April 27, 2021

MEMORANDUM

TO: **Council Members**

FROM: **Patty O'Toole, Fish and Wildlife Division Director**

SUBJECT: **Nez Perce Tribe staff presentation on their analysis of Snake River Basin Chinook and Steelhead – Quasi-Extinction Threshold and Call to Action**

BACKGROUND:

Presenter: Dave Johnson, Department Manager, Nez Perce Tribe Department of Fisheries Resources Management
Jay Hesse, Director of Biological Services
Ryan Kinzer, Research Scientist

Summary: Fisheries staff from the Nez Perce Tribe will present the results of their study on Snake River Basin spring/summer Chinook and steelhead population extinction risk to the Fish and Wildlife Committee at the May Committee meeting.

Relevance: This presentation is relevant to recent updates on salmon and steelhead return abundance, forecasts for 2021 and the status of ocean growth and survival conditions.

Background:

In March, the Council heard the report for the 2020 Columbia River salmon and steelhead returns and the forecasts for 2021 returns. Returns of spring and summer Chinook over the last few years have declined throughout the basin. The Council also heard in March that ocean conditions have been either poor or mixed for the last several

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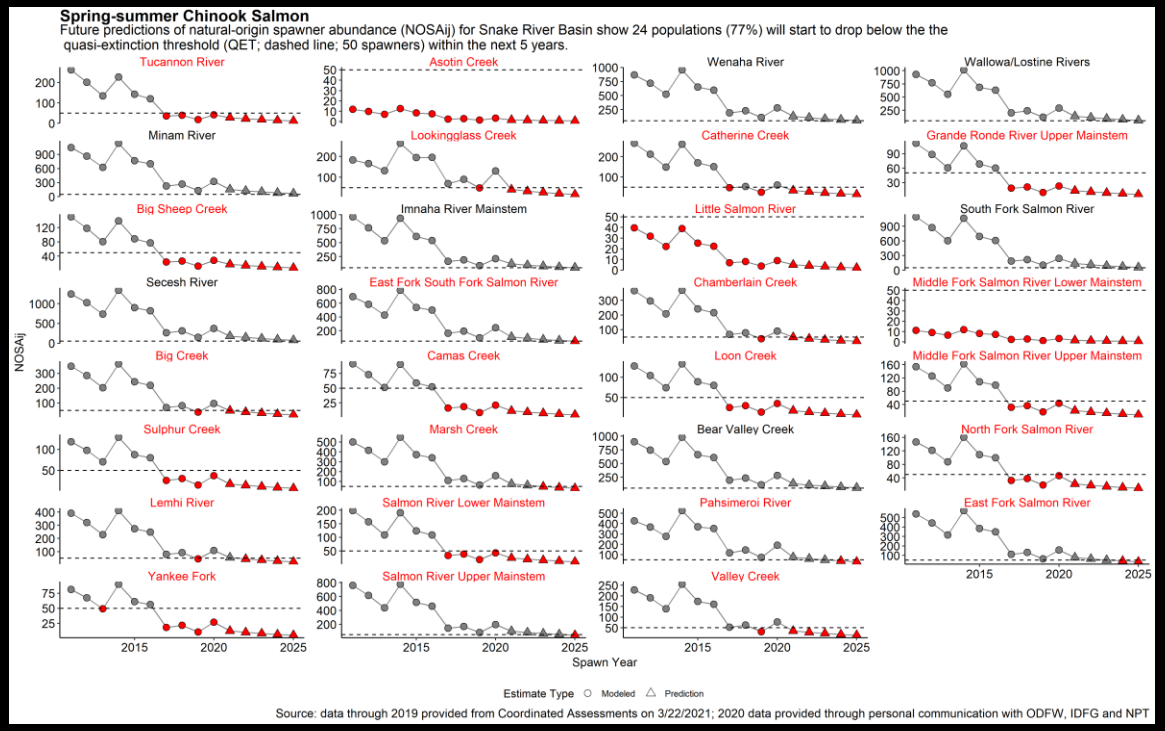
years. Some ocean indicators, such as copepod biomass and richness are showing some improvement, but with the increasing frequency of marine heatwaves, fisheries managers remain watchful and concerned.

In light of these declining returns, staff from The Nez Perce Tribe analyzed Snake River Basin spring/summer Chinook and steelhead population extinction risk and have requested an opportunity to present their results to the Fish and Wildlife Committee at the May Committee meeting (see attached). Tribal staff notes their results are troubling and the status of these populations requires emergency actions, in addition to what is already being done in the basin. A similar call to action occurred when the fish were first listed under the ESA and involved captive broodstock programs and gene-banking. The Tribe views survival improvements in the freshwater and early-ocean phase of their life cycle as essential to keeping these fish on the spawning grounds, especially during poor ocean conditions.

In January the Council heard a presentation from Mike Ford and Rob Markle of NOAA Fisheries regarding their 5-year Status Review for salmon and steelhead within the Columbia River Basin. Members may recall the review process involves two primary components: 1) the Viability Assessment and report from the Northwest Fisheries Science Center and 2) the 5-year status review report from the West Coast Regional Office. These processes occur in parallel, however the viability report will inform deliberations and findings at the regional office to be memorialized in the final 5-year status review report. The viability assessment is based on the prior 5-year period of available data and information. It does not forecast or predict future viability. Council staff has been informed that the final 5-year report is expected late this calendar year.

More information: see attached.

Snake Basin Chinook and Steelhead Quasi-Extinction Threshold Alarm and Call to Action



- **42% of the Snake Basin spring/summer Chinook populations have natural origin spawner abundance currently at or below QET (50)**
- **77% of the populations predicted to drop below critical level of 50 spawners by 2025**

"We are the circle. That's what life is all about. We take care of one another. So when we have someone in trouble, that's when the rest of us have to step in."

—Elmer Crow, Nez Perce

What is Quasi-Extinction?

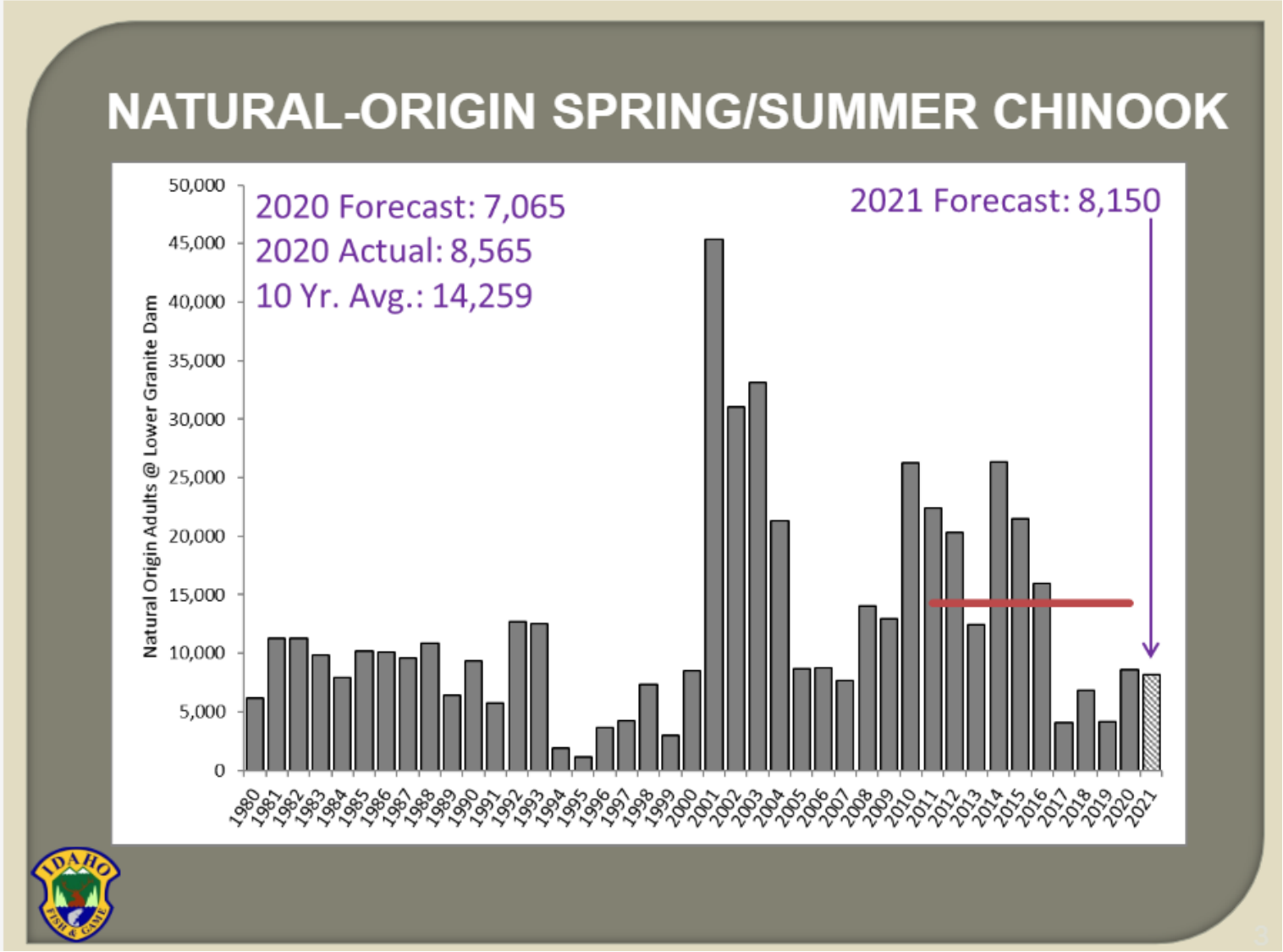
Abundance threshold for risk assessment and/or management intervention

- Adult salmon abundance in a population nearing absolute extinction.
- A state where the risk of extinction cannot be modeled but is considered to be unacceptably high.
- A population that is uncertain to persist.
- Probability of recovery low without substantial intervention.

Snake River Salmon and Steelhead Returns

IDFG Presentation to NPCC March 2021

https://nwcouncil.app.box.com/s/h0iyex0w1oo9m98fv4hojmzv0qogibpi (Slide 3)



Management Goals and Thresholds

Snake Basin Spring/summer Chinook Salmon
38 Extant (32 listed and 6 non-listed) Populations

Desired - Healthy and Harvestable – CBP, NPCC

- Range from 2,000 to 8,000 per population.
- 179,000 escapement at Lower Granite Dam, excluding blocked areas (235,000 with blocked areas).
- Aggregated values for Snake Basin populations = 121,000 (124,000 including Tucannon).

Delisting – Minimum Abundance Threshold (MAT) – NOAA

- Range from 500 to 2,000 per population.
- Aggregated values for Snake Basin populations = 30,000 (29,250 at Lower Granite Dam).

