Coastal Steelhead Season Planning: Town Hall #1

Region 6 Fish Management Team

Washington Department of FISH and WILDLIFE

wdfw.wa.gov/coastal-steelhead

Zoom Directions and Etiquette

Please note the following guidelines for our webinar:

- As you enter the webinar, you will be muted automatically.
- To ask a question, please raise your hand. If calling in, dial *9 or use the hand icon at the bottom of your screen if joining from a computer.
- When asked for questions and comments, unmute yourself using the mute button on your device or dialing *6 on your phone.
- If you experience technical issues during the webinar, please let us know in the chat, and we will assist you.- We ask that you treat everyone respectfully and avoid personal attacks, insults, or threats.
- Please discuss issues and questions rather than attacking individuals or organizations.
- Offensive, disrespectful, or derogatory language, including profanity, is prohibited.
- Please limit the length and number of times you speak on each topic for a balanced discussion.
- Assume positive intentions from those speaking, and listen respectfully.
- If you have any further questions or comments, please share them in written format online at ***wdfw.wa.gov/coastal-steelhead***.

2023/24 Pre-season schedule

- Mid July**:** Survey data exchange with tribal comanagers
- Mid August: Spawning escapement estimates finalized
- Early September: Exchange pre-season forecasts with Tribal Co-Managers
- Early October**:** Pre-season Forecasts Agreement with Tribal Co-Managers
- **October 25th Town Hall #1:** Final escapements and preliminary forecasts, public input on fishery proposals
- Mid November: Co-manager policy meetings to develop Management Plans
- Late November: Finalize Management Plans with tribal co-managers
- **November 27th Town Hall #2**: Communicate modeling results and Director's decision on agreed to fishing plans.
- December 1: Announce winter fishing rules

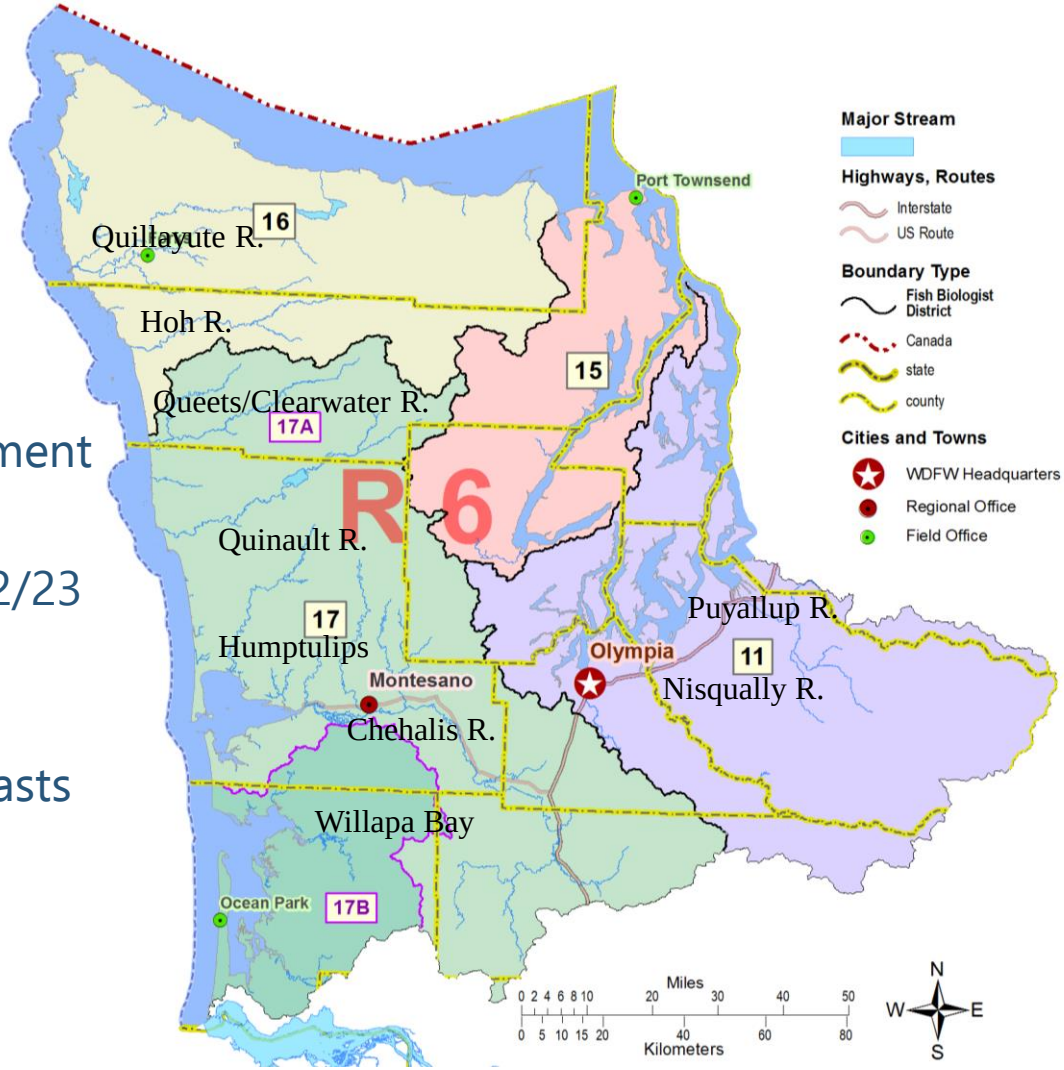
Agenda

Steelhead biology & stock assessment

Management framework and 2022/23 review

2023/24 preliminary runsize forecasts

Solicit proposals and questions



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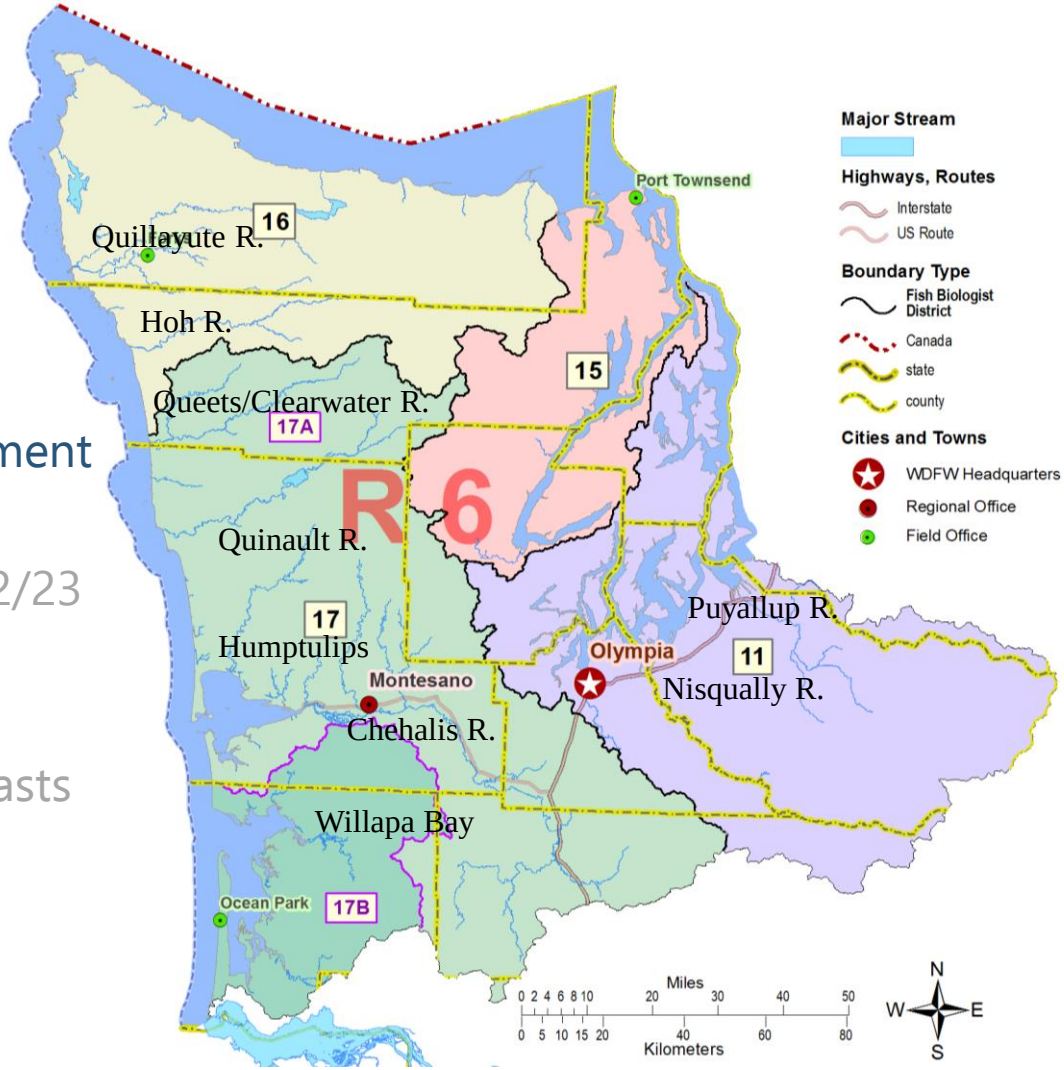


Biology/Stock Assessment

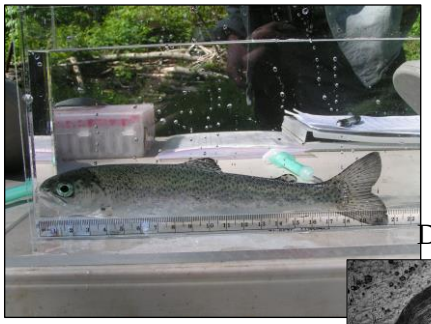
Cederholm 1984
Madel and Losee et al. 2017
Ronne et al. 2020

Spawning Ground Surveys

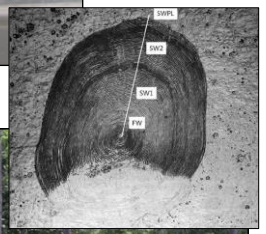
Spawning Grounds

Hatcheries

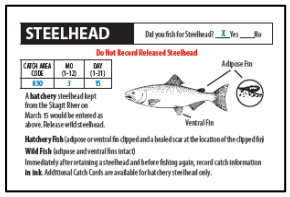
Hatchery Releases



Dauer et al. 2009



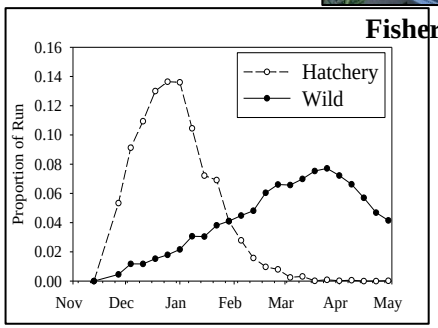
Bentley 2017

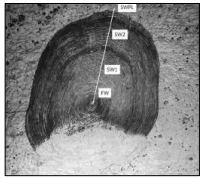


Fresh Water

Smolt and Kelt outmigration

Fishery Monitoring



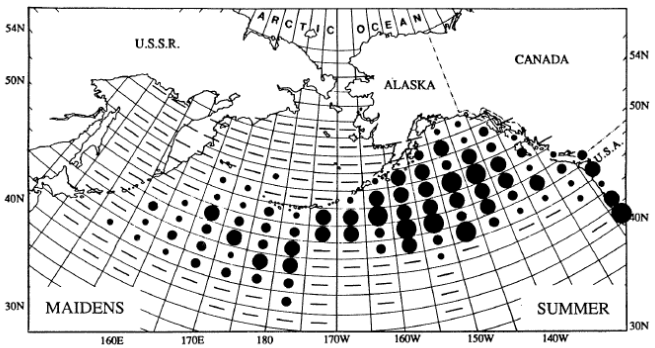


Marine

Ocean Phase

Collaborative Research

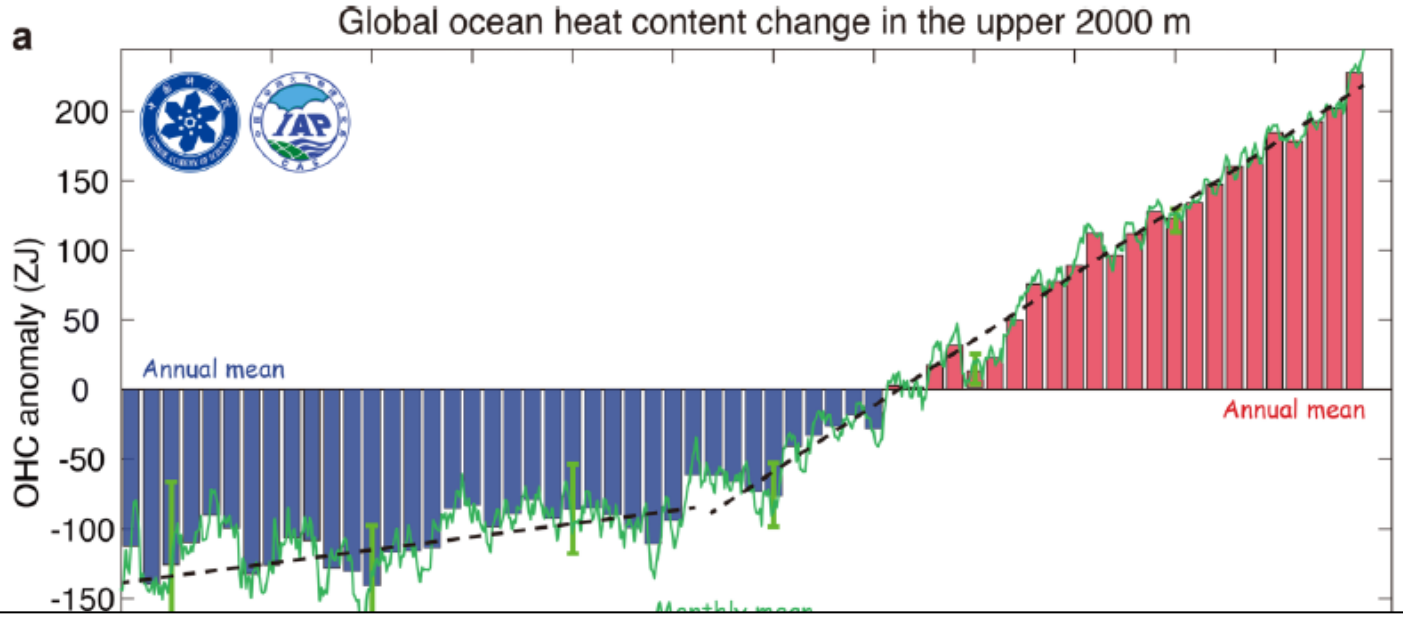
West et al. 2019



Light et al. 1989

Kendall and Mcmillan et al. 2015
Losee et al. 2020
Harbison et al. in prep.
Courtney et al. 2022

Steelhead Biology-Ocean Conditions



Past and future ocean warming

Lijing Cheng[1,2]✉, Karina von Schuckmann[3], John P. Abraham[4], Kevin E. Trenberth[5,6], Michael E. Mann[7], Laure Zanna[8], Matthew H. England[9,10], Jan D. Zika[10,11], John T. Fasullo[5], Yongqiang Yu[1], Yuying Pan[1,2], Jiang Zhu[1,2], Emily R. Newsom[8], Ben Bronselaer[12] and Xiaopei Lin[13,14]

ADVANCES IN A

• News & Views

Lijing CHENG[*1,2,11], John ABRAHAM[3], Jiang ZHU[1,2], Kevin E. TRENBERTH[4], John FA
Tim BOYER[5], Ricardo LOCARNINI[5], Bin ZHANG[2,6], Fujiang YU[7], Liying WAN
Xingrong CHEN[7], Xiangzhou SONG[8], Yulong LIU[9], and Michael E. MANN[10]

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Viktor GOURETSKI[1,2], Gengxin CHEN[13], Alexey MISHONOV[5,14], Jim REAGAN[5,14], and Jiang ZHU[1,2]

Steelhead Biology-Freshwater Habitat

Drought likely to develop in Washington after cool and dry spring

Union-Bulletin

Idaho Capital Sun

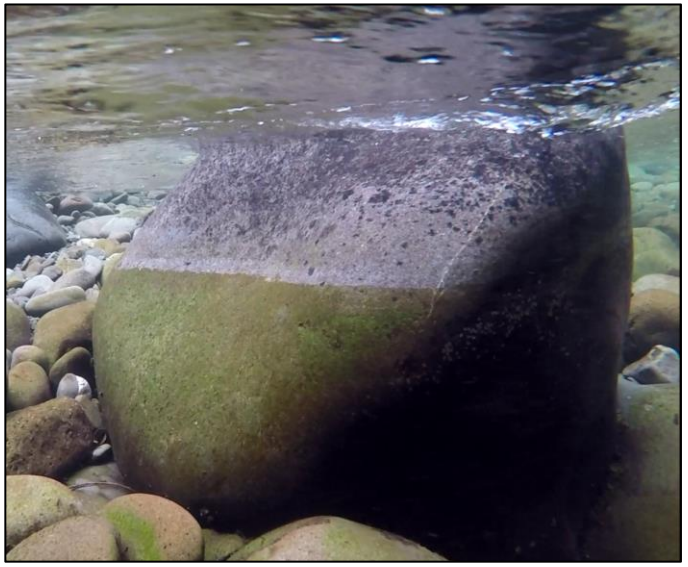
Washington declares drought emergency in 12 counties

