

# Hatchery Reform and our Pacific Region National Fish Hatcheries

Presented by  
Doug Olson



# Today's 3 Messages

1. Review

Hatchery Reform / Principles

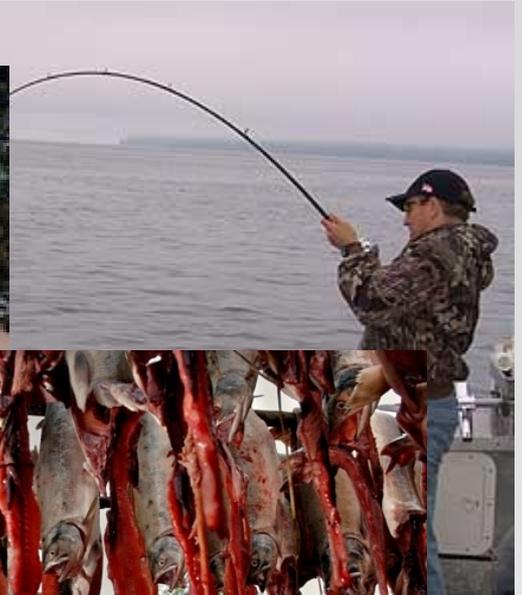
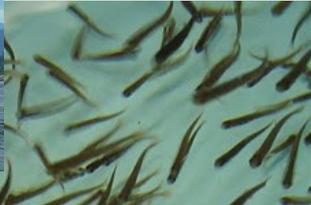
2. What Have We Accomplished?

3. On-Going Challenges

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# What is Hatchery Reform?

*“Hatchery reform is actually quite simple in principle: its managing hatcheries as a type of habitat, managing fish as components of viable populations, and managing populations – both hatchery and wild - for maximum viability.” – Don Campton*



Paul Perkinson

© mi Vitale

## 3 Guiding Principles

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1. Well-Defined Goals  
stated in terms of Benefits and Purposes
2. Scientific Defensibility (Measured Benefits  $>$  Risks)
3. Decision Making based on Monitoring & Evaluation





