

# Coastal Steelhead Season Planning: Town Hall #1

Region 6 Fish Management Team



# Zoom Directions and Etiquette

- All callers will be muted upon entry.
- You can type a question through the Q&A 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.
- When you are called on for a question or comment, we encourage you to speak up and provide comments live. 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.
- Be respectful of others
  - Mute phone or line
  - Be tough on issues and questions, not on people or organizations
  - No personal attacks, insults or threats
  - Listen and assume positive intentions from those speaking.
  - Speak and act professionally – no offensive, disrespectful, or derogatory language, including profanity
  - Allow for a balance of speaking time – limit length and number of times to speak on each topic
- Assume Positive Intentions
- Share questions or comments in written format online at [wdfw.wa.gov/coastal-steelhead](https://wdfw.wa.gov/coastal-steelhead)



# 2022/23 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 Town Hall #1:** Final escapements and preliminary forecasts
- Mid October: Co-manager policy meetings to develop Management Plans
- **November Town Hall #2:** Final pre-season planning
- Mid November: Finalize Management Plans with tribal co-managers
- **Late November Town Hall #3:** Communicate Director's decision on agreed to fishing plans
- December 1: Announce winter fishing rules



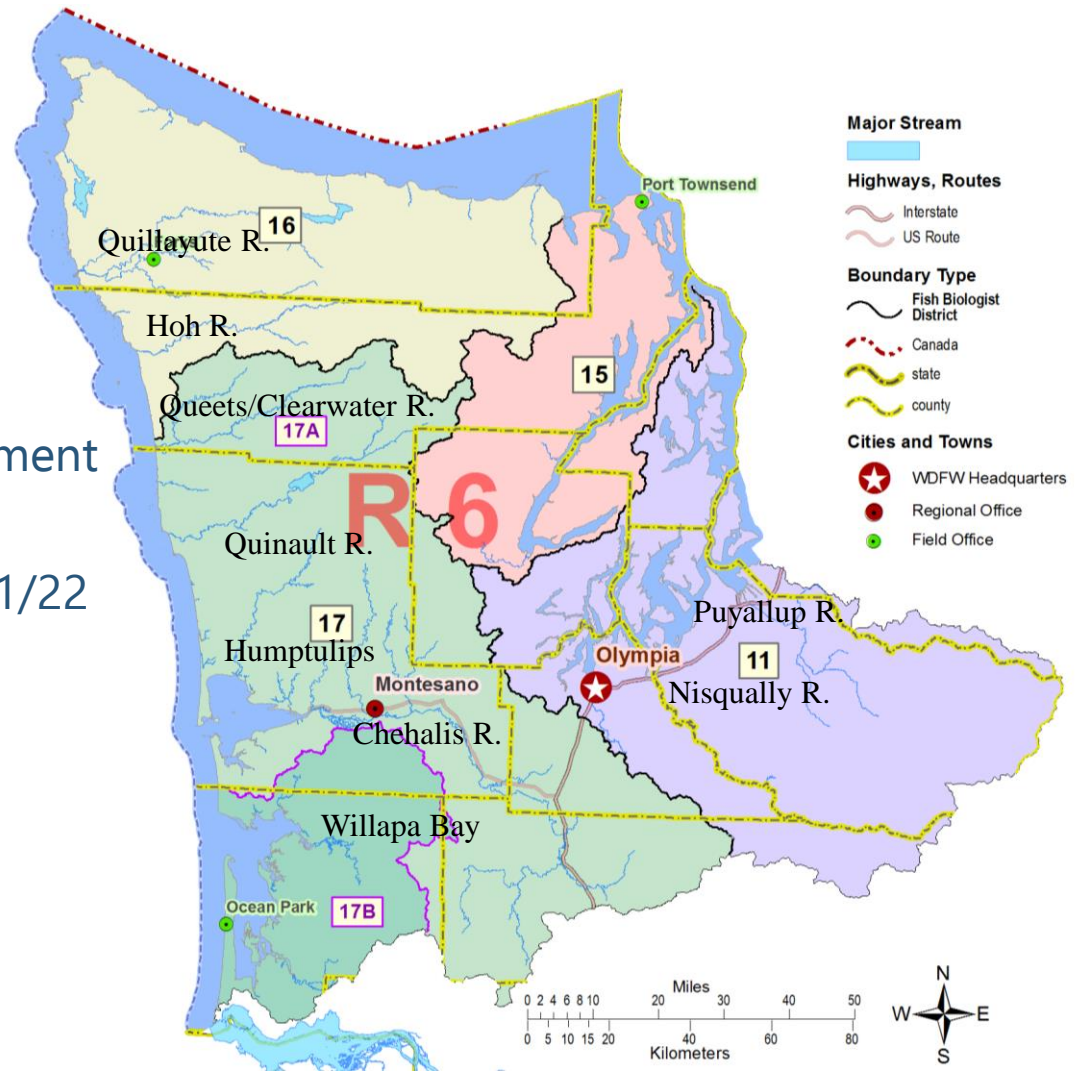
# Agenda

Steelhead biology & stock assessment

Management framework and 2021/22 review

2022/23 forecasts and regulation proposals

Questions and feedback



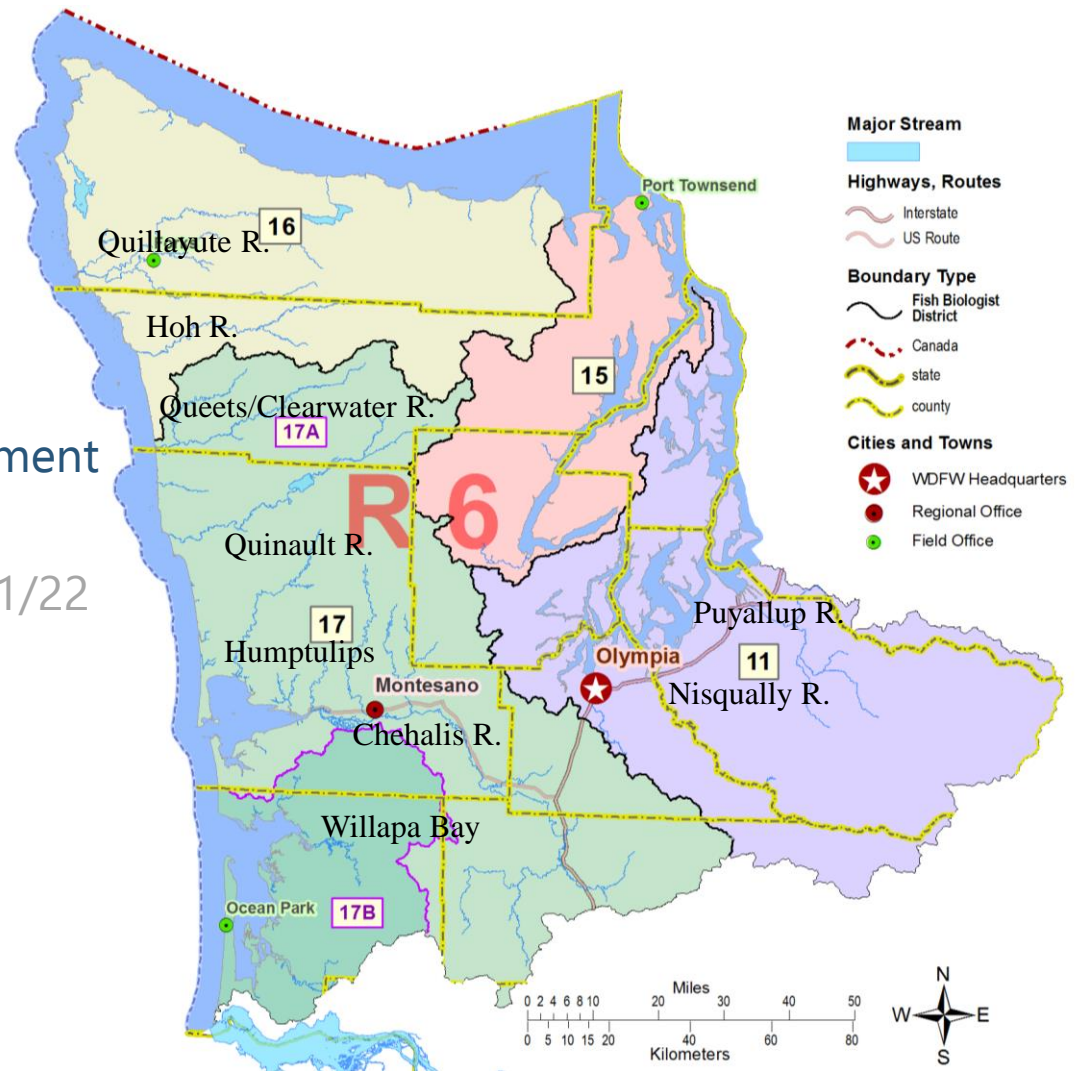
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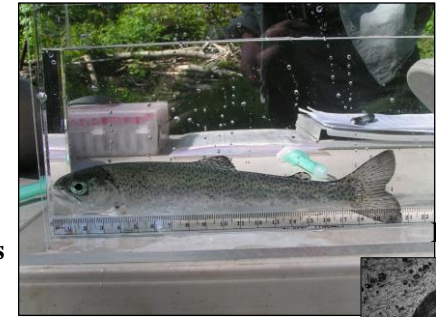
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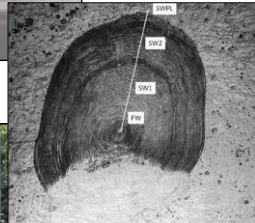


# Biology/Stock Assessment

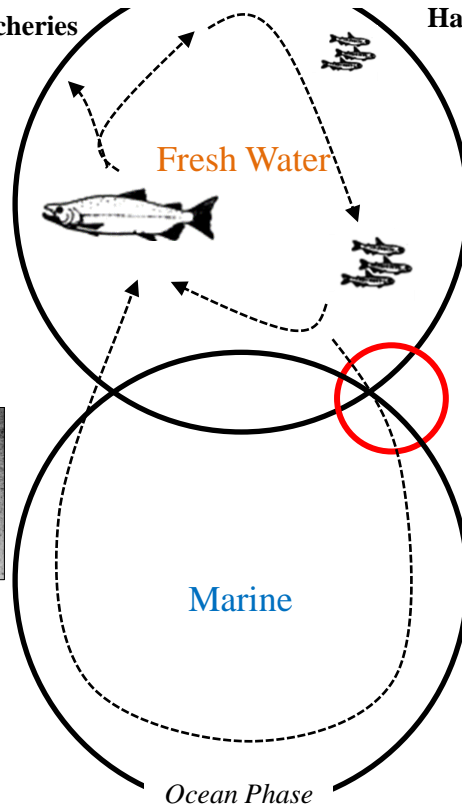
Cederholm 1984  
Madel and Losee et al. 2017  
Ronne et al. 2020



Dauer et al. 2009



Hatcheries      Spawning Grounds      Hatchery Releases



Spawning Ground Surveys

Fishery Monitoring

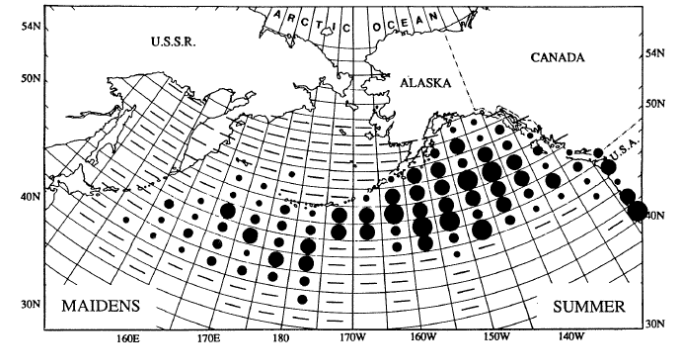
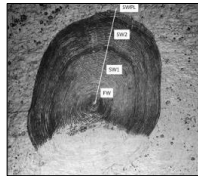
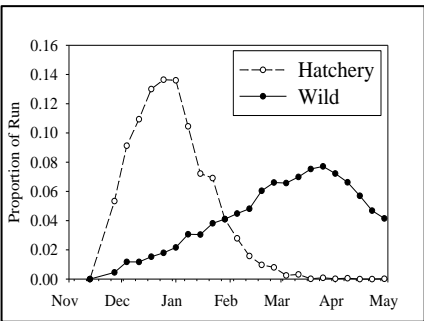
Smolt outmigration

Collaborative Research

West et al. 2019



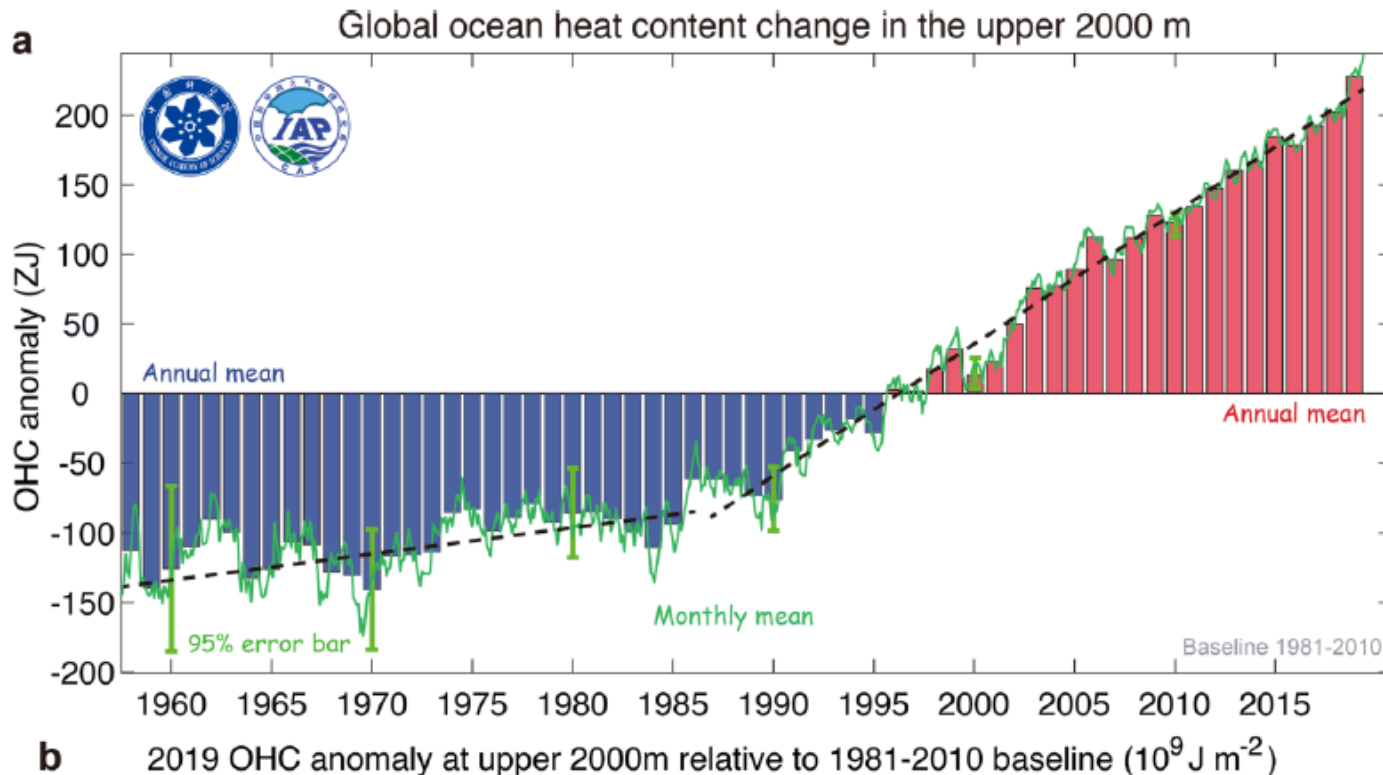
STEELHEAD			Did you fish for Steelhead? <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	
CATCH AREA	NO.	DATE		
CATCH	DATE	TIME		
<p><b>Do Not Record Released Steelhead</b></p> <p>A hatchery steelhead kept from the Slough River on March 12 would be entered as above. Release wild steelhead.</p> <p>Hatchery fish to appear on ventral fin clipped and a hook scar at the location of the clipped Wild Fish tag and ventral fin record. Immediately after retaining a steelhead and before fishing again, record catch information in link. Additional Catch Cards are available for hatchery steelhead only.</p>				



