

2024 Forecast Workshop: Idaho Perspectives

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September 11, 2024

- Overview of system(s) being managed

- Current approach to forecasting

- What data are available/used?

- What type of analyses do you conduct?

- Do you use your results to make management decisions?

- How well do they perform?

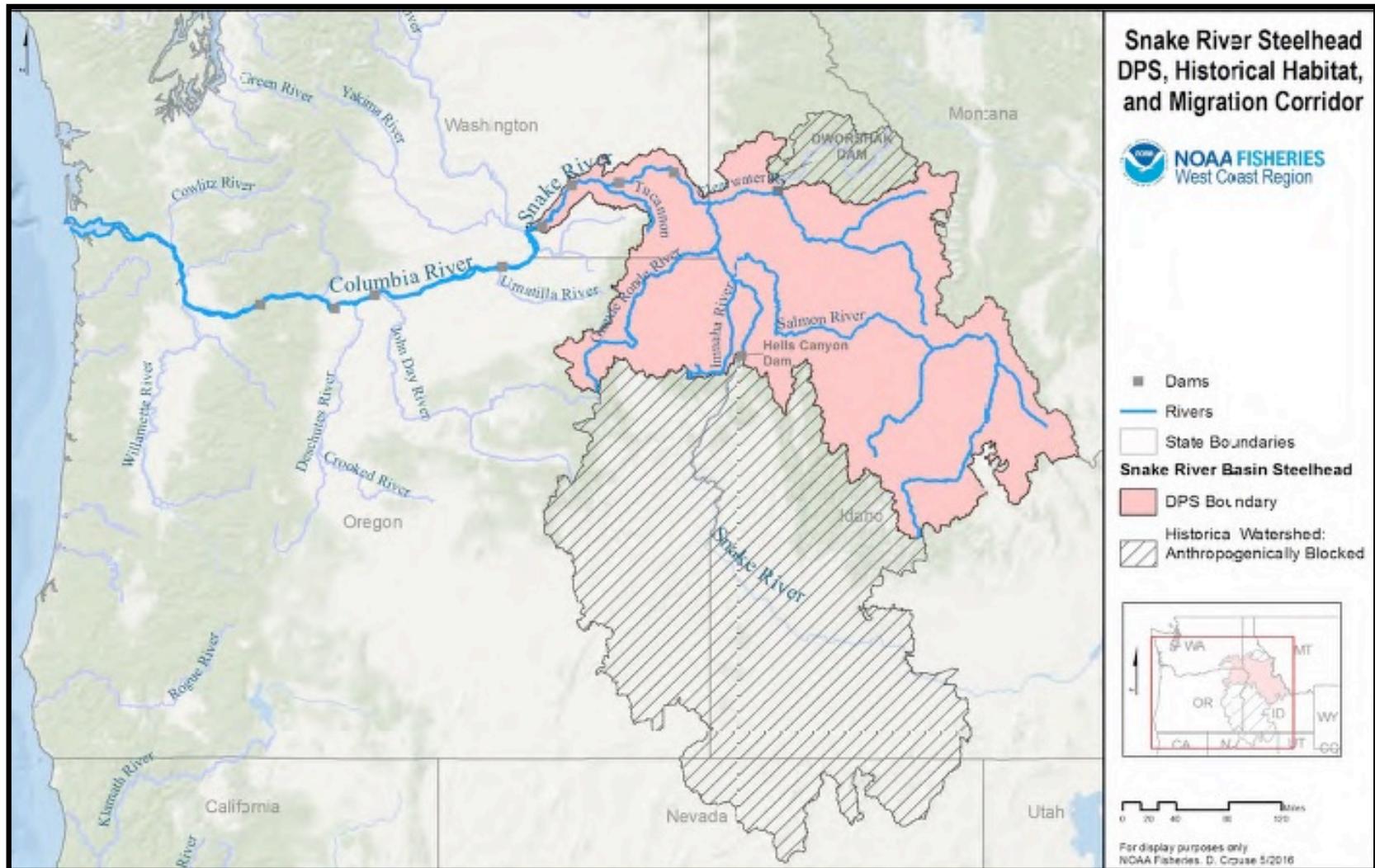
- What would most help you in improving future forecasts?

- General challenges

- In season management

Overview of system(s) being managed

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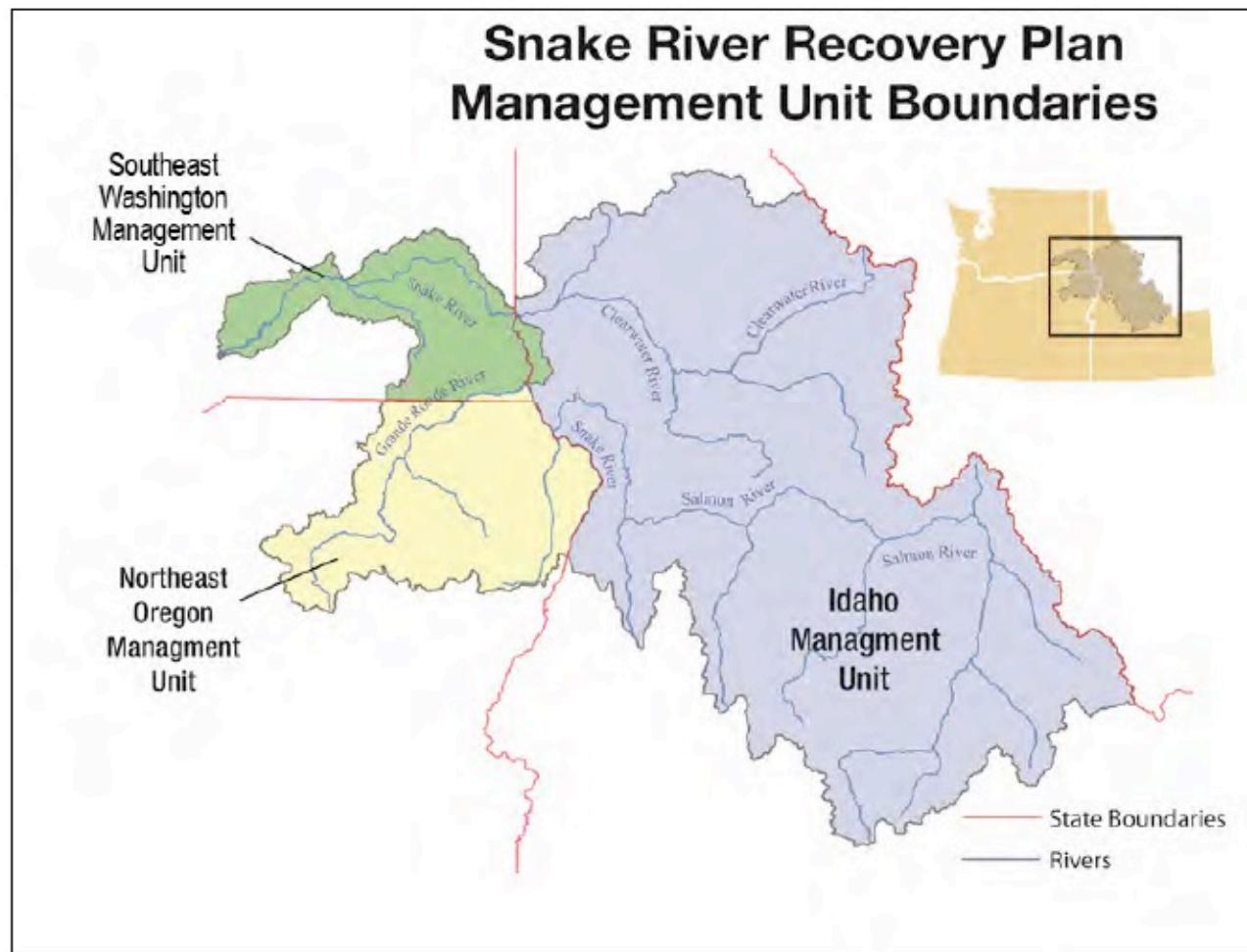
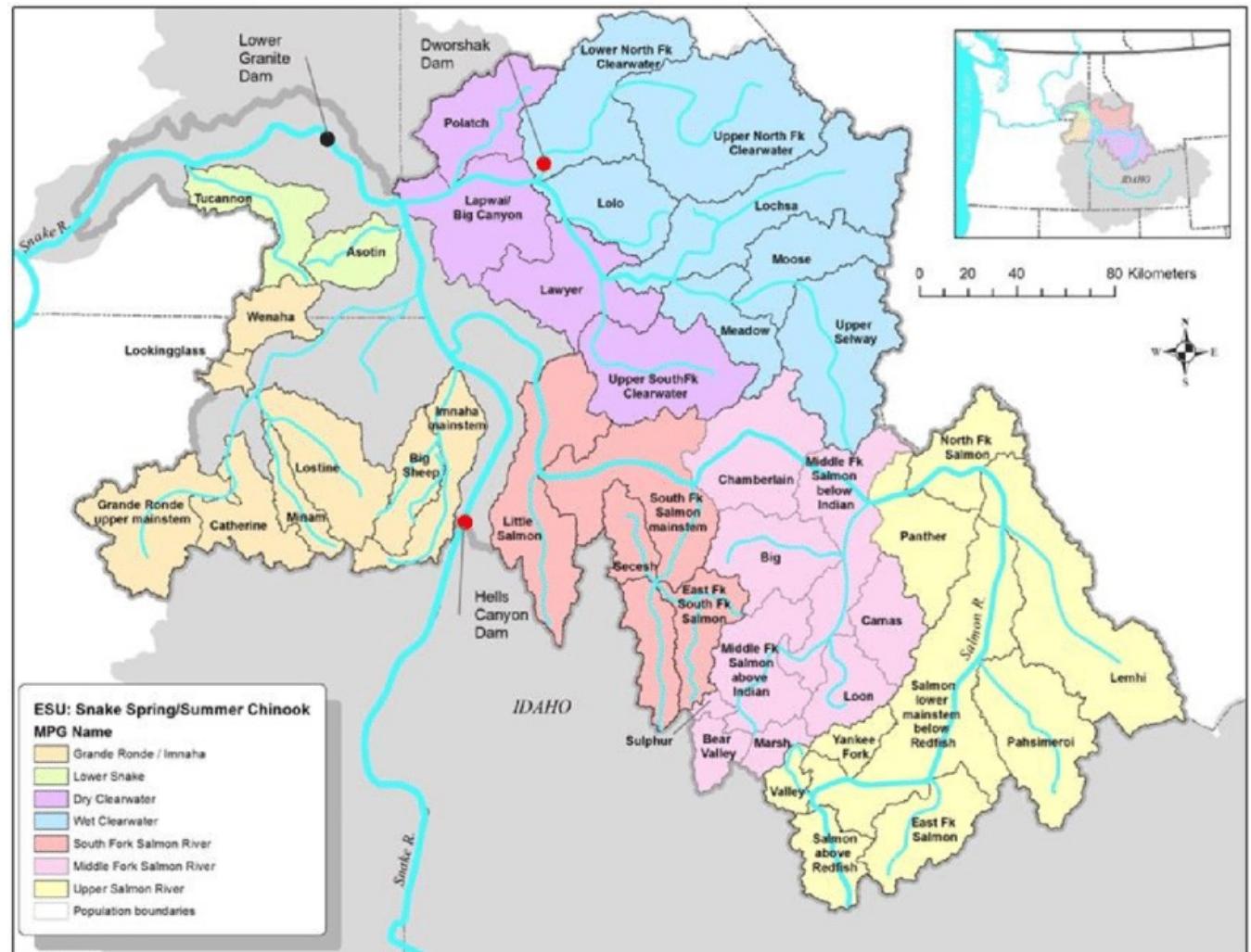


