

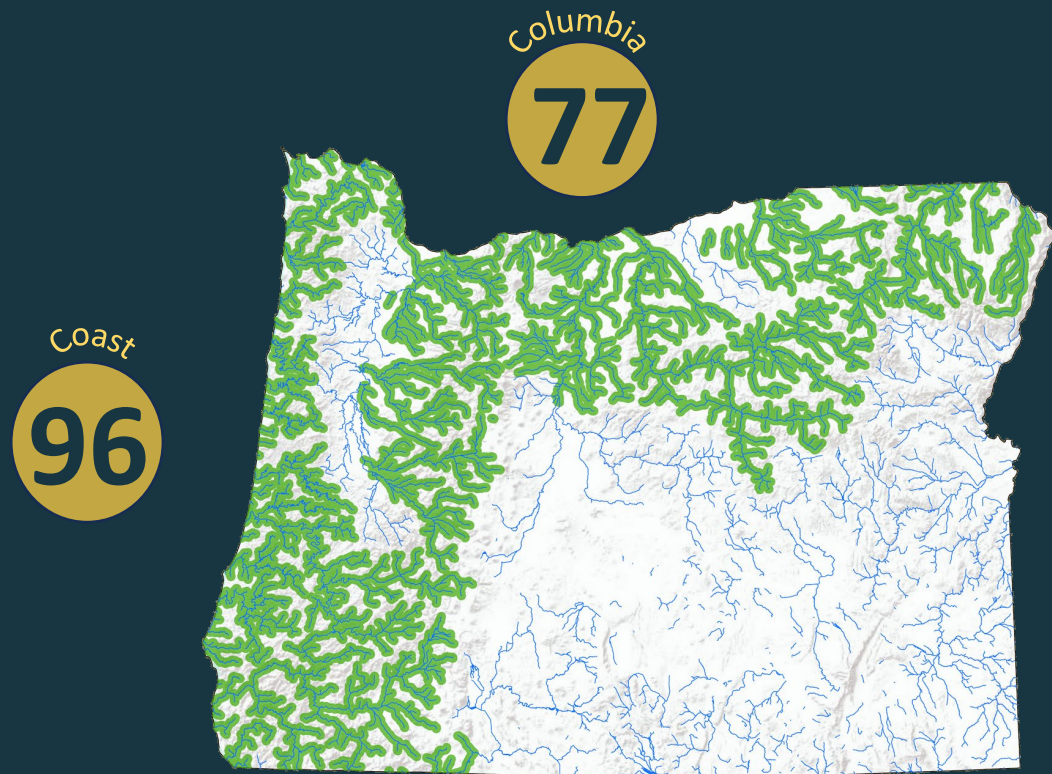


LOOKING AHEAD

Budget Note Assessment of Oregon's State hatchery system



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



Coho

summer
steelhead

winter
steelhead

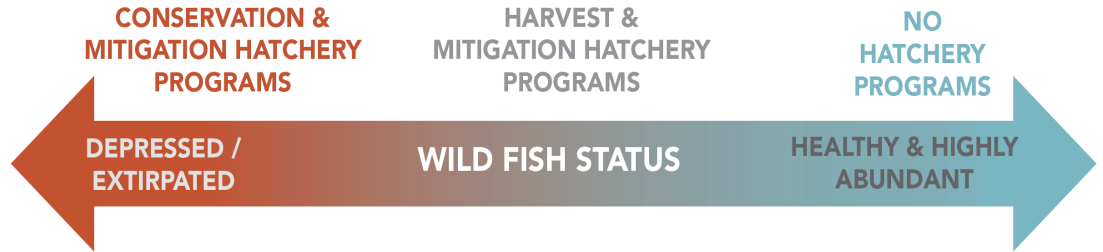
spring
Chinook

fall
Chinook

Chum



Why do we have hatcheries?



Mitigate for impacts to habitat (e.g., dams)

