



Statewide Fish Passage Barrier Prioritization Strategy

Presentation Outline

1. Purpose of strategy and legislative expectations
2. Process to develop the strategy
 - Coordination with Tribes
 - Statewide Outreach and Engagement
3. Overview of the draft strategy
4. Facilitated discussion
5. Next steps in the process



A large group of salmon swimming in a river, with the text "Section 1: Purpose of the Strategy and Legislative Expectations" overlaid in white.

Section 1: Purpose of the Strategy and Legislative Expectations

Statewide Fish Passage Prioritization Strategy

- The legislature was not confident that all fish passage barrier remediation plans and programs were working with the same priorities
- In 2020, the Washington State Legislature directed WDFW, WSDOT and the FBRB to develop a comprehensive statewide strategy through legislative provisos



Strategy Purpose Statement


To help **prioritize and reduce fish passage barriers** to benefit depressed, threatened, and endangered stocks, and that is informed by the best available science.



How will the strategy be used by the state?

- Focus efforts of culvert correction programs into a single strategy to maximize public investment in salmon and orca recovery
- Guide funding recommendations of FBRB and other state fish passage barrier programs
- May help direct limited WDFW compliance and enforcement resources
- Will not alter the obligation set forth in the permanent injunction, including the compliance deadline, or the guidelines for compliance within the specified timeline



The background of the slide is an aerial photograph of a vast, dark blue ocean. The water's surface is covered in a dense pattern of small, white-capped waves, creating a textured, shimmering effect. The lighting is bright, highlighting the white foam of the waves against the deep blue of the water.

Section 2: Process to Develop Draft Strategy

Project Team



Jane Atha, Fish Passage Strategist

Tom Jameson, Fish Passage Director



Phil Roni, Principal Scientist/Vice President

Jason Hall, Senior Scientist



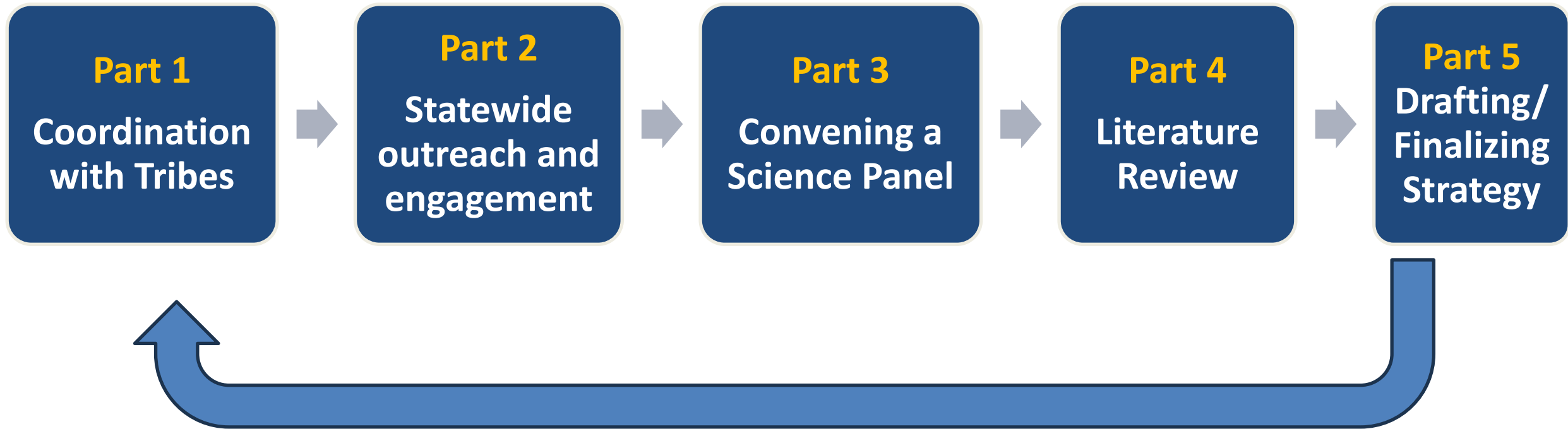
Betsy Daniels, Co-President/Senior Practitioner

Hilary Wilkinson, Director

Kate Galambos, Associate



Five-part Iterative Process to Develop Strategy



	2023				2024												
	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	
Part 1. Engagement and Consultation with Tribes	Briefing: 3/22/2023	Consultations	Consultations	Consultations	Consultations	Consultations	Consultations	Consultations	Consultations	Consultations	Consultations	Briefings: 7/15/2024 & 7/18/24	Review of Draft: 7/10 to 8/1	Consultations	Consultations	Consultations	Consultations
Part 2. Engagement of Partners and Stakeholders		Assessment Interviews April/May	Mtg w SRSC							Mtg w FBRB		7/16: FBRB	Council of Regions	Regional Sessions and Briefings w Recovery Groups	Review Draft Strategy 9/16-10/7		
Part 3. Science Panel			Jul & Aug	Oct. & Nov	Feb & Mar			May 16 & 24									
Part 4. Review of Existing Literature and Approaches																	
Part 5. Drafting and Finalizing Strategy (Cramer)							First Draft	Science Panel Review 4/25-5/8		WDFW Leadership Review 6/3-6/28	Tribal Review and Input 7/10-8/1		Stakeholder Reivew and Input 9/16-10/7			Final Strategy 12/1/2024	
	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	
	2023				2024												



A scenic landscape photograph of a river valley. The river flows through the center, reflecting the surrounding green and yellow foliage. The banks are covered in dense forests of evergreen and deciduous trees. In the background, mountains rise under a clear blue sky. The overall scene is peaceful and natural.

Coordination with Tribes

Part 1 – Coordination with Tribes

- Interviewed Tribes during assessment stage
- Tribal briefings
 1. 4-10-23
 2. 7-15-24
 3. 7-18-24
- NWIFC participation on Science Panel
- Ongoing consultation
- Tribal review/input on Draft Strategy (7/10/24 to 8/1/24)



A scenic view of a river flowing through a forested area. The foreground is dominated by large, smooth, light-colored rocks. The river flows from the left towards the center, with a small wooden structure or bridge in the distance. The banks are covered in dense green vegetation, including tall grasses and evergreen trees. The sky is overcast with grey clouds.

