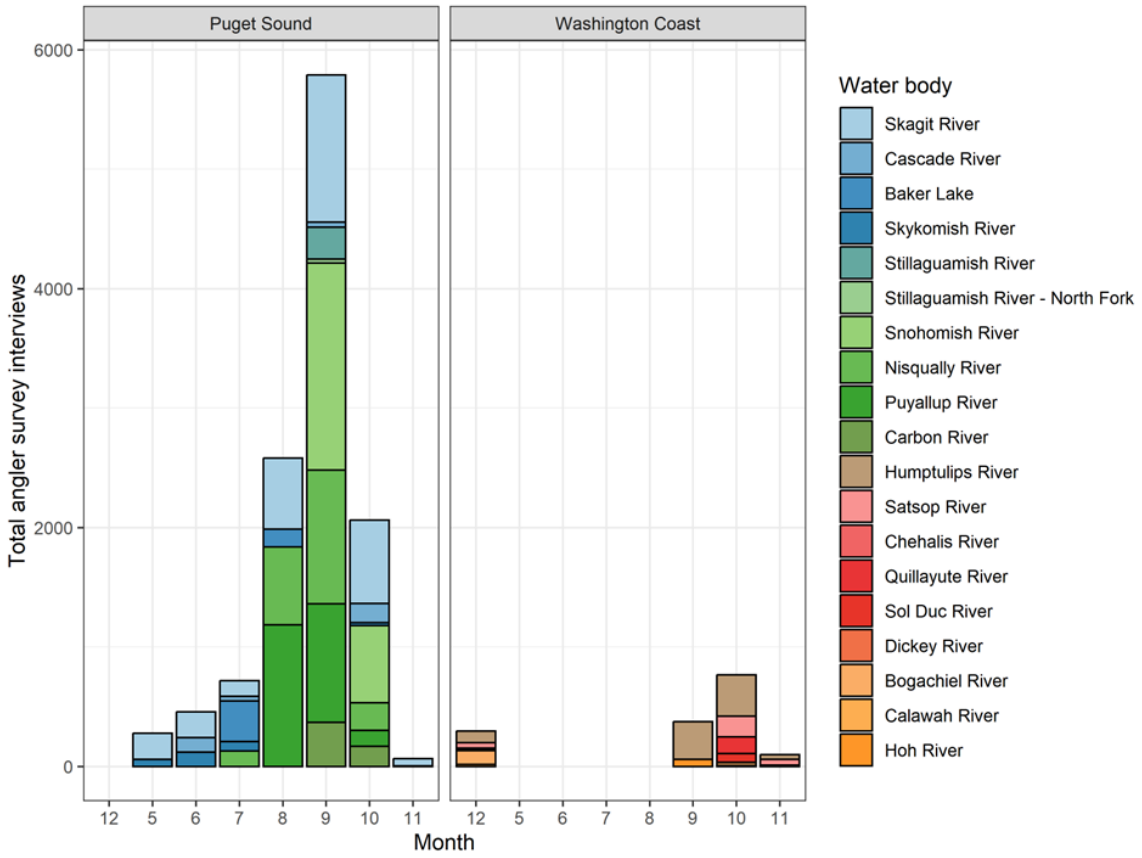

Figure 1. The monthly sum of angler group interviews obtained during freshwater salmon creels grouped by water body and plotted separately for fisheries occurring in either Puget Sound or Washington Coast rivers during the 12/2/2022 - 12/1/2023 reporting period.

Next Steps

With the continued support of the Washington State Legislature, tribal co-managers, the Governor's Office, and user groups, WDFW plans to implement a similar level of monitoring effort during freshwater salmon seasons from 12/2/2023 – 12/1/2024, relative to work completed in current reporting period. The location and season of fisheries is subject to change based upon co-manager discussions and in-season management actions, but the focus of our monitoring will again center on key fishery stocks across the Washington Coast and Puget Sound.

Ocean and Puget Sound Salmon Harvest

Proviso Language (SB 5693, 2022 p. 548):

(44) $2,116,000 of the general fund—state appropriation for fiscal year 2023 is provided solely to monitor salmon harvest from the ocean and Puget Sound.

Budget Overview

This proviso provided an additional $1,958,000 in FY23 and $1,158,000 annually to enhance existing salmon fishery monitoring programs occurring in the Ocean and Puget Sound. Mixed stock salmon fisheries management in the coastal and interior marine waters of Washington involves intensive sampling and monitoring to meet strict harvest guidelines to offer salmon fisheries opportunity while staying within agreed to conservation objectives required under the Endangered Species Act, the Pacific Salmon Treaty, and the US vs. WA and US vs. OR court decisions. As recreational fishing opportunities directed at salmon diminish and an increasing population demands access to abundant hatchery stocks, the need for robust and timely information regarding fisheries impacts is imperative. This funding is intended to complement existing funding and boost monitoring capability through increased staffing and one time equipment purchases.

Progress Update

Monitoring mixed stock marine area salmon fisheries has been a priority since the listing of Puget Sound Chinook as threatened under the Endangered Species Act in 1999. A new Chinook Resource Management Plan developed by the State and Tribal co-managers was submitted to NOAA fisheries in 2022 that includes strict limits on co-manager fisheries that have significant impacts on several Chinook stocks of concern, particularly Chinook from the Stillaguamish River. Robust monitoring programs allow for fisheries to occur while ensuring that fisheries impacts on listed stocks do not impede recovery goals.

