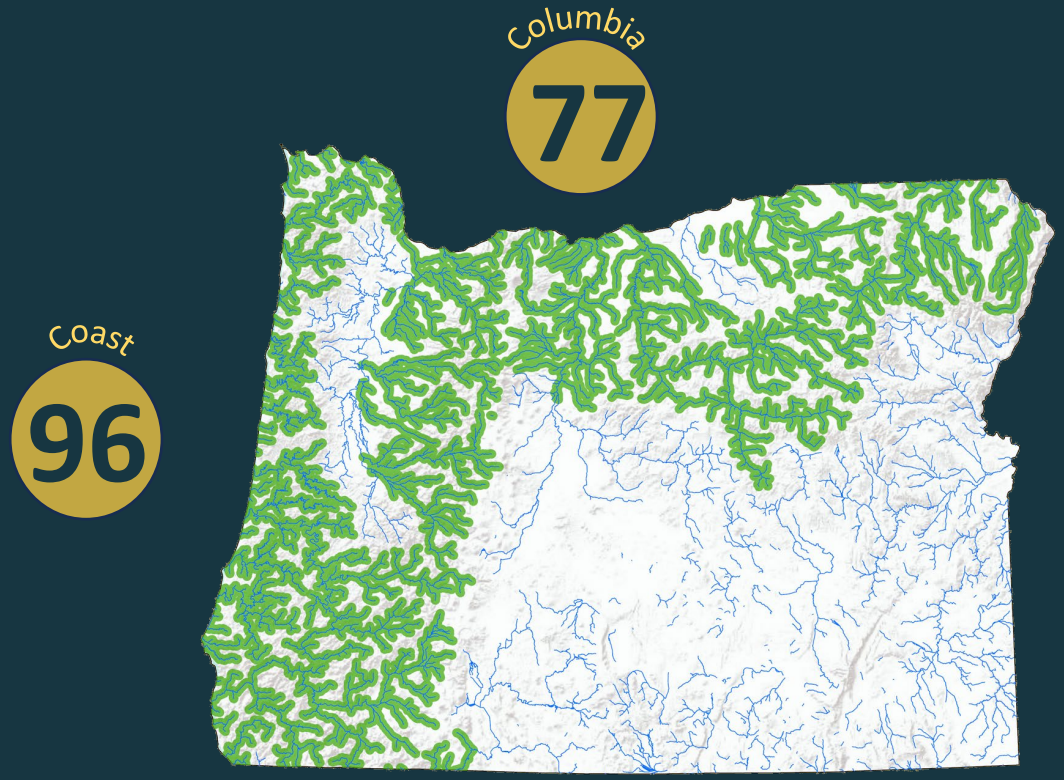
LOOKING AHEAD

Budget Note Assessment of Oregon's State Hatchery System

OREGON
Fish & Wildlife

Oregon is home to >170 wild populations of salmon and steelhead



Coho

summer steelhead

winter steelhead

spring Chinook

fall Chinook

Chum

Why do we have hatcheries?

CONSERVATION & MITIGATION HATCHERY PROGRAMS

HARVEST & MITIGATION HATCHERY PROGRAMS

NO HATCHERY PROGRAMS

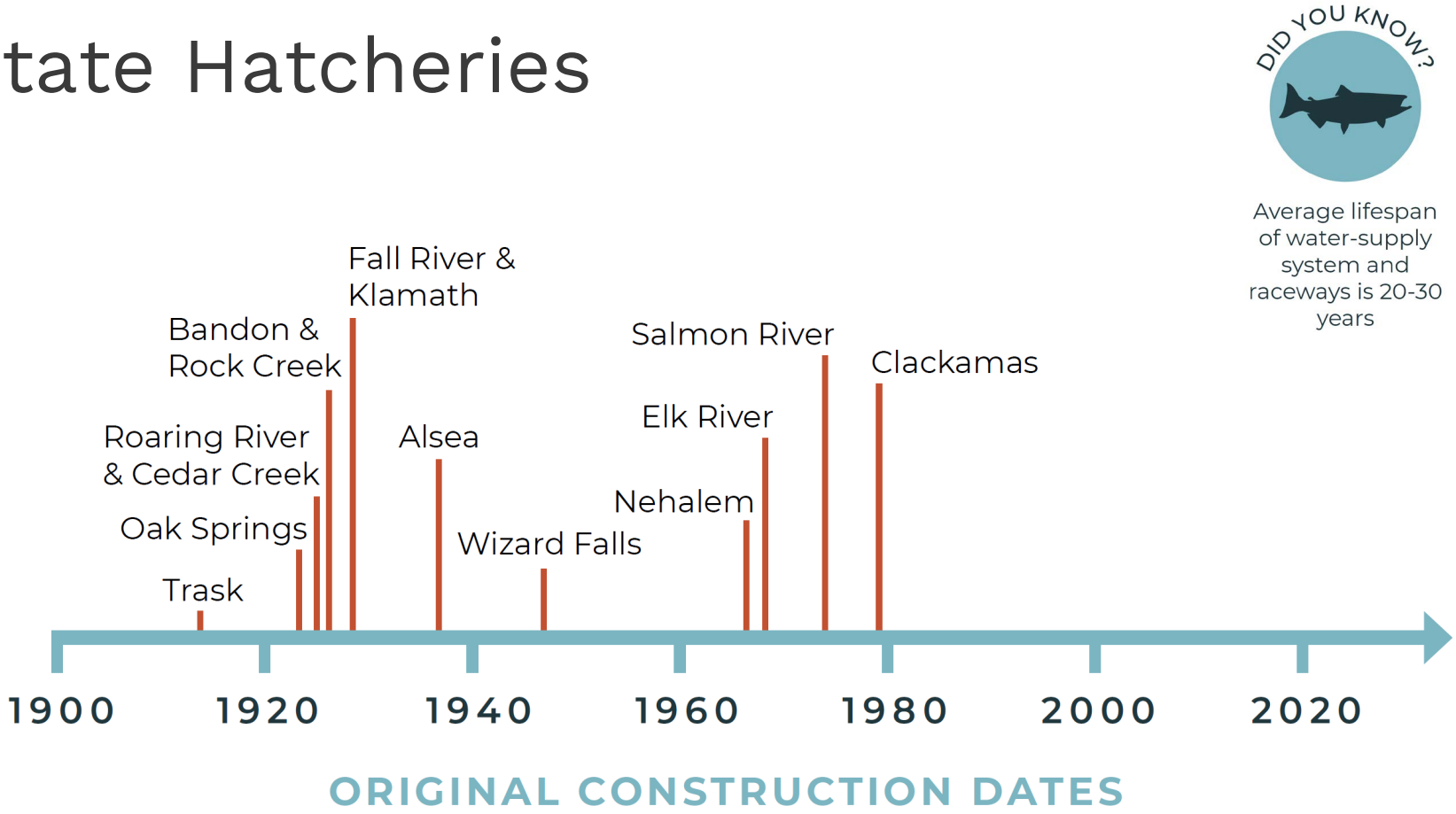
DEPRESSED / EXTIRPATED

WILD FISH STATUS

HEALTHY & HIGHLY ABUNDANT

- Mitigate for impacts to habitat (e.g., dams)
- Provide additional harvest opportunities
- Support imperiled wild populations

State Hatcheries



Key assumptions at time of construction

Stable environment

Abundant water, cool temperatures

Minimal fire risk

Reliable broodstock source

Climate change, aging hatchery infrastructure, and increasing costs are making it more difficult for Oregon's hatchery system to meet fishery and conservation goals.

ODFW is seeking to proactively meet these challenges by conducting an assessment of the hatchery system, and examining how we can adapt and invest for the future.