Statewide Outreach and Engagement

Part 2 – Statewide Outreach and Engagement

Phase 1 (2023)

- **Situation Assessment;** interviews with each recovery region and others (WSDOT; RCO-GRSO; WSAC; AWC; Colville Tribes)
- Briefings and meetings as requested

Phase 2 (2024)

- Briefings (regional; one on one)
- Input on Draft Strategy



Convening a Science Panel



Part 3 – Science Panel Members

- 8 members
- 6 entities



Science Panel Expertise

Evaluating fish
passage
projects

WDFW fish
passability
criteria

Fish passage
prioritization

Salmon and
steelhead
ecology

Salmon
recovery

Climate
change

Fish passage
economics



Science Panel - Highlights

- **8 meetings** (Aug 2023 to May 2024)
- Reviewed, discussed and made recommendations regarding:
 - **current barrier prioritization strategies** in Washington state
 - **existing literature** on fish barrier removal approaches and strategies
 - **pros and cons** of existing fish barrier removal approaches and strategies and their relevance to developing a statewide strategy
 - **data gaps and needs** related to fish passage barrier removal
 - the **best approach for a statewide strategy** to address fish passage barriers
 - recommended **criteria** for prioritization
 - the **draft strategy**.



Proviso Guidance - Strategy will Consider:

- barriers to listed salmon and steelhead and that limit prey for orca
- benefits of barrier removal to upstream, as well as lateral habitat
- access to high quality salmonid spawning and rearing habitat
- consider existing approaches to barrier prioritizations and criteria used to inform other state fish passage barrier removal funding programs, and
- whether full or partial barrier.



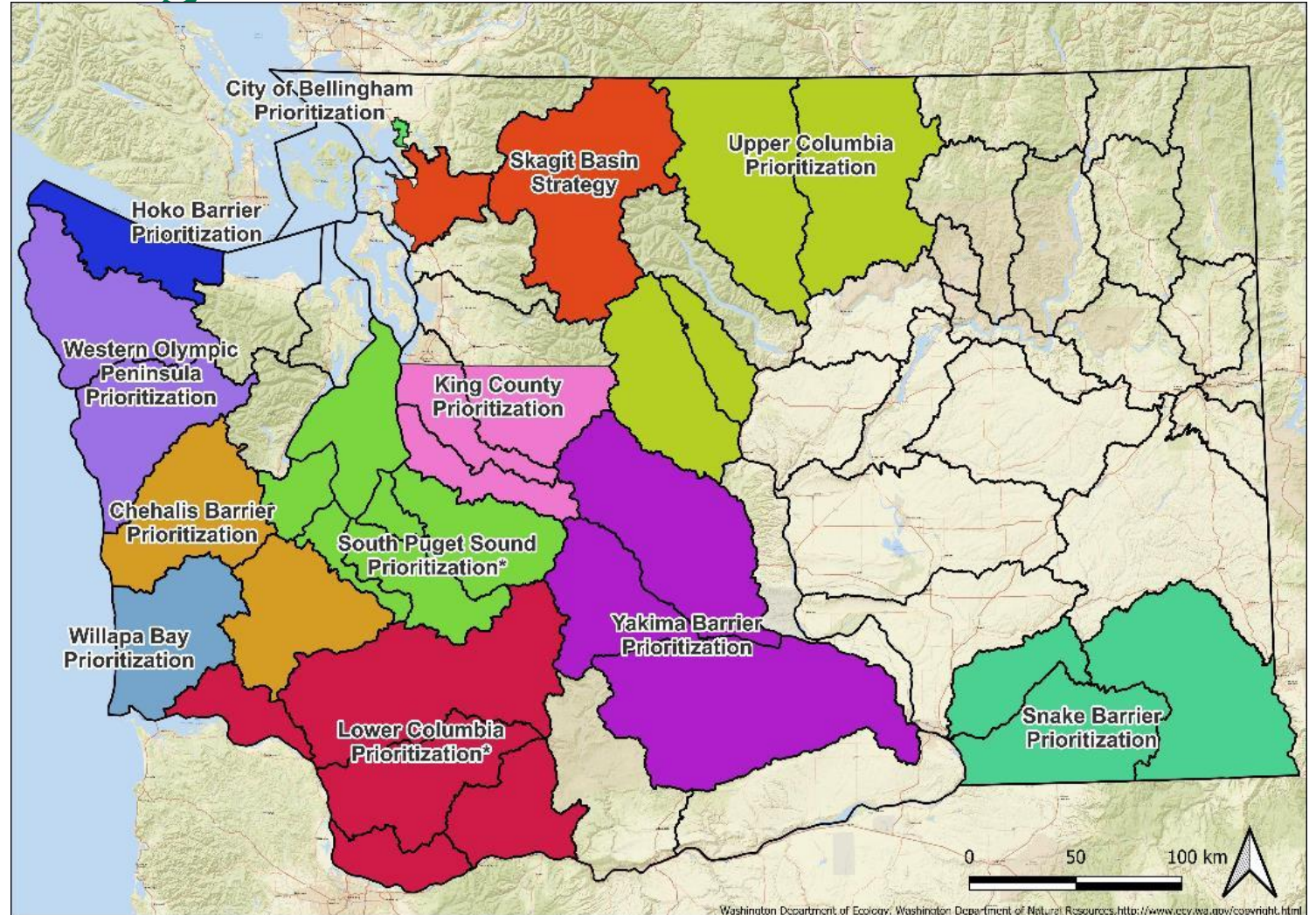
Review Literature and Existing Strategies



Part 4 – Review of existing barrier prioritization strategies in WA

Major strategies

- Chehalis
- City of Bellingham
- Hoko Fish Barrier Prioritization
- King County
- Lower Columbia
- Skagit Basin
- Snake Basin Barrier Culvert Analysis
- Snake Barrier Prioritization
- South Puget Sound
- Upper Columbia
- Western OP Fish Barrier Decision Support Tool
- Willapa Bay
- Yakima Barrier Prioritization
- 2025-027 FBRB Grant Round proposed criteria



Review of existing barrier prioritization strategies in WA

- All use some type of scoring and ranking
- Many are based on Upper Columbia Strategy
- Many included similar criteria

Strategy	Barrier	Habitat Quantity	Habitat Quality	Species	Climate	Feasibility	Total No.
Chehalis	3	5	9	1	1		19
Bellingham	2	3	1	2		4	12
Hoko	2	1	5	2			10
King County	3	1	3				7
Skagit Basin	2	1	2				5
Snake	5	1	2	2	4		14
Upper Columbia	3	1	4	2/5*	4		14/17*
Western OP	5	2	2	2	4		15
Willapa Bay	5		3	2	4		14
Yakima	5	1	2	2	4		14
FBRB Grant	2	1	3	2	1	6	15



Literature Review - Highlights

- Assess what has been done and how effective it has been
- 95 published papers and technical reports reviewed
- Key finding: Two main approaches to prioritizing barrier removal:
 1. Scoring and Ranking (or “Score and Rank”)
 2. Mathematical Optimization



Section 3: Overview of Draft Strategy



Definitions:

Optimization; Score & Rank

Optimization: A mathematical approach that solves a function with a defined objective and constraints (parameters) to solve for an optimal combination of barriers.

