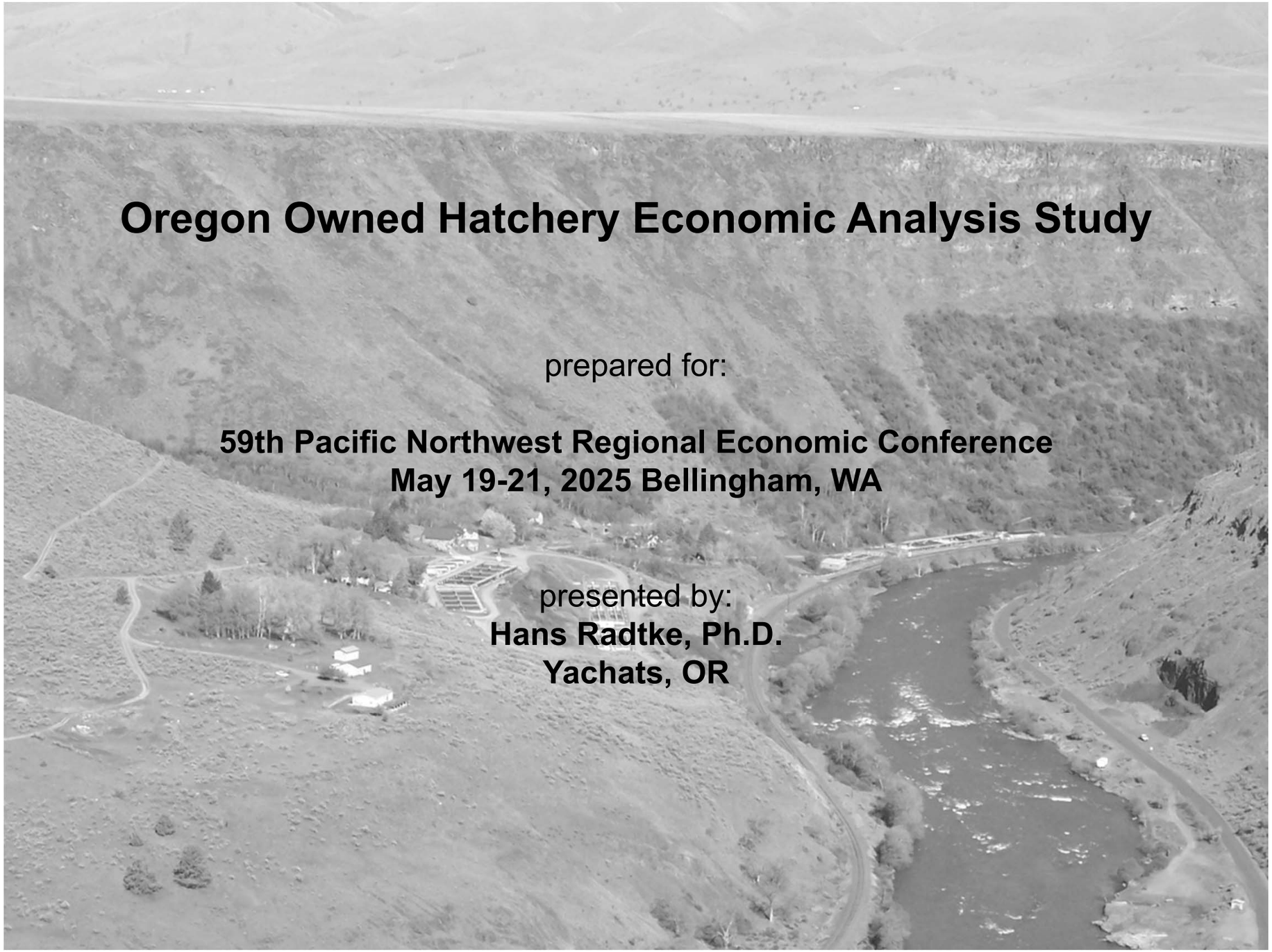
Slide 1



Oregon Owned Hatchery Economic Analysis Study

prepared for:

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presented by:
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Yachats, OR

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Biography

Hans D. Radtke, Ph.D.

