Appendix A

AQUATIC SPECIES RESTORATION PLAN UPDATES

DEPARTMENT OF ECOLOGY
State of Washington
OFFICE OF CHEHALIS BASIN

6/2/22

Chehalis Basin Board Meeting

TOPICS

- Project portfolio updates
- ASRP project site visits
- Unobligated reserve funds discussion

PROJECT PORTFOLIO UPDATES

PROJECT IMPLEMENTATION PROCESS ROLL-OUT

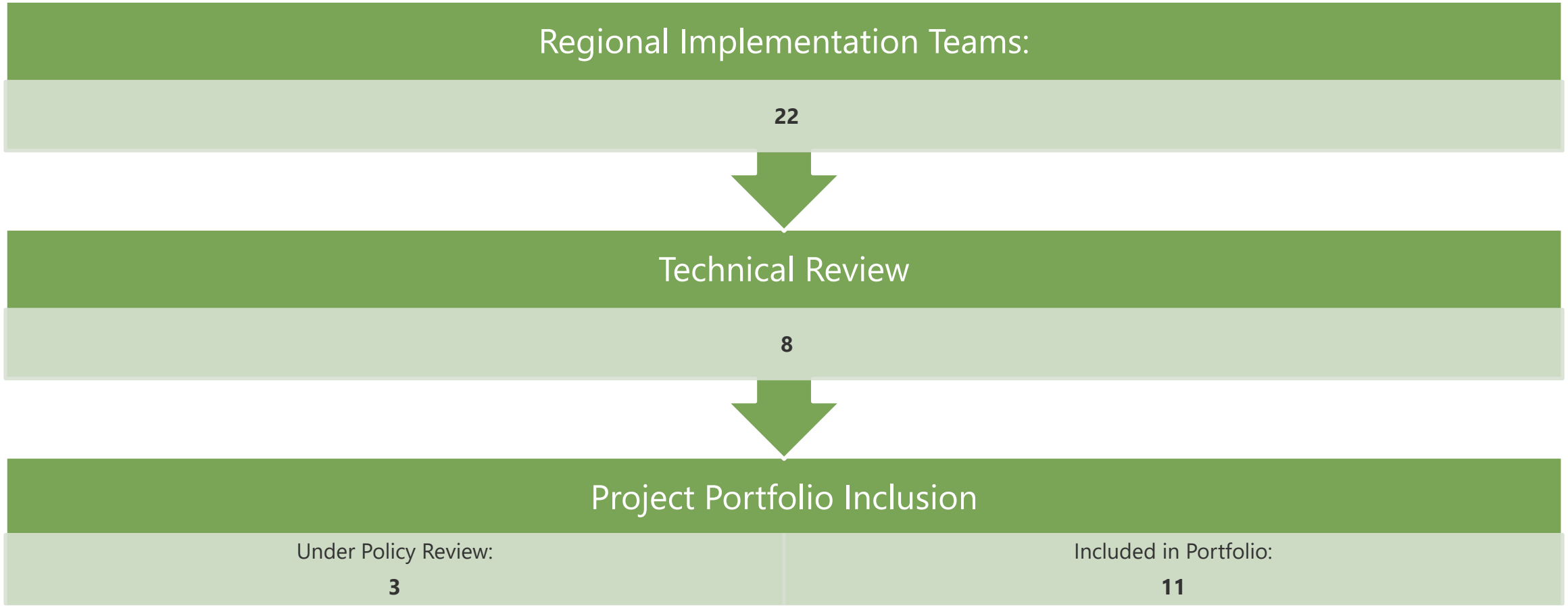
- 1st quarter 2022
  - Created new teams to support scaling up of program implementation
    - 3 Regional Implementation Teams
    - Technical Review Team
  - Facilitated new funding process
  - Refined policies
  - Filled over 2/3 of Project Portfolio/allocated $14.4M

21-23 PROJECT PORTFOLIO

- Adding new projects on “rolling” basis

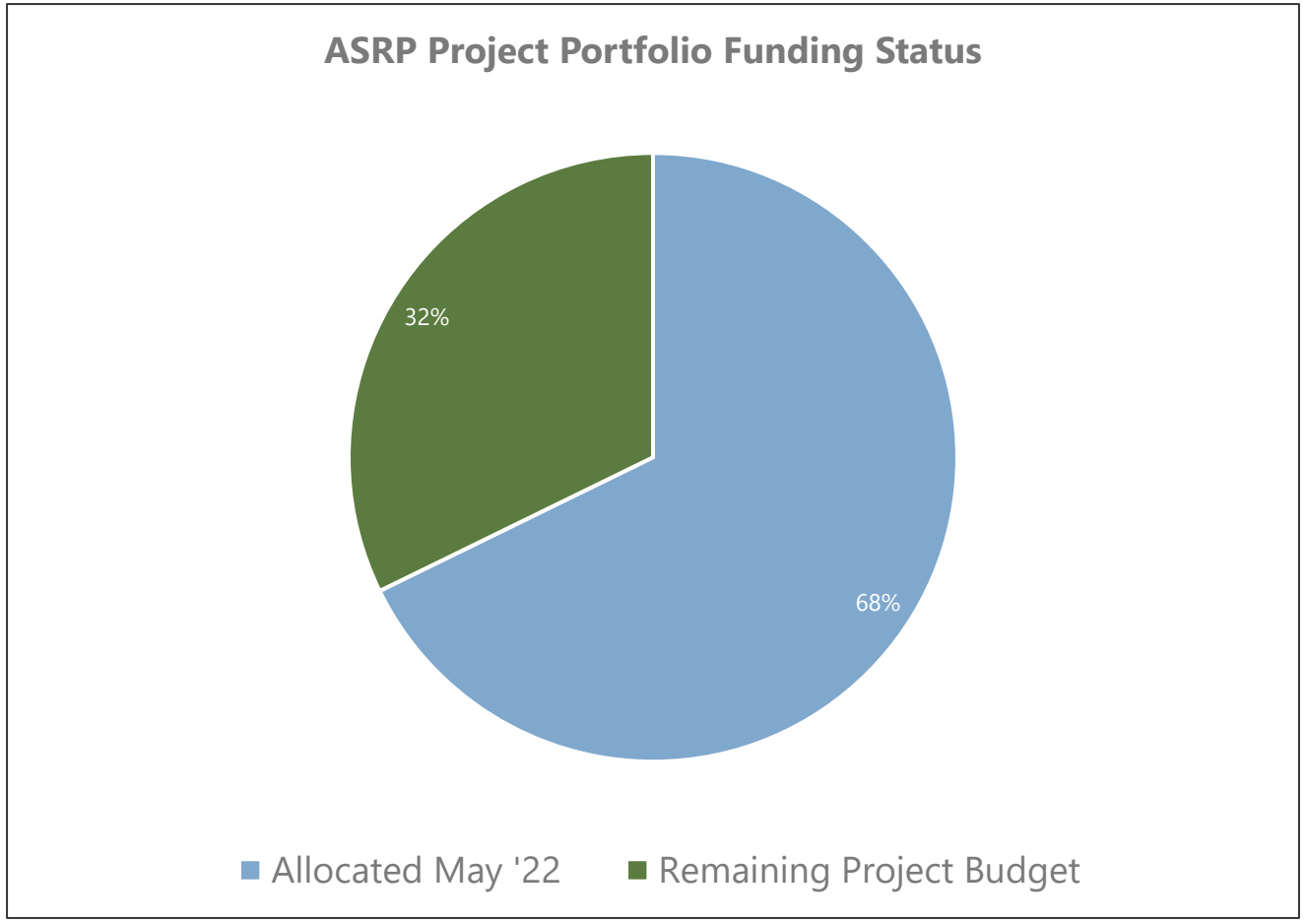
- Allocating all funds necessary for project completion upfront
  - Contracting/obligating funds in phases to large projects