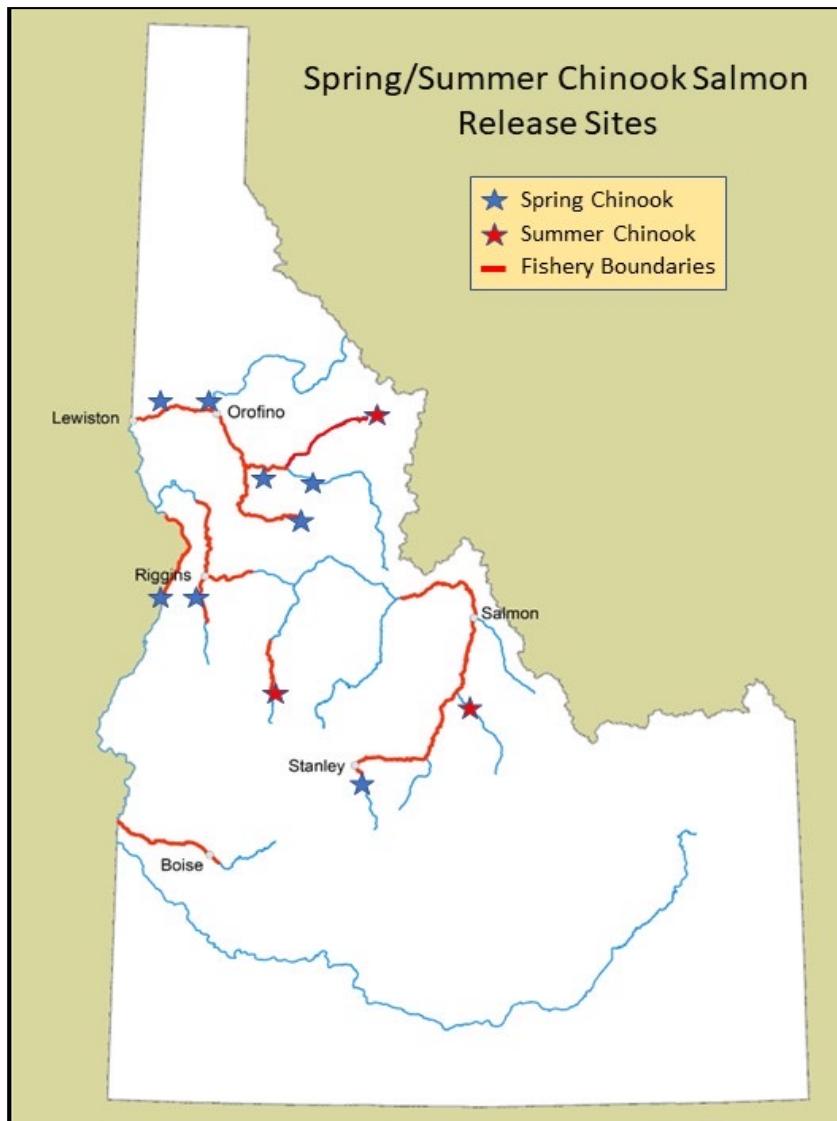
Figure 1-4. Snake River Recovery Domain Displaying the Idaho, Northeast Oregon, and Southeast Washington Management Units.

Overview of system(s) being managed

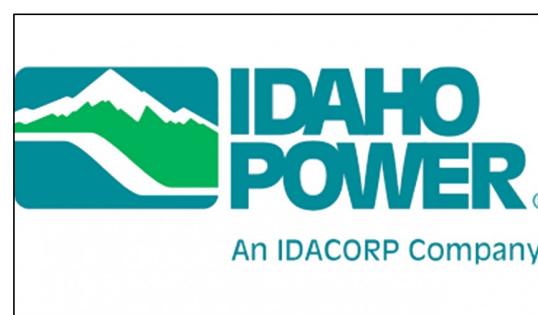
5 MPG's within ESU, all contain ESA listed stocks