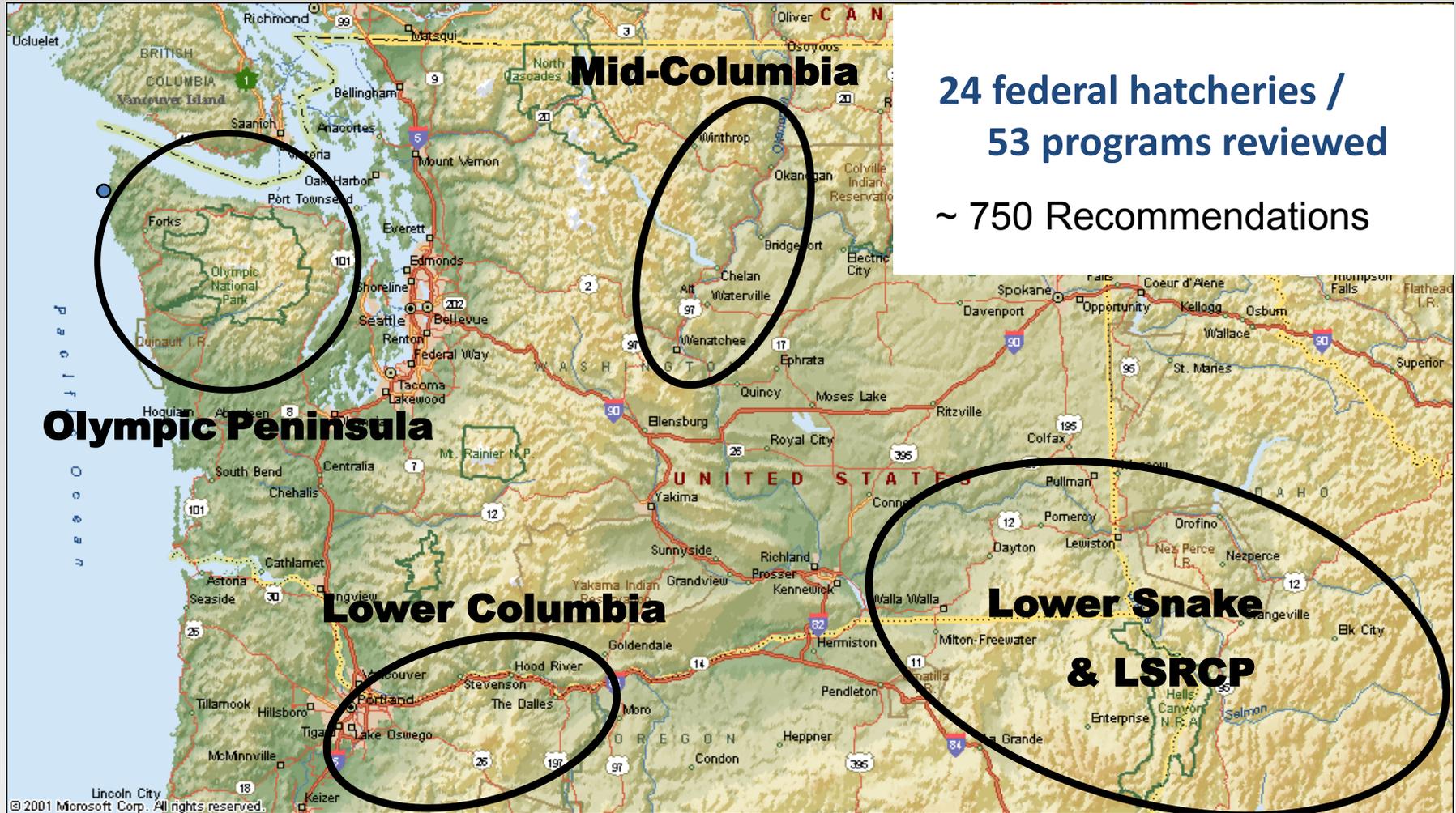
# Harvest and Conservation Goals for Warm Springs National Fish Hatchery



**in Cooperation with the Confederated Tribes of the Warm Springs Reservation of Oregon**

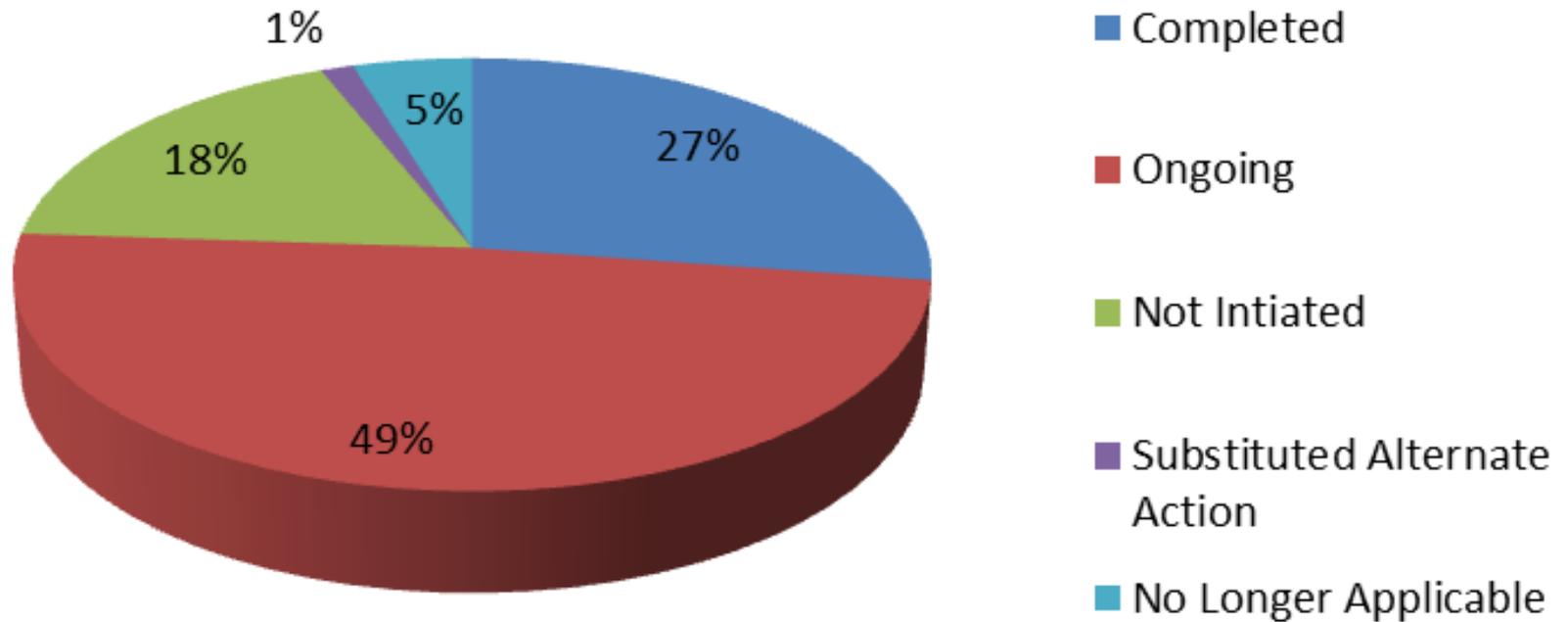
1. Produce Hatchery Spring Chinook Salmon for Harvest in the Deschutes and Columbia River.
2. Protect Wild Fish in the Warm Springs River by Minimizing Impacts from Hatchery Operations.

