# LOOKING AHEAD

## INVESTING IN A SUSTAINABLE HATCHERY SYSTEM FOR A HOTTER, DRIER FUTURE

Hatcheries operated by the Oregon Department of Fish and Wildlife provide social, economic, and cultural benefits to Oregonians by sustaining sport, commercial, and tribal fishing opportunities. Hatcheries can also help support imperiled fish populations and re-establish native fish in areas where populations have been lost.

# AT A GLANCE

Oregon Department of Fish and Wildlife (ODFW or the Department) operates 33 hatcheries throughout the state, 14 of which are state-owned. These facilities are vital to mitigating impacts from dams, providing for fishing opportunities, supporting local businesses and economies, and conserving imperiled wild populations.

These facilities are also facing challenges to ongoing operations. With funding from the Legislature, ODFW conducted a comprehensive, independent assessment of the state-owned facilities.

The assessment found that the hatchery system provides significant economic benefit to Oregon but faces considerable challenges from rising costs, deferred maintenance, and a changing environment. Some state-owned facilities are expected to be resilient to climate change, while other facilities are already being impacted by high water temperatures, low summer flows, and other environmental hazards that are projected to worsen in a changing climate.

The data from this assessment gives decision makers at all levels information to anticipate the impact of a changing climate on our hatchery system. It will inform decision making in the coming decade to strategically address infrastructure needs in a way that continues and adds resiliency to the system.

ODFW's mission is to protect and enhance Oregon's fish and wildlife and their habitats for use and enjoyment by present and future generations.

Oregon's rivers, streams and lakes are home to wild populations of salmon, steelhead, and trout. Salmon and steelhead spend a few days to years rearing in freshwater before migrating to the ocean where they may spend 1-4 years before returning to their natal rivers to spawn the next generation. In general, trout spend their entire life in freshwater. **IN MANY RIVER BASINS, WILD FISH ARE HEALTHY AND ABUNDANT AND SUPPORT VIBRANT FISHERIES.** For example, 75% of fall Chinook harvested on Oregon's coast each fall are of wild origin.

ODFW has many programs that support the conservation of wild fish. A primary focus of this work is the protection and restoration of habitat and ensuring that fish can move freely through streams to access habitat they need to complete their life cycles and adapt to a changing climate. Healthy habitats are the foundation of healthy wild fish populations. ODFW's programs also monitor the health of these populations and ensure fisheries are managed for long term sustainable opportunity.

# WHY DO WE HAVE HATCHERIES?

In some locations, the abundance of wild fish populations has declined significantly as a result of a range of factors. In these locations, wild fish alone may not be sufficiently abundant to meet the fishery demand and/or there may be a need to intervene to boost the wild population while habitat issues are addressed. Hatcheries are an important tool in these instances for providing fishery opportunity and conservation benefits. The need for, type, and characteristics of a hatchery program ultimately link back to the health of the wild population.

## Being good neighbors to wild fish

Because hatchery fish can have impacts to wild fish, ODFW has developed policies to guide the design and implementation of hatchery programs to reduce potential negative impacts of hatchery fish on wild populations while still achieving programmatic goals. Additionally, hatchery programs that culture or potentially interact with U.S. Endangered Species Act (ESA) threatened or endangered populations must comply with the terms and conditions and reasonable and prudent measures resulting from consultations under the ESA. As the state thinks about investments in hatchery infrastructure and hatchery programs, these policies will continue to provide important sideboards.

CONSERVATION & MITIGATION HATCHERY PROGRAMS

HARVEST & MITIGATION HATCHERY PROGRAMS

NO HATCHERY PROGRAMS

DEPRESSED / EXTIRPATED

WILD FISH STATUS

HEALTHY & HIGHLY ABUNDANT

## 3 TYPES OF HATCHERY PROGRAMS

**HARVEST**

Hatchery programs designed to augment or provide harvest opportunities have successfully supported commercial, tribal, and recreational fisheries. Harvest hatchery programs are managed to ensure risk to wild fish populations is within acceptable and clearly defined limits.

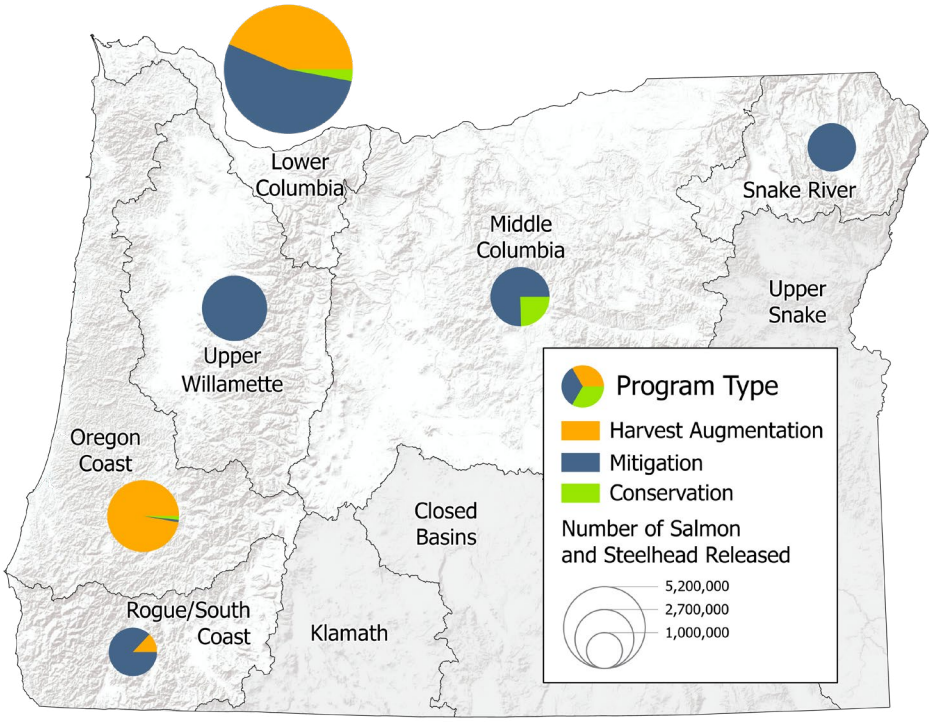
**CONSERVATION**

Conservation hatchery programs play an important role in supplementing natural populations, reintroduction of species, and the conservation and recovery of imperiled populations. Conservation programs are designed to provide a survival advantage compared to survival in the natural environment while having minimal impact on genetic, ecological, and behavioral characteristics of wild populations.

**MITIGATION**

Mitigation programs are in place where there is an agreement to provide fishing and harvest opportunities lost as a result of habitat deterioration, destruction or migration blockage. Mitigation programs can be either for conservation or harvest purposes, and in some cases serve a dual purpose. All of Oregon's federally owned hatcheries were built to mitigate for the fishery opportunity lost as a result of dams constructed by the federal government.

### TYPES OF HATCHERY PROGRAMS IN OREGON'S MAJOR WATERSHEDS



# HATCHERIES

## at a glance

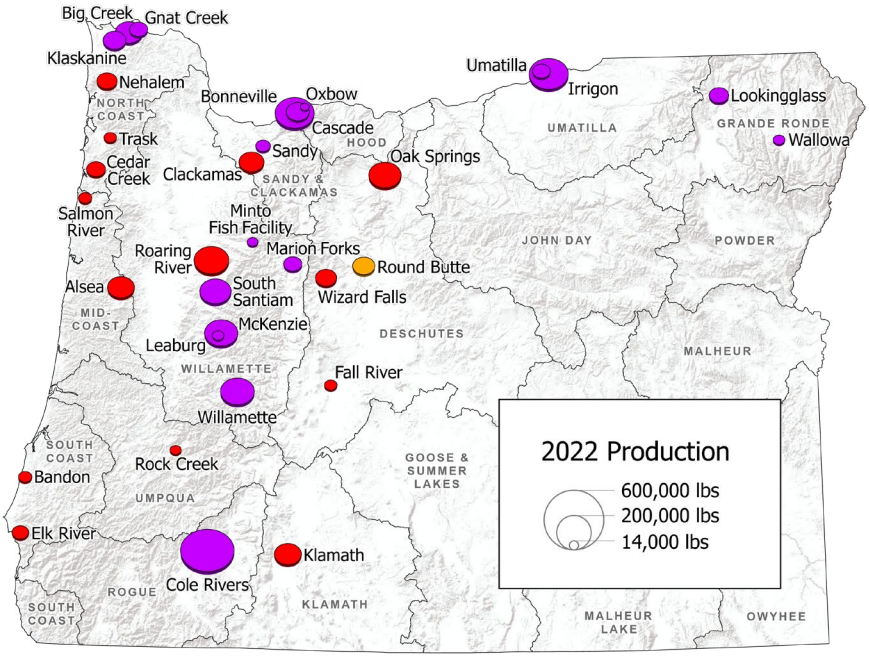
DID YOU KNOW?

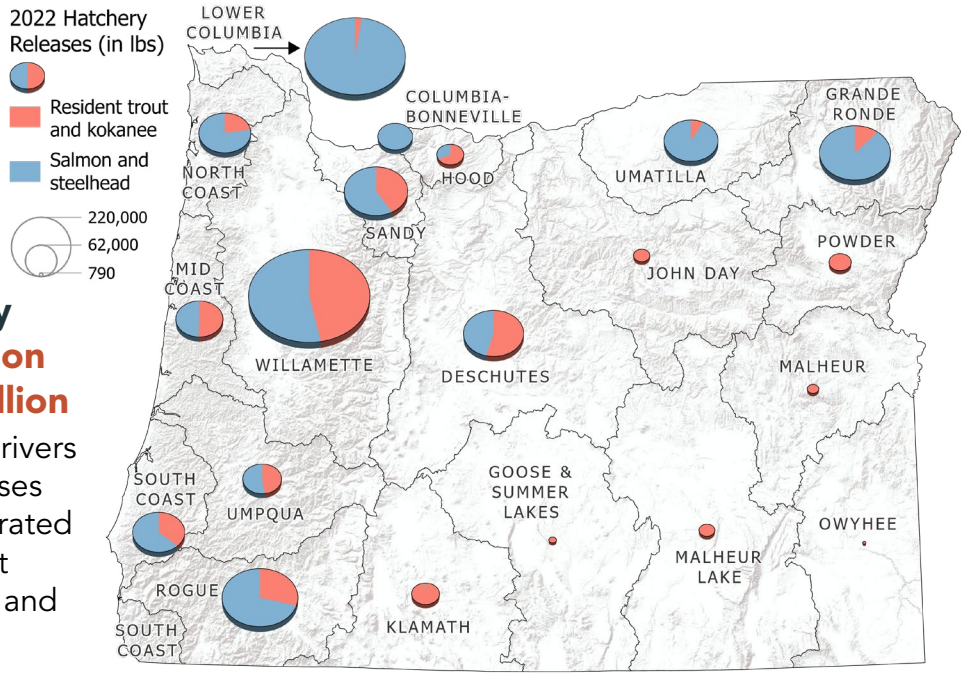
Over 70 percent of salmon and steelhead *harvested* in Oregon come from a hatchery

## ODFW OPERATES 33 HATCHERIES IN OREGON

- 14 state-owned
- 18 federally-owned
- 1 Portland General Electric facility

Ownership of the facilities results in different opportunities and constraints associated with investments and operations. For example, although operation of federal facilities has no cost to the state, funding and operational decisions are at the discretion of congress and federal agencies so there is less ability to ensure state priorities are met.



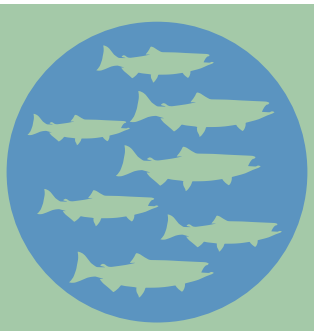

**These hatcheries annually produce ~35 million salmon and steelhead and ~5 million trout** for release into Oregon rivers and lakes. Some of these releases rely on additional facilities operated by tribes, the Salmon and Trout Enhancement Program (STEP), and other local entities.

# KNOW YOUR HATCHERY SYSTEM

HELPFUL TERMINOLOGY

### HATCHERY SYSTEM

The system of 33 ODFW operated facilities that work together to rear >40 million salmon, steelhead and trout annually.

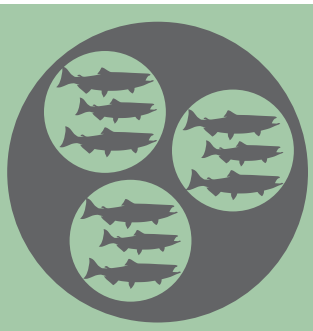


### HATCHERY PRODUCTION

The total pounds of fish reared for release (can be at a hatchery or in the system).