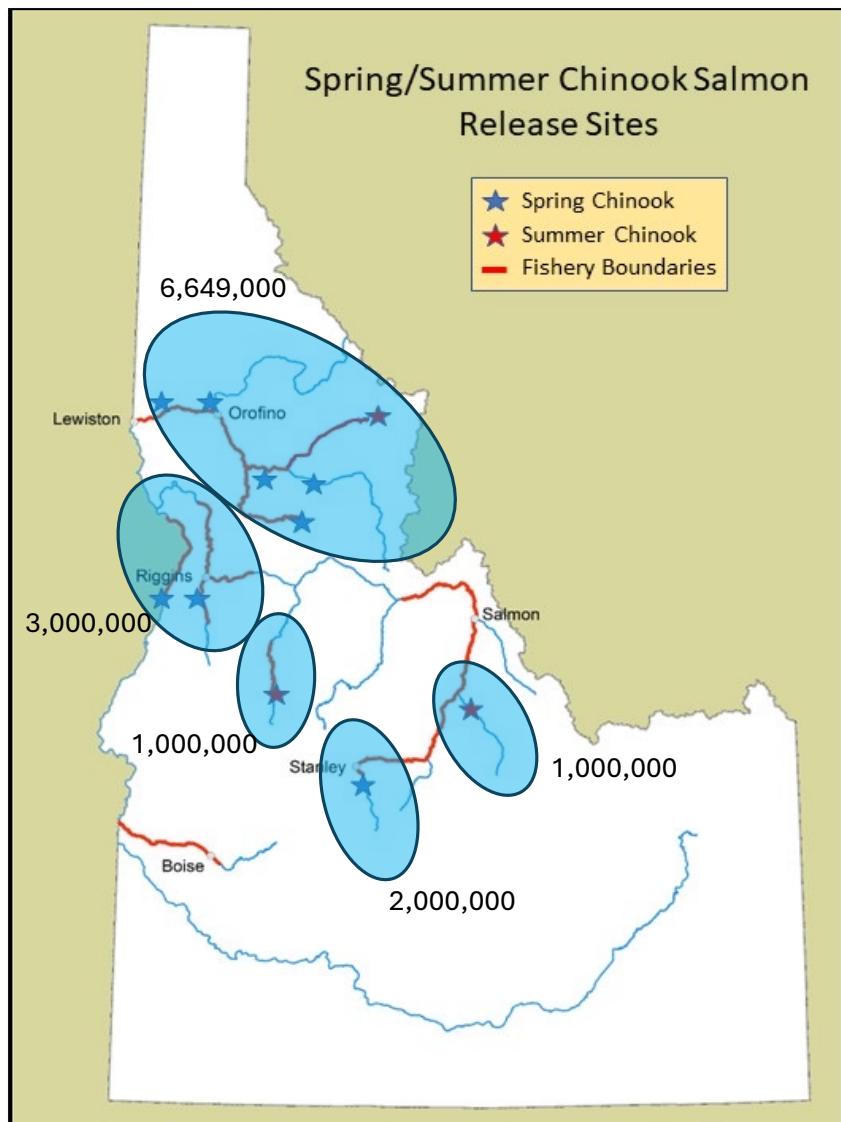


Overview of system(s) being managed



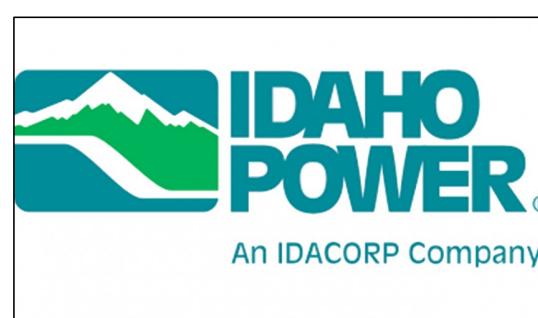
Mitigation Hatcheries





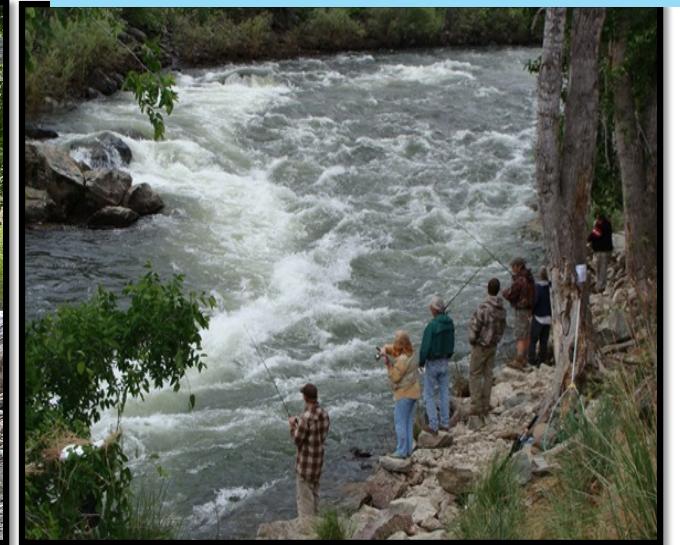
Overview of system(s) being managed

Mitigation Hatcheries



13,500,000+ hatchery smolts released

Overview of system(s) being managed



What data are available/used?

Run Reconstruction: Escapement at LGR using PBT and GSI

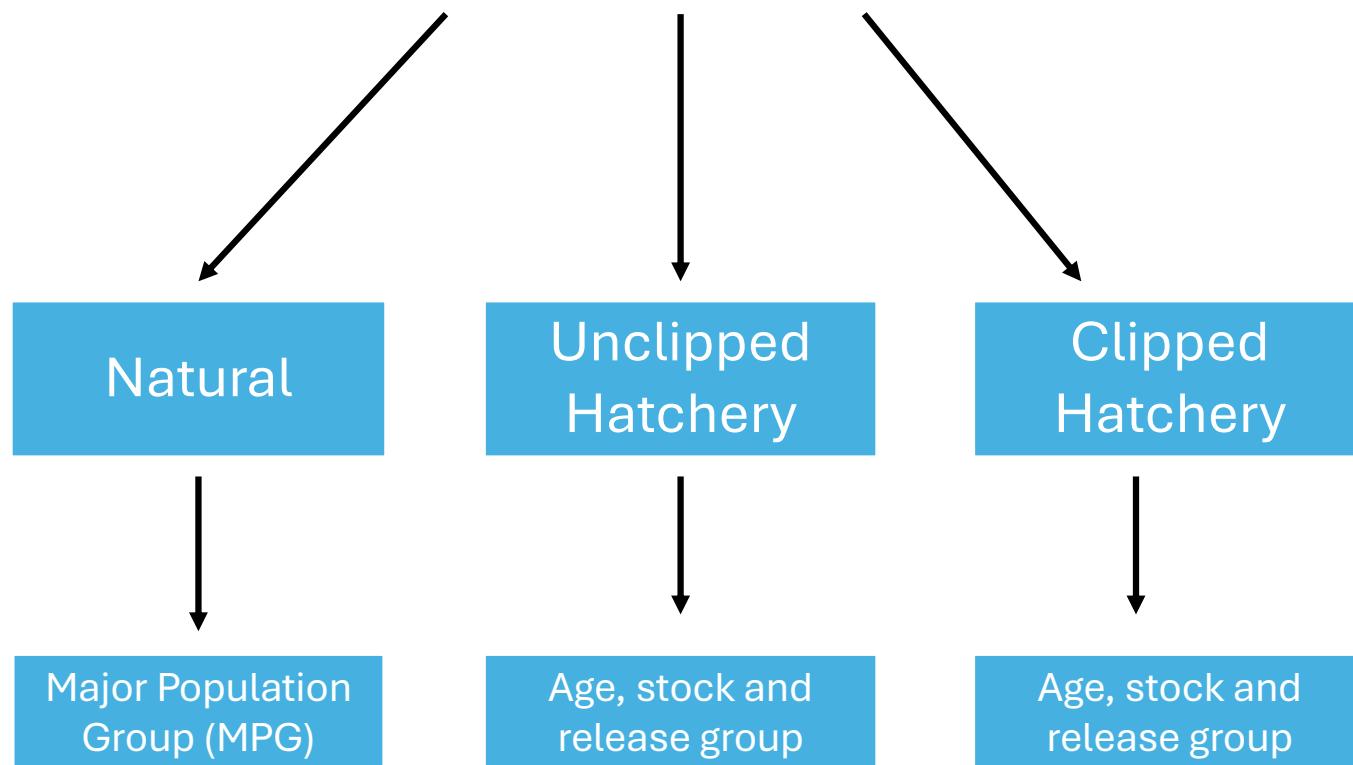
What data are available/used?

- Lower Granite Dam adult trap is operated 5 days/week throughout the adult migration
- Fin tissue is collected from all unclipped Chinook that are trapped (~ 20% sample rate)
- Fin tissue is collected from a subsample of the clipped hatchery fish trapped (2-8% sample rate)
- DNA is extracted from fin tissue for PBT/GSI analysis