There are several important parts of the sampling and monitoring programs that are vital to providing the needed information to scientists and managers for evaluation of these fisheries. Two of the most important needs are people to interview anglers about their fishing trips and people to work on the water during these fisheries in agency boats conducting test fisheries and effort surveys which inform management decisions during the season. For the 2023 fishing season, WDFW was able to purchase data collection devices (iPads) and hire staff for ocean fishery monitoring. We were also able to purchase six new vessels to conduct this work throughout Puget Sound and hire additional staff to ensure basic monitoring levels were maintained or improved. The table below shows the increasing number of angler interviews and hours conducting on-the-water monitoring in Puget Sound in the recent four-year period. This funding is vital to maintaining fishing opportunities throughout Coastal Washington and Puget Sound.

Table 4. Number of angler interviews and total hours on-the-water conducted in the Puget Sound over the 2020-2023 period.

Year	Total # of Angler Interviews	Total # of Hours on-the-water
2020	42,315	1,508
2021	45,815	2,929
2022	42,447	4,101
2023	51,800	4,729

Next Steps

Moving into 2024, we will continue to focus on recruiting and training permanent and seasonal staff, so we are fully staffed for monitoring in the coming season. Initial planning for sampling and monitoring the 2024/25 fishing season is under way.

Commercial Salmon Harvest

Proviso Language (SB 5693, 2022 p. 548):

(45) $994,000 of the general fund—state appropriation for fiscal year 2023 is provided solely to monitor salmon harvest from commercial fisheries.

Budget Overview

This monitoring proviso provided $994,000 in FY23 and $544,000 in annual funding to enhance monitoring of commercial chum salmon fisheries occurring in Puget Sound. WDFW developed a broad strategy with tribal co-managers to address information gaps and devote resources to expanded data collection associated with both State and Tribal commercial fisheries directed at chum salmon.

Progress Update

Puget Sound comanagers met to discuss commercial salmon harvest during the annual North of Falcon (NOF) process in 2022 and 2023 and developed a monitoring and sampling plan to address informational gaps, meet conservation goals, and build a sustainable and comprehensive fisheries management plan for Puget Sound chum salmon. The comanager developed monitoring and sampling plan included the following objectives:

a) expand our seasonal commercial test fisheries program in Central and South Puget Sound,
b) expand our onboard monitoring and scale sampling in chum directed commercial fisheries,
c) expand our tissue sampling and collections in chum directed commercial fisheries and test fisheries to build a real-time in-season stock composition assessment program,
d) improve management of our commercial fisheries and observer databases and assist our commercial team with commercial fisheries related data requests, and
e) build assessment tools for short-term and long-term evaluation of chum stocks of conservation concern.

To address objective a), WDFW contracted and commissioned two commercial test fishing vessels in 2022, one for Marine Area 11 and one for Marine Area 9 north of Hood Canal Bridge. WDFW expanded that effort to three commercial test fishing vessels in 2023, two for Marine Area 11 to cover traditional fishing areas in different migratory passages and one for Marine Area 9 north of Hood Canal Bridge. These vessels were successful in collecting up to 200 weekly tissue and age samples across 2022 and 2023, informing comanagers in-season with fisheries management decisions in both Hood Canal and Central and South Sound. For objective b), WDFW purchased a commercial monitoring vessel ($370,000) to transport staff and ensure fisheries observer coverage across all concurrent commercial fisheries. Additionally, WDFW hired 11 non-permanent Scientific Technician 2 staff members, one Career Seasonal Scientific Technician 2, and one Career Seasonal Scientific 3 Technician 3 to support the operation of the additional monitoring vessel and additional sampling and logistics needs for the May through December timeframe annually (Puget Sound commercial salmon seasons). The addition of the commercial monitoring vessel and observers allowed WDFW to improve spatial and temporal monitoring from directed mixed-stock commercial chum, pink, and sockeye fisheries, observe daily effort and catch, record bycatch, and sample catch onboard commercial fishing vessels in-season. For objective c), WDFW

contracted the agency's Molecular Genetic Lab to process tissue samples in-season and post-season (charged per sample) and provided six months of support for a Research Scientist I to prioritize and process the chum tissue samples. For objective d), WDFW hired a permanent Fish and Wildlife Biologist 2 to manage in-season and post-season commercial fisheries catch and monitoring databases, age data collection, and to lead one of the new test fishery operations. Finally, to address objective e), WDFW hired one 6-month Fish and Wildlife Biologist 2 to build tools to evaluate chum population status in-season to support fishery managers (i.e., weekly commercial fishery data distribution R-markdowns and shiny application), and to support development of a comprehensive chum management report for NOF 2024.