Light et al. 1989



# Steelhead Biology-Ocean Conditions



ADVANCES IN ATMOSPHERIC SCIENCES, VOL. 37, FEBRUARY 2020, 137–142

• News & Views •

## Record-Setting Ocean Warmth Continued in 2019

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

ADVANCES IN ATMOSPHERIC SCIENCES, 2021

• News & Views •

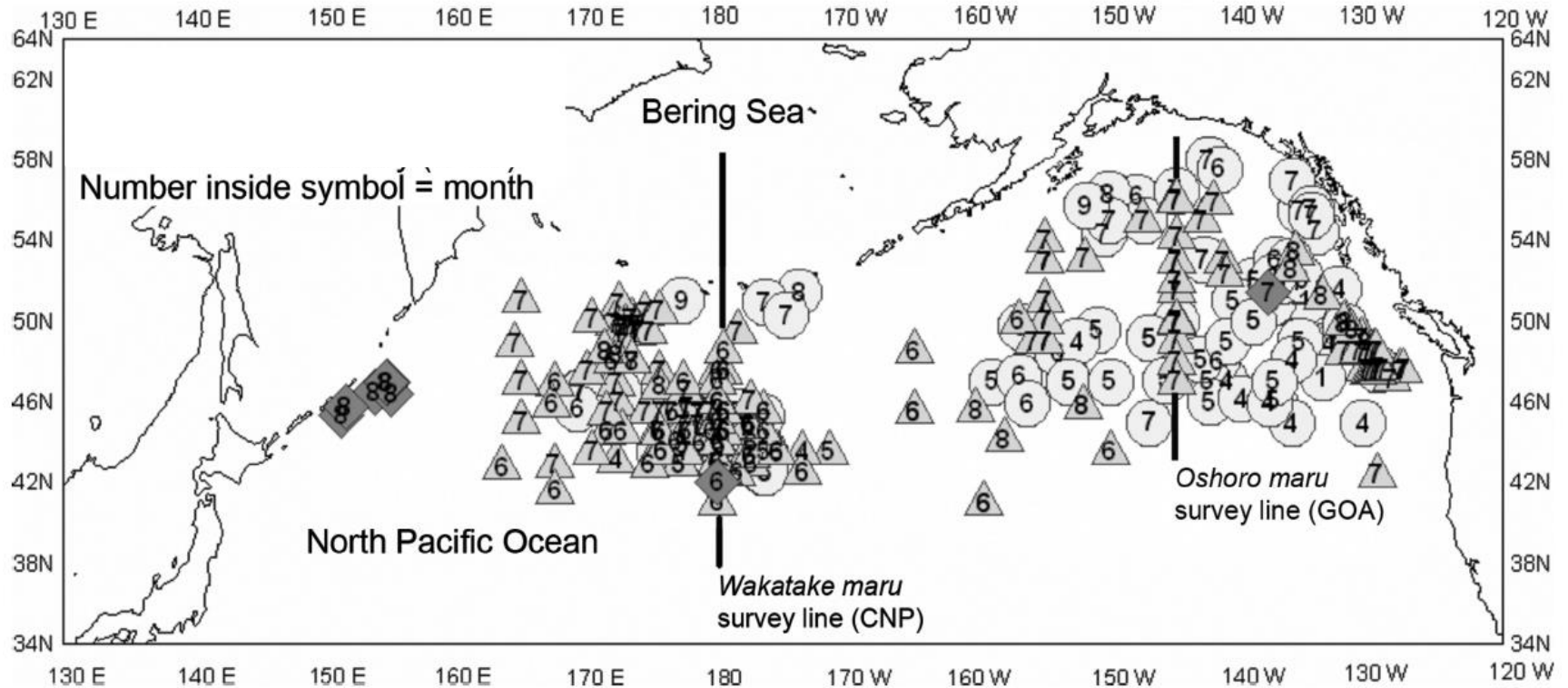
## Upper Ocean Temperatures Hit Record High in 2020


Lijing CHENG<sup>1,2</sup>, John ABRAHAM<sup>3</sup>, Kevin E. TRENBERTH<sup>4</sup>, John FASULLO<sup>4</sup>, Tim BOYER<sup>5</sup>,  
Ricardo LOCARNINI<sup>6</sup>, Bin ZHANG<sup>2,6</sup>, Fujiang YU<sup>7</sup>, Liying WAN<sup>7</sup>, Xingrong CHEN<sup>7</sup>, Xiangzhou SONG<sup>8</sup>,  
Yulong LIU<sup>9</sup>, Michael E. MANN<sup>10</sup>, Franco RESEGNETTI<sup>11</sup>, Simona SIMONCELLI<sup>12</sup>,  
Viktor GOURETSKI<sup>1,2</sup>, Gengxin CHEN<sup>13</sup>, Alexey MISHONOV<sup>5,14</sup>, Jim REAGAN<sup>5,14</sup>, and Jiang ZHU<sup>1,2</sup>

[https://www.ncei.noaa.gov/access/global-ocean-heat-content/monthly\\_analysis.html](https://www.ncei.noaa.gov/access/global-ocean-heat-content/monthly_analysis.html)



# Steelhead Biology-Marine Habitat

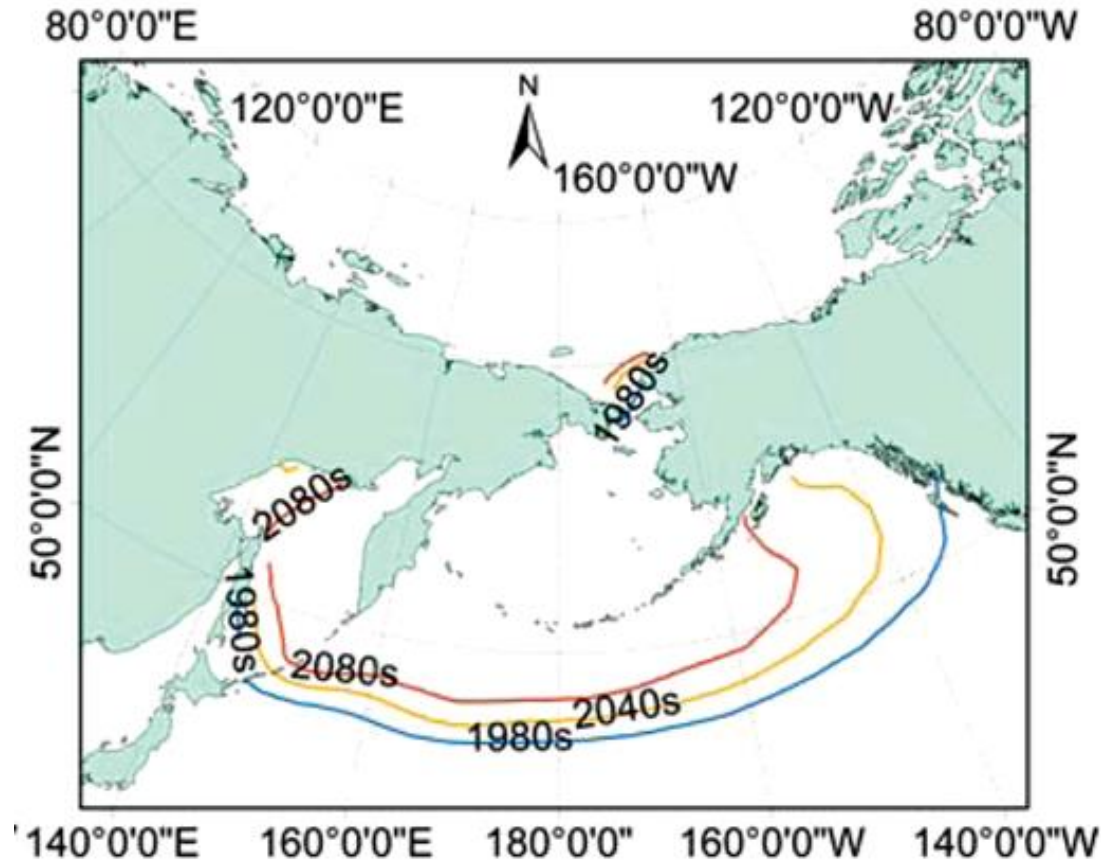


 Steelhead distributed in marine waters ranging from 6-12 degrees C (Myers 2018).





# Steelhead Biology-Marine Habitat



Steelhead high seas habitat projected to shrink by 24-43% in July (Abdul-Aziz et al. 2011)

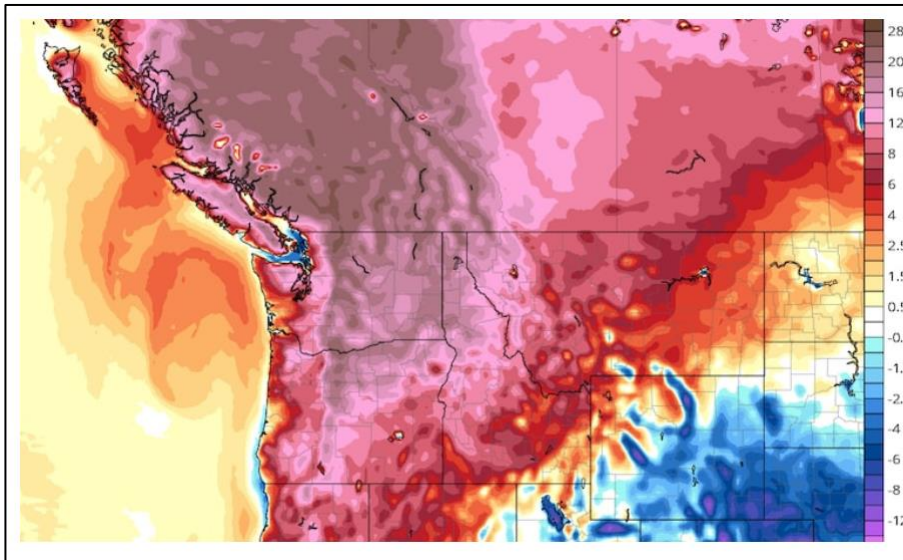


# Freshwater Habitat for Steelhead

## Canada sets new all-time heat record of 121 degrees amid unprecedented heat wave

The British Columbia village of Lytton set the country's heat record for a third straight day Tuesday, after Portland and Seattle notched all-time highs Monday

*The Washington Post*



Recent record temps and low flows in steelhead freshwater habitat



# Freshwater Habitat for Steelhead

## Fishing on most WA coastal rivers closes amid record low river levels

Oct. 7, 2022 at 9:04 am | U

 Crooked River drops to 10 cfs; fish concentrate in few remaining deep pools



Seemingly endless summer in Pacific Northwest to shatter more heat records, increase fire danger



## OUTDOORS: Low flows closing West End rivers to fishing

By Michael Carman

Thursday, October 6, 2022 4:30pm | SPORTS [OUTDOORS]



A DRY SUMMER coupled with a sunny start to autumn has drawn down stream flows to mere trickles in some patches, leading to more than 50 North Coast river and stream closures.

The closure begins Saturday and includes the biggies: the Quillayute, Sol Duc, Calawah and Bogachiel near Forks, the Hoh River and the South Fork of the Hoh River. A full list is available at [tinyurl.com/PDN-](https://tinyurl.com/PDN-)

## More than 80 percent of the U.S. is facing troubling dry conditions

There has not been more widespread abnormally dry and drought conditions in the U.S. since at least 2000.

By Zach Rosenthal

October 14, 2022 at 1:07 p.m. EDT

The Washington Post  
*Democracy Dies in Darkness*

es staff reporter



# Steelhead Biology- Marine and Freshwater Effects

*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<sup>1\*,†</sup>, Timothy J. Beechie<sup>2</sup>, Erica Fleishman<sup>3</sup>, Nathan J. Mantua<sup>4</sup>, Huan Wu<sup>5‡</sup>, John S. Kimball<sup>5</sup>, David M. Stoms<sup>6</sup> and Jack A. Stanford<sup>5</sup>

RESEARCH ARTICLE

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

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

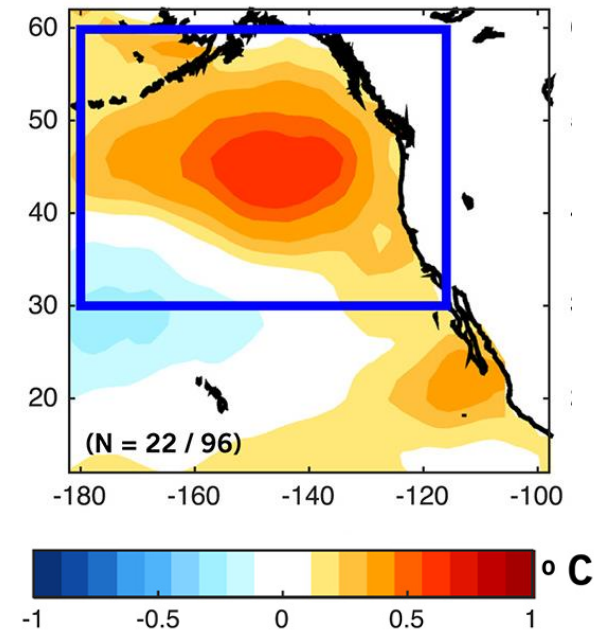
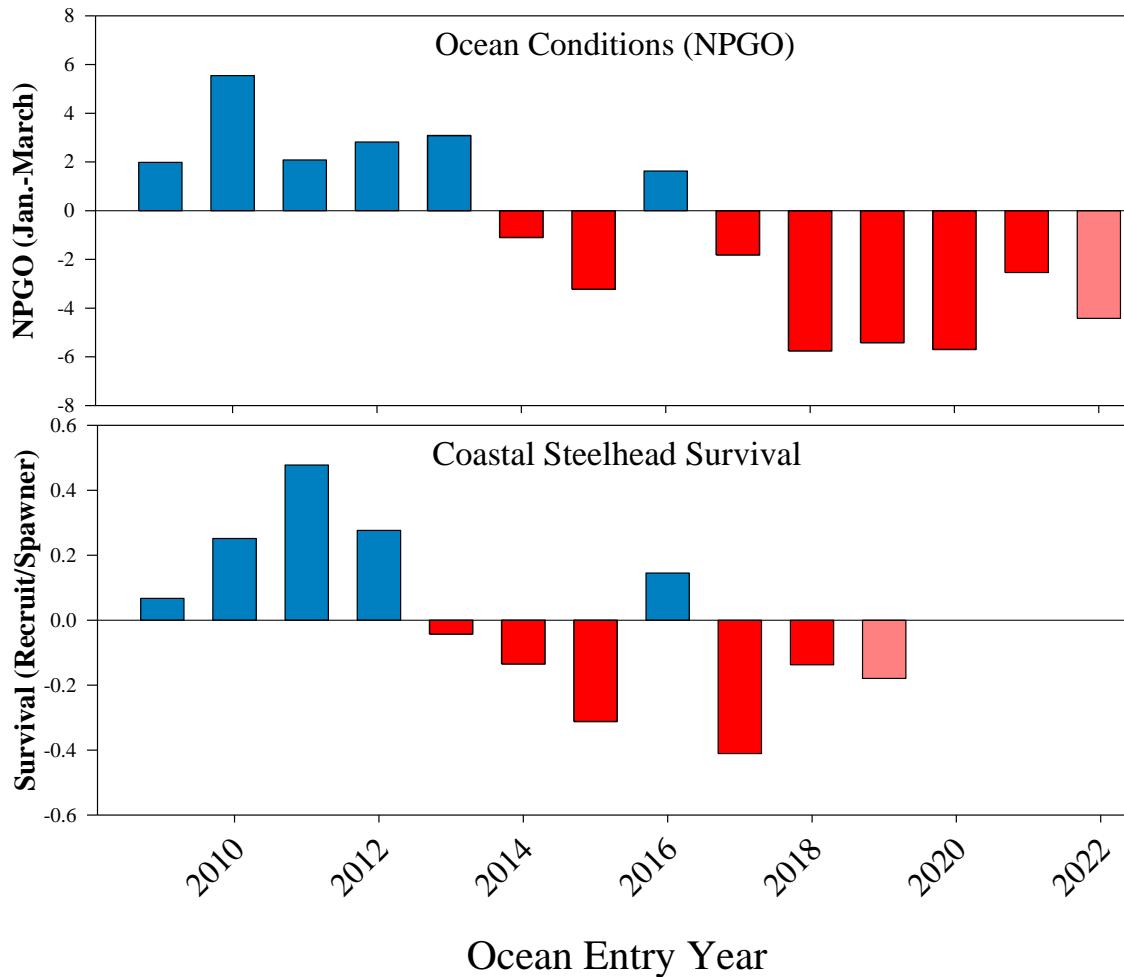
## Marine and freshwater regime changes impact a community of migratory Pacific salmonids in decline

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.