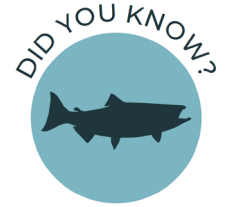


Provide additional harvest opportunities

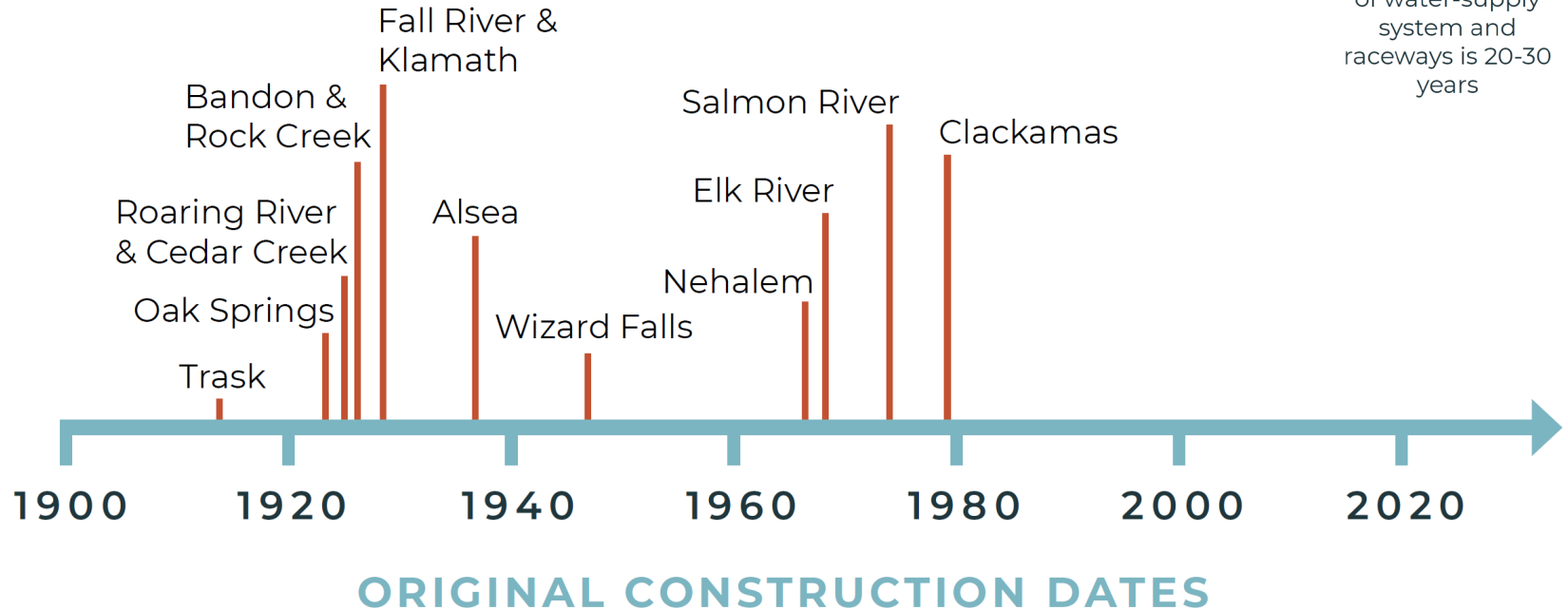


Support imperiled wild populations

State Hatcheries



Average lifespan
of water-supply
system and
raceways is 20-30
years



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

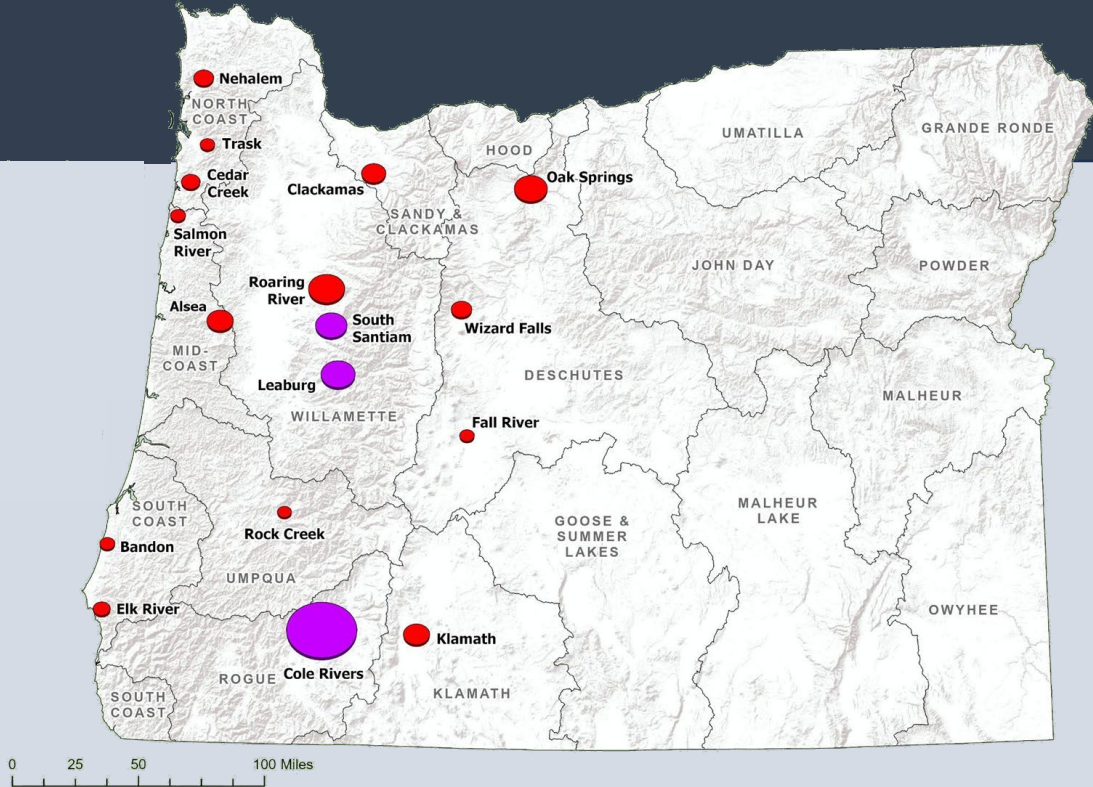


Hatcheries

under review

Focus on 17 facilities

- 14 state-owned
- 3 federally-owned





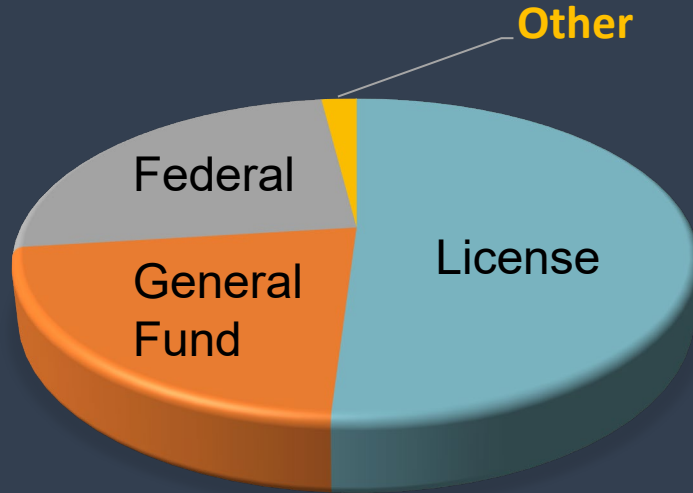
ECONOMICS

The Research Group LLC

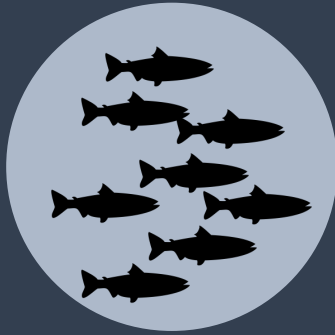
Total Costs

\$12.5 M

23-25 annual
cost



Detailed Cost Assessment



Production

Personnel, supplies
and services,
insurance, etc



Maintenance and Replacement

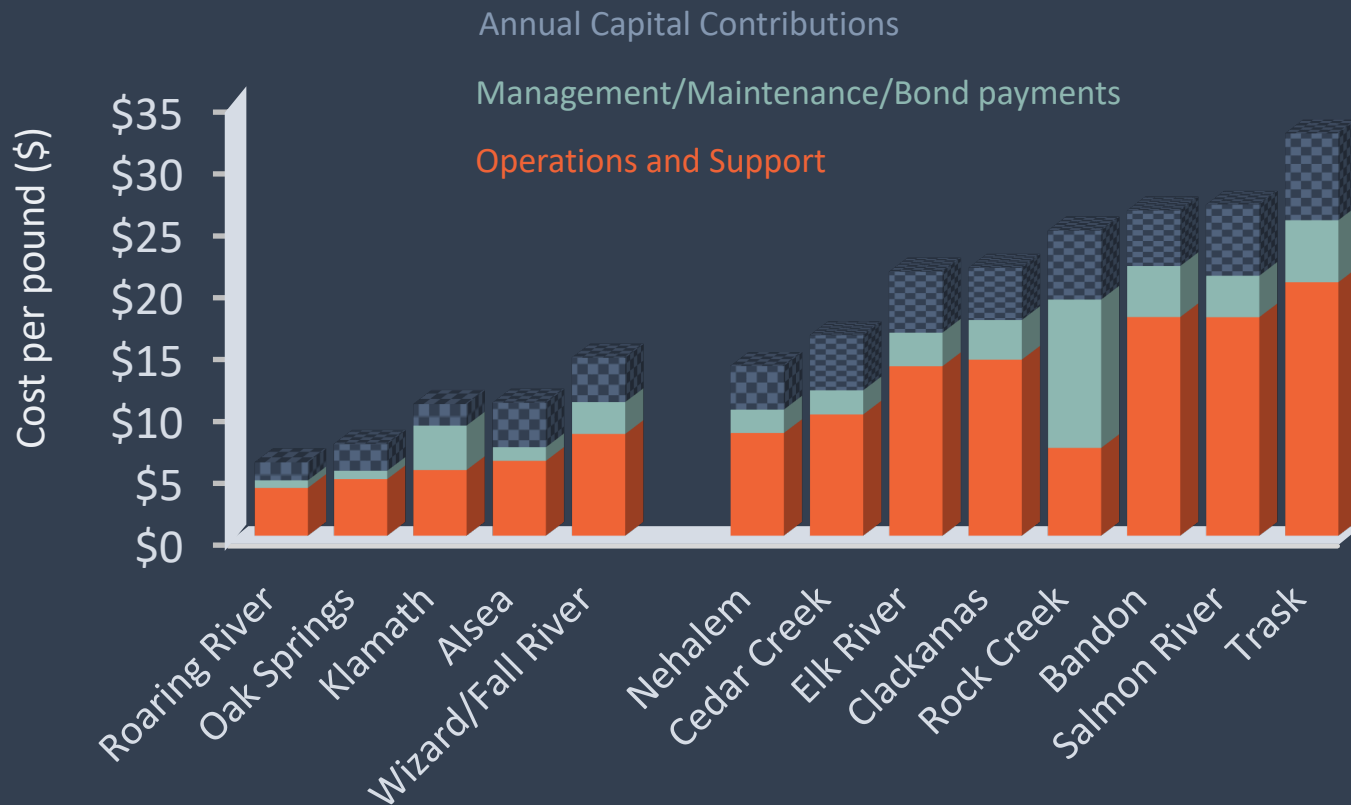
Ongoing and
improvements



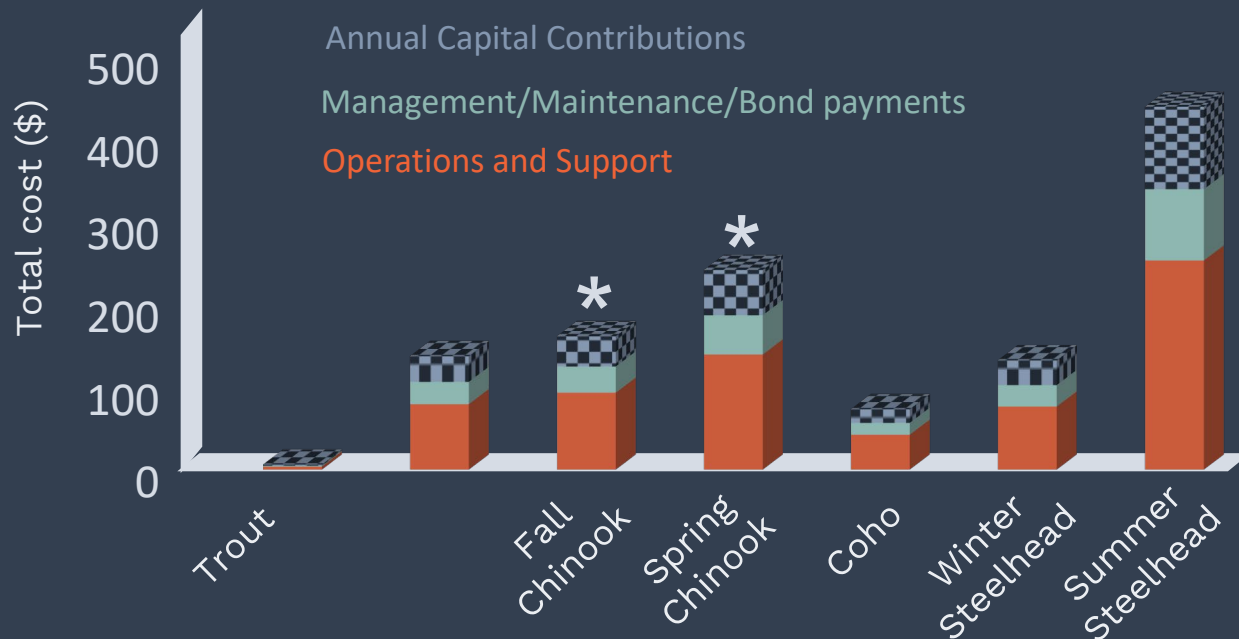