# Federal Hatcheries Reviewed



[www.fws.gov/pacific/fisheries/hatcheryreview](http://www.fws.gov/pacific/fisheries/hatcheryreview)

# Implementation Tracking of Recommendations: 2010



Graphic by S. Connolly

# Lower Columbia: Eagle Creek National Fish Hatchery

- **On-Going Recommendation: Continued support of tribal coho reintroduction programs in Yakama and Clearwater Rivers**
- **Completed Recommendation: Reduced steelhead hatchery program to reduce ecological and genetic risks (2009)**
- **On-Going Challenge: Mitchell Act & Budget, Staffing, Programs, Facilities**

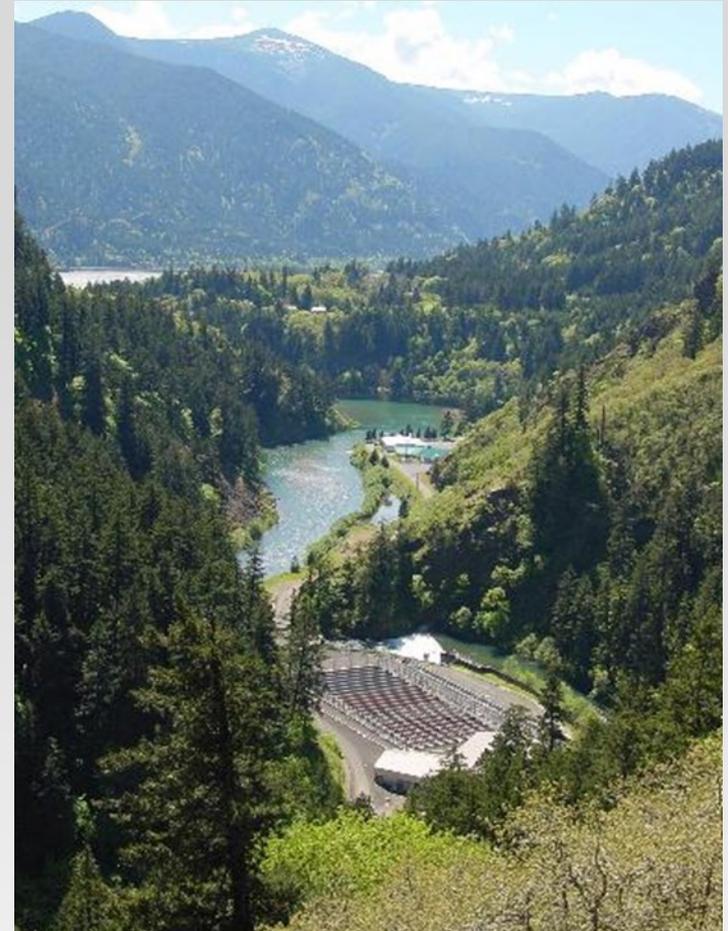


# Columbia River Gorge National Fish Hatcheries

- **Not Initiated (2010) to Completed (2015):** Fall Chinook Goals stated in terms of Total Adult Production and Harvest Benefits



- **No Longer Applicable?:**  
**Reduce Fall Chinook Production**
- **On-Going Challenge (pHOS Risk):**  
**Hatchery fish on Spawning Grounds**



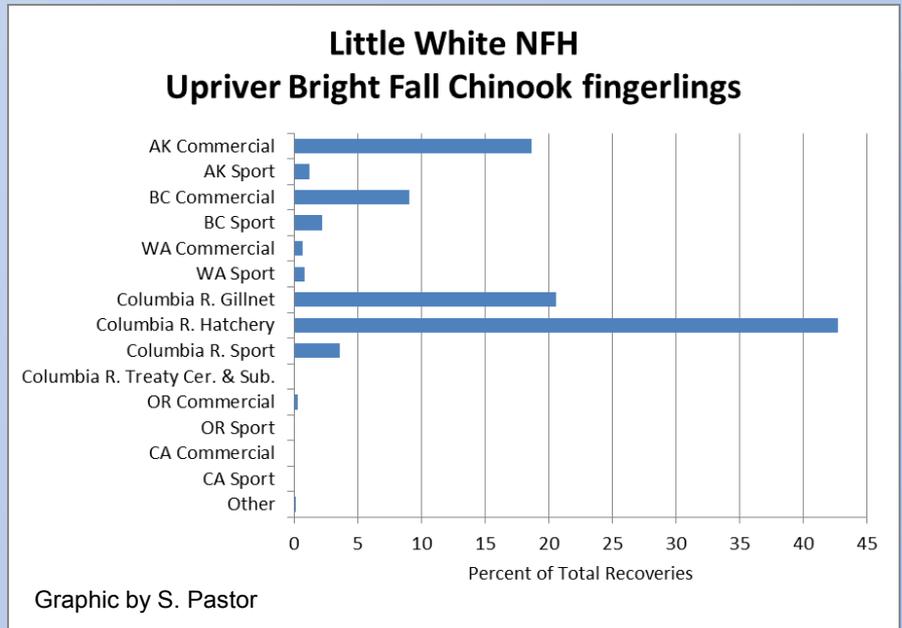
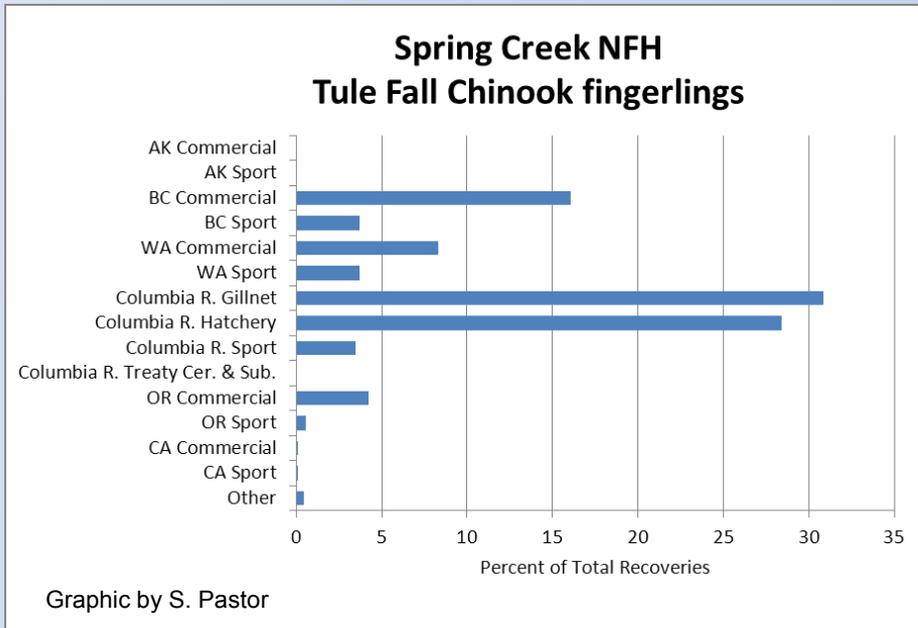
# Recommendation: Measurable Objectives and Benefits