### BROODSTOCK

The adult fish that ODFW uses to produce eggs for a hatchery program.



### HATCHERY PROGRAM/STOCK

Refers to all releases of fish that are managed as a single unit for fisheries or conservation purposes. For example, a program can consist of all trout released into the high lakes, coho released into the Nehalem, or steelhead released into the Nehalem.

## HATCHERIES DO NOT OPERATE INDEPENDENTLY

Each of the 33 hatcheries that ODFW operates depends on coordination with one or more of the other hatcheries to rear the full suite of stocks for programs approved in federal or state plans. ODFW staff manage the system to maximize efficiency and mitigate vulnerabilities.

## EFFICIENCY

Some operations are centralized to promote efficiency. For example, Roaring River Hatchery maintains a large rainbow trout broodstock. Eggs and fry from this facility are shipped to multiple other facilities for further rearing. This eliminates need for each hatchery to maintain its own broodstock.

## MITIGATING VULNERABILITY

Some hatcheries have issues with high temperature or low flow in summer requiring fish be moved offsite temporarily. In these instances, fish are moved to facilities that have available space and sufficient water quality/quantity.

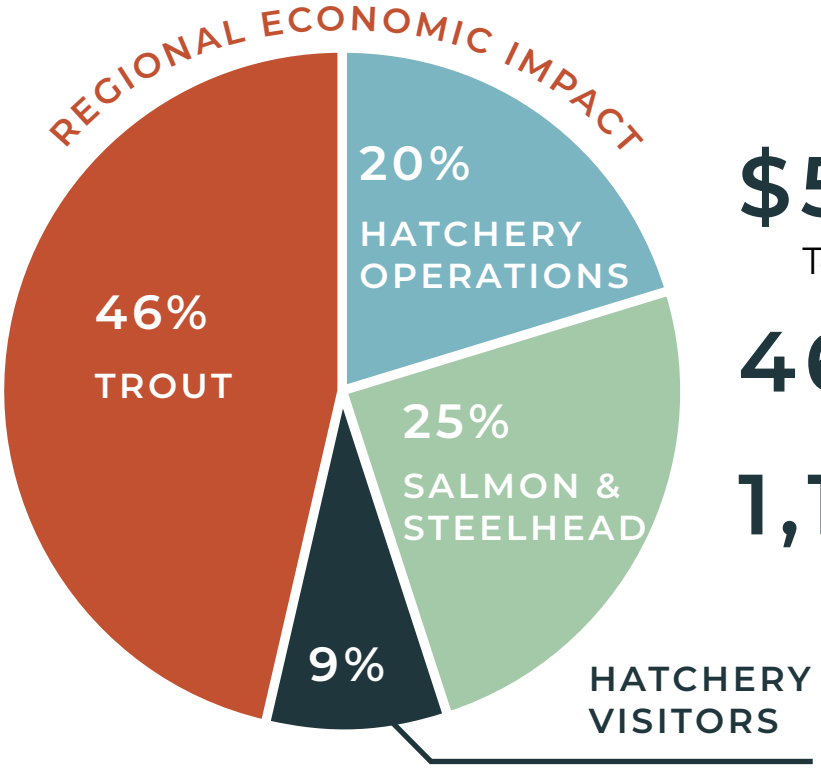
## DIFFERENT HATCHERY PROGRAMS/STOCKS FULFILL A RANGE OF NEEDS

ODFW maintains a range of hatchery programs/stocks to provide fishery opportunity at different times of year (e.g., spring Chinook support spring fisheries whereas fall Chinook support fall fisheries), to mitigate for impacts of dams on different wild stocks, or to conserve a wild stock that is imperiled.

# BENEFITS BEYOND FISHERIES AND CONSERVATION

Hatcheries provide a number of social, cultural, and economic benefits. An economic assessment conducted as part of the review concluded that the 14 state-owned hatcheries have a net economic benefit to the state of ~$50M annually and a total economic impact of ~$55.5M annually. These economic benefits are largely accruing to rural, underserved communities in areas where fisheries are an important part of the economy.

Trout production has the largest economic impact. Trout are relatively cheap to produce, have high survival, and high catch rates. Because of this, hatcheries that primarily produce trout had the highest net economic benefit to the state. Even so, all state-owned hatcheries had a positive net economic benefit-ranging from $218K for a small coastal facility to $8M+ each for three of the larger trout producing facilities (Roaring River, Wizard Falls, and Oak Springs hatcheries).




**$55.5 M**
Total Economic Impact

**46%** Impact Attributed to Trout

**1,100** Jobs Generated by the Hatchery System

**Data in the pie chart is for the 14 state-owned hatcheries only*

# BENEFITS BEYOND FISHERIES AND CONSERVATION

## HATCHERIES AS A TOURIST DESTINATION

Oregon's hatcheries are also a destination for many individuals and families. For example, Bonneville hatchery (a federally owned facility) hosts over a half million visitors annually—similar to Crater Lake National Park. Among the state-owned hatcheries, Wizard Falls Hatchery on the Metolius river has the highest visitation, with approximately 60,000 visitors annually. Visitation at the 14 state-owned hatcheries generates over $4M in net economic value to Oregon.

## CULTURAL IMPORTANCE

Many Tribal members live and fish in Oregon. Anadromous fish species and resident fish are interconnected with tribal culture and have been since time immemorial. Because of declines in wild populations, many Tribes now rely on hatchery production to meet ceremonial and subsistence fishery needs, as well as being a tool to recover wild populations or reintroduce fish to areas where they were extirpated.

## EDUCATION

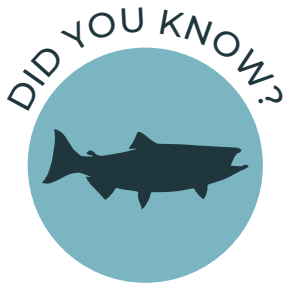
Hatcheries also serve an educational role in communities and schools, providing opportunities to learn about fish populations, biology, and conservation.

# HATCHERIES FACE HEADWINDS

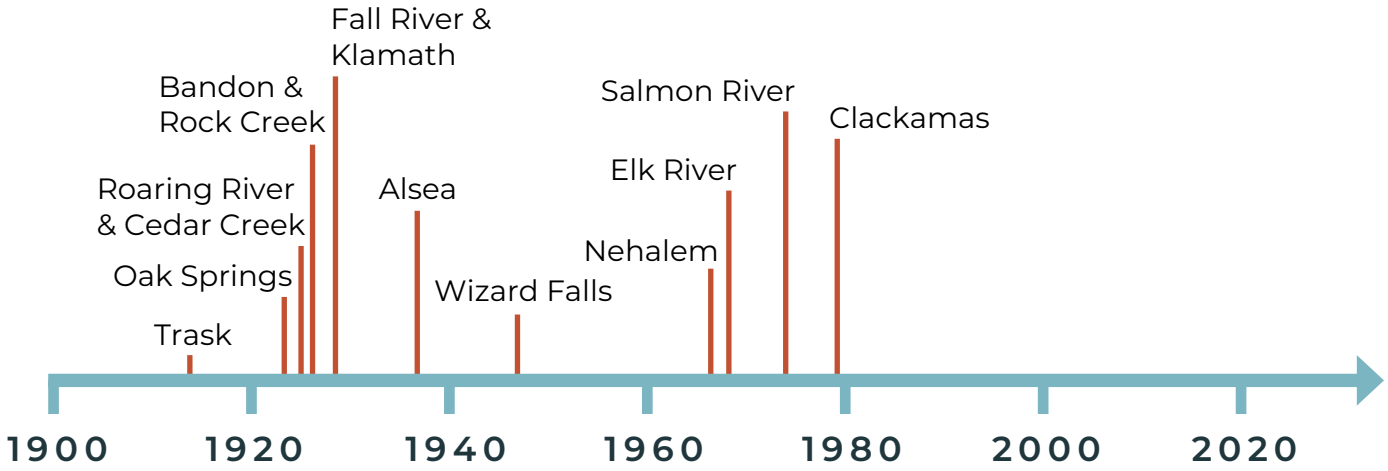
Aging hatchery infrastructure, a changing climate, and increasing costs are making it more difficult for Oregon's hatchery system to meet fishery and conservation goals. These challenges are only going to increase in the future.

## AGING HATCHERY INFRASTRUCTURE

Like much of the infrastructure in Oregon and the US, Oregon's state hatcheries were originally constructed 50-100 years ago. Although all facilities have been upgraded over time as funding allows, several still have elements of the original infrastructure (e.g., water supply piping and raceways) which are now well beyond their expected lifespan. The deferred maintenance backlog grows each year as available funds do not keep pace with the new needs. Additionally, we see more frequent natural hazard events (fires, ice storms, flooding) that can result in damage to critical infrastructure like water intakes and piping. The deferred maintenance need at state-owned hatcheries exceeds $100M.




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




ORIGINAL CONSTRUCTION DATES

## RISING COSTS

During the last decade, the Department has experienced significant increases in the cost of running the hatchery system. For example, fish food costs have increased, over 20% in the two years between 2021 and 2023 alone. Similarly, electricity costs have increased as power companies raise rates to account for new risks associated with wildfire liability-many hatcheries have high power demands to run pumps. And generally, the last several years have seen a cumulative inflationary increase of ~20% across the board that impacts operating expenses. The rising costs have meant putting off less critical maintenance, holding staff vacancies open, and reducing costs (e.g., buying cheaper, lower quality fish food).

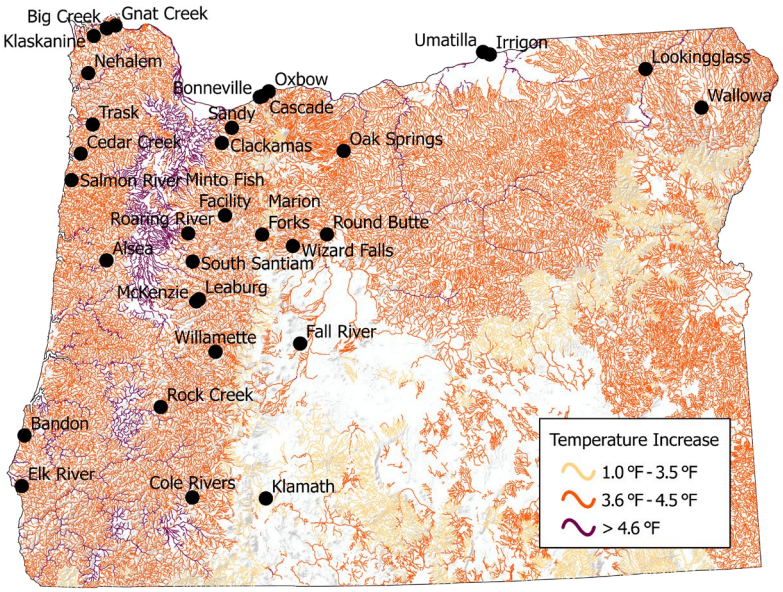
## ENVIRONMENTAL CHALLENGES

At the time these facilities were constructed, there was little consideration given to future water quality and quantity as cool and clean water was plentiful. Additionally, many state hatchery facilities are sited in forested areas that experienced few large fires in the decades after construction due to active fire suppression by forest managers.

## FAST FORWARD TO 2025 AND CONDITIONS HAVE CHANGED A LOT

Warming rivers and decreasing summer streamflow are already impacting many hatchery facilities in Oregon.

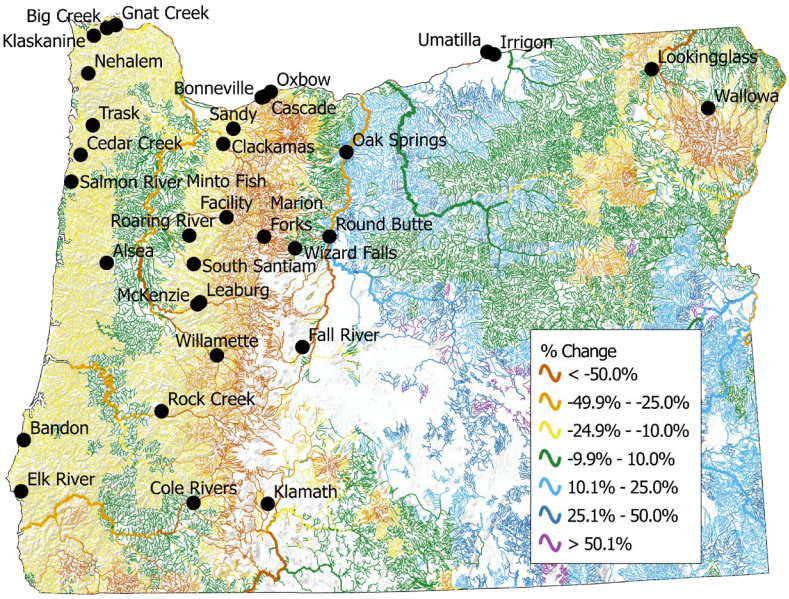
## INCREASING AVERAGE SUMMER TEMPERATURES AT HATCHERIES




The warming trend is expected to continue. The greatest impact is projected to be at our coastal facilities where average summer temperatures are predicted to rise by 3.6-4.5 degrees, with peak temperatures rising even further. Cascade facilities and the federal facilities in the Willamette and Rogue will be more resilient because of their reliance on groundwater and/or ability to draw from cooler water in reservoirs.