Fisheries

Rearing, release, harvest
rate, SARs etc

Annual Cost per Pound of Fish Released



Cost per adult harvested



Economic Impact and Net-Benefit



Economic impact

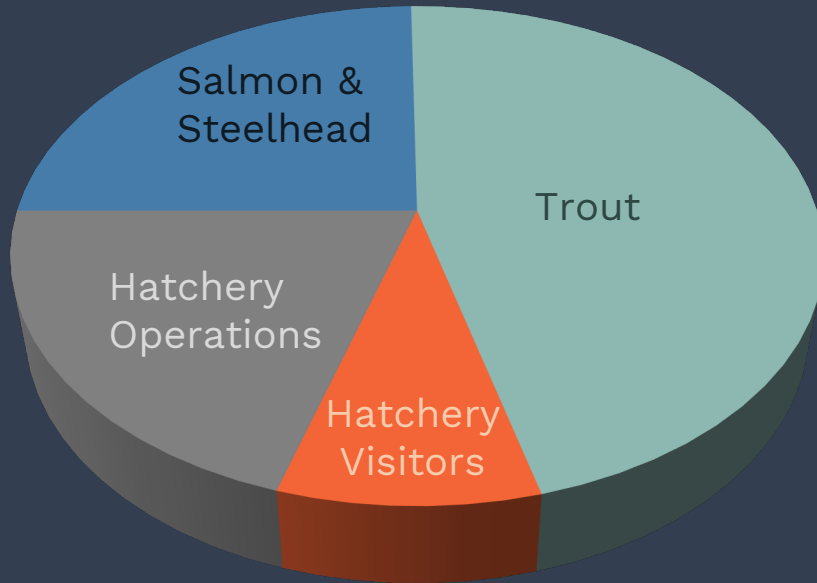
Measures financial activity associated with recreational/commercial fisheries and visits to the hatcheries.



Net-Benefits

Measures willingness to pay for a non-market commodity.

Regional Economic Impact



\$55.5 M

Total
economic
impact

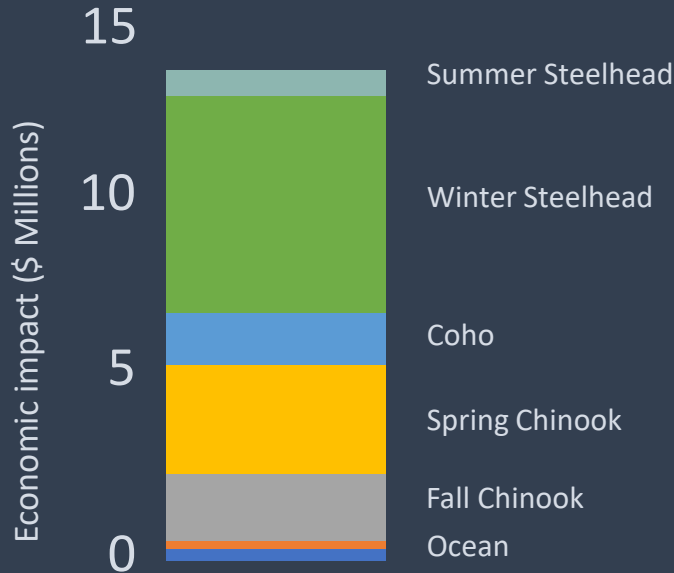
46%

Impact attributed
to trout

1,100

Jobs generated by
the hatchery system

Regional Economic Impact From Salmon & Steelhead Fisheries



\$13.7 M Total economic impact

\$13 M Impact attributed to inland fisheries

Winter steelhead account for highest proportion (46%) of economic impact for inland fisheries