PROJECT REVIEW PIPELINE

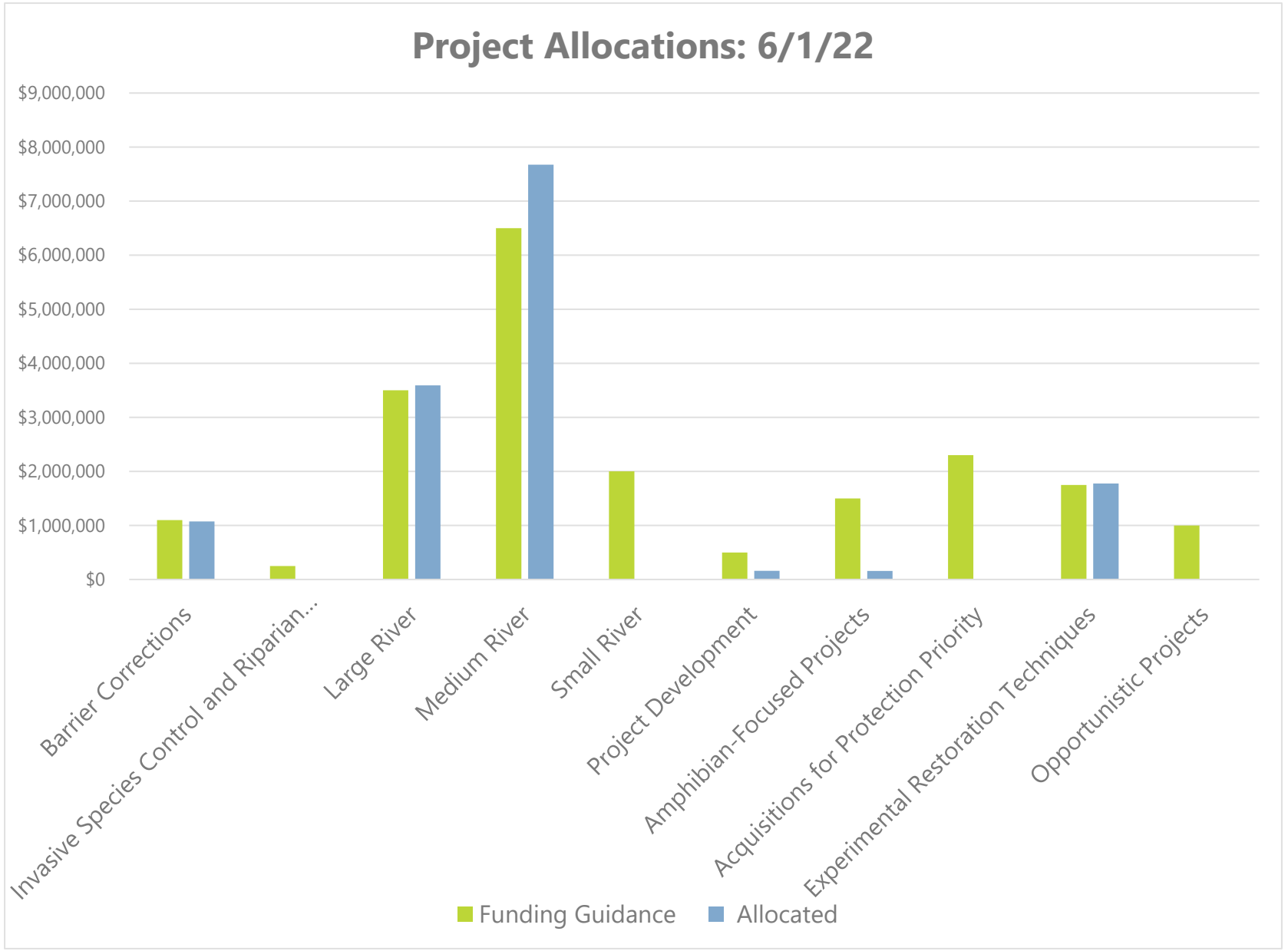


DEPARTMENT OF ECOLOGY
State of Washington
OFFICE OF CHEHALIS BASIN

PROJECT PORTFOLIO STATUS



PROJECT PORTFOLIO STATUS

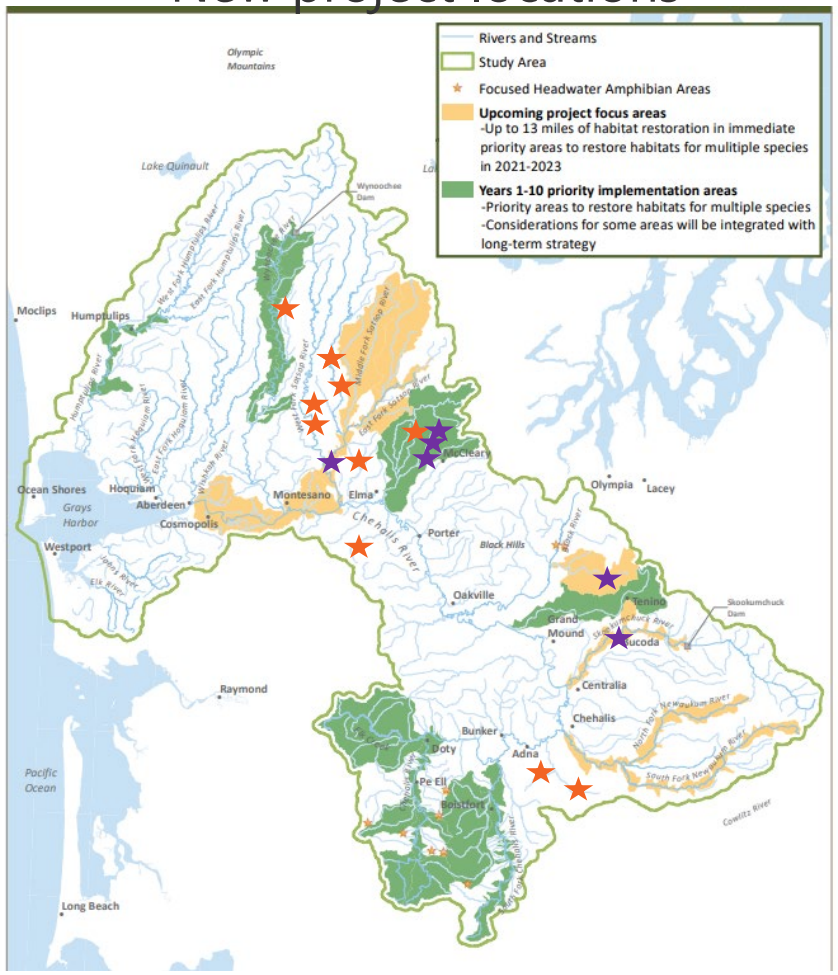


DEPARTMENT OF ECOLOGY
State of Washington
OFFICE OF CHEHALIS BASIN

21-23 PROJECT PORTFOLIO

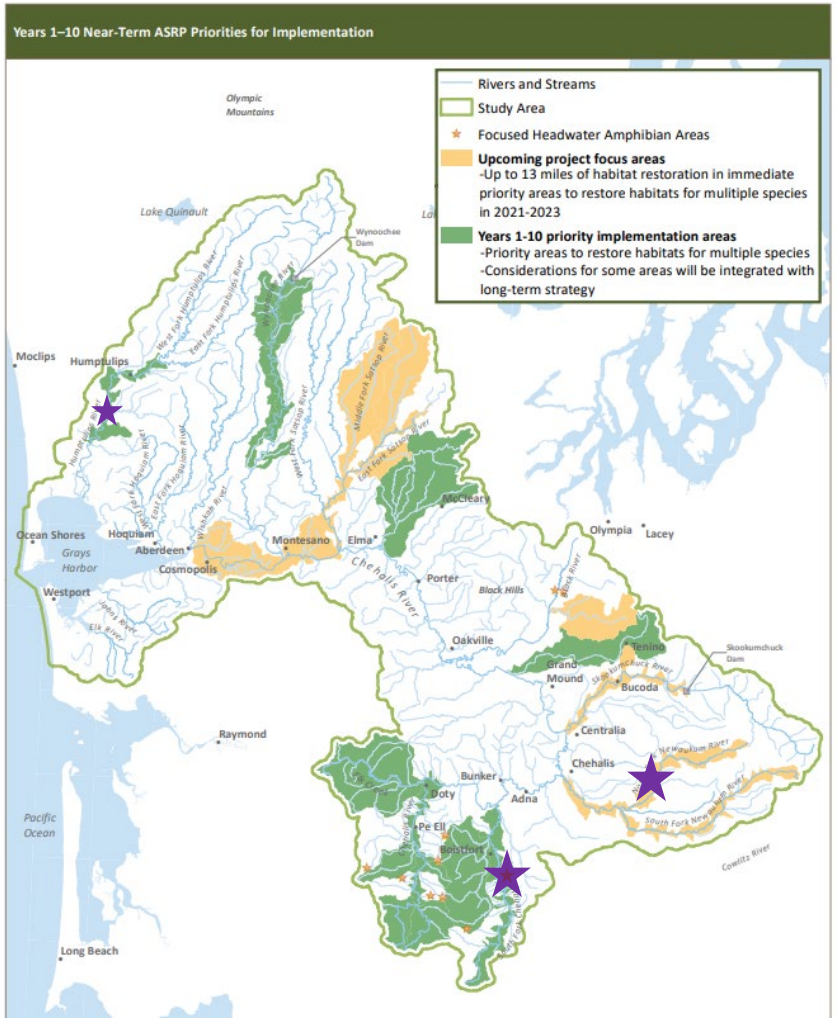
New Project Packages	Funding Allocated
Experimental Sediment Wedge (2)	$1,490,400
MF Wildcat Creek Barriers (3)	$1,073,700
Experimental Beaver Dam Analogues (8)	$286,000
Riverbend Ranch Reach (2.5RM)	$7,675,000
Satsop Reach (2.5RM)	$3,590,000
West Rocky Prairie Oregon Spotted Frog	$160,000
Project development (3)	$160,000
TOTAL	**$14,436,000**
Remaining 21-23 Project Funds	**$6,813,000**