With funding from the legislature, the Department worked with independent contractors to assess:

Economics

Financial sustainability, costs and benefits, funding models

Climate Vulnerability

Assessing the impact of climate change on hatchery infrastructure and programs, the need for these programs, and how can impacts be mitigated

Current State

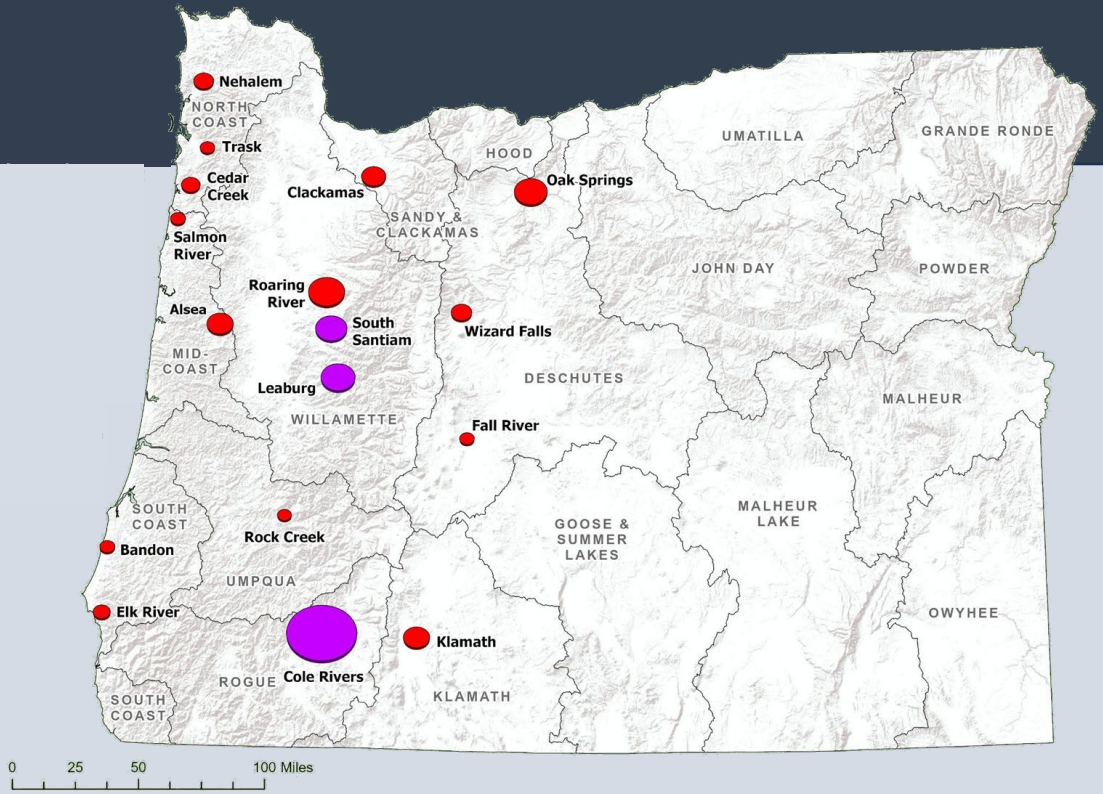
Document the deferred maintenance needs at all facilities