Score & Rank: Uses multiple criteria (e.g., area of habitat restored, cost, increase in biota) that are given individual scores (e.g., 0 to 5, 1 to 10) and then aggregated into a combined score.



Strengths:

Optimization and Score & Rank

Optimization:

- Best with large number of barriers
- Deals with barrier order and number
- Can balance multiple competing objectives

Score & Rank:

- Computationally simple, easily to implement, and understand scores/ranking
- Facilitates stakeholder buy in
- Easier to align with implementation constraints or opportunities

Common Challenges

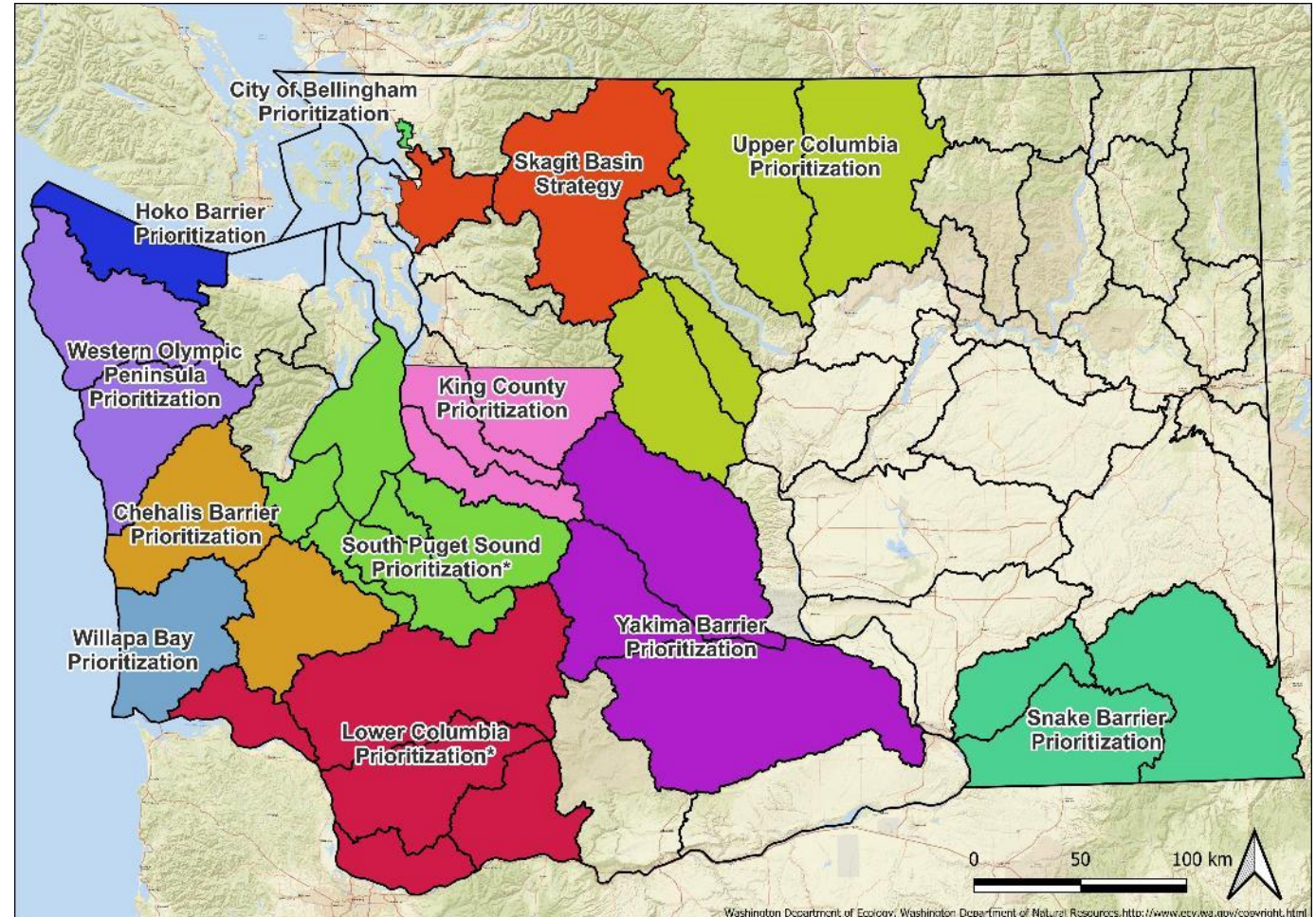
- Data must be current
- Data availability and quality



Recommended “Hybrid” Approach:

Leverages strengths and allows regional adaptation

- **Optimization**
 - Use at state-wide scale (primarily)
- **Score & Rank**
 - Use at regional/watershed scale.



Recommended Criteria - Optimization

Maximizes amount of accessible habitat for listed salmon and benefits orca and includes following criteria and constraints

- Barrier type
- Connectivity (downstream barriers first)
- Length of upstream habitat
- Benefits Chinook/orca
- Number of threatened, endangered, depressed species or stocks



Recommended Criteria - Scoring & Ranking

“Core” - criteria should be included in regional barrier prioritization strategy and for which data are believed to be available across all regions.

- Statewide priority (the output of the optimization model)
- Barrier type
- Barrier order
- Length of upstream habitat