Irrigators are facing water shortfalls, while officials worry about conditions for fish hatcheries and salmon migration within a number of Olympic Peninsula watersheds

1.5 million people asked to conserve water in Seattle because of statewide drought

Seattle Public Utilities is asking about 1.5 million customers in the Seattle area to use less water amid ongoing drought conditions

abc NEWS



Department of Fish and Wildlife

Steelhead Biology- Marine and Freshwater

Journal of Applied Ecology 2013, **50**, 1093–1104 doi: 10.1111/1365-2664.12137

Steelhead vulnerability to climate change in the Pacific Northwest

Alisa A. Wade[1*,†], Timothy J. Beechie[2], Erica Fleishman[3], Nathan J. Mantua[4], Huan Wu[5‡], John S. Kimball[5], David M. Stoms[6] and Jack A. Stanford[5]

RESEARCH ARTICLE

Climate vulnerability assessment for Pacific salmon and steelhead in the California Current Large Marine Ecosystem

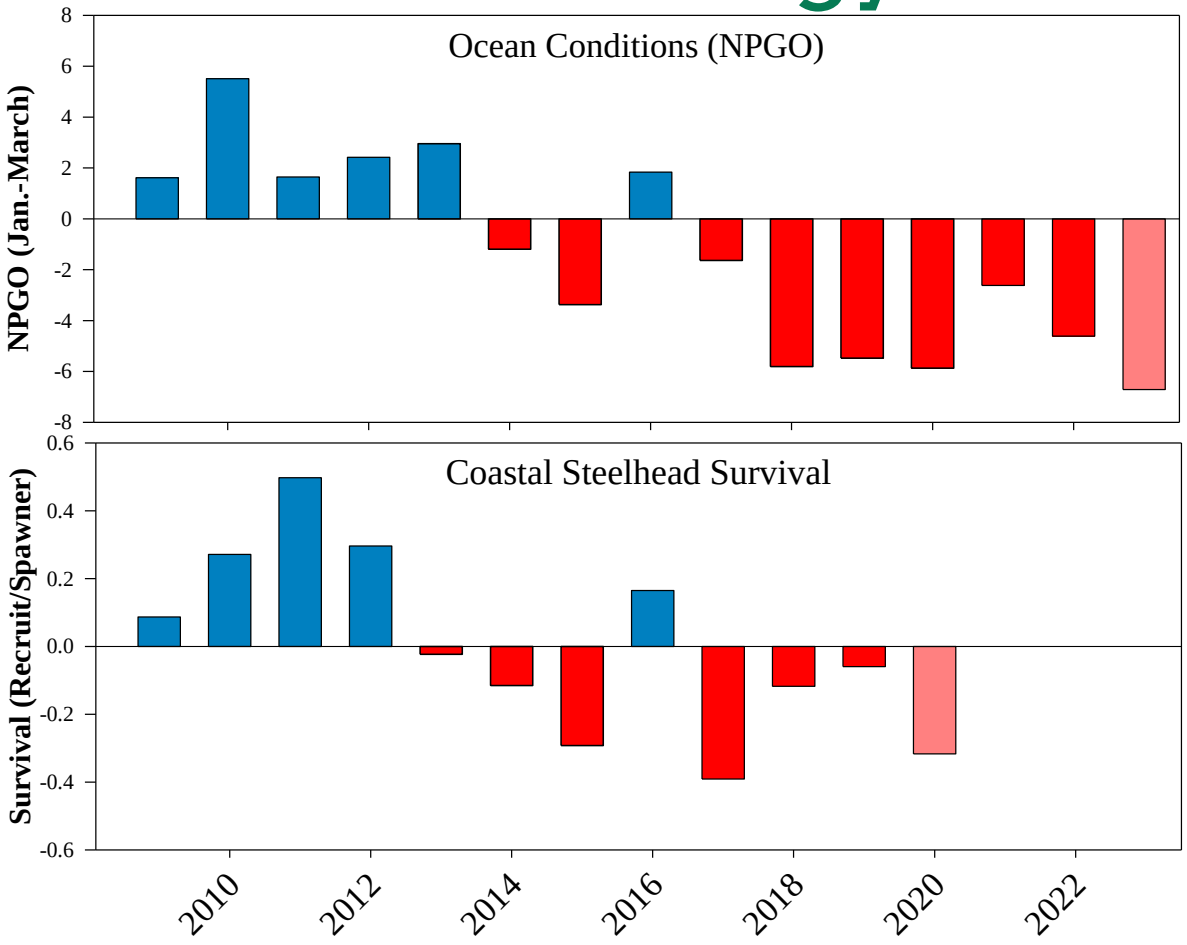
Lisa G. Crozier[1]*, Michelle M. McClure[1¤], Tim Beechie[1], Steven J. Bograd[2], David A. Boughton[3], Mark Carr[4], Thomas D. Cooney[1], Jason B. Dunham[5], Correigh M. Greene[1], Melissa A. Haltuch[1], Elliott L. Hazen[2], Damon M. Holzer[1], David D. Huff[1], Rachel C. Johnson[3,6], Chris E. Jordan[1], Isaac C. Kaplan[1], Steven T. Lindley[3], Nathan J. Mantua[3], Peter B. Moyle[7], James M. Myers[1], Mark W. Nelson[8], Brian C. Spence[3], Laurie A. Weitkamp[1], Thomas H. Williams[3], Ellen Willis-Norton[4]

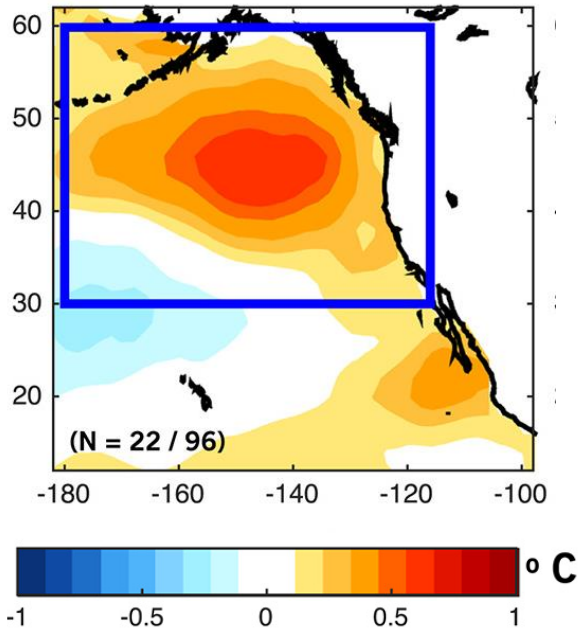
Marine and freshwater regime changes impact a community of migratory Pacific salmonids in decline

Kyle L. Wilson, Colin J. Bailey, Trevor D. Davies, Jonathan W. Moore,

Global Change Biology

Steelhead Biology-Ocean Conditions





Joh & Lorenzo 2017

Scheuerell et al. 2020

Steelhead survival is poor when ocean conditions are unfavorable (NPGO negative). Future returns are expected to follow extremely unfavorable conditions.

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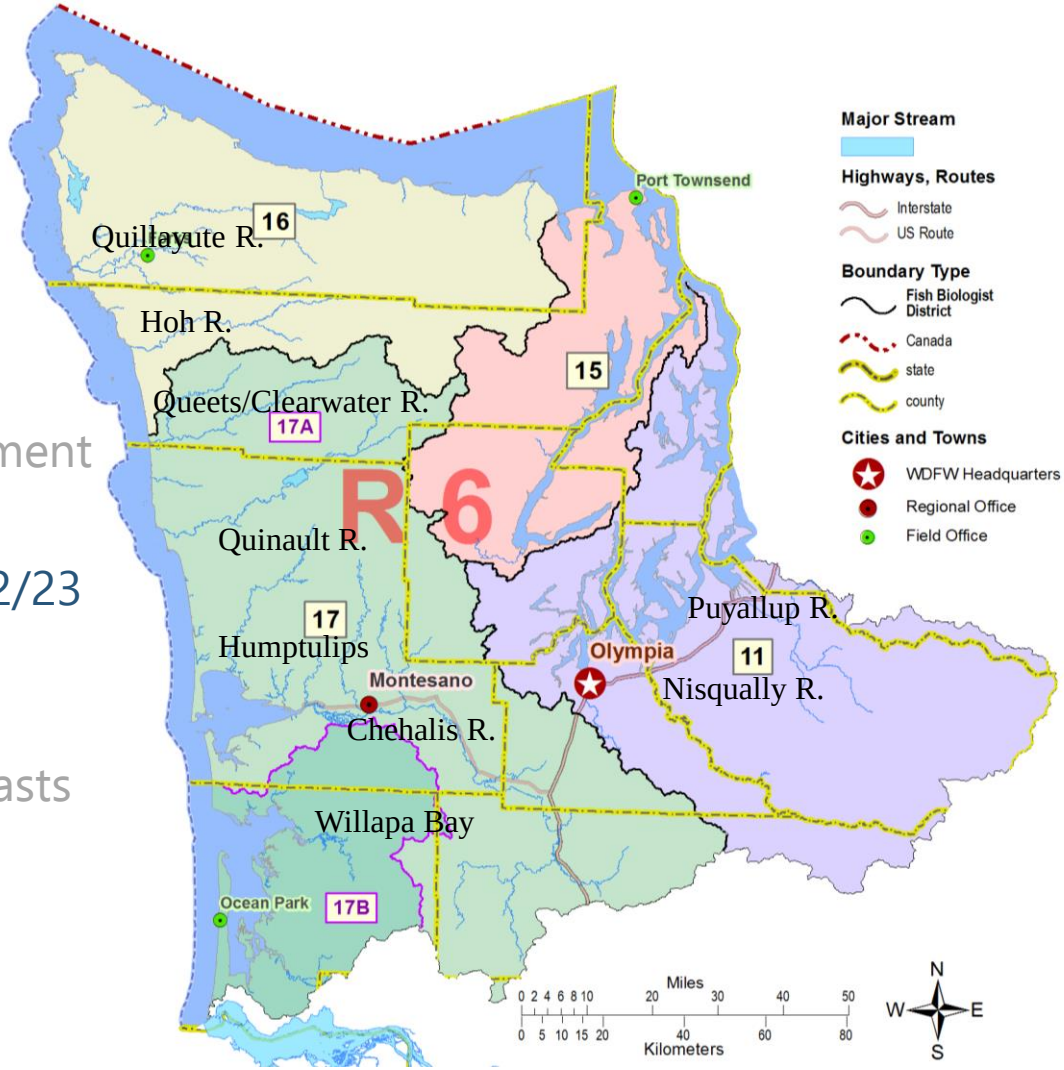
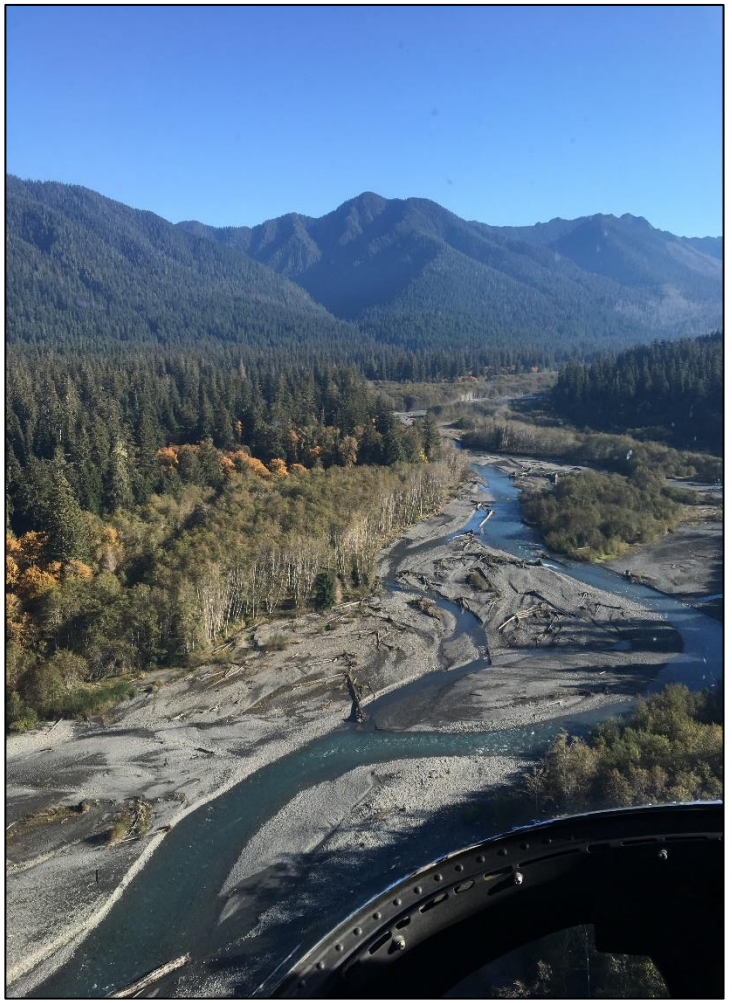


Coastal Steelhead Management-Considerations

- Limited in-season tools
- Effort shift uncertainty
- Forecasting uncertainty
- Tribal co-management
- National Park Service
- Escapement goals
- Protracted run timing
- Not ESA listed



Steelhead Management-Key Terms

Wild steelhead-Steelhead that were produced in the natural environment.

Hatchery steelhead-Steelhead that were produced in a hatchery.

Run- A group of anadromous fish on its return migration, identified by species, race and water of origin.

Escapement-Number of steelhead surviving to the spawning grounds or hatchery.

Redd-Spawning nest.

Runsize-Number of steelhead returning to the freshwater. Escapement + Harvest.

Survival-Number of steelhead produced by each parent spawner. Recruit per spawner.

Forecast-Predicted number of adult steelhead returning in future years.

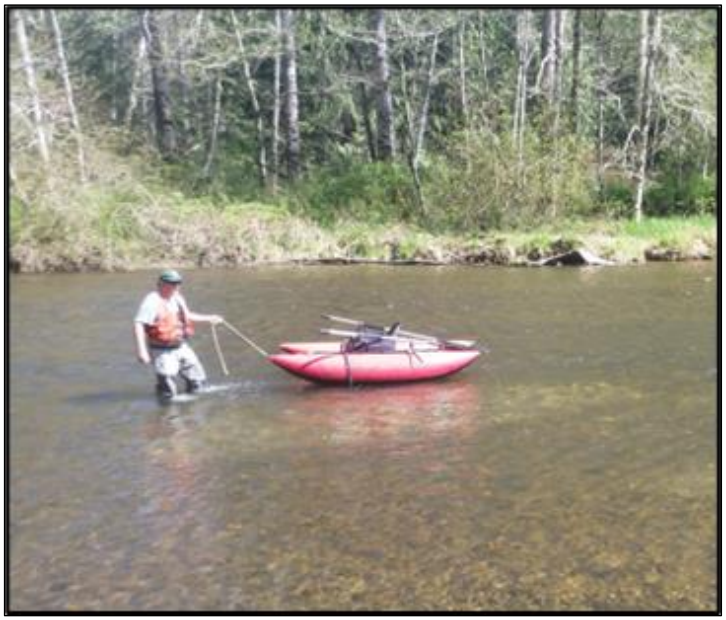
Integrated hatcheries-Genetically integrated with natural population.

Segregated hatcheries-Genetically segregated from natural population.

Kelt- Adult steelhead that survived spawning.

2022/23 Review: Monitoring and Performance

- Creel: Prioritized funding in 2022/23 to support increased monitoring of coastal steelhead fisheries in the Hoh and limited monitoring in the Quillayute and Willapa Bay.
- Spawning ground surveys
- Hatchery rack returns
- Tribal fisheries data
- Online in-season updates



2022/23 Review: Monitoring and Performance

- Preseason: Low forecasts in most rivers and conservative season regulations with bank fishing opportunity in Willapa and Hoh watersheds and boat fishing opportunity in the Quillayute watershed (Quillayute, Sol Duc, Calawah, and Bogachiel rivers).

- In-season: Sport and tribal catch suggested runsize similar to predictions.

- Post-season: Preliminary estimates of runsize and escapement suggest high forecast accuracy and some places where runsize exceeded preseason expectations.

- Surplus Hatchery Adult Steelhead: 1,237 planted in 7 coastal lakes.

2022/23 Review: Sport Monitoring

Comprehensive Creel conducted December 16th to March 31st in select watersheds.