- Residence: Yachats - 60 years
- Specialization: Natural resource economics
- Education: Doctorate, Oregon State University Agricultural and Resource Economics – 1972
- Employment and appointments:
  - Independent Resource Economist – 45 years
  - Oregon Governor's Council of Economic Advisors – 30 years
  - Pacific Fishery Management Council – 6 years including chairman; 3 years on Scientific and Statistical Committee
  - Northwest Power and Conservation Council, Independent Economic Analysis Board – 8 years
  - Marine Protected Area Federal Advisory Committee – 4 year term
  - Technical Dispute Settlement Board, as established by the Pacific Salmon Commission for the Pacific Salmon Treaty, since 2004
  - Oregon Wolf Conservation and Management Plan Development Committee, 2003 to 2004
  - Governor’s ad-hoc railroad advisory committee on Port of Tillamook Bay lottery fund application (circa 1997?)

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Hatchery Count, Location and Production

- ODFW operates 33 hatcheries of which 18 are federal owned, 14 State owned and 1 owned by Portland General Electric. The 2023 annual budget is $44.2 million or about 1/3 of ODFW total budget. Releases are anadromous 38.8 million and resident species (mostly rainbow trout) 5.3 million.
- State hatcheries only (14 of which 7 at Coast, 3 Willamette Valley, and 4 Central Oregon) operating budget $15.1 million with releases 8.4 million anadromous and 3.8 million resident species.
- About 70 percent of Oregon anadromous and resident fish catch is hatchery origin fish.

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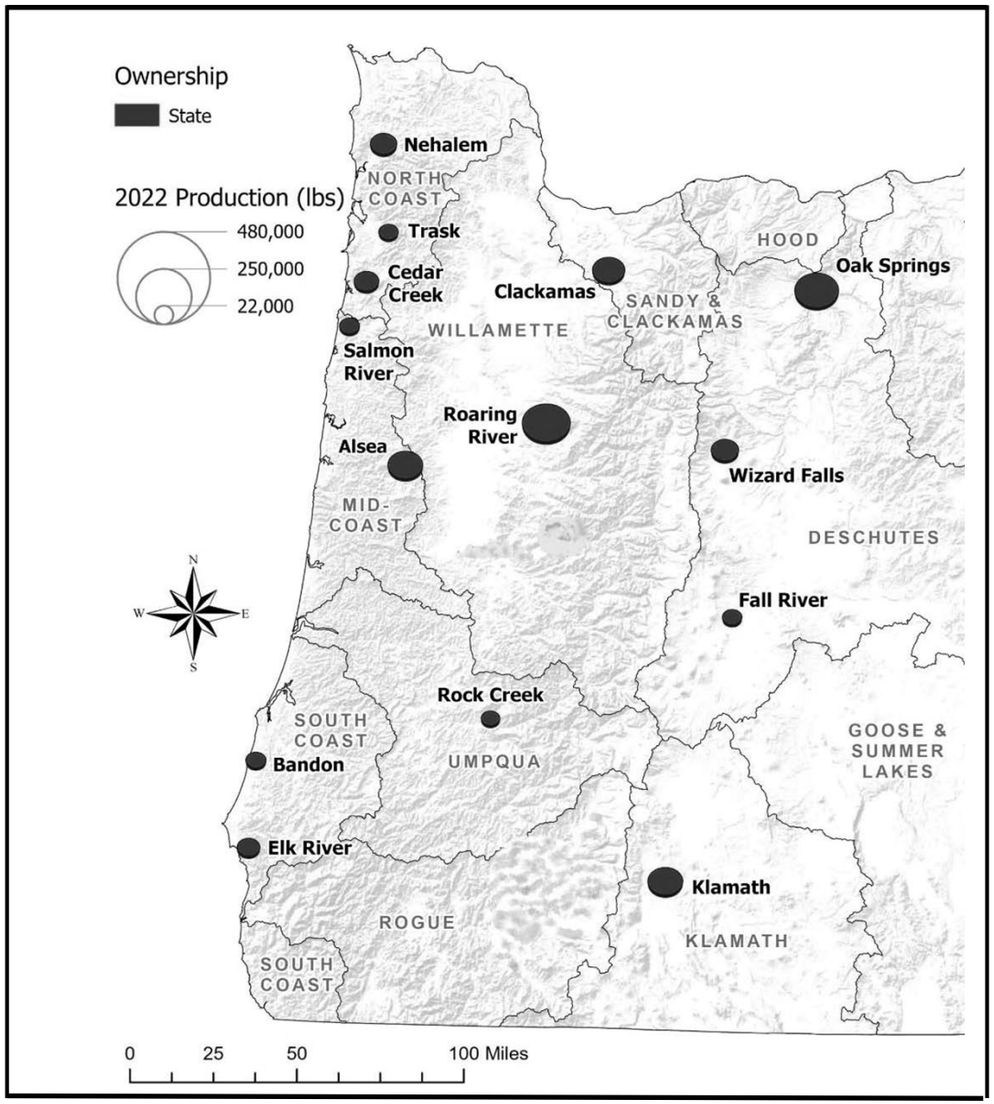
State Owned Hatcheries Operated by the Oregon Department of Fish and Wildlife