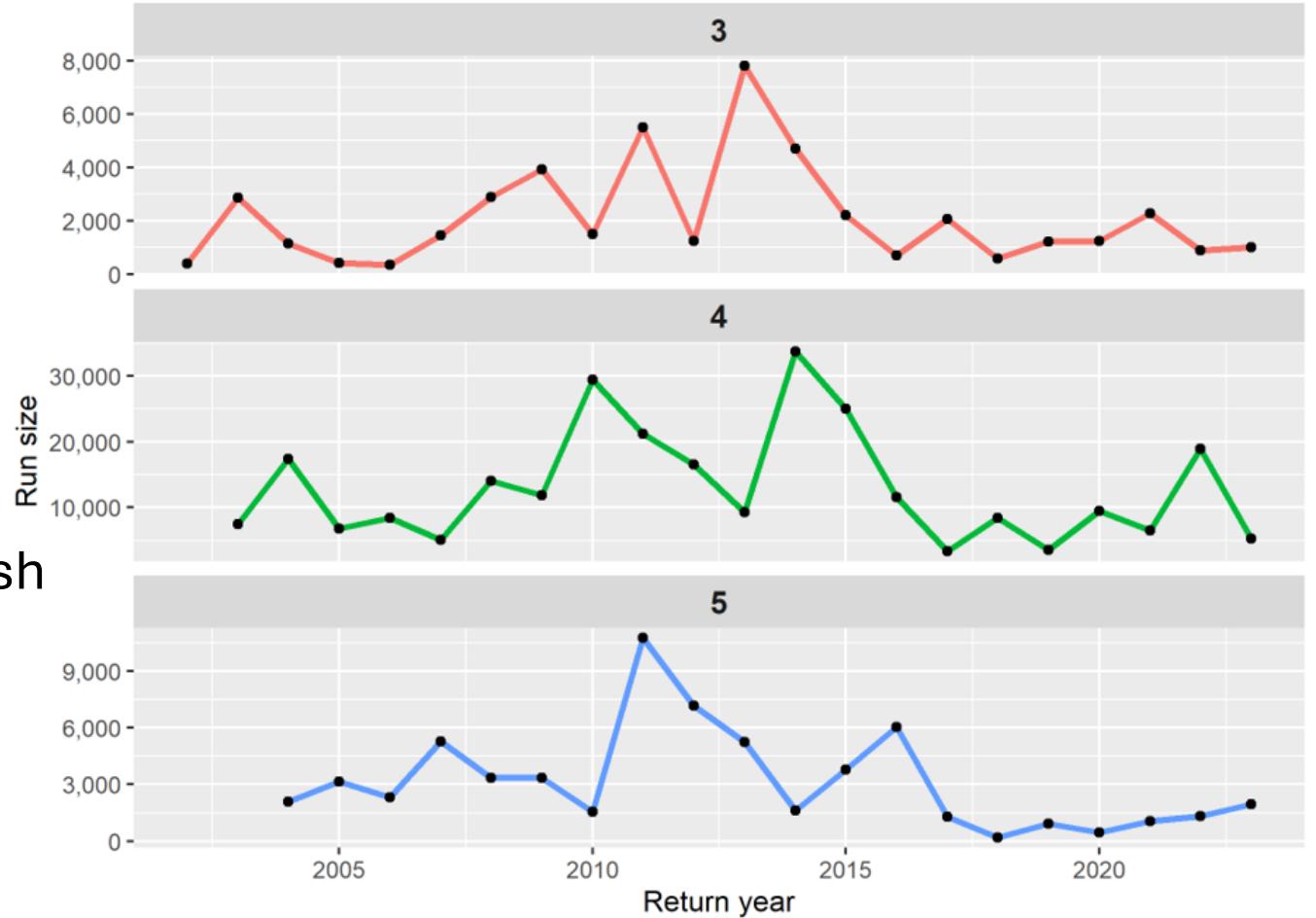
What data are available/used?

Lower Granite Dam Window Count



What data are available/used?

1.1. Snake wild returns by age class



Aggregate level forecasts for wild fish

Release site specific forecasts for hatchery fish

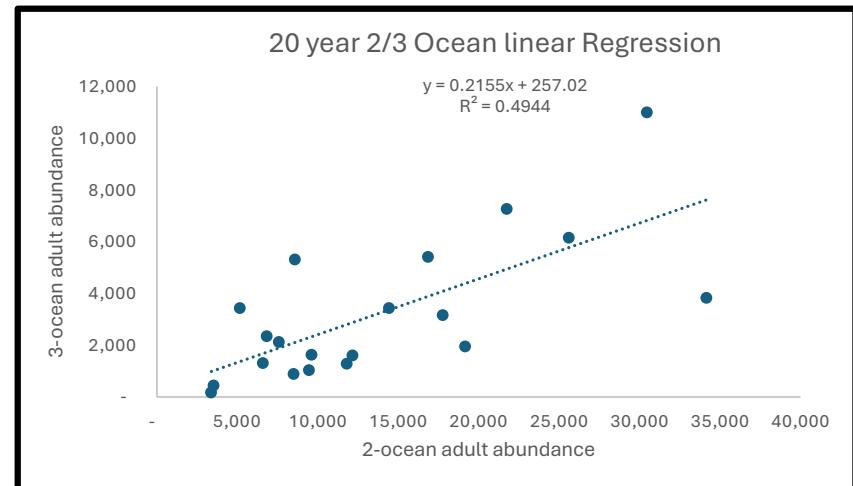
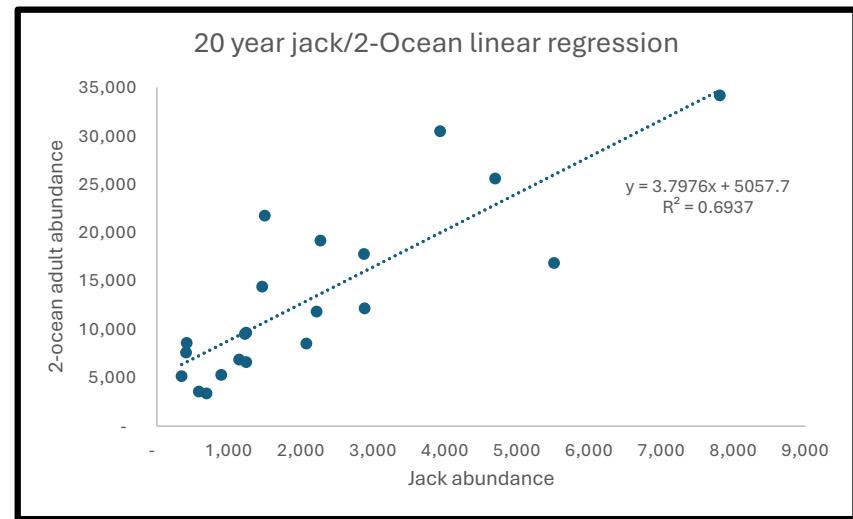
What type of analyses do you conduct?

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What analyses do we conduct?

Sibling regressions

- Previous year jack abundance predicts 2-ocean returns
- Previous year 2-ocean abundance predicts 3-ocean returns



Do you use your results to make management decisions?

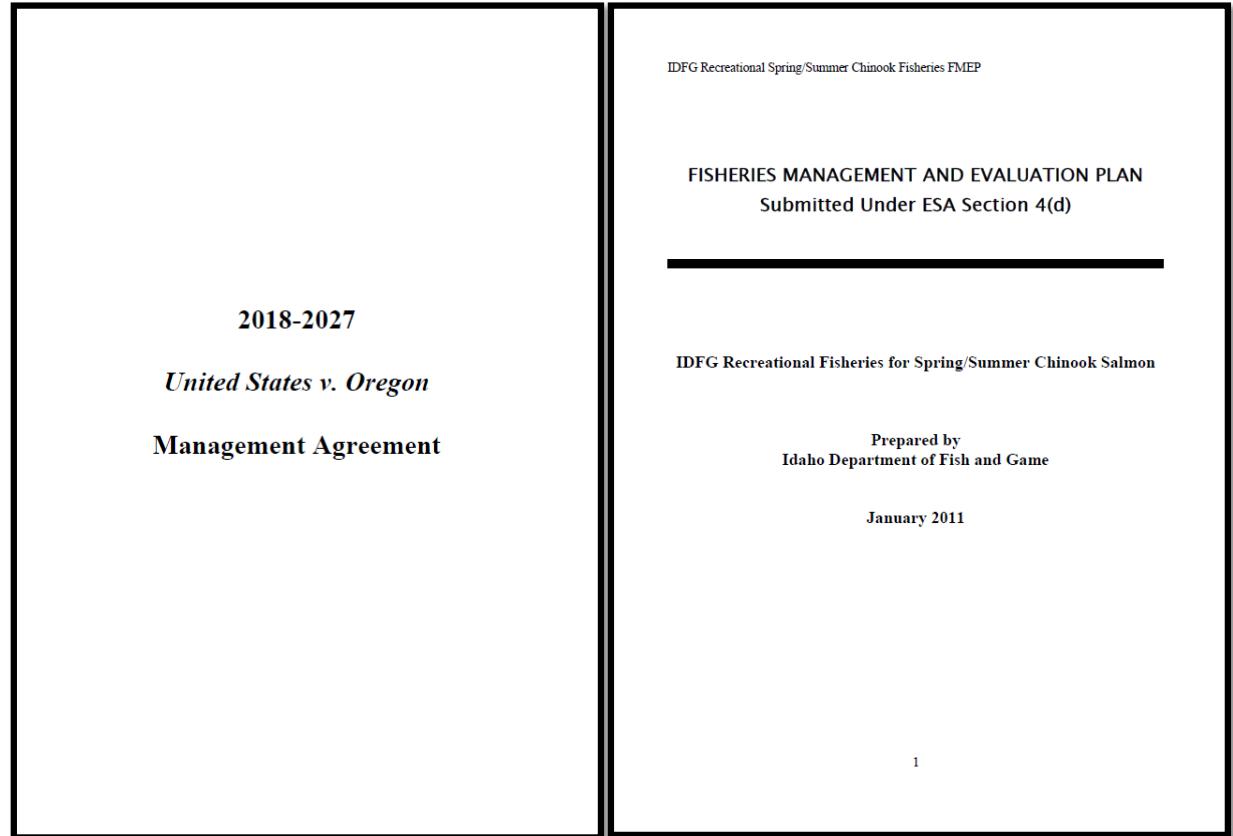
Do you use your results to make management decisions?