New project locations

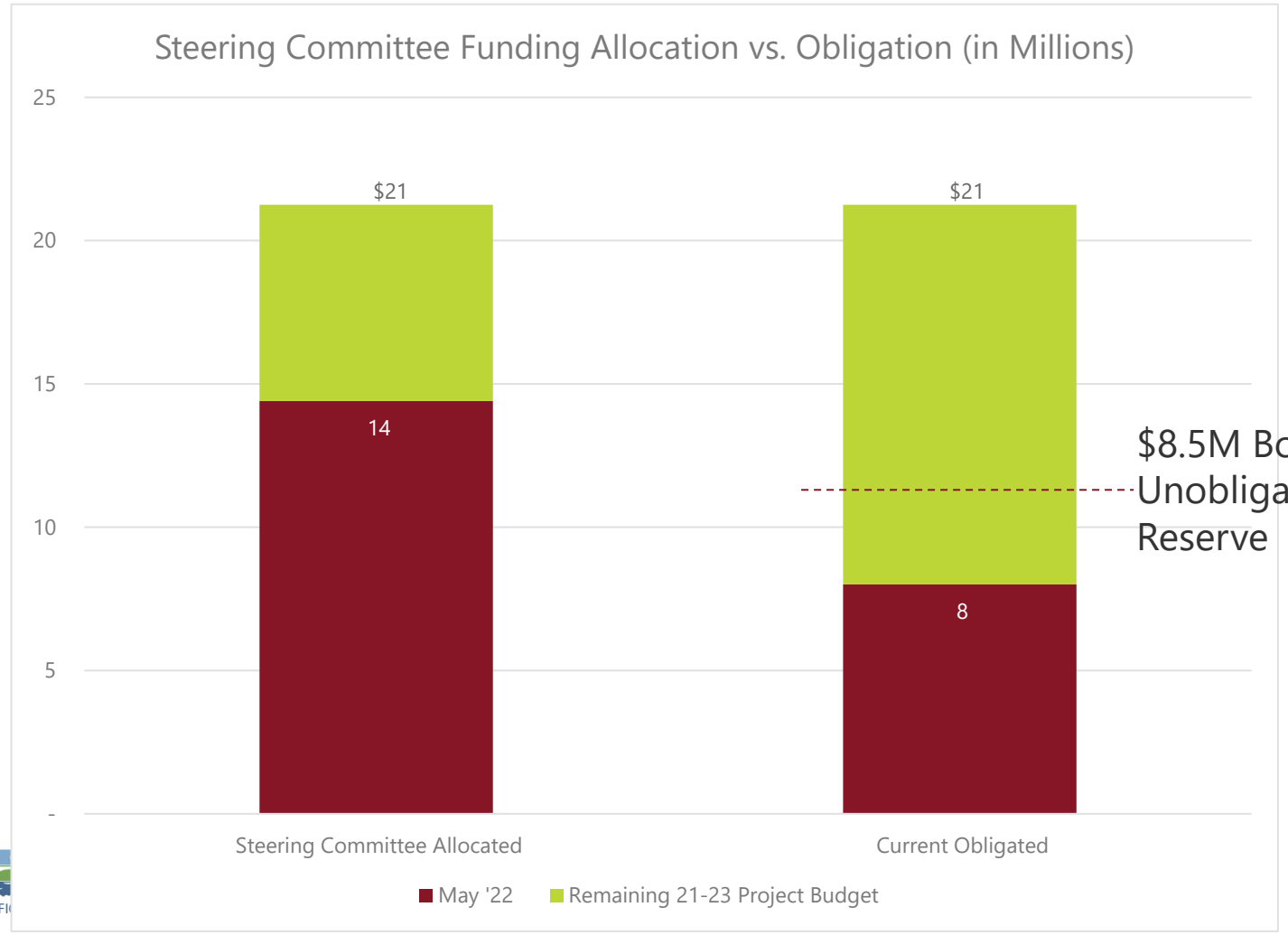


21-23 PROJECT PORTFOLIO

- New project development efforts are underway
- Capacity for sponsors to create new project opportunities
  - 3 new project development efforts:
    - SF Chehalis/Lake Creek Reach
    - NF Newaukum Reach
    - Middle Humptulips Reaches



ASRP PROJECT SPENDING



- Red bars will continue to increase as new projects are input into the Portfolio

- Obligated dollars will “jump” up due to construction phases

EARLY ACTION REACH SITE VISITS

SPRING SITE VISITS

- Skookumchuck
- East Fork Satsop
- Wynoochee

SPRING SITE VISITS

- What are 1-2 takeaways from the site tours?
- Which project elements are you interested in tracking as these projects get constructed?
- What types of ASRP projects would you like future opportunities to visit?

QUESTIONS OR DISCUSSION

ASRP UNOBLIGATED RESERVE FUNDS

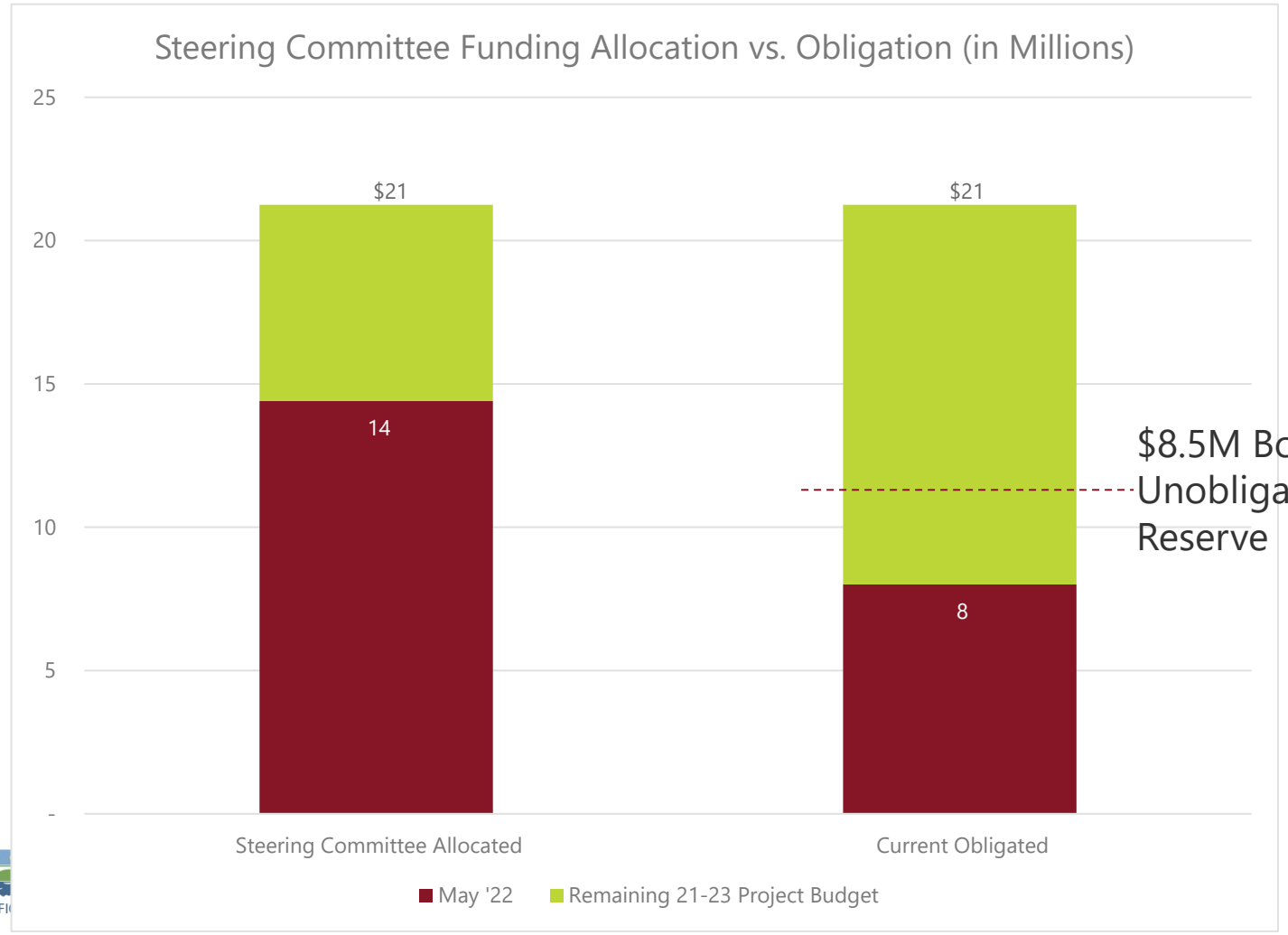
ASRP PROJECT BUDGET

- Carryover from 2019-21 = $880,000

- Board approved additional $20.37M in habitat funding for 2021-23
  - Reserved $8.5M unobligated funds

- ASRP projects budget = $21.25M, with $8.5M unobligated reserve funds

ASRP PROJECT SPENDING



- Red bars will continue to increase as new projects are input into the Portfolio

- Obligated dollars will “jump” up due to construction phases

ASRP PROJECT SPENDING

Spending is $4.5M under the reserve threshold….why now?

PROJECT SPENDING TIMELINE

January 2022 — May 2022

$0 allocated

$14.4M allocated

LOOKING AHEAD – SCOPE OF CHALLENGE

- 11 projects still under review for Portfolio inclusion

- New project opportunities discussed monthly at Regional Implementation Teams

- Project Development → Project Opportunities
  - 10 focused efforts underway
  - Proven track record

LOOKING AHEAD – COST OF CHALLENGE

- 32% of projects budget remaining
  - 11 projects in review
    - At least $3M, plus those who have not submitted budgets yet
  - More to come

CONSEQUENCES OF INACTION

- Possible delay of ASRP projects

- If funds available:
  - Early July = No delay
  - August or beyond = Expected delays
    - Ripple effects on project success and landowner partnerships, project sponsor trust
      - priority acquisitions
      - project development efforts

STEERING COMMITTEE REQUEST

The Steering Committee requests that the Board make the $8.5M unobligated habitat reserve funds available for ASRP projects

QUESTIONS OR DISCUSSION

Appendix B

Chehalis River Basin
Flood Control Zone District

Matthew F. Dillin, P.E., District Manager
Erik P. Martin, P.E., District Administrator

351 NW North St
Chehalis, WA 98532-1900

May 30, 2022

Andrea McNamara, Office of Chehalis Basin Director
Department of Ecology
PO Box 47600
Olympia WA 98504

Ms. McNamara,

As you are aware, the Chehalis River Basin Flood Control Zone District (District) is the project applicant for the proposed FRE water retention structure being evaluated under the state and federal Environmental Impact Statement (EIS) processes. One purpose of the EISs is to identify potential impacts from a project, then give the applicant the opportunity to find and commit to ways to avoid, minimize, or mitigate those impacts. For the FRE facility, this process has been working as it is designed and has recently resulted in the need to evaluate if the facility would be better situated at an adjusted alignment approximately 1,000 feet upstream or downstream from the currently proposed location. Such an alignment modification could have multiple potential benefits, including being able to avoid direct impacts to a sensitive cultural resource and potentially minimizing the impacts on migrating fish during the construction phase of the project. It may also have the potential to reduce construction cost, schedule, and complexity. The overall flood damage reduction benefits would remain the same for the adjusted alignments.