Critical - Quasi-Extinction Threshold (QET) - NOAA

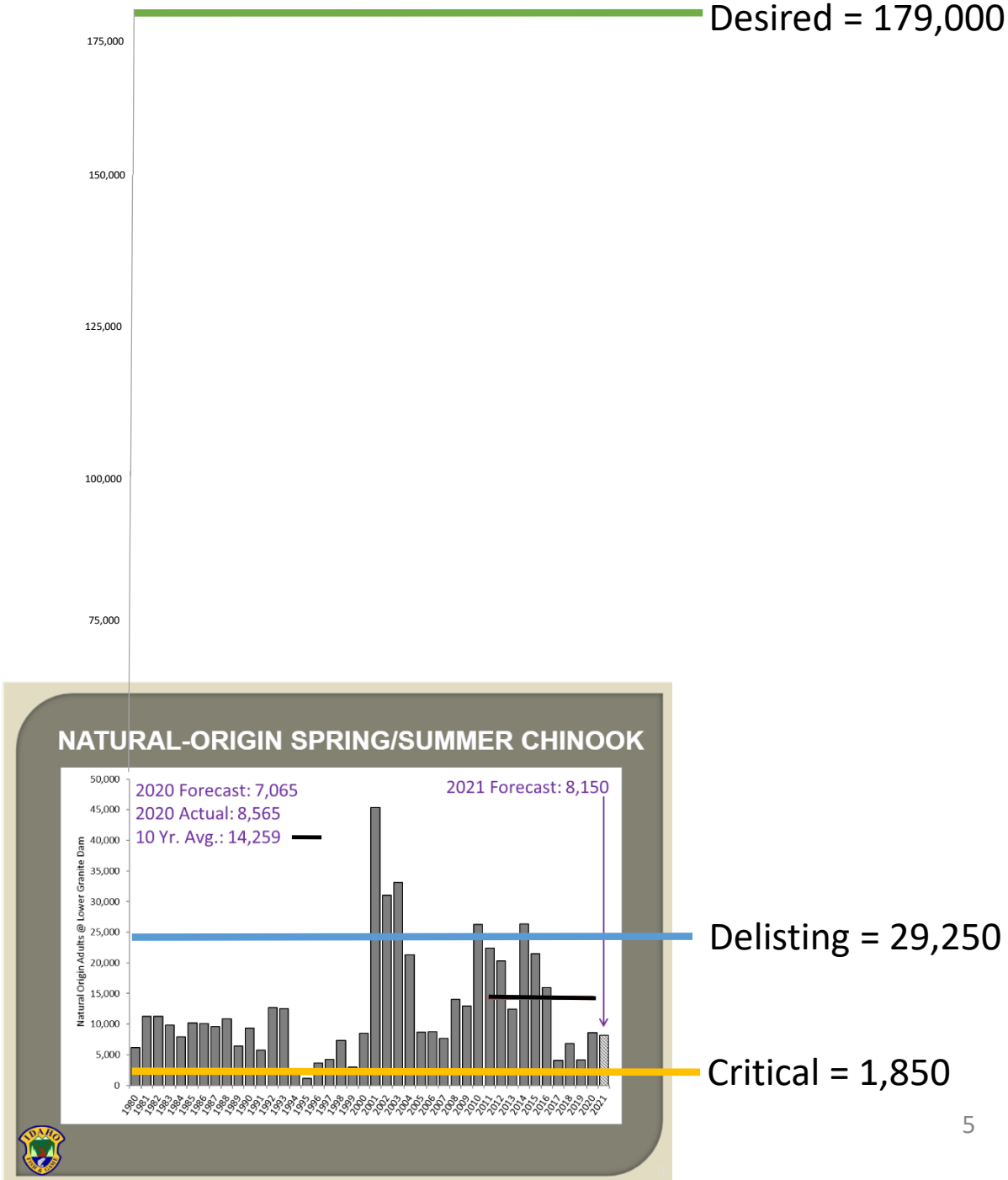
- 50 or fewer spawners within a population for four consecutive years.
- Aggregated values for Snake Basin populations = 1,900 (1,850 at Lower Granite Dam).

Extirpation - Functionally Extinct or Absolute Extinction

- One or fewer adults in each year of cohort/generation

Snake River Chinook Salmon Returns Relative to Aggregated Population Management Goals and Thresholds

Modified from IDFG March 2021 Presentation to NPCC

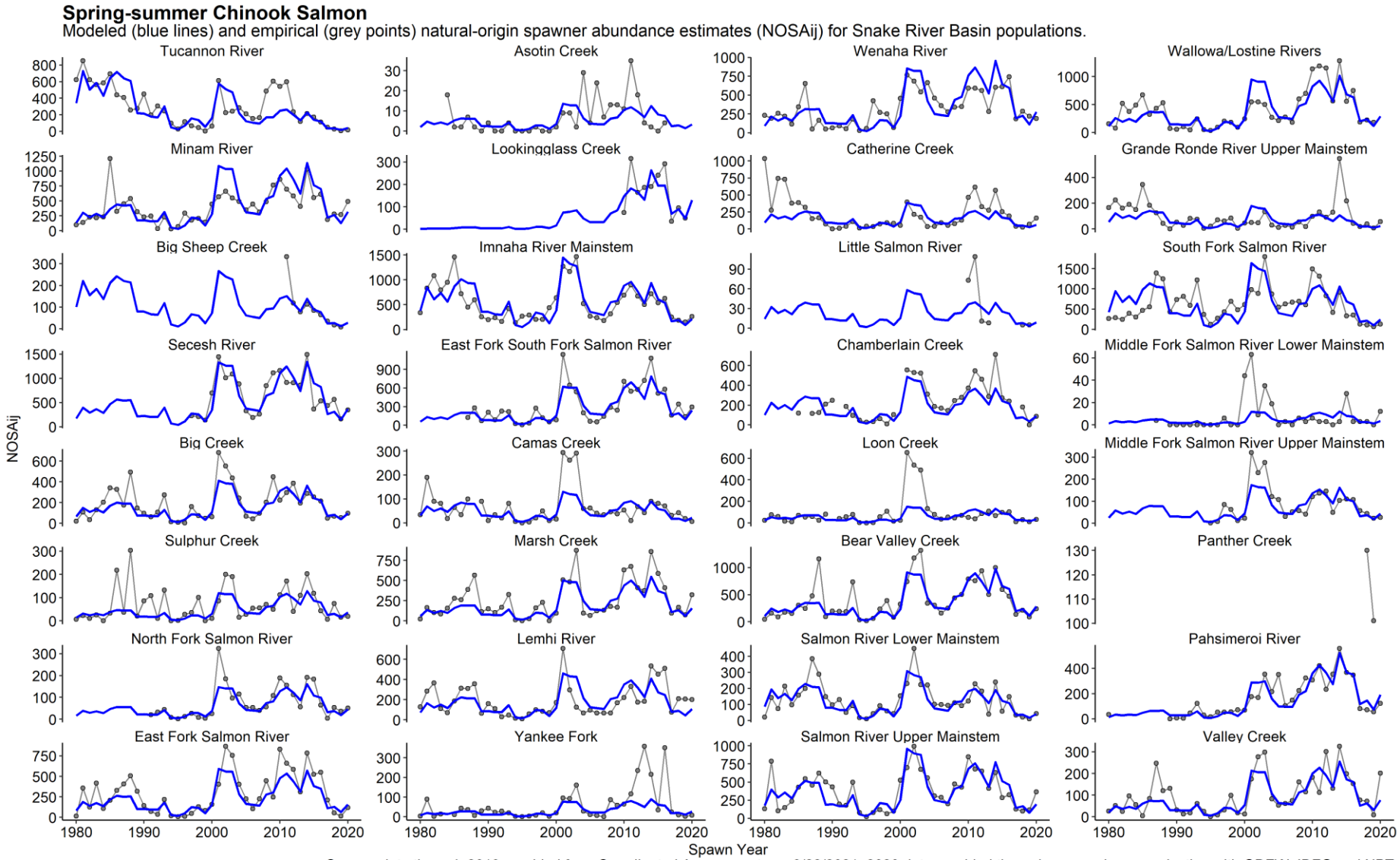


Population Specific Abundance Data Sources and Attribution

- Spring/summer Chinook NOSAij (weir M/R and SGS surveys)
  - 1980-2019 - Coordinated Assessments
  - 2020 – Personal Communication with IDFG, ODFW, NPT
- Results limited to 31 of 32 ESA listed spring/summer Chinook populations.
- Asotin, Lookingglass, and Big Sheep creeks already classified as functionally extirpated.
- Panther Creek and all Clearwater basin populations classified as extirpated.
- Natural origin abundance data includes jacks.

Abundance Fits Common Model

Spring/summer Chinook

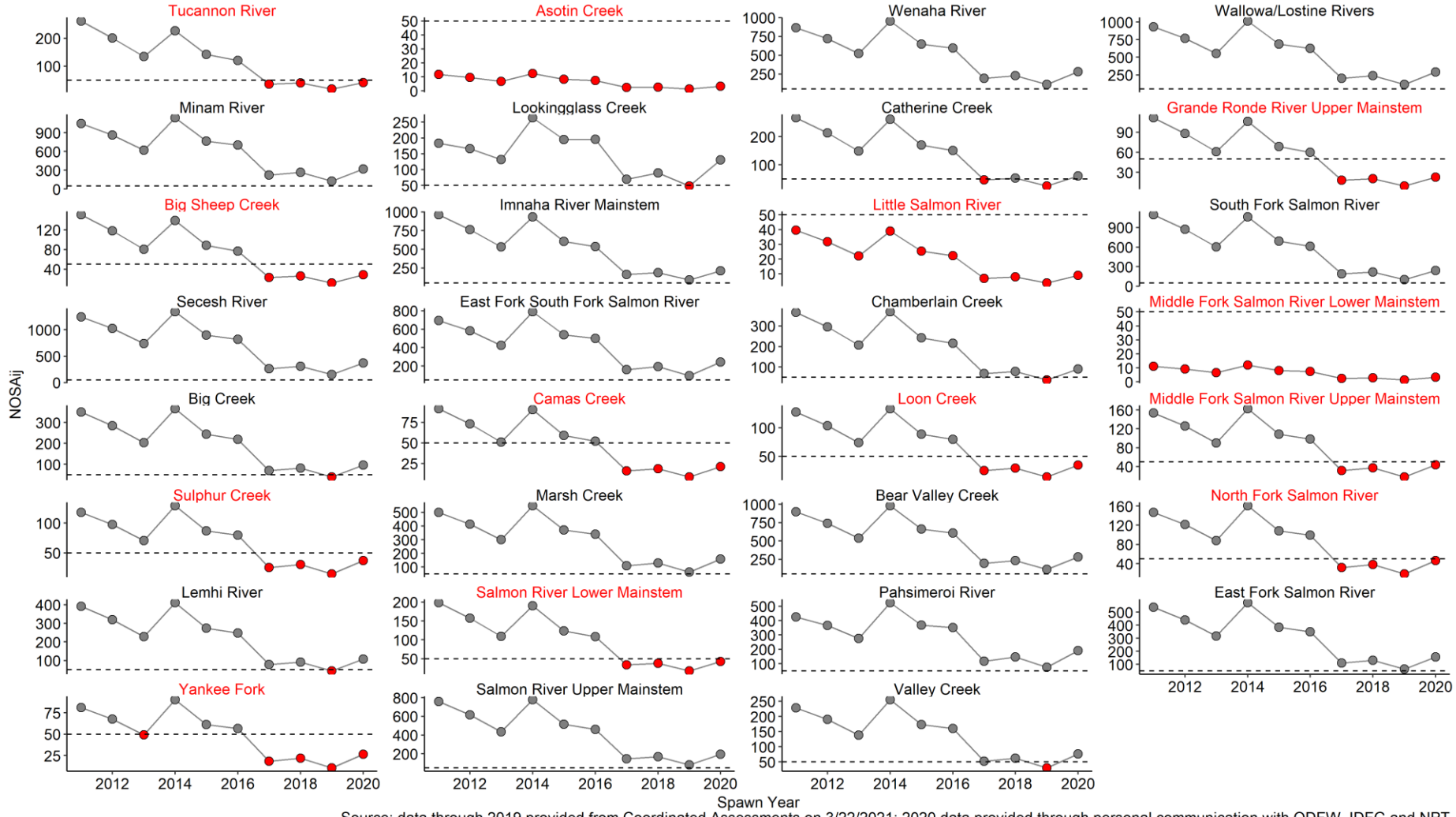


Source: data through 2019 provided from Coordinated Assessments on 3/22/2021; 2020 data provided through personal communication with ODFW, IDFG and NPT