Do you use your results to make management decisions?

Using forecasts for fishery management

- Forecasts generated at the Columbia River Mouth (USvOR) and Lower Granite Dam (Snake Basin Management)



Do you use your results to make management decisions?

Columbia vs Snake R Forecasts

Columbia River Adult Salmon Returns: Actual and Forecasted*				
		2022 Forecast	2022 Return	2023 Forecast
Spring Chinook	Upriver Total for Spring Management Period	122,900	185,209	198,600
	Upper Columbia (total)	21,700	29,605	41,400
	<i>Upper Columbia natural-origin</i>	2,800	5,264	5,800
	Snake River Spring/Summer (total)**	73,400	103,025	85,900
	<i>Snake River natural-origin**</i>	13,200	23,331	13,200
	Mid-Columbia (by subtraction)	27,800	52,579	71,300
Summer Chinook	Upper Columbia Total for Summer Management Period	56,300	78,494	84,800
Sockeye	Total Annual Return	198,700	664,935	234,500
	Wenatchee	19,200	147,473	44,300
	Okanogan	175,700	513,317	187,400
	Yakima	3,500	157	100
	Deschutes	100	35	100
	Snake River	200	2,329	2,600

* Components may not sum due to rounding.
 ** 2021 return is based on standard TAC run reconstruction methodology. IDFG does not support the TAC methodology and has provided alternate estimates of 47,949 total adults, including 6,975 natural origin.

Ad-Clipped Hatchery Origin Adult Chinook Salmon Returns	Age Specific Returns of Adult Sp/Su Chinook Salmon		
	2023 Forecast at Lower Granite Dam		
	2 Ocn	3 Ocn	Total
Dworshak			
NF Clearwater	5,304	43	5,347
Kooskia	2,214	20	2,234
Clearwater			
Clear Cr.	2,181	37	2,219
SF Clearwater	3,287	86	3,373
Selway	233	8	240
Powell (Su)	418	13	431
NF Clearwater	1,205	76	1,282
NPTH			
Onsite	188	159	347
Clearwater Total	15,030	442	15,472
Rapid River			
Rapid River	13,080	894	13,974
Little Salmon R.	1,046	0	1,046
Hells Canyon	2,616	0	2,616
McCall	5,617	363	5,980
Pahsimeroi	975	70	1,045
Sawtooth	2,192	122	2,314
Yankee Fork	342	13	355
Salmon / ID Snake	25,867	1,463	27,330
Idaho Hatchery Total	40,897	1,905	42,802

Downriver (i.e., Columbia R) fisheries – Snake River natural origin

Upriver (i.e., Snake Basin) fisheries
Natural and hatchery origin forecasts

Do you use your results to make management decisions?

Fishery Management in US v OR (Columbia R)

Table 1. Upriver 2023 TAC forecasts of Chinook and Sockeye Salmon

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Harvest Rate Schedule for Chinook in Spring Management Period							
A	B	C	D	E	F	G	H
Total Upriver Spring and Snake River Summer Chinook Run Size ⁶	Snake River Natural Spring/Summer Chinook Run Size ¹	Treaty Zone 6 Total Harvest Rate ^{2,5}	Treaty Catch Guideline	Non-Treaty Natural Harvest Rate ³	Non-Treaty Natural Harvest Rate ³	Total Natural Harvest Rate ⁴	Non-Treaty Natural Limited Harvest Rate ⁴
<27,000	<2,700	5.0%		<0.5%		<5.5%	0.5%
27,000	2,700	5.0%	1,350	0.5%	1,350	5.5%	0.5%
33,000	3,300	5.0%	1,650	1.0%	1,650	6.0%	0.5%
44,000	4,400	6.0%	2,640	1.0%	2,640	7.0%	0.5%
55,000	5,500	7.0%	3,850	1.5%	3,850	8.5%	1.0%
82,000	8,200	7.4%	6,068	1.6%	6,068	9.0%	1.5%
109,000	10,900	8.3%	9,047	1.7%	9,047	10.0%	
141,000	14,100	9.1%	12,831	1.9%	12,831	11.0%	
217,000	21,700	10.0%	21,700	2.0%	21,700	12.0%	
271,000	27,100	10.8%	29,268	2.2%	29,268	13.0%	
326,000	32,600	11.7%	38,142	2.3%	38,142	14.0%	
380,000	38,000	12.5%	47,500	2.5%	47,500	15.0%	
434,000	43,400	13.4%	58,156	2.6%	58,156	16.0%	
488,000	48,800	14.3%	69,784	2.7%	69,784	17.0%	

Do you use your results to make management decisions?

Fishery Management in Snake River basin

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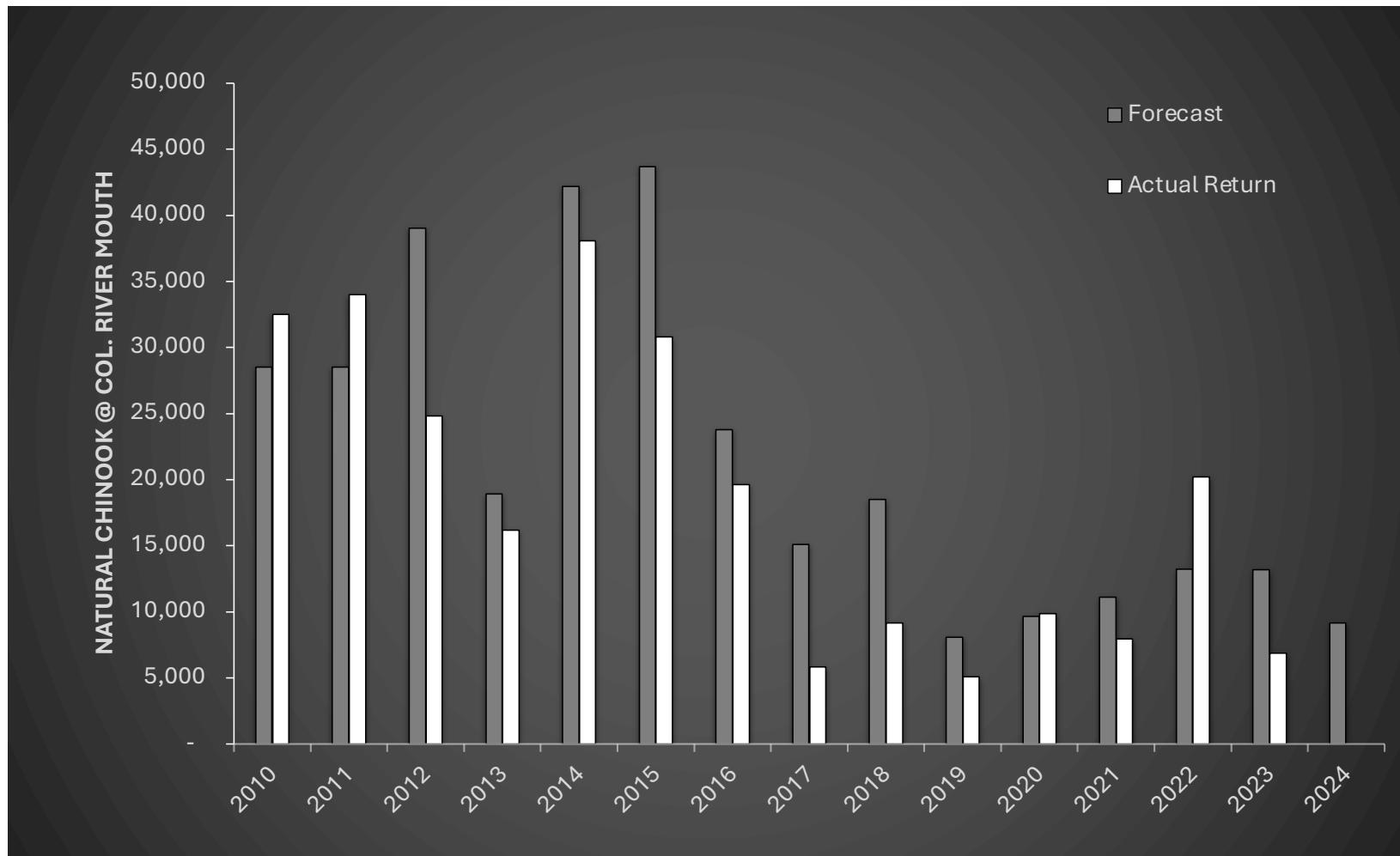
Hatchery and natural-origin forecasts used to set seasons