Hatcheries

under review

Focus on 17 facilities

- 14 state-owned
- 3 federally-owned

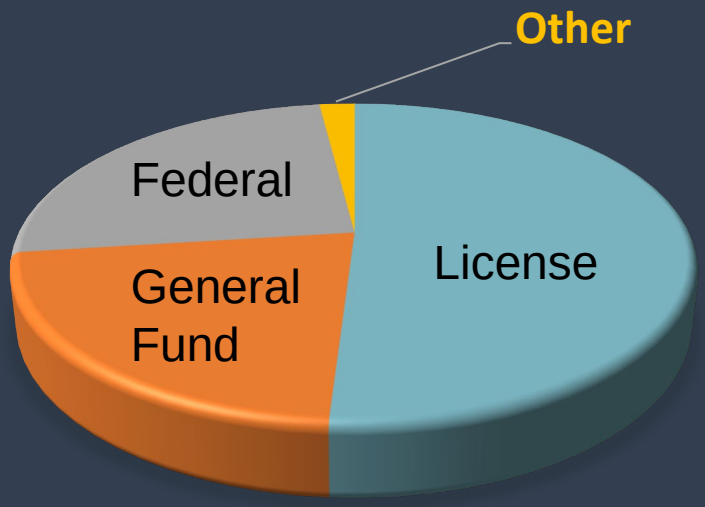


ECONOMICS

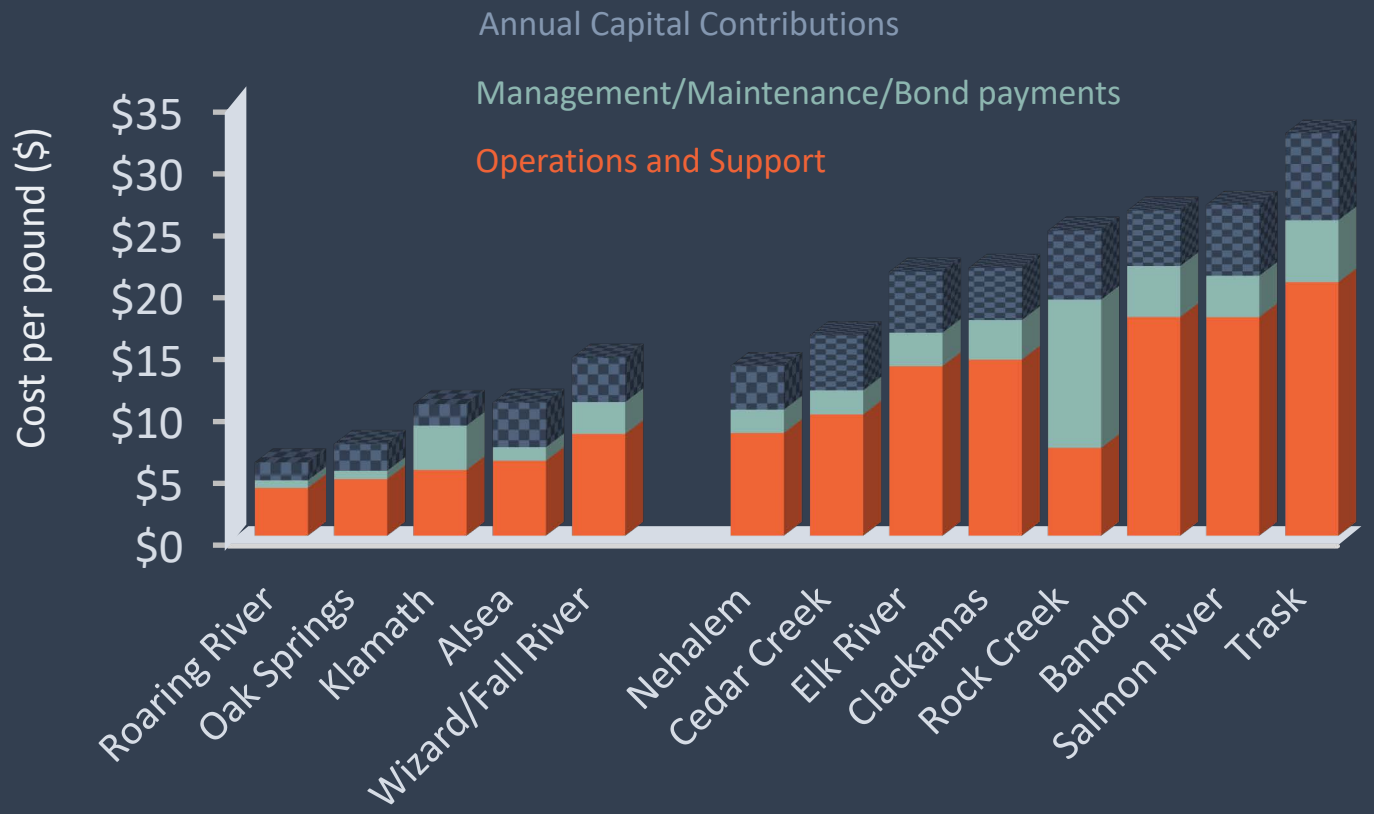
The Research Group LLC

Total Costs

$12.5 M 23-25 annual cost



Annual Cost per Pound of Fish Released



Cost per adult harvested

Economic Impact and Net-Benefit

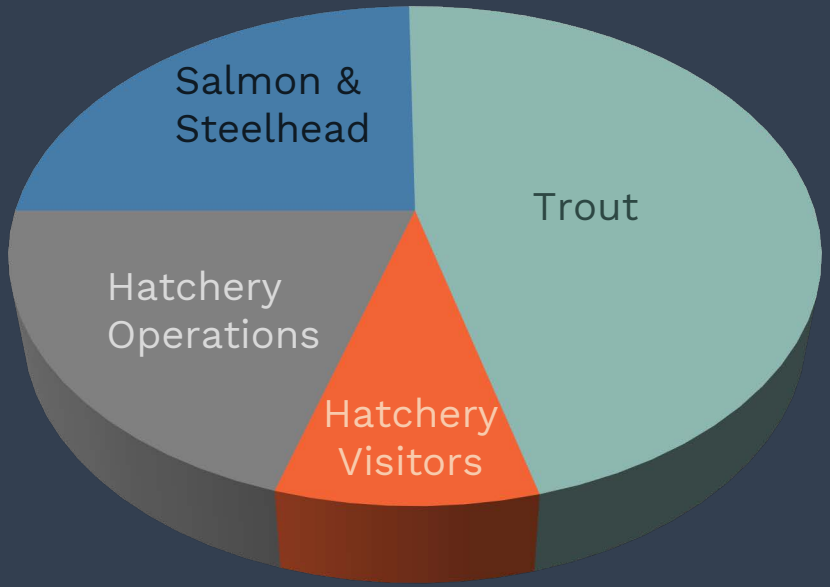
Economic impact

Measures financial activity associated with recreational/commercial fisheries and visits to the hatcheries.

Net-Benefits

Measures willingness to pay for a non-market commodity.