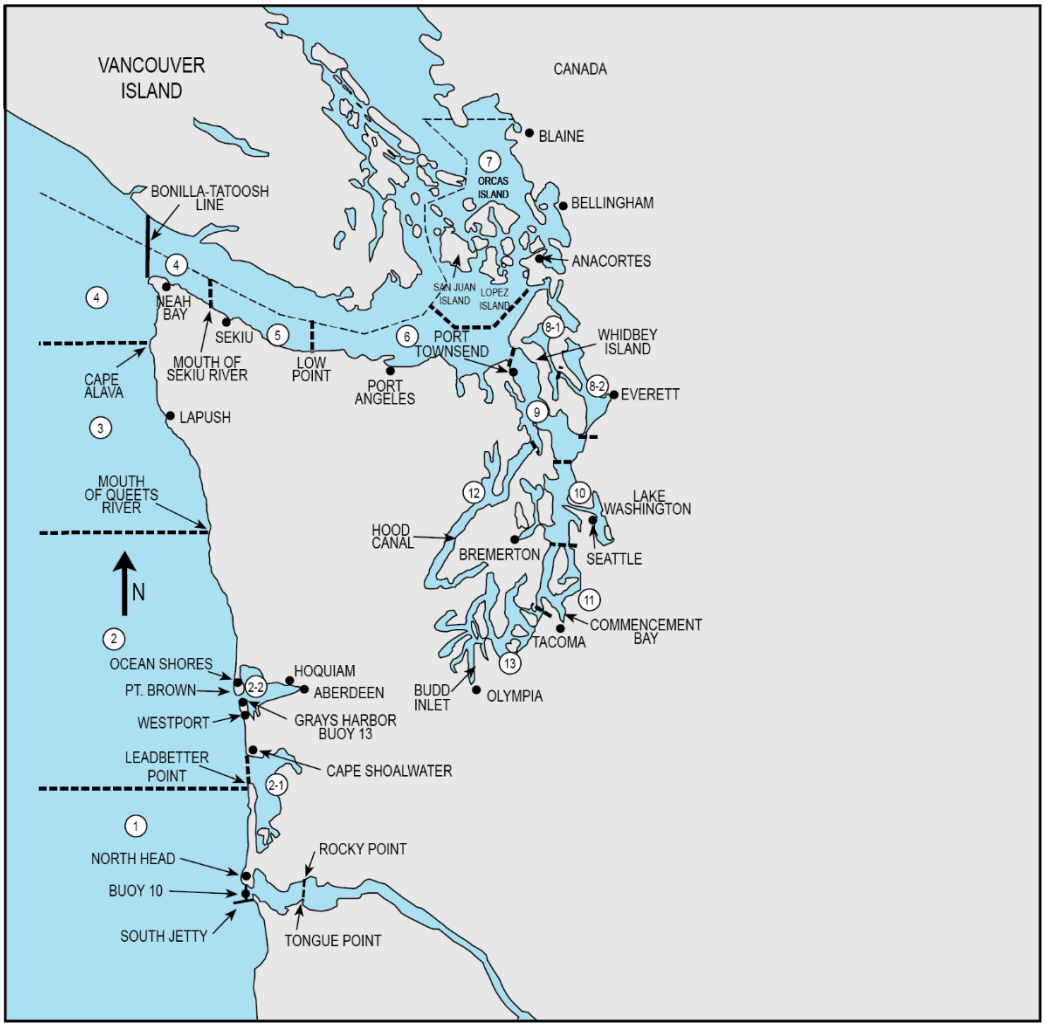

Figure 2. Map of the Marine Areas in Washington state.

During the 2022 commercial chum season, we collected 3,464 tissue samples from directed and test fisheries in Marine Areas 9 and 10, analyzing 2,400 of those samples post-season. Preliminary results were summarized and provided to comanagers during NOF 2023, to better understand composition within commercial chum directed fisheries and how they change from management week 42 to 46 (Figure 3).