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Hatchery Annual Costs by Species

	Cost Category		Species			
	Amount	Share	Trout		Anadromous	Share
Variable	9,347.5	57%	3,707.5	40%	5,640.0 60%	100%
Operation	8,199.7	50%	3,510.4	43%	4,689.3 57%	100%
Support	1,147.8	7%	197.1	17%	950.7 83%	100%
Fixed	7,002.2	43%	2,851.4	41%	4,150.8 59%	100%
Headquarter	254.4	2%	97.3	38%	157.1 62%	100%
Field management	219.0	1%	90.0	41%	129.0 59%	100%
Maintenance heavy (capital/fixed)	1,048.4	6%	454.8	43%	593.6 57%	100%
Bond expenses	440.0	3%	144.1	33%	295.9 67%	100%
Wildfire payments	1,160.0	7%	410.0	35%	750.0 65%	100%
Annual capital contribution	3,880.4	24%	1,655.2	43%	2,225.2 57%	100%
Total Costs	16,349.7	100%	6,558.9	40%	9,790.8 60%	100%

Notes:
1. Costs are thousands 2023 dollars.
2. Costs are allocated to species based on individual hatchery rearing time. The allocated costs are then summed over all State hatcheries.

Speaker notes: 1. Operation includes itemizations for PS, feed, utilities, travel, and other. Support includes fish health, CWT/marking, and fish liberation. Liberation costs include hauling truck costs. Labor for liberation is included in operations. Headquarter administration includes policy, report preparation, budgeting, monitoring, permitting, etc. Field management includes hatchery coordination and special insurance. Maintenance (heavy) includes housing costs, spending from emergency contingency and R&E funds for improvements and upkeep. Bond expenses are from each hatchery's contribution to maintaining a $10 million deferred maintenance/catastrophe bond fund. Existing assets assumed fully depreciated and annual capital contributions for replacement assumes straight-line method, 70 year life and 25 percent salvage value. Wildfire payments are required at the Klamath ($260,000) and Rock Creek ($900,000) hatcheries due to insurance company settlement for paying wildfire damages.

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Hatchery Production Cost Indicators by Species

			Anadromous Species					
	Total	Trout	Subtotal	Fall Chinook	Spring/Sum Chinook	Coho	Winter Steelhead	Summer Steelhead
Cost per release	1.31	1.59	1.17	0.82	0.86	0.70	2.35	3.25
Cost per facility pound	13.64	9.04	20.71	24.44	18.67	21.81	20.95	18.08
Cost per harvested adult	14.50	6.21	137	161	241	73	132	438

Notes: 1. Cost per harvested adult are for attributed catch in Oregon fisheries.