- Willapa Bay
  - -Willapa River: 291 interviews conducted,5,663 total estimated angler hours and 283 wild steelhead caught. ~20% of run caught.
  - -Naselle River: 203 interviews conducted, 6,204 estimates angler hours and 370 wild steelhead caught. ~21% of run caught.
- Hoh River
  - -666 interviews, 57,273 estimated angler hours, 3,575 wild steelhead caught. ~86% of run caught.
- Sol Duc River
  - -264 interviews, 28,329 estimated angler hours, 2,204 wild steelhead caught. ~55% of fish that entered the Sol Duc caught.
- Test Fishery Pilot project
  - -2 technicians for two months
  - -55 angler days fished 26 wild steelhead caught

2022/23 Review: Preliminary Tribal Catch

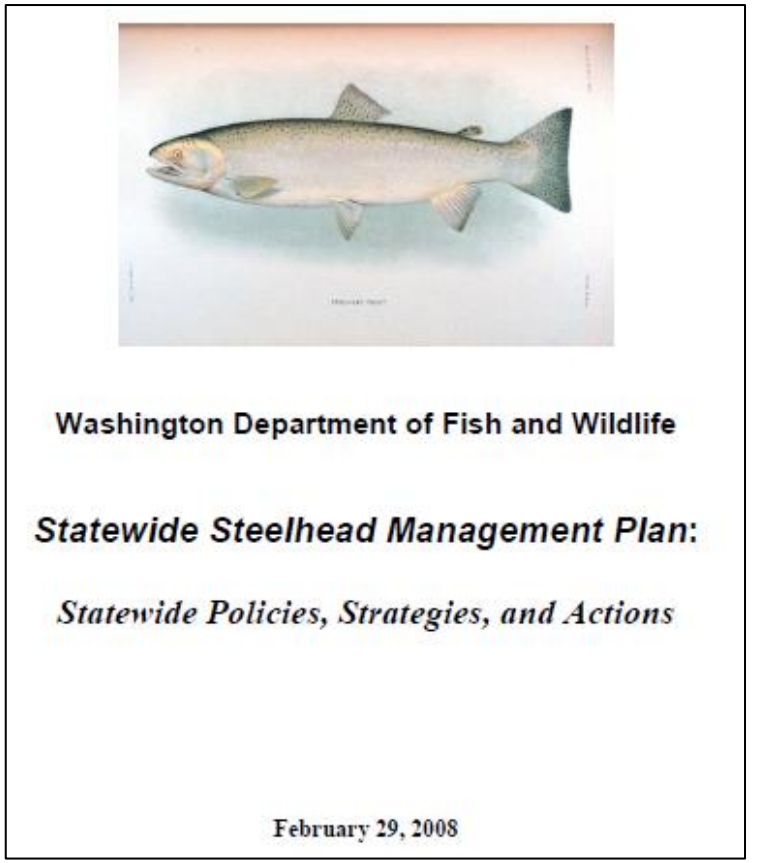
	Wild Projected	Wild Harvested
Willapa	0	0
Chehalis	0	0
Humptulips	0	0
Quinault	936	213
Queets	567	243
Hoh	297	124
Quillayute	1446	717

Tribal catch ~40% of what was projected preseason as a result of management actions and lower than expected effort.

Management Framework: Statewide Steelhead Management Plan (SSMP)

Policy guidance from **SSMP**. Goals to restore and maintain **Viable Salmonid Population (VSP)** parameters:

- **Abundance**
- **Productivity**
- **Distribution**
- **Diversity**



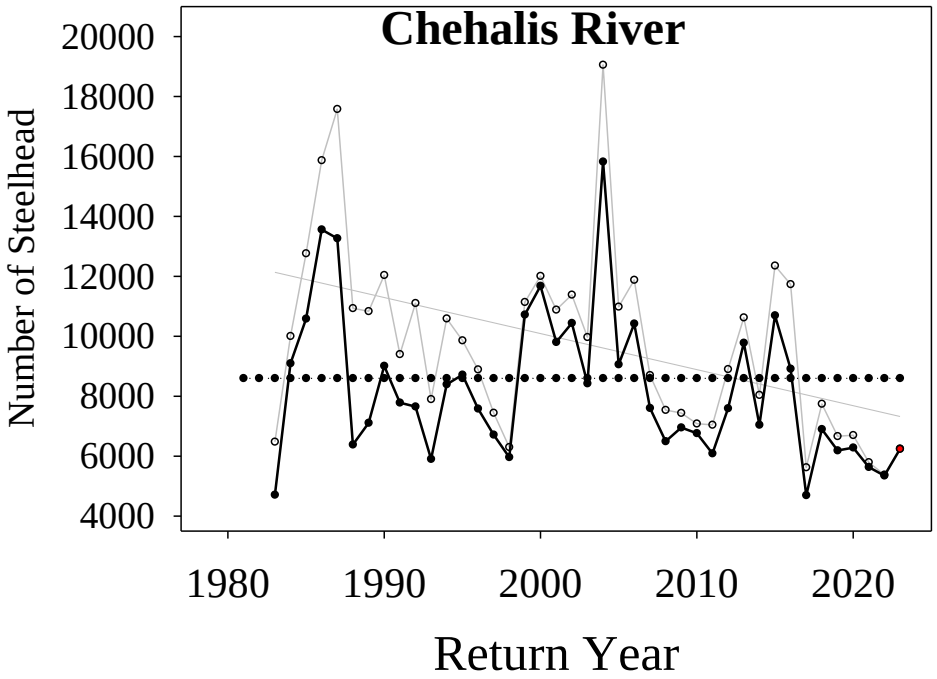
Review 2022/23: **VSP Parameters**

SSMP on abundance:

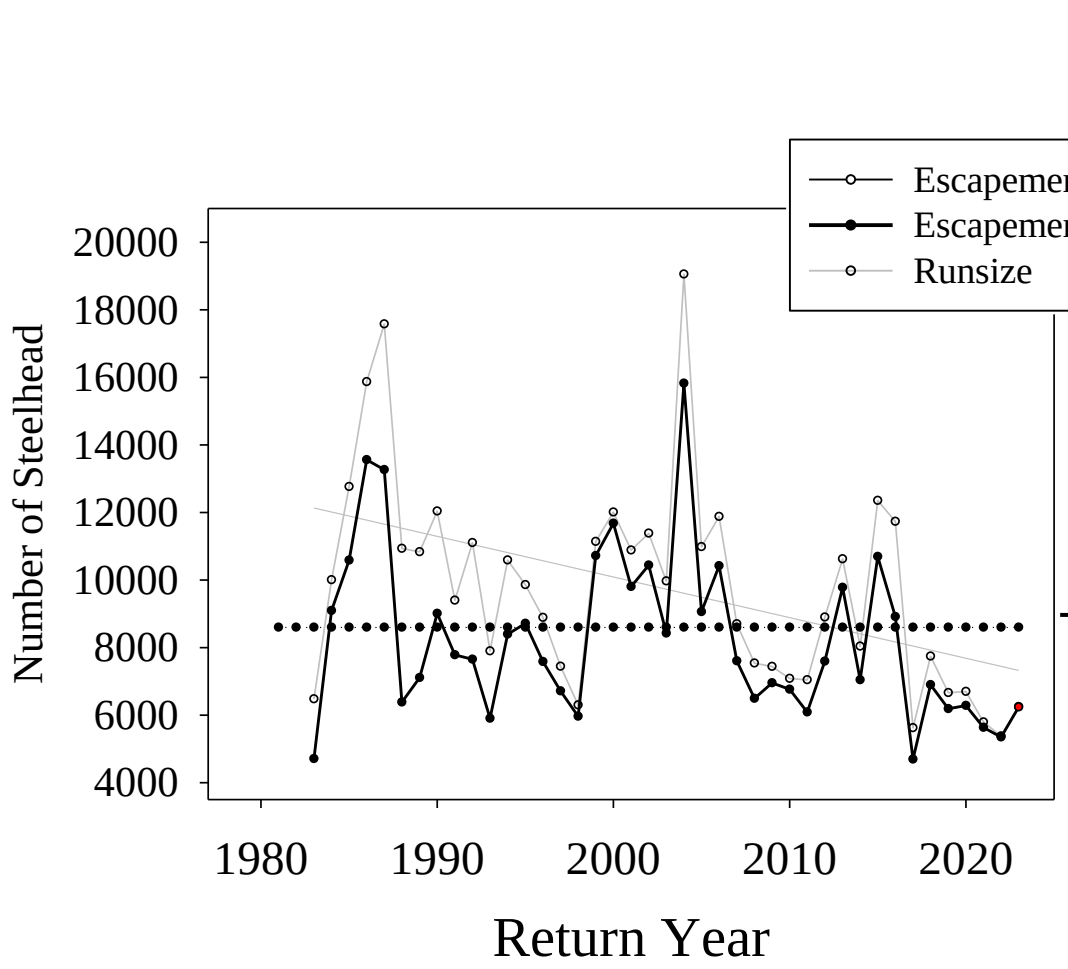
Runsize Greater than escapement goal: Assure escapement goals are met

Runsize less than escapement goal: Minimize mortality to wild stock(s); in no case exceed a 10% impact from all fisheries

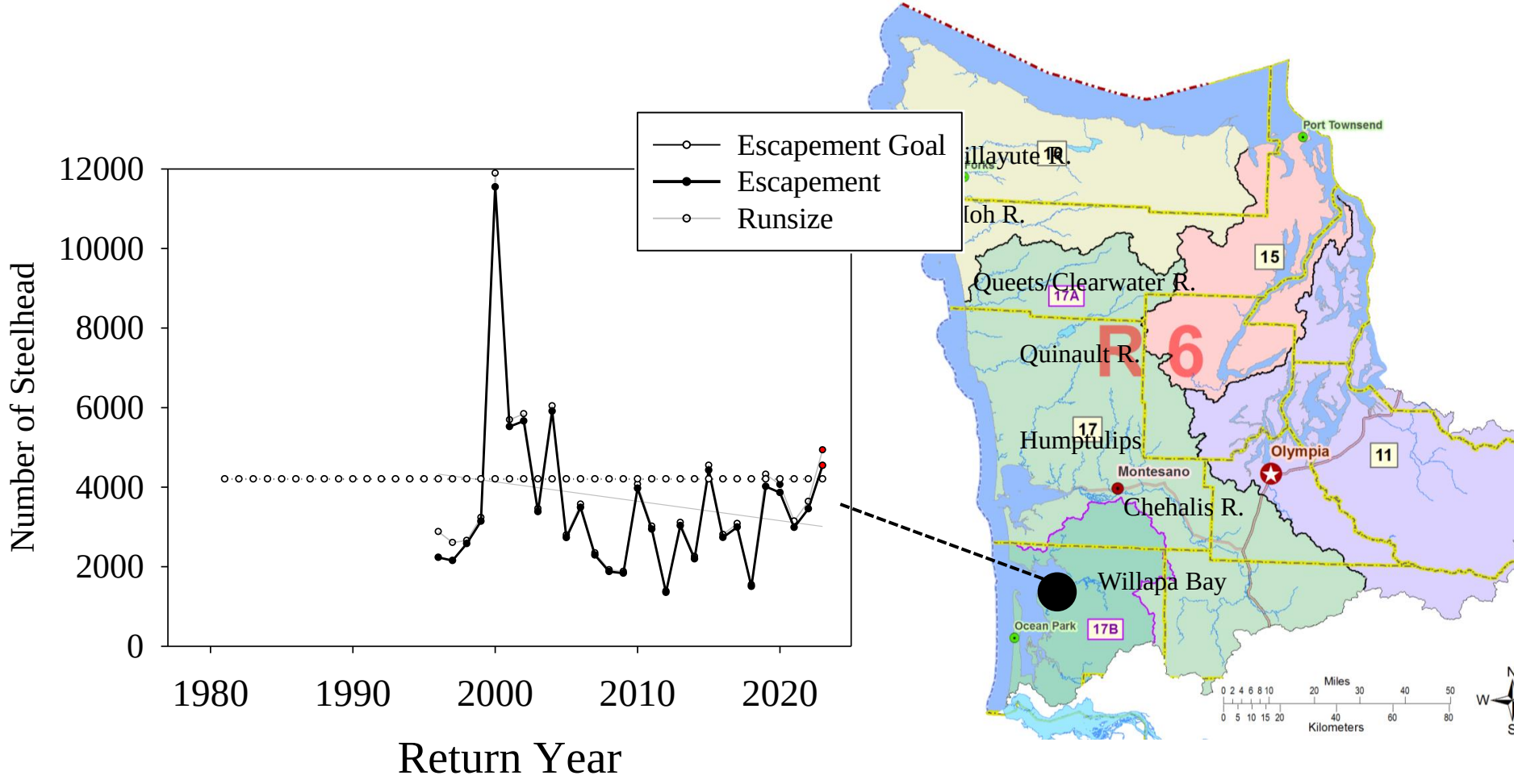
- **Abundance**
- Productivity
- Distribution
- Diversity