## DECREASING AVERAGE SUMMER FLOWS AT HATCHERIES

Similarly, coastal facilities which rely on surface water flows will likely see a 10-25% decrease in average stream flow in coming years. These decreases will be exacerbated during drought years. For Cascade facilities that depend on deep groundwater aquifers, the situation is more complex. While these facilities will be more resilient, it is likely they also will see decreased flows in late summer as the snow pack continues to decline.

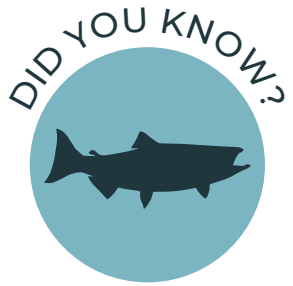



*Data source: Isaak et al., 2017 (Temperature) and USDA Forest Service (Flow)*

# FOR OUR HATCHERIES, THESE CHANGES ARE CREATING SIGNIFICANT CHALLENGES

Salmon, steelhead, and trout are coldwater species. In the wild fish are able to seek out cooler areas (e.g., springs or cooler tributary junctions) during the heat of summer. In a hatchery environment, fish are confined to a raceway so are vulnerable to high temperatures from the incoming stream flow. The optimal temperature for rearing these species in a hatchery is <60 degrees Fahrenheit.

Many of Oregon's hatcheries are now seeing incoming stream temperatures exceed 65 or even 70 degrees Fahrenheit during summer. Salmon and steelhead can tolerate this for short periods but ultimately it affects growth, increases incidence and severity of disease outbreaks, and in extreme events can cause mortality. Many hatcheries are also experiencing water shortages during summer. These shortages are further compounded during drought years.




Salmon, steelhead, and trout are cold water species that do best when temperatures are below 60º F in a hatchery

**To date, the Department has adjusted by moving fish offsite to other locations, but this creates its own set of challenges by placing strain on receiving facilities and increasing costs.**

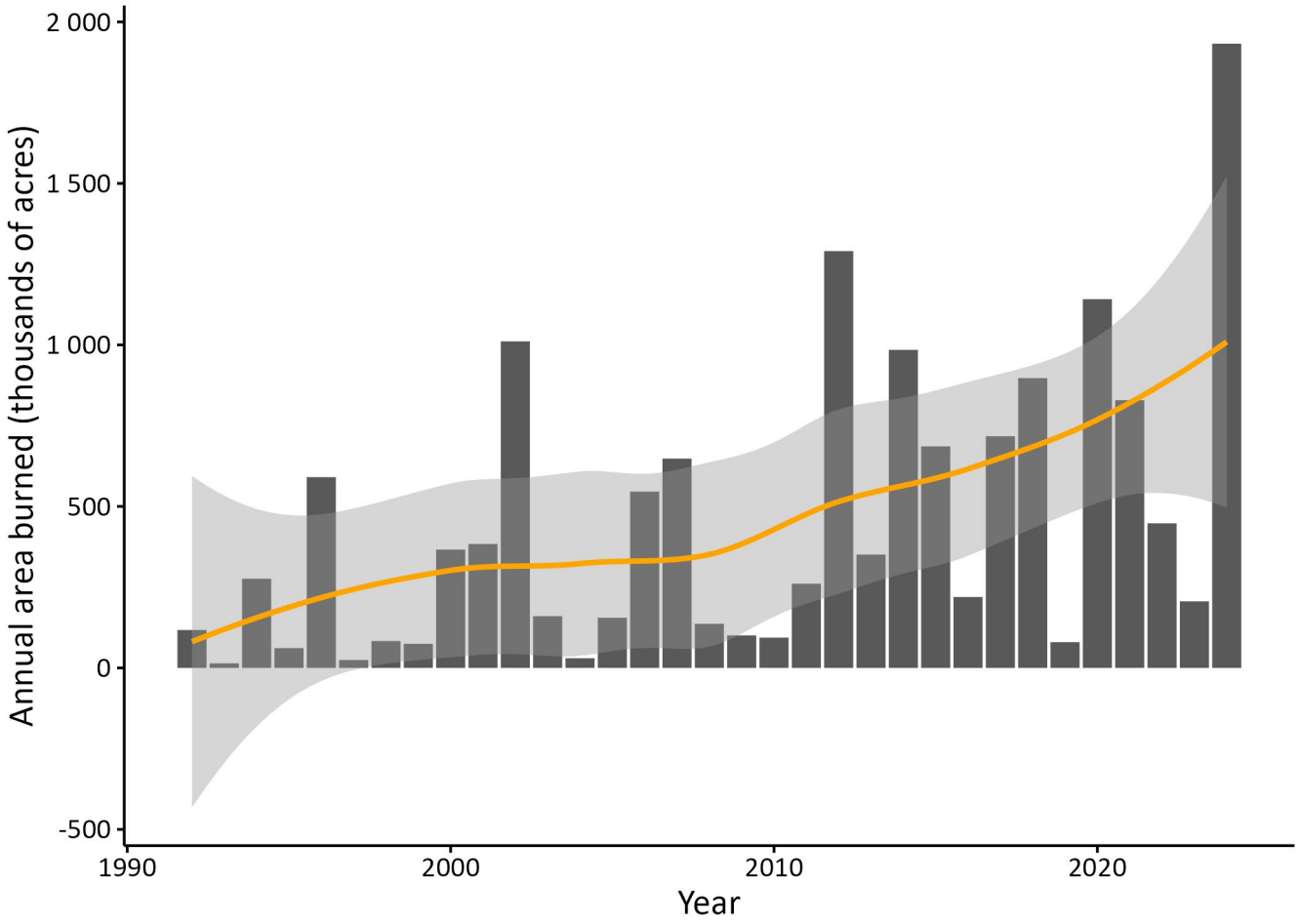
## Recent challenges in the news

**DROUGHT ACROSS WESTERN OREGON IN 2015 AND 2021 FORCED EARLY HATCHERY RELEASES AND CHANGES IN STOCKING LOCATIONS**

2015: Hatcheries releasing fish early because of drought

2021: Drought may mean changes to Oregon fish-stocking, hatcheries

# FIRE ACTIVITY IS ALSO INCREASING IN OREGON




*Data Source: Oregon Department of Forestry*


*Leaburg Hatchery during the 2020 Holiday Farm Fire taken as staff were being evacuated after releasing fish into the McKenzie River.*

# HATCHERIES IMPACTED AND/OR DAMAGED BY FIRE

**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

ODFW's hatcheries have been directly affected by fire every year since 2020. Impacts can range from having to move fish offsite or release early to partial or complete loss of infrastructure. When structures are destroyed it can take years to settle with insurance companies. Claims may also involve litigation with the party responsible for the fires, which can also take many years to resolve. This means that rebuilding could take years and changed conditions as a result of the fire may also impact the feasibility of operating a hatchery.

*Rock Creek Hatchery following the 2020 Archie Creek Fire*

# LOOKING AHEAD

With funding from the Legislature, ODFW is proactively meeting these challenges by conducting a thorough assessment of the hatchery system. The goal of "looking ahead" is to ensure the long term sustainability of the hatchery system so it can continue to provide fishery and conservation benefits. By looking ahead to understand the challenges facing both the ongoing operation of hatcheries and the viability of the different hatchery stocks, exploring potential solutions, and engaging the public in a discussion about meeting these challenges, ODFW will have the information needed to strategically invest in and make changes to the hatchery system to improve its resilience and sustainability.

**ODFW WORKED WITH INDEPENDENT EXPERTS TO COMPLETE A RANGE OF ECONOMIC, INFRASTRUCTURE, AND BIOLOGICAL ASSESSMENTS.** This information complimented analyses and assessments prepared by the Department. The information gathered through these assessments were shared with the public and Tribes to inform conversations about the hatchery system.

# WHAT WE LEARNED

## STATE HATCHERIES PROVIDE SIGNIFICANT ECONOMIC BENEFIT

The assessment found that the state-owned hatcheries have a significant economic impact and benefit to Oregon's economy. The Regional Economic Impact (REI) of state hatcheries from fisheries, visitors, and hatchery operations is $55.5 million, which is equivalent to 1,100 jobs in the state-level economy. **Trout fisheries account for nearly half of the total REI.** The majority of this benefit is realized in rural, underserved communities

A benefit-cost analysis based on fisheries and hatchery visitors concluded that benefits exceed costs at all state-owned hatcheries. **Fishery benefits exceeded costs for all fish species except summer steelhead, which did not have positive net benefits.**

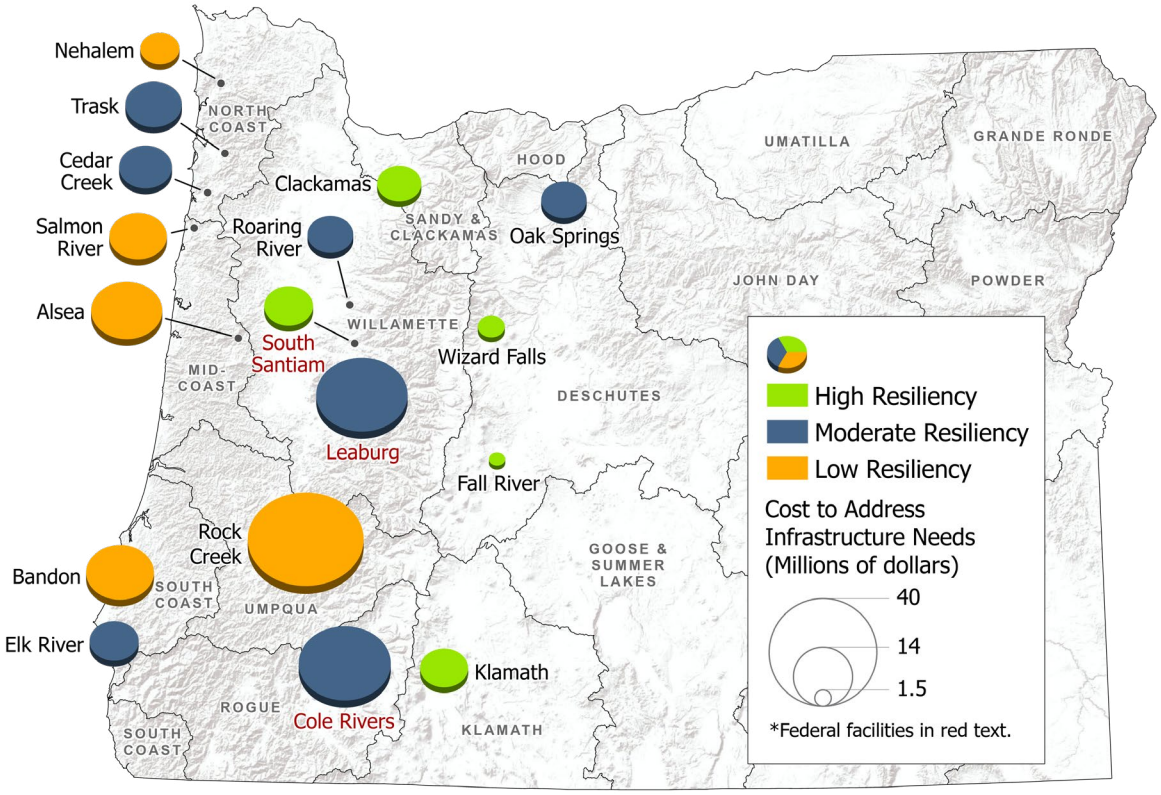
## NEED FOR CHANGES TO ENSURE FINANCIAL SUSTAINABILITY

Oregon's state-owned hatcheries utilize a mix of federal, license, and general fund dollars to fund annual operations. Surrounding states have a similar mix of revenue sources, though the relative contribution of each source varies. **Given rising costs, the assessment found that the ongoing financial sustainability of the system will be dependent on some combination of increased revenue and/or decreased costs.** The assessment highlighted some options, including an increase from existing revenue sources (e.g. through greater general fund appropriations or higher license and fee prices); establishment of new revenue sources (e.g. special mitigation or land/water development assessments); increased efficiency or lowering production levels to lower costs; and/or shifting production responsibilities to other entities.