Total Adult Production Objective: 15 Year Average Smolt-to-Adult Survival

- 14,382 Adult Salmon from 4.5 Million Smolt Release at Little White Salmon
- 49,592 Adult Salmon from 10.5 Million Smolt Release at Spring Creek

**Average Harvest: 28,000 Salmon**

**Average Harvest: 5,900 Salmon**



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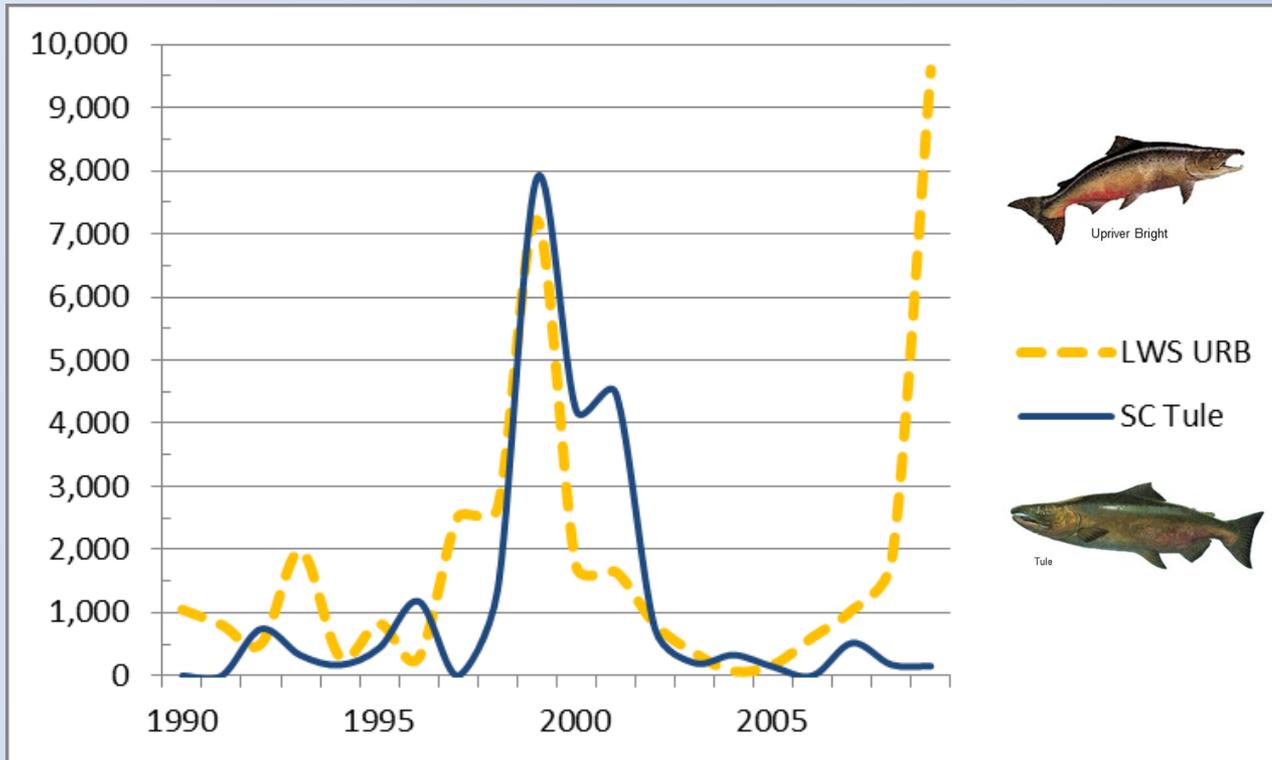