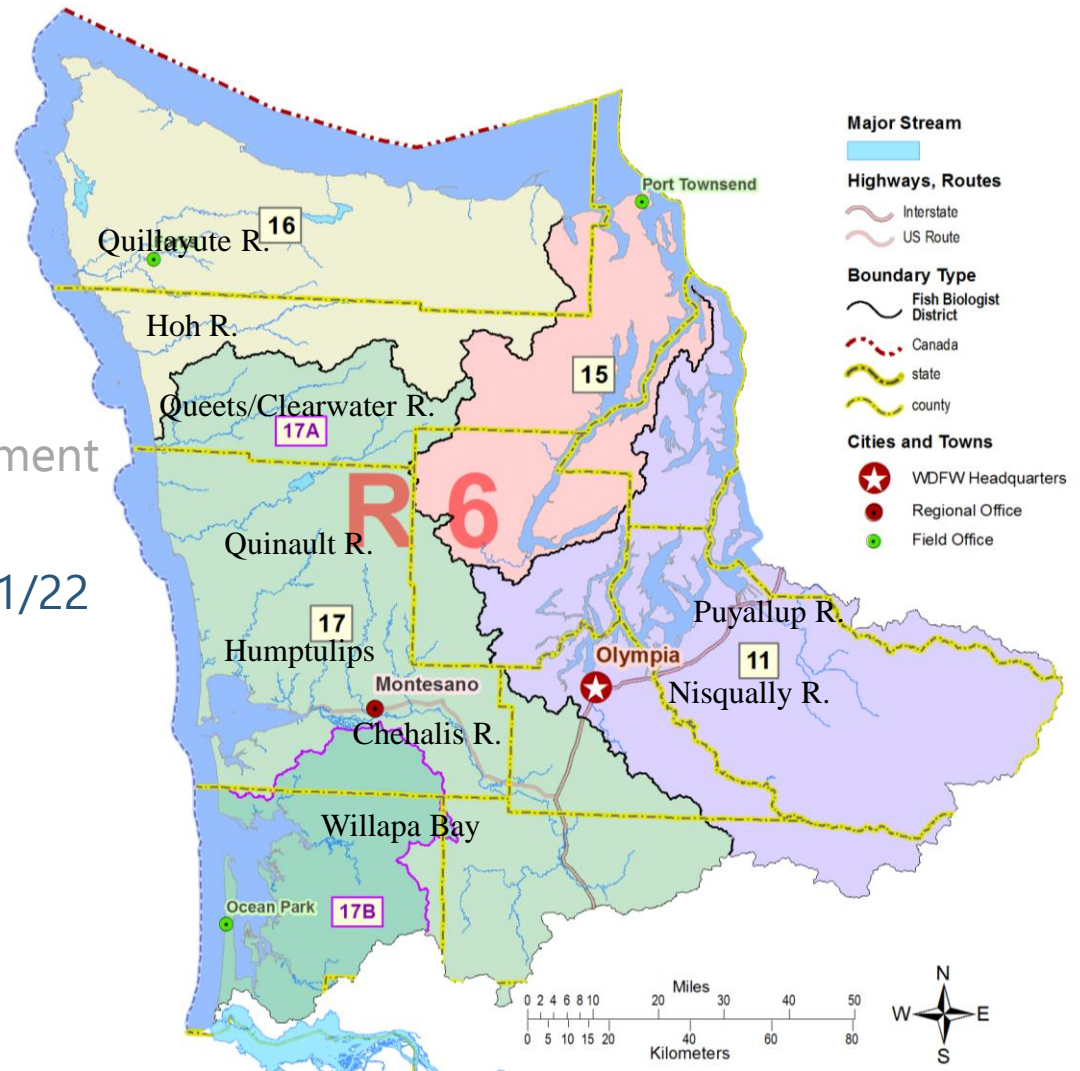
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Management framework and 2021/22 Review

2022/23 Forecasts and regulation proposals

Questions and feedback



# Steelhead Management- Considerations

- Limited in-season tools
- Effort shift uncertainty
- Recent history of over forecasting
- Tribal co-management
- National Park
- Escapement goals
- Run Timing



# 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.





# 2021/22 Review: Monitoring and Performance

- Creel: Prioritized funding in 2021/22 to support increased monitoring of coastal steelhead fisheries in the Hoh and Quillayute and pilot monitoring in Willapa Bay
- Spawning ground surveys
- Hatchery rack returns
- Tribal fisheries data



# 2021/22 Review: Monitoring and Performance

- Preseason: Low forecasts in all rivers and conservative season regulations with bank fishing opportunity in Willapa, Quillayute and Hoh watersheds and boat fishing opportunity in the Quillayute.
- In-season: Sport and tribal catch suggested lower than expected runsize.
- Emergency Regulations: Closed state and tribal fisheries in-season.
- Post-season: Preliminary estimates of escapement and runsize consistent with recent years.



# 2021/22 Review: Sport Monitoring

Effort counts and interviews conducted January 1-February 28th

- Willapa Bay
  - Willapa: 404 interviews conducted, 38 wild & 21 hatchery steelhead caught.
  - Naselle: 282 interviews, 51 wild & 9 hatchery caught.
- Quillayute River
  - 546 interviews, 254 wild & 22 hatchery caught.
- Hoh River
  - 1135 interviews, 252 wild & 0 hatchery caught.



# 2021/22 Review: Preliminary Tribal Catch

	Wild Projected	Wild Harvested
Willapa	0	0
Chehalis	0	0
Humptulips	0	0
Quinault	216	38
Queets	199	155
Hoh	311	292
Quillayute	1230	430



Tribal catch less than 50% of what was projected pre-season as a result of management actions.



# 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**



Washington Department of Fish and Wildlife

*Statewide Steelhead Management Plan:*

*Statewide Policies, Strategies, and Actions*

February 29, 2008



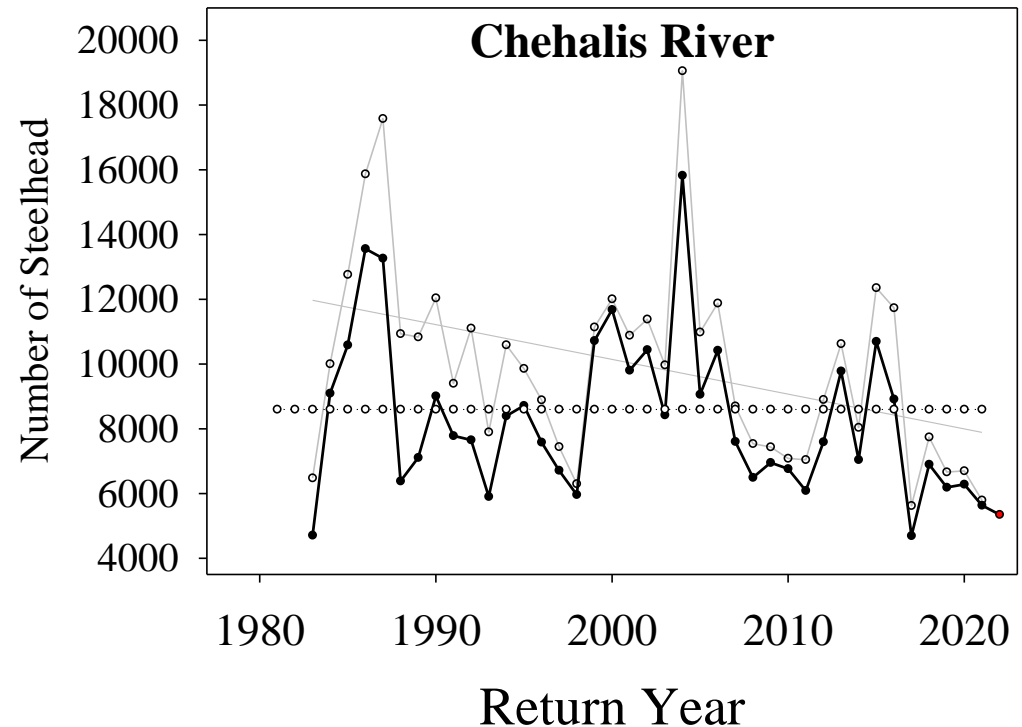
# Review 2021/22: VSP Parameters

## SSMP on abundance:

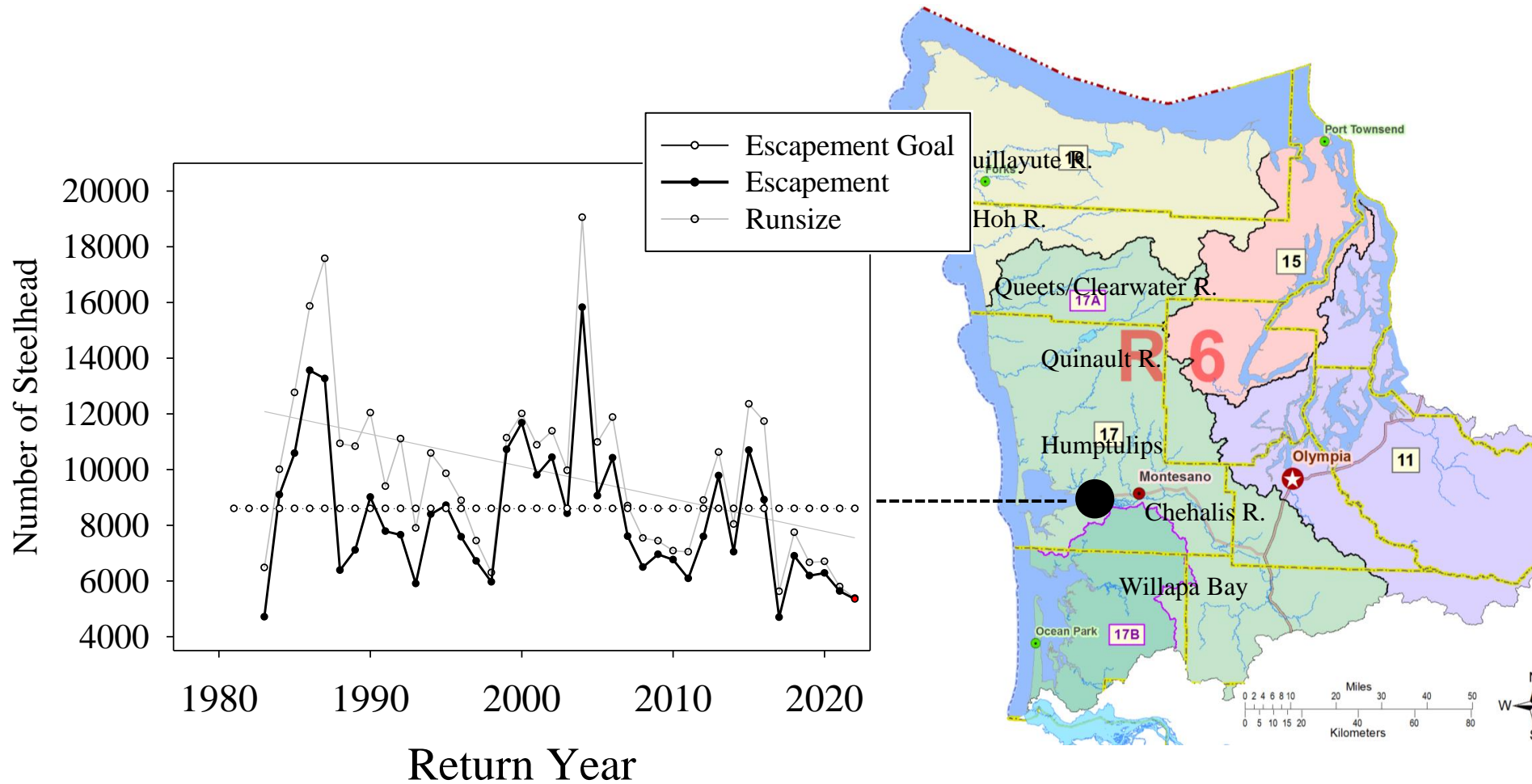
**Runsize Greater than escapement goal:** Assure escapement goals are met

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

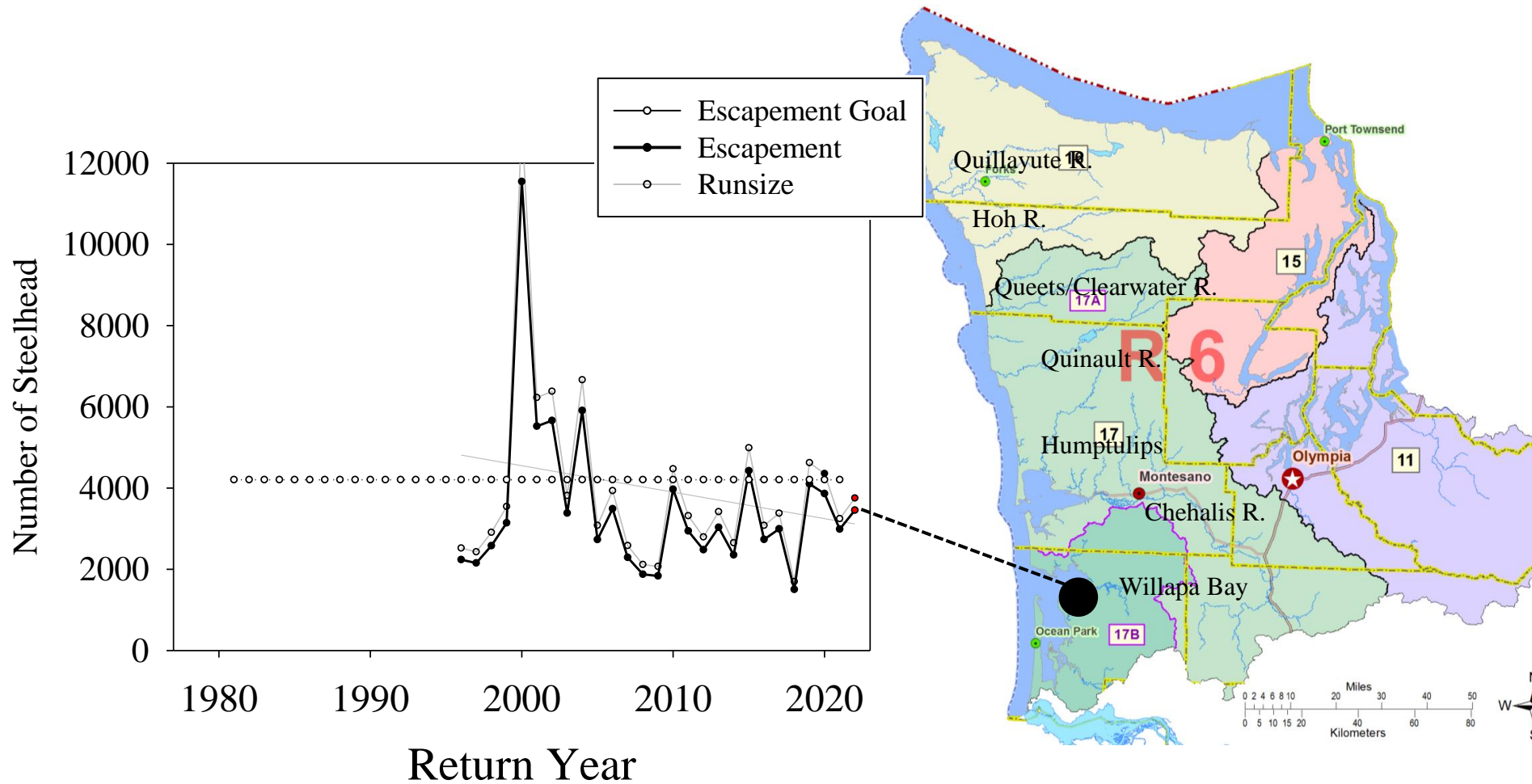
- **Abundance**
- Productivity
- Distribution
- Diversity