Even though the potential adjustment is very minor in the overall scope of the project it will require additional engineering work to prepare sufficient project description material to input into the EIS processes and to be certain of their viability. This work is estimated to take seven months. Given the extent of potential benefits, the District feels that the additional time and resources for the investigation of these alignments are an important and worthwhile investment for the EIS processes. The District has already requested the initial funds to begin investigating these alignment modifications. However, the full scope of work will require authorization by the Office of Chehalis Basin Board (OCB) for expenditure of funds to complete the EIS work. The District would like to brief the OCB board members at the June 2nd meeting.

Sincerely,

Erik P. Martin, District Administrator
Chehalis River Basin Flood Control Zone District
Erik.Martin@lewiscountywa.gov
360.740.2697 Office

Appendix C

HDR Engineering, Inc
Bellevue, WA 98004
Phone: (425) 450-6200

Lewis County Public Works Matt Dillin
2025 NE Kresky Ave
Chehalis, WA 98532

Lewis County - Chehalis River Basin Flood Control Zone District
Proposal for Mitigation FRE Structure and Inundation Area Locations Evaluation and Continued AMM and Environmental Support
Professional Services
25-May-22

			District OCB Request			
Original Task #	**AMM Engr Support Task #**	**Task Description**	**OCB Scope of Work for Supplemental 4 ($200K + $180K)**	**OCB Scope of Work for Supplemental 5**	**OCB Scope of Work for Supplemental 6**	**Task and Full Request Total**
1	1	Project Management	$50,000		$155,000	***$205,000***
2.1	18.1	Kickoff Meeting		$20,000		***$20,000***
2.2	18.2	Geological Investigation	$75,000	$969,000	$4,000	***$1,048,000***
2.3	18.3	Phase 1 Design	$95,000		$100,000	***$195,000***
2.4	7.1	Phase 1 - Fish Passage	$160,000		$105,000	***$265,000***
2.5	18.4	Phase 1 Design and Geotech Tech Memo			$110,000	***$110,000***
2.6	18.5	Comparitive Cost			$80,000	***$80,000***
2.7	18.6	Comparative Evaluation Technical Memorandum			$95,000	***$95,000***
2.8	18.7	Submittal for Ecology and Corps			$62,000	***$62,000***
2.9	18.8	Tech Sup for Ecology and Corps Submital			$18,000	***$18,000***
3.2	21	Environmental Coordination			$128,000	***$128,000***
		Supplemental Subtotals:	**$380,000**	**$989,000**	**$857,000**	***$2,226,000***

Appendix D

Submitted by:
Chehalis River Basin Flood Authority

CHEHALIS BASIN STRATEGY
REQUEST FOR RESERVE 2021-2023 BUDGET FUNDS

7-06-2022

Brief Title of Request: China Creek Floodwater Storage and Fish Habitat Project

Organization Making Request: Flood Authority on behalf of the City of Centralia

Funding Request: $643,000 to "Make the Project Whole"

Summary of 2021-2023 Funding & Work to Date:

- China Creek Project (phase I and phase II) is a Chehalis Basin Strategy grant funded project. See RCO grant funding project website here.

- China Creek Project (phase I and phase II) is complete. Total phase II cost was $3,053,000; however, Chehalis Basin Strategy grant funds only tallied to $2,410,000. This leaves the project short $643,000.

Description of Additional Needs:

- City of Centralia has requested $643,000 for the China Creek Floodwater Storage and Fish Habitat Project to make the project whole. See City request memo here.

- As a result of returning money to the Chehalis Basin process for the year without a state capital budget, the pandemic, supply-chain issues, delays and complexities associated with permitting (e.g., US Army Corps of Engineers), early funding partnerships not sustained, and changes in project staff and leadership, the project ultimately needed to borrow $643,000 from the City's stormwater fund to complete the project and pay its contractors.

- Project is complete. Celebration is scheduled for 7/12/2022 (3:00 PM, Centralia). See attached.

- Providing requested funding to the City would allow the City to pay back its stormwater fund.

List of Key Tasks & Assumptions:

- None.

Contact Information:

- Scott Boettcher, Staff
Chehalis River Basin Flood Authority
360/480-6600
scottb@sbgh-partners.com

Complete

Local Projects (Centralia, China Creek)

Our Views: China Creek an Example of Success in Chehalis Basin

China Creek is seen at near the Pine Street and Rock Street intersection in Centralia.
PETE CASTER / FILE PHOTO

Posted Friday, March 12, 2021 4:12 pm

March 12, 2021

By The Chronicle Editorial Board

Second Phase of China Creek Flood Mitigation and Fish Habitat Improvement Work Underway in Centralia

Dirt Work: Project Aims to Add More Water Storage, Reduce Flooding Downstream

Signage details the Chehalis Basin Strategy for China Creek flood and habitat protection seen Friday in Centralia.
JARED WENZELBURGER / JARED@CHRONLINE.COM

June 28, 2021

CHEHALIS RIVER BASIN FLOOD AUTHORITY

6-28-2022

From: Kim Ashmore
To: andrea.doyle@ecy.wa.gov; brandon.carman@rco.wa.gov; City Council; Kirsten Harma; Glen Connelly; colronjanaverill@comcast.net; Lauren Miles-Golembiewski; Alan Hall; Felix Kristanovich; John Toll; Greg Reub; Rob Hill; Amy Booth; Patty Page; Dan Agnew; Chronicle - External Contact; sean.swope@lewiscountywa.gov; Lindsey Pollock; Lee Grose; Centralia Department Heads; Scott Boettcher; Peter Abbarno; Kale, Nat (ECY)
Subject: RE: China Creek Phase 2 Celebration
Date: Tuesday, July 5, 2022 7:30:13 AM

Good Morning Team

After all the input we are going with July 12th for the celebration. I will send out a outlook invite shortly. Hope to see most of you on the 12th at 3:00.

Please share with others that should be here.

Thanks for all you do.

Kim

From: Kim Ashmore
Sent: Wednesday, June 29, 2022 8:32 AM
To: andrea.doyle@ecy.wa.gov; 'brandon.carman@rco.wa.gov' <brandon.carman@rco.wa.gov>; City Council <CityCouncil@cityofcentralia.com>; 'Kirsten Harma' <kharma@chehalistribe.org>; 'Glen Connelly' <gconnelly@chehalistribe.org>; colronjanaverill@comcast.net; 'Lauren Miles-Golembiewski' <lmiles@glacierenviro.com>; Alan Hall <alanh@glacierenviro.com>; 'Felix Kristanovich' <felixk@windwardenv.com>; John Toll <JohnT@windwardenv.com>; Greg Reub <gregr@windwardenv.com>; Rob Hill <RHill@cityofcentralia.com>; 'Amy Booth' <chehalisbasinintern@gmail.com>; Patty Page <PPage@cityofcentralia.com>; 'Dan Agnew' <danjagnew@gmail.com>; Chronicle - External Contact <news@chronline.com>; 'sean.swope@lewiscountywa.gov' <sean.swope@lewiscountywa.gov>; Lindsey Pollock <Lindsey.Pollock@lewiscountywa.gov>; Lee Grose <Lee.Grose@lewiscountywa.gov>; Centralia Department Heads <CentraliaDepartmentHeads@cityofcentralia.com>
Subject: China Creek Phase 2 Celebration

Good Morning Team,

You all and many others have had a role in completing the latest project on China Creek. Phase 2 of the project is complete and we would like to celebrate this accomplishment with you. Just knowing how busy you all are let's try and see if we can make either July 12th or July 14th work. I am proposing a 3:00p-6:00p time frame and I will provide some Firehouse subs, cookies and water.

Please respond with your availability ASAP so we can get the date on our calendars.

Thank You All,

Kim

Kim Ashmore **Public Works Director**
C: **City of Centralia** **A:** **1100 N Tower**
P: **360-623-1921** **C:** **360-520-9197**
Email: kashmore@cityofcentralia.com

Appendix E

Submitted by:
Chehalis River Basin Flood Authority

CHEHALIS BASIN STRATEGY
REQUEST FOR RESERVE 2021-2023 BUDGET FUNDS

7-06-2022

Brief Title of Request: New China Creek Gage

Organization Making Request: Flood Authority

Funding Request: $35,000 to "Jump Start Basin Gage Plan Update Recommendations"

Summary of 2021-2023 Funding & Work to Date:

- This funding request will be used by the Flood Authority to "jump-start" purchase, installation, and calibration of a gage on China Creek in advance of completion of a proposed update to the Flood Authority's 2017 Basin Gage Master Plan.

- It is expected that the proposed update to the 2017 Basin Gage Master plan will recommend China Creek be gaged (it is currently not).

- Flood Authority funded gages are regularly and exclusively maintained and operated by the Flood Authority through a process of interlocal funding agreements with Thurston, Lewis, and Grays Harbor counties.

- Purchase, installation, and calibration of gages has been funded through Chehalis Basin Strategy state capital budget dollars. Operations and maintenance (O&M) has not and cannot. O&M costs are covered by Flood Authority member jurisdictions through interlocal funding agreements with Thurston, Lewis, and Grays Harbor counties.