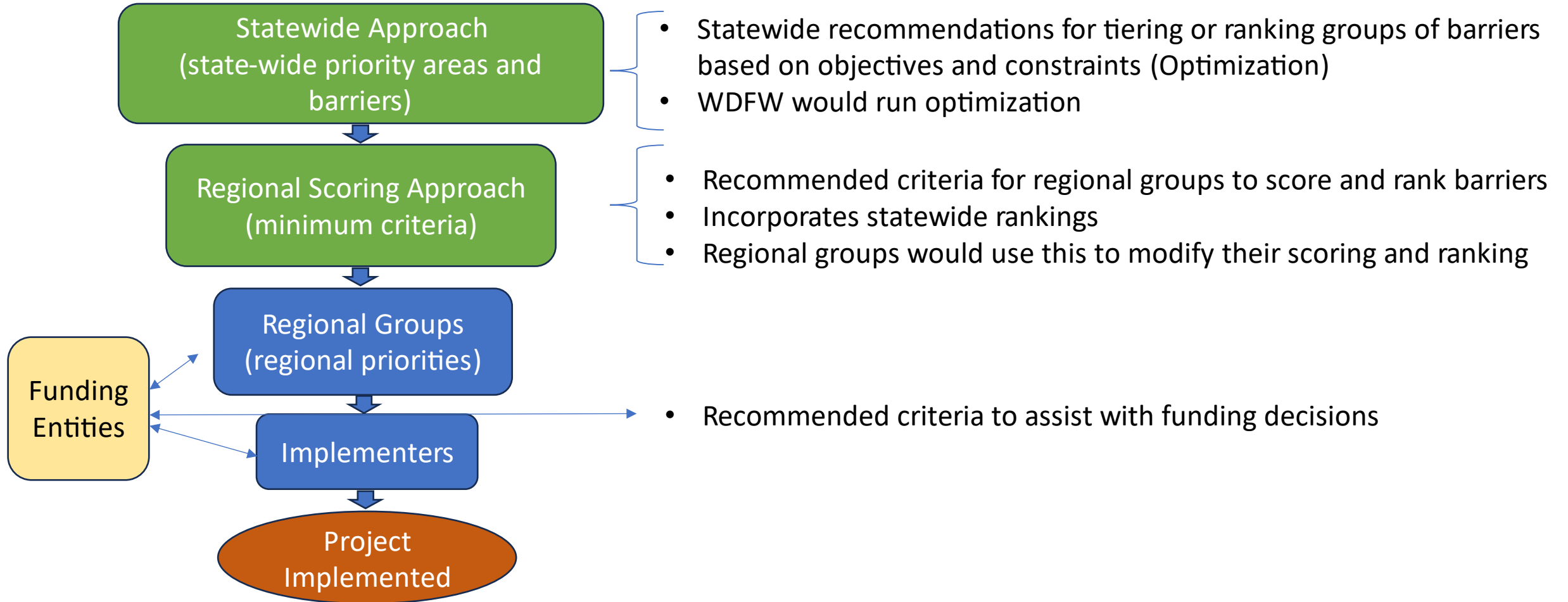
Optional Criteria - Scoring & Ranking

“Optional” criteria – additional criteria that may be considered for regional prioritization strategy including but not limited to:

- Species - colonization potential, priority recovery watershed
- Habitat quantity - total area of habitat gain
- Habitat quality - upstream reach gradient, riparian cover, pool and wood frequency
- Temp, Climate, and WQ – summer low flow, hydrologic regime shift, flood events, upstream distance to nearest summer habitat,
- Feasibility - ownership, community support, logistic considerations, benefit-cost



Potential Statewide Strategy Components



A photograph showing a corrugated metal culvert pipe installed under a stone retaining wall. A stream flows through the pipe, surrounded by rocks and vegetation. The scene is set in a wooded area with trees in the background.

Section 4: Facilitated Discussion

Questions

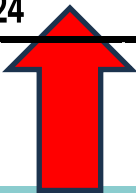
1. Does the proposed hybrid approach (optimization plus rank & score) seem reasonable?
2. Input on categories of criteria – is anything missing?
3. Input on specific criteria within categories – is anything missing?
4. Thoughts on implementation?



A photograph of a river with white-water rapids flowing over rocks. The water is a vibrant turquoise color, and the rapids are characterized by white foam and splashing water. The surrounding landscape is rocky and appears to be a forested area with some bare trees in the background.

Section 5: Next Steps

	2023				2024											
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Input process

- **7/10 to 8/1**: review period for Tribes
- **9/16 to 10/7**: review period for regional recovery groups/stakeholders
- **10/8 to 11/14**: input addressed
- **12/1/24**: Final Strategy



Quick Primer on Mathematical Optimization

- ▶ Kai Ross, Lead Biometrician, Cramer Fish Sciences



Quick Primer on Optimization

Maximize: Objective Function

Subject to: Constraint 1

Constraint 2

Constraint 3

Maximize F_T (1)

subject to

$$F_t = \sum_i S_{it}, \quad t = 1, \dots, T, \quad (2)$$

$$S_{i0} = N_i \quad \forall i, \quad (3)$$

$$S_{it} \leq R_{it} + \sum_j g_{jt}(1+r_j)S_{j(t-1)} \quad \forall i, \quad (4)$$

$$t = 1, \dots, T; \quad \sum_i g_{it} \leq 1 \quad \forall j, \quad (5)$$

$$\sum_i R_{it} \leq b_t, \quad t = 1, \dots, T, \quad (5)$$

$$S_{it} \leq \sum_{h=1}^{m_i} \sum_{k=1}^{n_{ih}} c_{ihkt} X_{ihk} \quad \forall i, \quad t = 1, \dots, T,$$

$$\sum_{k=1}^{n_{ih}} X_{ihk} = A_{ih} \quad \forall i, h,$$

$$\sum_i \sum_{h=1}^{m_i} \sum_{k=1}^{n_{ih}} c_{ihkt} X_{ihk} \leq C_{pt} \quad \forall p, \quad t = 1, \dots, T,$$

Maximize:

$$\sum_i \sum_{j=1}^3 \sum_t S_{ijt} \quad (12)$$

Subject to:

$$S_{ij0} = N_{ij} \quad \forall i, \forall j \quad (13)$$

$$D_{ij0} = M_{ij} \quad \forall i, \forall j \quad (14)$$

The EFCM Model

$$\text{Max} \sum_{m,t} \rho_{m,t} x_{m,t} - \sum_{i,t,j} \phi_j \alpha_i s_{i,t}^j 1.05^{(5-10t)}$$

Subject to:

$$\sum_j s_{i,t}^j \leq 1 \quad \forall i, t$$

$$\sum_{i \in S_m} \sum_j s_{i,t}^j \geq |S_m| x_{m,t} \quad \forall i, t$$

$$\sum_{k=1}^j s_{i,t-j}^k \geq s_{i,t}^j \quad \forall i, t, j$$

$$x_{m,t} \in \{0,1\} \quad \forall m, t$$

$$s_{i,t}^j \in \{0,1\} \quad \forall i, t, j$$

Objective function:

$$\text{Max} \sum_{m,t} \rho_{m,t} x_{m,t} - \sum_{i,t} \phi_\alpha \alpha_i s_{i,t} (1+d)^{\left(\frac{pt}{2} - pit\right)} \quad (1)$$

Subject to:

$$\sum_{i \in N_j} F_{(i,j),t} = \sum_{k \in N_j} F_{(j,k),t} \quad \forall j \in V, t \quad (2)$$

Mathematical Optimization - The Science of Optimal Allocation of Scarce Resources

Maximizes an **Objective Function**, subject to multiple constraints

- Maximize amount of habitat opened by removing barriers

O.F. composed of multiple parameters that add or detract from the objective value

- Barrier X adds 8.2 miles of habitat. Will take 6 months

Constraints must also be met

- Restore no more than 150 barriers
- Half of restored barriers must take less than 4 months

Objective Function:

Decisions variables are what we have control over

- ▶ Can be continuous, discrete , or binary
- ▶ E.g., Barrier_x = Should we restore barrier X: Yes or no

DVs gets parametrized to add or detract from the Objective total:

- ▶ $\text{O.F.} = \text{Barrier}_x * \text{Benefit}_x + \text{Barrier}_y * \text{Benefit}_y + \dots$