# WHAT WE LEARNED

## SOME HATCHERIES ARE RESILIENT, MANY ARE VULNERABLE TO A CHANGING ENVIRONMENT

The assessment used historical data on water use, water availability, and water temperatures, as well as forecasted changes in flows, temperatures, fire, and sea level rise to assess the vulnerability of each facility to climate change. Some state hatchery facilities are expected to be resilient to climate change, while other facilities are already being impacted by high water temperatures, low summer flows, and other environmental hazards that are projected to worsen in a changing climate.




## CHALLENGES CAN BE ADDRESSED WITH STRATEGIC INVESTMENTS

The assessment also evaluated the existing deferred maintenance needs and the potential hatchery infrastructure upgrades needed to mitigate the impacts of warming rivers, decreasing flows, and fire. The estimated costs of addressing these needs at state hatcheries, including deferred maintenance and climate resilience upgrades, ranged from less than $2 million at Fall River Hatchery to over $40 million at Rock Creek Hatchery. A conservative estimate of the total cost to address infrastructure needs at all 14 state hatchery facilities is approximately $180 million (2024 dollars).

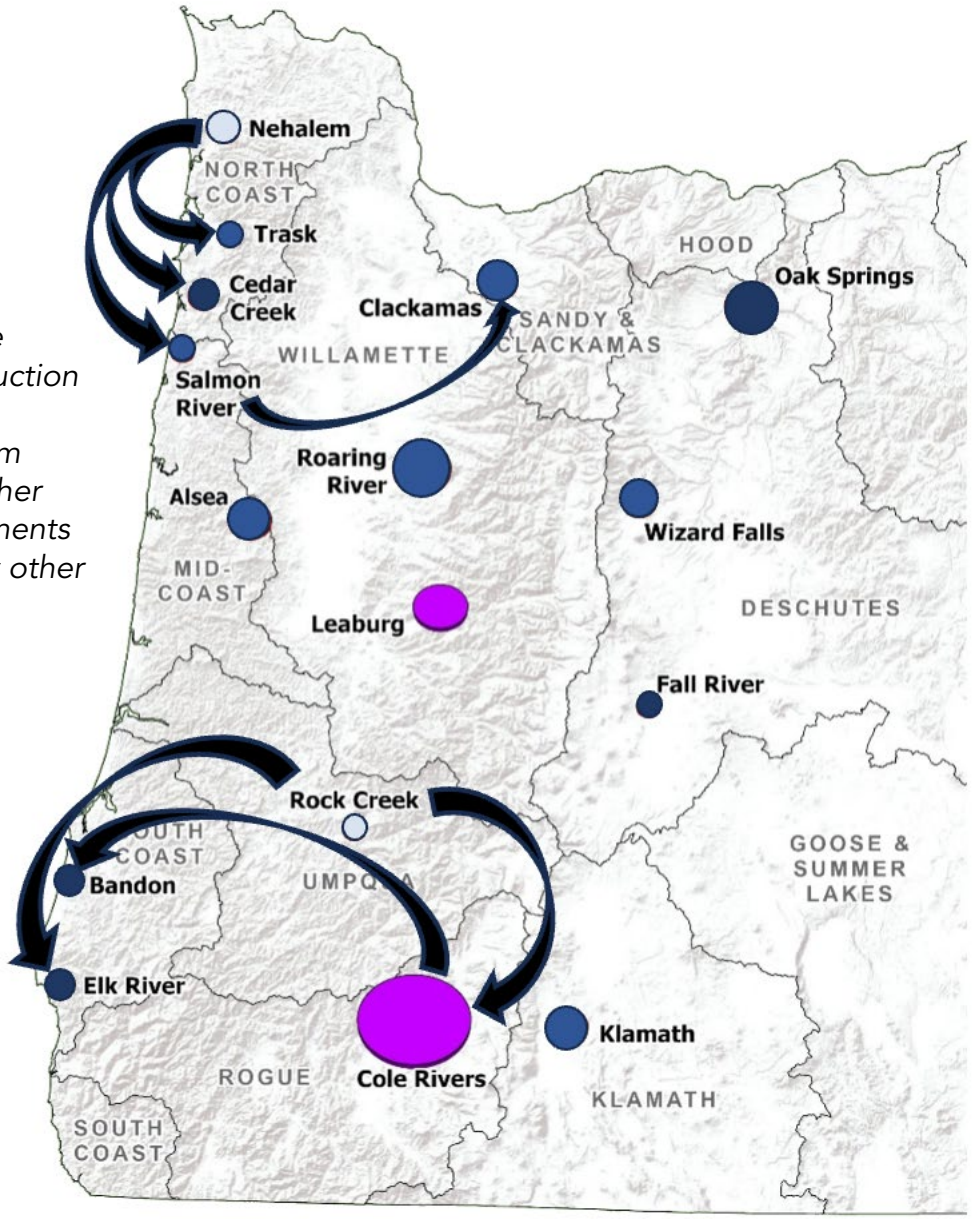
*Note: the dollar values referenced on this page are based on conservative estimates in 2024-actual cost at time of any work would likely be higher due to a combination of factors.*

# WHAT WE LEARNED

## THE HATCHERY SYSTEM FOOTPRINT COULD LOOK DIFFERENT IN THE FUTURE

The assessment evaluated the capital cost savings associated with a set of infrastructure alternatives that consolidate state hatchery production in fewer facilities, while maintaining the same total level of production. Doing so would require expansion at some facilities. In these alternatives, hatchery production is moved from more vulnerable (and therefore higher cost) facilities into more resilient facilities.

*Example of one alternative assessed that moves production from Nehalem Hatchery to other NW facilities and from Rock Creek Hatchery to other SW facilities. These movements would be accompanied by other shifts to create space.*




Consolidation could result in long-term infrastructure cost savings of $4–14 million while maintaining current system capacity. This savings is less than 10% of total cost to address infrastructure needs. Reducing the number of facilities would have both benefits and risks for hatchery resilience and ongoing operating/maintenance expenses.

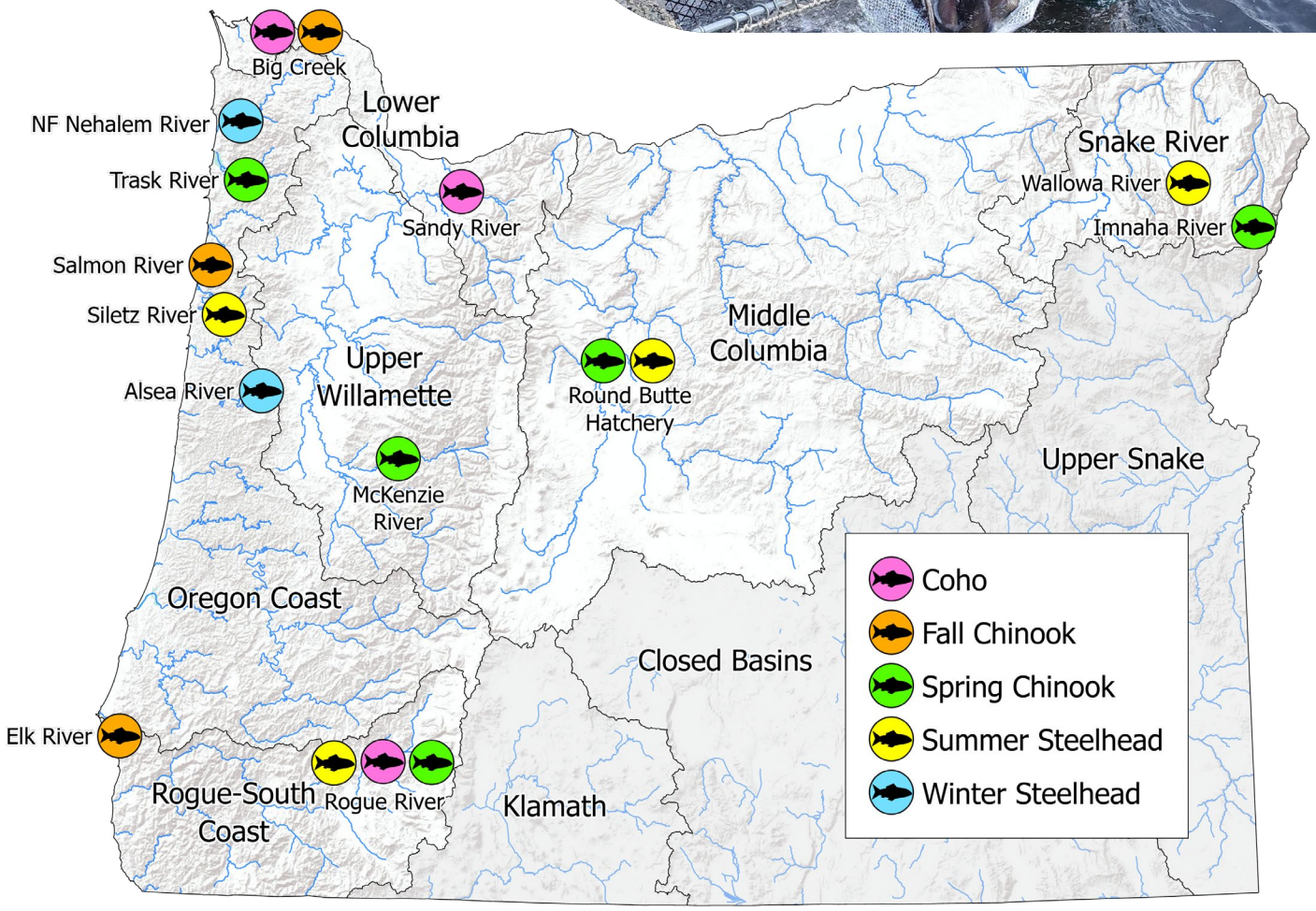
# WHAT WE LEARNED

## SOME HATCHERY STOCKS ARE VULNERABLE TO A CHANGING ENVIRONMENT

The assessment looked at the performance over time of different hatchery stocks in each area of the state. In many cases, performance was correlated with ocean indicators that are expected to become less favorable or more variable in the future. The assessment found that climate vulnerability varies among hatchery stocks depending on species, run type, and geographic location in the state. **Spring Chinook salmon and summer steelhead programs generally appear to be more vulnerable, while trout programs are highly resilient and adaptable.**

Given this expectation, we will likely see changes in programs in the future as less resilient stocks are not able to meet fishery targets and/or cannot be successfully reared because of challenges collecting brood or with poor survival in the hatchery.

### HATCHERY STOCKS EVALUATED



# WHAT WE LEARNED

## There will be an ongoing need for hatcheries

As the state thinks about investing in the hatchery system it is important to understand, to the extent possible, what the future need might be. The assessment concluded generally that the need for a combination of mitigation, harvest augmentation, and conservation hatchery programs in Oregon is expected to continue in the future. While conservation efforts may improve status of wild fish in some areas, the need for conservation hatchery programs is likely to increase in other areas because of the impacts of a changing climate and ocean.

### WILD FISH STATUS

Many populations of wild fish are doing well and are projected to continue doing well with ongoing management and restoration of habitat. These ongoing actions will also benefit wild populations that are currently not doing as well, increasing their abundance and potentially reducing need for hatcheries. In other areas, abundance will be reduced as a result of ongoing impacts of climate change resulting in ongoing need for harvest augmentation or conservation hatchery programs.

**FUTURE NEEDS FOR HATCHERIES**

### ONGOING OR NEW HABITAT IMPACTS

There is an expectation for ongoing presence of dams and/or new impacts that require mitigation.

### ANGLER DEMAND

License sales have been relatively flat indicating ongoing demand. Preferences may be shifting towards trout and warmwater species.

# LOOKING AHEAD

The assessment has shown that Oregon will continue to need hatcheries to mitigate for the impacts of dams, to provide harvest opportunity, and to support conservation of imperiled wild populations. It has also shown that climate driven changes will impact hatchery operations if actions are not taken to improve resiliency

**THROUGH SUSTAINED AND STRATEGIC INVESTMENT AND PARTNERSHIP IT IS POSSIBLE TO ENSURE THE SUSTAINABILITY OF OUR HATCHERY SYSTEM.** The path will involve a host of decisions and recommendations during the next two decades ranging from budget, policy, stocks reared, and priorities for new construction, maintenance, repairs, or, if necessary, closures or consolidation. These decisions will rest with the Department, the Oregon Fish and Wildlife Commission, the Legislature, consultation with Tribes, and involvement from the public.

The information gathered by the Department, analyses from the independent contractors, and a decision-making framework developed in partnership with stakeholders will be invaluable in informing these decisions.

# As we invest in the hatchery system, our eye is on achieving the following **outcomes**:

## GOOD CONDITIONS
Our hatcheries have the conditions needed to consistently raise high quality fish

## FLEXIBILITY
The hatchery system has the flexibility to meet changing needs for harvest and conservation

## RESILIENCY
The hatchery system is resilient to the impacts of a changing environment

## COMMUNITY
There are opportunities for community engagement

## GOOD NEIGHBORS
The hatchery system and its programs are a good neighbor to wild fish

## FINANCIALLY SUSTAINABLE
The hatchery system is financially sustainable

# How do we achieve these outcomes?

Sustained and strategic investment guided by the information gathered during this assessment can put our hatchery system on the path to a more sustainable future, even in the face of uncertainty.