Regional Economic Impact

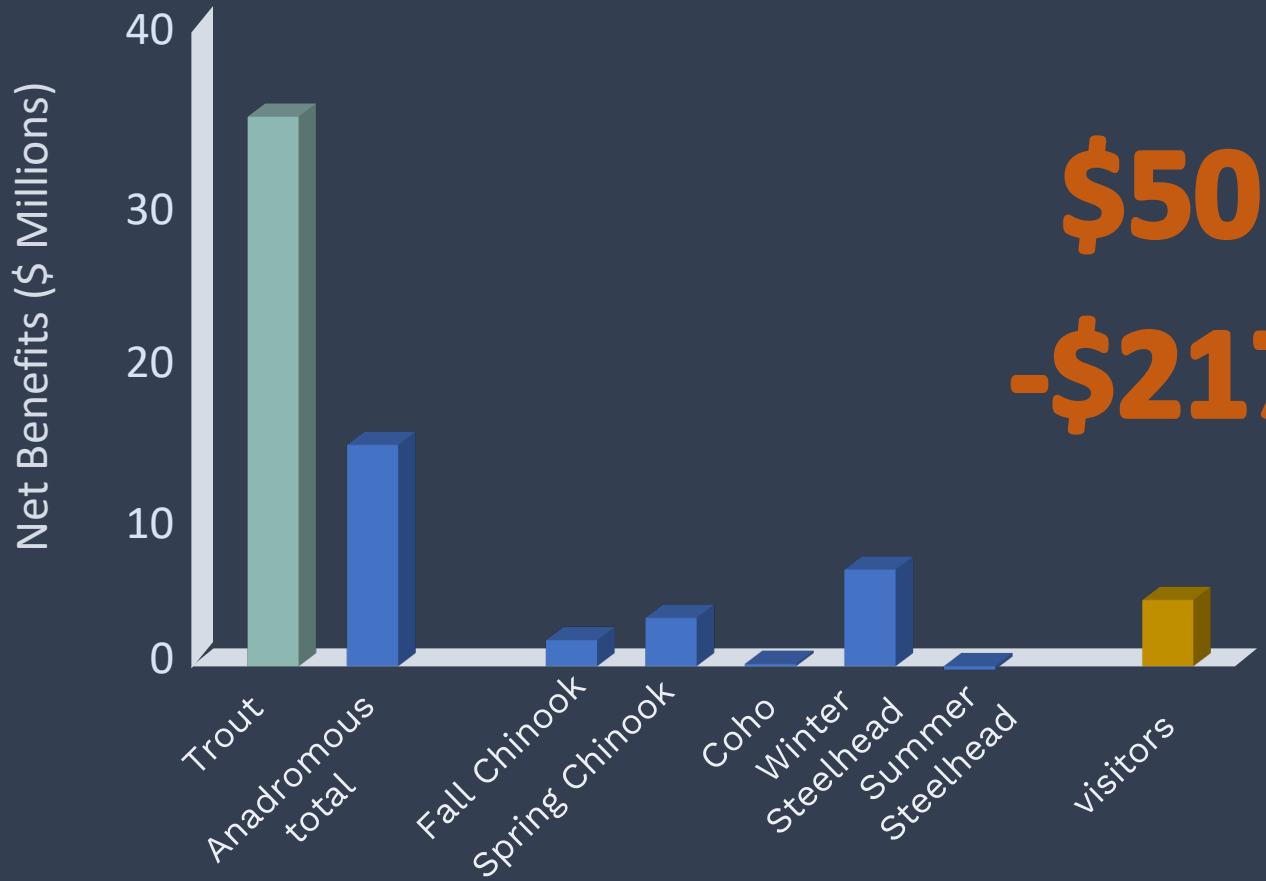


$55.5 M Total economic impact

46% Impact attributed to trout

1,100 Jobs generated by the hatchery system

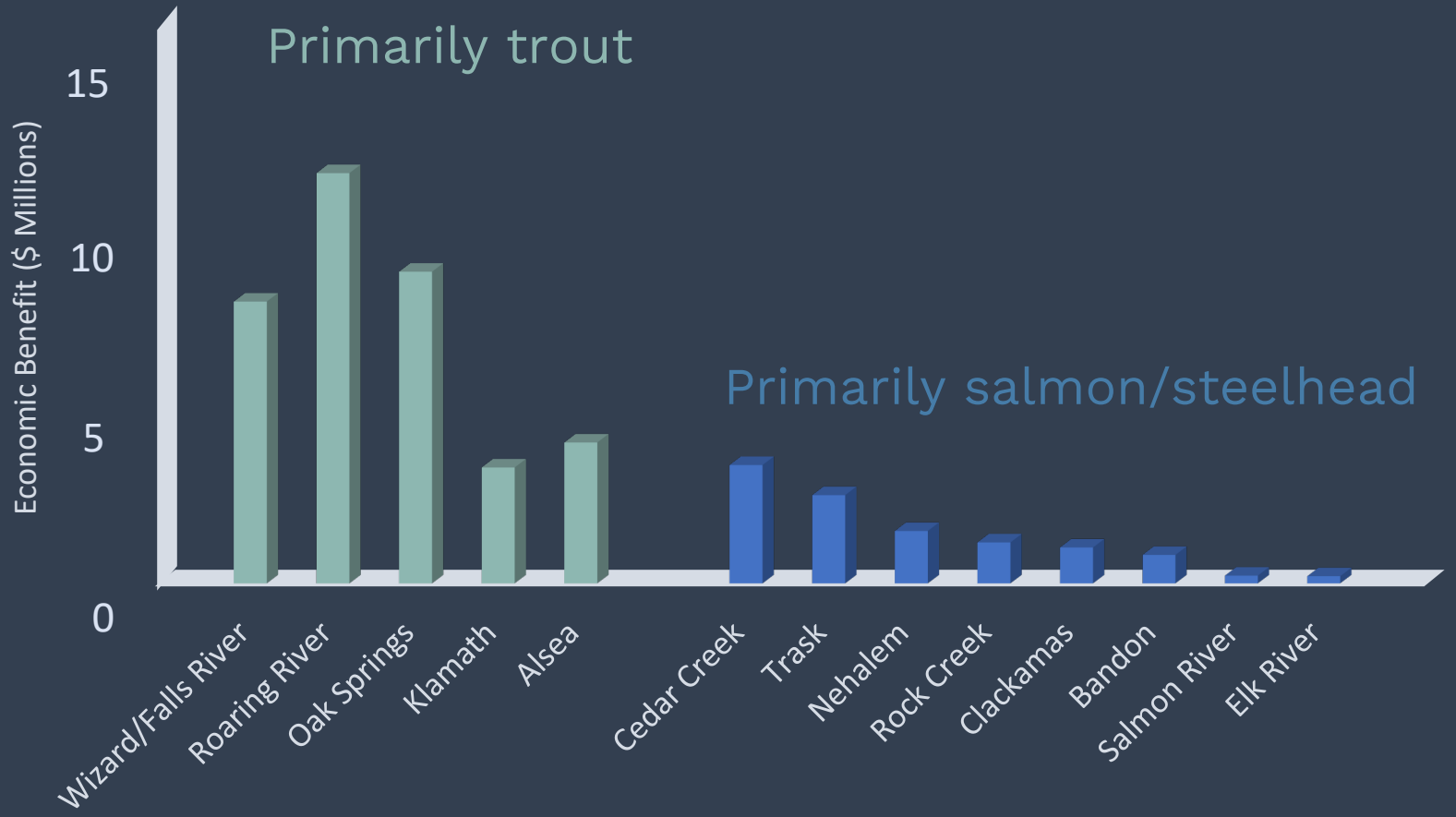
Net Benefits by Species/Hatchery Visits



$50 M Net Benefits

-$217K Net benefit for summer steelhead

Net Benefits by Hatchery



Take-homes

- The State system is a significant economic benefit to the State and rural communities.
- Trout stocking programs generate more economic benefit.
- Winter steelhead programs have highest impact and summer steelhead programs are not cost effective
- Smaller coastal facilities are less cost effective.