13 (42%) Spring/Summer Chinook Populations Currently At or Below QET (50)

Spring-summer Chinook Salmon

Modeled natural-origin spawner abundance (NOSAij) estimates for Snake River Basin populations relative to the quasi-extinction threshold (QET; dashed line, 4 years below 50 NOSAij) for the last 10-years (2011-2020). During the last four consecutive years 42% of the 31 populations had more than 4 years of abundances below the the QET.



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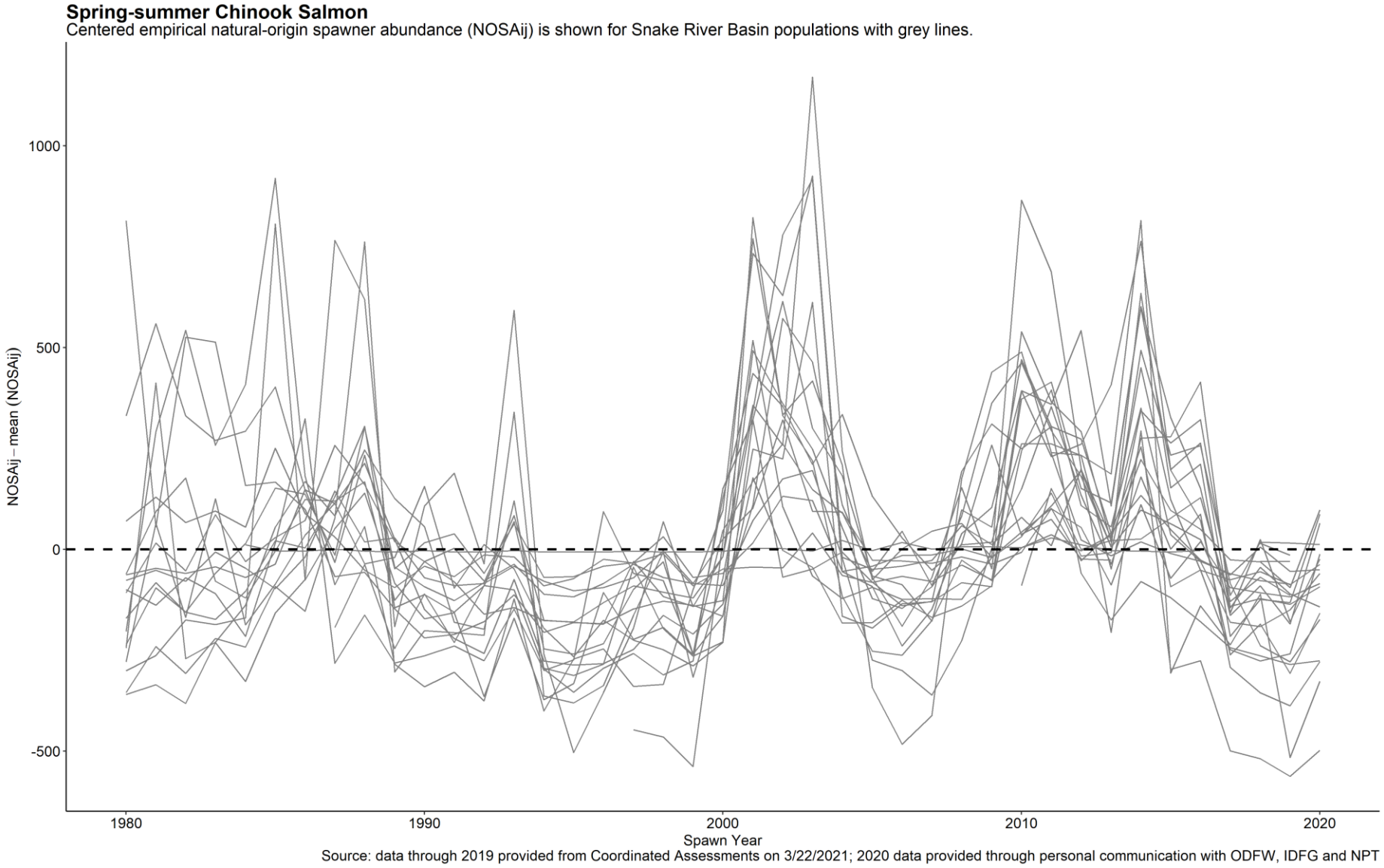
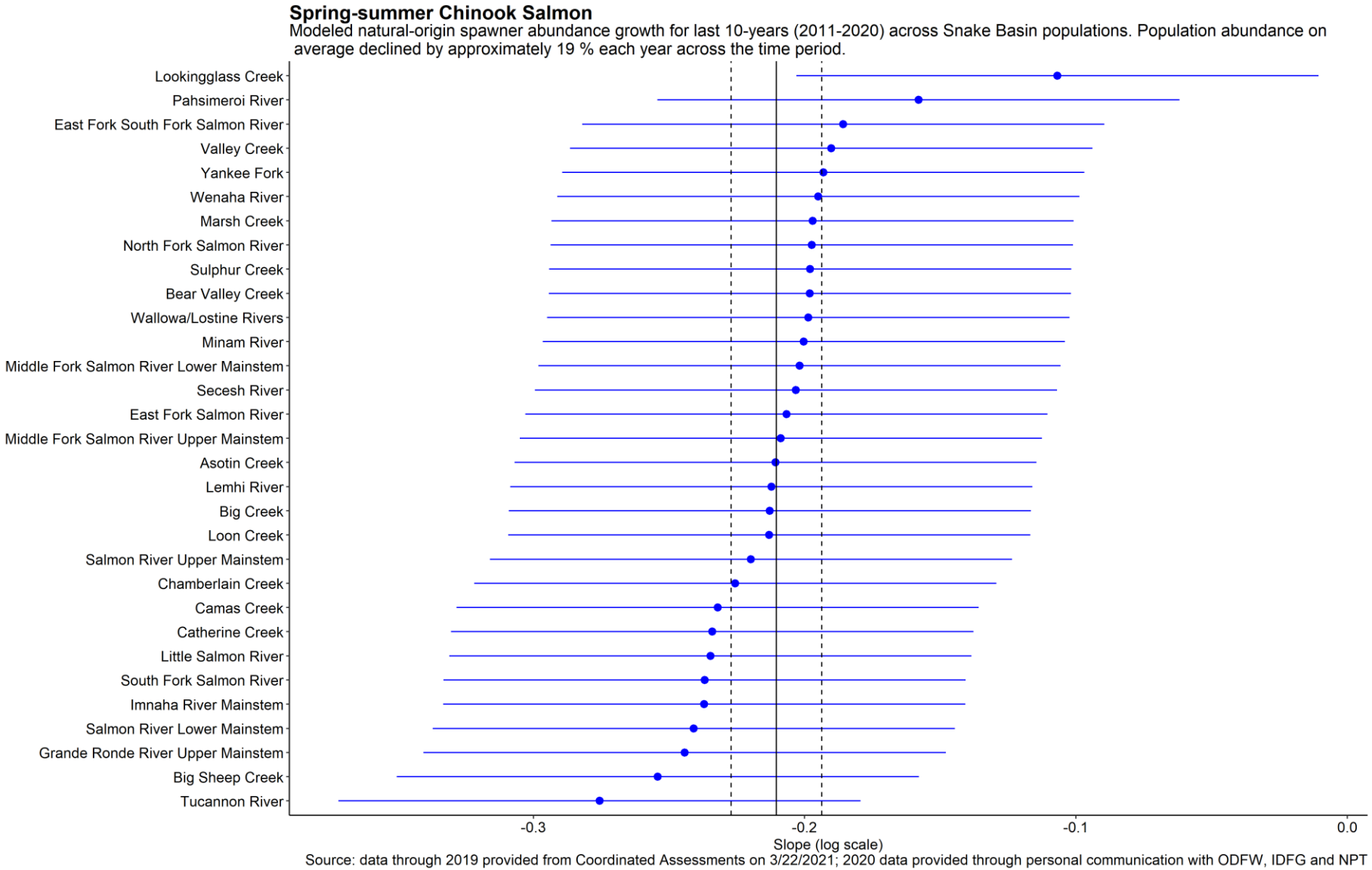
Synchrony Across Populations