### ADAPTING TO CHANGE AND UNCERTAINTY

While we have a good general understanding of the changes that will impact our hatcheries, there are details we don't know, such as how rapid these changes will be. Similarly, we know that we will face drought, ice storms, floods and other hazards that damage facilities, but we don't know when or where.

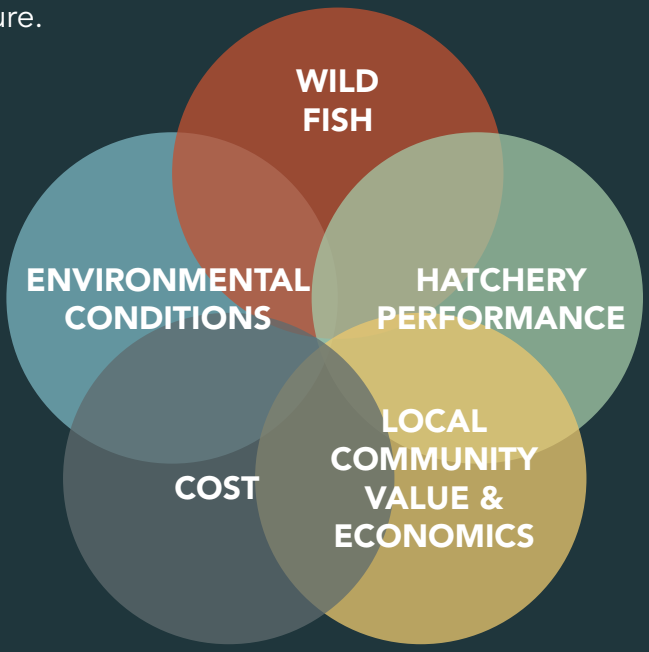
Because there is uncertainty about these changes and hazards, in the future status of salmon and steelhead populations, in future angler preferences, in the performance of different hatchery programs, and in future budgets, we envision investing a hatchery system that is flexible in terms of having the infrastructure to accommodate changing needs and with the space to relocate fish when disaster strikes.

As the Department thinks about investing in the system over the long-term, the information gathered during this assessment will help inform decisions. But, because of the uncertainties we also know we will have to update information as we make decisions and recommendations. A list of factors developed by stakeholders provides a useful framework through which to gather and assess relevant information at each significant action or decision point.

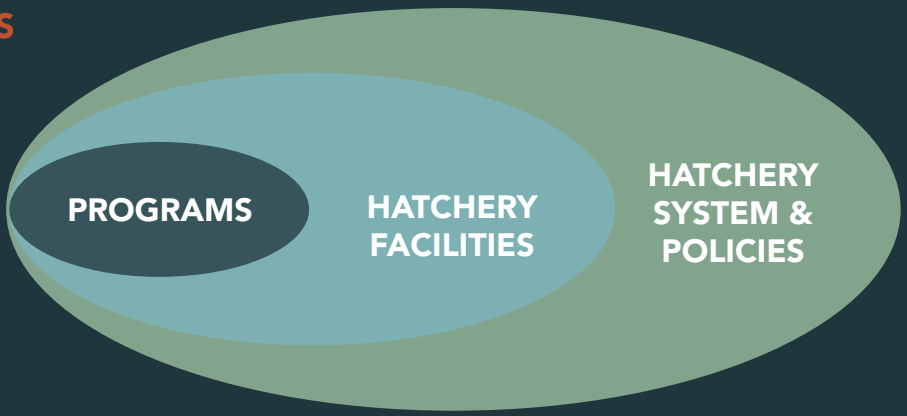
# The five factors-a stakeholder led framework for informing decisions

As part of a public process to share information and collect feedback, ODFW convened individuals from 10 groups that have an interest in ODFW's hatchery system, regularly engage statewide or across a broad geography on hatchery issues, and have a diversity of perspectives. The small group met five times over a two month period. Stakeholders, including this group, developed a list of factors they viewed as important to consider when thinking about decisions related to hatcheries today, and into the future.

## FACTORS




## SCALES




## DECISIONS

**BUDGET**
e.g., where to prioritize investments and, if necessary, reductions

**HATCHERY PROGRAMS**
e.g., prioritize better performing stocks; adjust programs based on wild fish population health

**HATCHERY MAINTENANCE & REPAIRS**
e.g., where to use limited funds to prioritize maintenance and repairs

# INCORPORATING TRIBAL PERSPECTIVES

In the process of "looking ahead", the Department reached out to all nine federally recognized Tribes in Oregon to share information about the challenges and hear their perspectives on hatcheries.

The Department heard a diverse range of perspectives among the Tribes, including:

- Concern over impacts of hatchery operations and a desire to limit their use to conservation programs to recover wild fish
- A preference to prioritize habitat and wild fish restoration over hatchery production
- A desire to maintain existing hatchery production while work continues to recover wild populations as hatcheries provide the only meaningful opportunity for ceremonial and subsistence harvest
- Interest in significantly expanding hatchery production to provide additional harvest opportunity

Additionally, several Tribes expressed a desire to sustain and, in some cases, grow the partnership with the state on both hatchery operations and habitat restoration.

As the Department makes decisions and recommendations about hatchery infrastructure we will, to the extent possible, incorporate these varying perspectives, and continue to grow partnerships.

# NEXT STEPS

## Investing in more resilient infrastructure

### 2025-2031

The assessment concluded that the hatcheries in the SW hatchery system (Rock Creek, Bandon, Elk River, Cole Rivers) are particularly vulnerable to changing environmental conditions. Initial focus will be on rebuilding capacity lost in the SW system during the Archie Creek Fire utilizing insurance funding and any available federal funds as well as taking steps to improve system resiliency at Bandon and Elk River. Depending on available funding, the Department will also make investments to address key bottlenecks in the NW system and ensure we can maintain necessary monitoring for the Pacific Salmon Treaty.

### 2025+

The information gathered during the assessment and from discussions with Tribes and the public has informed development of a concept to restore hatchery production capacity that was lost when Rock Creek Hatchery burned in 2020. The concept is based on a partnership with the Cow Creek Band of Umpqua Tribe of Indians (CCBUTI) and would make investments in infrastructure in the North and South Umpqua using insurance and any available federal funding. There are several uncertainties that may impact implementing this concept. ODFW and CCBUTI will work together to resolve these in the near future and refine the concept as needed.

### 2032 AND BEYOND

Investments and priorities for maintenance, repairs, and budget decisions will generally focus on more resilient facilities. For example, the assessment pointed to a need to expand capacity in facilities such as Cedar Creek, Oak Springs, and Fall River to enhance reliability and create flexibility and redundancy in the NW system. Elsewhere, the Department will utilize information related to the five factors, such as trends in hatchery and wild fish performance, changes in water quality or quantity, shifts in angler preference, and available funding to guide decision making.

### ONGOING CONVERSATIONS

The Department expects there will be ongoing public and Tribal involvement in many of these decisions, primarily those that involve hatchery programs and major capital investments.

# HATCHERY SPECIFIC INFORMATION

The following section summarizes information from the review regarding each hatchery's vulnerabilities, key infrastructure needs, and the uncertainties and/or challenges associated with addressing deferred maintenance and/or climate resilience needs.

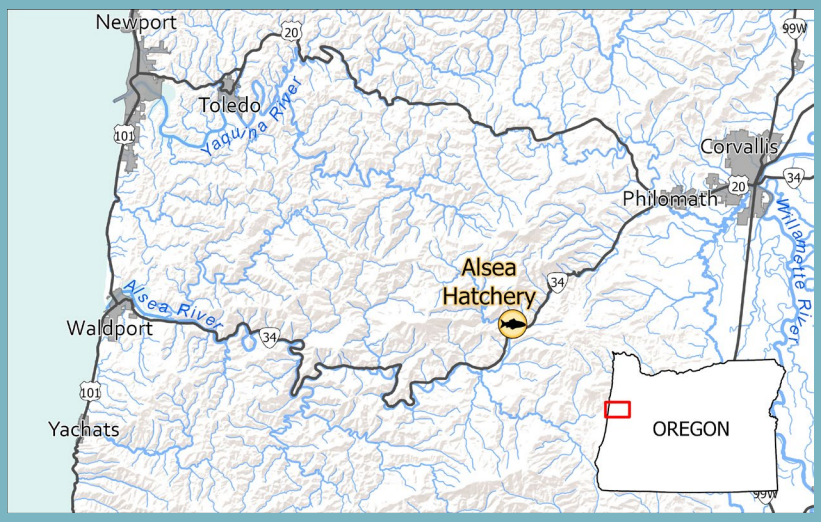
**The stated costs are reflective of a conservative estimate in 2024. In all instances, the actual costs at the time of construction will likely be higher given recent trends in construction costs.** Additionally, a more detailed engineering plan and site assessment is prepared at the time of construction. This assessment can reveal unforeseen circumstances (e.g., ground stability issues) or complications with the custom nature of these facilities that result in higher costs.

# ALSEA HATCHERY

Originally Constructed 1936

$4.38M/yr Regional Economic Impact

Currently rearing trout and winter steelhead




High Risk: Existing issues with low summer flows that will worsen in future

High Risk: Existing issues with high summer water temperatures that will worsen in future

Moderate risk from other hazards, primarily wildfire

## KEY INFRASTRUCTURE NEEDS

- Hatchhouse upgrade
- Rearing pond realignment to improve water use efficiency
- Recirculation and chilling technology to improve water quality
- Water intake replacement

## $19.4M ESTIMATED CONSTRUCTION COSTS

- $15.25M For deferred maintenance
- $4.15M For climate resilient upgrades

## UNCERTAINTIES/CHALLENGES

Recirculation and chilling technology is complex and carries some increased risks of fish loss in the event of failure as well as increased operating costs that would require additional biennial budget. This technology reduces the likelihood of disease outbreaks, but should they occur it is difficult to isolate and treat.

## OUTCOMES FROM INVESTMENTS

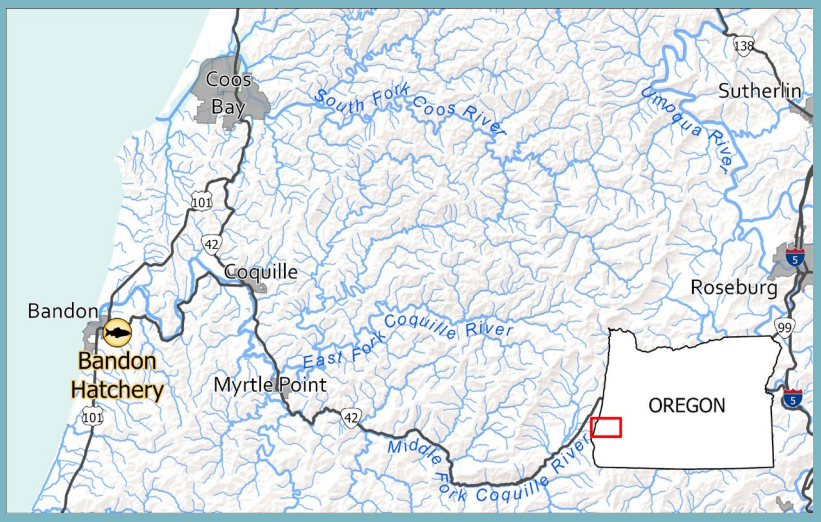
Restored functionality of existing structures and a moderate reduction in vulnerability to low flow and high temperature challenges.

# BANDON HATCHERY

Originally Constructed 1925

$1.85M/yr Regional Economic Impact

Currently rearing fall Chinook, winter steelhead, and trout




High Risk: Existing issues with low summer flows that will worsen in future

Moderate risk from increasing summer water temperatures

Risk from other hazards, including wildfire

## KEY INFRASTRUCTURE NEEDS

- Water supply dam and intake replacement
- Rearing pond replacement
- Recirculation and chilling technology to increase water use efficiency and rearing capacity

## $17.84M ESTIMATED CONSTRUCTION COSTS

- $15.80M For deferred maintenance
- $2.04M For climate resilient upgrades

## UNCERTAINTIES/CHALLENGES

Recirculation and chilling technology is complex and carries some increased risks of fish loss in the event of failure as well as increased operating costs that would require additional biennial budget. This technology reduces the likelihood of disease outbreaks, but should they occur it is difficult to isolate and treat. This small facility also has limited space for infrastructure development.