Units are often abstracted:

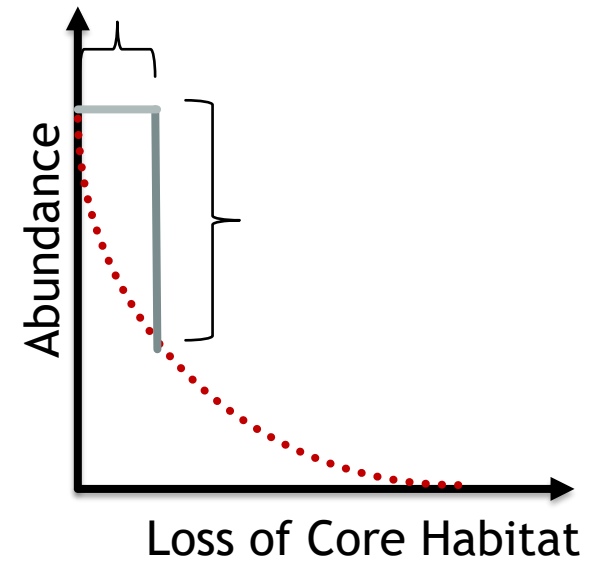
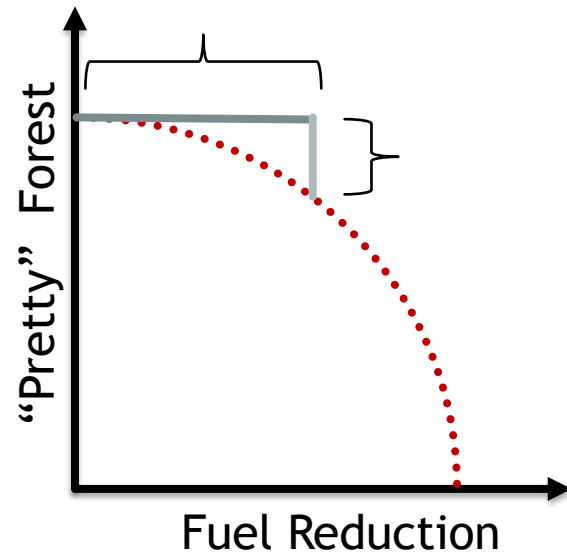
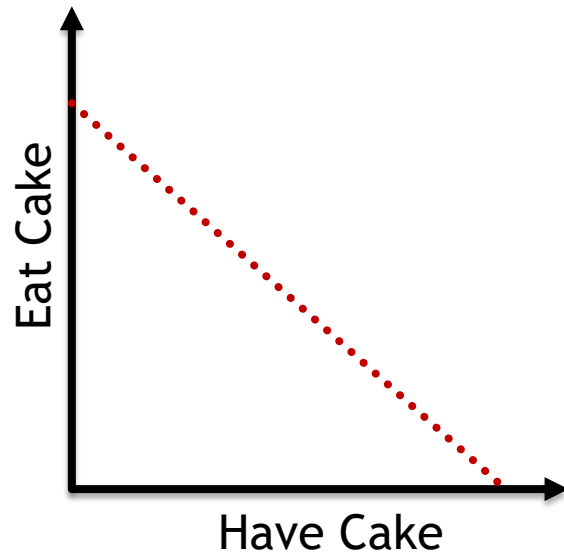
- ▶ $\text{Benefit}_x = (5 * \text{chinook_area}_x + 2 * \text{other_salmon_area}_x + \text{non_salmon_area}_x)$

Constraints

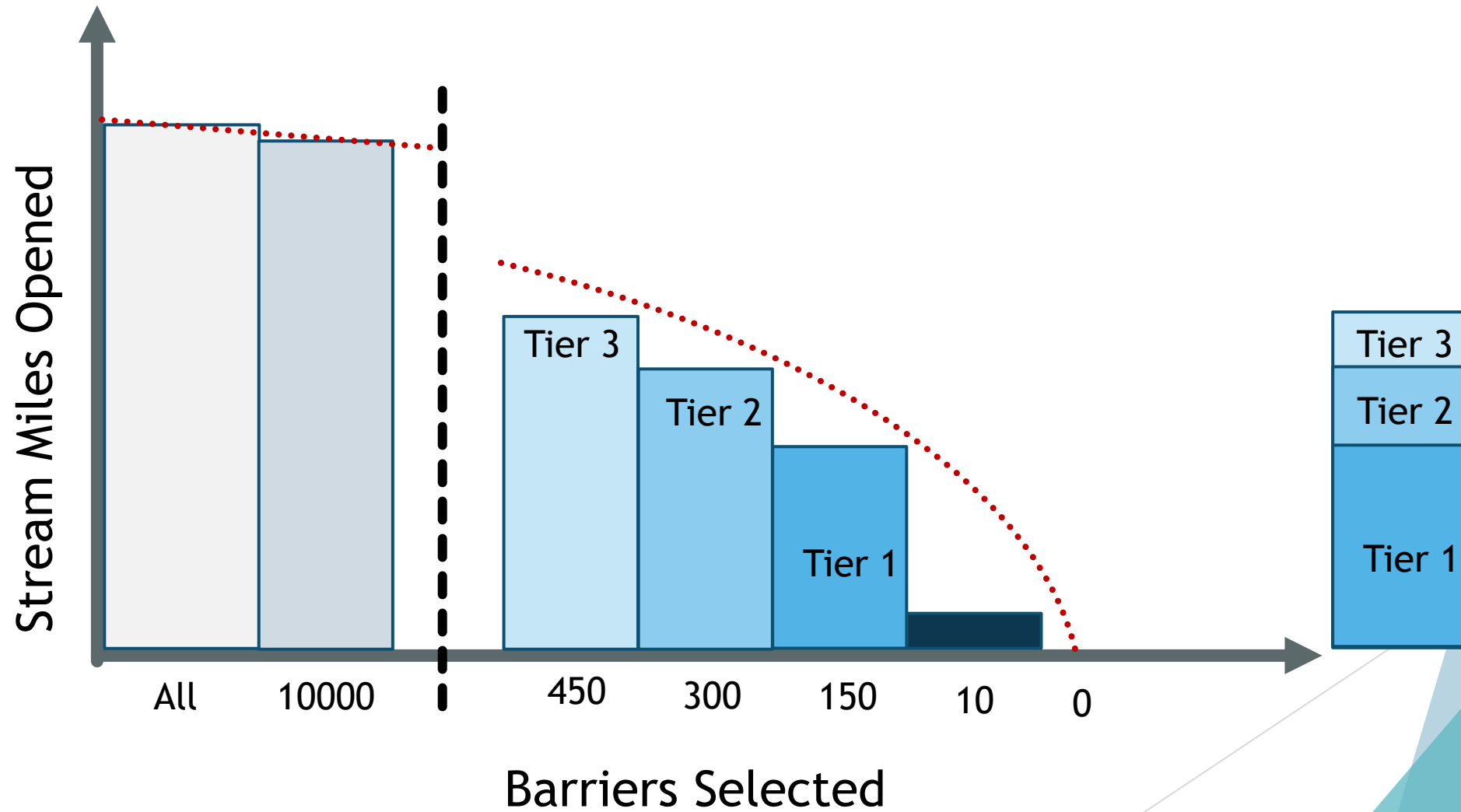
Parameters are limited by additional constraints