Spring/summer Chinook



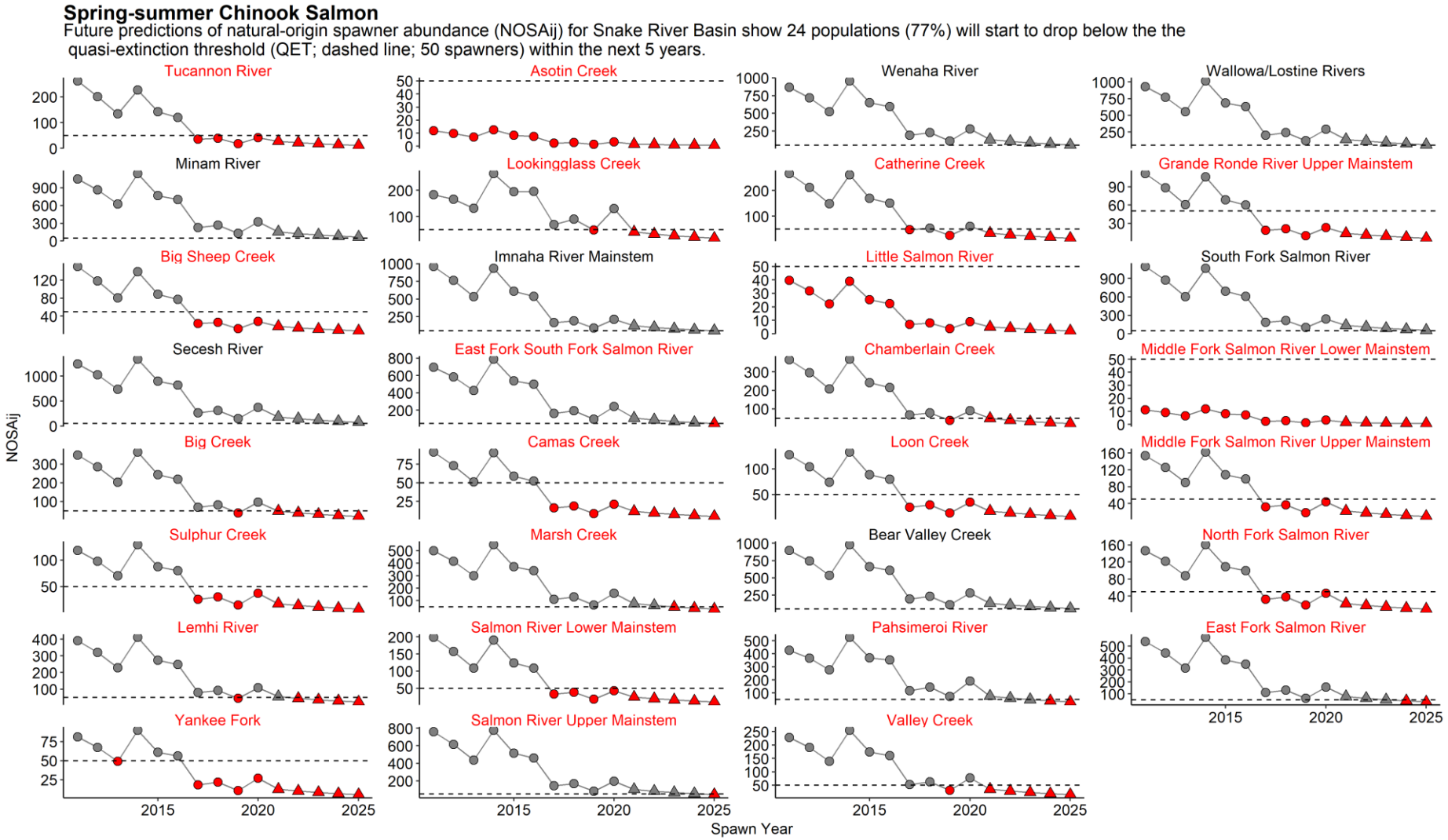
Abundance Declining 19% Each Year

Spring/summer Chinook



Source: data through 2019 provided from Coordinated Assessments on 3/22/2021; 2020 data provided through personal communication with ODFW, IDFG and NPT

24 (77%) Spring/Summer Chinook Populations Predicted to be at or Below 50 spawners by 2025



Source: data through 2019 provided from Coordinated Assessments on 3/22/2021; 2020 data provided through personal communication with ODFW, IDFG and NPT

Management Goals and Thresholds

Snake Basin Steelhead

25 Extant (all ESA listed) Populations

Desired - Healthy and Harvestable - CBP

- Range from 2,500 to 7,500 per population.
- 137,480 escapement at Lower Granite, excluding blocked areas.
- Aggregated values for Snake Basin populations = 105,000 (100,000 at Lower Granite Dam).

Delisting – Minimum Abundance Threshold (MAT) – NOAA

- Range from 500 to 1,500 per populations.
- Aggregated values for Snake Basin populations = 21,500 (20,000 at Lower Granite Dam).

Critical - Quasi-Extinction Threshold (QET) - NOAA

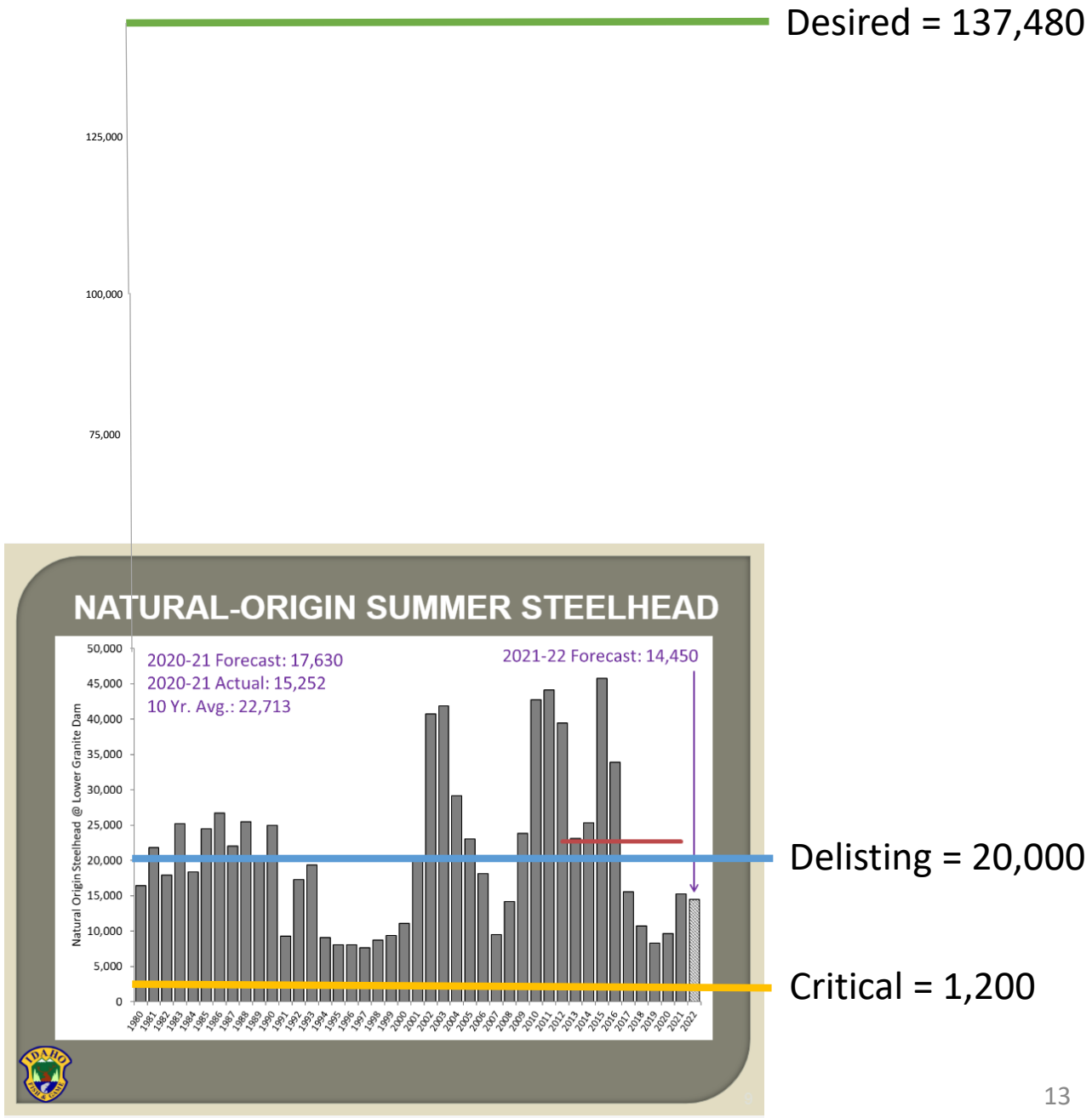
- 50 or fewer spawners within a population for four consecutive years.
- Aggregated values for Snake Basin populations = 1,250 (1,200 at Lower Granite Dam).

Extirpation - Functionally Extinct or absolute Extinction

- One or fewer adults in each year of cohort/generation

Snake River Steelhead Returns Relative to Aggregated Population Management Goals and Thresholds

Modified from IDFG March 2021 Presentation to NPCC



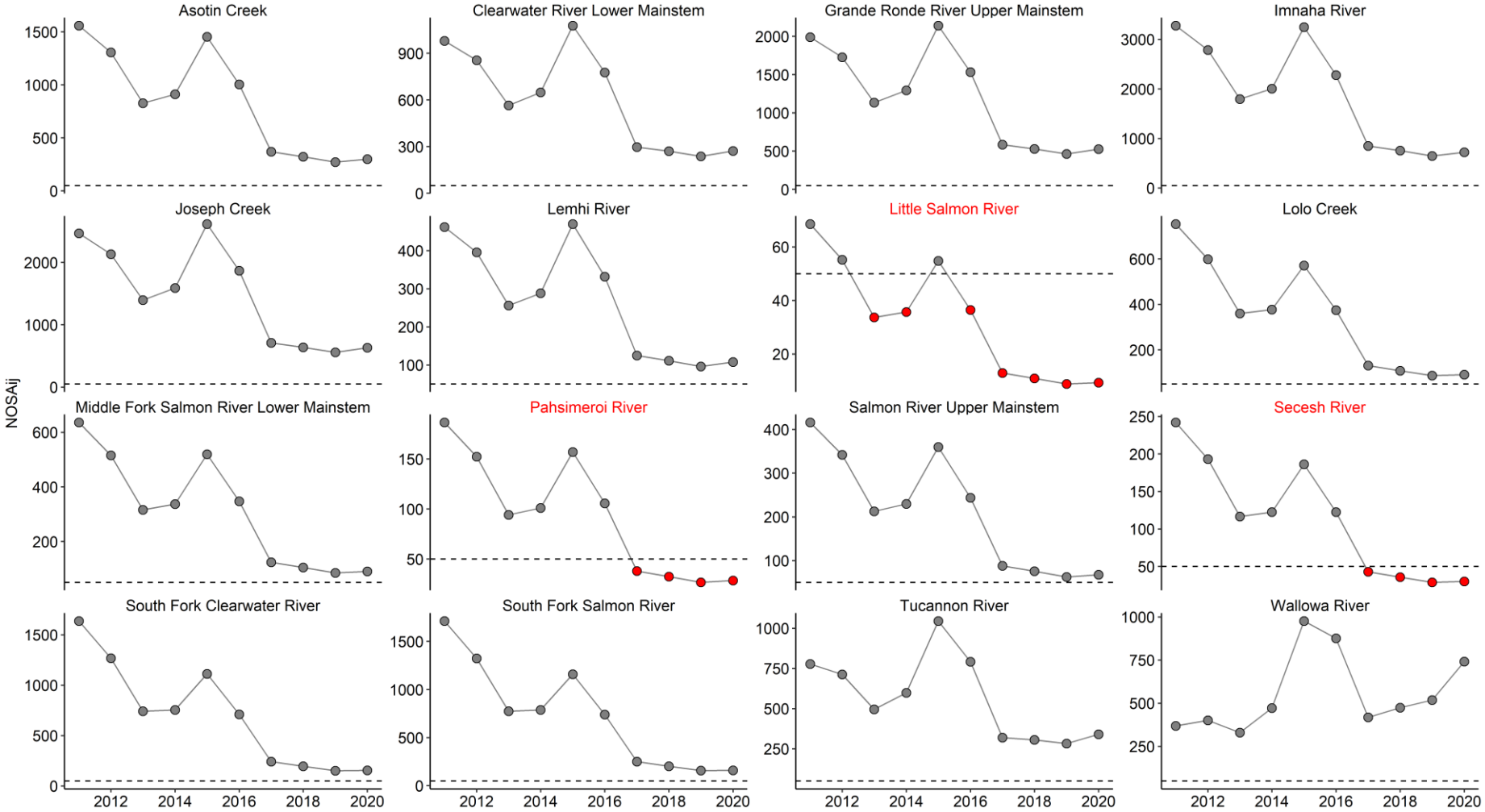
Population Specific Abundance Data Sources and Attribution

- Summer Steelhead (STADEM and DABOM)
  - 2010-2019 - Coordinated Assessments
  - 2020 – Personal Communication with NPT
- Results limited to 16 of the 25 extant ESA listed steelhead populations.
- No data for two populations (Chamberlain Creek and Middle Fork Salmon Upper Mainstem).
- Six populations lack sufficient data (East Fork Salmon River, Grande Ronde Lower Mainstem, Lochsa River, North Fork Salmon River, Panther Creek, and Selway River).
- Assessment limited to anadromous form of O. mykiss.