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# Challenge (Risk): Spawning Ground Recoveries

see also Smith and Engle (2011)



Data from S. Pastor CRIS



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# Snake River: Hagerman National Fish Hatchery

- **On-Going Challenge:**  
Declining Water Supply and Impact to Steelhead Hatchery Production



# Recirculating Aquaculture System



Target 4.5 fpp	RAS 3-30' x 6' Circular Tanks	Rectangular 100' Sections x 4
# FISH	90,000	90,000
LBS	19998	19998
FLOW(GPM) FRESH WATER	700/1400 (w/Recirc)	1481 x 4= 5924
VOLUME cuft	11655	12000
DENSITY lbs/ft <sup>3</sup> / (Kg/m <sup>3</sup> )	1.7/(27.5)	1.66/(26.9)
LBS/GPM	28.6	3.4

# Mid-Columbia: Leavenworth NFH Complex

## Completed Recommendation:

- Entiat NFH Spring Chinook – Discontinued:  
Risks outweighed benefits, replaced with Summer Chinook

## On-Going Research:

- Winthrop NFH Steelhead – Developed localized, integrated broodstock and Experiment with 2 year smolt (NMFS and USFWS)

## Potential Future Grand Challenge:

- Reintroduction of Salmon and Steelhead Upstream of Grand Coulee



# Region-Wide Issues, Guidelines (2013)



## PROGRAM MANAGEMENT

- **Issue 1: Establish Well Defined Goals**
- Issue 2: Ensuring Scientific Defensibility in Future Decisions
- Issue 3: Planning Documents and Multi-Year Co-manager Agreements
- Issue 4: Hatchery Evaluation Teams
- **Issue 5: Fish Culture Best Management Practices**
- Issue 6: Outreach Best Practices
- Issue 7: Mark/Tag and Tag Recovery Strategies
- Issue 8: Pollution Abatement and Management of Hatchery Effluent
- Issue 9: Water Use and Reporting
- **Issue 10: Climate Change**

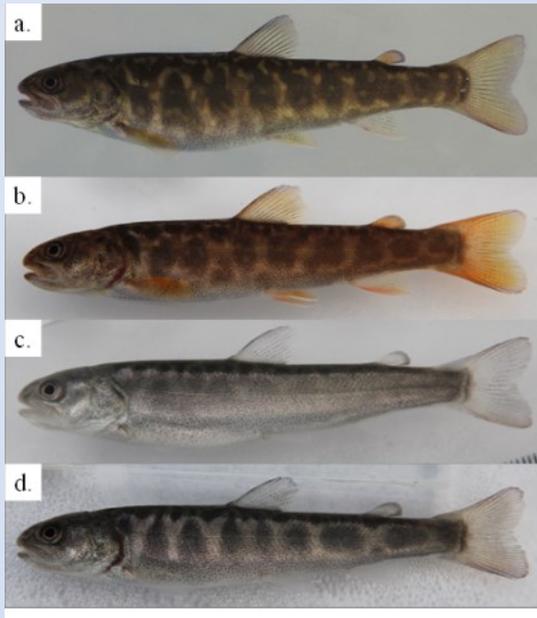
## PROTOCOLS, PROCEDURES, AND DATA MANAGEMENT

- Issue 11: Reports and Documentation
- Issue 12: Co-managers Working at National Fish Hatcheries
- Issue 13: Standard Operating Procedures
- **Issue 14: Monitoring and Evaluation Standards**
- Issue 15: Data Management
- Issue 16: Sharing Data Externally

## RESEARCH

- **Issue 17: Research Needs**

# On-Going Challenge: Conservation Hatchery Programs



- Rear **Bull Trout** under variable habitat, temperature and feeding regimes to understand and compare the survival of captive fish in the wild (W.R. Brignon);
- Rear **Pacific Lamprey** and conduct feeding, thermal and antibiotic trials to evaluate growth, condition, and effects on metamorphosis (Jolley et al.);
- Develop a **Structured Decision Model** to inform bull trout and Pacific lamprey conservation actions (Brignon et al.).