# 2021/22 Review: Chehalis R.

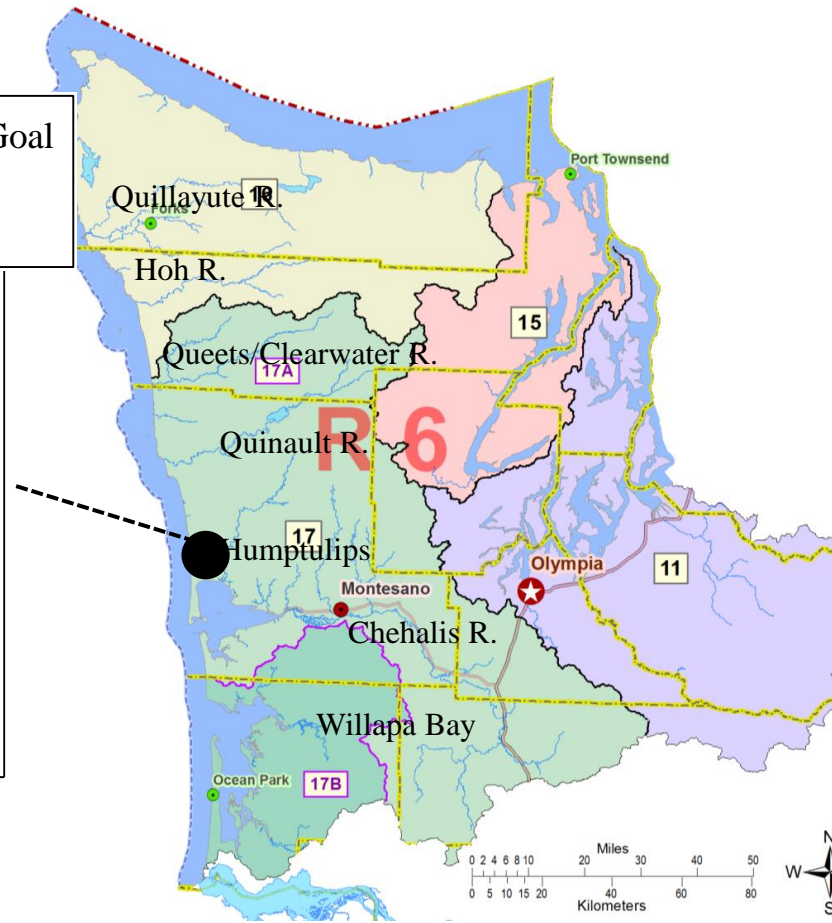
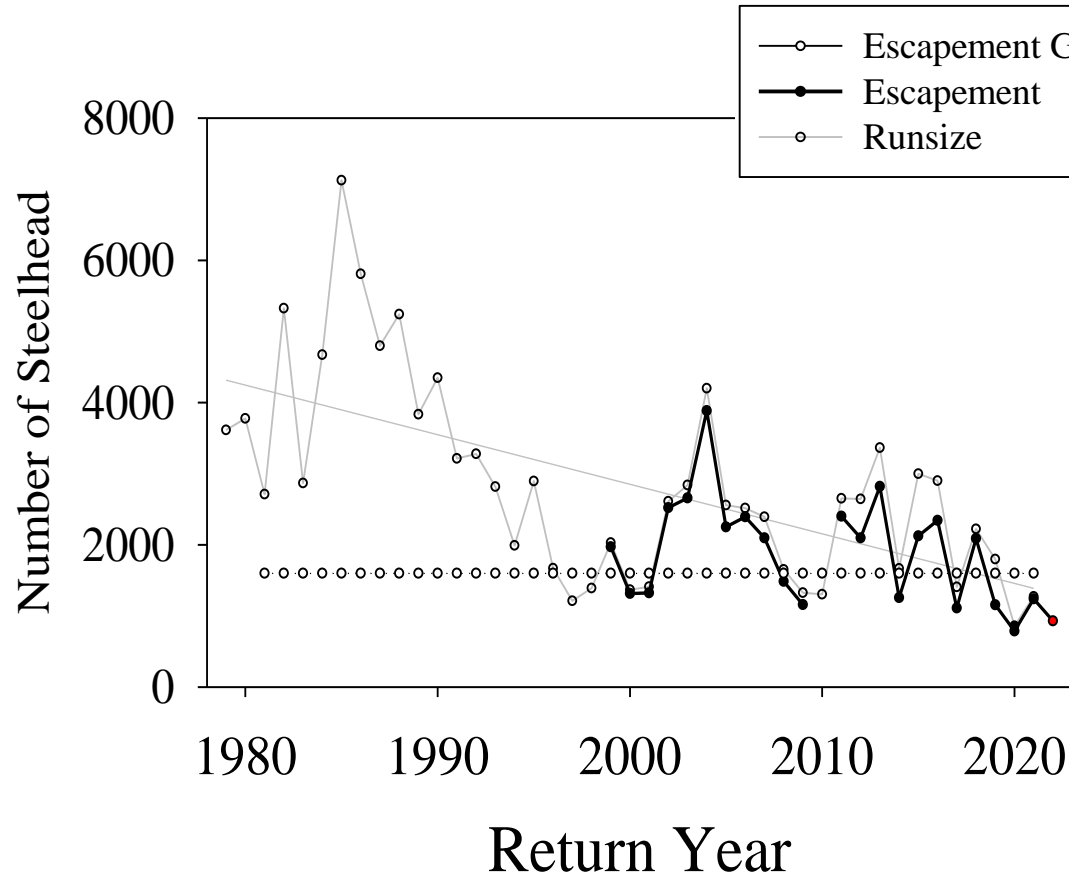


# 2021/22 Review: Willapa Bay

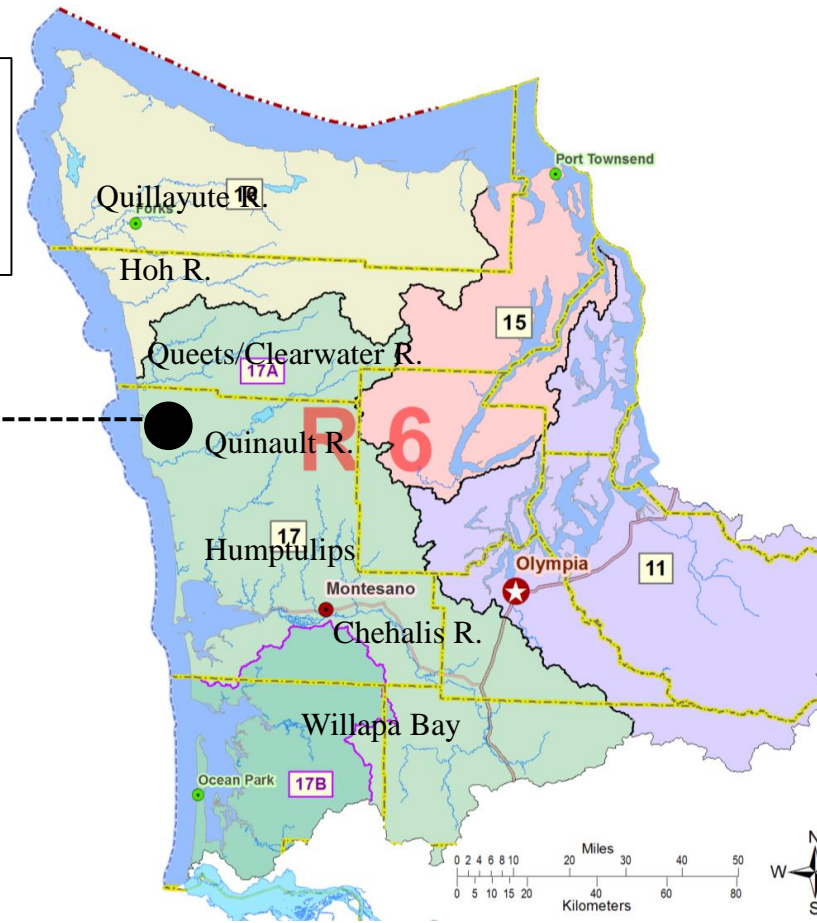
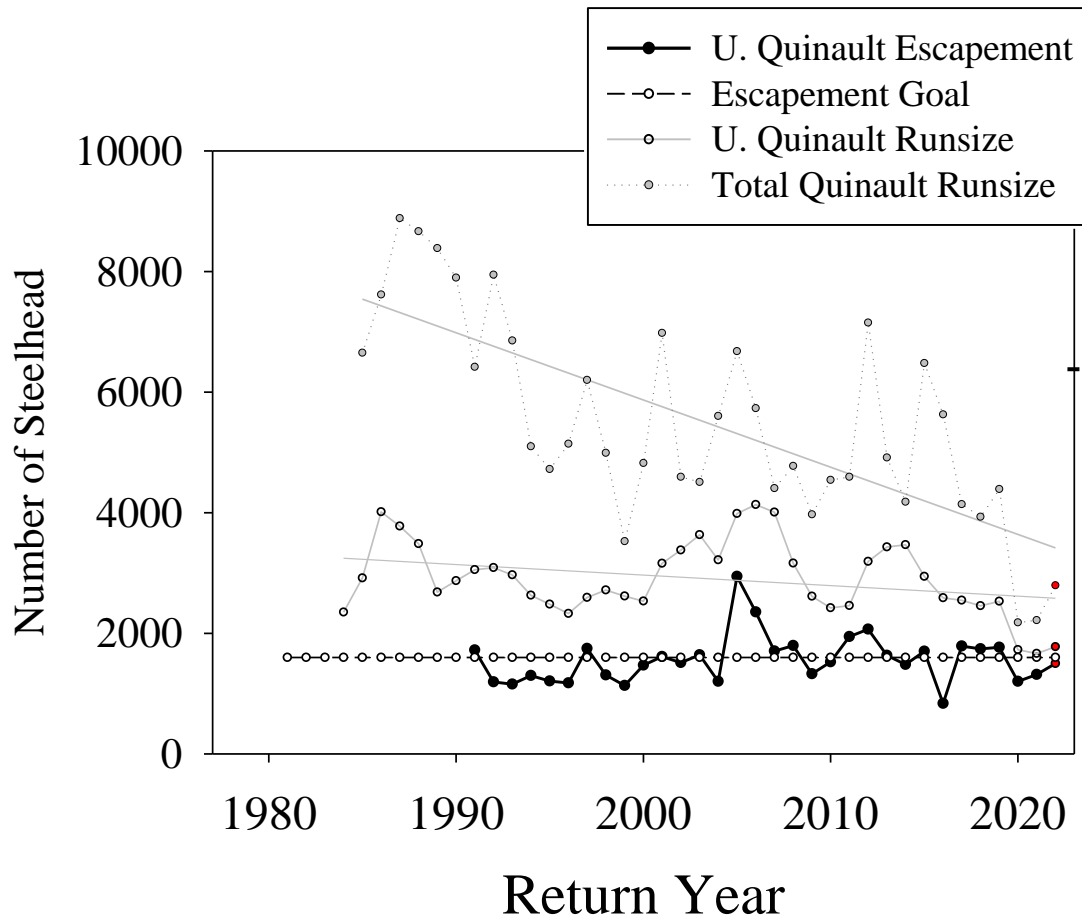




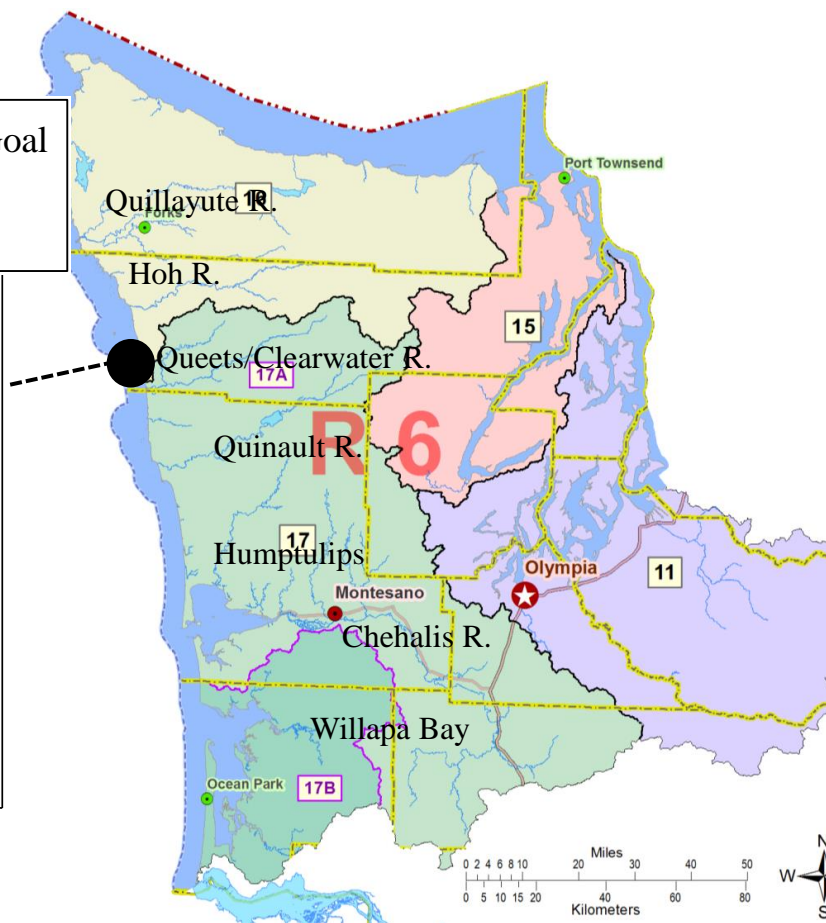
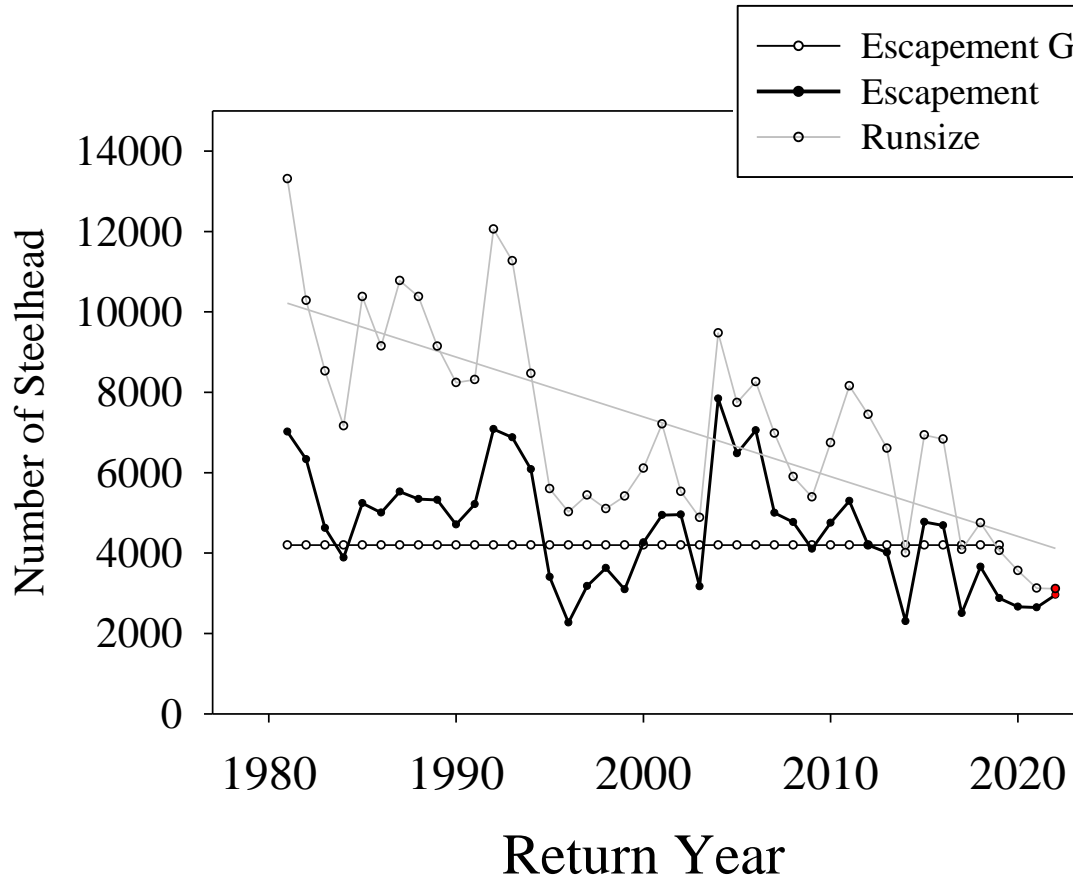
# 2021/22 Review: **Humptulips R.**