3 (19%) Summer Steelhead Populations Currently At or Below QET (50)

Summer Steelhead

Modeled natural-origin spawner abundance (NOSAij) estimates for Snake River Basin populations relative to the quasi-extinction threshold (QET; dashed line, 4 years below 50 NOSAij) for the last 10-years (2011-2020). During the last four consecutive years 19% of the 16 populations had more than 4 years of abundances below the the QET.

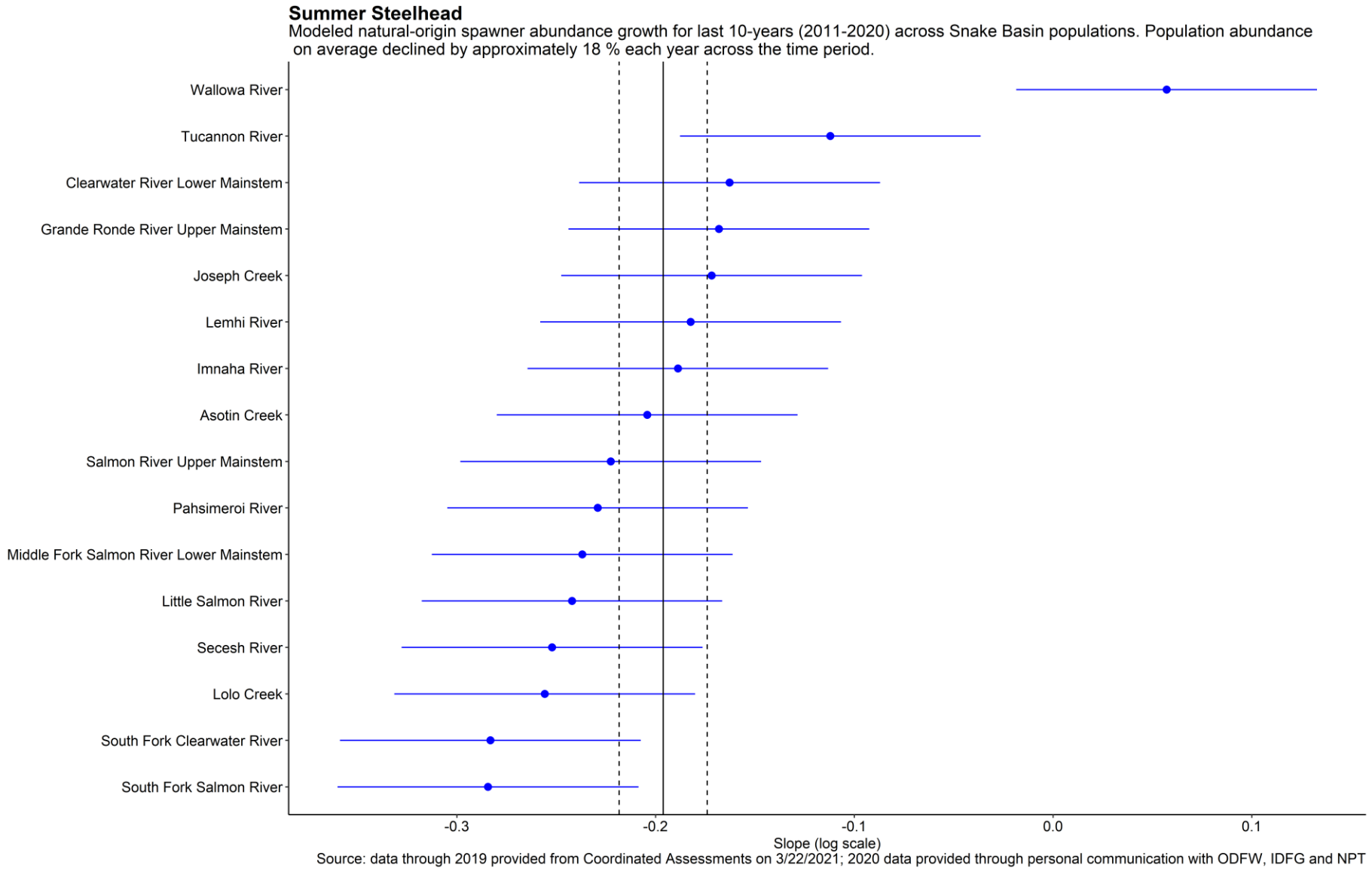


Source: data through 2019 provided from Coordinated Assessments on 3/22/2021; 2020 data provided through personal communication with ODFW, IDFG and NPT

Abundance Declining 18% Each Year

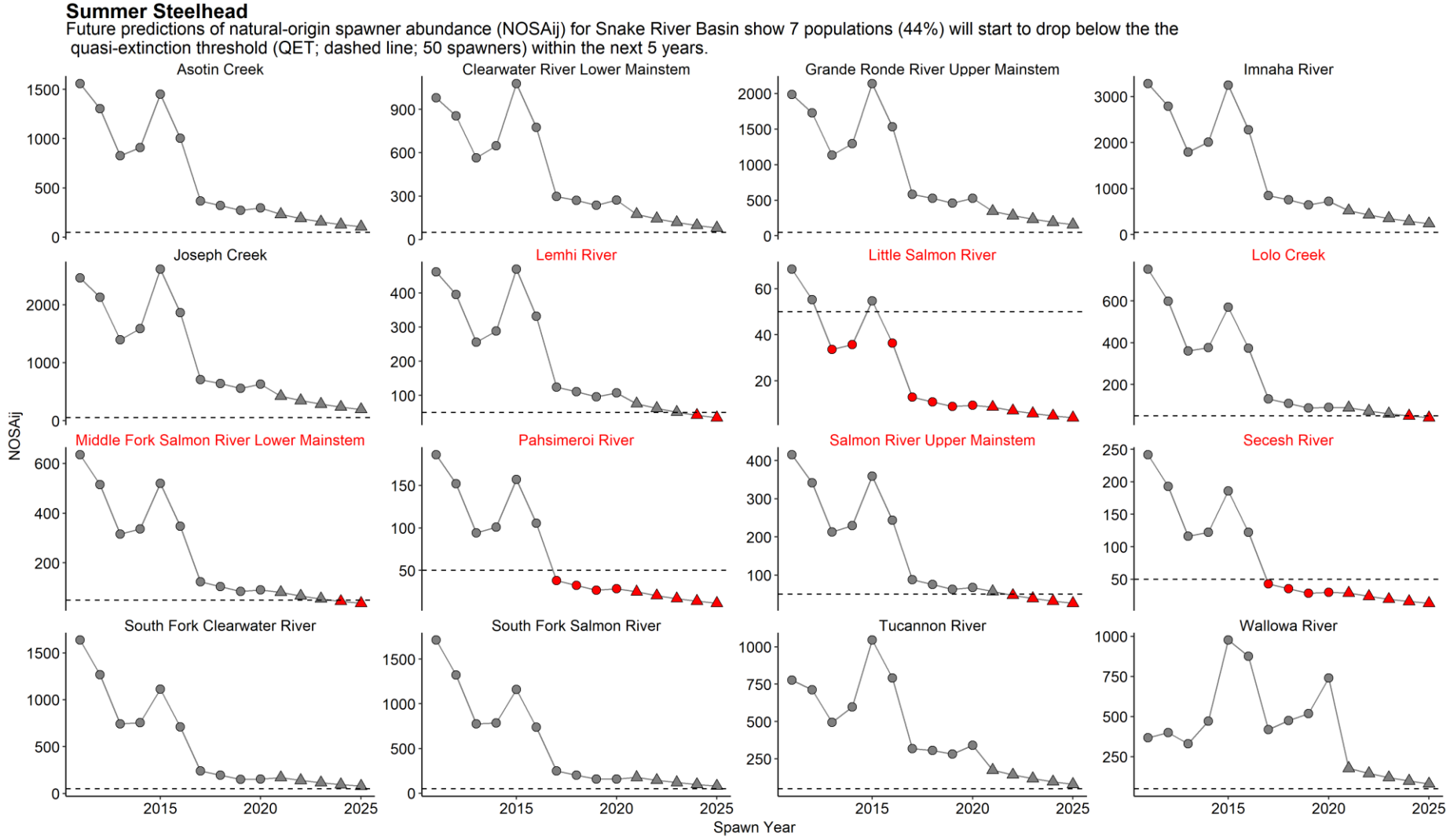
B-run Populations Declining at Faster Rate

Summer Steelhead



Source: data through 2019 provided from Coordinated Assessments on 3/22/2021; 2020 data provided through personal communication with ODFW, IDFG and NPT

7 (44%) Summer Steelhead Populations Predicted to Be At or Below 50 spawners by 2025



Source: data through 2019 provided from Coordinated Assessments on 3/22/2021; 2020 data provided through personal communication with ODFW, IDFG and NPT