Description of Additional Needs:

- Flood Authority has requested $75,000 to update the Flood Authority's 2017 Basin Gage Master Plan as discussed at their 5/19/2022 and 3/17/2022 meetings (see here and here) and presented by WEST Consultants 6/22/2022 (see here).

- Updating the 2017 Basin Gage Master Plan will set Flood Warning System improvement and investment priorities for the next 5 years (i.e., 2022-2027).

- 2022 flood season saw a substantial increase in Flood Warning System usage and desire for accurate, up-to-date flood warning information.

- China Creek is currently ungagged, posing a significant challenge to being able to accurately forecast flooding in this populous area of the Basin (i.e., Centralia).

- Gaging China Creek will be one of the recommendations to come out of updating the 2017 Basin Gage Master Plan.

- By jump starting purchase, installation, and calibration of a new China Creek gage now (ahead of completion of the Basin Gage Master Plan update), the City of Centralia and other Flood Warning System users can be ever-better prepared for upcoming 2022/23 flood season. [To not jump start and wait until after the Basin Gage Master Plan update is complete would be to effectively wait until the following year's 2023/24 flood season.]

List of Key Tasks & Assumptions:

- Updating the 2017 Basin Gage Master Plan will be accomplished through following broad tasks:
  1. Hydrometeorological Monitoring
  2. Flood Forecast and Warning System Improvements
  3. Final Report and Budget

- Read more here.

- Establishing a new gage on China Creek (in advance of the finalization of the basin Gage Master Plan update, will consist of (broadly) of:
  1. Purchase
  2. Installation (maybe at new flow control weir)
  3. Calibration (two years, two flood cycles)

- Establishing a new gage on China Creek will cost $35,000, can be completed in time for 2022/23 flood season (significantly before 6/30/2023), and will be maintained and operated through the Flood Authority's normal process (i.e., Lewis county as fiscal agent to the Flood Authority collects and disburses Flood Authority agreed upon annual O&M amounts from Thurston, Lewis, and Grays Harbor counties.)

Contact Information:

- Scott Boettcher, Staff
  Chehalis River Basin Flood Authority
  360/480-6600
  scottb@sbgh-partners.com

GAGE MASTER PLAN

CHEHALIS RIVER BASIN FLOOD AUTHORITY

October 18, 2017

WEST Consultants, Inc.

Appendix F

Submitted by:
Chehalis River Basin Flood Authority

CHEHALIS BASIN STRATEGY
REQUEST FOR RESERVE 2021-2023 BUDGET FUNDS

7-06-2022

Brief Title of Request: Mill Creek Multi-Objective Implementation Plan, Phase II

Organization Making Request: Flood Authority on behalf of the City of Cosmopolis

Funding Request: $25,000 to "Complete Significant Phase of Project"

Summary of 2021-2023 Funding & Work to Date:

- Mill Creek Project (Phase II) is a Chehalis Basin Strategy grant funded project. See RCO grant funding project website here. [Mill Creek (phase I) was also a Chehalis Basin Strategy grant funded project. See here.]

- Mill Creek Phase II Project is a design and costing project looking at design improvements and solutions for 4,500 ft. of Mill Creek culvert improvements.

- Cosmopolis is requesting $25,000 to conduct additional surveying that will enable full completion of this stage of the Phase II project by 6/30/2022.

Description of Additional Needs:

- $25,000 to conduct additional surveying that will enable full completion of this stage of the Phase II project by 6/30/2022.

List of Key Tasks & Assumptions:

- Additional surveying.

Contact Information:

- Scott Boettcher, Staff
  Chehalis River Basin Flood Authority
  360/480-6600
  scottb@sbgh-partners.com

Appendix G

City of Aberdeen

City of Hoquiam

June 23, 2022

Office of Chehalis Basin
Attn: Andrea McNamara Doyle
300 Desmond Dr SE
Lacey, WA 98503-1274

SUBJECT: FRY CREEK PUMP STATION
2021-2023 MID BUDGET REVIEW REQUEST

Ms. McNamara Doyle:

Both the Cities of Aberdeen and Hoquiam are extremely excited to advance the Fry Creek Pump Station given it is the first element of the Aberdeen-Hoquiam Flood Protection Project transitioning into construction. This generates immense momentum for the entire regional flood protection effort that has been underway for years.

This letter is intended to provide a simple framework for a request from the City of Aberdeen for an additional $2.5 million dollars to complete the funding package for construction of the Fry Creek Pump Station as you consider potential OCB budget reallocations from your 2021-2023 budget.

To shed a little more light on this segment of the Aberdeen-Hoquiam Flood Protection Project, completion of the Fry Creek Pump Station will provide immediate benefit by dramatically increasing flood protection through replacement of the deteriorated tide gates with a new fish passage structure and also replacing existing significantly undersized pumps. This benefit will extend to over 700 privately owned properties with assessed structure values totaling almost $135 million dollars based on 2021 assessed values.

The estimated construction costs for the project was $16,080,000. The project was advertised in April 2022 and a bid opening was held on May 11, 2022. The apparent low bid total was $17,554,244 with the second bidder at $18,576,324. During the award phase it was discovered through protest that the basis of bid for the apparent low bidder was intending to supply a non-specified fish screen. All bids were recently rejected and the project has been re-advertised. We are anticipating the bid amount will be much closer to the second bidder when supplying the appropriate products, ultimately resulting in a net $2,500,000 increase in the construction cost.

The partnership between the Cities of Aberdeen and Hoquiam and the Office of Chehalis Basin has been critical in helping us get to this exciting point. Over the past 6 years we have worked through design, permitting, right of way, and are now ready to initiate construction for this

regionally significant flood damage reduction project. The revised bid opening is scheduled for July 6, and we intend to celebrate this project reaching the construction phase with state, local, and congressional leaders on July 7. Our intent is to award a construction contract at the next Council meeting and physical construction work should begin in August. Even with our current funding gap, implementation of the Chehalis Basin Strategy through completion of our large-scale measures remains a critical priority to both Aberdeen and Hoquiam.

Critical infrastructure improvements of the Aberdeen – Hoquiam Flood Protection Project to provide both flood protection and restoration of aquatic species would not be positioned for success if not for the continued support of the Office of Chehalis Basin. The Office of Chehalis Basin has previously allocated over $17.5 million dollars to Aberdeen-Hoquiam projects. We have been good stewards of these funds, spending them down in a timely fashion and wisely retaining funds for construction where appropriate. Of the previous allocations, approximately $4,167,000 has been used in preliminary design for the North Shore Levee, approximately $1,047,000 has been used for design of the Fry Creek Pump Station, and we have held $7,740,000 for construction of the Fry Creek Pump Station. An additional $4,600,000 was also allocated to the City of Hoquiam for Design of the North Shore Levee West. Both the North Shore Levee and North Shore Levee West will be in position for construction funding in the 2023-25 biennium. We have worked diligently to advance these projects and anticipate spending down all currently appropriated funds within the current biennium.

We hope there can be some grace and understanding given the existing market conditions every project is dealing with while we work to complete this first step of our regional flood protection focus. Any additional funds allocated by the Officie of Chehalis Basin Board will immediately be utilized in our critical flood protection project and will be spent within 12 months.

We look forward to a continued partnership with the Office of Chehalis Basin as we work to complete this initial segment and work towards future segments of our large scale flood damage reduction measures. Building on the success of the Fry Creek Pump Station request, we will be requesting additional funds in the 2023-25 biennium for future elements of the flood reduction plan.

Thank you for your consideration and should you need any additional information, please feel free to let us know.

Sincerely,
City of Aberdeen

Nicholas D. Bird, P.E.
City Engineer

CC: STORM-2018-0002

Electronic Folder: [X:\~Projects\STORM\STORM-2018-0002 Fry Creek Pump Station\100 Financial\130 Funding Applications]

Appendix H

Submitted by:
Chehalis River Basin Flood Authority

CHEHALIS BASIN STRATEGY
REQUEST FOR RESERVE 2021-2023 BUDGET FUNDS

7-06-2022

Brief Title of Request: Berwick Creek Flood Reduction and Restoration Project

Organization Making Request: Flood Authority on behalf of the Port of Chehalis

Funding Request: $89,257 to "Pay Back Project"

Summary of 2021-2023 Funding & Work to Date:

- Berwick Creek Project is a Chehalis Basin Strategy grant funded project. See RCO grant funding project website here.
- Berwick Creek Project is a design and permitting project that is currently underway. Initial design and cultural resources investigations have been completed. Final design is pending.

Description of Additional Needs:

- Port of Chehalis has requested $89,257 for the Berwick Creek Flood Reduction and Restoration project to pay back the project.
- Funds were borrowed from the project to help with construction of last fall and winter's emergency Lower Satsop Right Bank Conservation project (see slides 4-6 here).
- Requested funds will aid with final design and completion of this phase of the project (as originally scoped and budgeted).

List of Key Tasks & Assumptions:

- None.

Contact Information:

- Scott Boettcher, Staff
  Chehalis River Basin Flood Authority
  360/480-6600
  scottb@sbgh-partners.com

Appendix I

Submitted by:
Chehalis River Basin Flood Authority

CHEHALIS BASIN STRATEGY
REQUEST FOR RESERVE 2021-2023 BUDGET FUNDS

7-06-2022

Brief Title of Request: Haul Road Immediate Protection Project

Organization Making Request: Flood Authority on behalf of the Port of Grays Harbor

Funding Request: $400,000 to "Immediately Construct Urgent Project"

Summary of 2021-2023 Funding & Work to Date:

- Port of Grays Harbor has brought to CBB's attention need for immediate action to protect key infrastructure threatened by further erosion of Port's Haul Road from Chehalis River. See recent CBB presentations:
    1. 4/07/2022 – Here.
    2. 5/05/2022 – Here.
    3. 6/02/2022 – Here.