- Can be individual – e.g., can't remove the same barrier twice
- Can be for all – e.g., can only select up to 150 barriers
- Can be specific – e.g., can only select up to 10 barriers from any one region
- Can alter **O.F.** values – e.g., barrier X provides small benefit, but large benefit if barrier Y is also selected (connectivity)
- Can be complex – e.g., require at least 30 miles opened in three years, but any site with a bridge doesn't count towards this total, except in region 6, unless more than 4 barriers in region 6 are selected.
- Can relax or alter constraints to explore tradeoffs – e.g., what if we can remove 200 barriers instead 150?

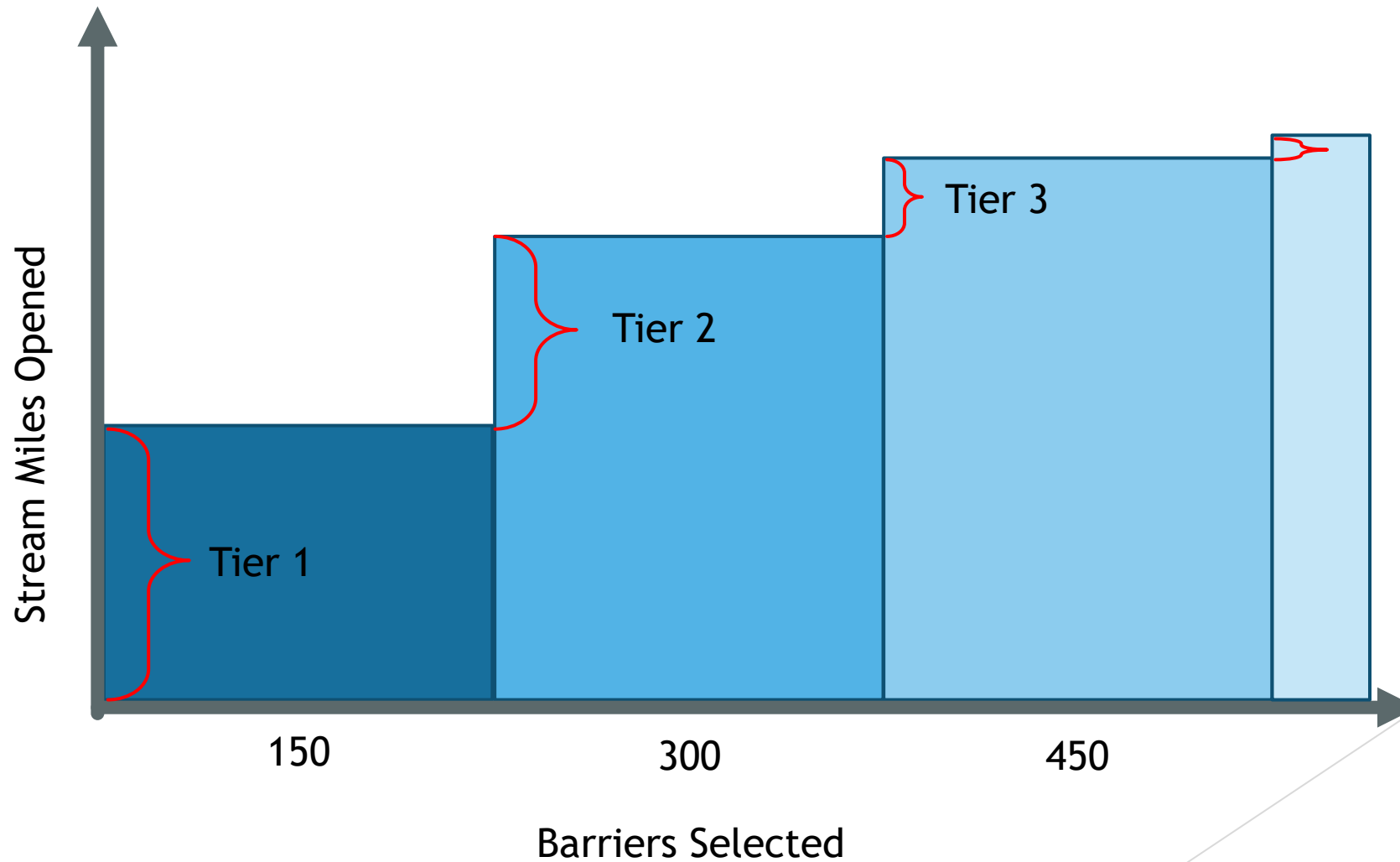
Trade off analysis:



Trade off analysis:



Trade off analysis:



Mathematical Optimization Approach

Key Questions:

What are our Decision Variables

- Are they continuous, discrete, or binary?

How do we parameterize the O.F.

- What factors or criteria should we use to assess benefit and cost?

What are the constraints

- What must be done? what can't be done?

Are there competing objectives

- Usually tied to a constraint

Barrier Optimization Example

- ▶ Decisions variables: Which barriers to restore (binary)
- ▶ O.F.: Maximize amount of stream length opened above restored barriers, weighted to prioritize Chinook
- ▶ Constraints:
 - ▶ Each barrier can only be selected once
 - ▶ Keep total selection of barriers below target number
 - ▶ Only select an upstream barrier if all downstream barriers also selected
 - ▶ Ensure that each major region has at least 10 barriers selected
- ▶ Competing Objectives:
 - ▶ Minimize number of barriers selected (biggest bang)

Examples of optimization

Several for barriers:

- ▶ Optipass
- ▶ Oregon Tide Gate

Others:

- ▶ Forest harvest scheduling (how much, from where, in what year, all within Forest Practice Rules)
- ▶ Habitat reserve selection (species benefit, connectivity, edge effects, cost, access)
- ▶ Scheduling nurses or fire crews (required down time, minimize overtime, always have some of each type, employee X can't work on weekends etc.)

Questions on Optimization?