Challenging Environment Ahead

Urgency needed as at risk populations already well below forecasted abundance

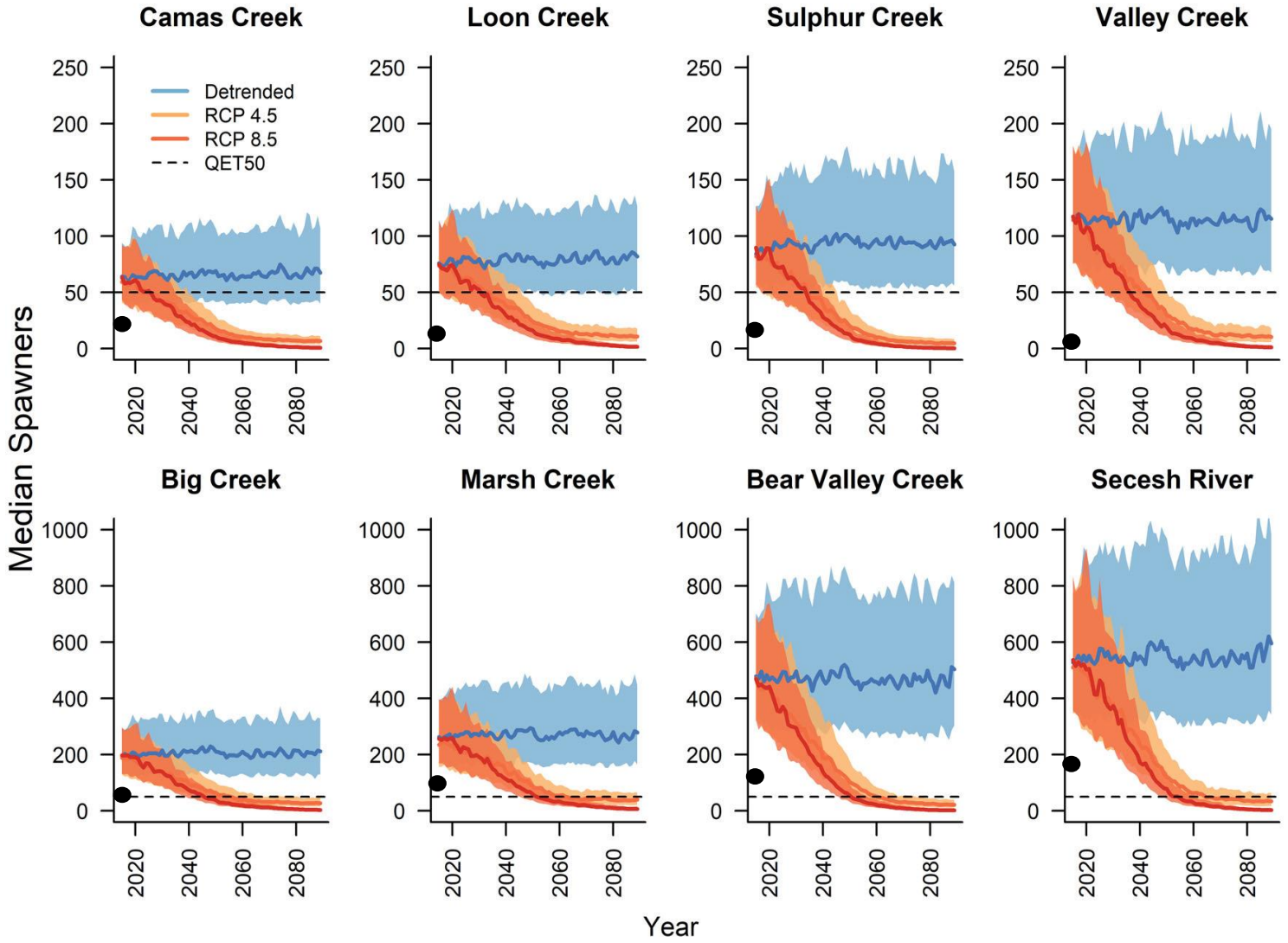
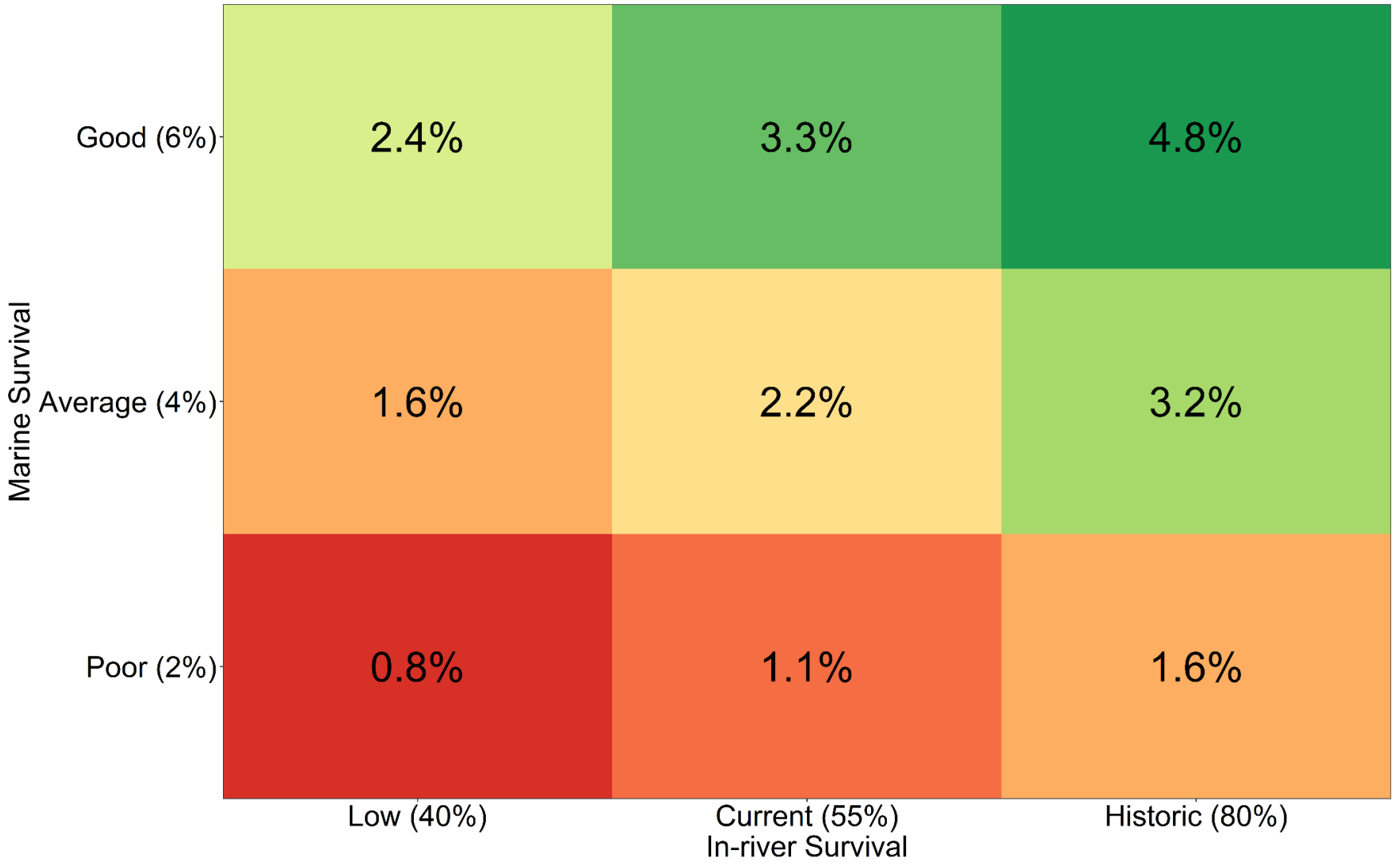


Fig. 4 - Crozier et al. 2021 (modified with actual 2019 abundance - indicated by black dots ●).

Mainstem Survival Has Direct Effect on SARs and Number of Returning Adults

(Generalized Example)



At-Risk Populations Spring/summer Chinook

- 13 (42%) currently at or below QET (50) (highlighted yellow in table).
- 19 (61%) at or below 50 spawners in at least one year since 2017.
- 24 (77%) predicted to be at or below 50 by 2025 (red text in table).

MPG	Population	Endemic Hatchery	Cryo-preserved	Predator	Habitat	Hydro	Harvest	Listing Status
L. Snake	Tucannon	X	X	M	X	X	M/T	T
	Asotin (ext)			M	X	X	M/T	T
Dry Cl	Upper South Fork (ext)	X		M	X	X	M/T	
Wet Clearwater	Lolo (ext)	X		M	X	X	M/T	
	Lochsa (ext)	X		M	X	X	M/T	
	Meadow (ext)			M		X	M/T	
	Moose (ext)			M		X	M/T	
	Upper Selway (ext)	X		M		X	M/T	
Grande Ronde / Imnaha	Wenaha			M		X	M/T	T
	Minam		X	M		X	M/T	T
	Catherine	X	X	M	X	X	M/T	T
	Lookingglass (ext)	X		M	X	X	M/T	T
	Lostine/Wallowa	X	X	M	X	X	M/T	T
	U Grande Ronde	X	X	M	X	X	M/T	T
	Imnaha	X	X	M		X	M/T	T
	Big Sheep (ext)	X		M		X	M/T	T
South Fork Salmon	Little Salmon			M		X	M/T	T
	Secesh		X	M	X	X	M/T	T
	South Fork Salmon	X	X	M	X	X	M/T	T
	East Fork South Fork	X	X	M	X	X	M/T	T
Middle Fork Salmon	Chamberlain			M		X	M/T	T
	Big		X	M		X	M/T	T
	Lower Middle Fork			M		X	M/T	T
	Camas			M		X	M/T	T
	Loon			M		X	M/T	T
	Upper Middle Fork Salmon			M		X	M/T	T
	Sulphur			M		X	M/T	T
	Bear Valley		X	M	X	X	M/T	T
	Marsh		X	M	X	X	M/T	T
Upper Salmon	North Fork Salmon			M		X	M/T	T
	Lemhi			M	X	X	M/T	T
	Lower Mainstem Salmon			M		X	M/T	T
	Pahsimeroi	X	X	M	X	X	M/T	T
	East Fork Salmon			M		X	M/T	T
	Yankee Fork Salmon River	X		M	X	X	M/T	T
	Valley			M		X	M/T	T
	Upper Mainstem Salmon	X	X	M		X	M/T	T
	Panther (ext)	X		M	X	X	M/T	T