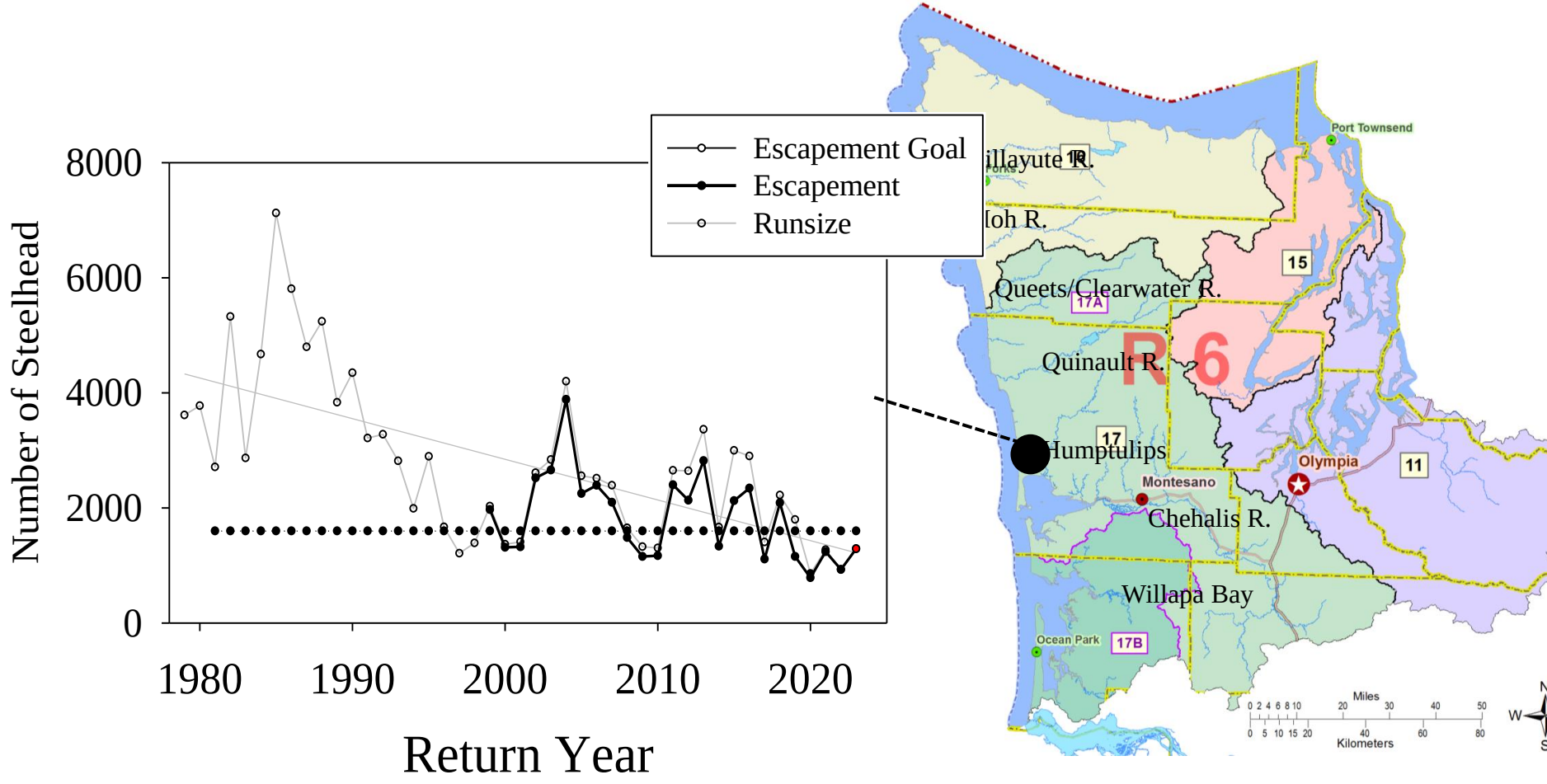
2022/23 Review: **Chehalis R.**



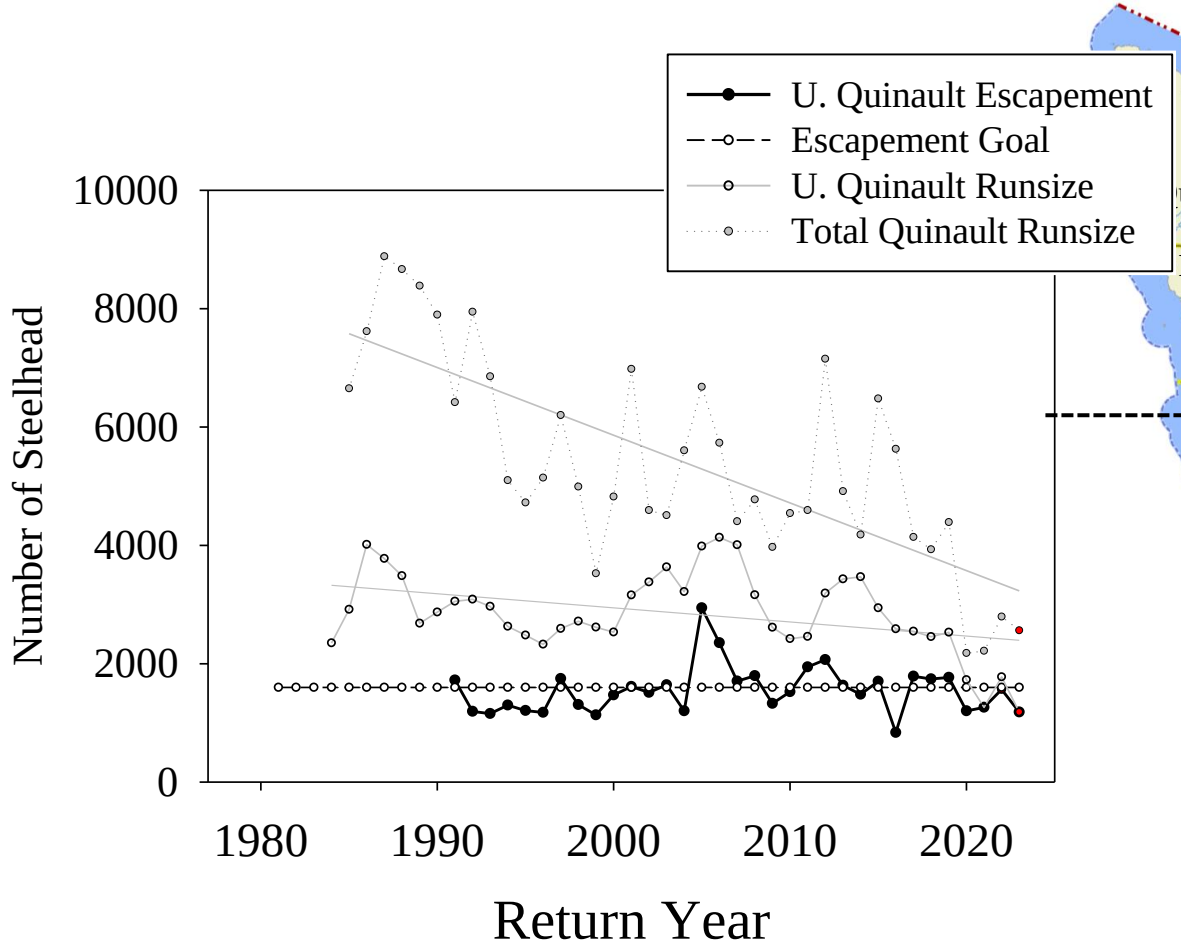
2022/23 Review: **Willapa Bay**

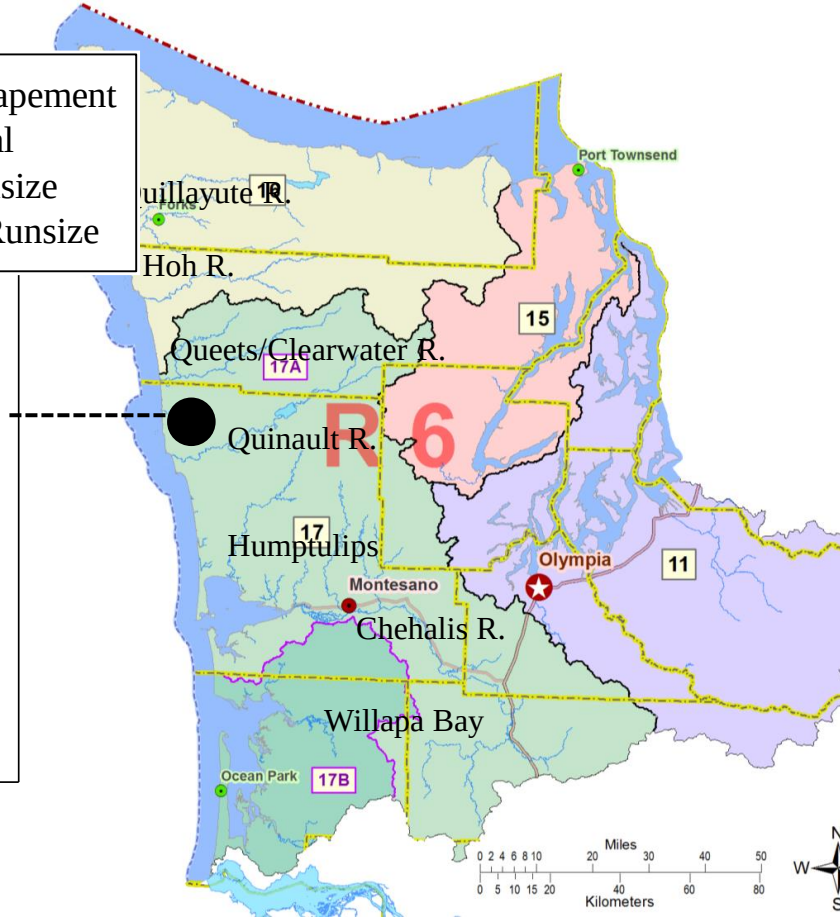


2022/23 Review: **Humptulips R.**

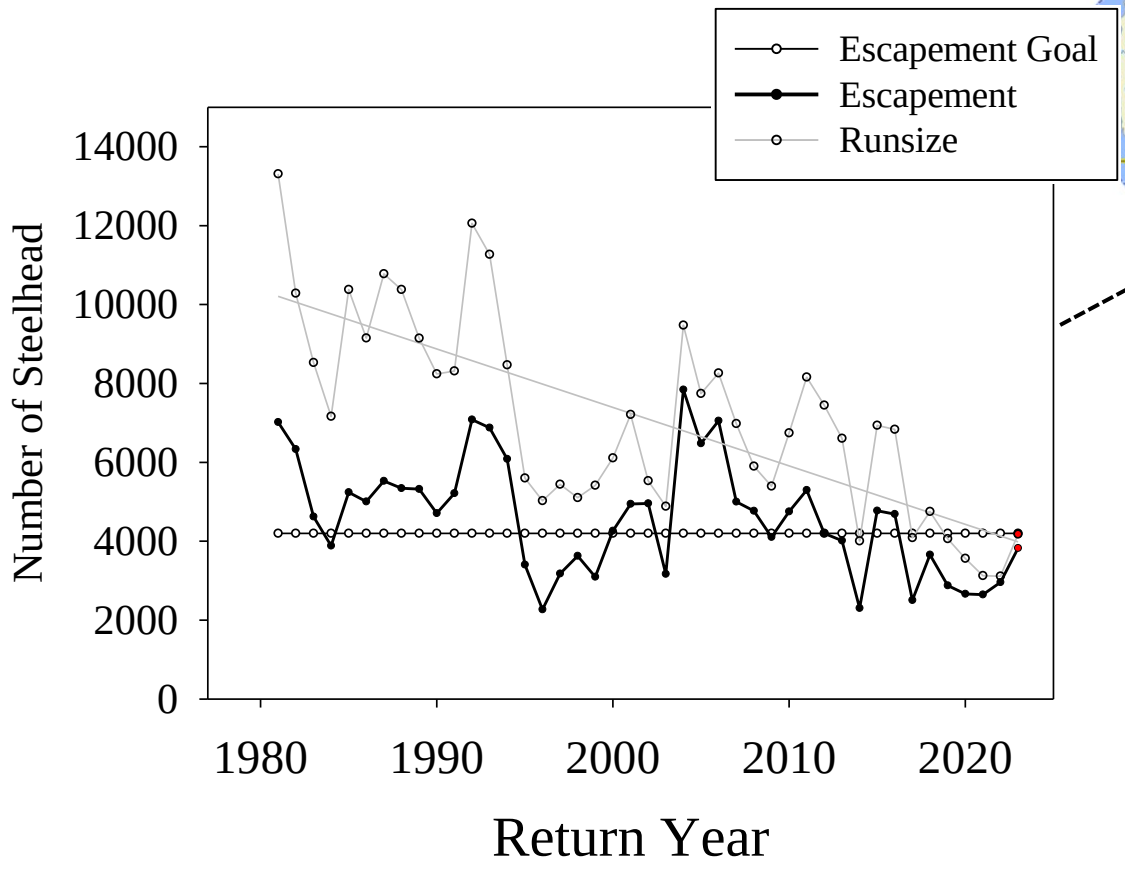


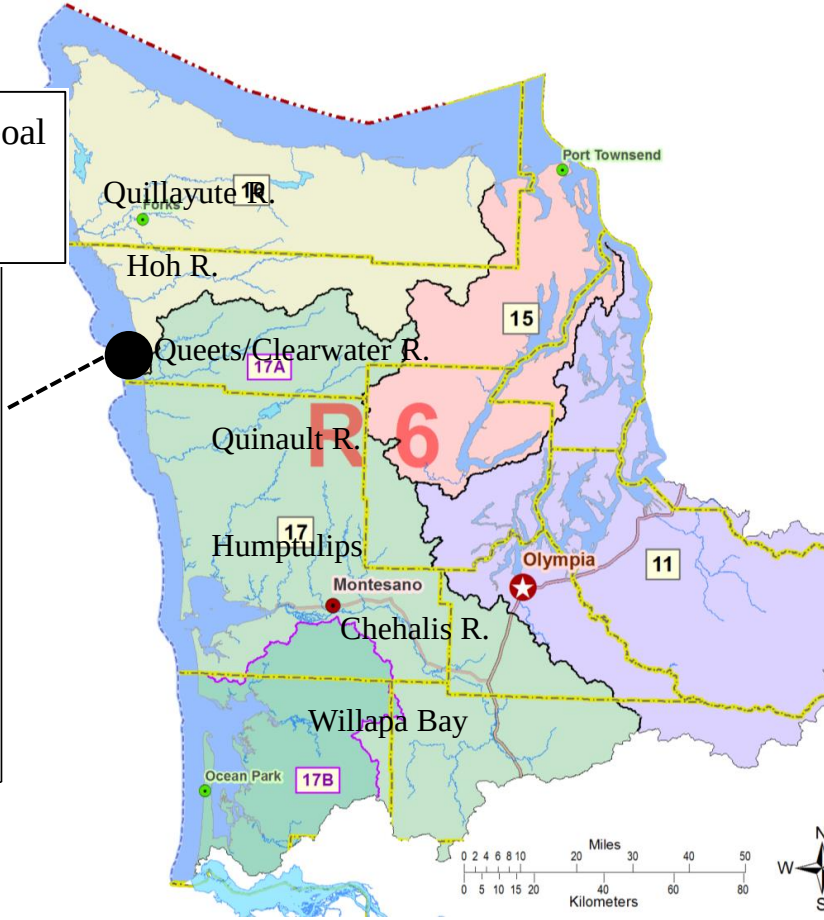
2022/23 Review: **Quinault R.**



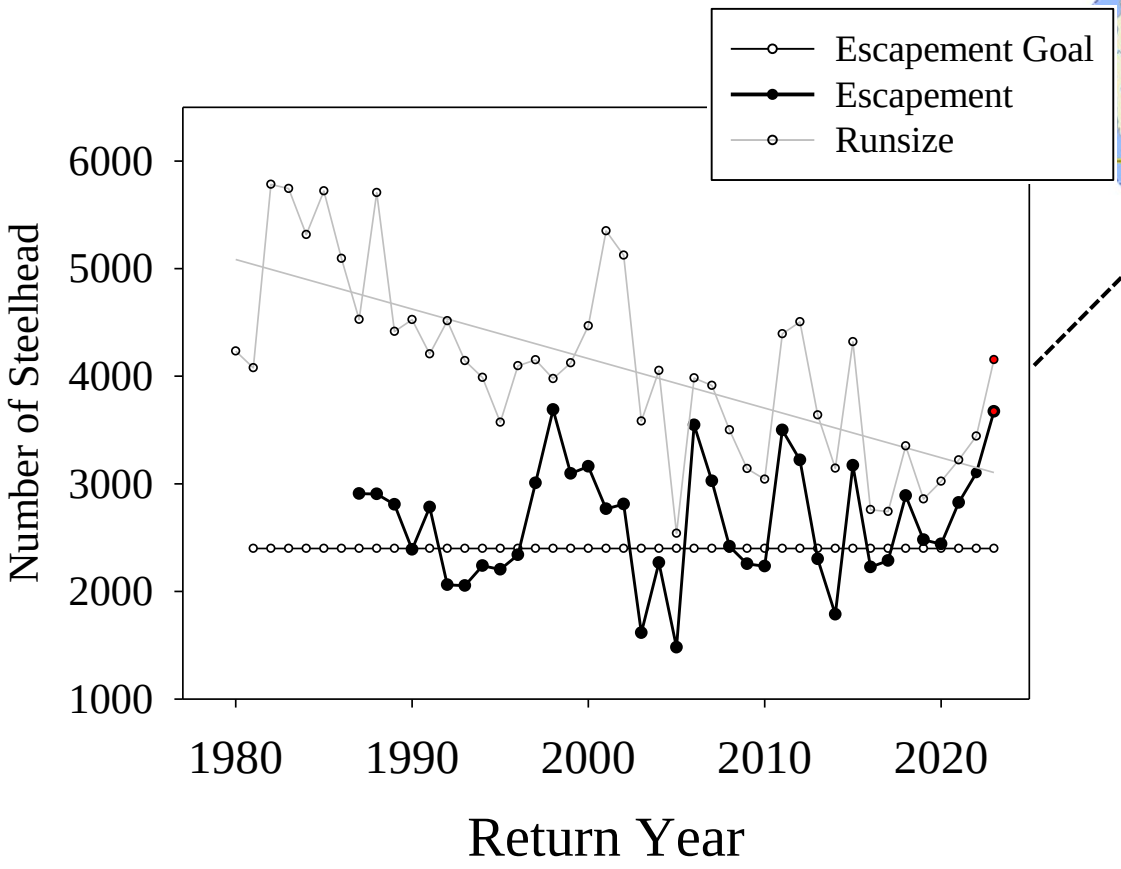


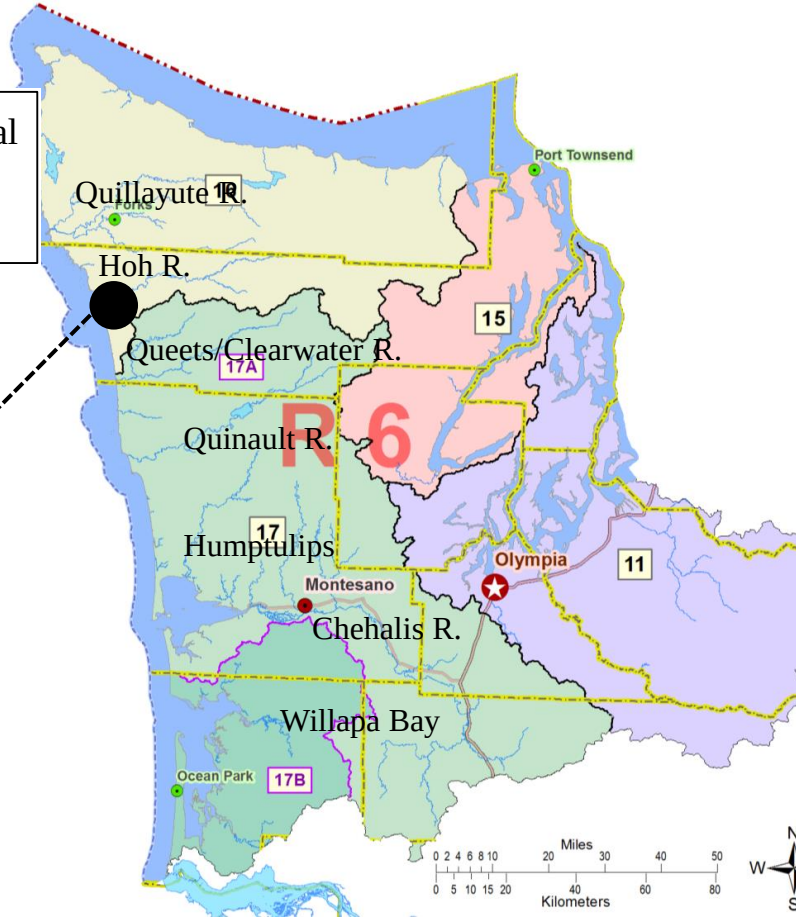
2022/23 Review: **Queets R.**



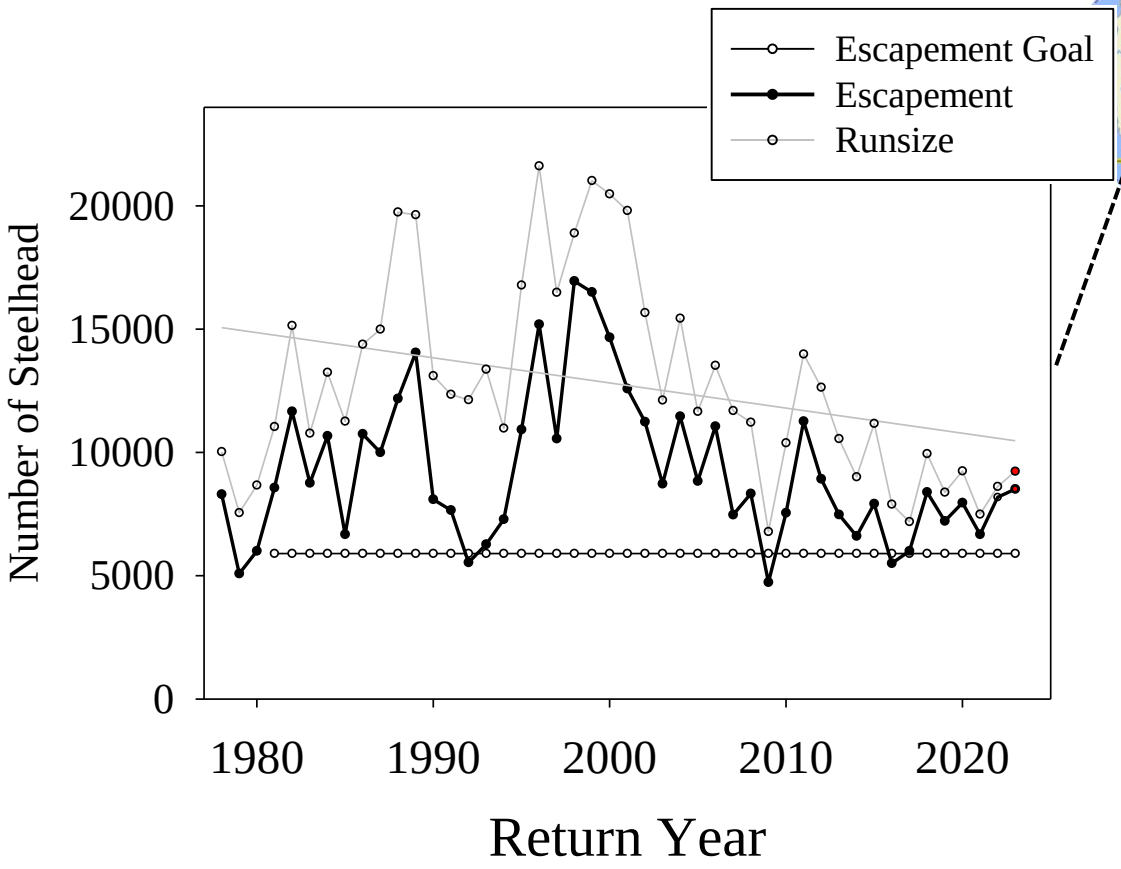


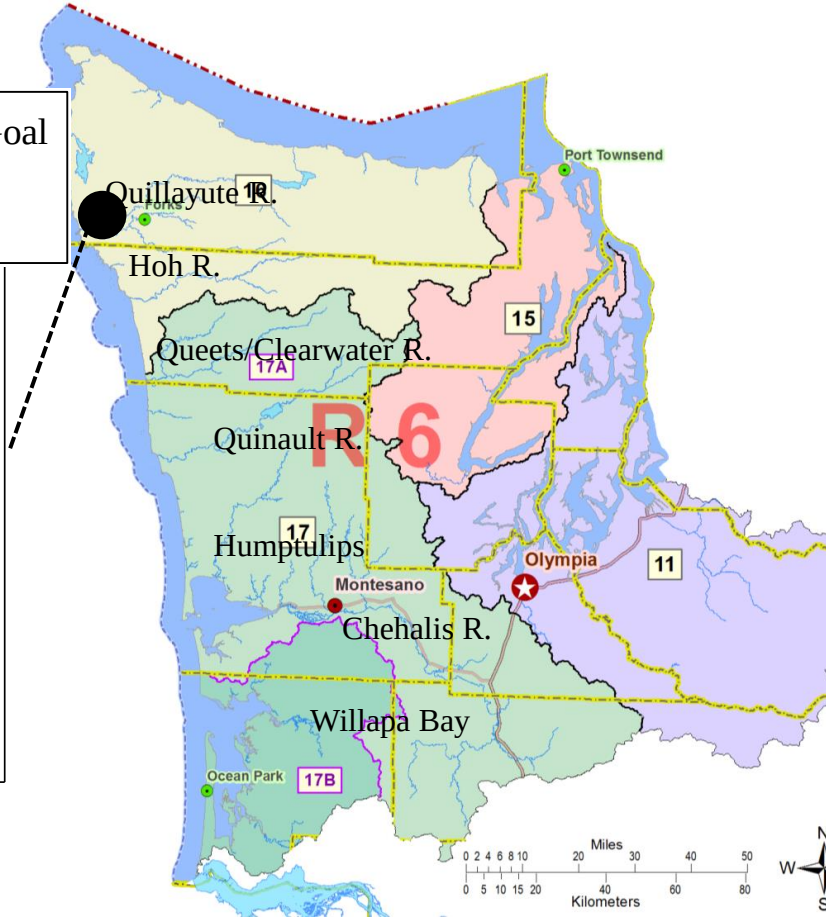
2022/23 Review: **Hoh R.**



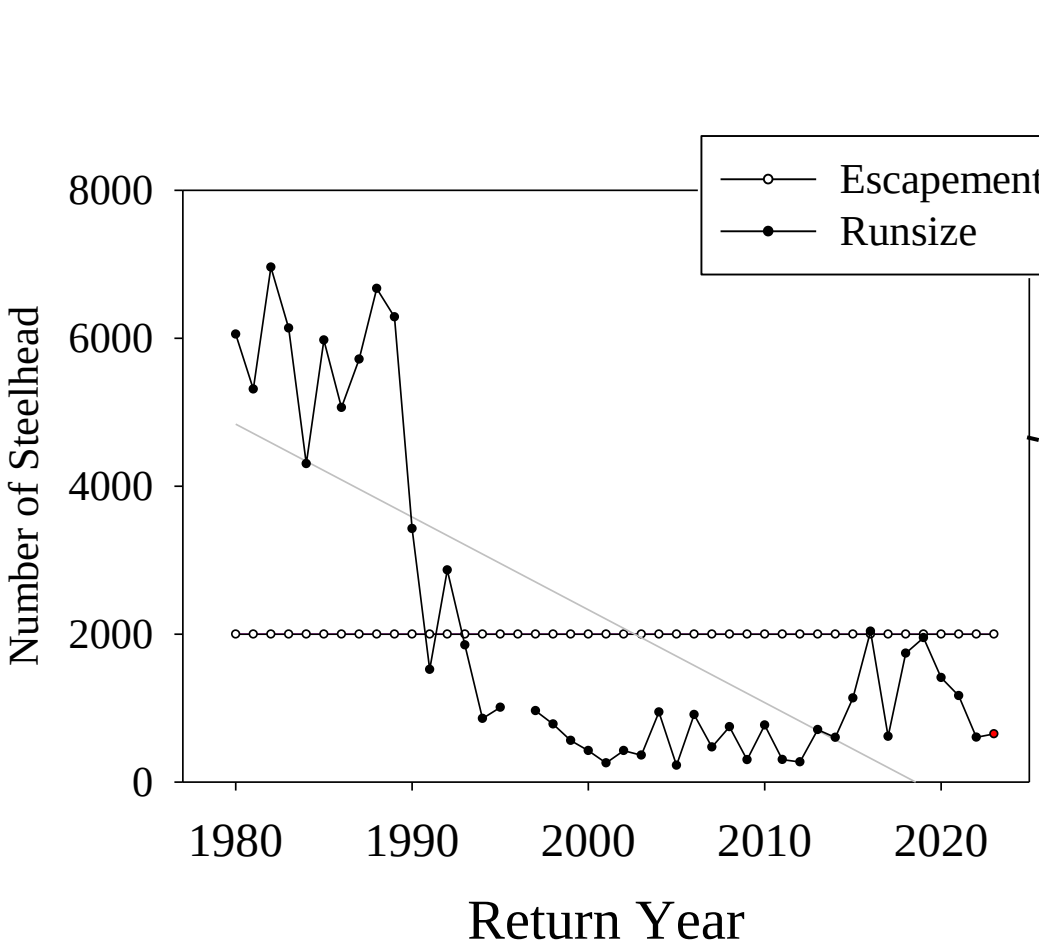


2022/23 Review: **Quillayute R.**

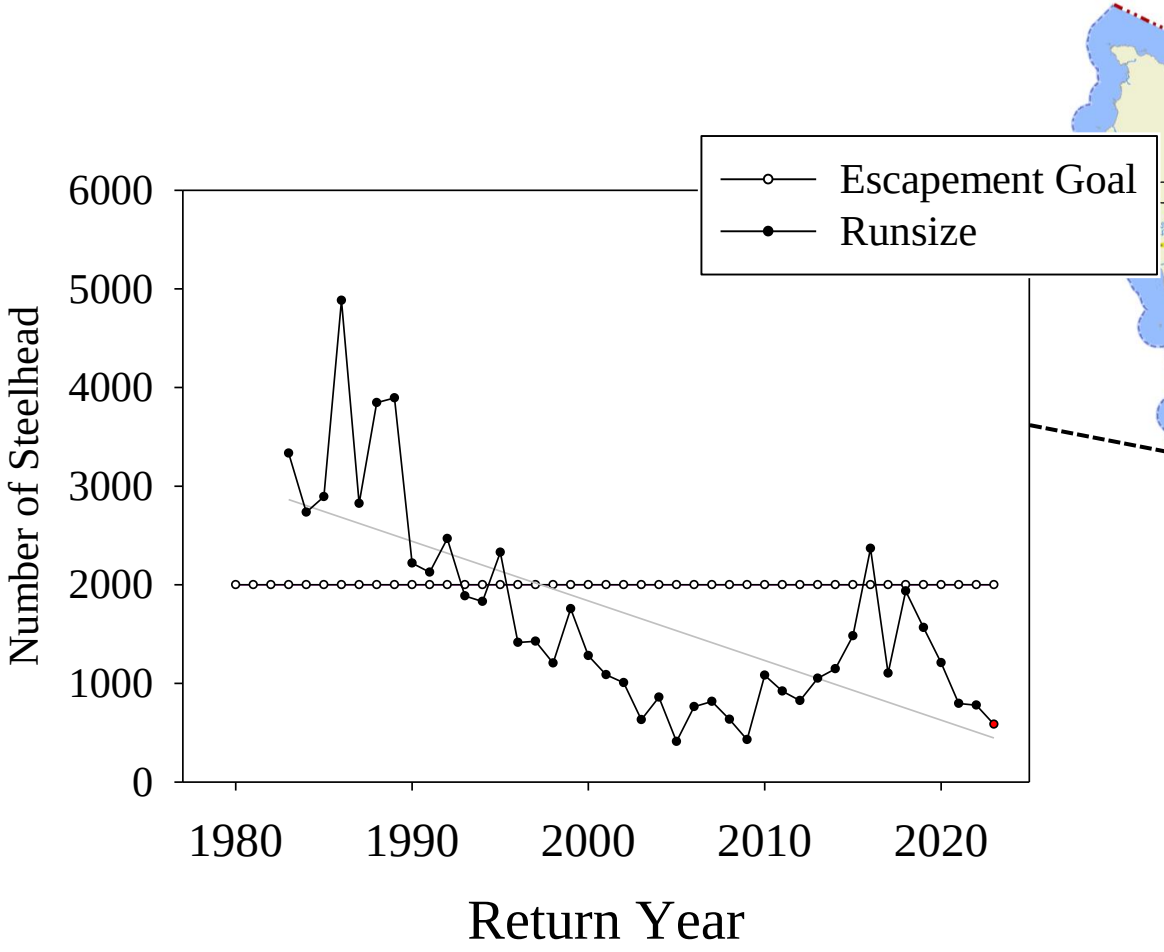




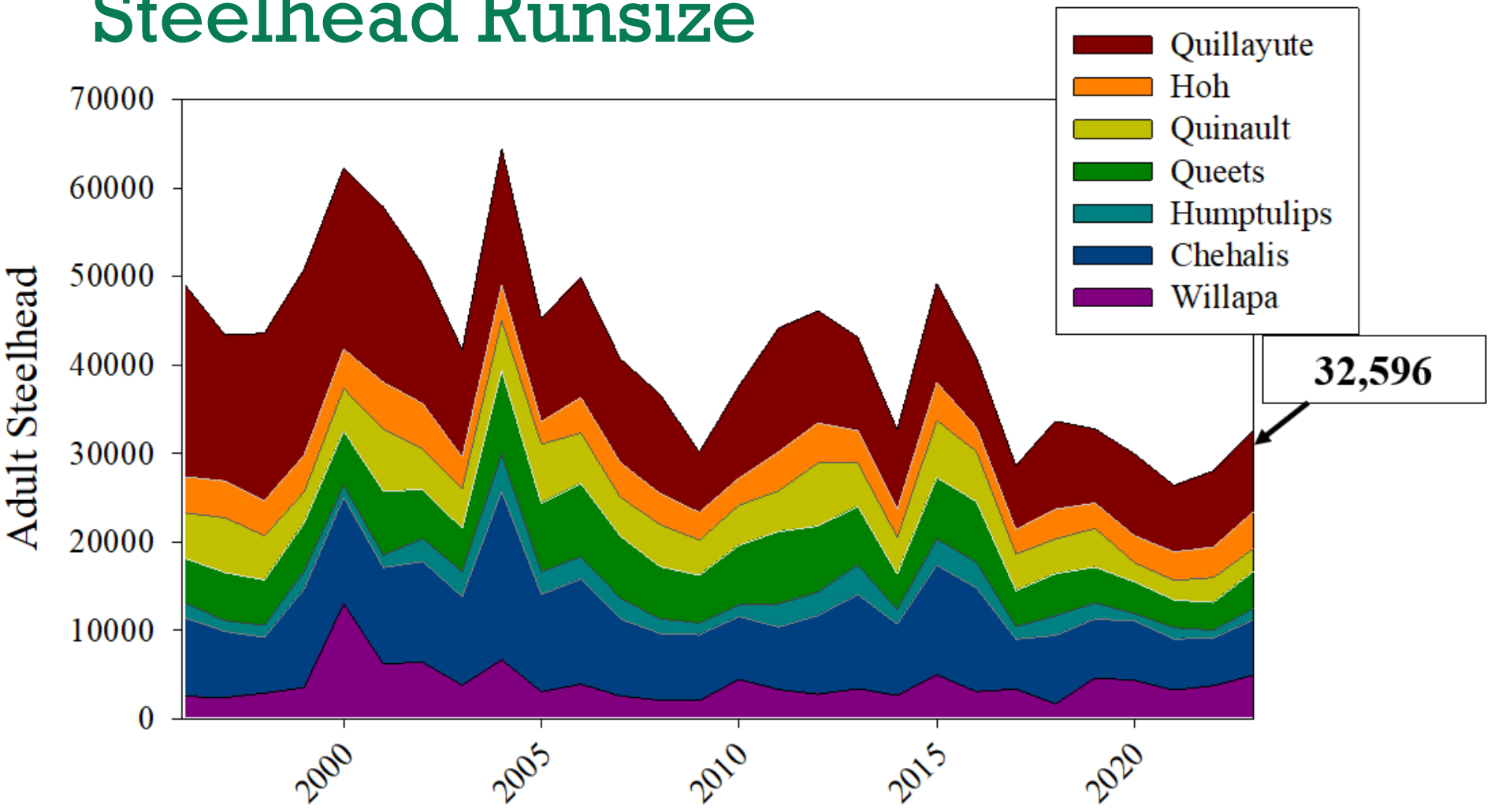
2022/23 Review: **Nisqually R.**



2022/23 Review: **Puyallup R.**