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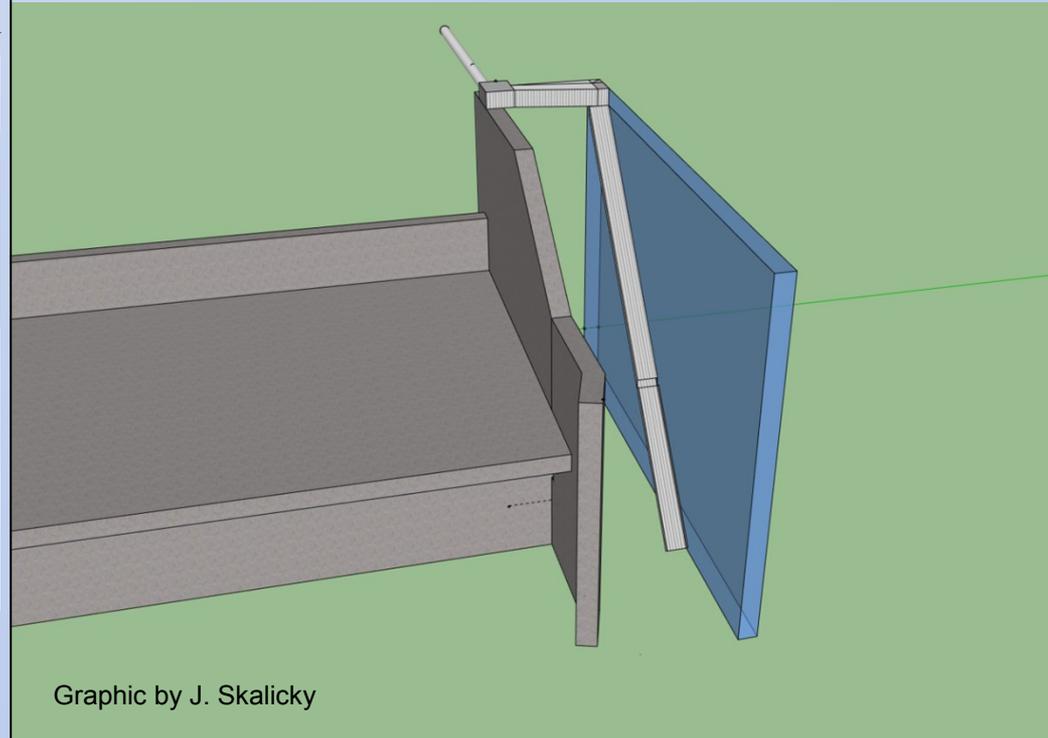
# On-Going Challenge: Pacific Lamprey Passage

U.S. Fish and Wildlife Service  
Columbia River Fisheries Program Office

**Pacific Lamprey and Bull Trout Passage  
Assessment at Warm Springs National Fish Hatchery  
2014 Report**



Gallion, D. and J. Skalicky  
U.S. Fish and Wildlife Service  
Columbia River Fisheries Program Office  
Vancouver, WA 98683  
<http://www.fws.gov/columbiariver>



Graphic by J. Skalicky



U.S. Fish and Wildlife Service  
Columbia River Fisheries Program Office

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AMERICA'S  
*Fisheries*

Conserving America's Fisheries



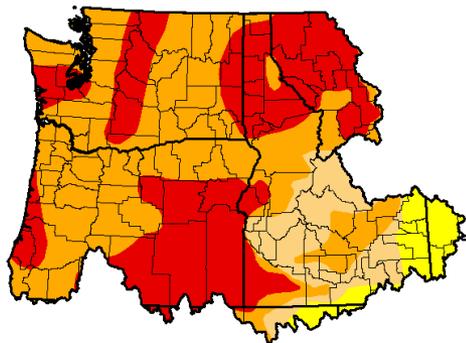
# On-Going Challenge: Climate Change and Extreme Weather