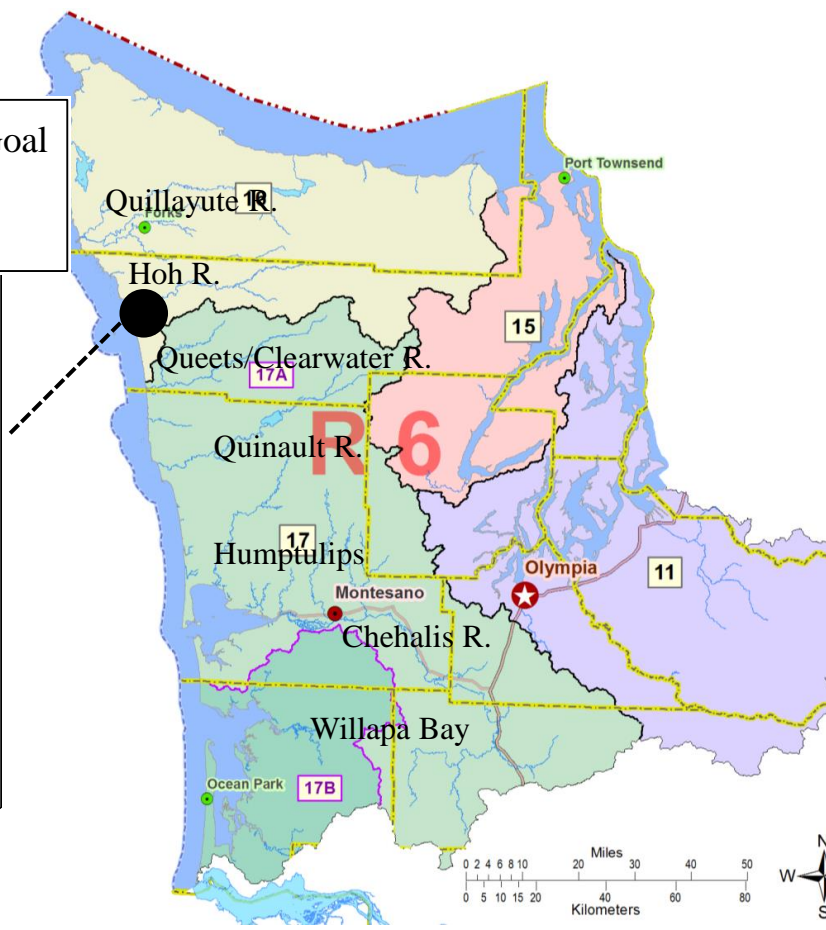
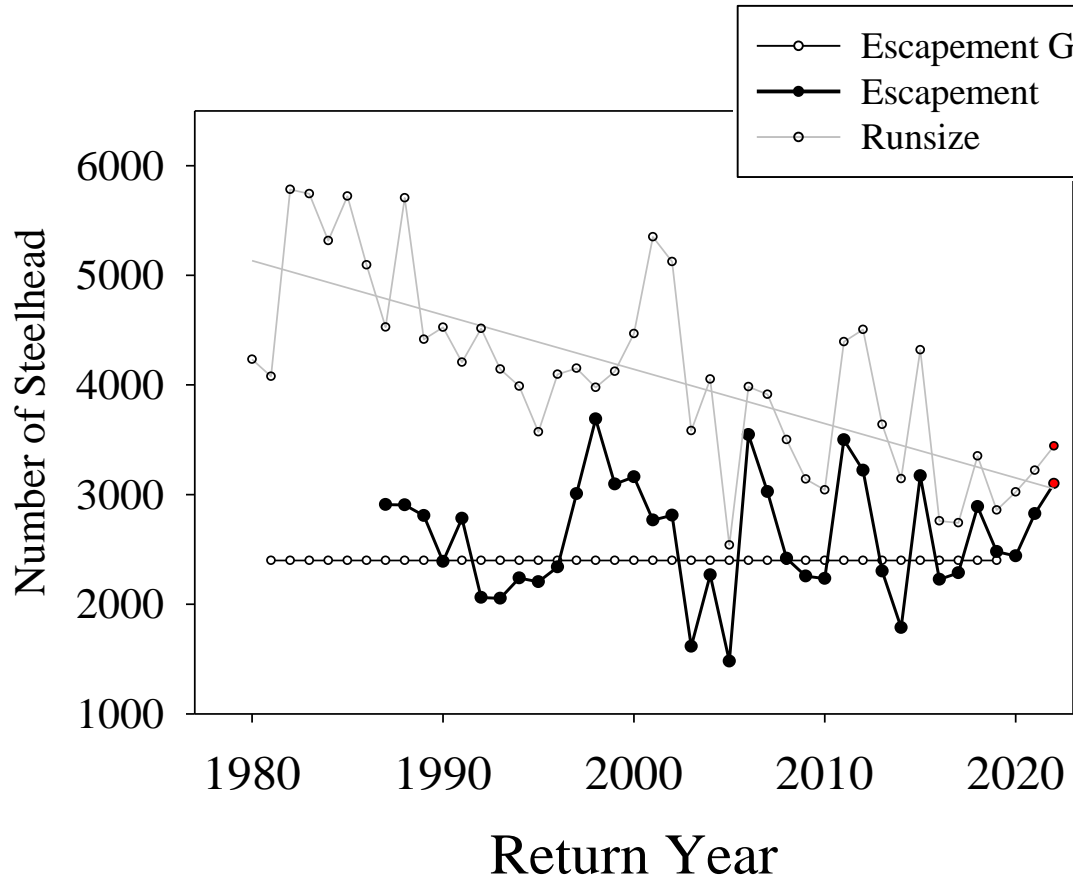
# 2021/22 Review: Quinault R.



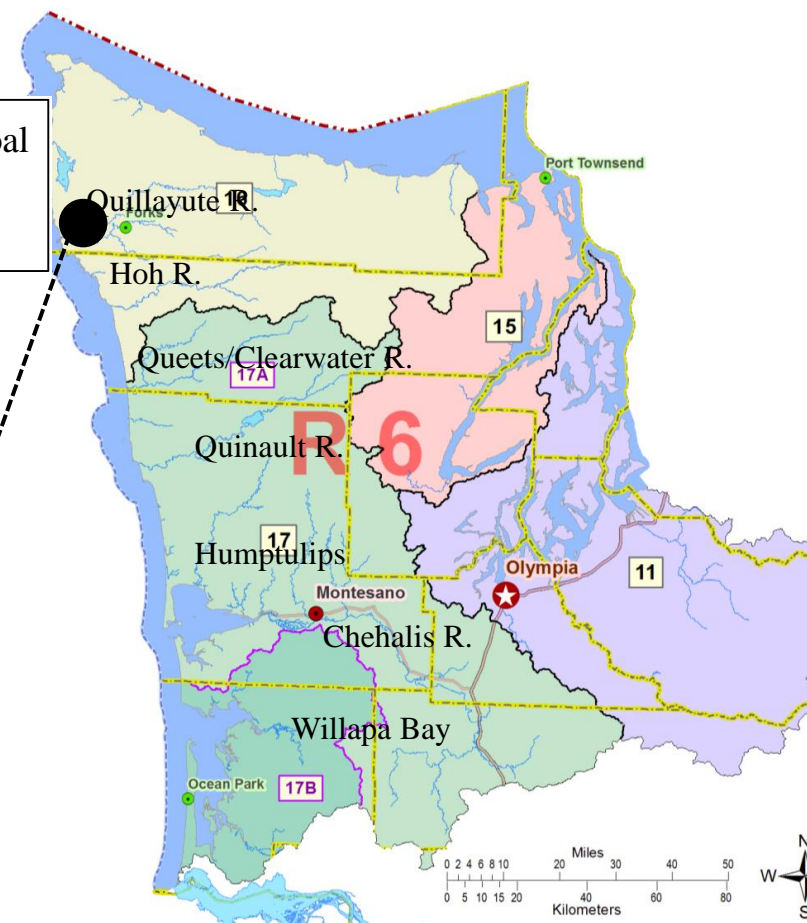
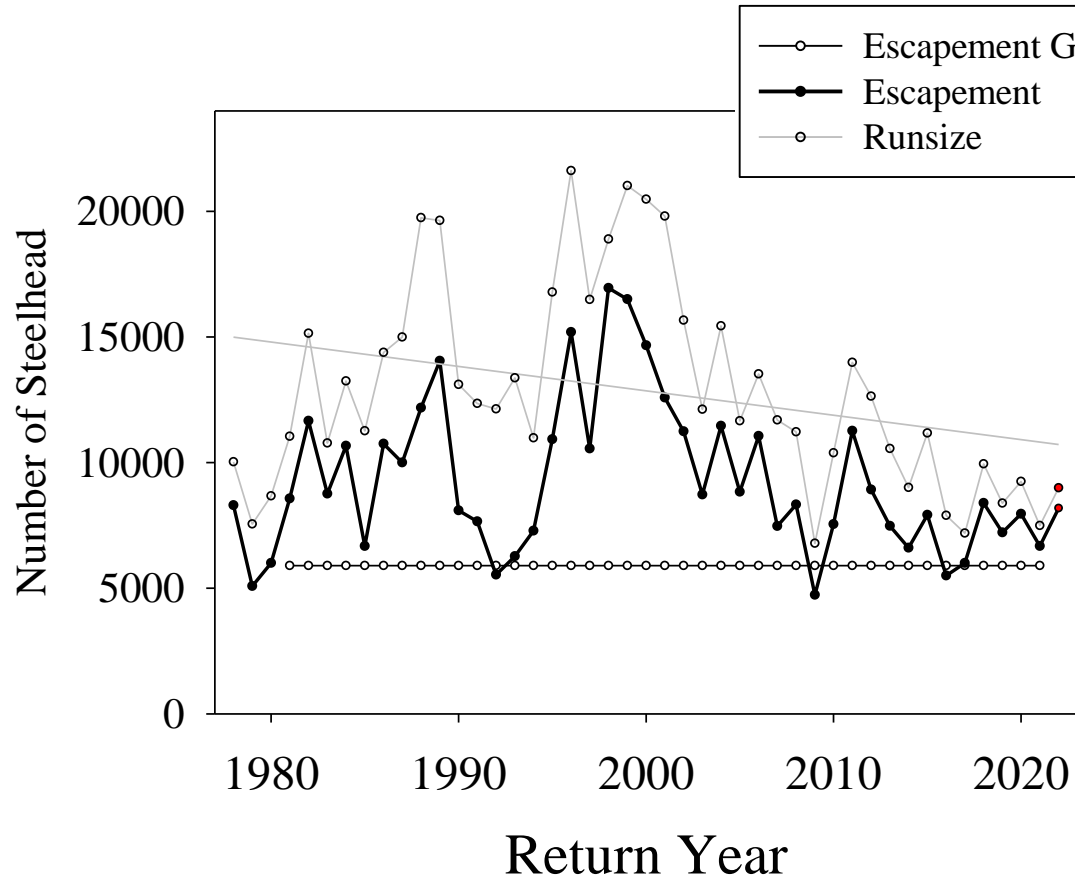
# 2021/22 Review: Queets R.



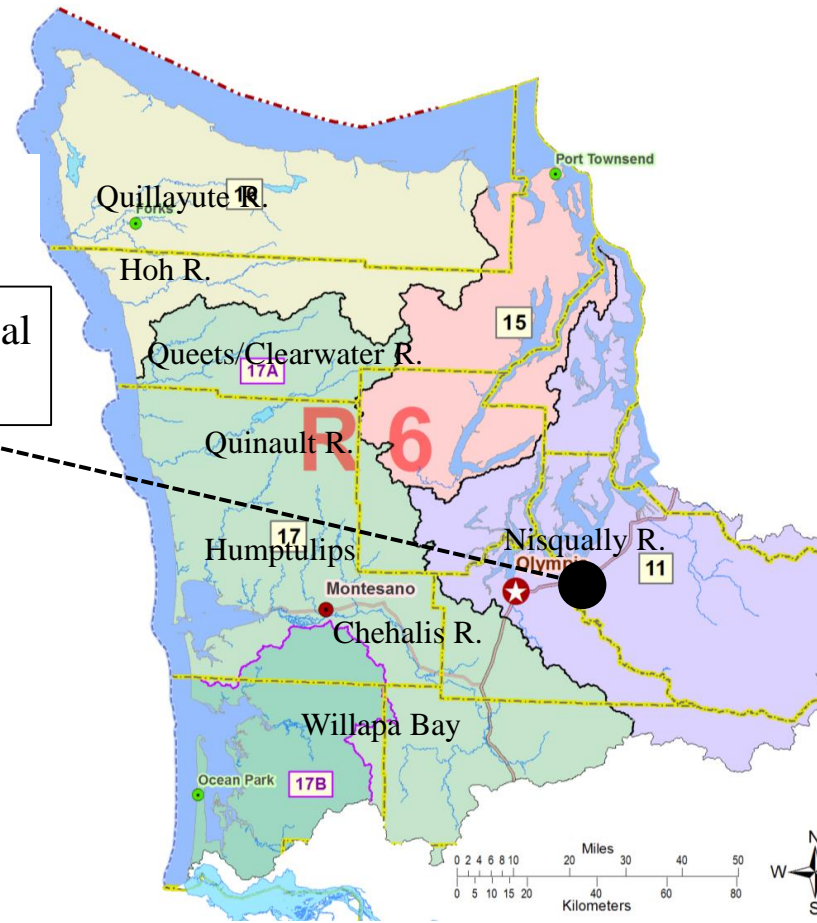
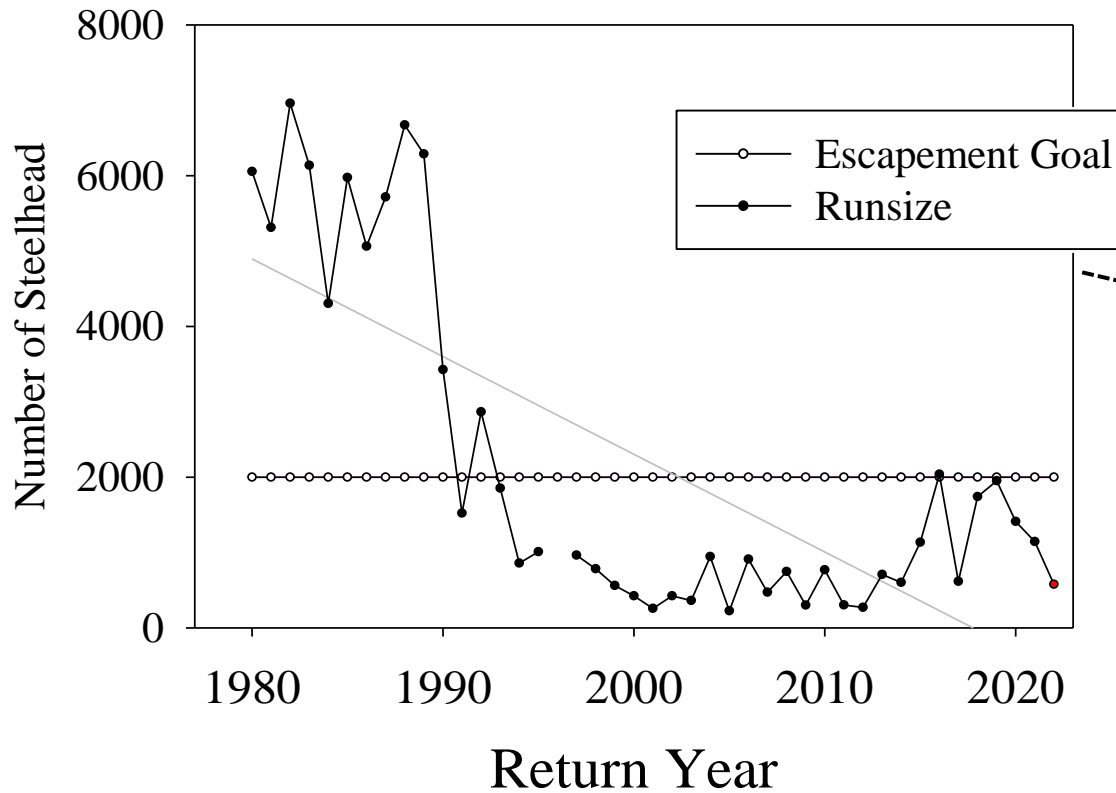
# 2021/22 Review: Hoh R.