Calculating Net-Benefit

Standard methods, but
does not account for
all benefits and costs



Costs

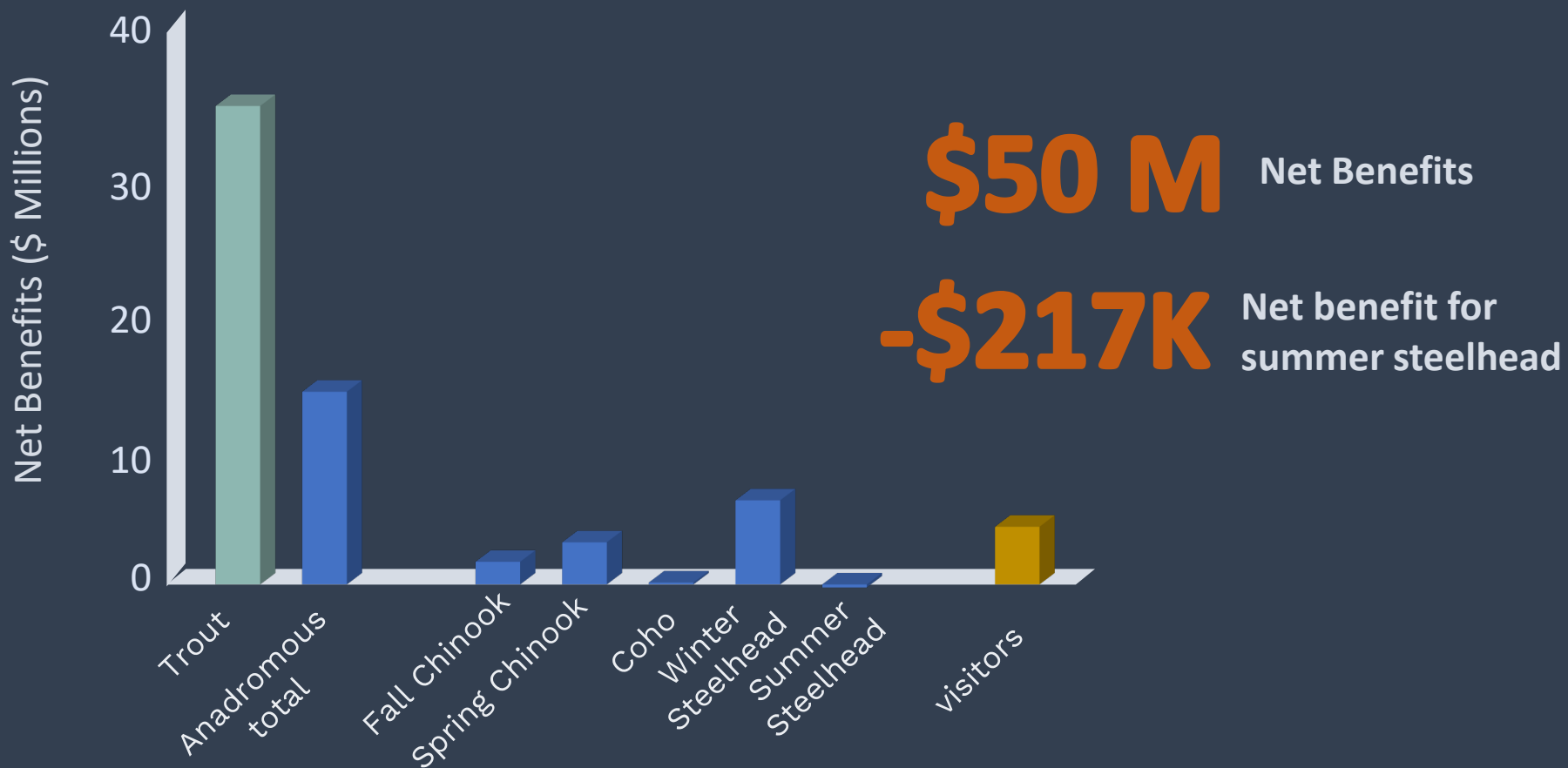
- Personnel
- Utilities/feed/travel
- Support
- Maintenance
- Bonds
- Insurance
- Depreciation



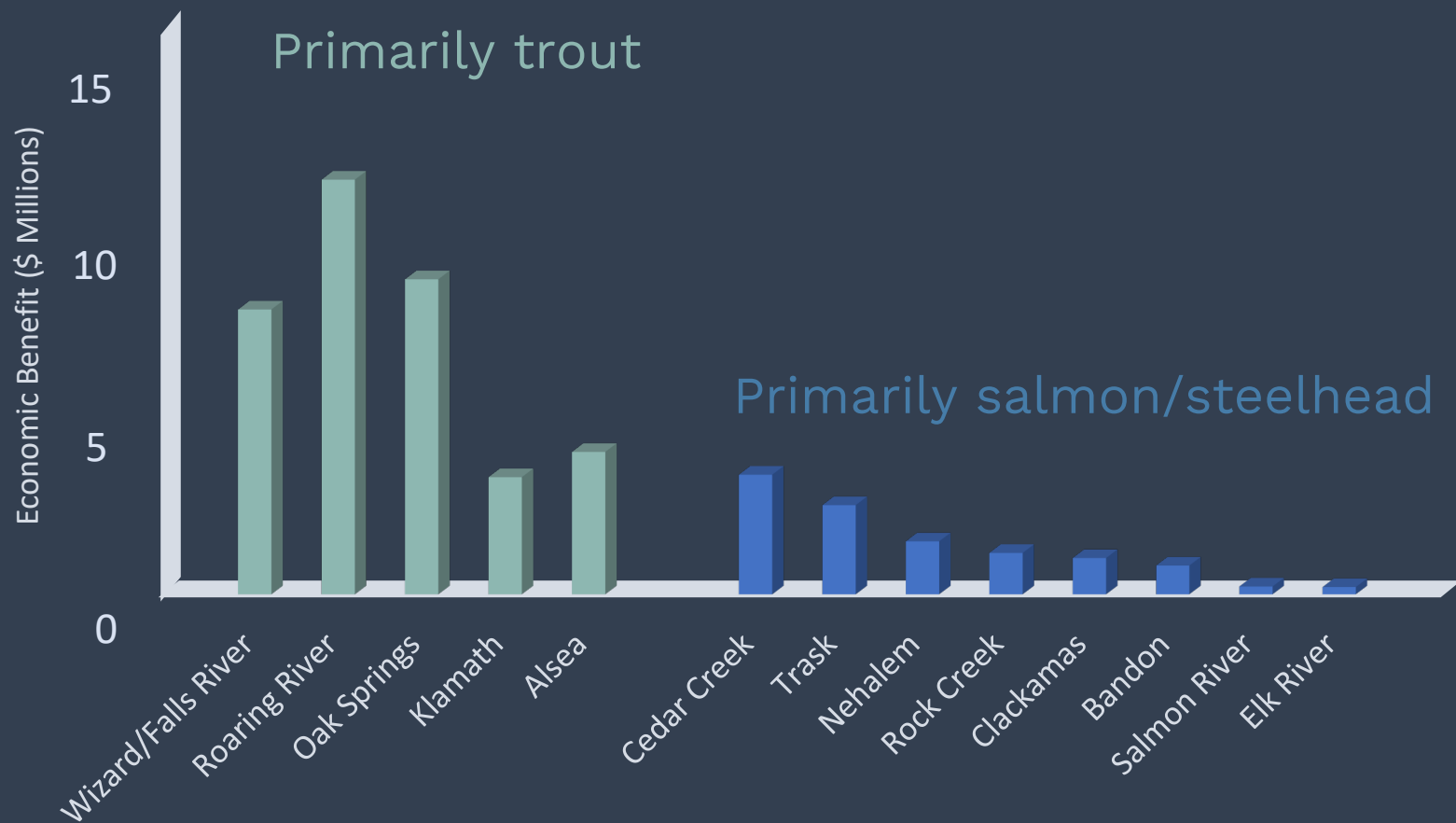
Benefits

- Recreational angler willingness-to-pay
- Commercial harvester and primary processor profitability and portion of fixed costs.
- Visitor willingness-to-pay