CLIMATE IMPACTS

Climate resilience assessment

Water Availability

Water rights, natural summer flow

Water Quality

Temperature, pathogens, flooding etc

Other hazards

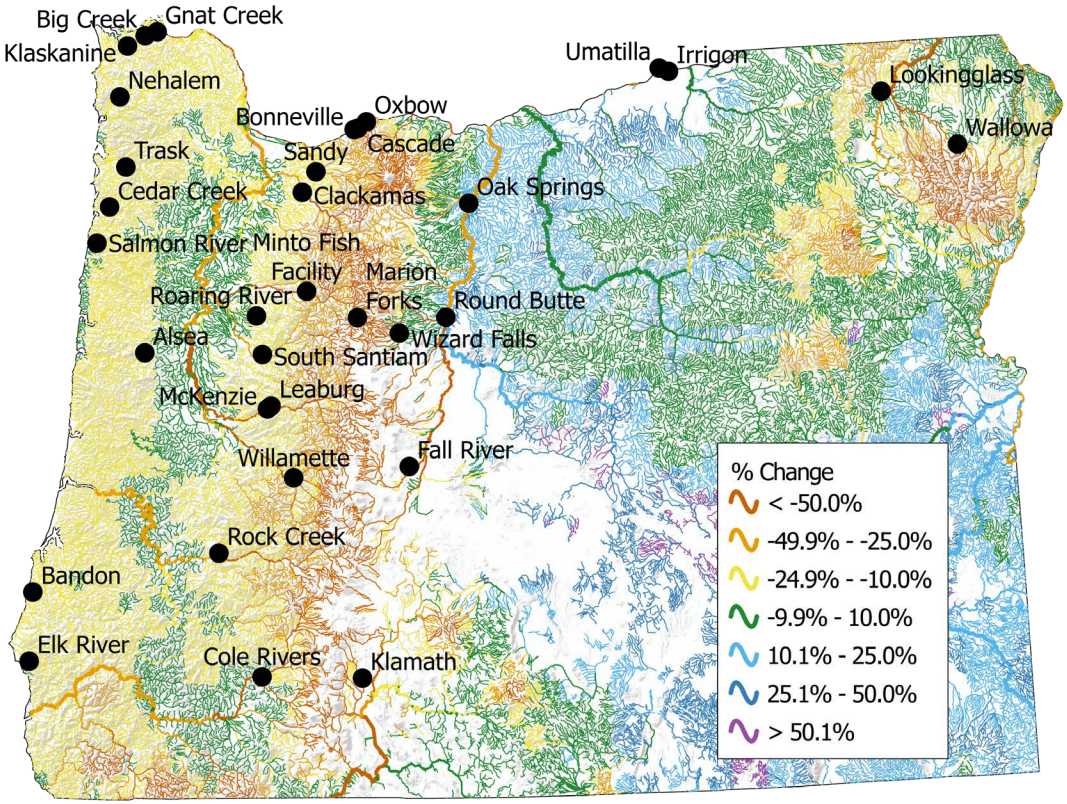
e.g., Fire, sea level rise, GHG

Compare hatchery resilience under three scenarios

Future Flows

10-25% decrease in flow at coastal facilities

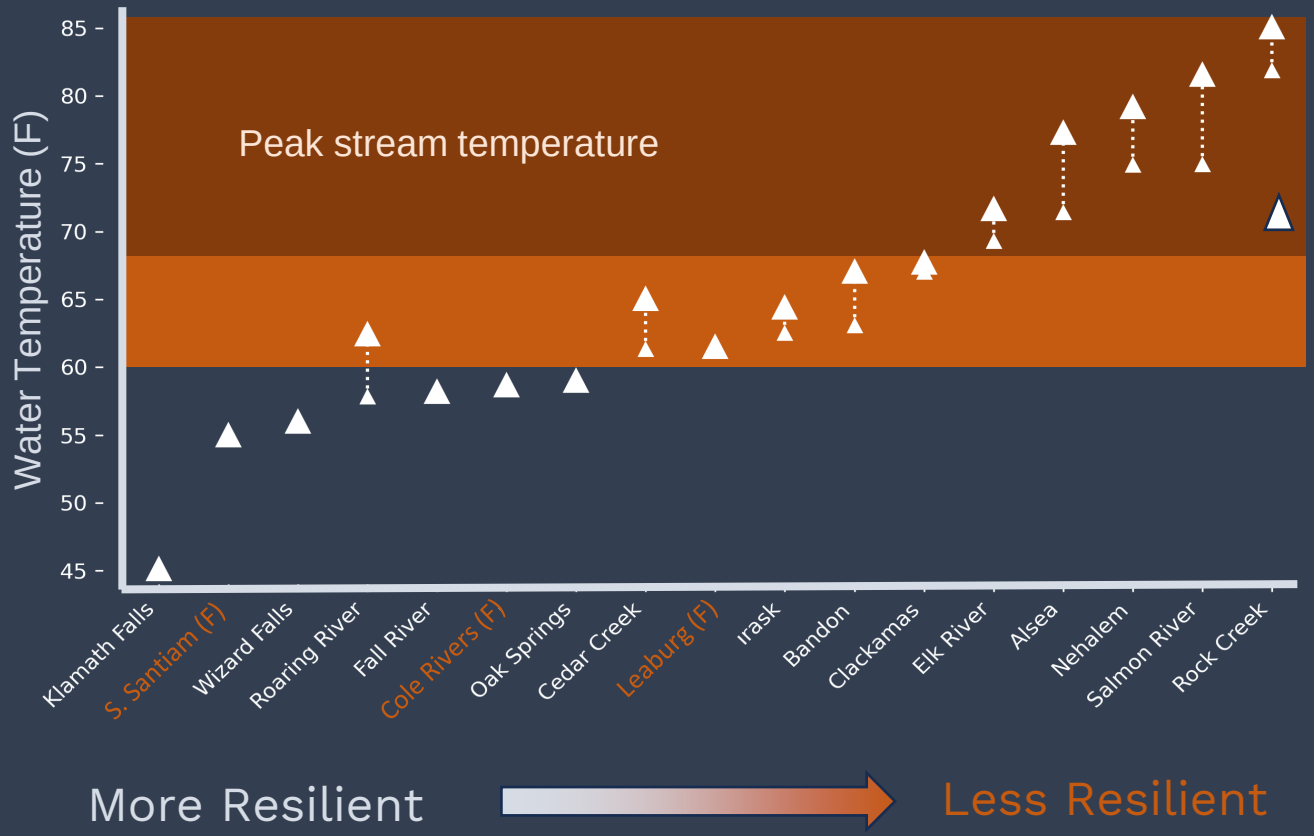
Cascade facilities more resilient



Current and Future Temperatures

3-4.5º increase at coastal facilities

Cascade facilities more resilient



Wildfire Risk

2017
Cascade Hatchery

2020
Clackamas, Roaring River, Marion Forks/**Minto**, South Santiam, McKenzie, **Leaburg**, Dexter, Wizard Falls, Oak Springs, Salmon River, **Rock Creek**, **Klamath**, Cole Rivers