In-season updates used to modify season structure and harvest targets

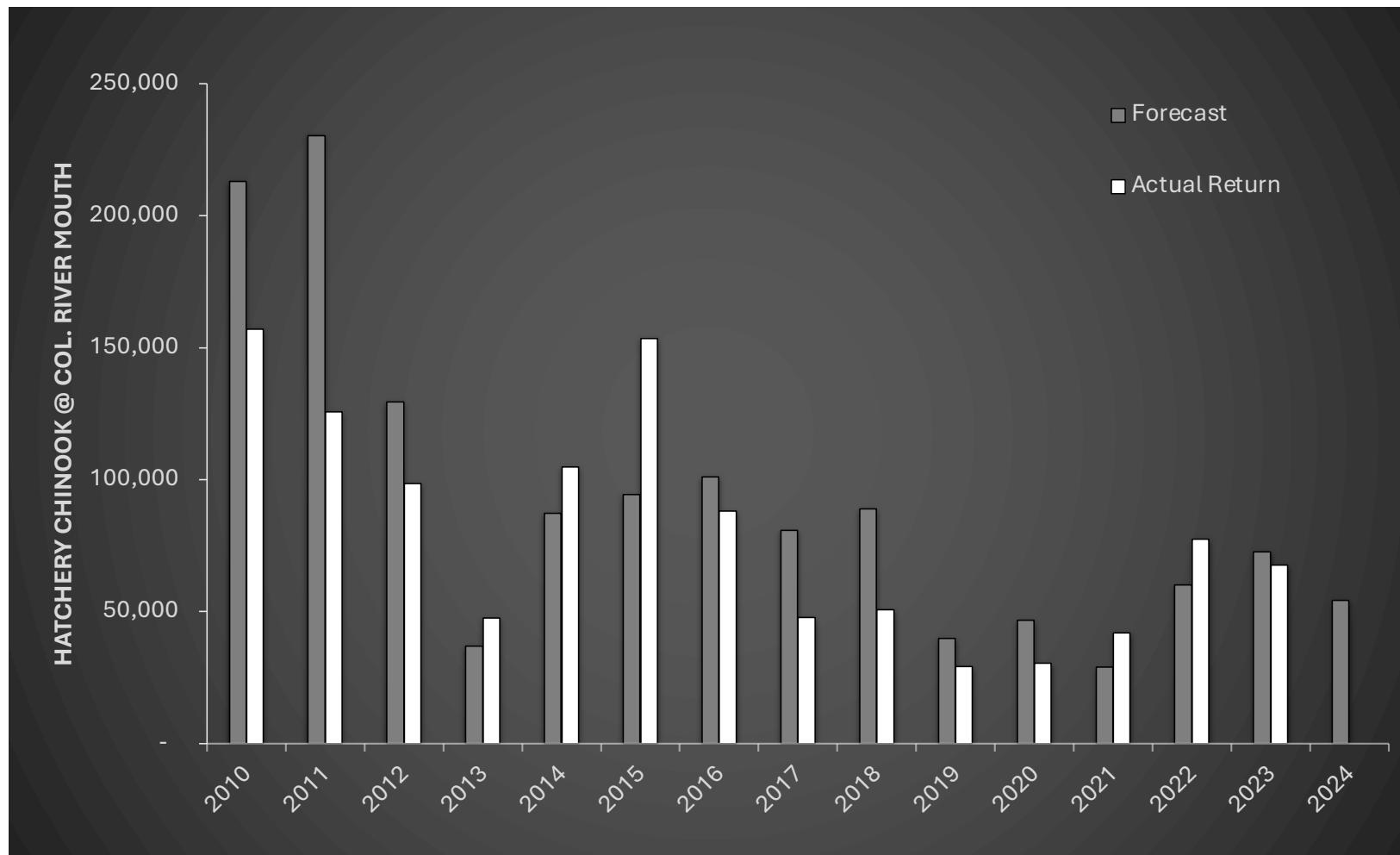
Natural Population	2023 Preseason Forecast at Granite
Marsh Creek	556
Bear Valley Creek	804
Sulphur Creek	120
Camas Creek	78
Loon Creek	80
Big Creek	262
Chamberlain Creek	153
Middle Fork Salmon River below Indian Creek	8
MF SALMON MPG TOTAL	2,060
South Fork Salmon River Mainstem	581
East Fork South Fork Salmon River	581
Secesh River	581
SF SALMON MPG TOTAL	1,743
Salmon River Upper Mainstem above Redfish Lake	726
Salmon River Lower Mainstem below Redfish Lake	96
Valley Creek	183
Yankee Fork	27
East Fork Salmon River	338
Pahsimeroi River	217
Lemhi River	408
North Fork Salmon River	90
Panther Creek	72
UP SALMON MPG TOTAL	2,156
HELLS CANYON MPG TOTAL	4,348
GRAND TOTAL	10,307

How well do forecasts perform?

How well do forecasts perform?



How well do forecasts perform?

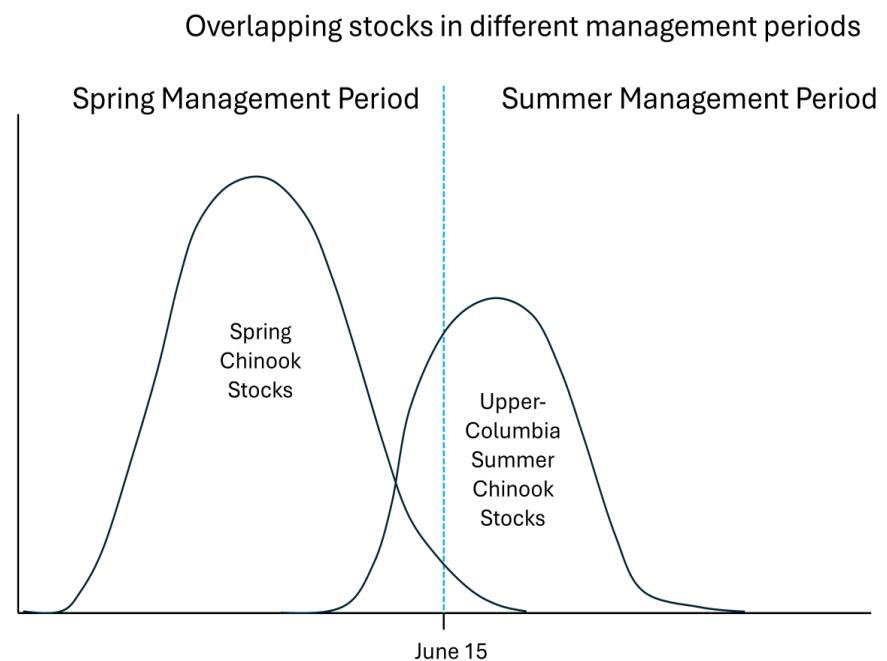


What would most help you in improving future forecasts?

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Improving Forecasts

- Better run reconstructions?
 - Stock-specific for USvOR instead of time based

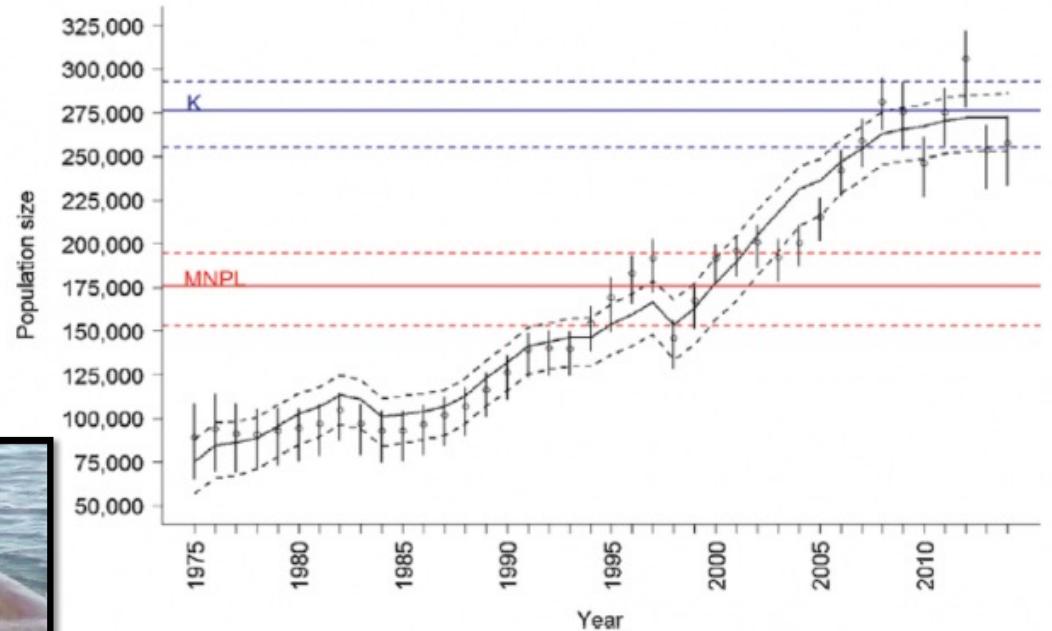


Improving Forecasts

- Better run reconstructions?
 - Stock-specific for USvOR instead of time based
 - Account for all sources of mortality