- To date, Port's activities have centered around problem identification, solution identification, design, permitting, engineering, and regulatory coordination. Port has already received initial funding from CBB for these activities (i.e., $125,000) as well has contributes its own funds in excess of $100,000).

Description of Additional Needs:

- Port of Grays Harbor is requesting $400,000 for an immediate action this Fall using bioengineering techniques (brush matts, root wad tree, timber piles) to protect a critical portion of the Port's Haul Road in time for upcoming 2022/23 flood season (and well before the end of biennium).

- Funding request will cover materials procurement, construction, oversight, and contingency (adaptive management). More specifically:
    1. $300,000 -- Construction
    2. $60,000 -- Construction contingency at 20% (adaptive management)
    3. $40,000 -- Construction oversight, reporting, documentation

- The Port will follow this immediate project with an additional funding request through the Flood Authority's 2023-25 funding recruitment process to design and permit a continuation of this project Summer 2023. This project (immediate project) averts the immediate crisis. Next project (2023-25 project) will better address underlying conditions and provide the time needed to design reach-scale solutions.

List of Key Tasks & Assumptions:

- Key tasks for immediate project are:
    1. $300,000 -- Construction
    2. $60,000 – Construction contingency at 20% (adaptive management)
    3. $40,000 – Construction oversight, reporting, documentation

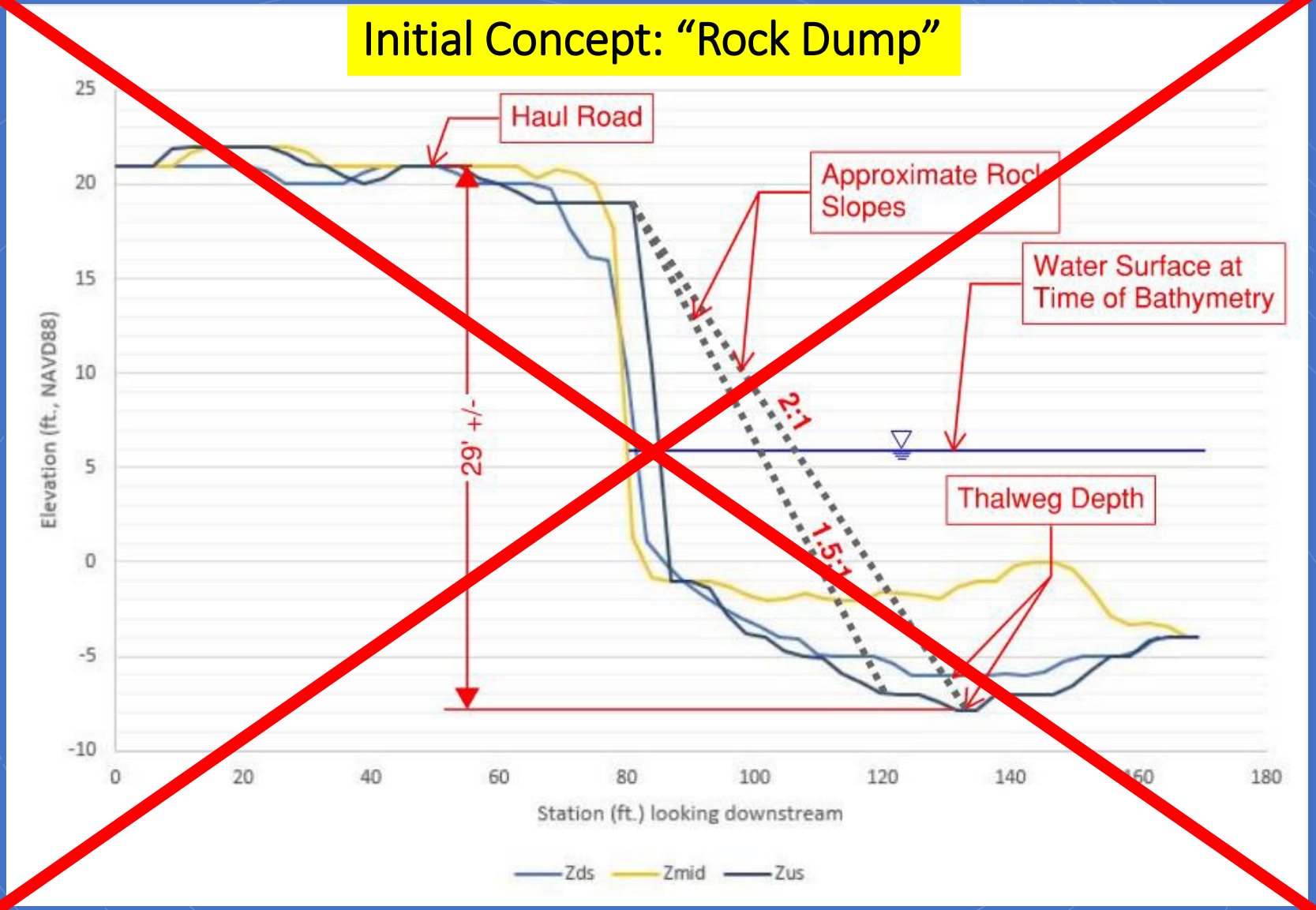
    [NOTE: Experience tells us erosion projects like this, especially when using innovative techniques like as are proposed, require holding a significant contingency as the construction environment is very dynamic and the need for on-the-fly adaptive management and subsequent documentation is always present.]

Contact Information:

- Scott Boettcher, Staff
  Chehalis River Basin Flood Authority
  360/480-6600
  scottb@sbgh-partners.com

No Longer Proposed Project

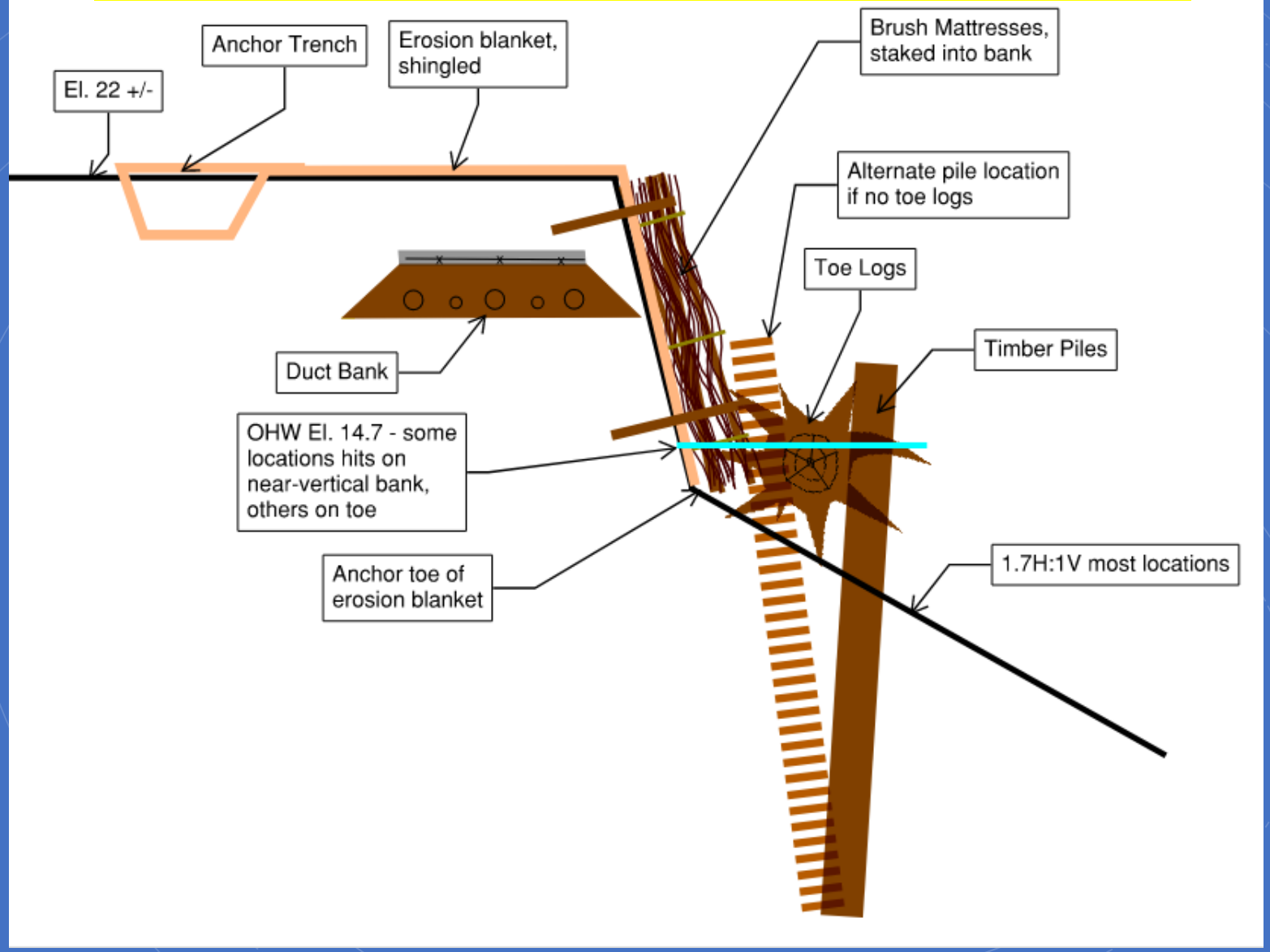
Initial Concept: “Rock Dump”