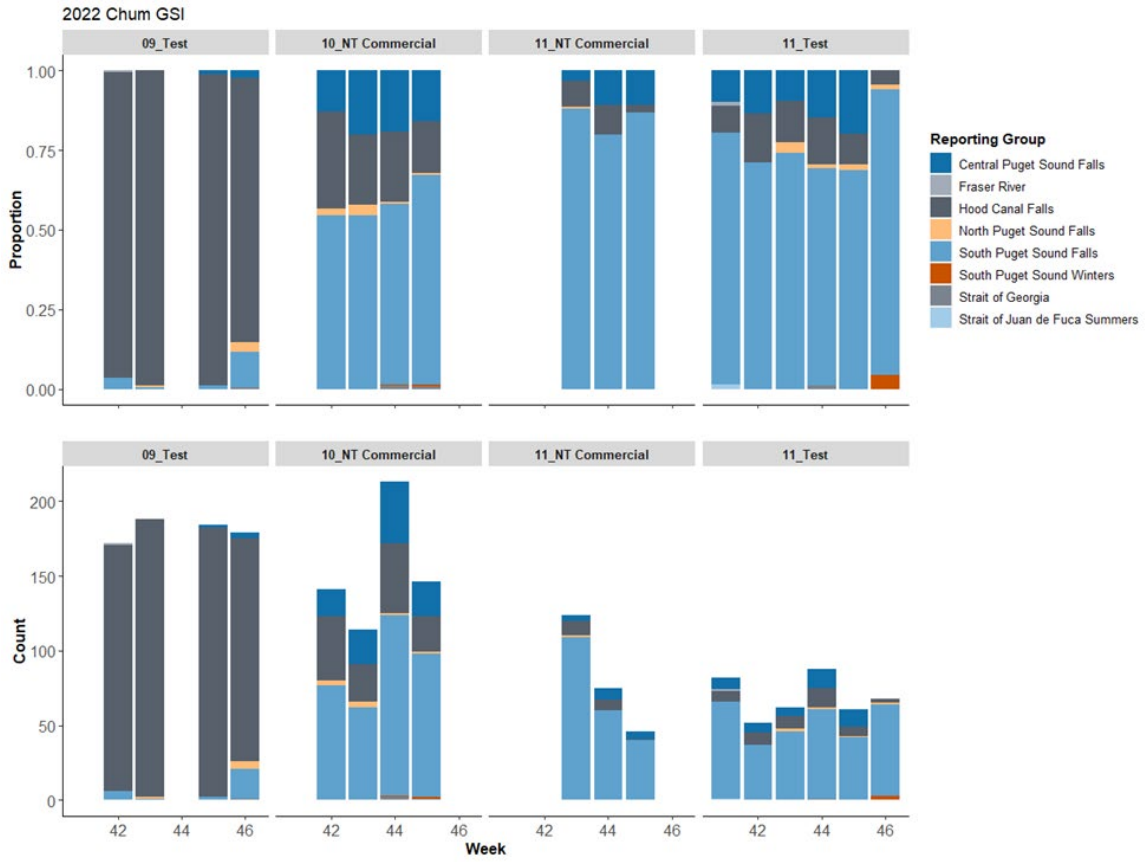

Figure 3. Chum genetic stock composition from tissue samples collected during chum test fisheries in Marine Areas 9 and 11, and state commercial chum directed fisheries in Marine Areas 10 and 11 in 2022.

Results indicated that stocks of concern, such as South Puget Sound wild winter chum, were likely detected in traditional commercial fishing areas in week 46. Using data from these and historical collections, WDFW commercial staff built a model to estimate the expected proportion of South Puget Sound wild and hatchery winter chum (Figure 4, Figure 6).

During our 2023 commercial chum season, we have collected approximately 3,000 samples from directed and test fisheries in Marine Areas 9, 10 and 11, and plan to collect up to 4,000 by the end of season. In 2023, the genetics lab has processed 2,225 samples for in-season analysis and will process an additional 2,000 samples for post-season analysis. The season is ongoing, and we are in management week 45, so we have summarized real-time results only through week 44 (Figure 5). Using the collections, a real-time assessment of expected proportion of winter chum impacts was also produced (Figure 6).

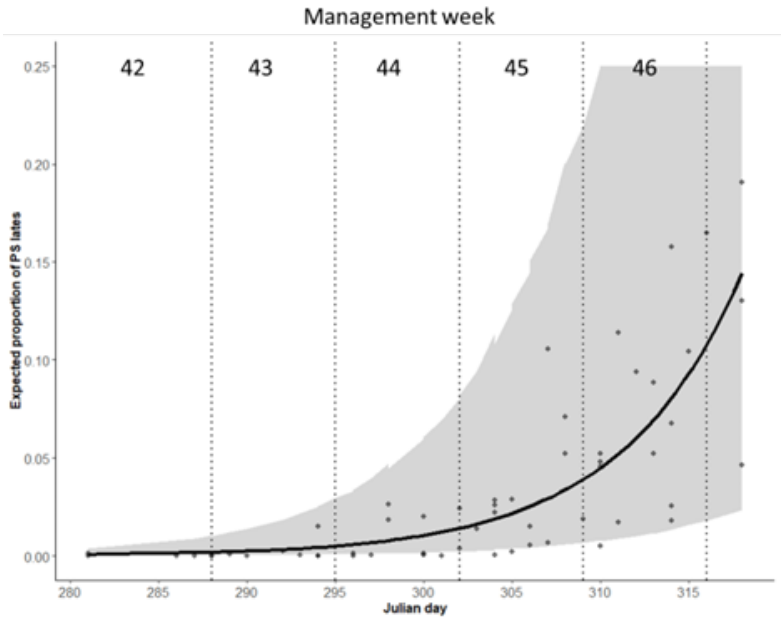

Figure 4. Pre-season model estimated expected proportion of hatchery and wild winter chum salmon in Marine Areas 9 and 10.

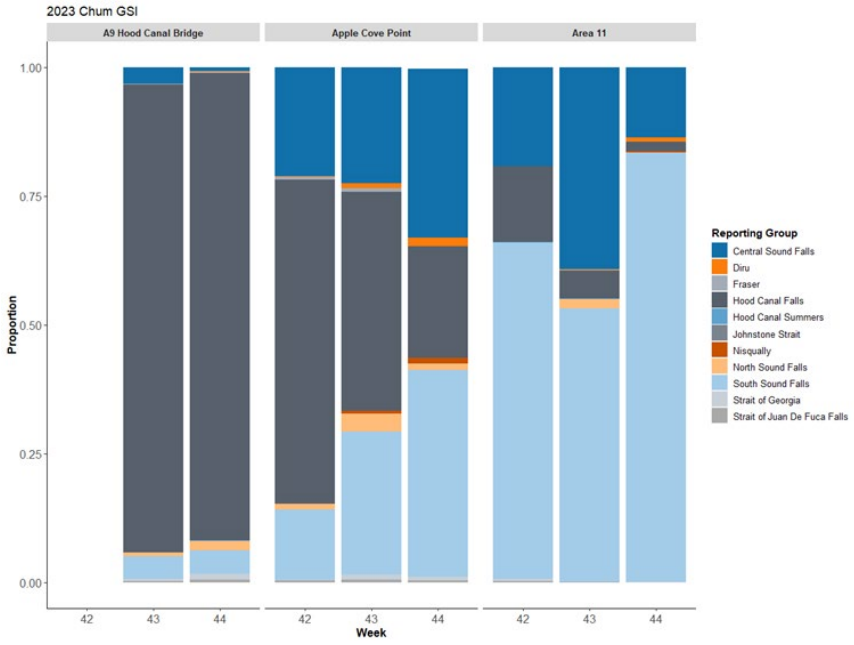

Figure 5. Chum genetic stock composition from tissue samples collected during chum test fisheries in Marine Areas 9, 10, and 11 in 2023.