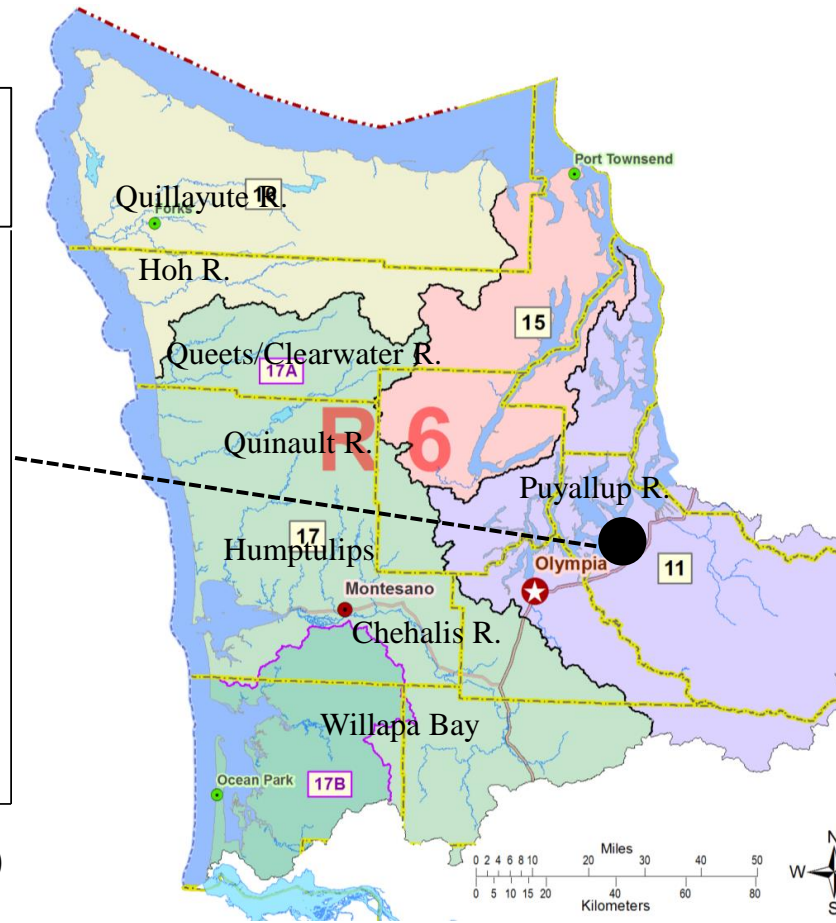
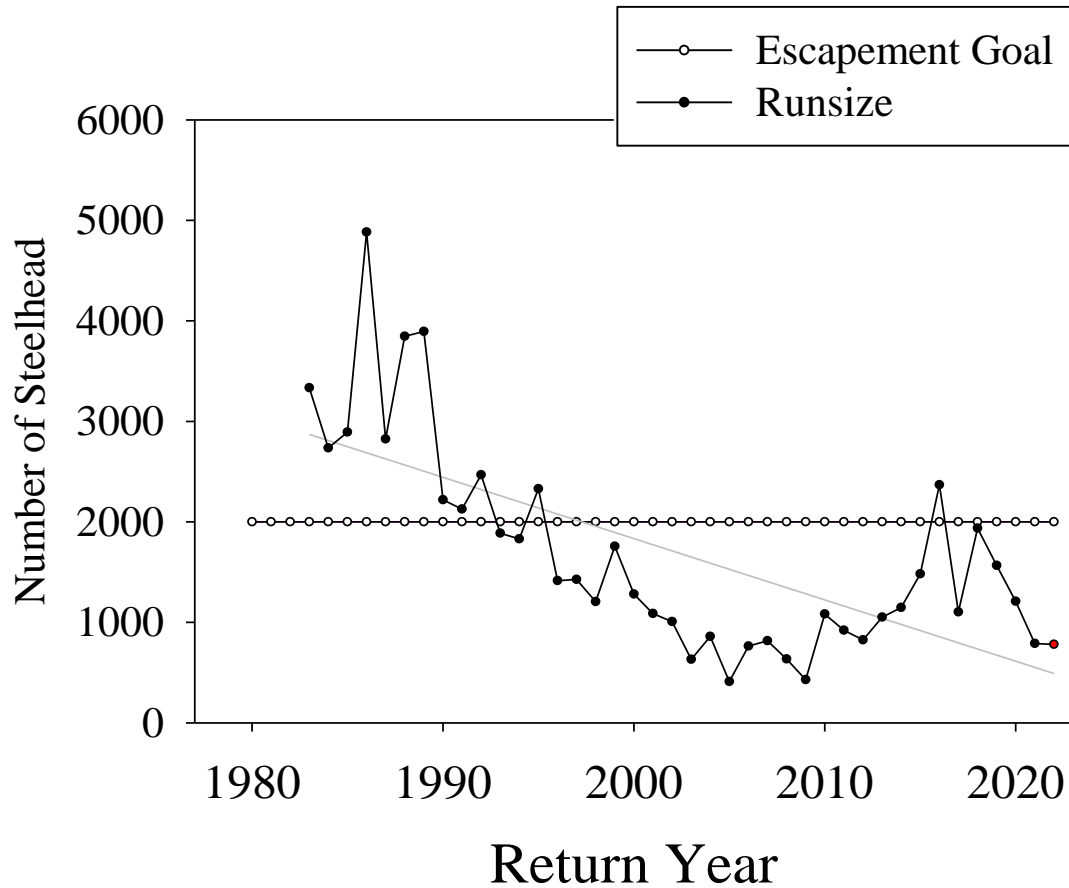
# 2021/22 Review: Quillayute R.



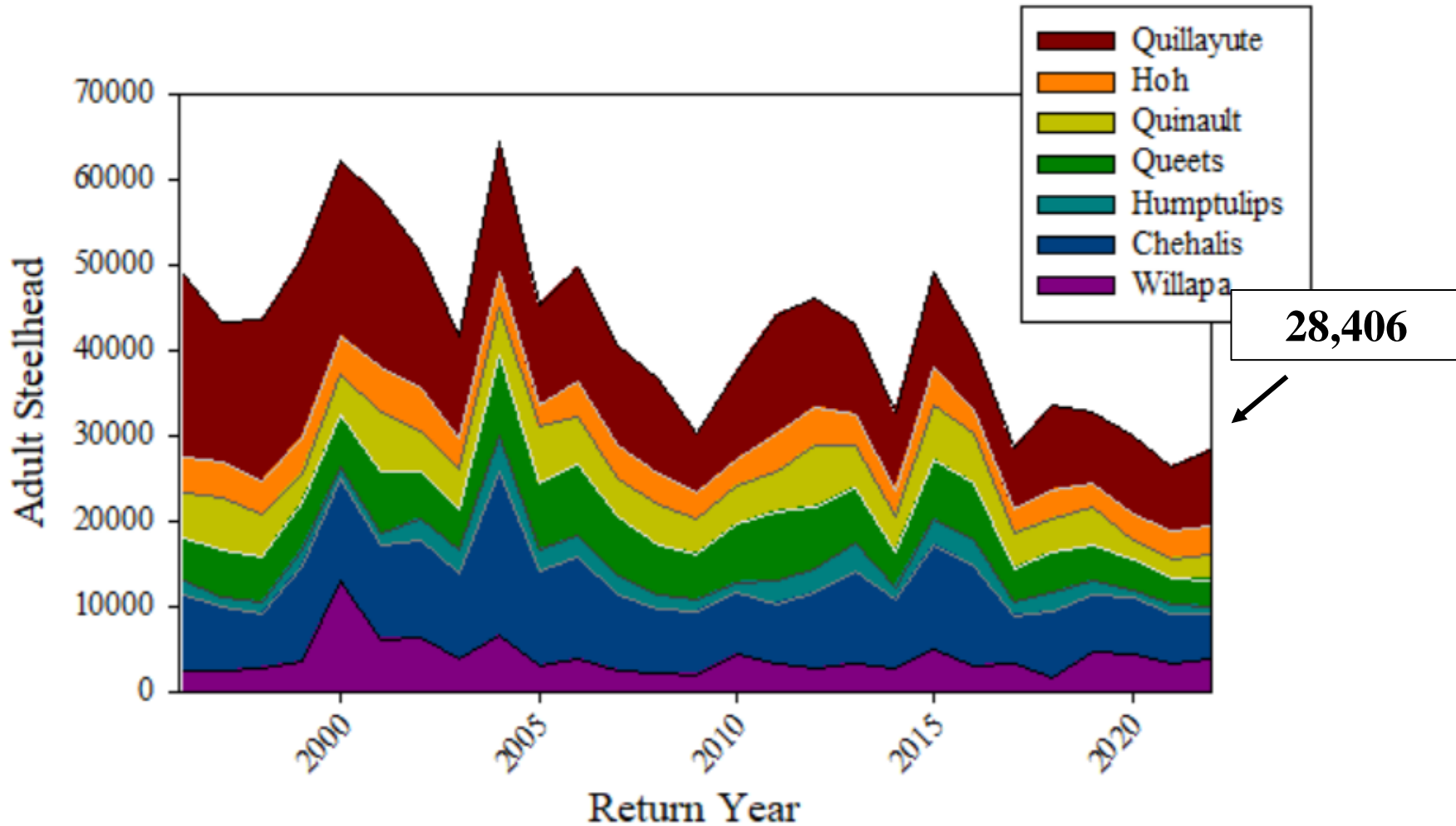
# 2021/22 Review: Nisqually R.



# 2021/22 Review: Puyallup R.



# 2021/22 Review: Abundance





# 2021/22 Review : Preliminary Runsize

<b>River/Area</b>	<b>Predicted Runsize</b>	<b>Actual Runsize</b>
Willapa	3,188	3,753
Chehalis	5,681	5,378
Humptulips	1,343	928
Upper Quinault	1,128	1,776
Queets/Clearwater	3,203	3,114
Hoh	3,141	3,443
Quillayute	8,516	8,996



# 2021/22 Review : Preliminary Runsize

<b>River/Area</b>	<b>Predicted Runsize</b>	<b>Actual Runsize</b>	<b>Escapement Goal</b>	<b>Escapement</b>
Willapa	3,188	3,753	4,206	3,456
Chehalis	5,681	5,378	8,600	5,350
Humptulips	1,343	928	1,600	928
Upper Quinault	1,128	1,776	1,600	1,498
Queets/Clearwater	3,203	3,114	4,200	2,959
Hoh	3,141	3,443	2,400	3,100
Quillayute	8,516	8,996	5,900	8,186



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Hoh	3,141	3,443	2,400	3,100
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Forecasted within 5% of actual runsize in 2021/22 and escapement goals not met in 5 of 7 rivers.



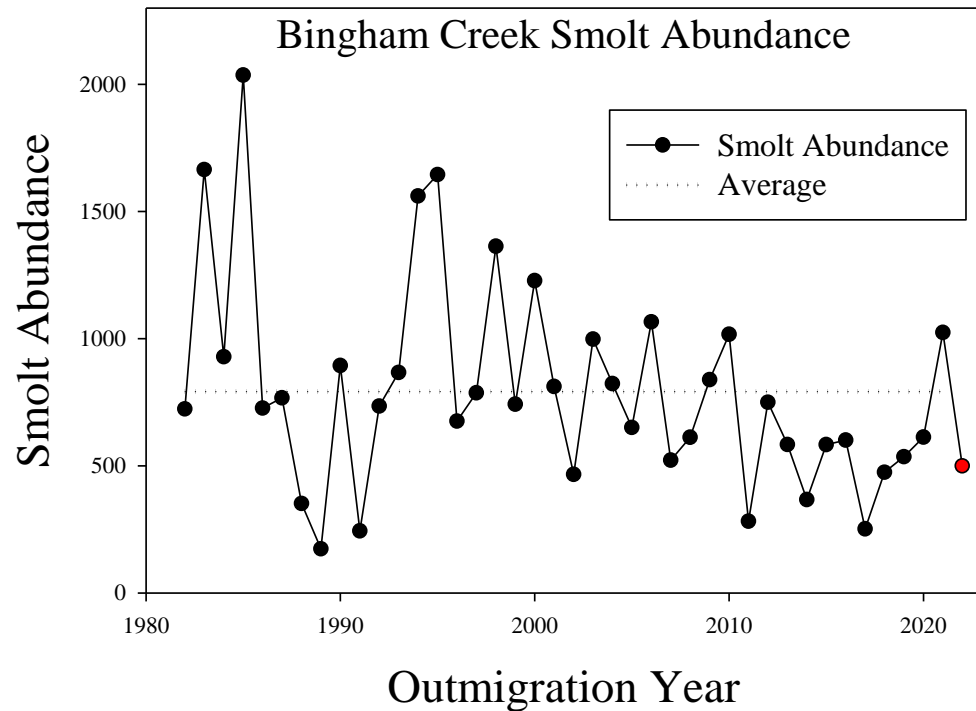
# 2021/22 Review: Productivity

## SSMP on productivity:

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



- Abundance
- Productivity
- Distribution
- Diversity

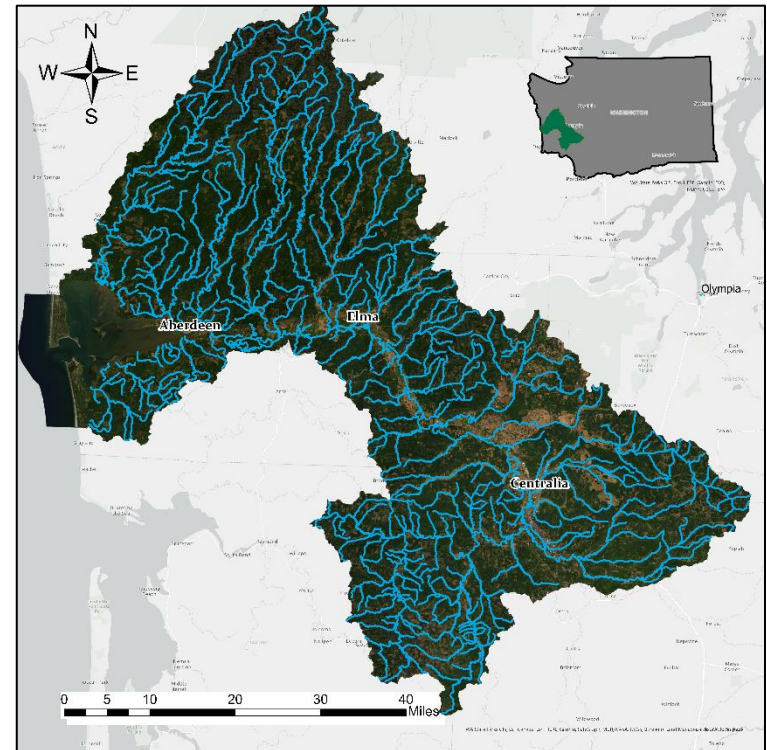


# 2021/22 Review: Distribution & Diversity

## SSMP on Distribution and Diversity:

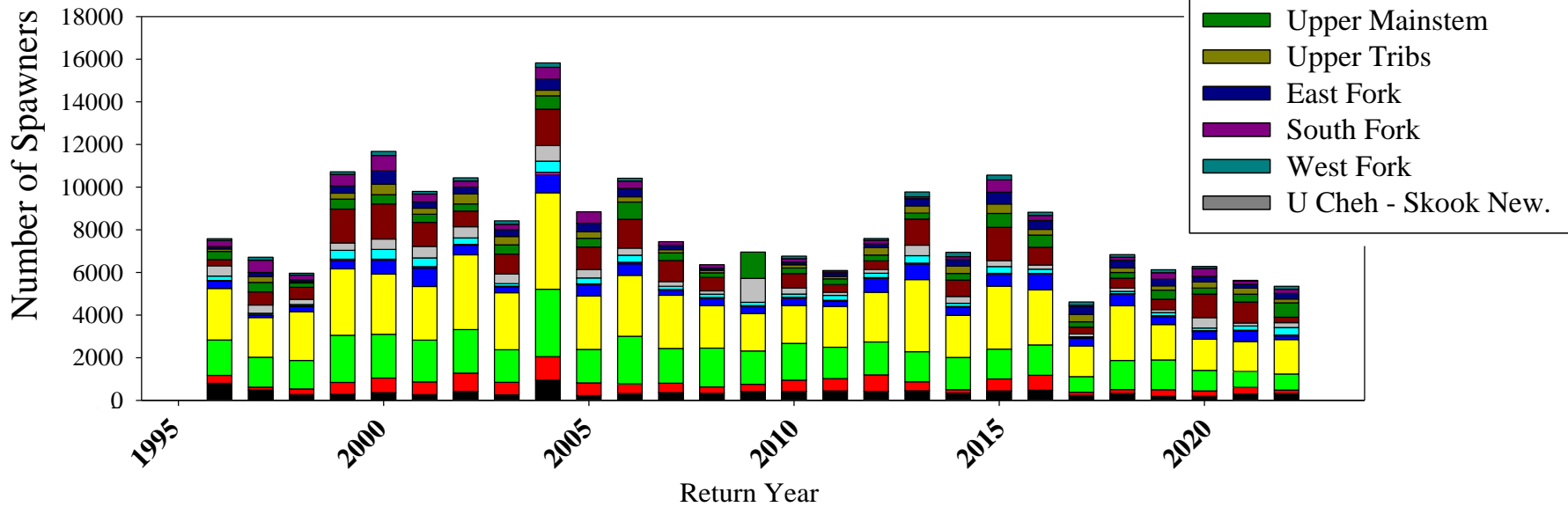
“Modify the timing of fisheries, gear types, or fishery characteristics to enhance diversity and spatial structure consistent with watershed goals”