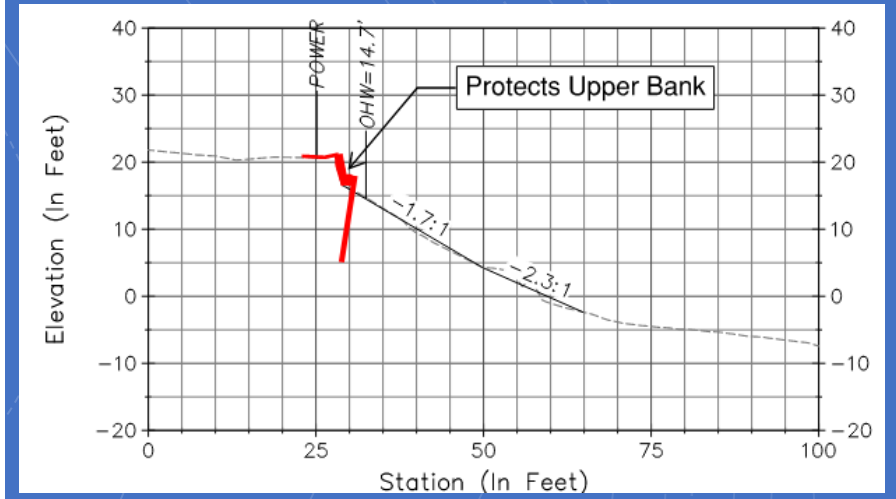
- ✓ Not favorable.
- ✓ Not permittable.
- ✓ Not fundable.
- ✓ Very Expensive.

Current Proposed Project

Current Concept: Brush Mattresses with Piles



- ✓ Favorable.
- ✓ Permittable.
- ✓ Fundable.
- ✓ Affordable.



2. Pros/Cons of Immediate Action Alternative

Pros	Cons
Provides some protection for the duct bank and haul road this flood season	Trades durability for permittibility, material availability, and constructability; not a long-term solution
Positive habitat Impact	Trial application of this method in these conditions
Permittable	Only protects the upper bank; does not address the full bank height
Uses readily available materials	Significant additional effort needed for long-term success
Can be constructed quickly	
Some potential for repair or maintenance	
Can be incorporated into the near-term design	
Provides time for design and permitting of the near-term option	
Additional time opens up additional materials and methods for consideration in near-term design	

3. Project Phasing

Phase	Actions
Phase I: Immediate Action (2022)	Design, permit, and construct brush mattress concept for upcoming flood season
Phase II: Near-Term Action (2023)	Design, permit, and construct Near-Term project to address full bank height in immediate project area
Phase III: Longer-Term Action (2025 and beyond)	Implement reach-scale project program generated by the Keys Road to SR-107 Reach Analysis and Investment Plan

4. Immediate Action Funding Request

A. Funding Partners:

1. Grays Harbor Energy -- $50,000 [2023]
2. Grays Harbor PUD – In-Kind [2022]
3. Grays Harbor County -- $TBD (0.09 funds) [2023]
4. ***

B. Immediate Funding Request:

1. Project Construction → $300,000 (max.)
2. Project Oversight/Administration/Contingency → $100,000 (max.)
3. Total = $400,000 immediately.

C. Future Funding Requests:

1. Phase II
2. Phase III

Appendix J

MEMORANDUM

Date: June 30, 2022
To: Nat Kale, Office of Chehalis Basin
From: John Ferguson (Anchor QEA) and Larry Lestelle (Biostream)
cc: Merri Martz (Anchor QEA)
Re: Cost Proposal to Collect Data on Adult Chinook Salmon Migration Timing into the Skookumchuck River Using Sonar Under an Experimental Low Flow Regime

Executive Summary

An experimental study is proposed to change the timing and volume of water released from the Skookumchuck Dam during late summer/early fall starting in 2022. The potential action would delay the required ramp-up in flow released from the dam that is initiated on September 1 to produce flow conditions that more closely mimic the historical (natural) flow pattern from mid-August through mid-October. The study is proposed for a three-year period.

The goal of the experiment is to increase the separation between spring-run and fall-run Chinook salmon spawn timing. Genetic analysis of Chinook salmon shows that substantial interbreeding has occurred between the spring- and fall-run types in the Skookumchuck River. This is causing a shift in the population structure of Chinook salmon, which disproportionately affects the spring-run compared to the fall-run type and has likely contributed to the decline of spring-run Chinook salmon. The proposed action is intended to learn if changing the flow regime during the August-September period back to the historical pattern would reduce the rate of hybridization between the run types.

Evaluation of the proposed action consists of three components. The first part would occur during the period when adult salmon move into the Skookumchuck River and spawn. The flow regime would be altered, which should delay the arrival of early migrating fall-run Chinook salmon and enable spring-run Chinook salmon that are already in the river to spawn without hybridizing with early arriving fall-run Chinook salmon. During this part of the study, a sonar camera would be operated in the lower river to monitor the arrival of early fall-run Chinook in August and September at a cost of $103,781 in 2022. This memorandum focuses on this part of the study but provides information on both parts for context.

The second part of the study would occur during the months of January to May each year following spawning when fry produced by the spawners emerge and begin their migration downstream. The Quinault Indian Nation (QIN) has conducted a fry trapping project over the past three years, during which genetic analysis was done to assess genetic composition (spring- or fall-run or hybrid). Fry trapping as part of the experiment would continue for three years to provide the means of evaluating how the changed flow regime affected the genetic composition of the population. The cost of fry

trapping in 2023 and genetic analysis of the samples is still being discussed but is expected to be no more than $260,000.

The third component of the study would be to analyze the complete set of available data related to the experiment and develop a project completion report. This would include 1) processing the sonar data from each year of study (2022-2024) to translate images into hourly and daily fish counts, 2) evaluating the sonar, fry genetics, observed flow record, and adult index count data (conducted each year under separate funding by WDFW) in an analytical framework to assess the effectiveness of the experimental flow regime, and 3) developing draft and final reports.

Purpose

A study was completed in 2021 titled *Initial Data Compilation and Analysis for Flood Damage Reduction and Aquatic Species Benefits at Skookumchuck Dam* and reported to the Chehalis Basin Board via a memorandum from Anchor QEA to the Office of Chehalis Basin dated September 24, 2021. The memorandum identified a potential near-term action to change the timing and volume of water released from the dam during fall to improve separation between spring-run and fall-run Chinook salmon spawn timing. The potential action delays the required ramp-up in flow released from the dam each year that occurs starting on September 1. The proposed (alternative) flow release schedule would start in mid-August and be in place until mid-October.

The goal of this proposed action is to reduce flow released during what is historically a low flow period from signaling to fall-run Chinook salmon that it is time to migrate into the Skookumchuck River and spawn. Fall-run Chinook salmon that arrive early to the spawning area may spawn with a spring-run Chinook salmon or dig up (place their redd on top of) a spring-run Chinook salmon redd. Both inter-breeding and redd superimposition reduce the production of spring-run Chinook salmon in the basin. Delaying fall-run Chinook salmon migration timing by even a few weeks should provide greater separation in spawn timing between the two runs of Chinook salmon.

This memorandum outlines the background, monitoring approach, and cost to collect data on adult Chinook salmon migration timing into the Skookumchuck River using sonar starting in August 2022. The work proposed herein is directed at the adult phase of a study to evaluate the efficacy of the proposed action on adult Chinook spawning and the extent of interbreeding between the two run types. To be able to conduct a valid evaluation, work is also needed on the emergent fry produced by the spawners. That phase of the work would assess the genetic composition of the fry to evaluate the rate of interbreeding between the run types. This memorandum only briefly describes that separate phase of the evaluation—a full description of the integrated project is currently being prepared.

Background

On March 3, 2021, the Washington Department of Fish and Wildlife (WDFW) requested that TransAlta change the flow regime released from Skookumchuck Dam during fall due to recent observations of fall-run Chinook salmon moving upstream earlier now compared to historical migration timing (WDFW 2021). WDFW hypothesized that increased flows on September 1 may be triggering artificial freshet cues for fall-run Chinook salmon to begin their spawning migrations into the river from the Chehalis River. WDFW requested that the minimum flow be reduced from 120 cubic feet per second (cfs) to 95 cfs from September 1 to October 20 starting in 2021 and proceeding through 2025.

Chinook salmon evolved to segregate their timing on the spawning grounds between different genetically determined run types. Spring-run Chinook salmon enter the river during spring and early summer, while fall-run fish enter beginning in late summer and continue into fall. Their spawning timing also typically differs, with spring-run fish beginning to spawn before fall-run fish. WDFW has observed what are believed to be fall-run Chinook salmon entering the Skookumchuck River and spawning in the same locations or at the same time as what are believed to be adult spring-run Chinook salmon. Mixed spawning of the two run types can lead to a phenomenon called introgression, which is defined as the transfer of genetic information from one species to another. When the two Chinook run types interbreed, or hybridize, the viability of spring-run Chinook salmon is believed to be adversely affected. Spatial-temporal segregation of the two run types is necessary for the two populations to maintain their genetic identity and population structure that is critical to the long-term viability of the spring-run type.