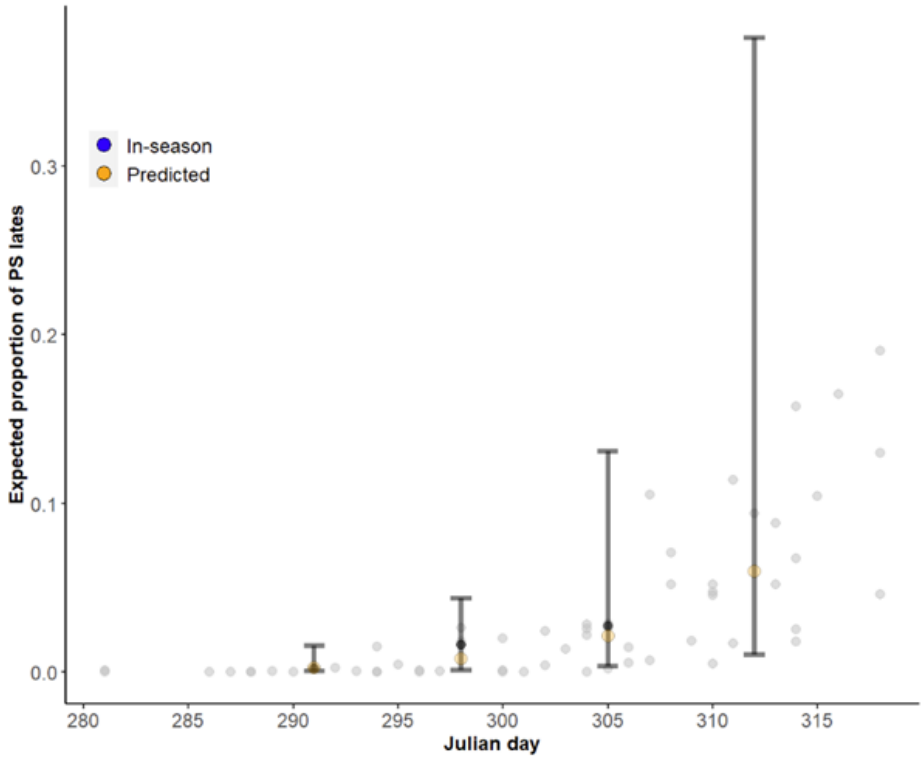

Figure 6. In-season estimates and model estimated proportions with 95% confidence intervals of hatchery and wild winter chum salmon by Julian day in Marine Area 9 and 10 in 2023.

Next Steps

During our 2023 commercial chum season, our Fish and Wildlife Biologist 2 also built a tool to review test catch in-season, to support fishery managers and provide information in real-time to the public. The application is still under development, but a preview output is currently available here: https://elsatoskey.shinyapps.io/WDFW_In_Season_Chum_Test_Fishing_App/.

Figure 7. South Puget Sound Chum Salmon Test Fisher Application

Moving into 2024, we will continue work on the test fishing application, will process genetic samples taken in 2023 fisheries and age data collected from spawning ground sampling. We will also focus on summarizing results of monitoring and sampling programs implemented in fall fisheries for desired outcomes and effectiveness.

Hatchery Production Evaluation

Proviso Language (SB 5693, 2022 p. 549):

(50) $4,283,000 of the general fund—state appropriation for fiscal year 2023 is provided solely to develop a monitoring and evaluation program for salmon and steelhead hatcheries in western Washington with the goal to improve survival of hatchery fish to adult returns and adaptively manage hatchery programs to better achieve management goals, including rebuilding natural populations for conservation purposes and increasing fishing opportunities.

Budget Overview

One of the priorities for state and tribal co-managers in Governor Inslee's Salmon Strategy was development of a comprehensive hatchery monitoring and evaluation program for our westside hatcheries. The 2022 supplemental budget included $4.2M in ongoing funding to develop a robust monitoring program like what we have for our eastside hatchery programs. This monitoring program will allow us to answer critical questions about survival of hatchery fish and better understand and explain their role in conservation and recovery of wild stocks. It will allow us to compare the effectiveness of our programs at achieving not just hatchery survival and production goals but also out-of-hatchery survival metrics. This Hatchery Monitoring and Evaluation (Hatchery M&E) program is being implemented in three phases:

- Phase 1: In-hatchery survival monitoring – during this phase we will focus on assessing whether we are seeing the expected hatchery survival benefits.
- Phase 2: Out-of-hatchery survival monitoring – during this phase we will focus on assessing whether post-release and marine survival meeting expectations.
- Phase 3: Evaluation – during this phase we will focus on whether program goals being achieved while containing risk.

Progress Update

The agency is currently implementing Phase 1 of the program, focused on in-hatchery survival, and worked this past year to integrate new team members with existing hatchery teams to support data collection and analysis through the first spawning season. The agency completed the first task of recruiting and hiring the program lead for this work in March 2023. The process of hiring the supporting core team commenced immediately after that and eight cross-regional positions (Hatchery M&E leads) were filled by mid-July. During July and August, this group hosted meetings at the regional and complex level to bring together staff from all divisions and inform them about the vision, plan, and next steps regarding hatchery monitoring and evaluation. Hatchery M&E leads have been working in their areas with hatchery facility managers and staff to develop protocols and procedures, as well as providing additional staffing support. Hatchery M&E staff have also provided technical and analytical support, have assisted with Hatchery and Genetic Management Plans, date and size at release studies, as well as gathering other hatchery program information.