August Board Decision-Project Funding List 2025-2027

Kaylee Kautz
Fish Passage Scoping Section Manager
Habitat Program



Milestones 25-27

August 2023-Scoring Criteria and Manual Updates Approved

October 2023- Grant Round Opens

January 2024-Application Deadline

Completed-Eligibility Check by RCO (55 projects- all eligible)

Current- Score and Rank by TRT and WDFW staff

August Board Meeting- Ranked List Presented to the Board



Overall Summary

55 Proposed Projects

- 23 Planning Projects
- 32 Restoration Projects
- ~90 barriers

Costs – No Cutoff

- Project Total : ~70.8M

Project Ownership

- x City-Owned
- x County-Owned
- x Privately Owned
- x multiple ownership
- x unknown ownership

FBRB Priority Watersheds

- x Projects



Previous Rounds Comparison

<u>2017-19</u>	<u>2019-21</u>	<u>2021-23</u>	<u>2023-25</u>
19 Project apps	56 Project apps	88 Project apps	102 Project apps
~\$18.9M	~\$24.7M	~\$26.8M	TBD
13 projects funded	52 projects funded	21 projects funded	61+ projects funded*



Quick FYI – no action required

- ~6 projects propose a roughened channel, no tide gates.
 - All eligible and will be ranked.
 - Just FYI in case future discussions, you're aware.
- Multiple projects on the same stream, sequence check-in
 - i.e. multiple sponsors, project types, same sponsor strategic sequence
 - Review scores and rank to ensure sequence is appropriate



Quick FYI – no action required

Mill Creek- 2 projects

Lorenzan Creek- potential contamination (fuel storage site)

Coleman Creek- Diversion and Fishway

Fauntleroy Creek- Unique structure

Lower Day Slough Culvert- Submersible bridge

Burley Creek- Multiple ownership

Crossing Funding Limits- RCO, WDFW



Questions?

Thank you!



2023-25 Biennium Funding: Project Award: **\$45,189,000**

Ranl Project Name	Grant Applicant	PROTEC	NOAA re Project Award	Running Total
LEGEND:				
FBRB FUNDED				
FULLY FUNDED OR SPONSOR DECLINED				
PROTECT FUNDED				
NOAA FUNDED				
ECOLOGY FUNDED				
1 Damon Creek at Kirkpatrick Road Fish Passage Const	Chehalis Basin FTF		\$ 740,500	\$ 740,500
2 Sexton Creek Fish Passage Restoration	Snohomish Co Surface Water		\$ 1,038,190	\$ 1,778,690
3 Johnson Crk Triple Restoration, Hoko-Ozette '22	North Olympic Salmon Coalition		\$ -	\$ 1,778,690
4 West Fork Grays Fish Passage Project	Cowlitz Indian Tribe		\$ 295,389	\$ 2,074,079
5 Clear Creek Reconnection	CREST		\$ 1,664,219	\$ 3,738,298
6 Garlock Road Delameter Creek Fish Passage Project	Cowlitz County of		\$ 1,657,500	\$ 5,395,798
7 Harper Estuary Barrier Correction	Kitsap County of	x	\$ -	\$ 5,395,798
8 Squalicum Cr at Baker Cr Fish Passage Improvement	Bellingham City of		\$ 4,132,623	\$ 9,528,421
9 MF Newaukum Trib- Kruger Fish Passage Const- FBRB	Lewis County Public Works		\$ 1,067,870	\$ 10,596,291
10 Mission Creek Subbasin Fish Barrier Removal Design	Chelan Co Natural Resource		\$ 188,087	\$ 10,784,378
11 Newskah Trib at Newskah Road 2 Fish Passage Const.	Chehalis Basin FTF		\$ 562,902	\$ 11,347,280
12 Langlois Creek Culvert Replacements (SVT & PSE)	Snoq Vly Watershed Dist		\$ 1,219,166	\$ 12,566,446
13 Beaver Creek Barriers 603181 and 603183	Chelan Co Natural Resource		\$ 78,406	\$ 12,644,852
14 Griggs Creek Private Fish Passage Project	South Puget Sound SEG		\$ 261,000	\$ 12,905,852
15 Thompson Creek at Thompson Creek Rd. Fish Passage	Thurston County Public Works		\$ 500,000	\$ 13,405,852
16 Mill Creek Passage - Roosevelt Street	Tri-State Steelheaders Inc		\$ 1,774,885	\$ 15,180,737
17 Fisher Creek Restoration at Cedardale and Starbird	Skagit County Public Works	x	\$ 3,980,984	\$ 19,161,721
18 Jones Creek Fish Barrier Removal	Cowlitz Indian Tribe		\$ 669,484	\$ 19,831,205
19 Naneum Creek at SM 3.75	Kittitas Co Conservation Dist		\$ 205,300	\$ 20,036,505
20 Eagle Creek Four Barrier Corrections	Chelan Co Natural Resource		\$ 1,211,865	\$ 21,248,370
21 Mill Creek Passage - 5th Avenue Bridge	Tri-State Steelheaders Inc		\$ 2,186,954	\$ 23,435,324
22 Williams Creek Fish Passage Design	Snohomish Co Surface Water		\$ 462,400	\$ 23,897,724
23 George Davis Creek Fish Passage Construction	Sammamish City of		\$ -	\$ 23,897,724