## OUTCOMES FROM INVESTMENTS

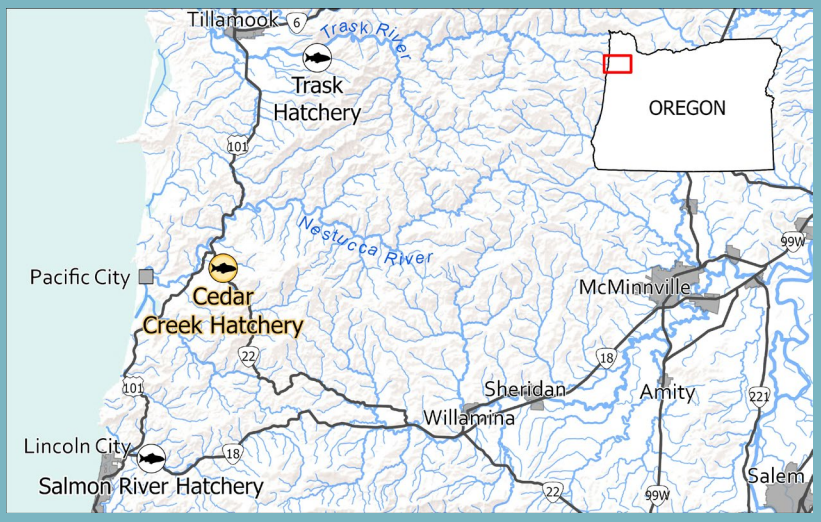
Improved functionality of existing structures and a reduction in vulnerability to low flow and rearing capacity challenges.

# CEDAR CREEK HATCHERY

Originally Constructed 1924

$3.81M/yr Regional Economic Impact

Currently rearing spring & fall Chinook and summer & winter steelhead




Moderate risk from lower summer flows in future

Low risk of summer water temperature impacting operations

Moderate risk from other hazards, including wildfire

## KEY INFRASTRUCTURE NEEDS

- Replace asphalt pond with raceways
- Replace other existing raceways
- Hatchhouse expansion

## $11.53M ESTIMATED CONSTRUCTION COSTS

- $11.10M For deferred maintenance
- $0.43M For climate resilient upgrades

## UNCERTAINTIES/CHALLENGES

Water quantity may be a challenge in the future with existing infrastructure, especially during droughts.

## OUTCOMES FROM INVESTMENTS

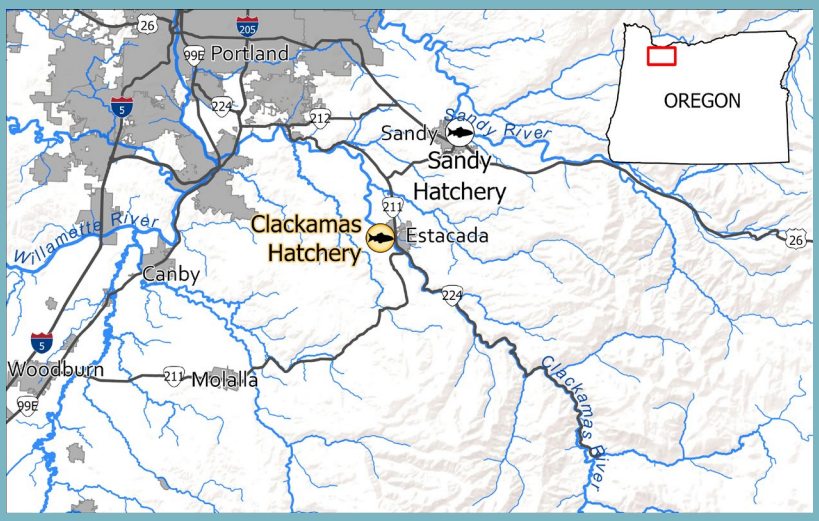
Improved functionality of existing infrastructure to increase hatchery capacity and resilience in the Northwest Zone.

# CLACKAMAS HATCHERY

Originally Constructed 1979

$3.88M/yr Regional Economic Impact

Currently rearing coho salmon, spring Chinook, and winter steelhead




Adequate year-round water source into the future

Moderate risk from increasing summer water temperatures

Low risk from other hazards

## KEY INFRASTRUCTURE NEEDS

- Complete pipeline realignment
- Increase water chilling/treatment capacity
- Shade cover for raceways to reduce heating and predation risk, potentially with solar energy generation
- Adult trap expansion
- Hydropower generation to lower costs

## $8.41M ESTIMATED CONSTRUCTION COSTS

- $4.20M For deferred maintenance
- $4.21M For climate resilient upgrades

## UNCERTAINTIES/CHALLENGES

Water quality and disease risk are challenges due to the hatchery water source. Water chilling and treatment investments could reduce vulnerability.

## OUTCOMES FROM INVESTMENTS

Improved functionality and sustainability of existing infrastructure with lower risk of fish loss during rearing.

# ELK RIVER HATCHERY

Originally Constructed 1968

$1.66M/yr Regional Economic Impact

Currently rearing fall Chinook, winter steelhead, and trout


Vulnerability due to future outlook and need to maintain instream flows

Moderate risk from increasing summer water temperatures

Low risk from other hazards

## KEY INFRASTRUCTURE NEEDS

- Additional raceways and implementing serial water use to improve efficiency
- Water intake and supply line replacement
- Additional staff housing
- Shade covering for raceways, potentially with solar energy generation

## $10.10M ESTIMATED CONSTRUCTION COSTS

- $7.85M For deferred maintenance
- $2.25M For climate resilient upgrades

## UNCERTAINTIES/CHALLENGES

Increasing water temperatures in the future will be a challenge at this facility and may require additional investments to maintain adequate hatchery water quality during the summer and may require further water efficiency or operational changes in future to ensure sufficient instream flows during drought years.

## OUTCOMES FROM INVESTMENTS

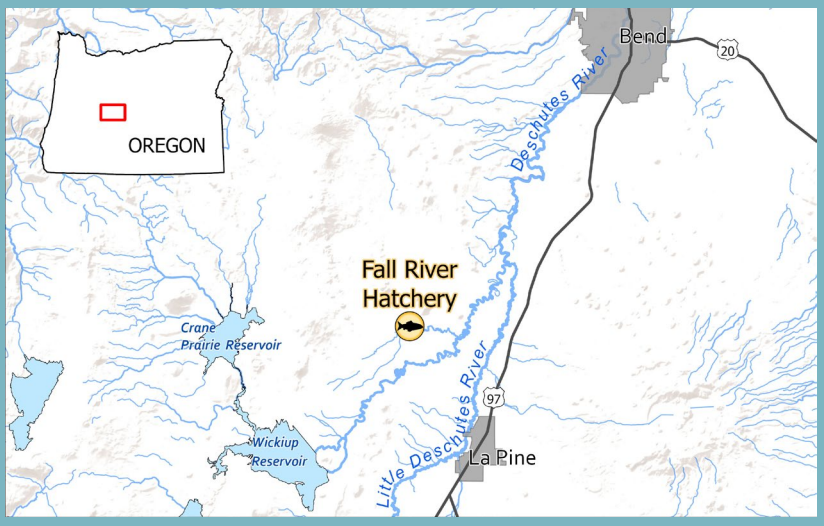
Upgraded facility with increased capacity to support Southwest Zone programs while also using water more efficiently.

# FALL RIVER HATCHERY

Originally Constructed 1929

Regional Economic Impact: see Wizard Falls Hatchery

Currently rearing trout and spring Chinook




Adequate water available year-round

Cool groundwater-fed water source

Lower risk from other hazards, although wildfire still a concern

## KEY INFRASTRUCTURE NEEDS

- Additional raceways to hold fish currently reared at western OR and/or Klamath facilities
- New abatement pond
- Shade cover for raceways, potentially with solar power generation

## $1.48M ESTIMATED CONSTRUCTION COSTS

- $0.30M For deferred maintenance
- $1.18M For climate resilient upgrades

## UNCERTAINTIES/CHALLENGES

Wildfire risk is the primary concern for this facility, which is otherwise expected to be resilient.

## OUTCOMES FROM INVESTMENTS

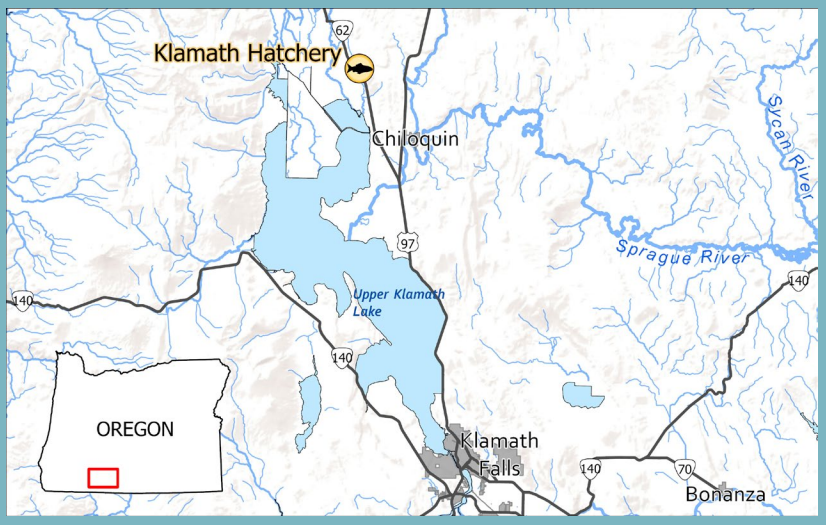
Increased trout rearing capacity to reduce strain on coastal facilities and/or support production at Klamath hatchery.

# KLAMATH HATCHERY

Originally Constructed 1929

$3.74M/yr Regional Economic Impact

Currently rearing trout with near-term potential for greater role in anadromous fish reintroduction




Adequate water available year-round

Cold spring water source

Moderate risk from other hazards, especially wildfire

## KEY INFRASTRUCTURE NEEDS

- Complete rebuild of hatchhouse destroyed in 2020 fire
- Requires evaluation of capacity to support spring Chinook reintroduction
- Recirculation technology to increase water use efficiency
- Bank stabilization following fire
- Evaluate screening and containment

## $9.72M ESTIMATED CONSTRUCTION COSTS

- $6.97M For deferred maintenance
- $2.75M For climate resilient upgrades

## UNCERTAINTIES/CHALLENGES

Wildfire risk is the primary concern for this facility, which is otherwise expected to be resilient. Investing in recirculation would assure that water is available for additional raceways but would increase risks from power or equipment failure.

## OUTCOMES FROM INVESTMENTS

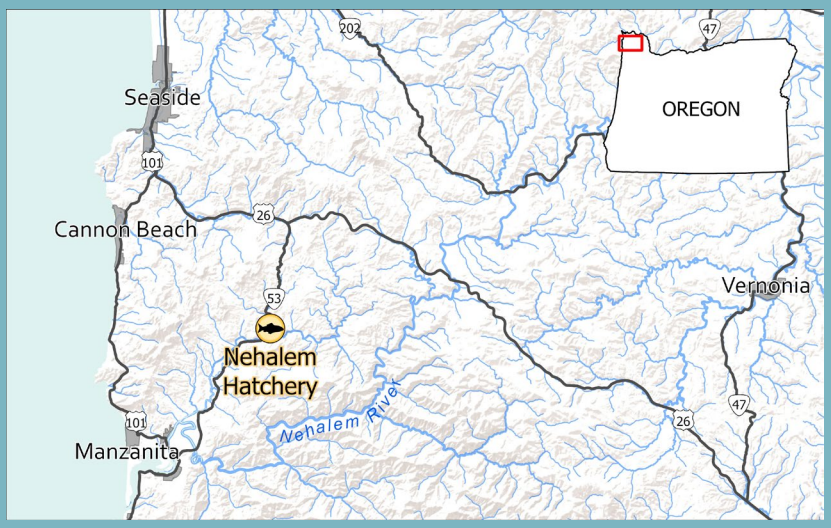
Restored functionality of existing infrastructure and ability to support reintroduction of spring Chinook.

# NEHALEM HATCHERY

Originally Constructed 1966

$2.42M/yr Regional Economic Impact

Currently rearing coho salmon, fall Chinook, winter steelhead, and trout




Moderate risk from lower summer flows in future

High Risk: Existing issues with high summer water temperatures that will worsen in future

Moderate risk from other hazards, including wildfire

## KEY INFRASTRUCTURE NEEDS

- Rearing pond replace and realignment to improve stability and water use efficiency
- Water treatment in the hatchhouse
- Water intake replacement
- Shade cover for raceways

## $6.82M ESTIMATED CONSTRUCTION COSTS

- $2.62M For deferred maintenance
- $4.20M For climate resilient upgrades

## UNCERTAINTIES/CHALLENGES

Increasing water temperatures in the future will be a challenge at this facility and may require additional investments to maintain adequate hatchery water quality during the summer.