To date, the newly in place M&E staff have been able to provide additional resources onsite at the hatcheries across western Washington and lay important groundwork for the years ahead, including

important cross-training efforts, additional staffing and real-time observations of processes and procedures that directly impact our IT-related efforts to build an inclusive database for long-term data management.

The full complement of staff to execute Phase 1 of the Hatchery M&E Plan has been hired and development of a centralized database accessible for all WDFW staff has begun. By the end of FY24, the current database tool, Fishbooks, will be replaced with a new Hatchery Data Management System. By the end of this year, the Hatchery M&E teams will have assisted with spawning of fish and collection of data at all our facilities in Western Washington and has engaged with region and division leads to develop approaches for Phase 2 of the M&E Plan (out-of-hatchery monitoring).

Next Steps

In FY25 we will enter full implementation of Phase 1 which will focus on in-hatchery monitoring, and begin Phase 2, out-of-hatchery monitoring, pending funding. Phase 2 of the comprehensive plan will include monitoring of post release survival and several other hatchery performance metrics. A host of analytical approaches will be used to monitor hatchery programs in-season to improve management opportunities and create a common understanding of status across staff in the regions and headquarters. Westside Hatchery Monitoring and Evaluation staff will support regional teams' needs whenever they are available. Technicians have already begun training with project leads in the region to help expand capacity.

WDFW staff assess steelhead at Kalama Falls Hatchery.

Fish Migration Monitoring

Proviso Language (SB 5693, 2022 p. 549):

(51) $2,392,000 of the general fund—state appropriation for fiscal year 2023 is provided solely to conduct fish in/fish out monitoring for the purposes of measuring freshwater systems salmon productivity for purposes of salmon recovery.

Budget Overview

Funding was provided to expand fish in/fish out monitoring for salmon and steelhead populations in Western Washington. This investment will enhance the agency's monitoring and strengthen our understanding of the productivity of freshwater and marine environments by funding new monitoring projects in watersheds where we lack data as well as new positions dedicated towards developing metrics and indicators that link fish productivity data to habitat data. These efforts will allow WDFW to build baseline metrics that can be used to better measure the effects of habitat restoration actions and climate change on salmon recovery.

A portion of these funds are being used to stabilize funding for existing adult and juvenile salmon abundance monitoring sites. Existing sites that were on unstable or partial funding including Snow Creek, Salmon Creek, Duckabush, Touchet, Grays River, and Wind River were fully funded on an ongoing basis thanks to these funds. Another portion of the funds are being used to fund new work that will fill key data gaps. New projects being funded by this proviso include an adult abundance estimation project on the Samish River, an investigation into Skagit River Chinook genetic baseline, and a new Sonar Team for the Washington Coast.

In addition to the investments made in monitoring activities, ongoing funds were used to hire three new staff that will be dedicated to planning, developing, and implementing the new fish and habitat baseline metrics and tools.

Progress Update

After hiring the three dedicated support positions (1 Project Coordinator and 2 Research Scientists), a cross program project team was formed and has been meeting regularly to more clearly define the "current environmental baseline" objective that was called out in the original budget request. The focus of this team has been to determine how to establish a meaningful and useful "environmental baseline". This team is tasked with developing models, metrics, and other tools that will show a relationship between defined habitat conditions and salmon population performance. The team is still in the planning stages of this effort.

Three new adult monitoring projects have been implemented over the past year, which all included hiring new field staff, purchasing equipment, and getting the new equipment installed at the new sites. These new monitoring projects are:

Adult steelhead abundance methods

This is a study taking place in the Samish River. Staff have purchased and installed an underwater camera in a fish ladder located down river from 98% of the steelhead spawning grounds (Figure 8). The camera will provide an accurate count of all adult steelhead that pass upriver. This count will then be compared to the abundance estimates that are derived from the various other estimation methods being used statewide, which will then highlight the level of accuracy and precision for each method used.

Figure 8. An adult steelhead passing through the Samish River fish ladder. On their way through the ladder, the fish must pass through an in-river camera housing which has an infrared sensor and a light to illuminate fish for the photos.

Adult sonar monitoring

Staff will install a SONAR unit in two coastal rivers, the Sol Duc for coho and the Clearwater (a tributary of the Queets River) for steelhead. The SONAR allows researchers to passively monitor fish movement past a fixed site by producing high-resolution video images 24 hours a day (Figure 9). This effort will not only result in more precise adult abundance estimates in these rivers but will also show the level of accuracy with the previously used methodology, potentially leading to correction factors for redd-based methods.

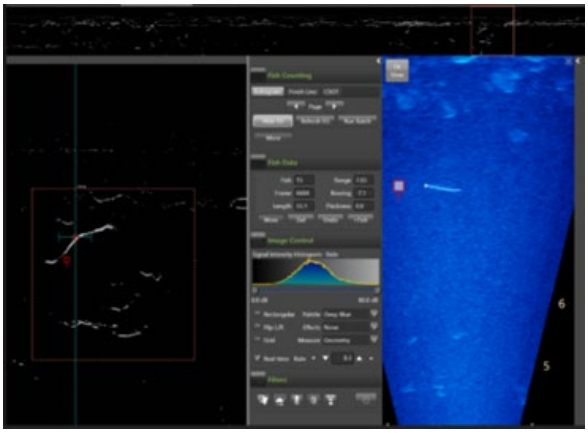

Figure 9. A still image taken from a SONAR video. This image shows a summer coho being measure for length. Monitoring staff are trained to use the SONAR software and how to differentiate salmon from other objects that pass by.