2022/23 Review: Wild Coastal Steelhead Runsize



2022/23 Review : Preliminary Runsize

River/Area	Predicted Runsize	Actual Runsize
Willapa	3,535	4,936
Chehalis	7,114	6,249
Humptulips	1,222	1,290
Upper Quinault	2,376	1,182
Queets/Clearwater	3,958	4,176
Hoh	2,995	4,154
Quillayute	9,344	9,230

2022/23 Review : Preliminary Runsize

River/Area	Predicted Runsize	Actual Runsize	Escapement Goal	Actual Escapement
Willapa	3,535	4,936	4,206	4,546
Chehalis	7,114	6,249	8,600	6,238
Humptulips	1,222	1,290	1,600	1,290
Upper Quinault	2,376	1,182	1,600	1,182
Queets/Clearwater	3,958	4,176	4,200	3,824
Hoh	2,995	4,154	2,400	3,672
Quillayute	9,344	9,230	5,900	8,513

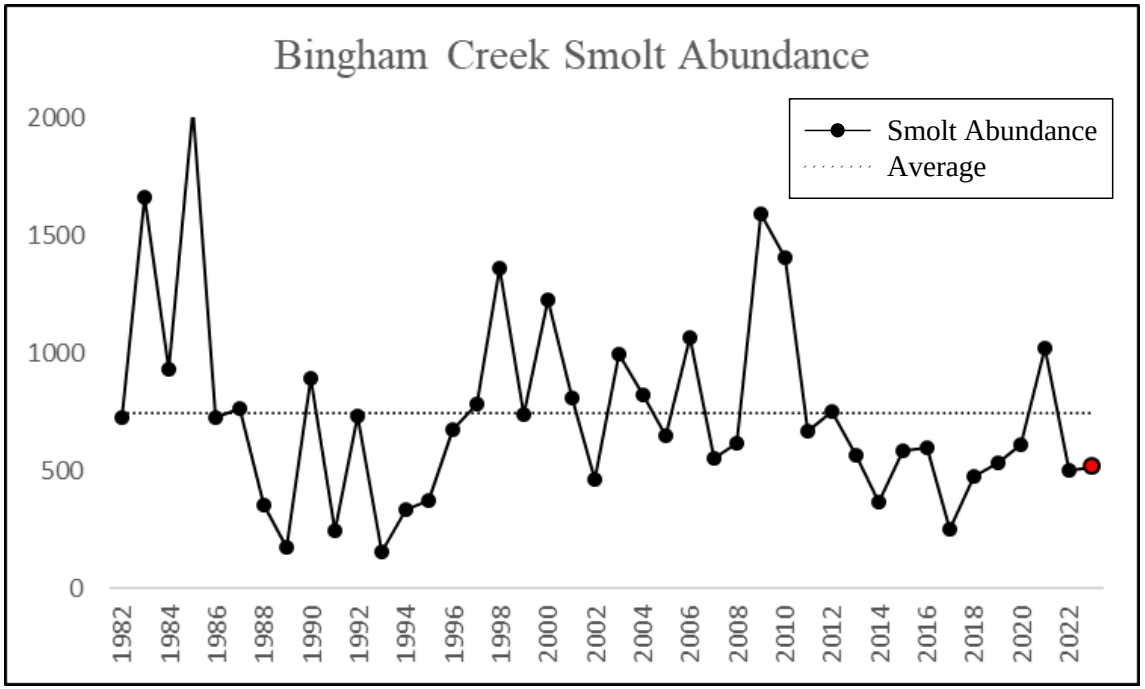
Forecasted within 3% of actual runsize in 2022/23 and escapement goals met in 3 of 7 rivers. In Willapa Bay escapement goal was met for the second time in 20 years.