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

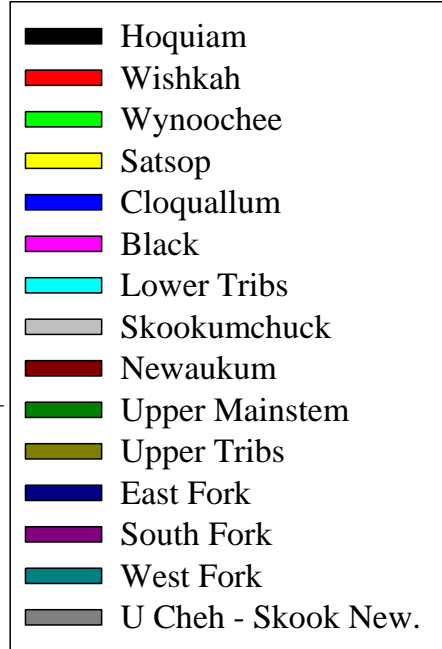


# 2021/22 Review: Distribution & Diversity

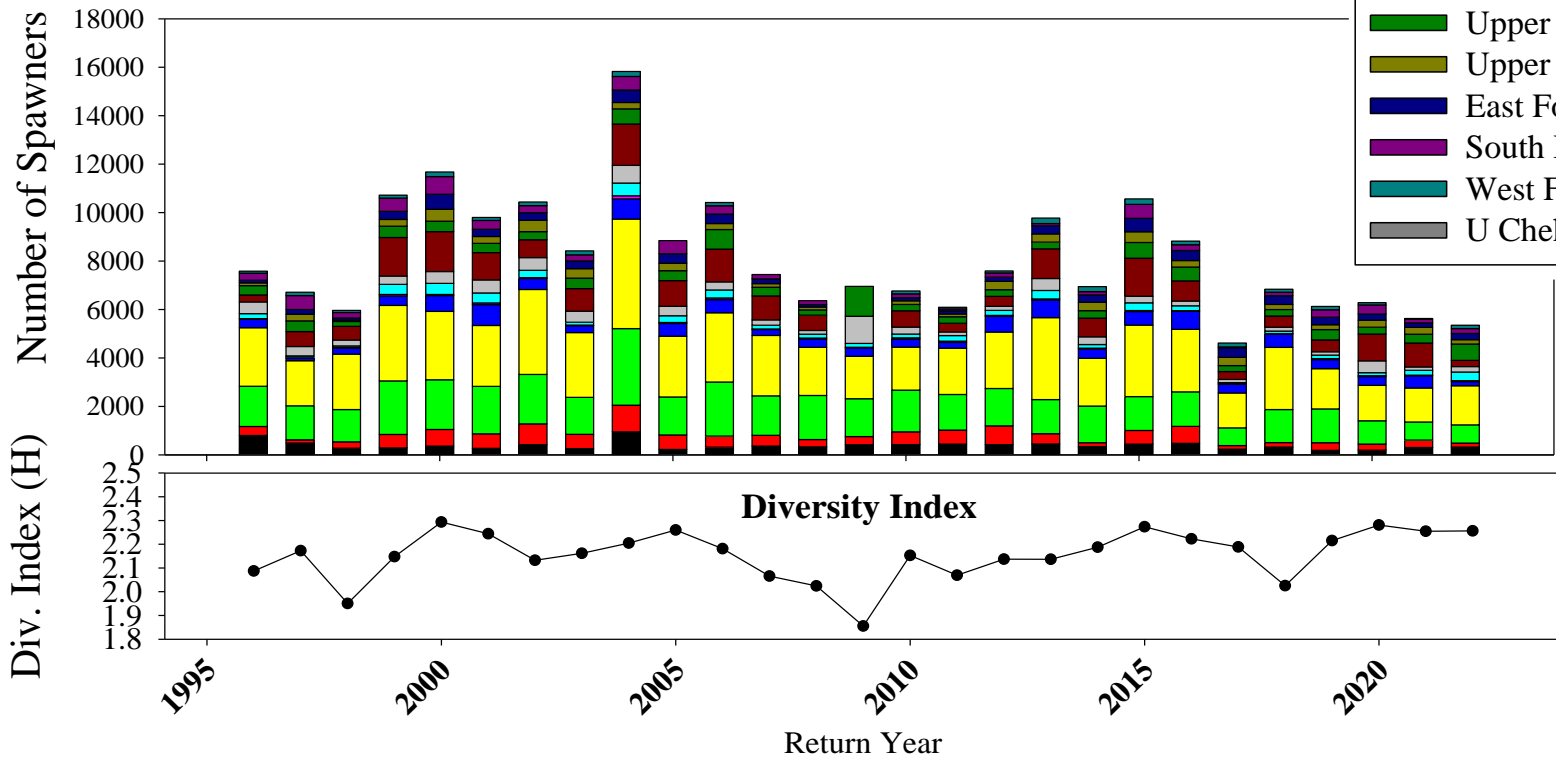
## Chehalis River Spawning Escapement by Tributary



# 2021/22 Review: Distribution & Diversity

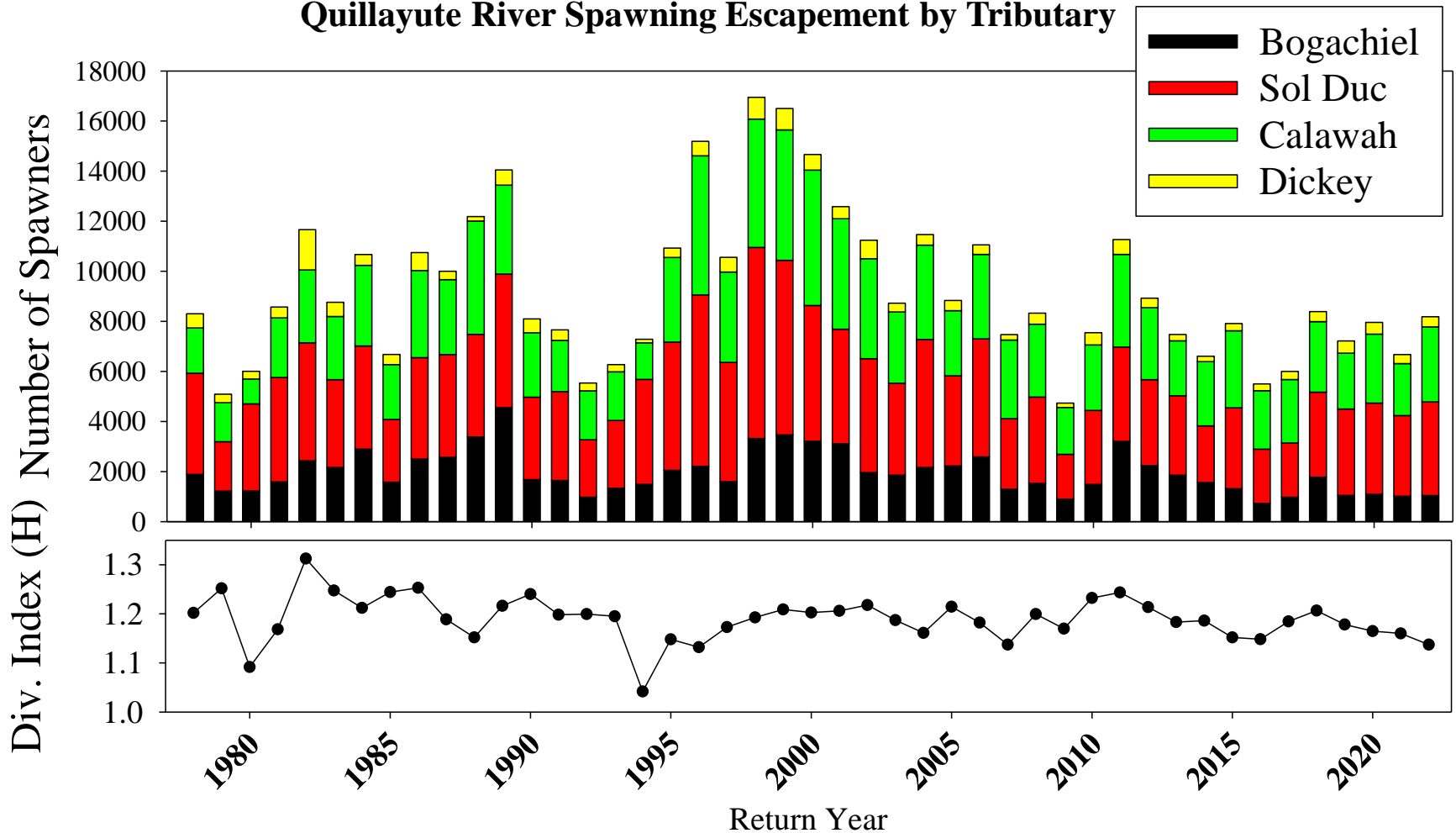


**Chehalis River Spawning Escapement by Tributary**



# 2021/22 Review: Distribution & Diversity

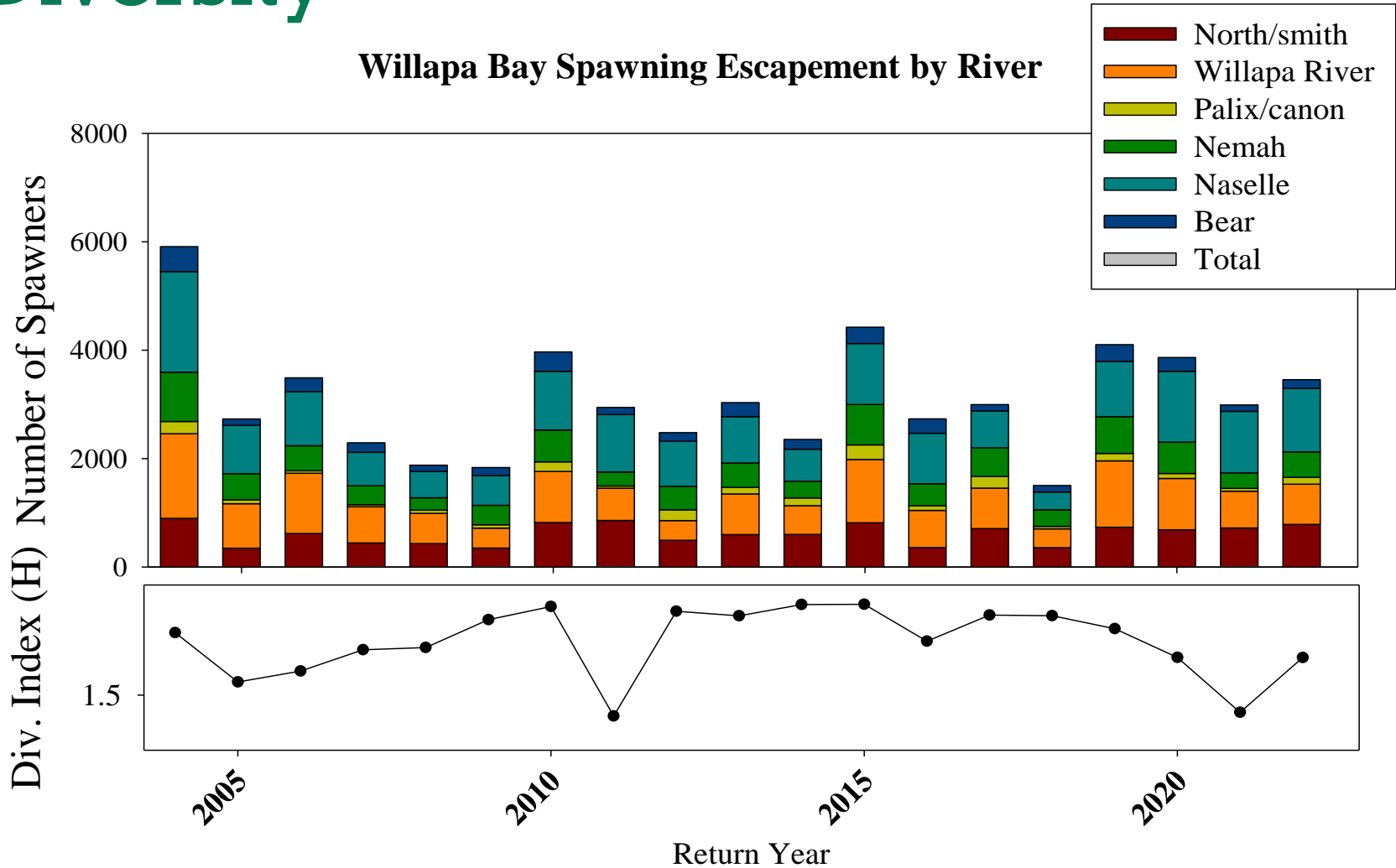
Quillayute River Spawning Escapement by Tributary





# 2021/22 Review: Distribution & Diversity

Willapa Bay Spawning Escapement by River

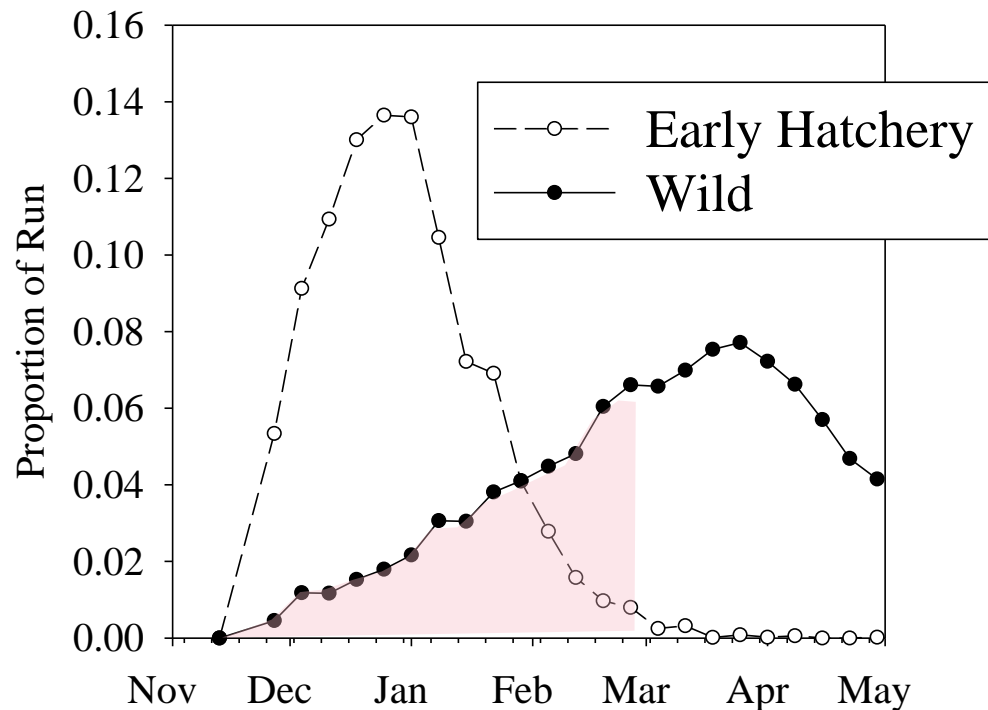


# 2021/22 Review: Distribution & Diversity

## 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”

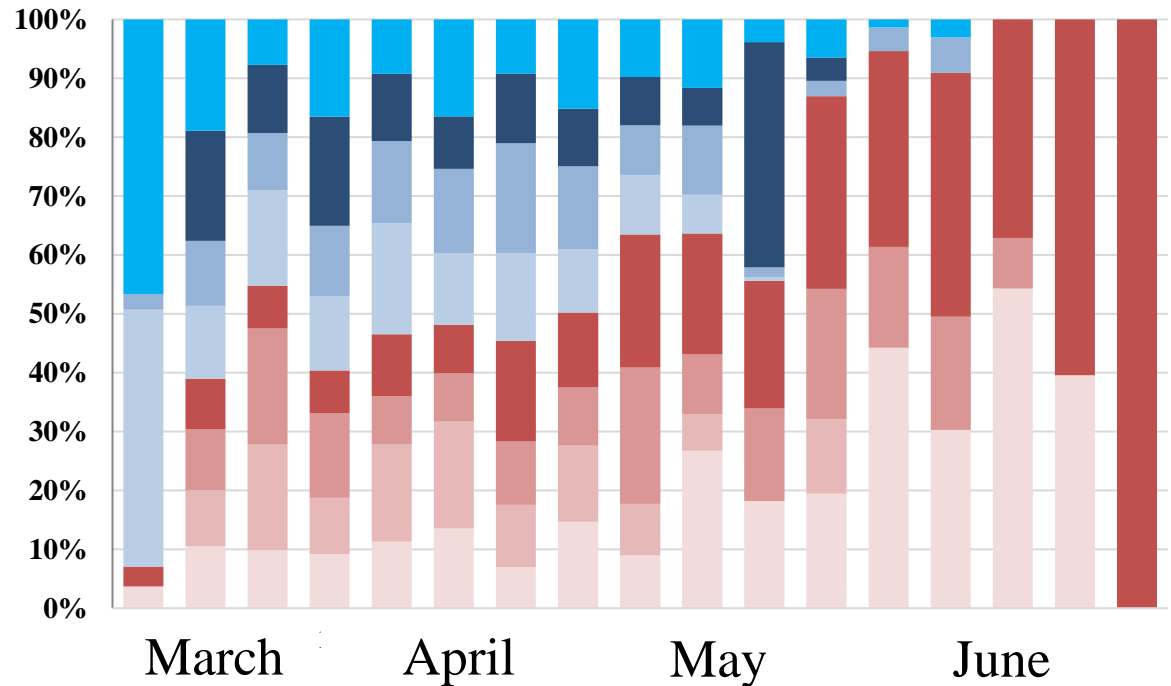
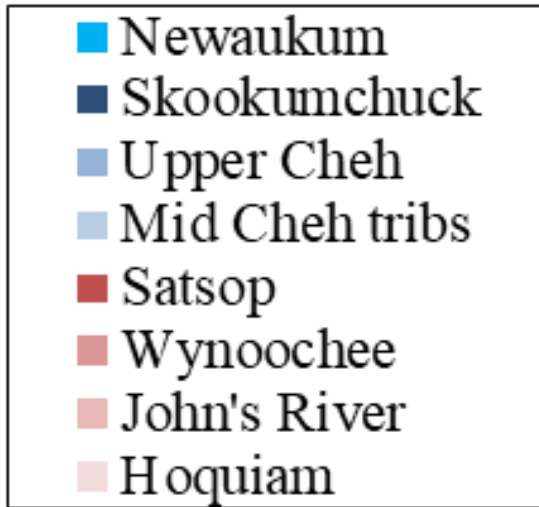
- Abundance
- Productivity
- **Distribution**
- **Diversity**