Skagit River Chinook genetic baseline

Staff will collect tissue from the populations of wild and hatchery Chinook throughout the Skagit watershed and analyze DNA to build a reference baseline that can identify members of each population.

Currently there are six recognized natural Chinook salmon populations in the Skagit Basin, plus the segregated Marblemount spring Chinook salmon population. We are currently unable to distinguish among some populations with enough precision to be used in monitoring. This project should lead to improved ability to genetically identify members of each population allowing for more targeted monitoring and management strategies.

Finally, one-time funds were used to either purchase new monitoring equipment or for much needed upgrades or repairs at existing smolt or adult monitoring sites. Most of the one-time funds were used to purchase and install new PIT tag arrays, which are used to track PIT tagged salmon and steelhead. These arrays will help improve the data being collected at some of our existing monitoring sites. Arrays were installed in Mill and Germany Creeks, Kalama River, and the lower Touchet River.

Next Steps

During this next year, the cross-program project team will finalize a project plan and begin working towards building the first version of the model(s), metrics, and/or reporting tools. Once this is accomplished the next step will be to build a framework around how the metrics and tools can be implemented and used by agency staff and partners.

For all the new monitoring projects, this next year will be spent collecting and analyzing data. For these projects, multiple years' worth of comparisons are necessary to account for year-to-year environmental variability and run sizes that could impact the accuracy and precision of certain monitoring methods more than others.

Shellfish Harvest

Proviso Language (SB 5693, 2022 p. 549):

(52) $1,040,000 of the general fund—state appropriation for fiscal year 2023 and $295,000 of the limited fish and wildlife account are provided solely to monitor recreational shellfish harvest in Puget Sound.

Budget Overview: Puget Sound Shellfish

The fully funded budget request to support this work was $1.68 million per year. The Department requested funding to expand the Puget Sound Shellfish Program's capacity to help address priority needs including risks to shellfish from climate change, record fisheries participation, and a rapidly growing human population in Puget Sound. Updating our program by adding a range of staff is necessary to address short and long-term needs, to adapt to evolving management conditions, to continue to meet tribal co-management obligations, and to continue to ensure the healthy shellfish populations for the citizens of Washington state.

Progress Update

In FY 23, we received $1.04 million of the requested $1.68 million which necessitated modifying our hiring plans to stay within the reduced budget. The agency prioritized hiring the following positions:

- Fish and Wildlife Biologist 4 (1 FTE), Shellfish Disease Prevention Unit (Unit Lead) – hired Oct. 2022
- Scientific Technician 2 (1 FTE), Shellfish Disease Prevention Unit (Surveys and monitoring) – hired July 2023
- Fish and Wildlife Biologist 3 (1 FTE), Intertidal Unit (Olympia Oyster, emerging issue focus, Commercial Fishery support) – hired July 2023
- Fish and Wildlife Biologist 2 (1 FTE), Crustacean Unit (Recreational crab and shrimp focus) – hired in Dec. 2022.
- Scientific Technician 2 (1 FTE), Crustacean Unit (Commercial fisheries monitoring) – Hired Aug. 2022
- Scientific Technician 3 (1 FTE), Crustacean Unit (Recreational fisheries monitoring) – Hired Dec. 2022
- Scientific Technician 2 (0.25 FTE), Crustacean Unit (Recreational fisheries monitoring) – hired in Spring 2023

These newly hired staff positions have allowed the Puget Sound shellfish team to expand our work in many key areas including:

Fisheries monitoring: Intertidal bivalves

The additional three scientific technicians supported by this funding contributed to 117 creel surveys that were conducted on 24 beaches, 2,156 people creeled, and 61,593 clams and 13,505 oysters processed by creel staff in the spring/summer in 2023.

Fisheries monitoring: Crabs

The funding from this proviso and the accompanying spending authority described below, supported 10 new staff positions dedicated to recreational crab fisheries monitoring and management. This year the newly hired creel staff surveyed 30 different boat ramps throughout Puget Sound during the open summer recreational season, which resulted in 1,538 boats interviewed, 2,305 Catch Record Cards checked, and 7,906 Dungeness crab and 1,426 red rock crab sampled for compliance and biological data.

Shellfish and seaweed health and biosecurity

The two new staff hired to this unit have greatly expanded our field capacity. Thus far in 2023, the new staff capacity has allowed the team to perform 46 inspections of shellfish grower facilities and has contributed to 166 shellfish transfer and import permits issues, and hundreds of consultations with shellfish growers thus far.

Olympia Oyster Restoration and Emerging Issues

The new Fish and Wildlife Biologist 3 position was filled in July 2023. This additional capacity has allowed the program to begin updating the state's 10-year Olympia Oyster Restoration Plan, create an Olympia Oyster Restoration Catalog, coordinate a team focused on developing rapid response planning for climate change-related heat wave events and other threats to intertidal shellfish, and begin working on smaller projects such as updating the state's approach to genetic risks with Olympia oyster hatchery production.

Olympia oysters

Since receiving the remaining funds in FY 24/25, the agency has updated our hiring plans. We are now in the process of hiring the following position:

- (1) IT Data Management Journey (1 FTE)

Due to changes in program priorities and staff pay changes, we are not planning to fill the following initially identified positions:

- Scientific technician 2 (0.25 FTE) – crustacean creeling
- Research Scientist 1 (1 FTE)
- Scientific technician 2(2 FTE) – fisheries sampling

The remaining funds received in FY24 are being used to extend the scientific technician staff positions to creel monitor the recreational squid fishery in Puget Sound (Scientific Technician 2 – 1.5 FTEs) in fall/winter 2024 and verifying Dungeness crab catch record card harvest information via a phone/email survey ($80,000).