## OUTCOMES FROM INVESTMENTS

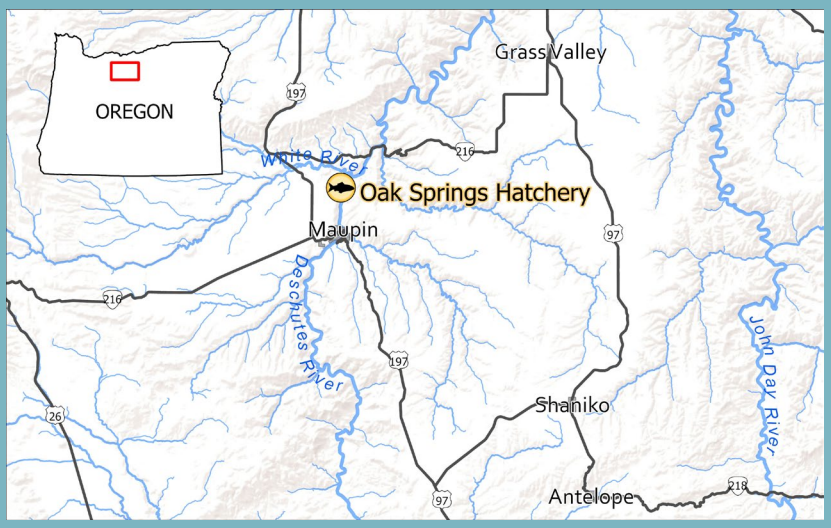
Upgraded functionality of existing infrastructure and greater climate resilience.

# OAK SPRINGS HATCHERY

Originally Constructed 1922

$7.99M/yr Regional Economic Impact

Currently rearing trout, summer & winter steelhead




High vulnerability to declining flows in future

Cool spring water source

Lower risk from other hazards, although wildfire still a concern

## KEY INFRASTRUCTURE NEEDS

- Additional raceways and adult holding ponds
- Recirculation technology to increase water use efficiency
- Shade cover for raceways, potentially with solar power generation
- Additional microhydropower generation to reduce costs

## $8.83M ESTIMATED CONSTRUCTION COSTS

- $4.55M For deferred maintenance
- $4.28M For climate resilient upgrades

## UNCERTAINTIES/CHALLENGES

Flow in spring water source has been slowly declining, which will likely reduce rearing capacity in the future unless water use efficiency increases. Investing in recirculation technology would assure that water is available for facility but would increase risks from power or equipment failure.

## OUTCOMES FROM INVESTMENTS

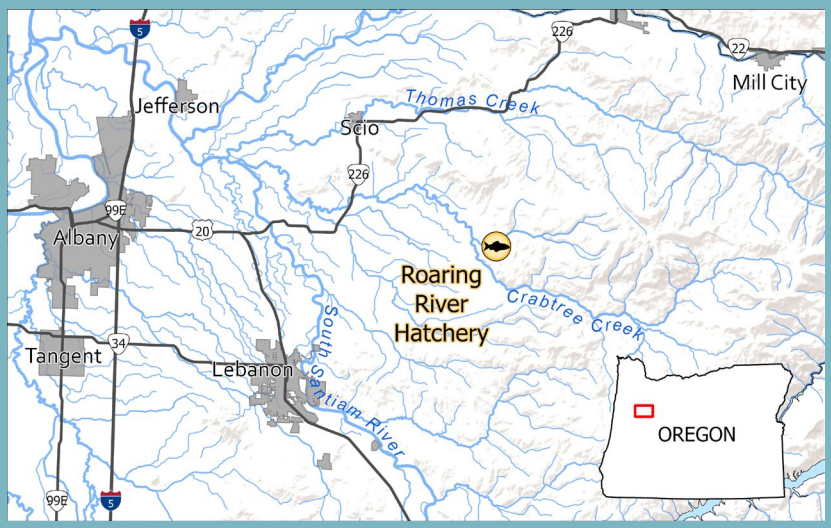
Upgraded infrastructure with increased trout rearing capacity to reduce strain on coastal facilities.

# ROARING RIVER HATCHERY

Originally Constructed 1924

$9.84M/yr Regional Economic Impact

Currently rearing trout, summer & winter steelhead




Moderate risk from lower spring and summer flows in future

Moderate risk from increasing summer water temperatures

Lower risk from other hazards, including wildfire

## KEY INFRASTRUCTURE NEEDS

- Upgrade brood ponds
- Upgrade water intake and ladder
- Configure for serial water use to improve efficiency
- Shade cover for raceways, potentially with solar power generation

## $8.94M ESTIMATED CONSTRUCTION COSTS

- $7.55M For deferred maintenance
- $1.39M For climate resilient upgrades

## UNCERTAINTIES/CHALLENGES

Water availability challenges are expected to increase in the future. Serial water reuse helps improve water use efficiency but also increases risk from disease.

## OUTCOMES FROM INVESTMENTS

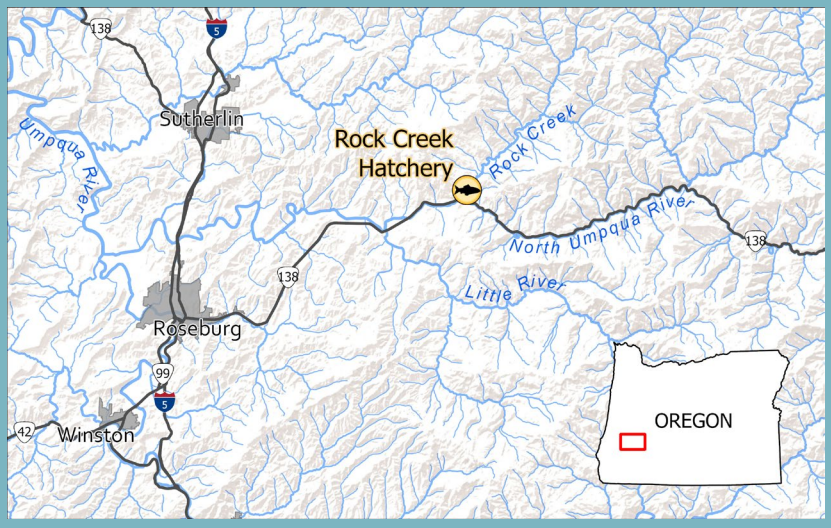
Resilient facility that continues to served as a trout production hub.

# ROCK CREEK HATCHERY

Originally Constructed 1925

$2.80M/yr Regional Economic Impact

Spring Chinook, coho, winter steelhead, and trout




Moderate risk from lower summer flows in future

High Risk: Existing issues with high summer water temperatures that will worsen in future

High risk from other hazards, including wildfire

## KEY INFRASTRUCTURE NEEDS

- Rebuild hatchery infrastructure destroyed in the 2020 Archie Creek Fire (hatchhouse, employee housing, water intake, etc.)
- Install chilling and recirculation technology with UV/ozone treatment system
- Install solar power array to offset new energy costs for chilling

## $45M ESTIMATED CONSTRUCTION COSTS

- 2023 estimate to restore partial production capacity

## UNCERTAINTIES/CHALLENGES

Recirculation and chilling technology is complex and carries some increased risks of fish loss in the event of failure as well as increased operating costs that would require additional biennial budget. This technology reduces the likelihood of disease outbreaks, but should they occur it is difficult to isolate and treat.

## OUTCOMES FROM INVESTMENTS

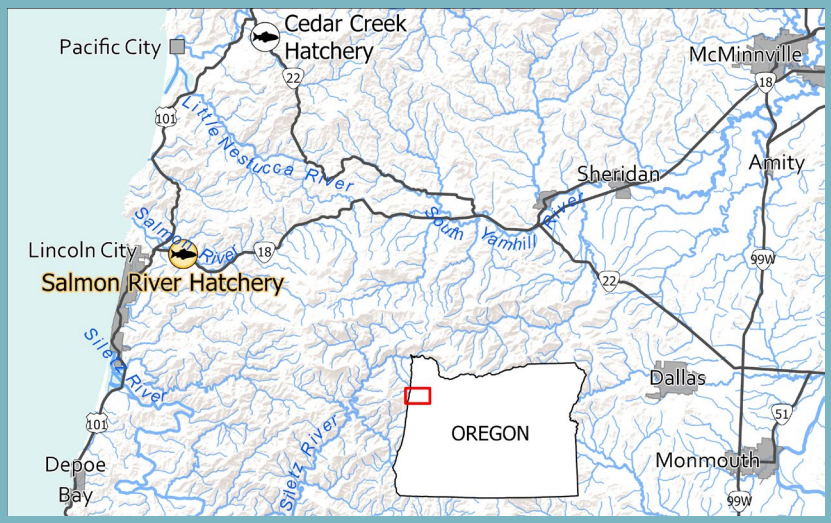
Restored functionality of hatchery and a reduction in vulnerability to high temperature challenges.

# SALMON RIVER HATCHERY

Originally Constructed 1975

$1.71M/yr Regional Economic Impact

Currently rearing fall Chinook, coho, summer steelhead, and trout




Moderate risk from lower summer flows in future

High Risk: Existing issues with high summer water temperatures that will worsen in future

High risk from other hazards, especially sea level rise and flooding

## KEY INFRASTRUCTURE NEEDS

- Weir and water intake replacement
- Extend pond walls and raise height of electrical room

## $13.38M ESTIMATED CONSTRUCTION COSTS

- $10.83M For deferred maintenance
- $2.55M For climate resilient upgrades

## UNCERTAINTIES/CHALLENGES

Water supply system is at risk due to aging diversion structure. Hatchery site is prone to flooding that will worsen with sea level rise and projected increases in winter flows. High water temperatures are another challenge and will likely require additional investments in the future.

## OUTCOMES FROM INVESTMENTS

Maintained functionality of hatchery infrastructure and a reduction in vulnerability to flooding.

# TRASK HATCHERY

Originally Constructed 1916

$3.07M/yr Regional Economic Impact

Currently rearing spring & fall Chinook, coho, and winter steelhead


Moderate risk from lower summer flows in future

Moderate risk from increasing summer water temperatures

Moderate risk from other hazards, including wildfire

## KEY INFRASTRUCTURE NEEDS

- Replace or expand adult holding ponds
- Replace water intake
- Recirculation and chilling technology

## $12.95M ESTIMATED CONSTRUCTION COSTS

- $6.71M For deferred maintenance
- $6.24M For climate resilient upgrades

## UNCERTAINTIES/CHALLENGES

Recirculation and chilling technology would reduce vulnerability to summer low flows but also carries some increased risks of fish loss in the event of failure as well as increased operating costs that would require additional biennial budget. This technology reduces the likelihood of disease outbreaks, but should they occur it is difficult to isolate and treat.

## OUTCOMES FROM INVESTMENTS

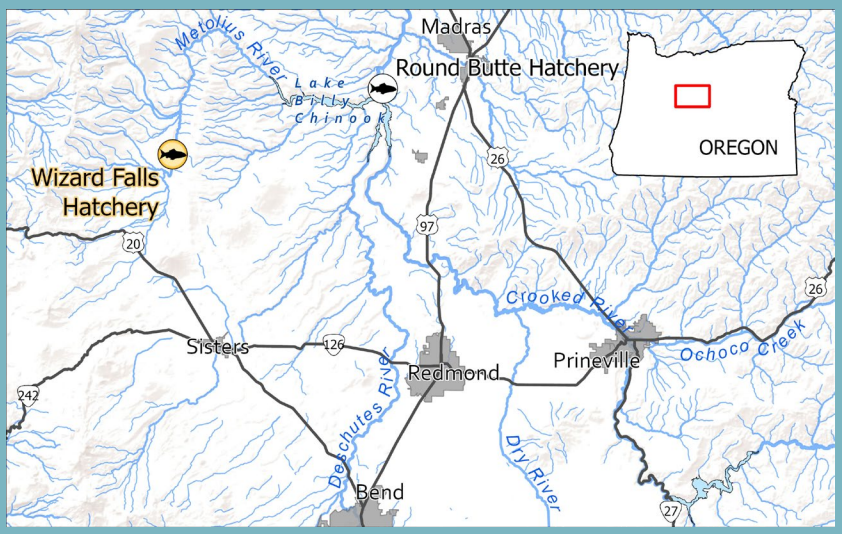
Maintained functionality of hatchery infrastructure and a reduction in vulnerability to summer low flows.

# WIZARD FALLS HATCHERY

Originally Constructed 1947

$8.33M/yr Regional Economic Impact (including Fall River Hatchery)

Currently rearing trout, kokanee, and summer steelhead




Adequate water available year-round

Cool spring water source

High risk from other hazards, especially wildfire

## KEY INFRASTRUCTURE NEEDS

- Replace bridge to facility
- Shade cover for raceways, potentially with solar power generation

## $3.56M ESTIMATED CONSTRUCTION COSTS

- $0.55M For deferred maintenance
- $3.01M For climate resilient upgrades

## UNCERTAINTIES/CHALLENGES

Wildfire remains a risk despite work to mitigate risk in the surrounding landscape.