# 2021/22 Review: Distribution & Diversity

## SSMP on Distribution and Diversity:

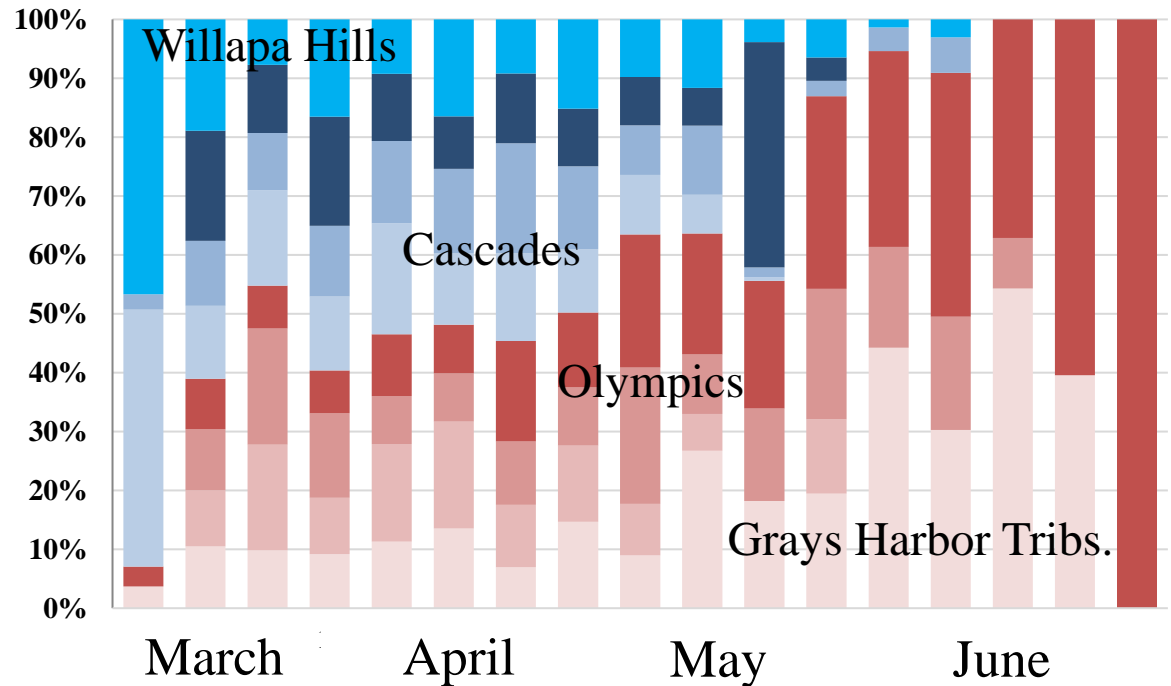
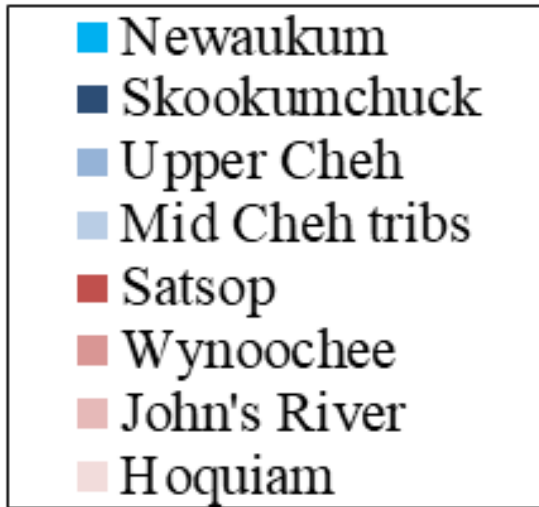
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# 2021/22 Review: Summary

- 🐟 Forecasted wild abundance in 2021/22 within 5% of actual runsize.
- 🐟 Escapement goals not met in 5 of 7 rivers.
- 🐟 Future returns are expected to follow extremely unfavorable environmental conditions.
- 🐟 Declining populations of steelhead in all coastal populations.
- 🐟 2021/22 Fishery regulations supported diverse spawning distributions and run timing.
- 🐟 Tribal catch less than 50% of pre-season plans as a result of regulation changes.



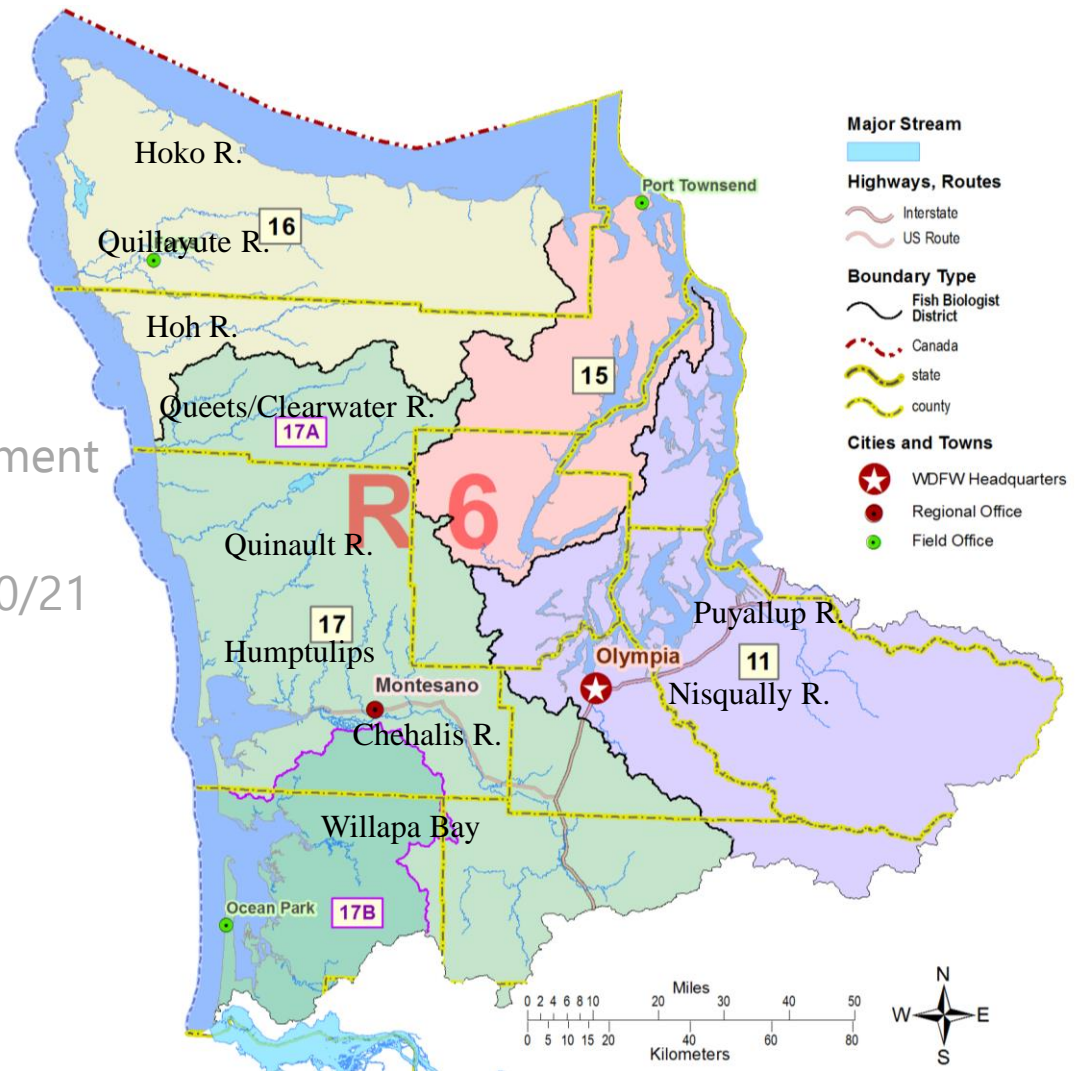
# Agenda

Steelhead biology & stock assessment

Management framework and 2020/21 review

2022-23 Forecasts and regulation proposals

Questions and feedback



# 2022-23: Preliminary Forecasts

<b>River/Area</b>	<b>Run-to-River</b>	<b>Escapement Goal</b>
Willapa	3,535	4,206
Chehalis	7,114	8,600
Humptulips	1,222	1,600
Upper Quinault	2,376	1,600
Queets/Clearwater	3,958	4,200
Hoh	2,995	2,400
Quillayute	9,344	5,900



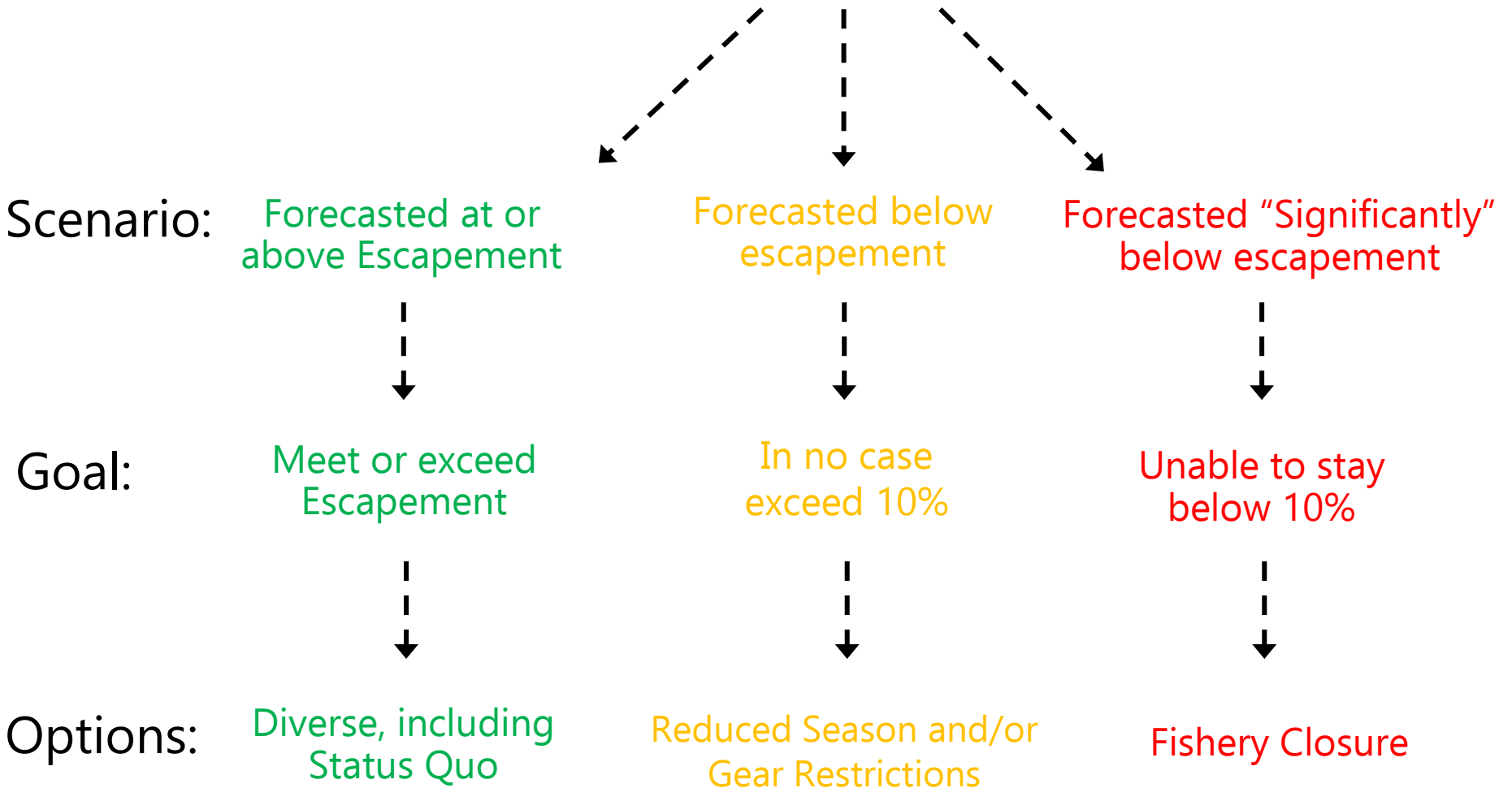
# 2022-23: Preliminary Forecasts

River/Area	Run-to-River	Escapement Goal	Wild Steelhead Relative % above/below	
			To Goal	Goal
Willapa	3,535	4,206	-671	-16%
Chehalis	7,114	8,600	-1,486	-17%
Humptulips	1,222	1,600	-378	-24%
Upper Quinault	2,376	1,600	776	49%
Queets/Clearwater	3,958	4,200	-242	-6%
Hoh	2,995	2,400	595	25%
Quillayute	9,344	5,900	3,444	58%

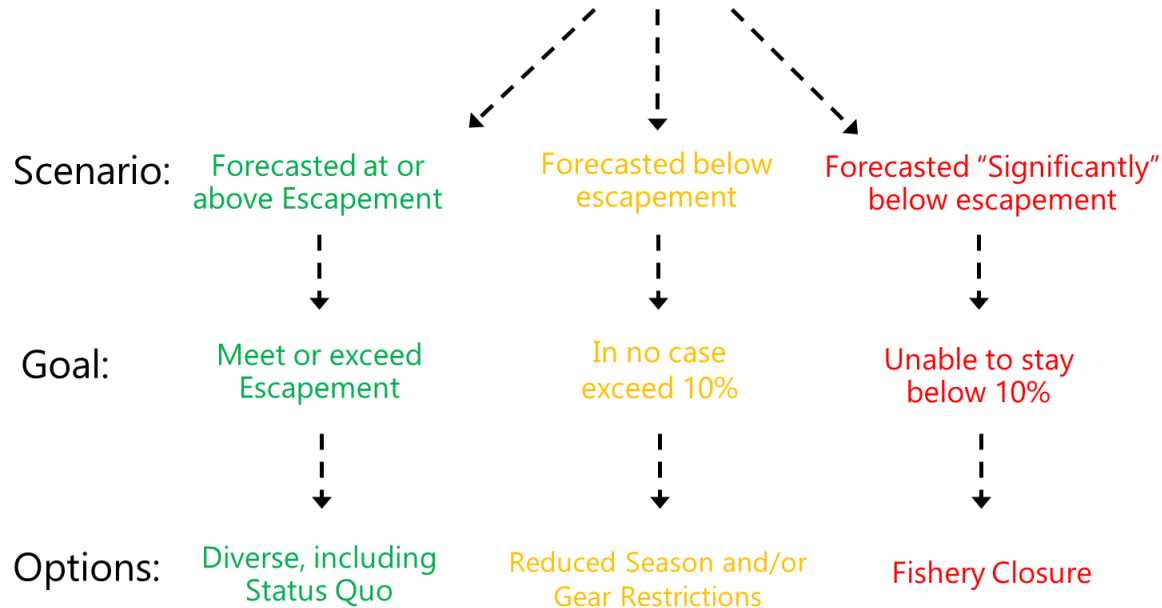




# River Specific Regulation Options



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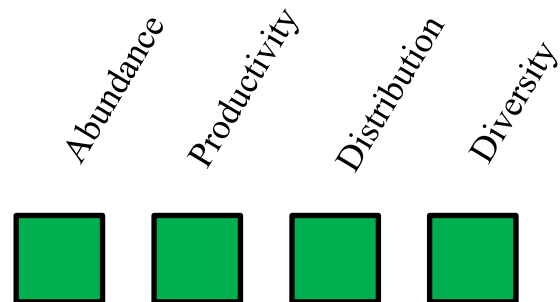


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# 2022/23 Fishery Proposals

1. Coastwide closure
2. Last year's regulations
3. Last year's regulations with reduced days
4. Status Quo with reduced days a week
5. Hatchery and salmon directed fisheries in specific watersheds and lake planting of surplus



# Questions? Feedback?

## We're especially interested in

- 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 Q&A 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](https://wdfw.wa.gov/coastal-steelhead)