24	Wisem Creek Barrier Corrections x3 Project, Ph 2	Trout Unlimited – WA Coast	x	\$	-	\$	23,897,724
25	Naylors Cr. Culvert Replacement Construction	Jefferson Co Public Works	x	\$	51,609	\$	23,949,333
26	Stonewater Ranch Passage Improvement Project	Trout Unlimited-WA Water Proj		\$	209,750	\$	24,159,083
27	Lucas Crk Trib at MP 4.39- Fish Passage Const-FBRB	Lewis County Public Works		\$	1,045,798	\$	25,204,881
28	Padden Cr at 14th St Fish Passage Improvement	Bellingham City of		\$	1,335,973	\$	26,540,854
29	Padden Cr at 30th St Fish Passage Improvement	Bellingham City of		\$	4,103,719	\$	30,644,573
30	Berwick Creek at Logan Fish Passage Const – FBRB	Lewis County Public Works	x	\$	-	\$	30,644,573
31	Taylor Creek Fish Passage Improvements	Seattle Public Utilities				\$	30,644,573
ORIGINAL FUNDING LINE							
32	Anton & Cedar Creek Fish Passage Restoration	Wild Salmon Center		\$	707,780	\$	31,352,353
33	Padden Cr at 12th St Fish Passage Improvement	Bellingham City of		\$	1,615,867	\$	32,968,220
34	Lucas Crk Trib at MP 4.24- Fish Passage Const-FBRB	Lewis County Public Works		\$	1,140,358	\$	34,108,578
35	Hoko Ozette Rd MP 6.38 80001279 Culvert Replacement	North Olympic Salmon Coalition		\$	249,235	\$	34,357,813
36	North Fork Goble Creek Fish Passage Design	Cowlitz County of		\$	382,500	\$	34,740,313
37	Carpenter and English Cr Fish Passage Barrier Impr	Skagit Fish Enhancement Group		\$	353,351	\$	35,093,664
38	Black Slough Comprehensive Barrier Removals Design	Whatcom County FCZD		\$	207,000	\$	35,300,664
39	Laughing Jacobs Creek Barrier Removal	Trout Unlimited Inc.		\$	755,860	\$	36,056,524
40	Peoples Creek Fish Passage	Tulalip Tribes		\$	329,950	\$	36,386,474
41	Hoko Ozette Rd MP 2.9 80001331 Culvert Replacement	North Olympic Salmon Coalition		\$	264,450	\$	36,650,924
42	Beatty Crk at Chelsie Ln Fish Barrier Replacement	South Puget Sound SEG		\$	490,000	\$	37,140,924
43	Mill Creek Passage Design – Colville to 3rd	Tri State Steelheaders Inc		\$	-	\$	37,140,924
44	Carpenter Creek at Cascade Ridge Design	Skagit County Public Works		\$	250,125	\$	37,391,049
45	Wright's Creek Culvert and Hatchery Intake Replace	North Olympic Salmon Coalition		\$	316,073	\$	37,707,122
46	SE 432nd Street Culvert	King County of		\$	950,000	\$	38,657,122
47	Eagle Creek Barrier Design & Replacement 601620	Chelan Co Natural Resource		\$	354,199	\$	39,011,321
48	Elliott Rd Barriers Design	Tulalip Tribes		\$	-	\$	39,011,321
49	Williams Creek #1	Tulalip Tribes		\$	283,000	\$	39,294,321
50	Ennis Creek Fish Passage Design	Port Angeles City of		\$	-	\$	39,294,321
51	Pilchuck Tributary Watt Crossing	Tulalip Tribes		\$	-	\$	39,294,321
52	W. Beeville Loop Road Fish Passage Planning	Trout Unlimited Inc.		\$	-	\$	39,294,321

53	CR 28 East Hickox Road at Carpenter Cr.	Skagit Fish Enhancement Group		\$	192,500	\$	39,486,821
54	Secret Creek Fish Passage Design	Snohomish Co Surface Water		\$	501,900	\$	39,988,721
55	Barrel Springs and Dry Creek Restoration	Skagit County Public Works		\$	990,531	\$	40,979,252
56	Berwick Crk at Bishop Fish Passage Constr - FBRB	Chehalis Port of		\$	-		
57	Coal Creek Fish Passage Restoration	Trout Unlimited Inc.		\$	-		
58	W. Beeville Road Fish Passage Planning	Trout Unlimited Inc.		\$	-		
59	North Creek Fish Barrier Correction Project at McC	Adopt A Stream Foundation		\$	-		
60	Center Road MP 3.23 Fish Barrier Removal	Jefferson Co Public Works		\$	-		
61	Green Cove at Country Club Rd. Fish Passage Design	Thurston County Public Works		\$	-		
CURRENT FUNDING LINE							
62	Coleman Creek at SM 4.7	Kittitas Co Conservation Dist		x	\$		-
63	Scammon Creek at Graf Fish Passage Const - FBRB	Lewis County Public Works		x	\$		-
64	Berwick Creek at Labree Fish Passage Const - FBRB	Lewis County Public Works		x	\$		-
65	Forrester Barrier Culvert Removal	Kitsap Conservation District			\$		-
66	East Tarboo Creek Fish Passage	Northwest Watershed Institute			\$		-
67	Erick Creek Fish Passage Project	Cowlitz County of		x	\$		-
68	Lynch Road MP 2.27-Lynch Creek Barrier Planning	Mason County of			\$		-
69	Percival Creek Fish Barrier Removal	Tumwater City of		x	\$		-
70	Derby Creek BNSF Crossing	Chelan Co Natural Resource			x	\$	-
71	Williams Creek #2	Tulalip Tribes			\$		-
72	Barnabee Farms Springbrook Creek Restoration	Bainbridge Island Land Trust			\$		-
73	Seidel Creek Multiple Fish Barrier Correction Desi	Adopt A Stream Foundation			\$		-
74	Whiskey Creek Barriers, Ellensburg	Mid-Columbia RFEG			\$		-
75	NC 213 Norway Park Creek at Pavilion Dr	Skagit Fish Enhancement Group			\$		-
76	Ruby Creek Culvert at Sidney Rd Port Orchard	Port Orchard City of			x	\$	-
77	Mill Creek Barrier Improvements NE 259th St-61	Clark County Public Works			\$		-
78	South Fork Dogfish Creek Culvert Replacement	Poulsbo City of			\$		-
79	Upper Catherine Creek Barrier Correction Design	Adopt A Stream Foundation			\$		-
80	Clearwater Creek Bridge Design	Sea Resources			\$		-
81	Fletcher Bay Rd Fish Passage Restoration	Mid-Puget Sound Fish Enh Grp			\$		-
82	North Cr Culvert Replacement at Harborview Dr	Gig Harbor Public Works			\$		-
83	Crystal Creek	Trout Unlimited Inc.			\$		-

84 Schoolhouse at 108th	Pierce County of		\$	-
85 Cutler Barrier Removal	Cascadia Conservation District		\$	-
86 20th Street Culvert Replacement Design	Fife City of		\$	-
87 Newberry Hill Culvert Replacement Site ID 99813	Kitsap County Public Works	x	\$	-
88 Mill Creek Trib. Shadow Valley Fish Passage	South Puget Sound SEG		\$	-
89 Derby Creek Barrier Correction	Cascade Col Fish Enhance Group		\$	-
90 Hammer and Guenther Fish Barrier Removal	Lewis Conservation District		\$	-
91 Panther Creek Barrier Removal - Talbot Road	Renton City of		\$	-
92 Ridgefield - Gee Creek Culvert Replacement	Ridgefield City of	x	\$	-
93 Cooper Creek Culvert Restoration	Bainbridge Island City of		\$	-
94 Annapolis Creek Culvert Removal at Bay St	Port Orchard City of		\$	-
95 Derby Creek Barrier Design	Cascade Col Fish Enhance Group		\$	-
96 Gilliam Creek Fish Passage Prelim Dsgn	Tukwila City of		\$	-
97 Little Chumstick Fish Barriers Design	Cascade Col Fish Enhance Group		\$	-
98 Fautleroy Creek Culvert Replacement at 45th	Seattle Public Utilities		\$	-
99 Derby Canyon Orchards	Chelan Co Natural Resource	x	\$	-
100 Camas Creek Crossing Design Project	Chelan Co Natural Resource		\$	-
101 kenmore 192 trib culvert	Kenmore City of	x	\$	-
102 SE 256th St Culvert Replacement CIP 1145	Covington City of		\$	-
	Total		\$	40,979,252