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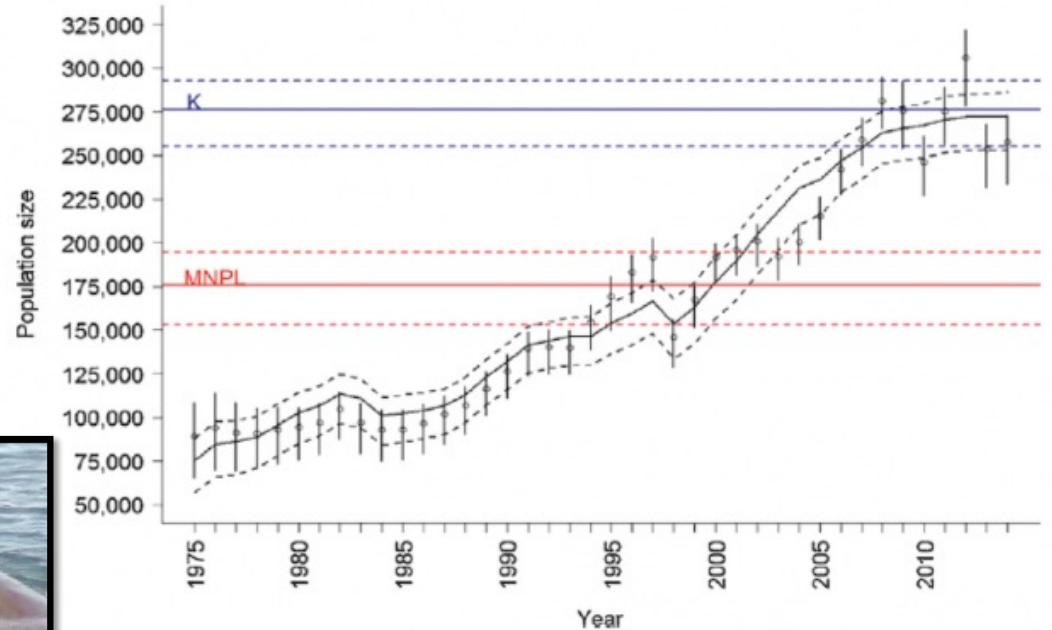


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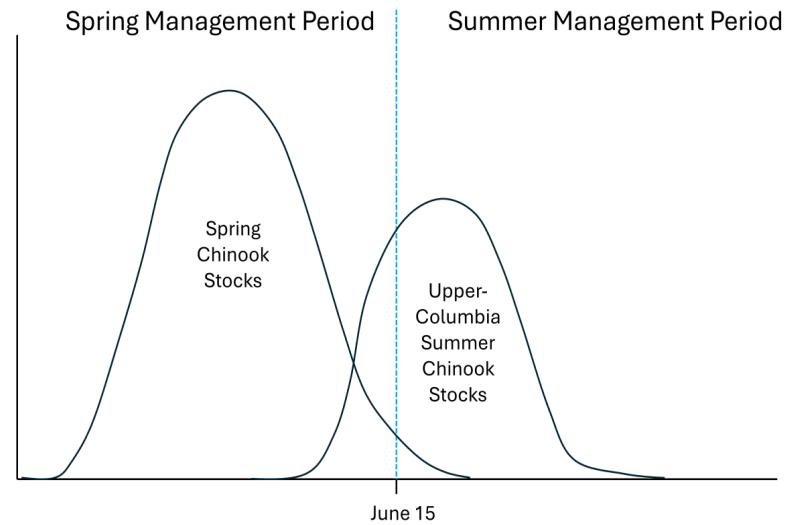
10-40% of spring Chinook can be lost to pinniped predation below Bonneville Dam

General challenges?

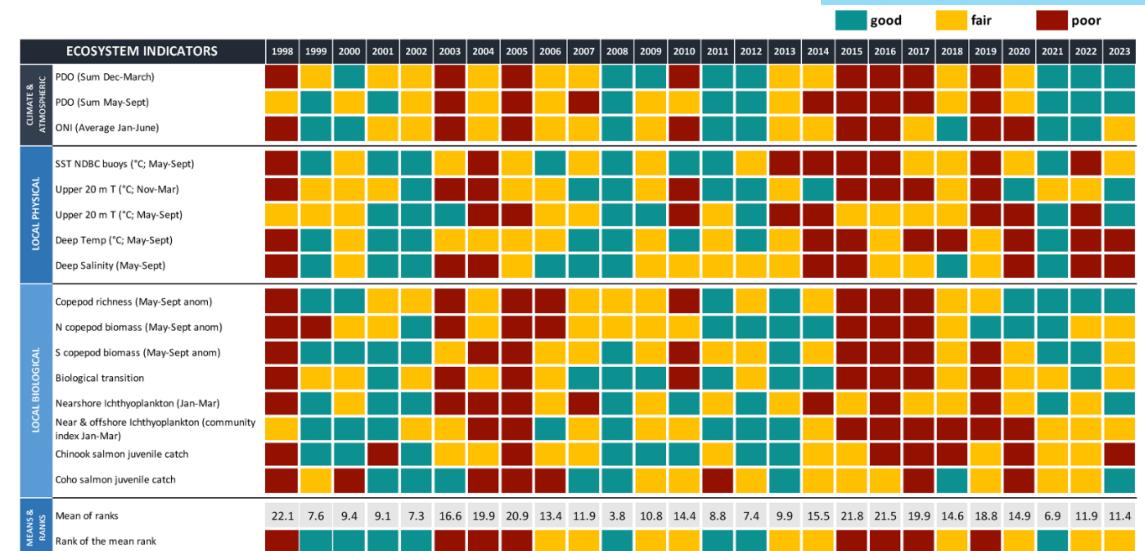
Columbia R Management

- Predicting run size for a subset of the population within a management period

The Problem: Overlapping stocks in different management periods



General challenges



Columbia R Management

- Predicting run size for a subset of the population within a management period
- Predicting the effects of change:
 - Ocean conditions
 - Predator base
 - Migratory corridor