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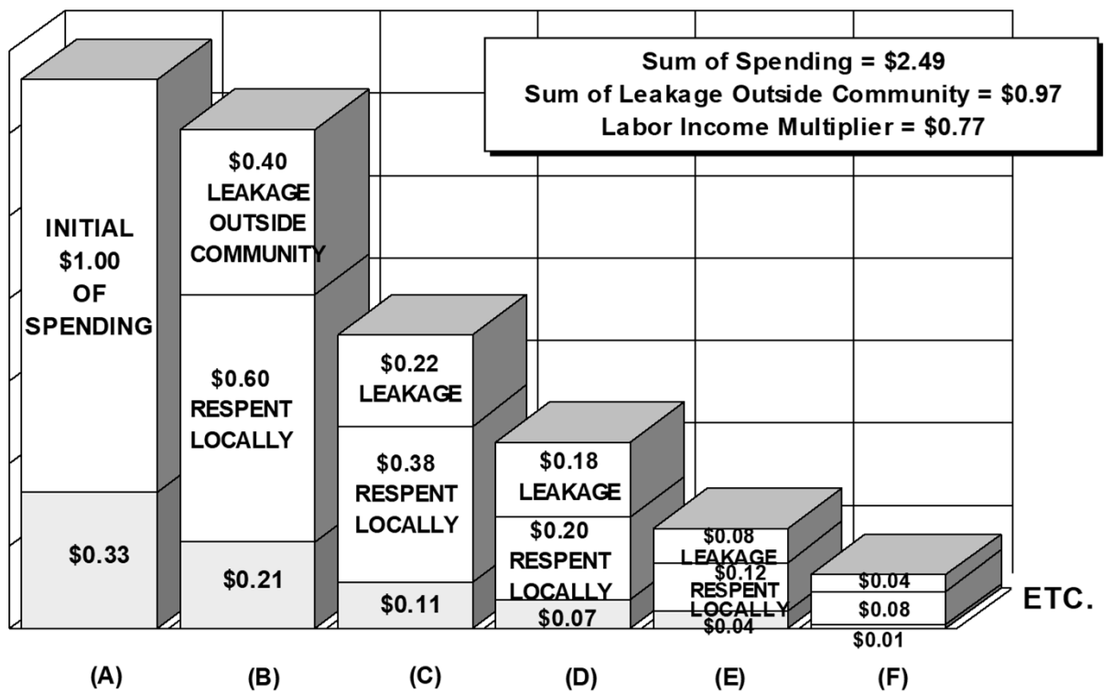
Economic Contributions

- Method application is for status quo operations.
- Initial operations spending, fisheries spending, and visitor spending is added to the reverberating spending in the economy until money leaks.
- Results are shown for the local economy and statewide economy.
- Analysis results are expressed as labor income and equivalent jobs, and not output.

Multiplier for Labor Income



Speaker notes: The shaded portion of spending that goes to households in terms of wages, salaries, and proprietor profits is called labor income.

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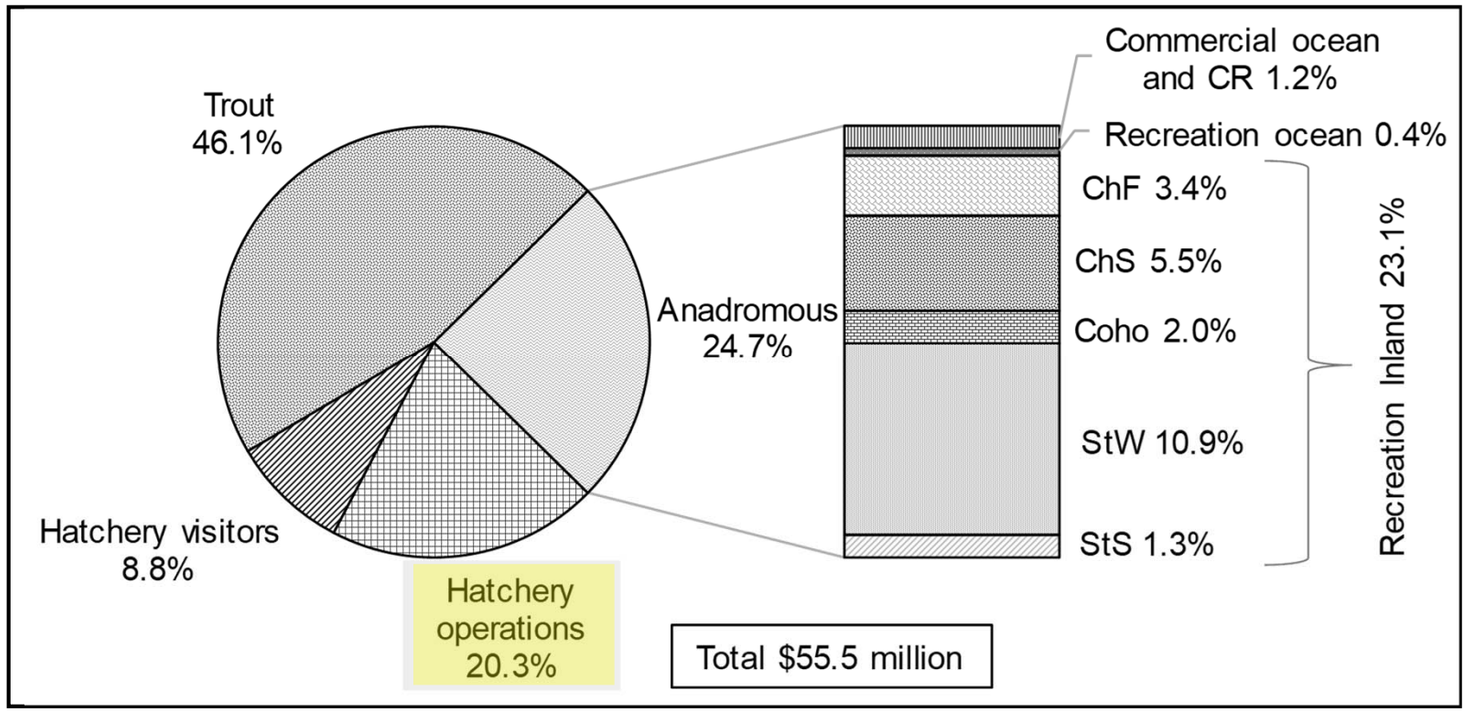
Regional Economic Impact From Fisheries, Hatchery Visitors, and Hatchery Operations