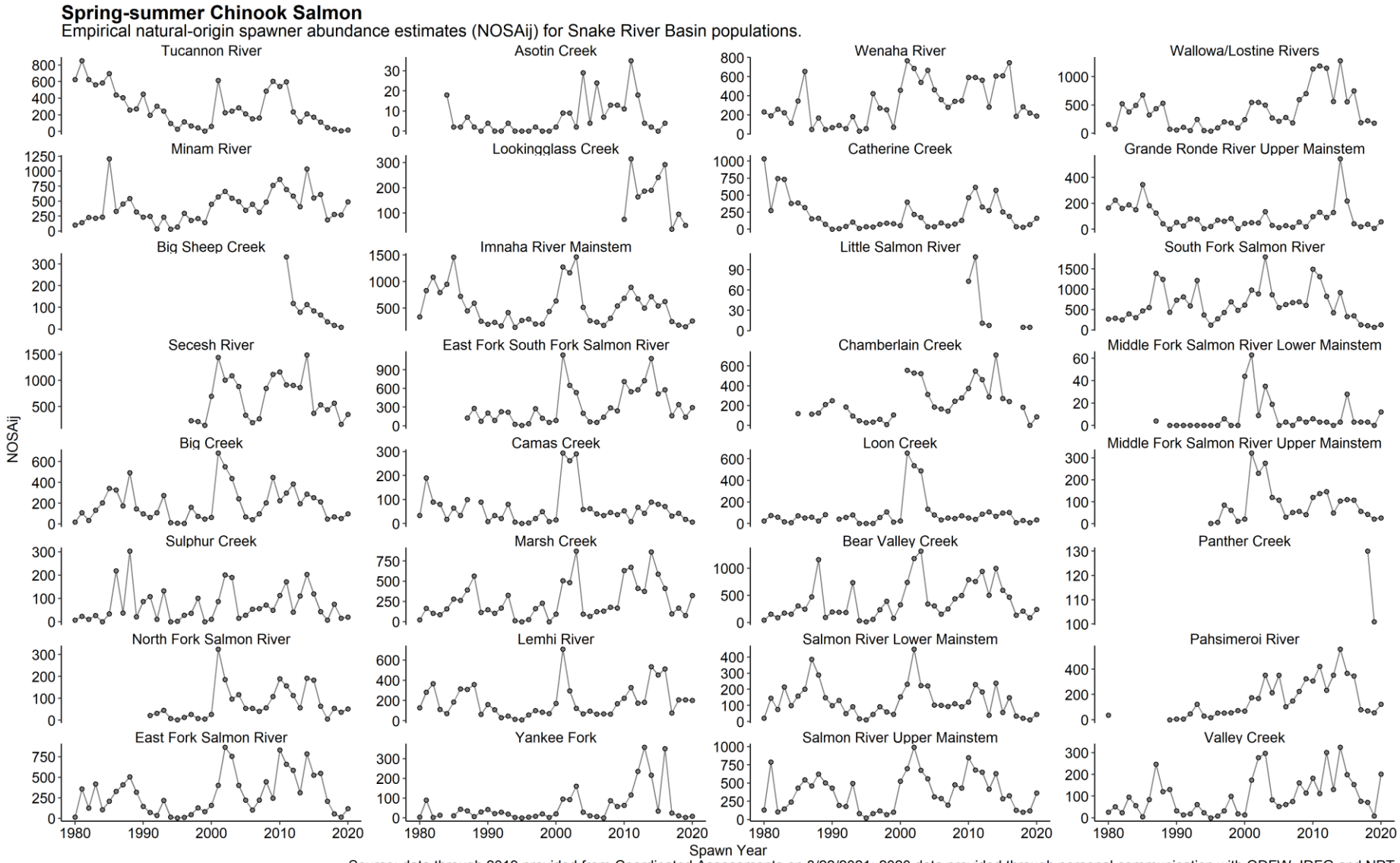
Call to Action

- Multiple factors contributing to low abundance.
- Improving survival at multiple life stages needed.
- Maximizing freshwater survival during periods of poor ocean conditions paramount.
- Seek actions sufficient to address current crisis and help salmon thrive – Simpson solution.

Bonus Slides

Empirical Population Specific Abundance

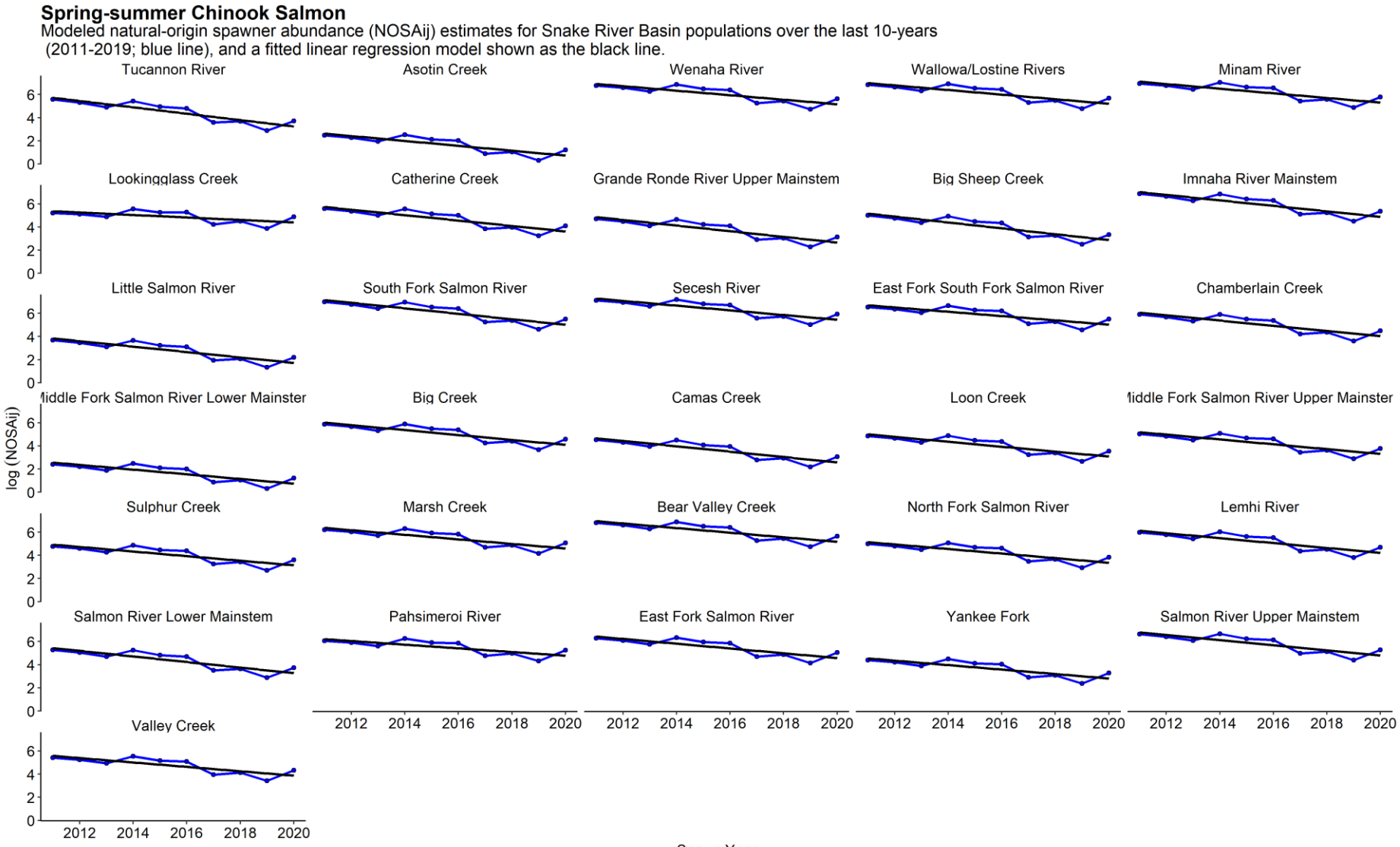
Spring/summer Chinook



Source: data through 2019 provided from Coordinated Assessments on 3/22/2021; 2020 data provided through personal communication with ODFW, IDFG and NPT

Populations in Decline Over Last 10 Years

Spring/summer Chinook



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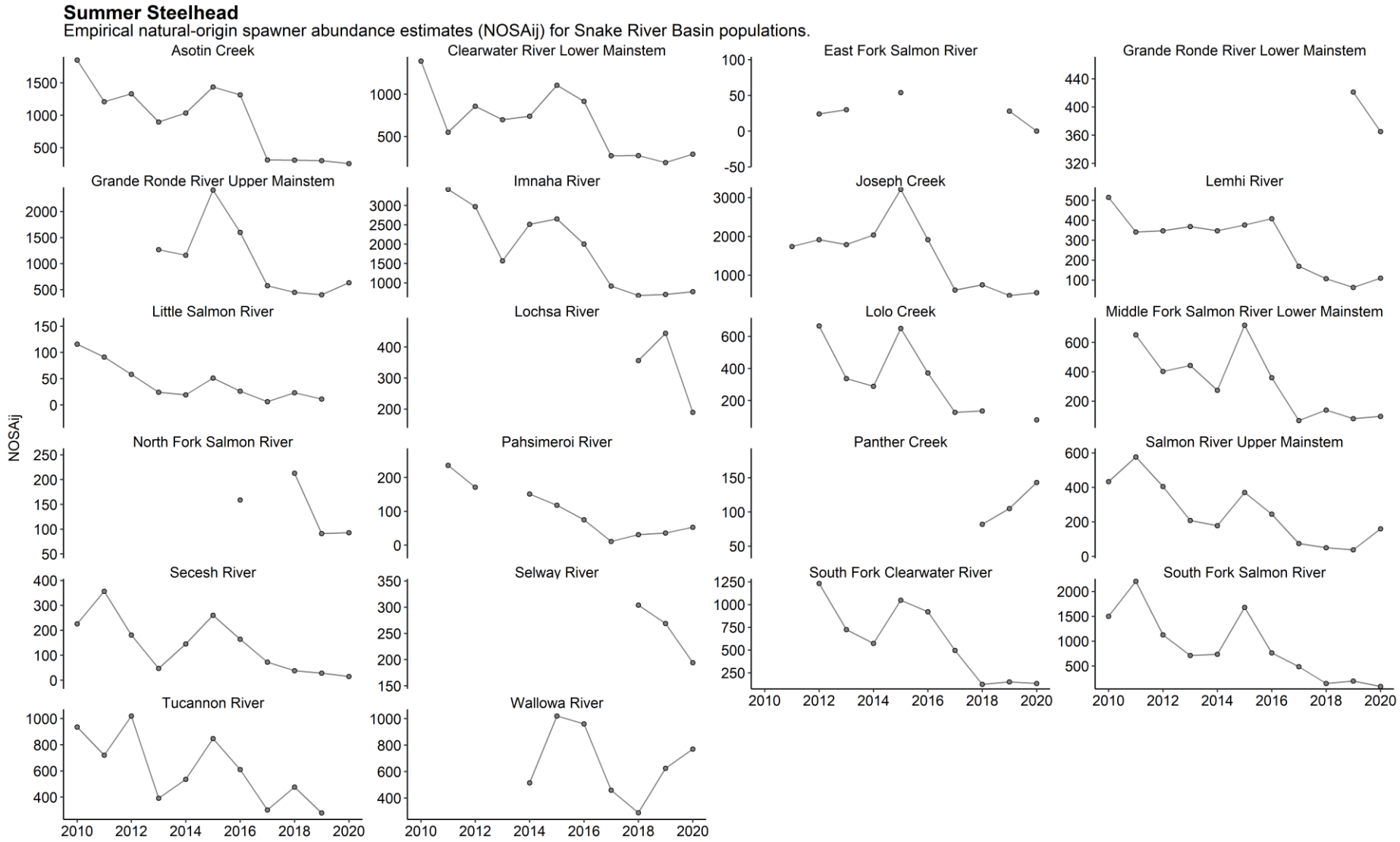
Empirical Population Specific Abundance