2022/23 Review: Productivity

SSMP on productivity:

"Abundance and productivity are the cornerstone of healthy, self-sustaining wild steelhead populations."

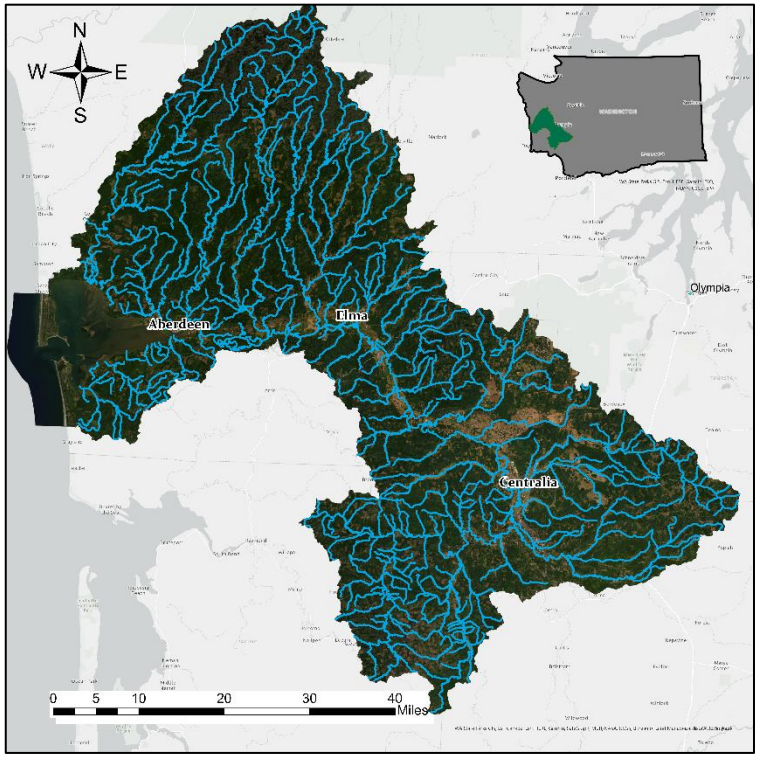
- Abundance
- **Productivity**
- Distribution
- Diversity



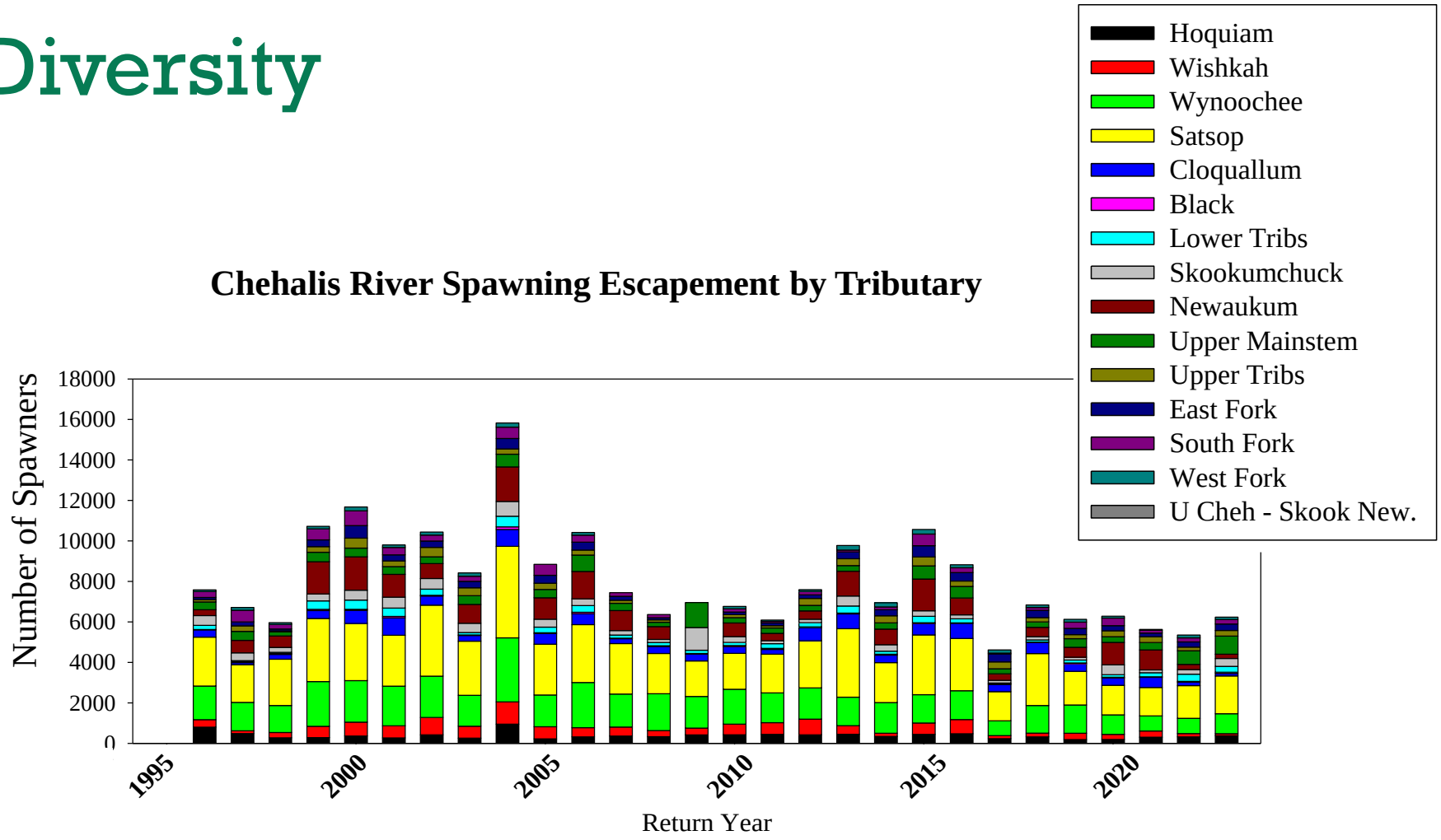
2022/23 Review: Distribution & Diversity

SSMP on Distribution and Diversity:
"Modify the timing of fisheries, gear types, or fishery characteristics to enhance diversity and spatial structure consistent with watershed goals"

- Abundance
- Productivity
- **Distribution**
- **Diversity**



2022/23 Review: Distribution & Diversity



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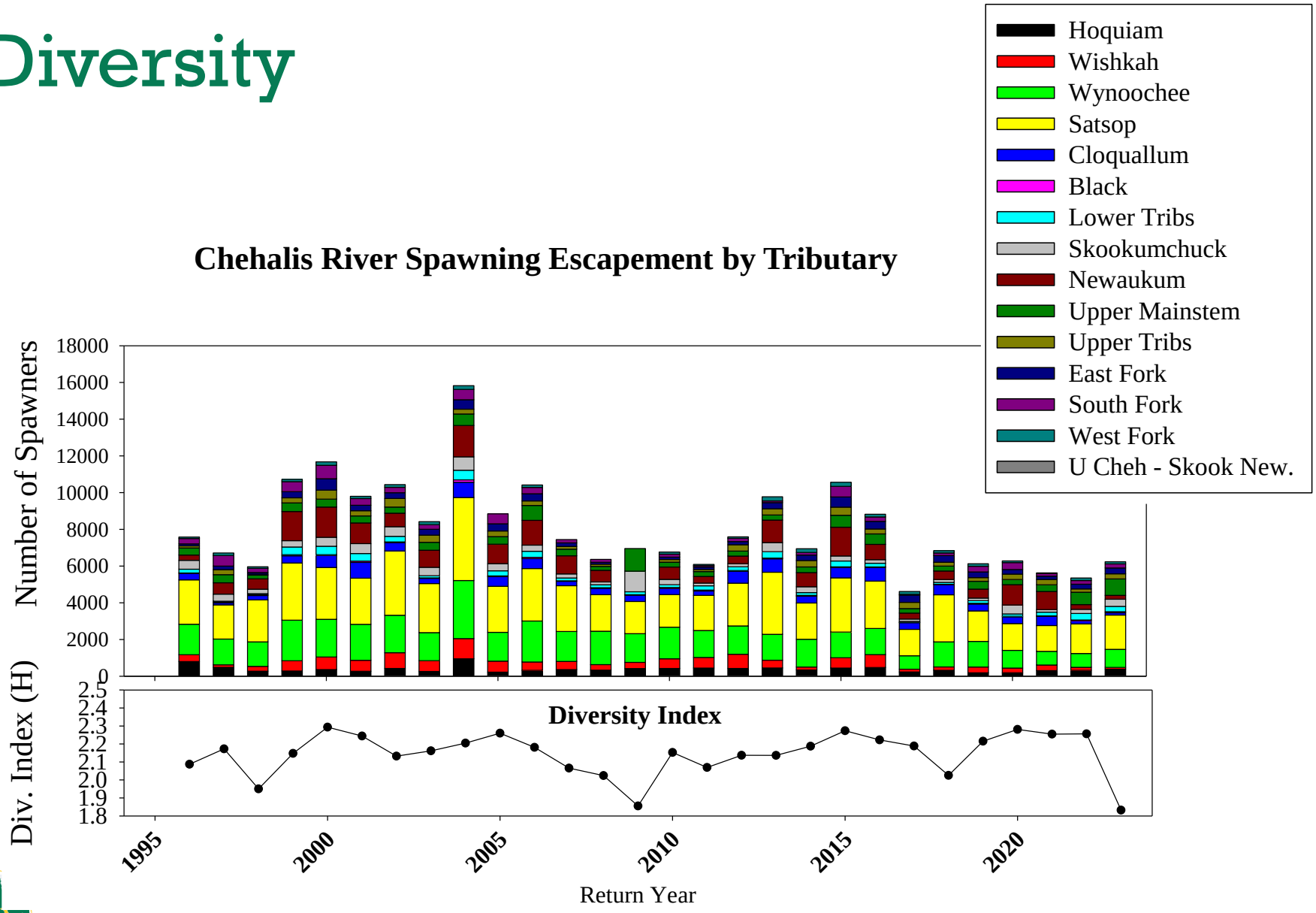

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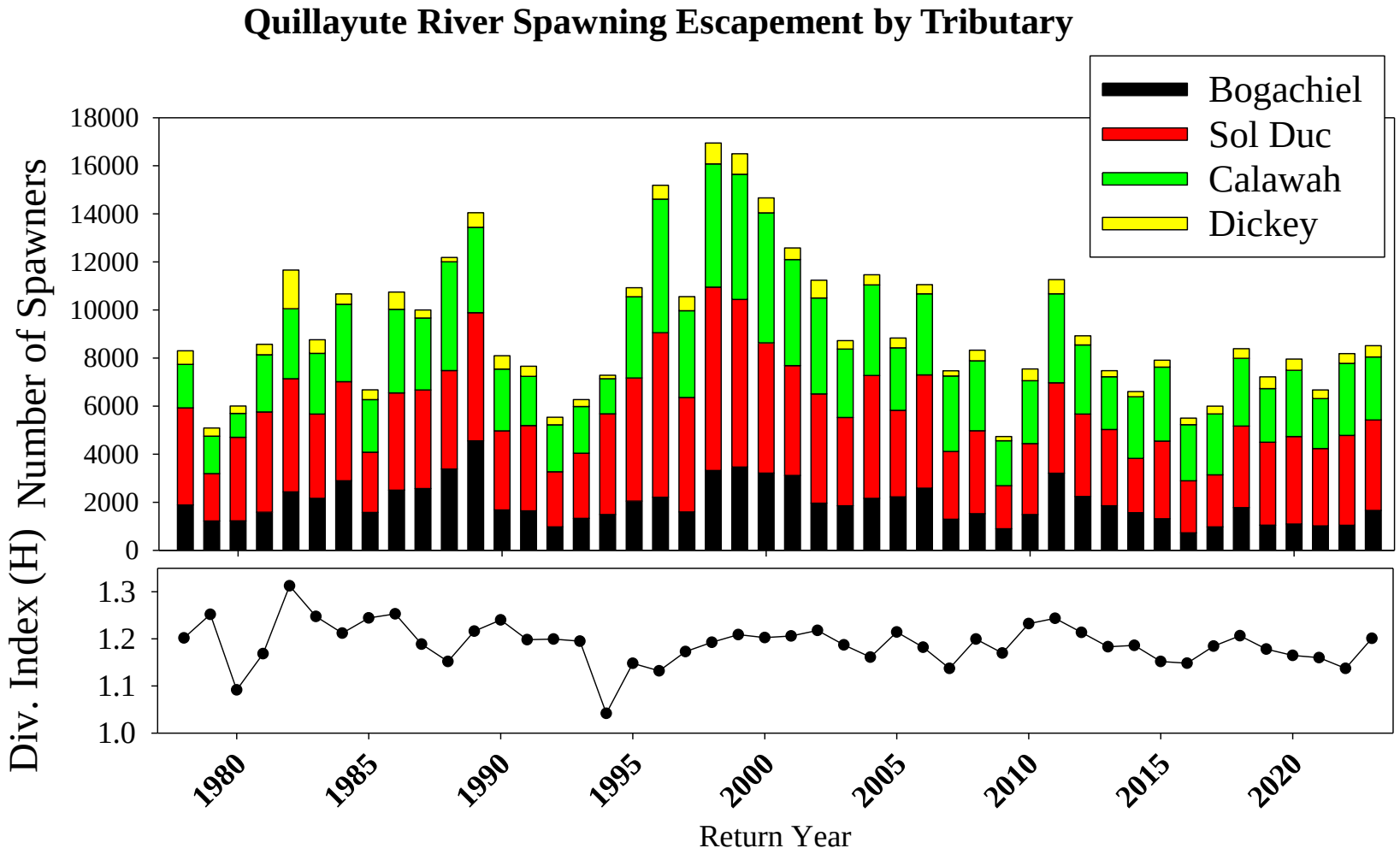

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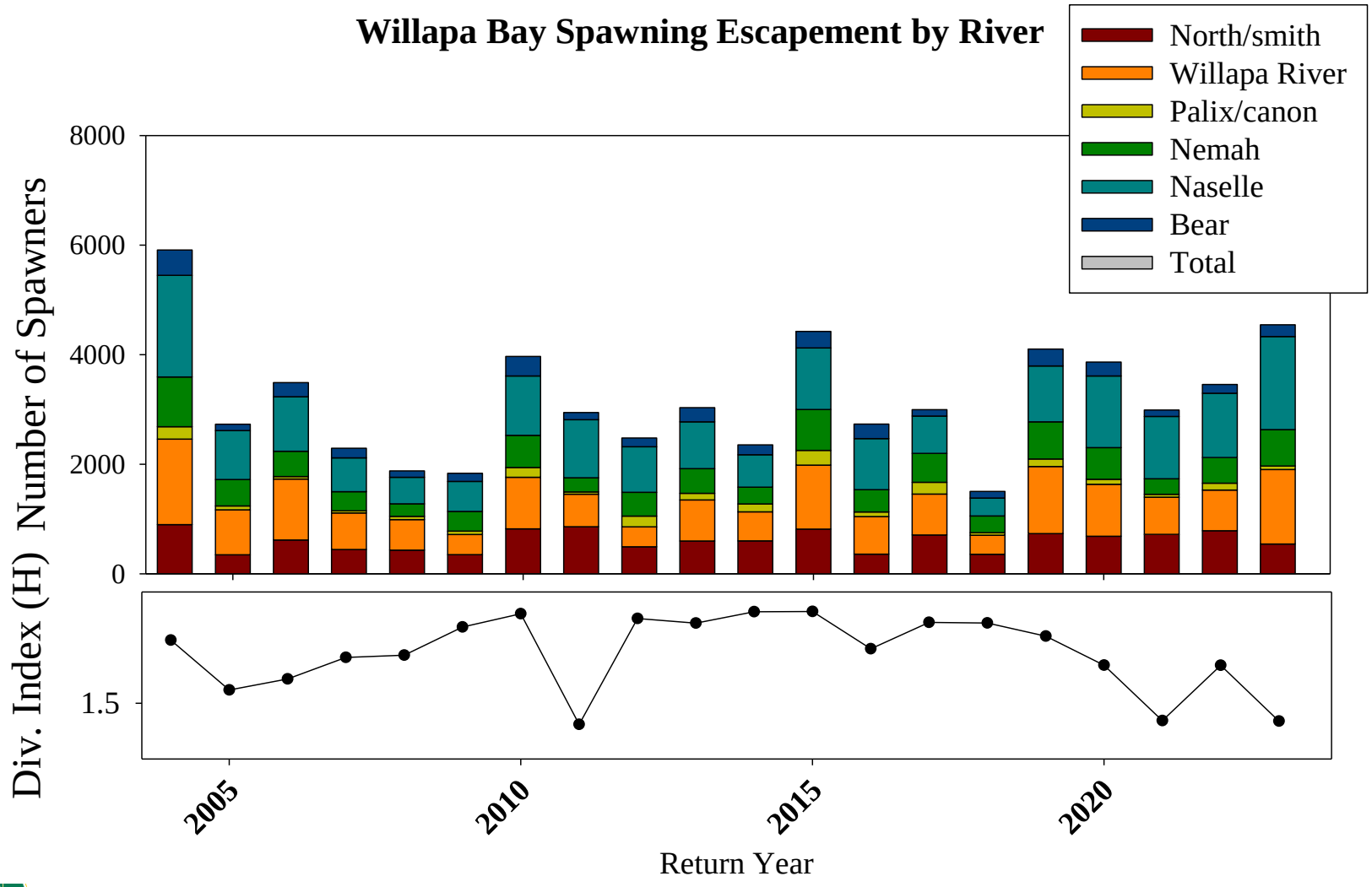