	REI	
	Labor Income ($000's)	FTE Jobs
Fisheries	39,303	779
Hatchery visitors	4,909	97
Hatchery operations	11,273	223
Total	55,484	1,100



Speaker notes: REI is at the statewide economy level. Hatchery supported fisheries and hatchery visitor REI assumes single purpose per day trip expenditures.

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Net Benefits Analysis

- Limited benefit-cost analysis; more complex analysis uses envisioned benefits, opportunity and other costs over a time horizon using discount rates.
- Net economic value (NEV) benefits are from three sources:
  (1) Recreational angler willingness-to-pay for access to hatchery production minus costs to access.
  (2) Commercial harvester and primary processor profitability and portion of fixed costs.
  (3) Hatchery visitor willingness-to-pay for the trip minus actual trip costs.
- Costs are production costs plus capital contributions.
- Net benefits = NEV - Costs. Can be shown as absolute value or ratio NEV divided by costs.
- Calculated net benefits are highly dependent on existing willingness-to-pay assumptions. Specific situation survey results should be used.

Benefiter	NEV	Costs	Net Benefits
Recreational	61,748		
Commercial	381		
Visitor	4,214		
Total	66,344	16,350	49,994

Notes: 1. Thousands of Year 2023 dollars.

Speaker notes: Net benefits can be a comparative cost effectiveness measure and a return on investment measure.

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Hatchery Net Benefits From Fisheries by Species and Visitors

Species	Costs	NEV	Net Benefits	Ratio
Trout	6,559	41,531	34,973	6.33
Fall Chinook	1,549	3,205	1,656	2.07
Spring/sum Chinook	1,688	4,768	3,080	2.82
Coho	1,918	2,062	144	1.08
Winter steelhead	3,336	9,480	6,144	2.84
Summer steelhead	1,300	1,083	(217)	0.83
Visitors		4,214	4,214	
Total	16,350	66,344	49,994	4.06

Notes: 1. Cost, NEV, and net benefits are in thousands.

2. Capital costs apportioned to species production based on rearing time spent at hatchery.

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Individual Hatchery Net Benefits From Fisheries and Visitors

Hatchery	Costs	NEV	Net Benefits	Ratio
Alsea	1,297	5,594	4,297	4.31
Bandon	840	1,705	866	2.03
Cedar Creek	1,094	4,703	3,609	4.30
Clackamas	1,776	2,871	1,095	1.62
Elk River	1,023	1,241	218	1.21
Klamath	1,154	4,689	3,535	4.06
Nehalem	971	2,568	1,597	2.64
Oak Springs	1,465	10,969	9,504	7.49
Roaring River	1,301	13,808	12,507	10.61
Salmon River	1,055	1,289	234	1.22
Trask	874	3,565	2,691	4.08
Wizard/Falls River	1,393	9,986	8,593	7.17
Rock Creek	2,107	3,355	1,248	1.59
Total	16,350	66,344	49,994	4.06

Notes: 1. Cost, NEV, and net benefits are in thousands.
2. Capital costs apportioned to species production based on rearing time spent at hatchery.