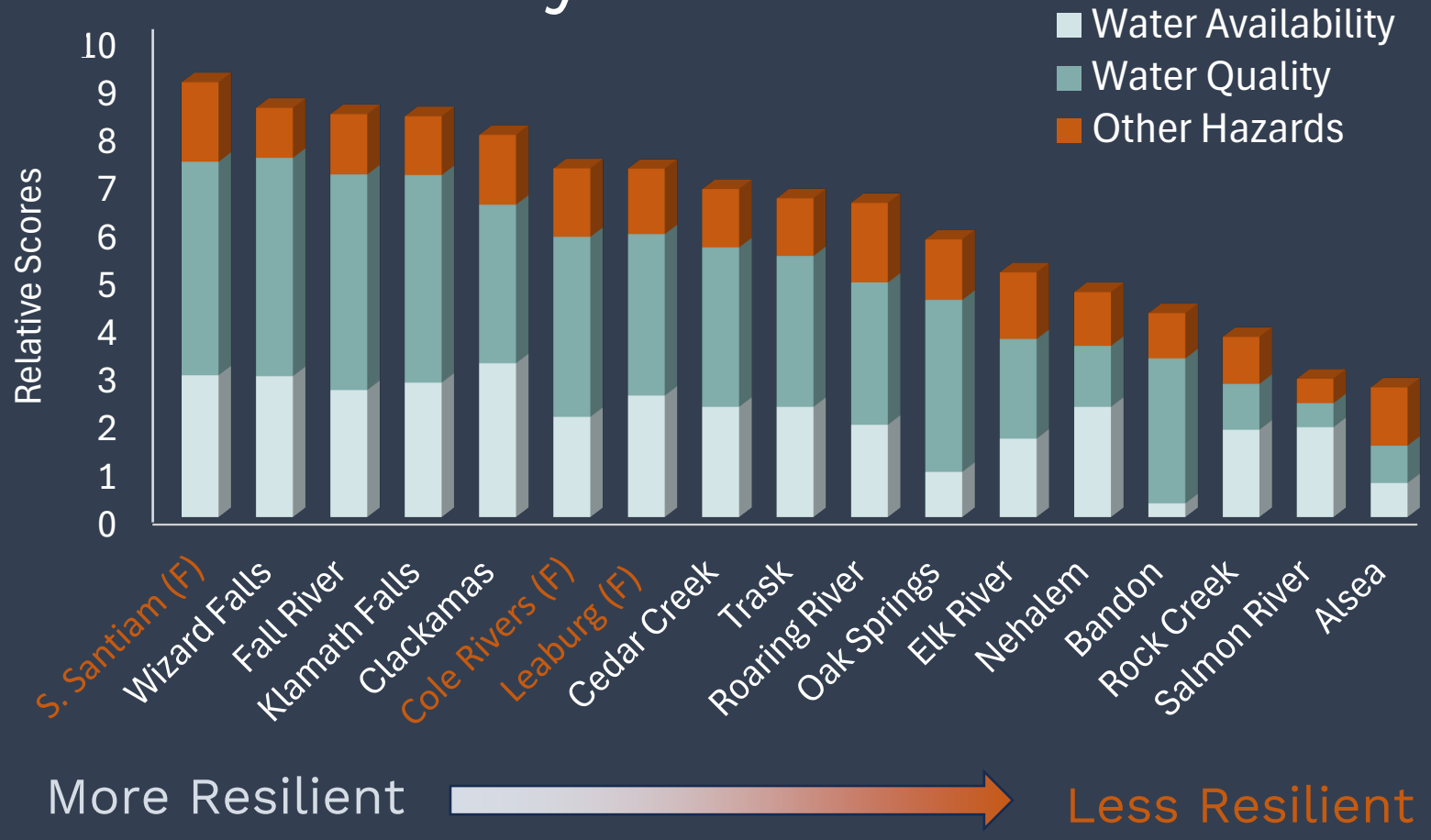
2021
Willamette, Oak Springs

2022
Willamette, Clackamas, Oak Springs, Imnaha

2023
Elk River, Willamette, Oak Springs

Hatcheries impacted by recent fire

Overall Hatchery Resilience



Lynker

Hatchery Infrastructure Assessment

Infrastructure costs

Deferred maintenance

Address existing issues, BUT to a level needed to address future risks

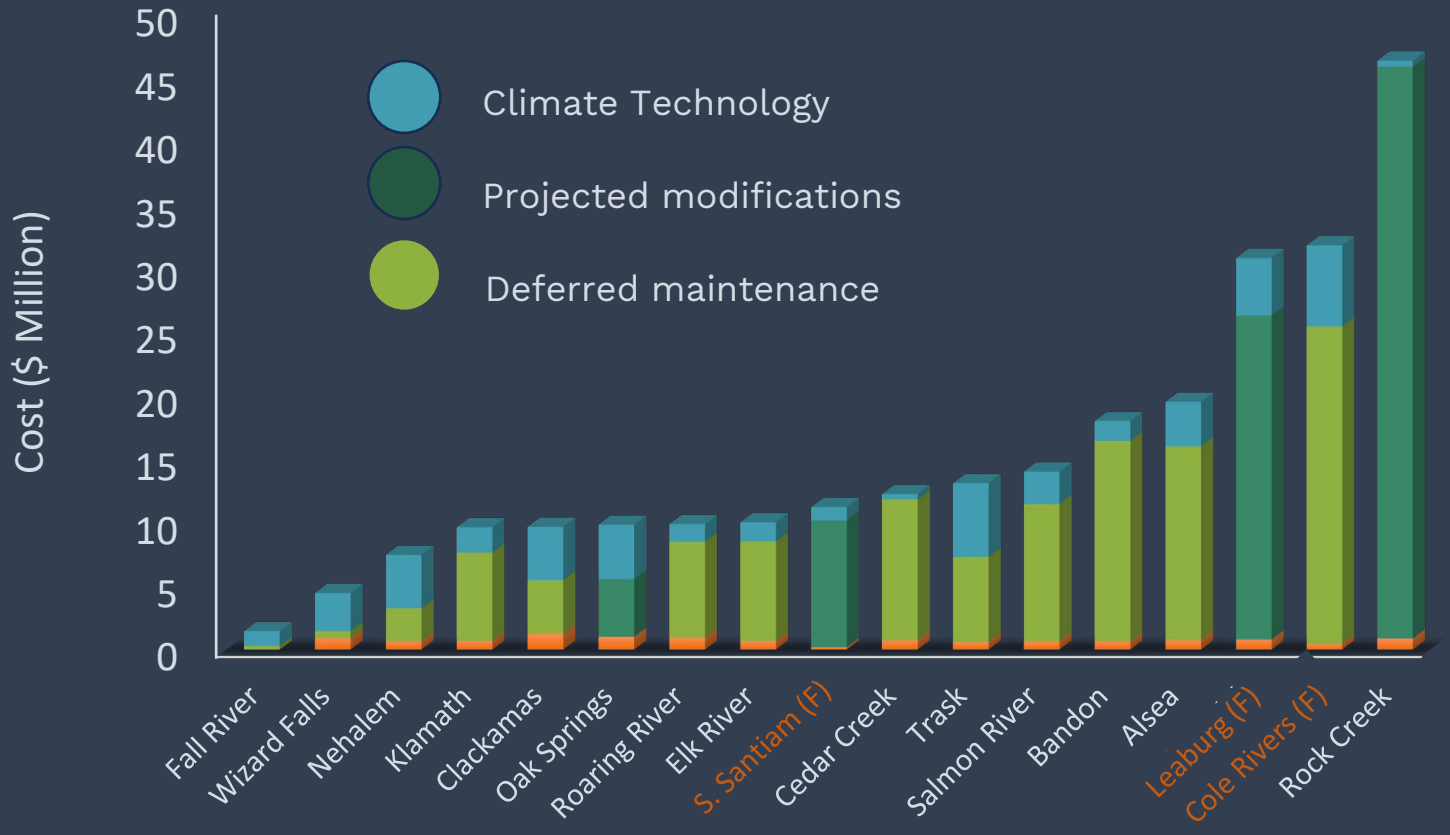
Projected modifications

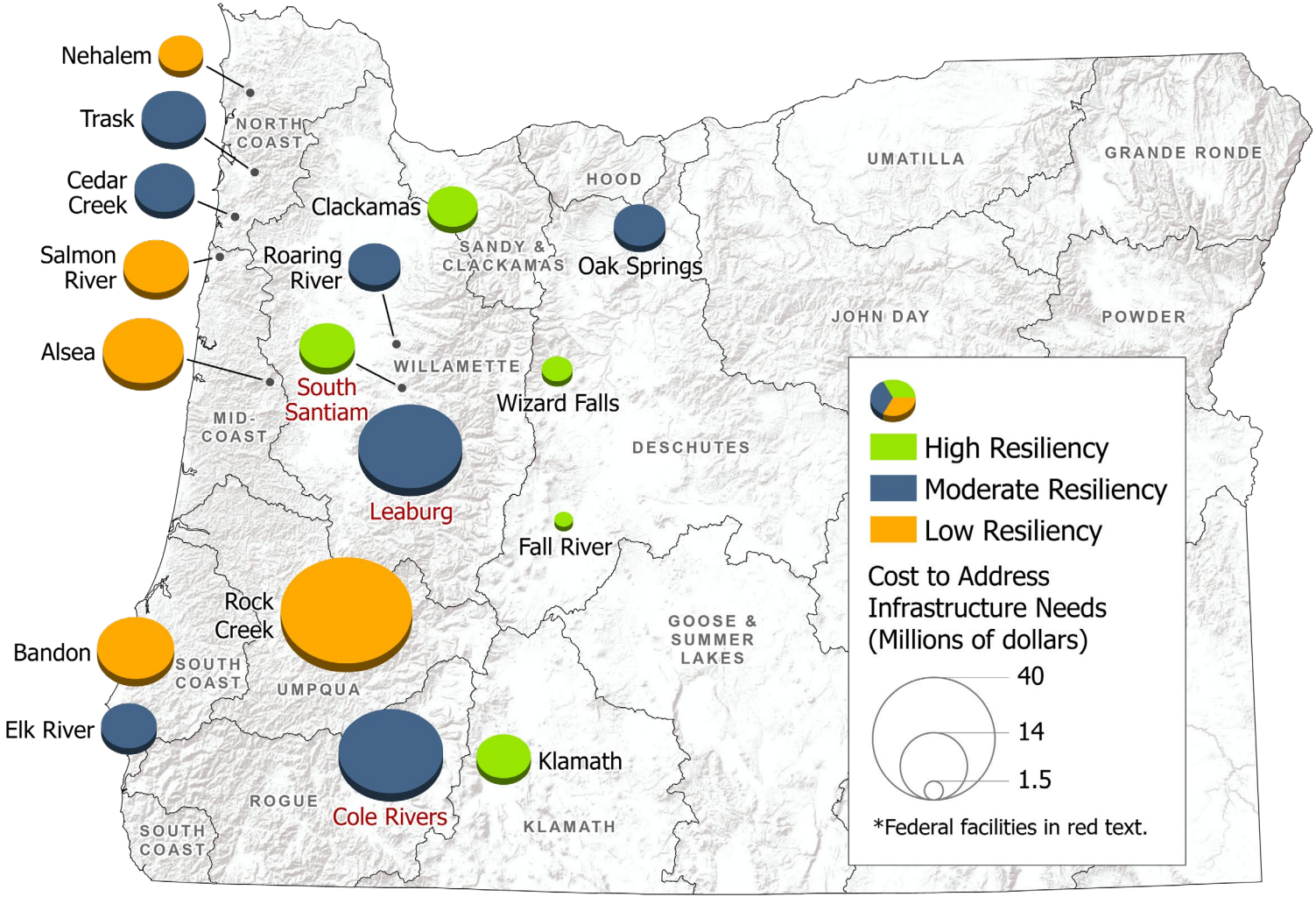
Address special circumstances

Climate, technology upgrades

Chilling, recirculation, shade etc

Infrastructure costs

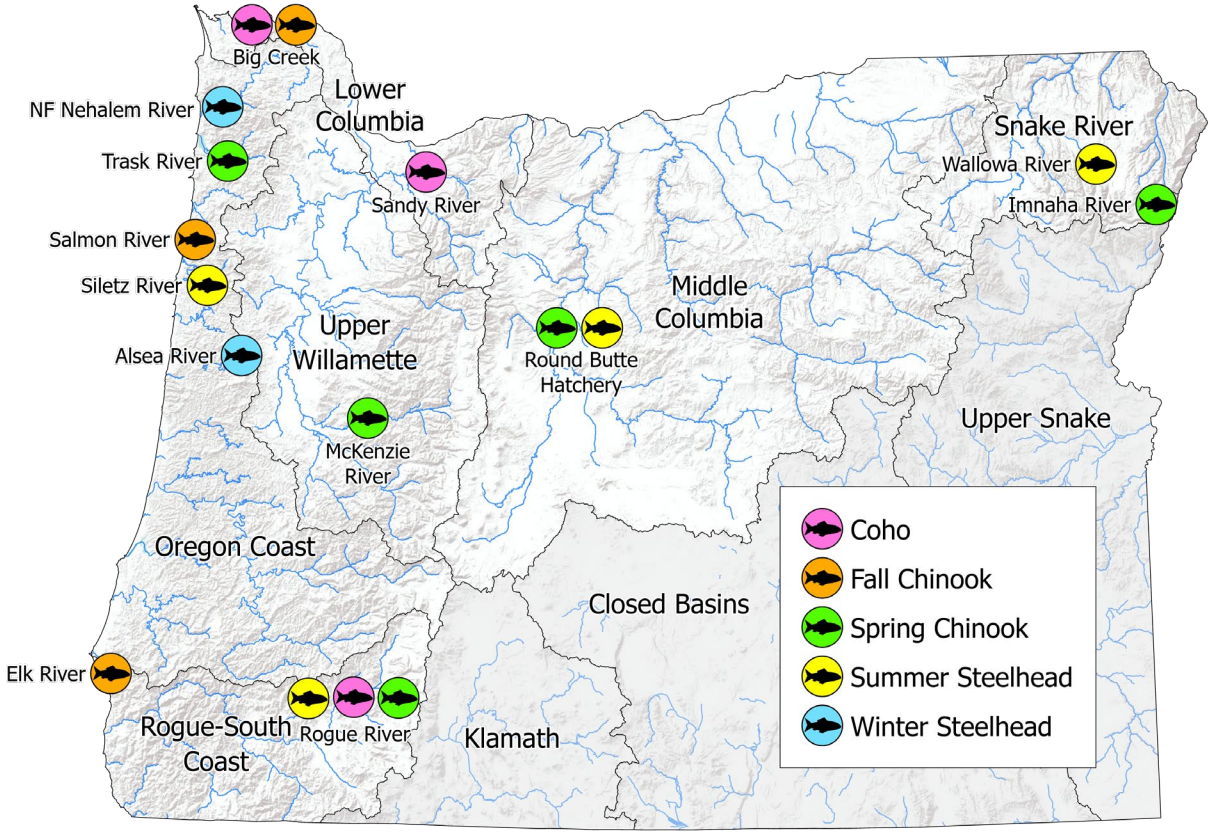



Nehalem
Trask
Cedar Creek
Salmon River
Alsea
Clackamas
Roaring River
South Santiam