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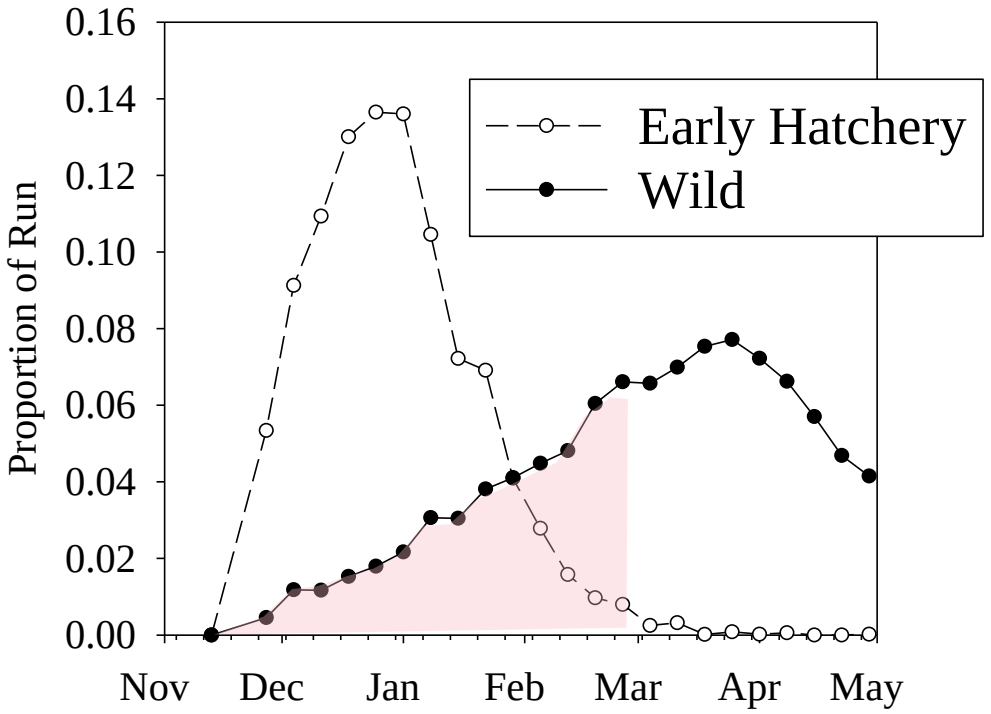
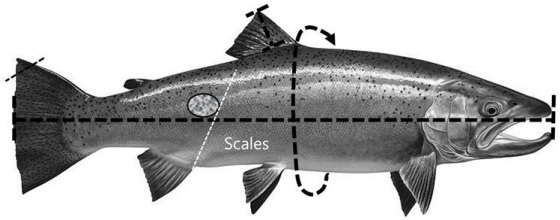
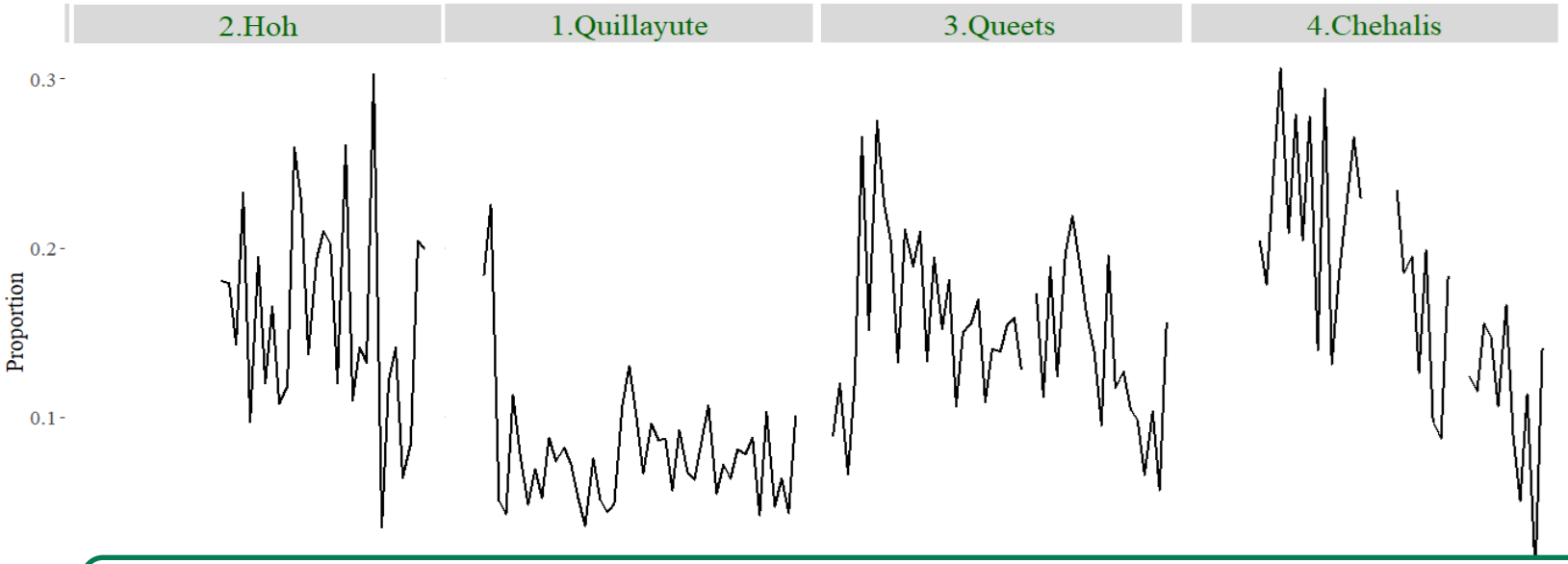
- Abundance
- Productivity
- **Distribution**
- **Diversity**



2022/23 Review: Distribution & Diversity

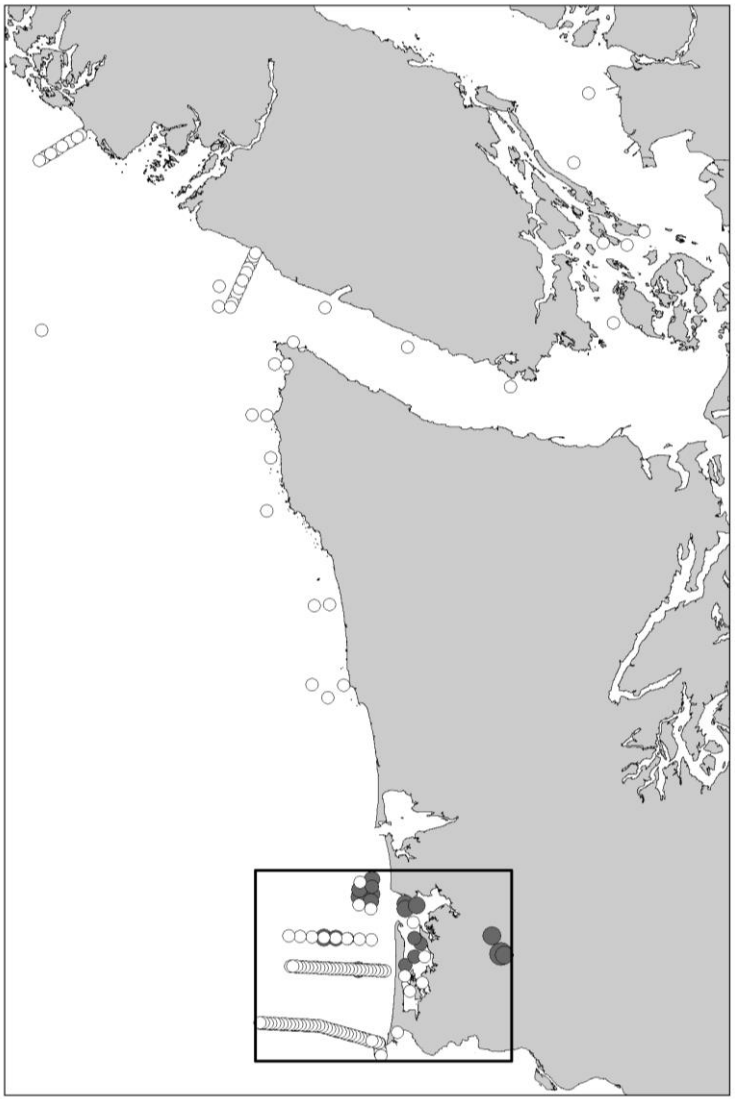
SSMP on Distribution and Diversity:
"Modify the timing of fisheries, gear types, or fishery characteristics to enhance diversity and spatial structure consistent with watershed goals"

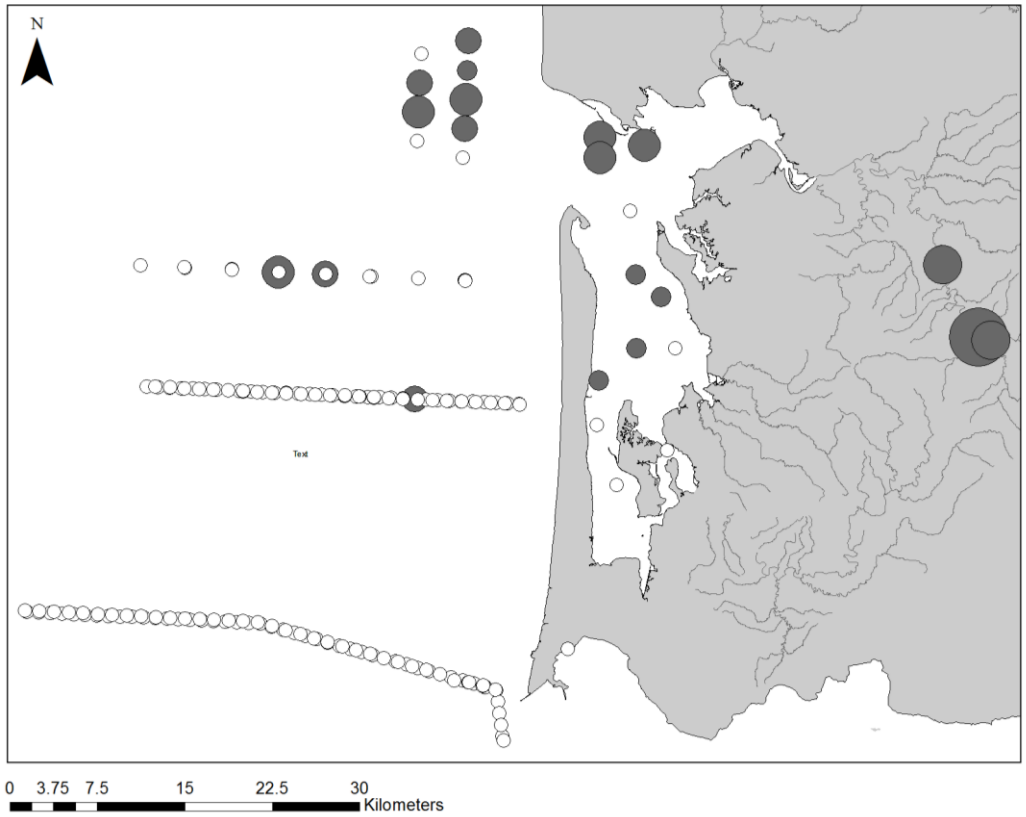




Declining and highly variable rates of repeat spawners.

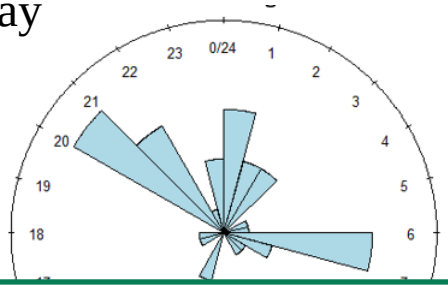
Coastal Steelhead Kelt Movements



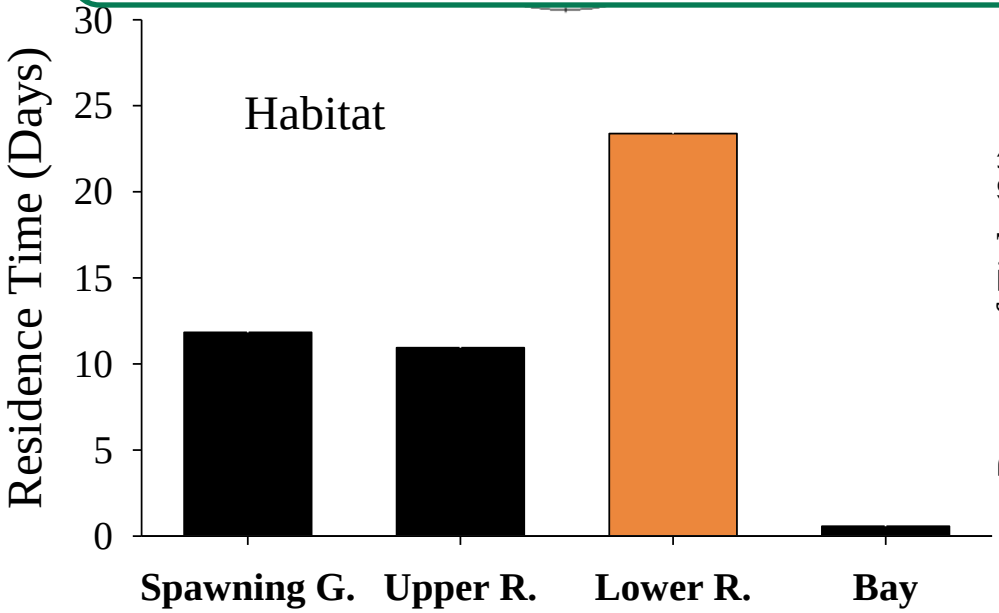


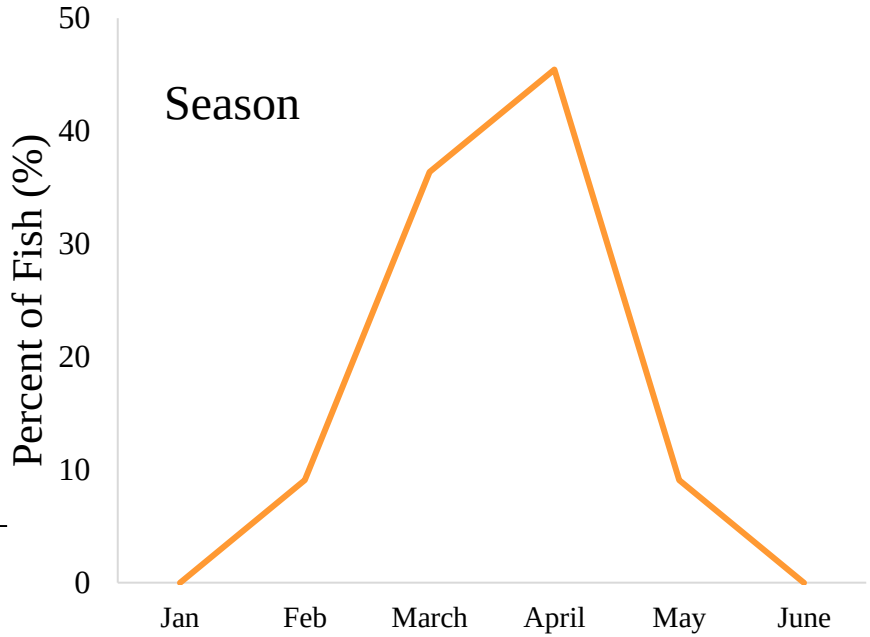
Coastal Steelhead Kelt Movements

Time of Day



Surviving kelts moved slowly in lower river in March and April, "holding" during the day, then migrated rapidly offshore.





https://qrcodes.pro/HpG206

2022/23 Review: Summary

- Forecasted wild abundance in 2022/23 within 3% of actual runsize.
- Escapement goals met in 3 of 7 watersheds.
- Future returns are expected to follow extremely unfavorable environmental conditions.
- Long term decline of steelhead abundance in all coastal systems.
- 2022/23 Fishery regulations supported diverse spawning distributions and run timing.
- Tribal catch ~ 40% of pre-season plans as a result of management actions and lower than expected effort
- Kelt movement in freshwater is focused around lower rivers in March and April. Marine movements characterized by rapid offshore migration.