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Sustainable Funding

- Review of hatchery budget revenue sources and cost trends raises questions about State hatchery financial stability. There is pending financing crunch from decreasing license and fee sales while trying to satisfy objectives for constant production.
- There is scrutiny for relying on general funds when State hatchery purpose for enhancing fisheries opportunity for small society segment.
- Suggest financing planning study to flesh out innovative financing techniques, determine fisheries participation demand, identify “free riders,” develop range of solutions accompanied with social and economic impact analysis, and assist Department find preferred alternative.
- There is a significant imbalance between the hatchery production cost per harvested fish and any direct and indirect layered fisheries access fee accounting. Further, findings show high WTP values per fish and in aggregate. The political will to shift funding burden could rely on those findings, but there will still be stakeholder resistance to raising fees. Fisheries direct users are habituated to comparatively low cost access to fish resources. Taking steps to resolve the imbalance through benefiter fee increases will make further progress for enhancement hatchery sustainable funding.

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Fisheries Direct User Associated Funding Liability

- Assigning fisheries direct user or other benefiters funding responsibilities would be consistent with the well-established utility principle of cost recovery. This thinking suggests an apportionment of hatchery costs would correspond with benefits received.
- One problem is finding an equitable mechanism to extract additional payments. Licenses and fees are already surcharged to support hatcheries. It could be marketing studies would show that fisheries participant extracted revenue has maximized (i.e. there is price elasticity).
- License and fee revenue is distributed across many programs to carry out ODFW missions. There can be exploration for reprioritization for how license and fee revenue is shared across programs, but then backfilling the other program budgets is necessary.

	Direct Fisheries Associated Funding Liability	
Fisheries	Proportion of Benefits Received	Production Costs
Commercial		
Anadromous	0.1%	0.1%
Recreation		
Anadromous	33.1%	59.7%
Trout	66.8%	40.1%

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Study Takeaways

1. State owned hatcheries are expensive to operate and build. Cost indicators show high hatchery production costs per Oregon fisheries catch. For example, a spring Chinook costs $241 and a trout costs $6.21.
2. Oregon hatchery origin fish are caught in non-Oregon fisheries. For example, 55 percent of north coast fall Chinook are caught in SEAK, BC, and WA fisheries.
3. Economic analysis calculations are very sensitive to smolt-to-adult (SAR) Oregon fisheries catch rates.
4. The State enhancement hatcheries create significant regional economic impacts in rural economies. State hatcheries economic contributions are a small (six percent in 2021) proportion of the overall Oregon commercial salmon fishing industry economic impacts.
5. Net economic value (NEV) surveys show commercial and recreational fisheries participants are willing to spend more than actually spent in order to have status quo fisheries quality.
6. Net benefits (NEV less production costs) are positive for each hatchery but vary widely depending on individual hatchery trout production and overall production levels.

Study Takeaways (cont.)

7. There are passive and cultural use values, but measurements are abstract to the public and policy makers.
8. There is a pending financial crunch from declining license and fee revenue, rising production costs and facilities reaching end-of-life cycle.
9. New thinking may be necessary for changing production objectives (toward conservation) and numbers (lowering production) to save costs. Or a combination of securing more general funds and innovative financing support.
10. The study presented financing options and discussed in detail the user pays principle. A suggestion was to complete an all hatchery financing planning study since there are interactions between the other non-state owned hatcheries and they all are under same budget (declining revenues and increasing costs) pressures.

Comments

- BCA is limited. For example, adverse impacts to wild stocks are not included. Passive use values were not tracked. Time horizons with discounted financial flows were not included such as might be used to account for climate effects. Opportunity costs are not included such as alternative use of funds for other production techniques. Therefore tradeoff investigations were not carried out.
- Individual hatchery BCA results were highly correlated with proportional size of trout production. Trout put and take programs had high net benefits.
- External study surveys show gap between willingness-to-pay and access license/fee payments. However, there is evidence of payment price elasticity and general decreasing interest (per capita license sales).
- Accountancy showed costs are not universally tracked at the species program level. Headquarter costs were not separable between hatchery operations and other conservation. Presumptions were used.
- Current commercial and recreational fishing access license/fee schedules have some hatchery user itemizations, but additional cures exist such as mandatory hatchery fish catch cards and inland harvest location endorsements. Ocean mixed stock fisheries and differing hatchery marking programs make cost recovery mechanisms design difficult.

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Questions?

Contacts
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Study Report
https://www.dfw.state.or.us/fish/hatchery/resilience.asp

Photo credit Oregon Department of Fish and Wildlife.

Thank you for the opportunity to provide this information.