Leaburg
Wizard Falls
Oak Springs
Fall River
Rock Creek
Bandon
Elk River
Cole Rivers
Klamath
NORTH COAST
MID-COAST
SOUTH COAST
UMPQUA
ROGUE
SOUTH COAST
SANDY & CLACKAMAS
HOOD
WILLAMETTE
DESCHUTES
JOHN DAY
UMATILLA
GRANDE RONDE
POWDER
GOOSE & SUMMER LAKES
KLAMATH
High Resiliency
Moderate Resiliency
Low Resiliency
Cost to Address Infrastructure Needs (Millions of dollars)
40
14
1.5
*Federal facilities in red text.

HATCHERY FISH VIABILITY

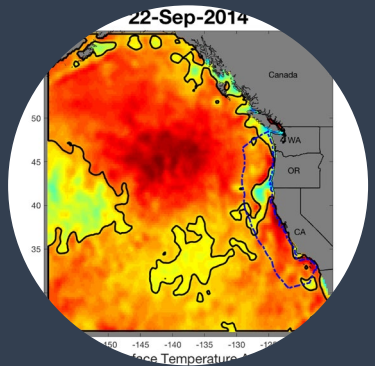
Hatchery Programs Assessed

Impact of environment on trends in survival

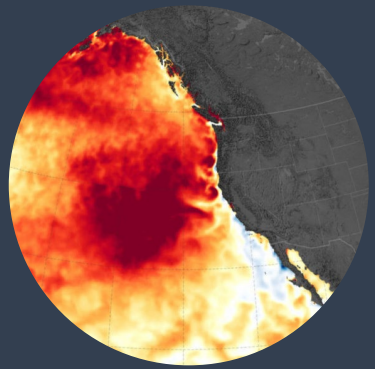


Environmental Variables

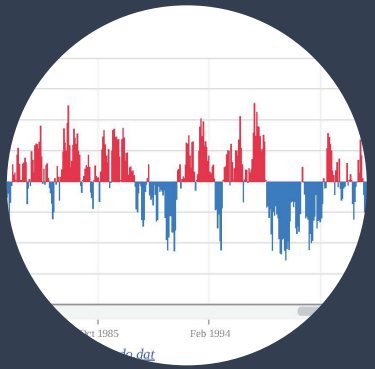
River flow during outmigration



Sea Surface Temperature (summer and winter)