Net Benefits by Species/Hatchery Visits



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

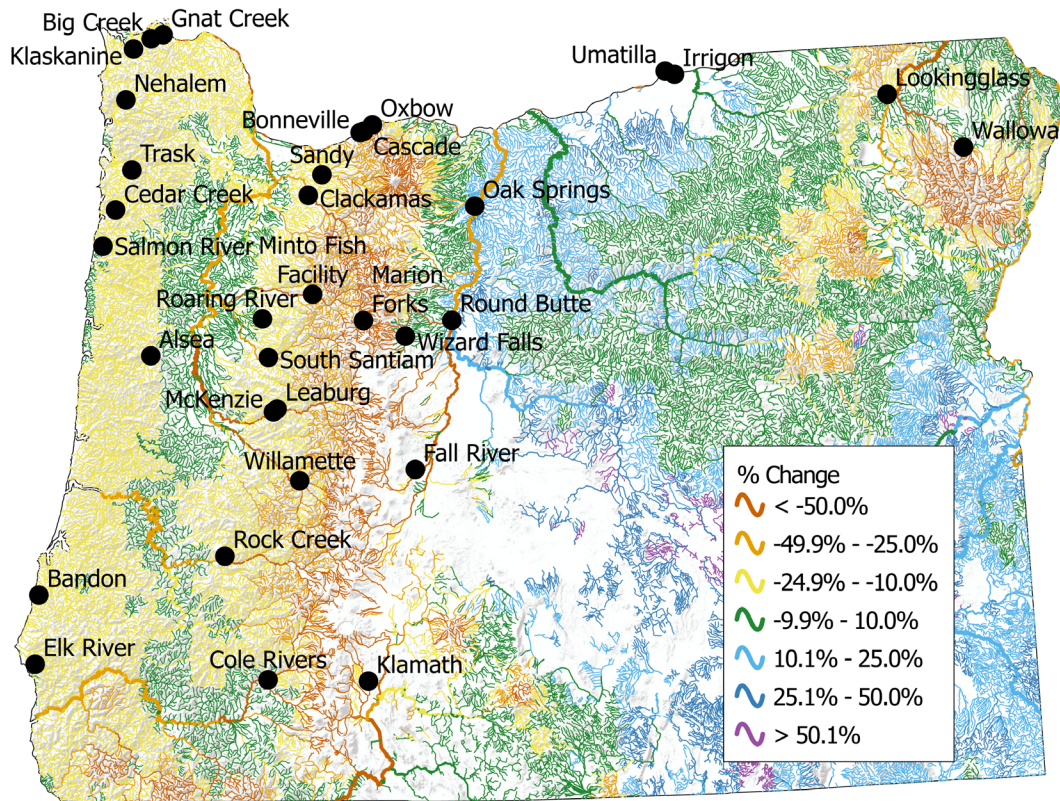
Compare hatchery resilience under three scenarios