## OUTCOMES FROM INVESTMENTS

Maintained functionality of hatchery infrastructure.

# FEDERALLY OWNED FACILITIES

ODFW operates 18 federally-owned hatchery facilities. These facilities have four major funding sources:

- **U.S. Army Corps of Engineers** funds facility operation in the Columbia, Willamette and Rogue river basins, as part of their obligation to mitigate for the impacts of USACE owned dams on native fish populations.

- **The National Oceanic and Atmospheric Administration** (NOAA Fisheries) funds operation of facilities in the Lower Columbia basin through the Mitchell Act. The Mitchell Act was passed by congress in 1938 to advance the conservation of salmon and steelhead fishery resources in the Columbia River Basin. Under the Mitchell Act, funding is provided to produce salmon and steelhead in for harvest and conservation purposes, currently supporting roughly one-third of all hatchery production in the Columbia River.

- **The U.S. Fish and Wildlife Service** funds hatchery operations through the Lower Snake River Compensation Plan. The plan was authorized by Congress in 1976 to mitigate for fishery impacts associated with the federal hydropower system in the Snake River basin.

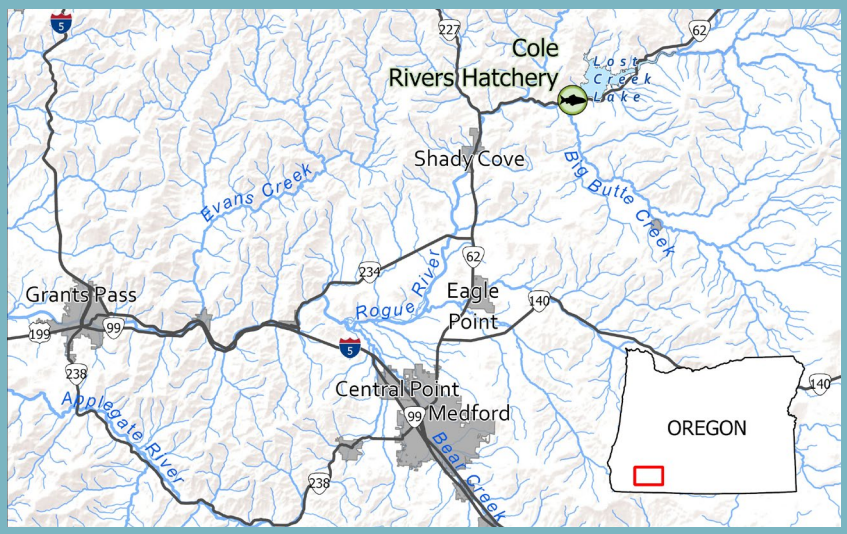
- **The Bonneville Power Administration** funds hatchery operations in the Lower and Mid-Columbia to mitigate the loss of fishing and harvest opportunities due to loss of habitat and migration blockage resulting from the Columbia Basin hydropower system. Umatilla River programs also provide for the restoration of fish populations that were extirpated.

Federally-owned hatcheries have a significant deferred maintenance backlog that will require additional federal funding to address. Climate resilience upgrades will also be needed at many of these hatcheries, but no systematic assessment has been conducted to estimate needs and costs for ODFW operated federal facilities in Oregon. In some instances, plans are in place to complete such an assessment (e.g., USFWS is planning to assess facilities in NE Oregon, SE Washington and Idaho). Because ODFW does not have authority to address infrastructure needs at federal facilities we work with federal agencies, Tribes, stakeholders, and Oregon's congressional delegation to advocate for investments at federally owned hatcheries. Since 2020, significant investments have been committed to facilities in the Columbia and Rogue basins. The information in the following pages provides a high level overview of the needs. Cost estimates are likely very conservative.

# ROGUE VALLEY HATCHERIES

Cole Rivers Hatchery originally constructed in 1973

Currently rearing spring & fall Chinook, coho, summer & winter steelhead, and trout




## FEDERAL FUNDING SOURCE

US Army Corps of Engineers

**> $50M**
**estimated construction costs**

- Some work completed since 2022 as a result of recent federal appropriations.

## KEY INFRASTRUCTURE NEEDS

- Water treatment system and hatchhouse replacement
- Water intake replacement
- Complete enhancements to electrical supply system
- Shade cover for raceways
- Potential expansion depending on capacity in state hatchery system

## UNCERTAINTIES/CHALLENGES

- Federal funding for deferred maintenance
- Interdependence with investments at other facilities
- Expansion would likely require additional water right and involves a decade plus long process to secure federal approvals for construction using state funds, the outcome of which is uncertain

## OUTCOMES FROM INVESTMENTS

Restored functionality of hatchery infrastructure to meet federal mitigation obligations and support state programs.

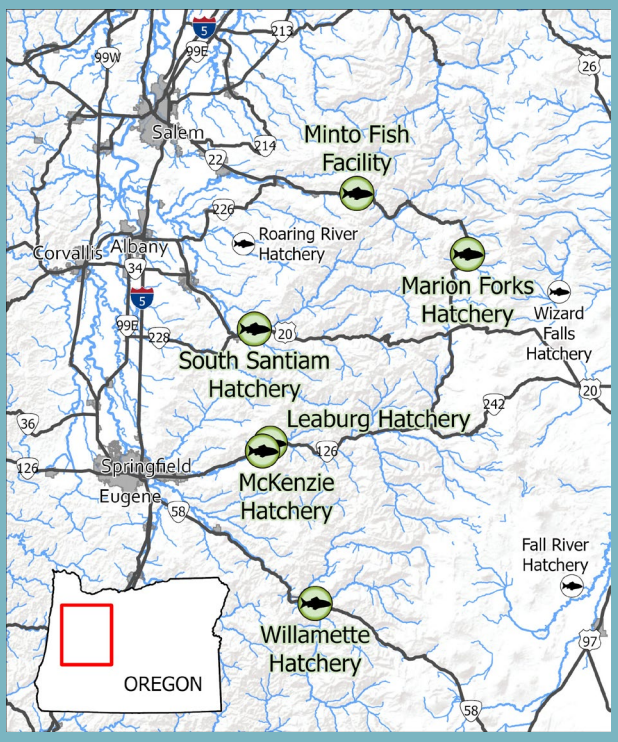
# WILLAMETTE VALLEY HATCHERIES

Originally Constructed 1951–1975

Currently rearing spring Chinook, summer steelhead, and trout

## FEDERAL FUNDING SOURCE

US Army Corps of Engineers




**> $159M**
**estimated construction costs**

- Does not include cost of upgrades to the Dexter facility-est. to be $50-$100M

## KEY INFRASTRUCTURE NEEDS

- Alternative water intake and supply line infrastructure at McKenzie and Leaburg hatcheries
- Water intake replacement at Marion Forks Hatchery
- Raceway renovations at most facilities
- Shade cover for raceways at all facilities
- Determine if additional juvenile rearing capacity can be developed at South Santiam Hatchery

## UNCERTAINTIES/CHALLENGES

- Resolving how to address the loss of water supply to McKenzie and Leaburg hatcheries following Leaburg dam removal will likely take over a decade and will be dependent on congressional appropriations. It is unlikely this will be resolved without disruption to hatchery production
- Federal funding has not kept pace with cost increases
- Fire risk

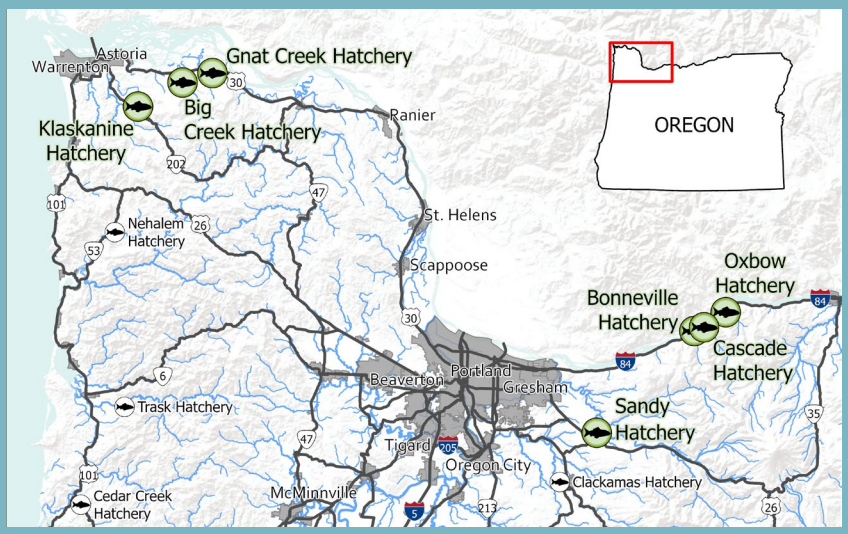
## OUTCOMES FROM INVESTMENTS

A more resilient hatchery system that can meet mitigation obligations and support reintroduction of wild populations above dams.

# LOWER COLUMBIA HATCHERIES

Originally Constructed or Major Renovations in 1952-1960 under Mitchell Act

Currently rearing spring & fall Chinook, coho salmon, sockeye salmon, summer & winter steelhead, and trout




## FEDERAL FUNDING SOURCES

- Mitchell Act
- US Army Corps of Engineers
- Bonneville Power Administration

**> $30M**
**estimated Capital Infrastructure/ Deferred Maintenance Needs**

- Some work planned in next 5 years as a result of recent federal appropriations

## KEY INFRASTRUCTURE NEEDS

- Replace aging pipes, intakes, and raceways at several facilities
- Water chilling, filtration, and recirculation technology to improve water quality and quantity at Sandy and Klaskanine hatcheries
- Assess well options at Cascade Hatchery to moderate water temperatures in summer and winter
- Expand adult holding ponds at Big Creek Hatchery

## UNCERTAINTIES/CHALLENGES

- Federal funding has not kept pace with cost increases
- Water quantity and/or quality, depending on the facility

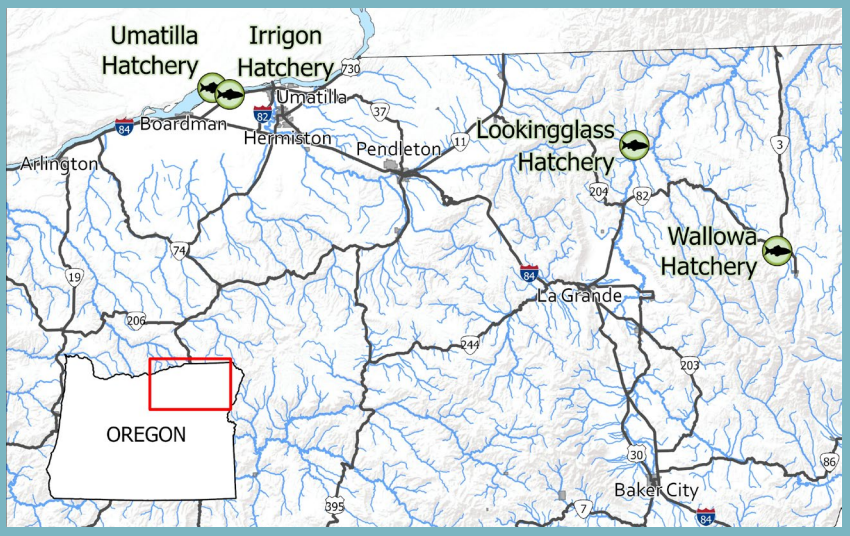
## OUTCOMES FROM INVESTMENTS

Restored functionality of original infrastructure and improved resilience to higher water temperatures and lower flows

# MID-COLUMBIA AND SNAKE RIVER HATCHERIES

Originally Constructed or Major Renovations in 1982-1991

Currently rearing spring and fall Chinook, coho salmon, summer steelhead, and trout




## FEDERAL FUNDING SOURCES

- Lower Snake River Compensation Plan
- Bonneville Power Administration

**> $27M**
estimated Capital Infrastructure/ Deferred Maintenance Needs

- Some federal funding recently appropriated to address deferred maintenance needs

## KEY INFRASTRUCTURE NEEDS

- Address deferred maintenance at all facilities
- Additional water development at Umatilla (wells or recirculation)
- Shade cover for raceways, potentially with solar power generation (especially at Umatilla and Irrigon hatcheries)
- Complete water intake upgrade at Lookingglass Hatchery
- Improve infrastructure at acclimation and brood collection satellite facilities

## UNCERTAINTIES/CHALLENGES

- Federal funding
- Fire risk at Lookingglass

## OUTCOMES FROM INVESTMENTS

Restored functionality of original infrastructure and increased resilience to impacts of climate change