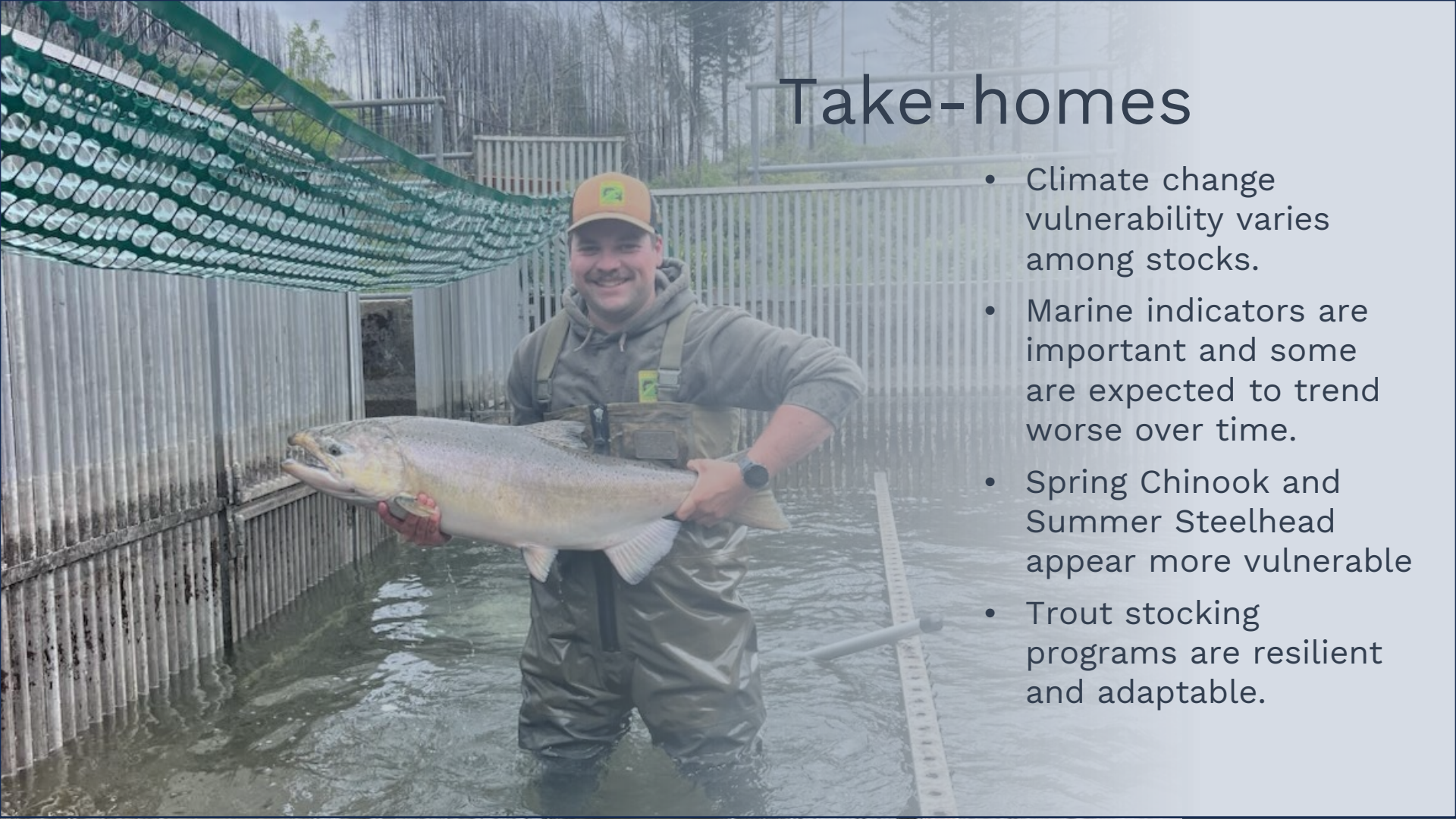


Marine Heat Wave intensity and duration



Large Scale Climate Patterns (PDO, NPGO)

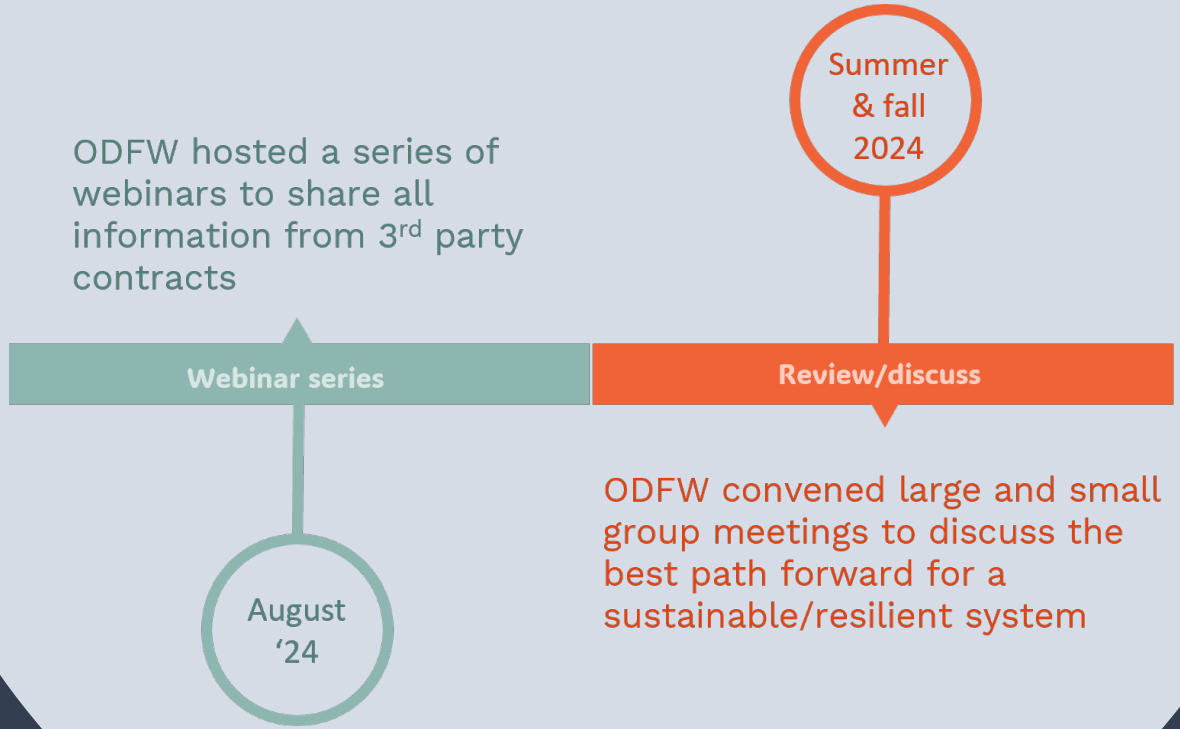
And more....



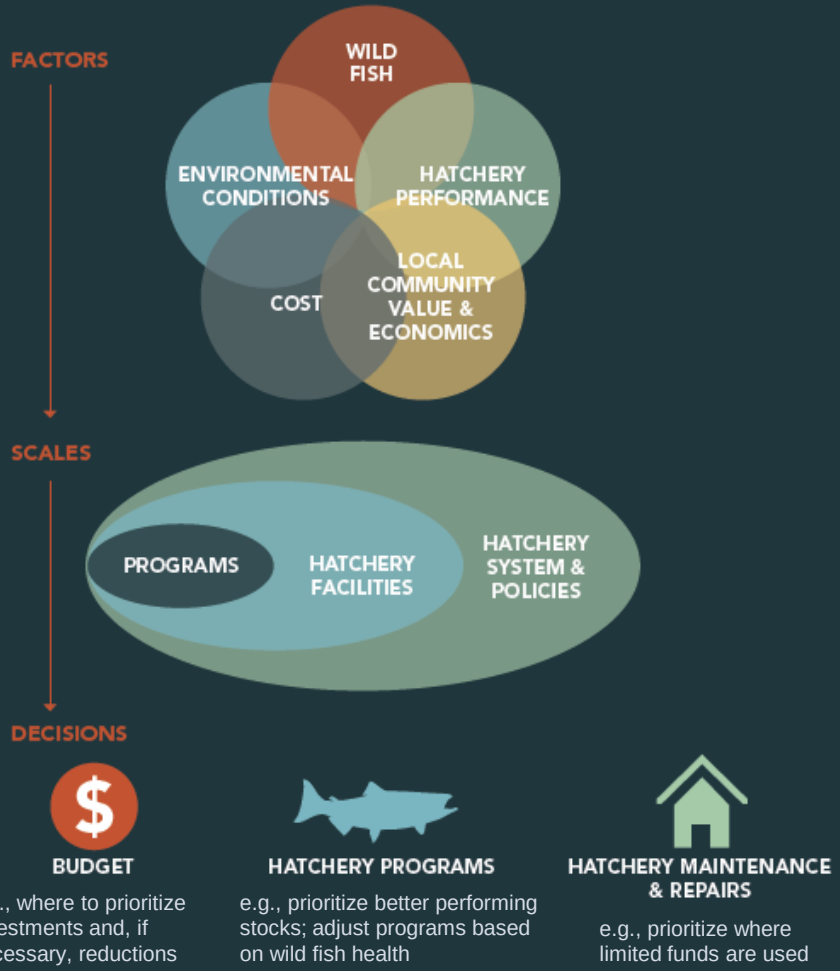
Take-homes

- Climate change vulnerability varies among stocks.
- Marine indicators are important and some are expected to trend worse over time.
- Spring Chinook and Summer Steelhead appear more vulnerable
- Trout stocking programs are resilient and adaptable.

Public Involvement



The five factors – a stakeholder led framework for informing decisions



THANK YOU

The data from this assessment will inform decision making in the coming decade to strategically address infrastructure needs in a way that continues and adds resiliency to the system.