10-25% decrease in
flow at coastal
facilities

Cascade facilities
more resilient

Future Flows

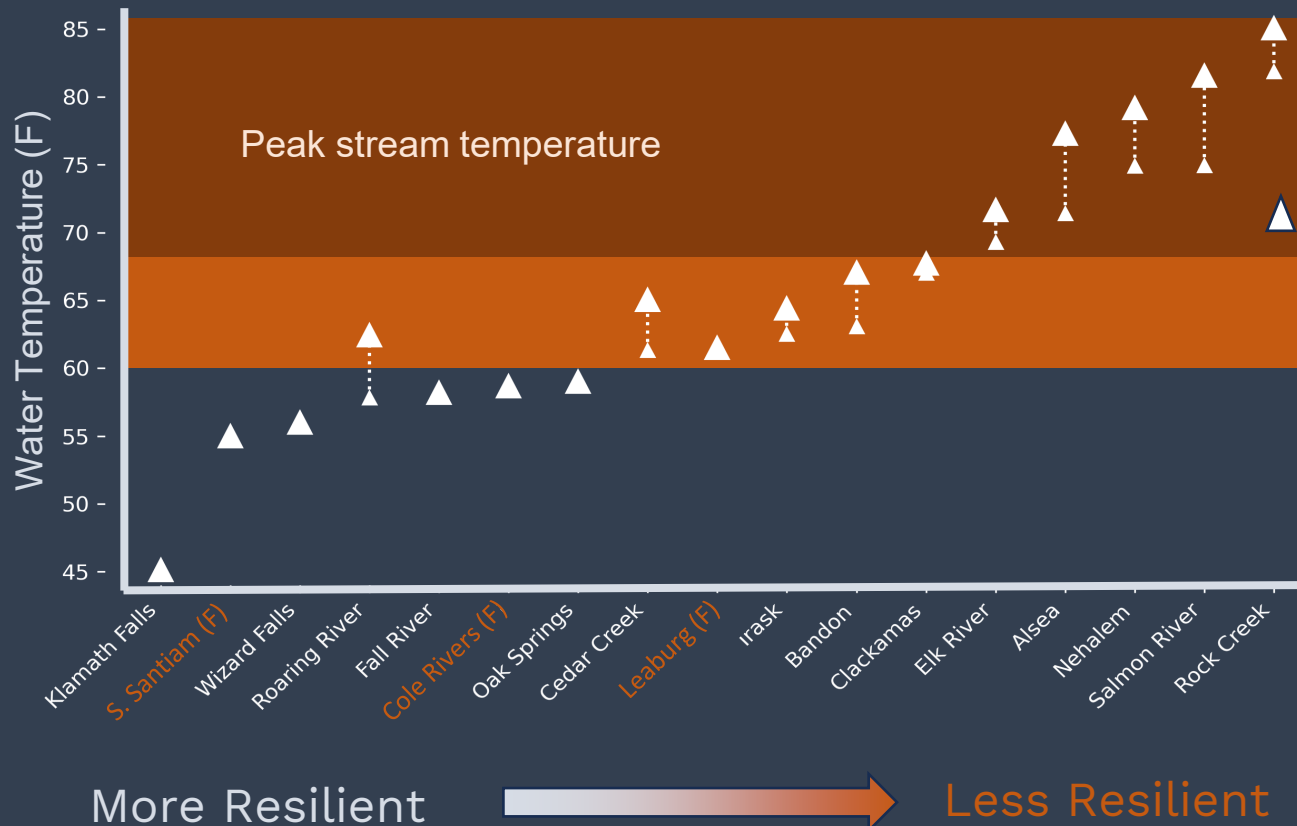




3-4.5° increase at
coastal facilities

Cascade facilities
more resilient

Current and Future Temperatures





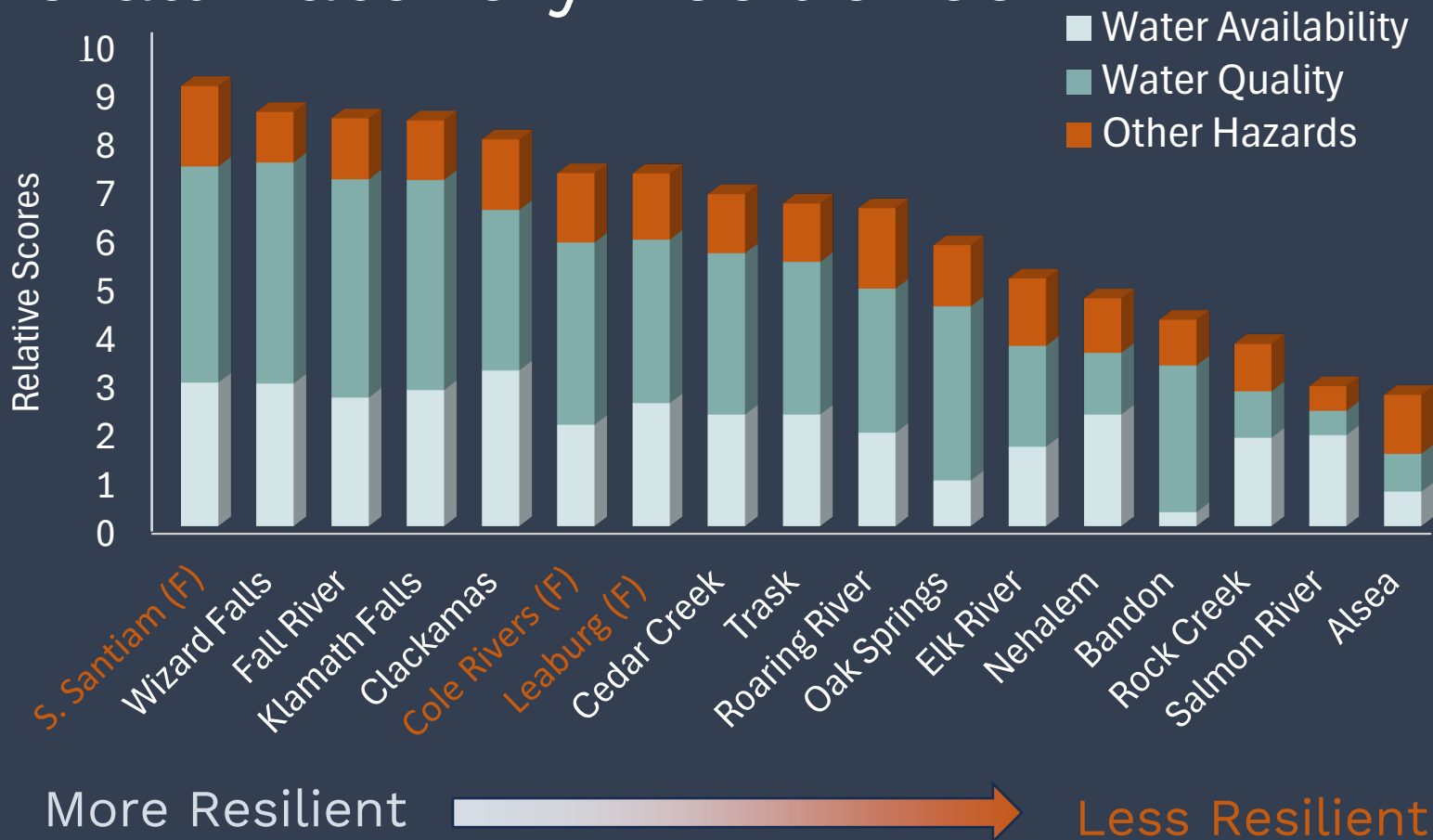
Wildfire Risk



Hatcheries impacted by recent fire



Overall Hatchery Resilience





Hatchery Infrastructure Assessment



Infrastructure costs



Deferred maintenance

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



Projected modifications

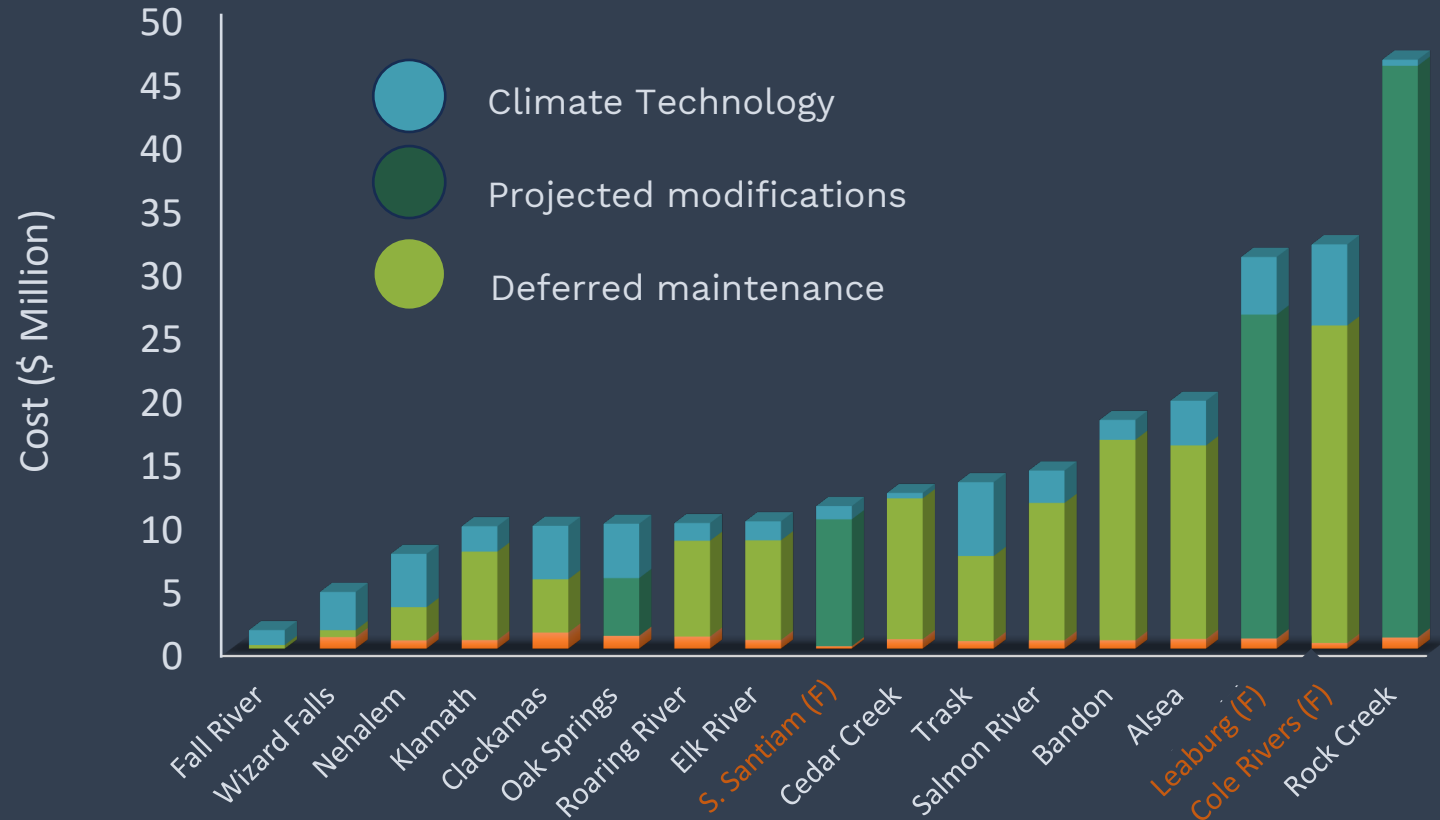
Address special circumstances



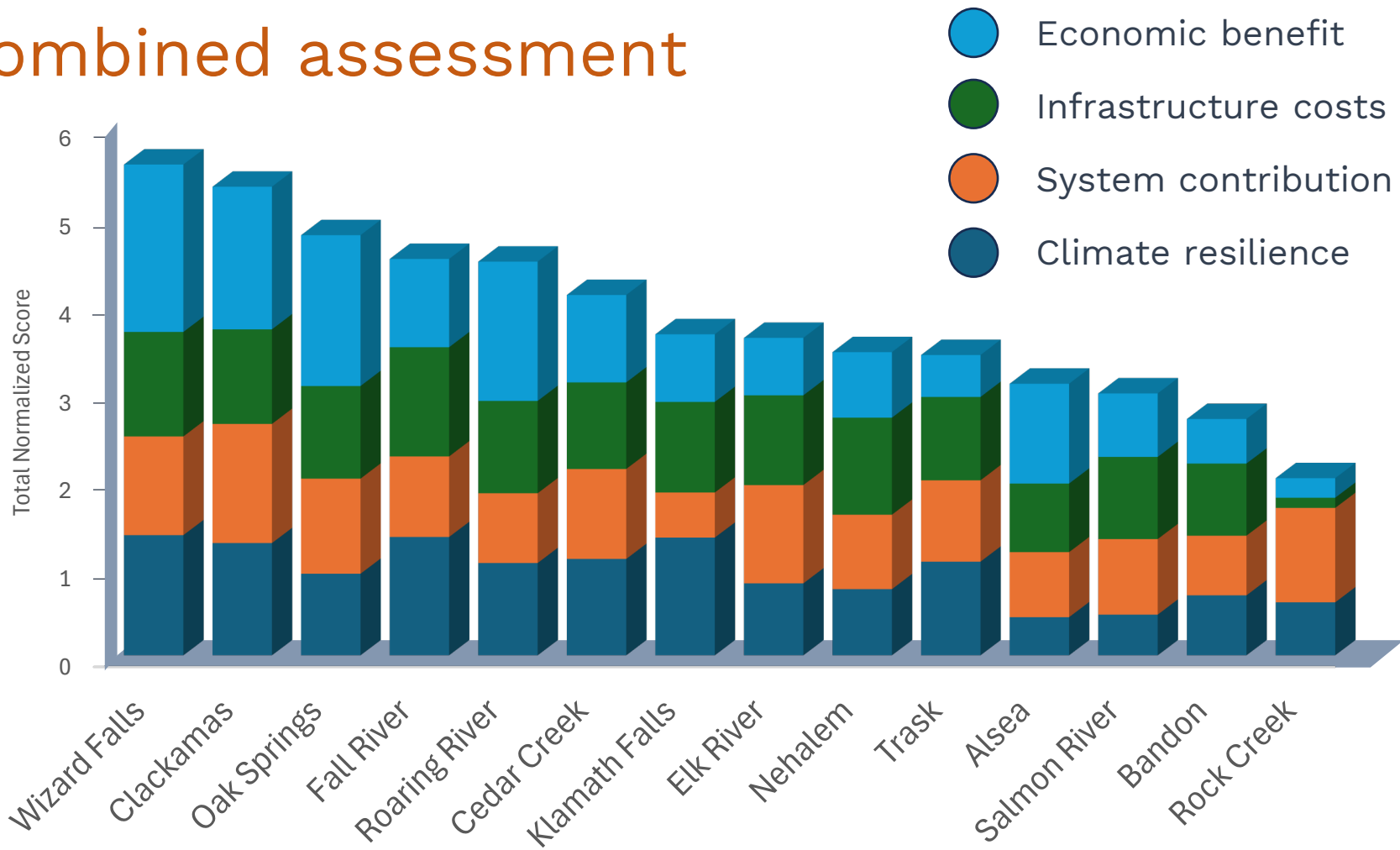
Climate, technology upgrades

Chilling, recirculation, shade etc

Infrastructure costs



Combined assessment



Comparing alternative system configurations



Status quo

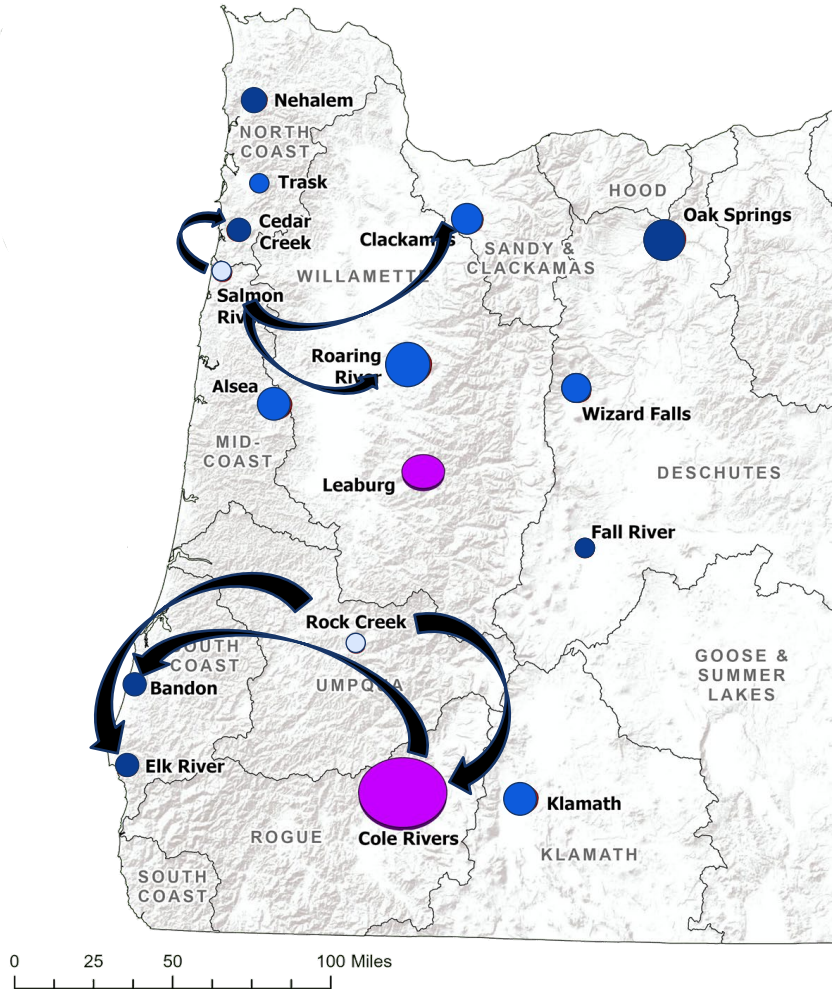
VS



**Consolidated
production**

Evaluated three
alternatives to consolidate
production in NW and SW

Results in advantages and
challenges



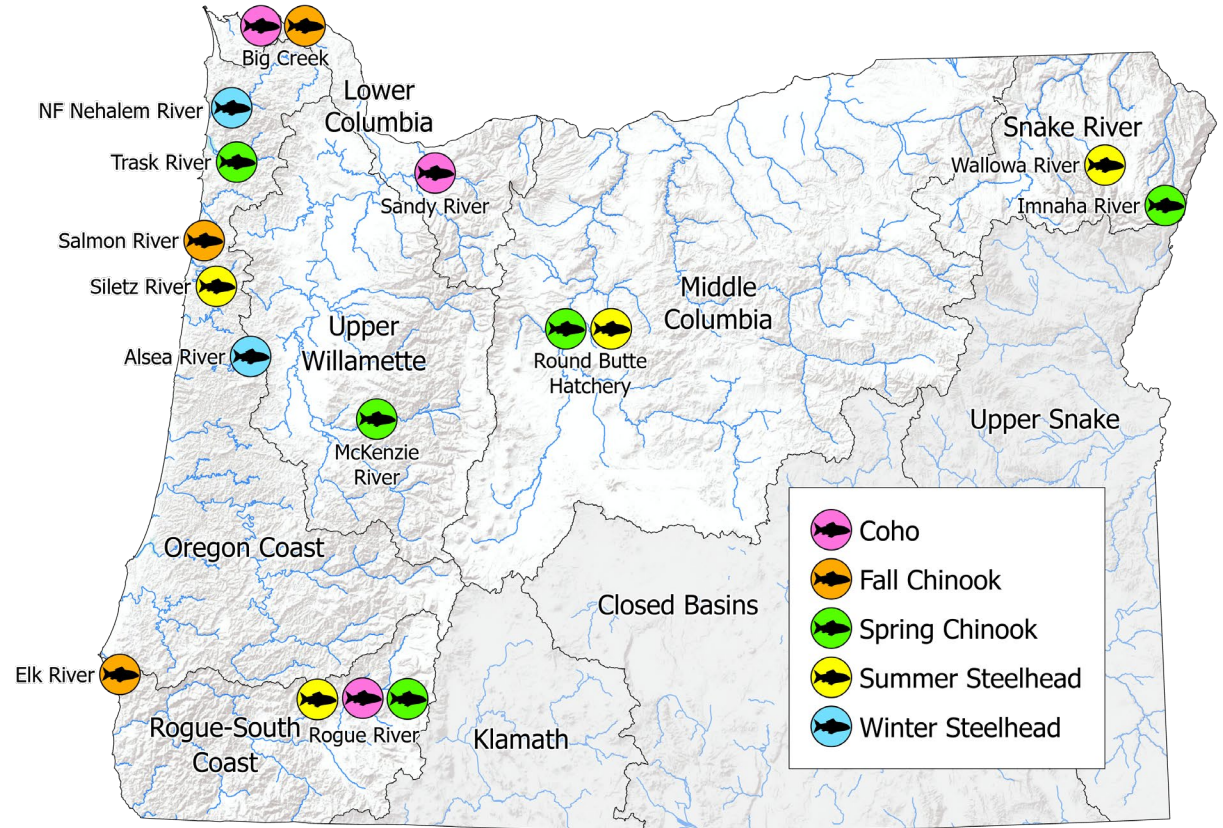