Summer Steelhead



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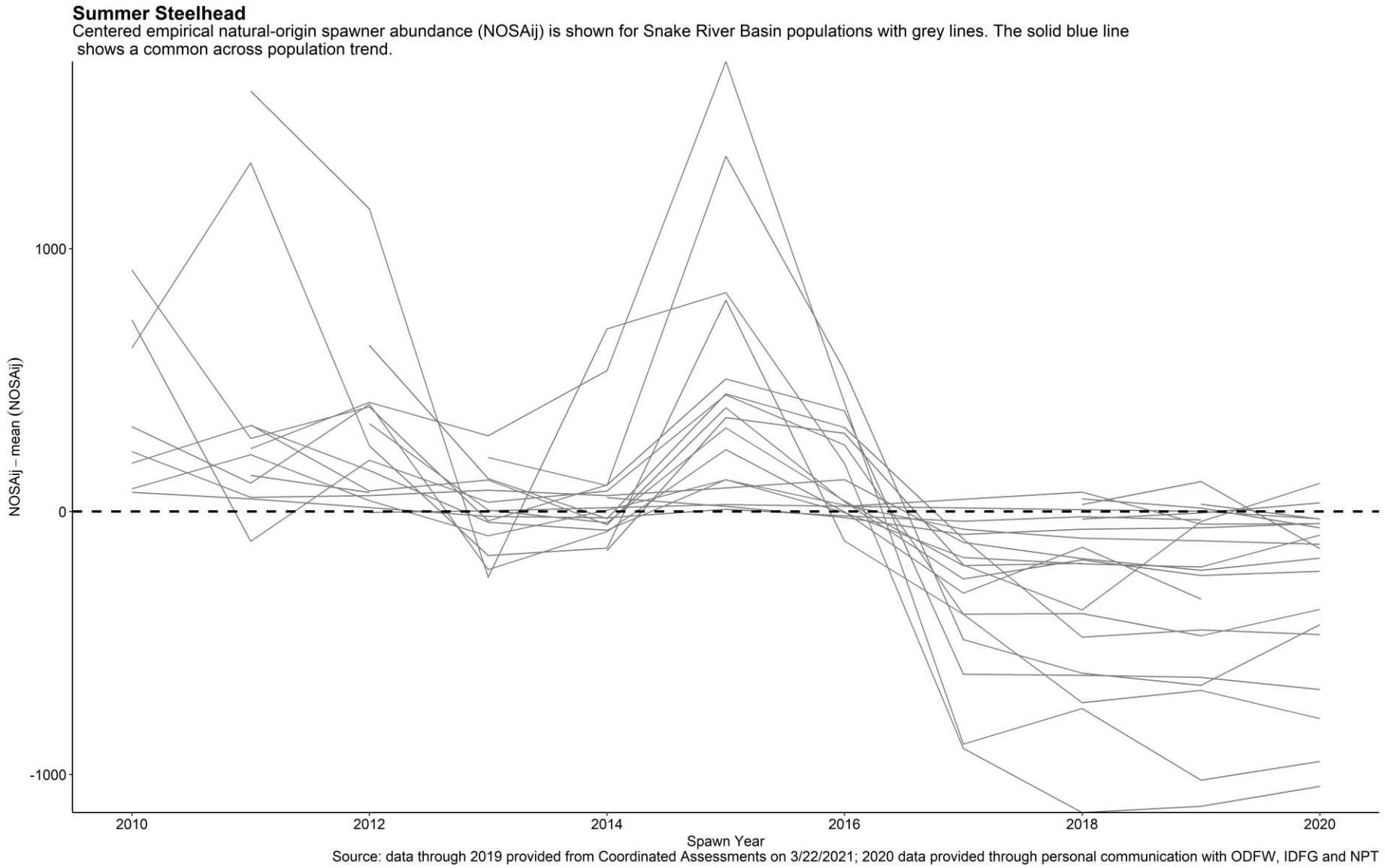
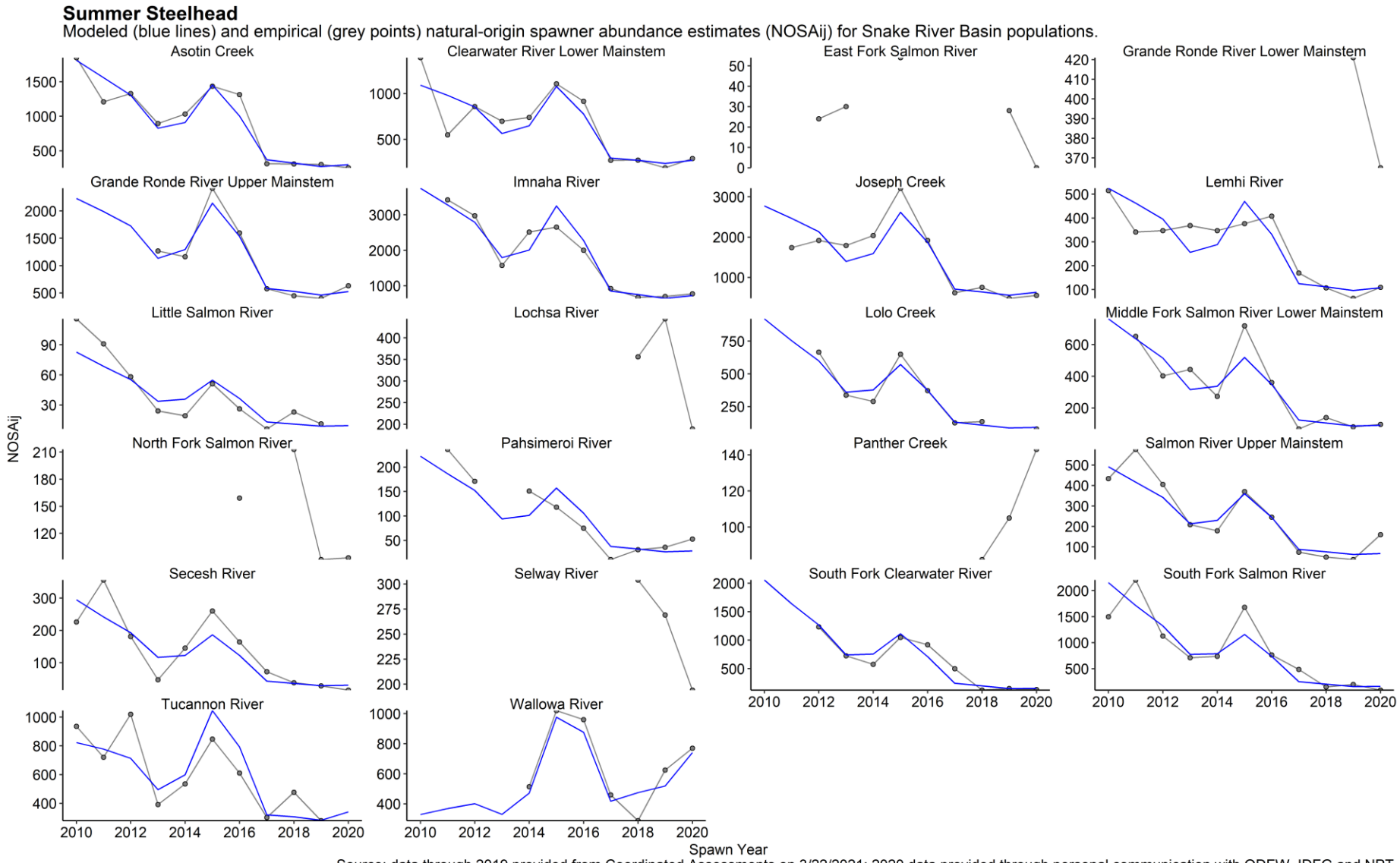
Synchrony Across Populations

Summer Steelhead



Abundance Fits Common Model

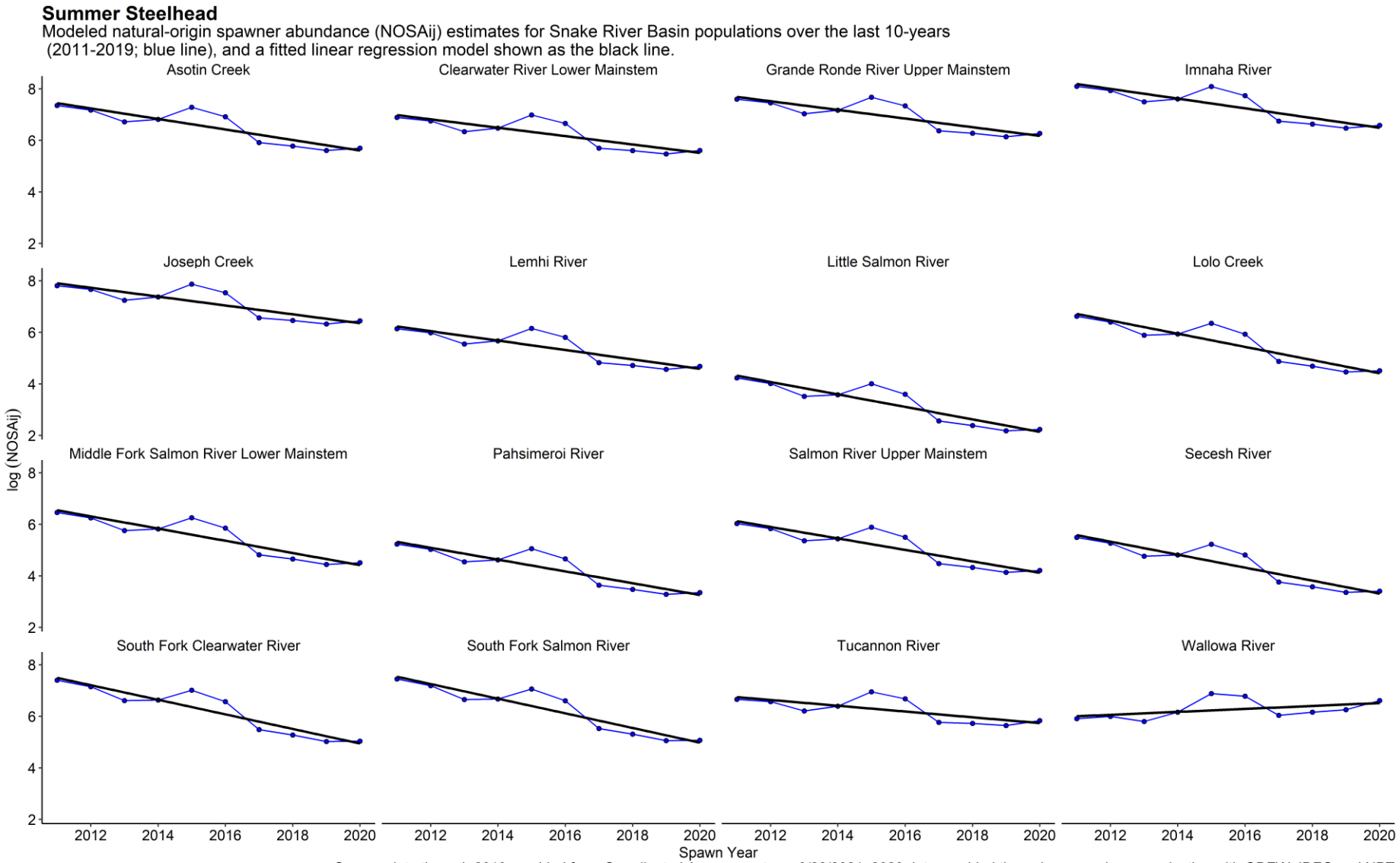
Steelhead



Source: data through 2019 provided from Coordinated Assessments on 3/22/2021; 2020 data provided through personal communication with ODFW, IDFG and NPT

Most Populations in Decline Over Last 10 Years

Summer Steelhead



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