General challenges

Snake Basin Management

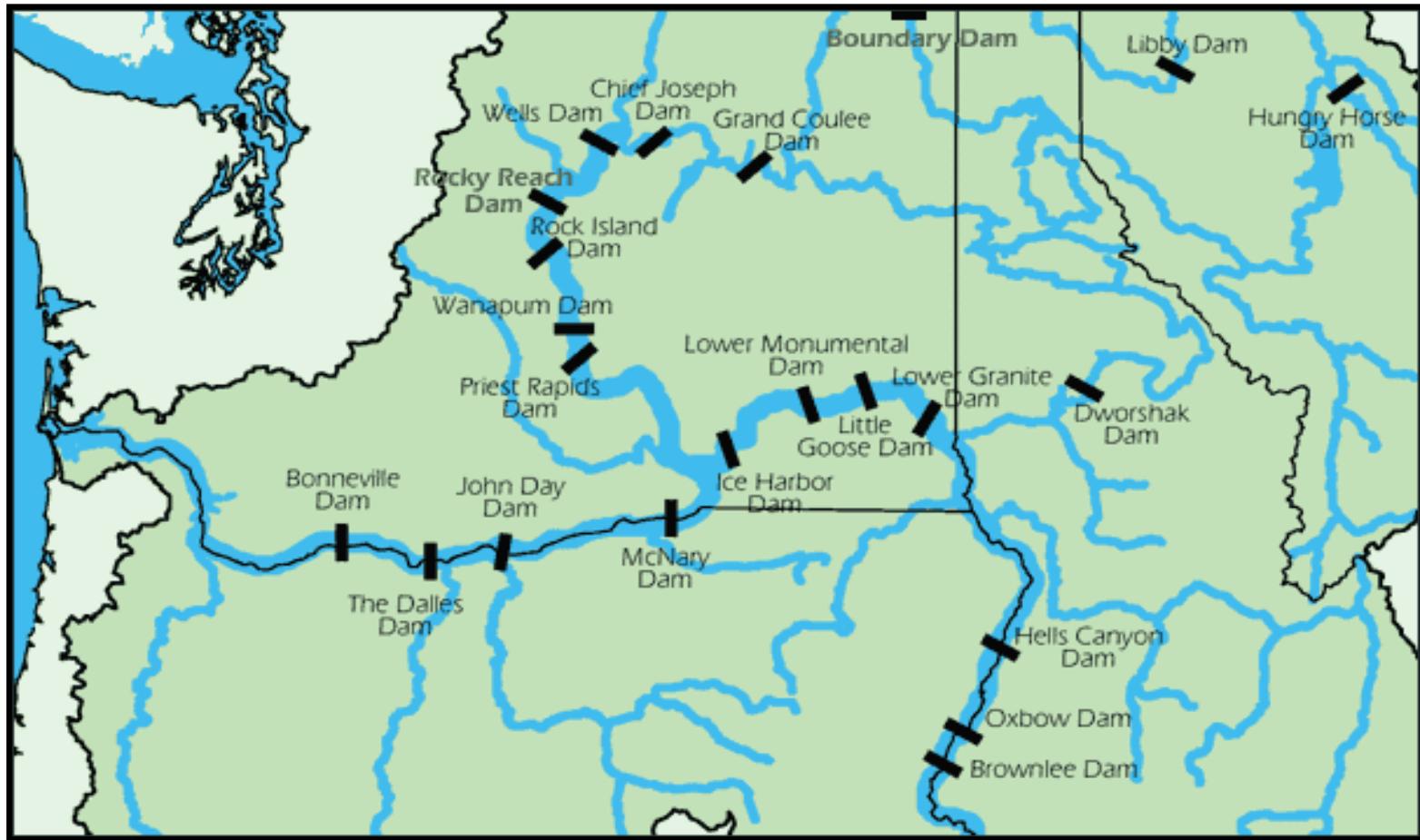
- Predicting the impact of Columbia River harvest and river conditions on survival through hydrosystem



Estimating abundance in-season

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Estimating Abundance In-season



Estimating abundance in-season

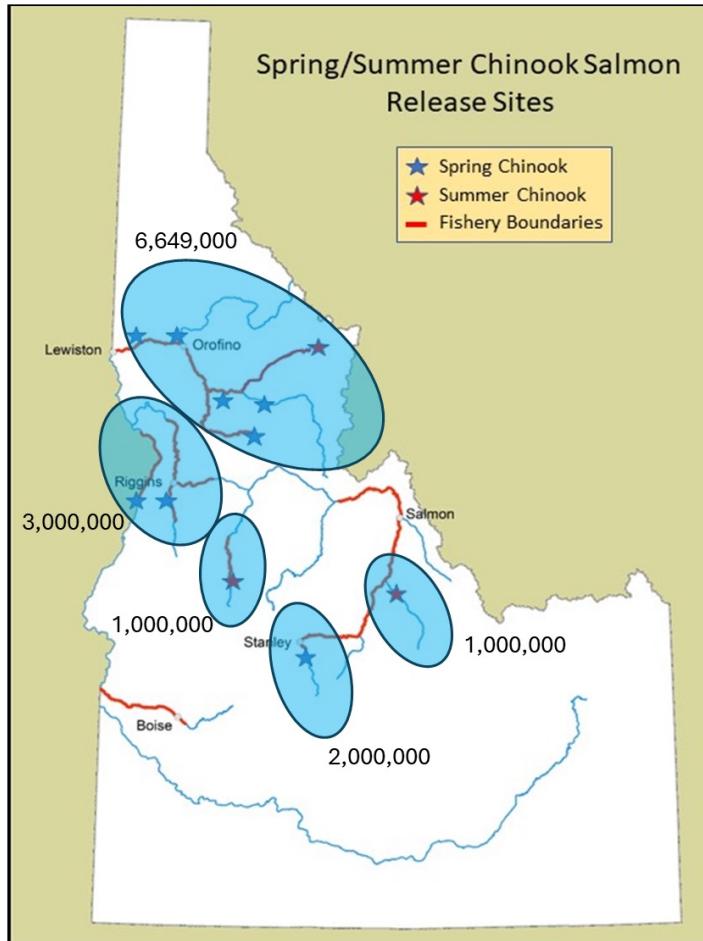
Estimating Abundance In-season



<https://www.nwcouncil.org/reports/columbia-river-history/fishpassage/>

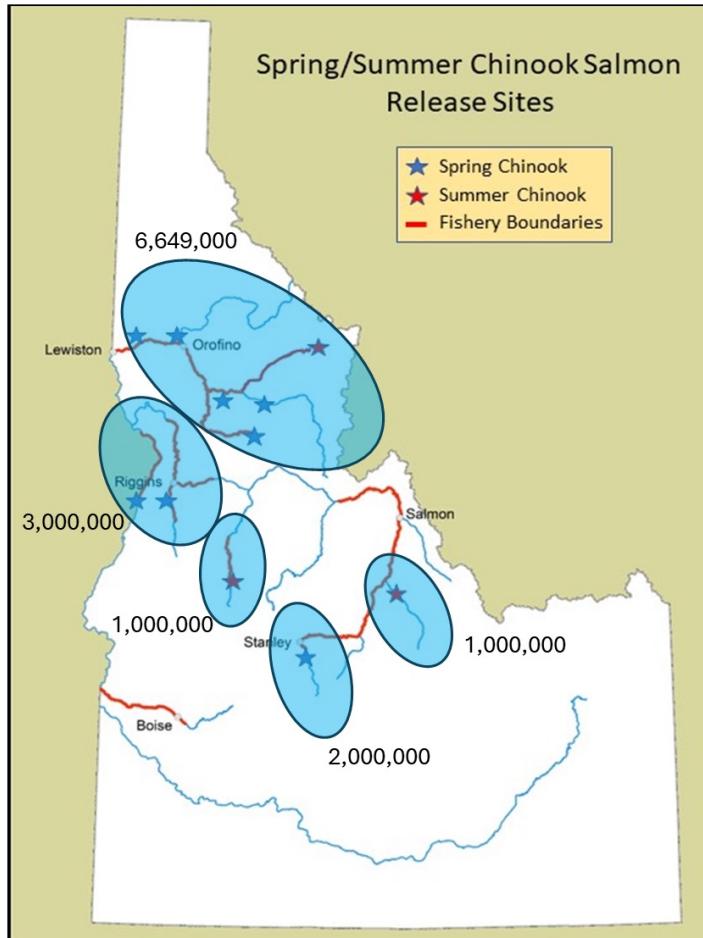
Estimating abundance in-season

Estimating Abundance In-season



All Snake Basin hatchery stocks are PIT-tagged and PBT tagged

Estimating Abundance In-season



PIT tags are expanded by juvenile tagging rate to estimate abundance at Columbia and Snake River dams

Adult Chinook associated with PIT groups

Release Group	Granite Pre-Season Forecast	Current Lower Granite Estimate	Broodstock Need	Estimated Harvestable Share Above LGD
Dworshak	2,561	1,469	1,134	167
Kooskia	1,941	412	619	-103
Lolo Cr		1	0	0
CFH-Selway	302	229	268	-58
CFH-Red River	2,060	852	733	59
CFH-Clear Creek	1,753	537	424	57
CFH-NF Clearwater	2,025	456	0	228
NPTH (ad-clipped)	184	60	483	-50
Total Clearwater River (Springers)	10,826	4,015	3,661	301
Powell (summers)	608	228	440	-106
Total Clearwater River (Summers)	608	228	440	-106
Hells Canyon	1,541	698	278	210
Total Snake River	1,541	698	278	210
Rapid River	8,982	3,844	1,974	935
Little Salmon	712	308	119	94
RR and LS Combined	9,694	4,152	2,093	1,029
Sawtooth	1,678	1,608	966	321
Yankee Fork	110	228	0	114
Pahsimeroi	317	200	664	-232
McCall SFSR	1,226	532	897	-183
Total Salmon R.	13,025	6,719	4,620	1,049
TOTAL	26,000	11,661	8,999	1,455

Estimating abundance in-season

Lower Granite Dam Adult Trap



Lower Granite Dam Adult Trap

- 20% of run is handled/sampled
 - Updated wild estimates
- “Real-time” genetic analysis
 - Updated PIT tag expansion rates
- Information is used to directly manage fisheries to stay within harvest shares and ESA impact rates



Questions?