Due to concerns that spring-run Chinook salmon abundance in the basin has declined from historical levels, in 2020 the Quinault Indian Nation (QIN) in partnership with the University of California Davis (UCD) began a project to capture and sample genetics of newly emerged Chinook salmon fry in several upper Chehalis River locations, including the Skookumchuck River. Results from that first year of study indicated that very few fry produced in the Skookumchuck River were pure spring-run Chinook salmon. For the Mainstem Skookumchuck trap site (river mile 6.2), 80.8% were fall-run Chinook salmon, 16.4% were heterozygotes (i.e., a mixture of spring-run and fall-run genetic material), and 3.0% were spring-run Chinook salmon (Gilbertson et al. 2021). That separate project has continued for three consecutive years. Results from year two of the project are comparable to those from the first year. Samples from the third year are currently being analyzed.

This proposal to collect data on adult Chinook salmon migration timing into the Skookumchuck River using sonar starting in August 2022 is one (bolded below) element of the proposed approach to evaluate how changing the regulated flow regime might reduce hybridization. The hypothesis is that restoring a more natural flow regime in the lower reaches of the Skookumchuck River would reduce the early entry

of fall-run Chinook into this river, as well as returning hybrids[1], and thereby reduce the rate of hybridization with pure spring-run fish. A complete list of all the required elements for context is as follows:

- Coordination between the Office of Chehalis Basin and TransAlta confirming the flow regime request can and will be implemented (Ecology and TransAlta; initiated; confirm in summer 2022; note the co-managers are also involved in these discussions)
- **Collect data on adult Chinook salmon migration timing into the Skookumchuck River using sonar (West Fork Environmental; mid-August to mid-October 2022)**
- Collect index data on adult Chinook salmon spawning (ongoing annual surveys in the Skookumchuck River conducted separately by WDFW; fall 2022)
- Chinook fry trapping (separate study) to collect samples to estimate the proportion of spring- and fall-run Chinook salmon fry, as well as hybrid fry, produced from spawning in fall 2022 (QIN and West Fork Environmental; winter and spring 2023); we note that the fry trapping project that occurred in 2020-2022 will need to be continued for the duration of the study and that trapping outside of the Skookumchuck River is needed to serve as a control that the results from Skookumchuck River study will be compared to
- Genetic analysis of fry samples collected in winter and spring 2023 (separate study; University of California Davis; 2023)
- Meeting among co-managers and scientific partners to discuss and agree on the analytical approach for analyzing the sonar, adult index count, fry trapping, and genetic tissue data to determine the effectiveness of the proposed action to provide greater separation in spawn timing between the two runs of salmon (all parties; 2022 and 2023); discussions between QIN biometricians, UCD, and Larry Lestelle (Biostream) have occurred, and a draft approach has been developed
- A report summarizing each of these bullets and results of the analysis on the effectiveness of the proposed action (TBD; 2023)

[1] / Hybrids between spring- and fall-run timed Chinook generally have an intermediate run timing between the two run types.

Experimental Flow Regime

The proposed action calls for managing pre-spawning and spawning flow releases from Skookumchuck Dam that reflect the natural pre-dam flow regime discharging into the Chehalis River for 3 years starting in 2022. Late August flow of approximately 30 cfs would be maintained through the month of September, and possibly into early October, to the extent this can occur based on required minimum flow releases from the dam and rain events. The proposed (alternative) flow regime attempts to mimic the historical natural hydrograph as much as possible during September and early October, while maintaining TransAlta flow diversion requirements and other water rights.[2]

Flow to be released from Skookumchuck Dam would be approximately 30 cfs plus the amount of water that is diverted by TransAlta at river mile (RM) 7.2. If TransAlta takes the full water right sufficient for one generator at the Centralia Big Hanaford power plant, the diverted flow would be 26 cfs. Therefore, approximately 56 cfs would be released from the dam through September. This includes water that is supplied to the WDFW Skookumchuck Hatchery from Skookumchuck Dam and returned to the river. Flow between Skookumchuck Dam and RM 7.2 would be approximately 56 cfs, which is also expected to aid spring-run Chinook salmon spawning. Flow between RM 7.2 and 0.0 would be approximately 30 cfs.

The amount of flow entering the Chehalis River will vary within and between treatment years and will be greater than 30 cfs when rainfall events occur that result in tributary inflow. Based on a review of data from 2007 to 2021 during September at the U.S. Geological Survey (USGS) gage located at RM 6.4 near Bucoda, Washington, flow is typically minimal, and the proposed approach appears feasible.

Sonar Proposal

Monitoring and enumeration of Chinook salmon entering the Skookumchuck River through the study period (August 15 to October 15) will be conducted each year starting in 2022 and continue for three consecutive years. A study team has been researching the best approach for monitoring adult Chinook salmon migration behavior and recommends the following:

- Using advanced sonar technology (ARIS Explorer Model 3000; https://www.oceanmarineinc.com/products/aris-3000/), count the number of upstream and downstream adult Chinook salmon movements past a fixed location in the lower Skookumchuck

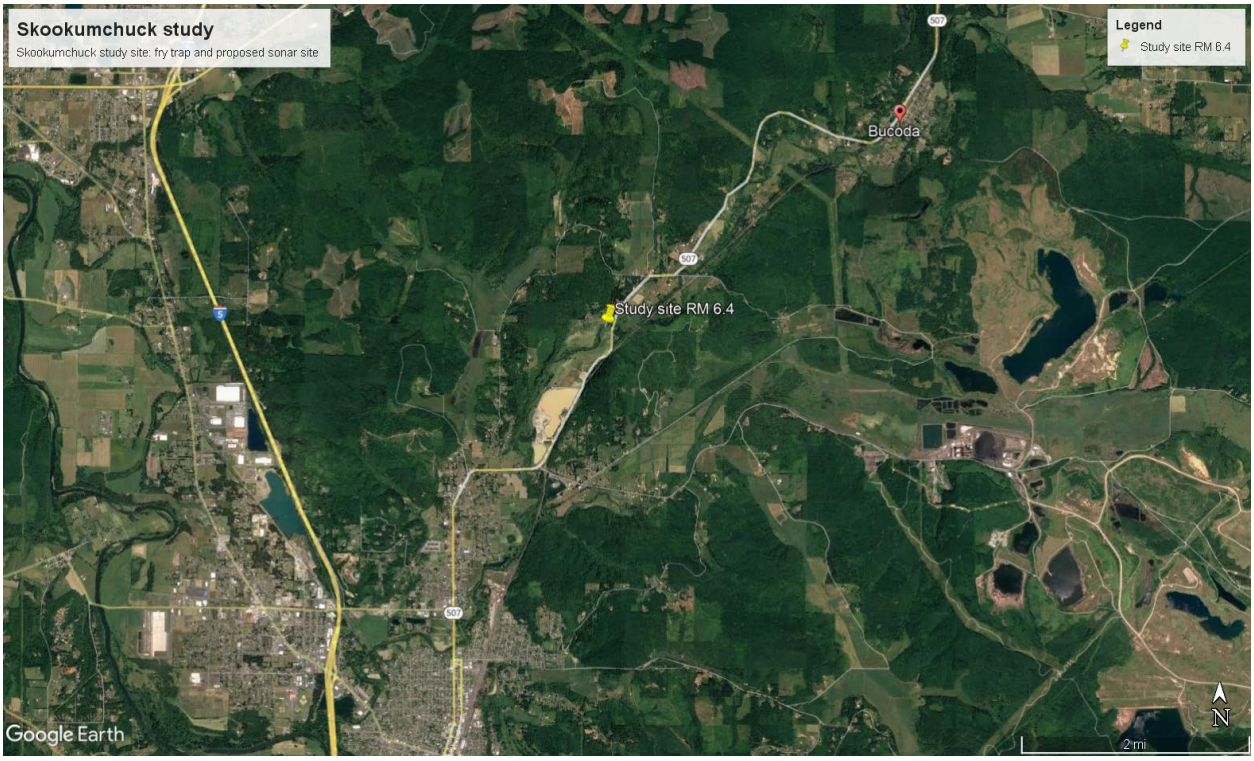
[2] / Some discharge from the TransAlta power generation facility occurs via Hanaford Creek into the very lower Skookumchuck River. Consideration will be needed for how much water is being delivered to the Skookumchuck River in this process in setting the target flow level for the lower end of the river.

River. This is state-of-the art technology that works in zero visibility with high resolution up to 15 meters.

- The ARIS unit will be placed at a location just downstream of USGS gage near Bucoda, Washington (Figure 1). Landowner's permission has been obtained by West Fork Environmental for a secure site. The ARIS will be placed to scan across the river and monitor adult Chinook movements. The deployment will be visited by West Fork Environmental daily and data files will be downloaded daily for later analysis.

- Cost estimate for 2022: $103,781

Figure 1. Proposed ARIS Location at the USGS Gage Near Bucoda, Washington



Need for Continued Fry Trapping and Genetic Analysis

A continuation of the fry trapping and genetic analysis for three years will be needed to evaluate if there are differences between the years prior to the flow regulation study and the years of the flow regulation study. Fry trapping is proposed for all sites assessed in 2020-2022 to assess extent and patterns of change for the Skookumchuck River and the other sites. The cost of fry trapping in 2023 and genetic analysis of the samples is still being discussed but is expected to be no more than $260,000.

References

Gilbertson, L., T. Jurasin, R. Coshow, and M. Miller, 2021. *Run-Type Composition of Juvenile Chinook Salmon in the Upper Chehalis River Basin in 2020*. Technical Report Series 2021-1, Quinault Indian Nation Department of Fisheries, July 2021.

WDFW (Washington Department of Fish and Wildlife), 2021. Letter from Peggy Miller and Mike Scharpf, WDFW, to Adam Abel, Skookumchuck Dam Supervisor, TransAlta. Regarding: Skookumchuck Hydroelectric Project FERC No. 4441, Exemption Article 2, Terms and Conditions – Minimum Flow. March 3, 2021.