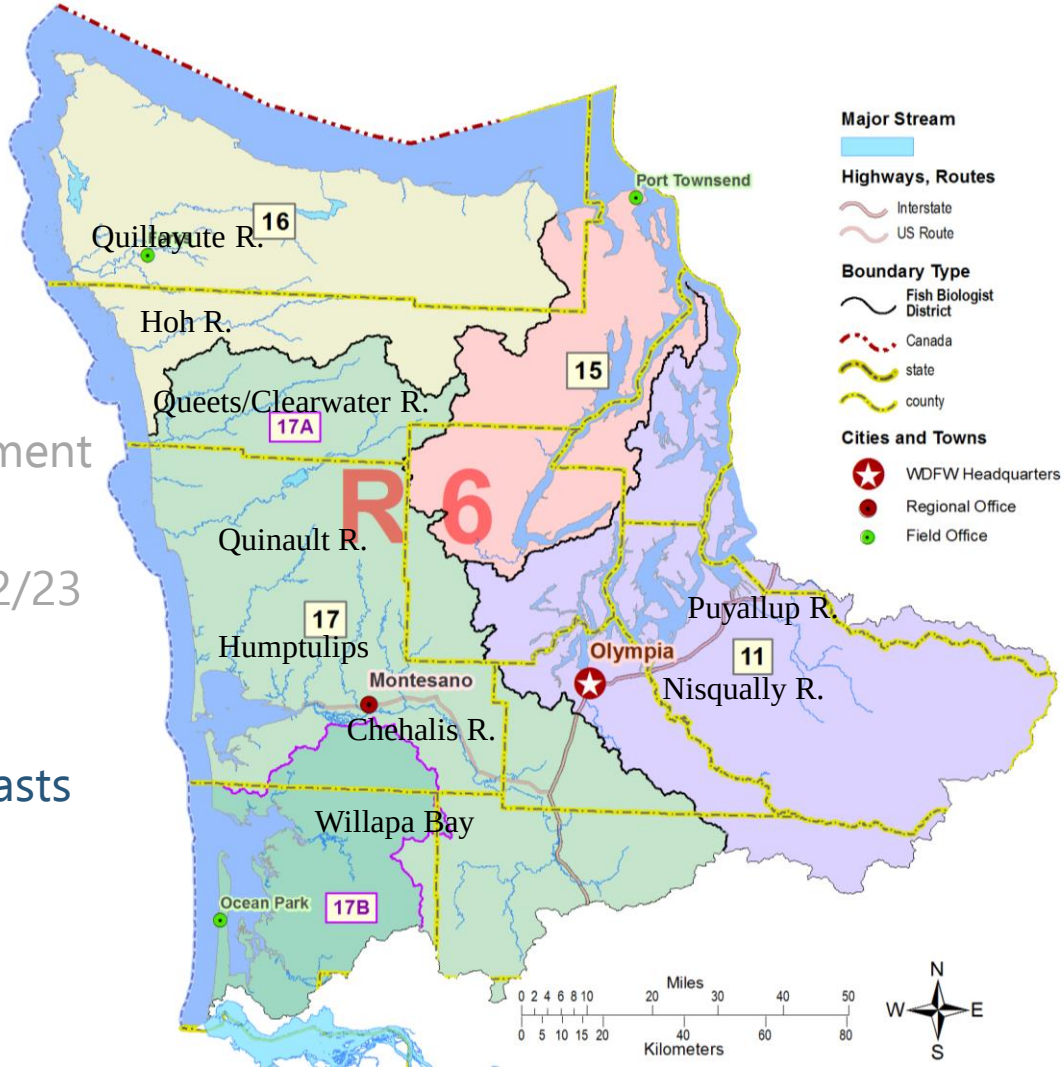
Agenda

Steelhead biology & stock assessment

Management framework and 2022/23 review

2023/24 preliminary runsize forecasts

Solicit proposals and questions



2023-24: Preliminary Forecasts

System	Run-to-River Forecast	Escapement Goal
Willapa	4,085	4,206
Chehalis	7,148	8,600
Humptulips	1,343	1,600
Upper Quinault	1,870	1,600
Queets/Clearwater	4,150	4,200
Hoh	3,389	2,400
Quillayute	9,096	5,900

2023-24: Preliminary Forecasts

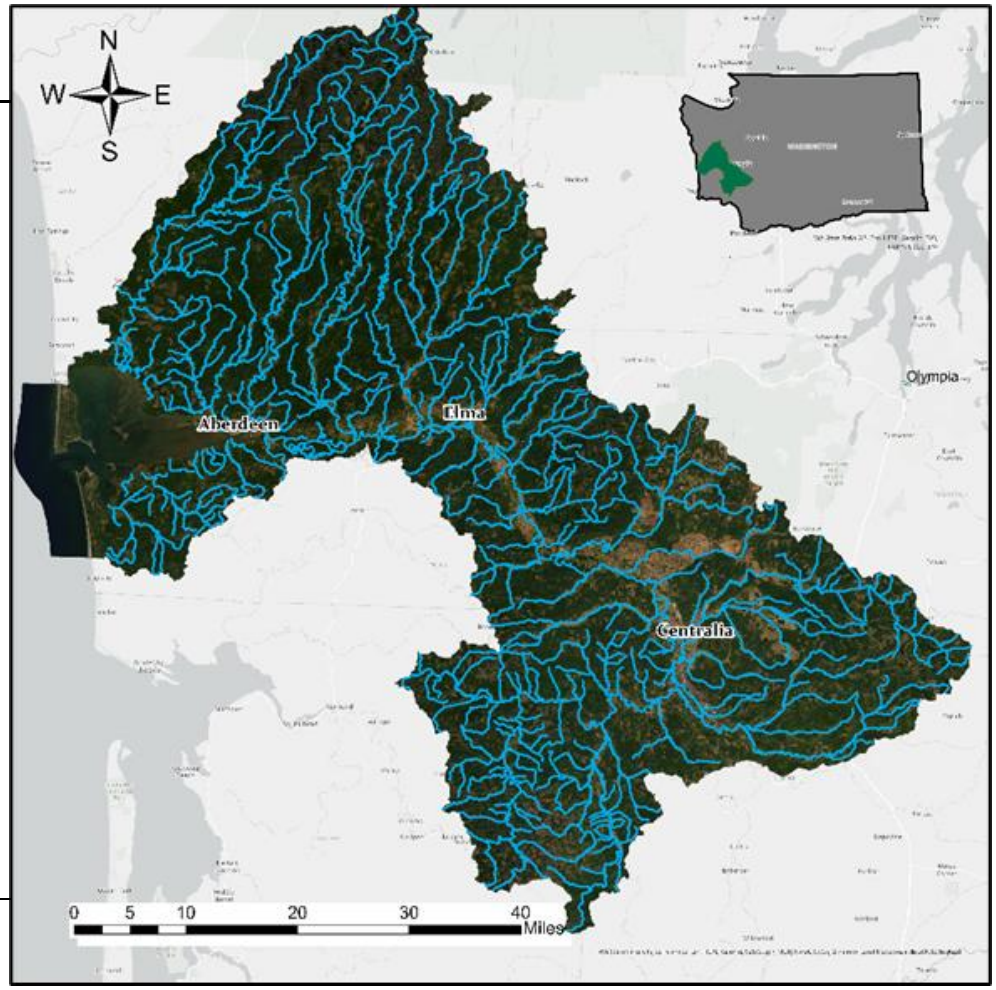
System	Run-to-River Forecast	Escapement Goal	Wild Steelhead Relative to Goal	Sport Impact Limit
Willapa	4,085	4,206	-121	409
Chehalis	7,148	8,600	-1,452	214
Humptulips	1,343	1,600	-257	67
Upper Quinault	1,870	1,600	270	135
Queets/Clearwater	4,150	4,200	-50	208
Hoh	3,389	2,400	989	495
Quillayute	9,096	5,900	3,196	1,598

Analysis of Options: Hatchery Directed Fisheries

Tributary	Forecasted Sport Impact Limit
Hoquiam	10
Wishkah	12
Wynoochee	41
Satsop	62
Cloquallum	12
Black	1
Lower Chehalis Tribs.	6
Upper Chehalis Mainstem	11
Skookumchuck	9
Newaukum	23
Upper Chehalis Tribs.	7
EF Chehalis	8
SF Chehalis	8
WF Chehalis	4

*Does not account for mixed "stock" encounters

Chehalis Watershed



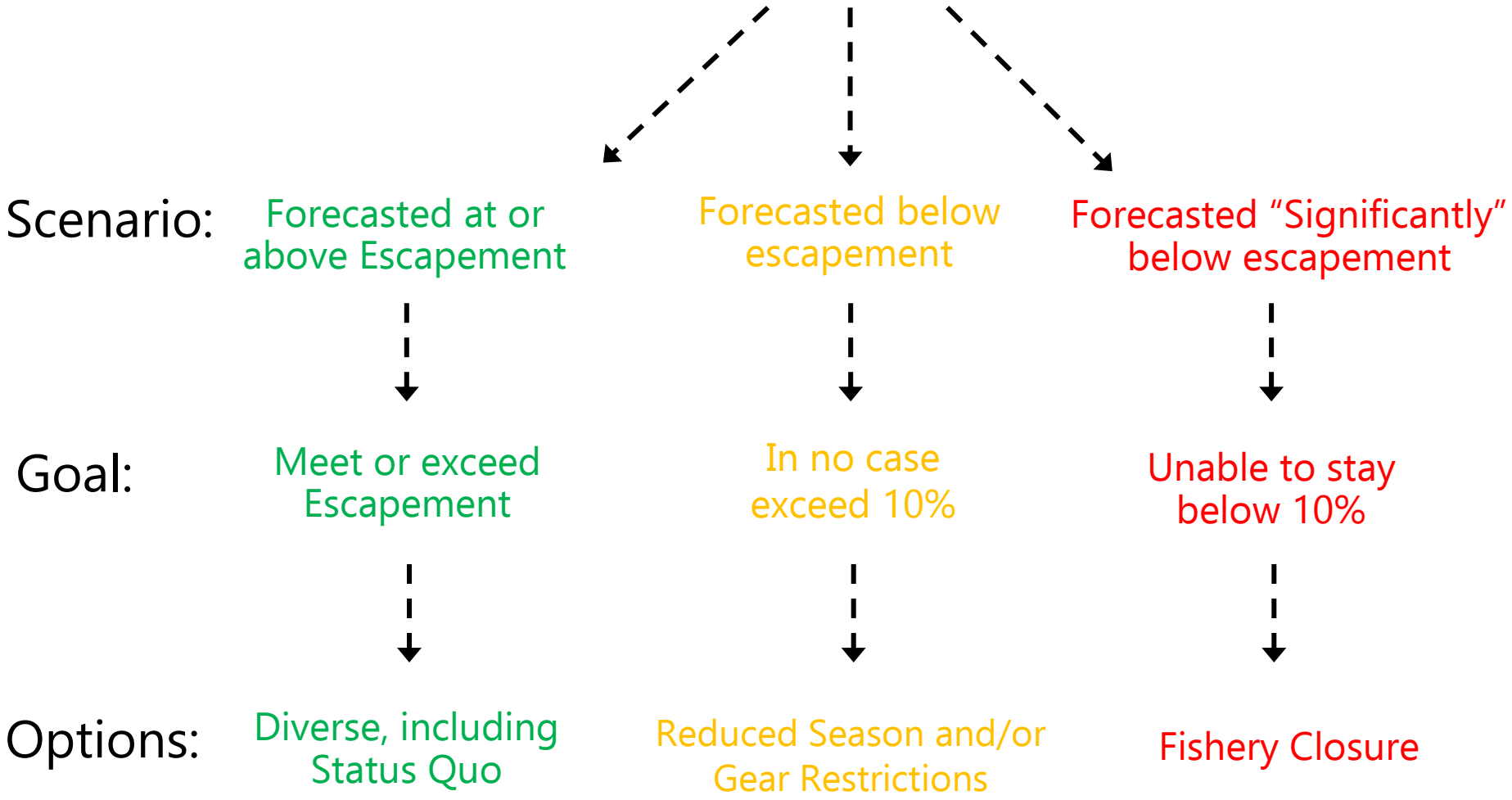
Analysis of Options: Hatchery Directed Fisheries

Tributary	Forecasted Sport Impact Limit	December	January	February	March	April
Hoquiam	10	0.6	1.6	2.1	2.9	2.9
Wishkah	12	0.7	1.8	2.5	3.4	3.4
Wynoochee	41	2.4	6.3	8.7	11.8	11.8
Satsop	62	3.6	9.6	13.3	18.0	17.9
Cloquallum	12	0.7	1.8	2.5	3.3	3.3
Black	1	0.1	0.2	0.2	0.3	0.3
Lower Chehalis Tribs.	6	0.4	0.9	1.3	1.8	1.8
Upper Chehalis Mainstem	11	0.6	1.7	2.3	3.1	3.1
Skookumchuck	9	0.5	1.4	2.0	2.7	2.7
Newaukum	23	1.3	3.6	5.0	6.7	6.7
Upper Chehalis Tribs.	7	0.4	1.1	1.5	2.0	2.0
EF Chehalis	8	0.4	1.2	1.7	2.2	2.2
SF Chehalis	8	0.4	1.2	1.7	2.2	2.2
WF Chehalis	4	0.2	0.6	0.8	1.1	1.1

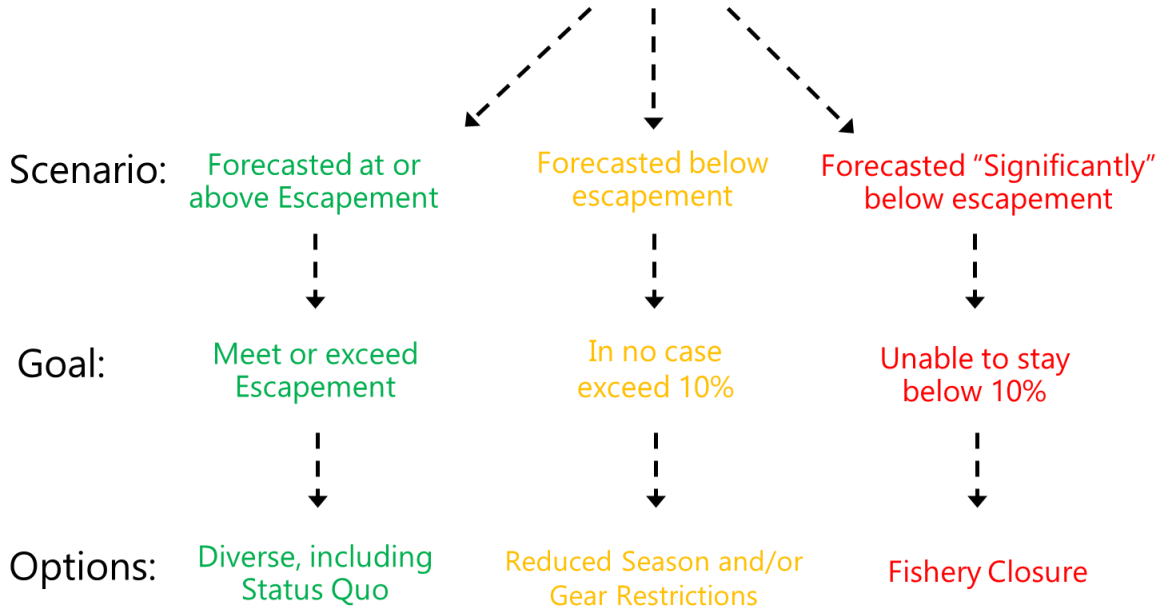
Hatchery Steelhead Preliminary Forecasts

Run Type	Facility	2023/24 Forecast
Early Winter	Naselle	1,369
	Humptulips/Wishkah	1,132
	Fork Creek/Willapa R.	833
	Hoh River	641
	Bogachiel	3,497
Late Winter	Bingham/Satsop	508
	Skookumchuck	1,585
	Eight Creek & Carlisle Lake	981
	Lk. Aberdeen/Wynoochee R.	1,336
	Quinault R. (Quinault Tribe)	4,718
	Salmon R./Queets R.	1,789

River Specific Regulation Options



River Specific Regulation Options



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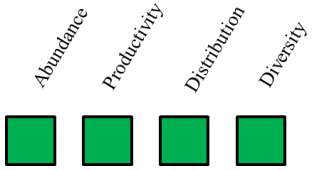

Questions? Feedback?

We're especially interested in

- Ideas for evaluating no fishing out of a boat regulation
- Questions about what was presented
- Proposals for steelhead fisheries
- Your perspective on river-specific conservation needs

ZOOM Reminders:

- You can type a question through the chat function or ask a question by "raising your hand." If you're calling in you can raise a hand by dialing *9 on your phone, or if you're calling from a computer, you can find the hand icon at the bottom of your screen.
- To speak you will need to unmute yourself by using the mute button on your computer or mobile device or enter *6 if you're calling from a land line.
- If you have a technical issue during the webinar, please drop us a note in the Q&A and we will help you through it.
- Questions in written format are accepted an online portal a: wdfw.wa.gov/coastal-steelhead