An underwater photograph showing a large group of fish, likely salmon, swimming in a body of water. The fish are of various sizes and are densely packed in the center and foreground. The water is slightly murky, and the lighting is soft, creating a naturalistic scene. The fish have silvery scales with some darker spots, and their fins are visible. The overall composition is dynamic, with fish swimming in different directions.

HATCHERY FISH VIABILITY



Impact of environment on trends in survival

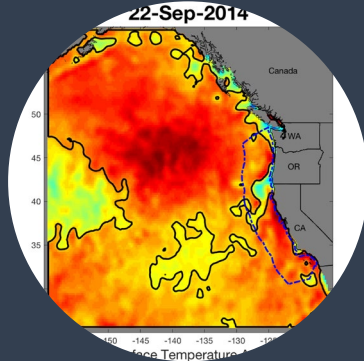
Hatchery Programs Assessed



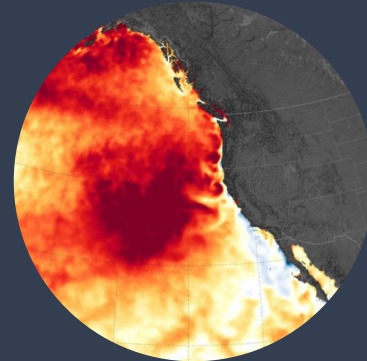
Environmental Variables



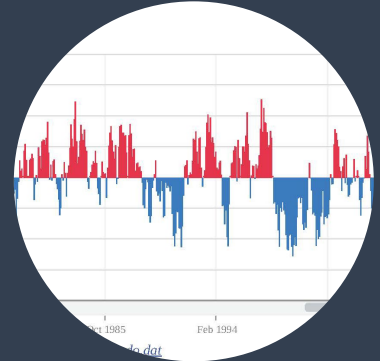
River flow during
outmigration



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.





FUTURE NEED FOR HATCHERIES

Wild fish status

Many populations doing well and expected to continue doing so with management

In some areas abundance likely reduced resulting in increased need for hatchery programs

ONGOING FUTURE NEED FOR HATCHERIES

Ongoing or new habitat impacts

Expectation for ongoing presence of dams and or new impacts that require mitigation

Angler Demand

Ongoing, stable license sales, but potential for shifts towards trout and/or warmwater spp.



POLICY AND PLANNING

Hatchery fish provide significant social, cultural, economic, and conservation benefits



Hatcheries and hatchery fish can have ecological, genetic, and environmental impacts

A photograph of two brown trout swimming underwater. The trout in the foreground is slightly out of focus, showing its brown and orange scales and dark spots. The trout behind it is more in focus, showing its head and open mouth. The water is clear and blue-green, with some light reflecting off the surface.

Take-homes

- Policy and planning framework in place to achieve benefits while minimizing risk
- Thorough federal process to address risk to listed stocks
- These sideboards will govern future programs

THANK YOU

A yellow Grove crane is positioned on a construction site, lifting a large metal structure into a concrete water channel. The site is surrounded by tall pine trees, and the sky is blue with some clouds. The crane's boom is extended high into the air, and the metal structure is being lowered into the channel. The concrete channel is filled with water, and there are some pipes and valves visible at the bottom. The overall scene is a construction project in a natural setting.

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.