Proviso Language (SB 5187, 2023, p. 427)

(17) $509,000 of the general fund—state appropriation for fiscal year 2024 and $305,000 of the general fund—state appropriation for fiscal year 2025 are provided solely to monitor recreational shellfish harvests, monitor intertidal and crustacean fisheries, address emerging environmental issues, maintain a new data management infrastructure, and develop a disease and pest management program to protect shellfish fisheries in the Puget Sound.

Budget Overview: Recreational Shellfish Monitoring

The request to increase the spending authority for Puget Sound crab catch record card funds allowed the Puget Sound shellfish team to add needed capacity to adequately monitor recreational shellfisheries by updating historic harvest, effort, and compliance data that is crucial for sustainable fisheries management. To meet these needs, we initially requested to hire seven seasonal Scientific Technicians (2.7 FTE) dedicated to creel monitoring summer recreational Dungeness crab and recreational intertidal bivalve harvest. With the allocated funds, we were able to include an additional .25 FTE of a Scientific Technician 2, bringing the total staff to eight seasonal Scientific Technicians (2.9 FTE) dedicated to creel monitoring summer recreational Dungeness crab and recreational intertidal bivalve fisheries.

Progress Update

The eight scientific technicians dedicated to creel monitoring of recreational crab and intertidal bivalves were hired for the first time in spring 2023 and their contributions are summarized in the “Shellfish Harvest” section above.

- (5) Scientific Technician 2 (1.2 FTE), Crustacean Unit (Recreational fisheries monitoring) – hired spring 2023.
- (3) Scientific Technician 2 (1.7 FTE), Intertidal Unit (Recreational fisheries monitoring) – hired in Spring 2023.

Dungeness Crab Harvest

Proviso Language (SB 5693, 2022 p. 549):

(53) $710,000 of the general fund—state appropriation for fiscal year 2023 is provided solely to monitor recreational Dungeness crab harvest along the Washington coast.

Budget Overview

This new funding for Dungeness crab monitoring will allow the agency to hire new staff positions and purchase critical equipment needed to enhance our recreational Dungeness crab harvest monitoring along the Washington Coast. This work will be implemented in two phases. In this first fiscal year, phase one of this work commenced and was focused on program development, building the monitoring plan, hiring and training staff and purchasing monitoring equipment. In the second fiscal year we will enter phase two of the project, the implementation phase, where our team will begin executing the monitoring plan.

The agency's first step in phase one was to recruit and hire a lead biologist position to oversee this work. The lead biologist started November 16, 2022, and has been working to develop an appropriate monitoring program that produces statistically sound recreational Dungeness crab harvest estimates. The first task of the lead biologist will be to begin researching and reviewing existing sampling and estimation programs to inform the monitoring program. The lead biologist also hired additional staff to support program development and implementation.

Photo of the newly formed Coastal Recreational Crab Unit.

Progress Update

The lead biologist met with internal and external partners and reviewed existing sampling methodologies from the WDFW Ocean Sampling Program, Puget Sound Crustacean Team, and freshwater river creel surveys, as well as the Oregon Department of Fish and Wildlife's (ODFW) recreational Dungeness crab project. Through field observations and research, a preliminary field sampling protocol was developed. This protocol provides instructions for crab samplers to follow when working in the field. In addition to the protocol, a crab creel survey form was created to collect data electronically via the iForm Application. The team is collecting four types of data: ingress/egress, effort counts, crabber interviews, and biological data. This data will help determine peak effort at various access points, amount of crabbing pressure and catch per unit effort (CPUE), and average size and weight of crab harvested throughout the year. Sampling efforts are focused on boat, land, and dock access points in Grays Harbor, Willapa Bay, Columbia River, and along coastal beaches. With a fully implemented team we were able to create a field sampling schedule that allows for data collection 7 days per week to generate a baseline data set.

Additional staff hired to complete the team include one Fish and Wildlife Biologist 2 (hired April 2023) and three Scientific Technician 2's (hired July 2023). Staff received training immediately and began field data collection in August 2023. Prior to hiring staff, gear and equipment were purchased. This included four vehicles, sampling gear (counters, scales, calipers, buckets), iPads and accessories for field data collection, and personal protective equipment (rain gear, gloves, boots, life jackets, PLBs, various safety gear).

The team is also collaborating with the agency communication team on public engagement and has published two blog posts describing our newly formed Coastal Recreational Crab Unit and proper gear allowed during crab pot closure season. A "Crabbing on the Coast" sport fishing guide brochure was created to provide tips for new and existing crabbers. To help educate the public on coastal crab rules they created crabber kits that contain cheat sheets on rules, regulations, seasons, how to measure crab for legal size, preventing pot loss, as well as a crab a measuring gauge and rot cord. To help reduce fishing violations informational crabbing signage was developed and posted at all major access sites. They also had the opportunity to collaborate on a Crab Washington sticker design that is very popular with the public.

Next Steps

With the program now fully staffed, the data collected will support the further development of estimation procedures. During this next year, the team will refine the sampling methodology to account for between site variability and the impact of seasonality and other contributing factors that impact fishing effort. The team will work to build a database and develop harvest estimation methodology through continued coordination with internal and external partners. Before moving out of the pilot phase and into full implementation of this work, the lead biologist will coordinate internal and external review of the sampling regime and estimation methods with partners and co-managers.