- Hatchery Vulnerability Assessments led by Abernathy Fish Technology Center



- **Warm Springs 2015**

## U.S. Drought Monitor Pacific Northwest Watershed



July 28, 2015

(Released Thursday, Jul. 30, 2015)  
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.03	99.97	94.38	83.17	37.01	0.00
Last Week 7/23/2015	0.03	99.97	94.17	77.28	19.58	0.00
3 Months Ago 4/26/2015	23.12	76.88	56.06	32.47	12.99	0.00
Start of Calendar Year 1/2/2014	34.96	65.04	49.92	25.01	11.14	0.00
Start of Water Year 9/25/2014	20.90	79.10	52.43	31.66	11.60	0.00
One Year Ago 7/29/2014	22.13	77.87	47.02	32.67	5.77	0.00

Intensity:

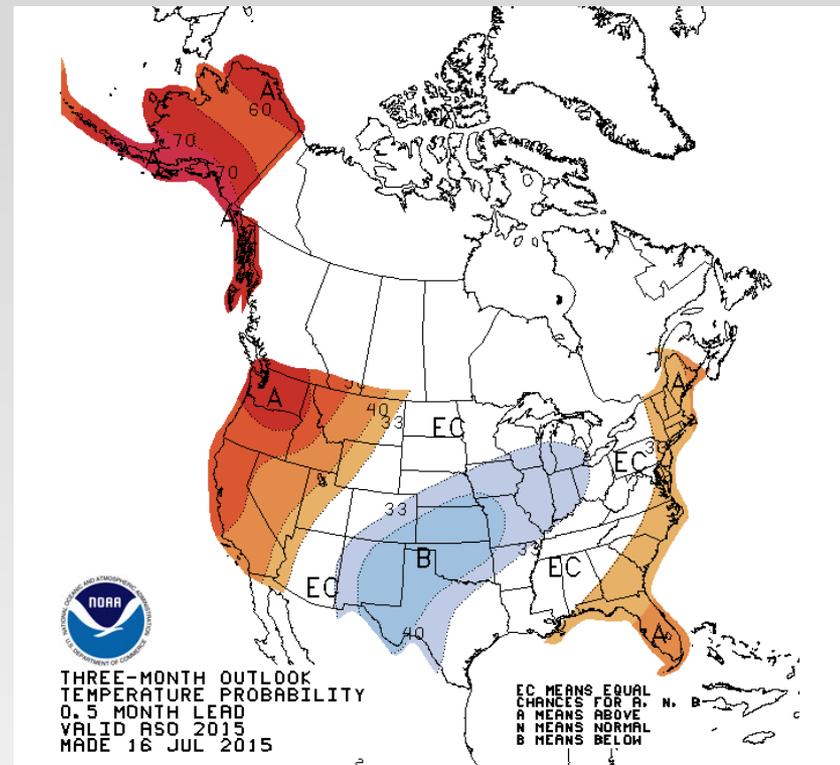


The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:  
Richard Heim  
NCEI/NOAA



<http://droughtmonitor.unl.edu/>



# On-Going Challenges to Consider When Implementing Reforms

- Immediate to Several Years to Implement
- Programmatic Changes and Goal Setting for Hatcheries and their Populations Require Agreement Among Co-Managers
- Monitoring & Evaluation are Essential for Measuring Success towards Achievement of Population Goals
- Facility Upgrades often Needed to Reduce Risks, Increase Benefits





[www.fws.gov/pacific/fisheries/hatcheryreview](http://www.fws.gov/pacific/fisheries/hatcheryreview)

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Carl Schreck, Douglas DeHart, Tom Flagg, Joe Krakker, Ray Brunson, Dave Carie, Dave Zajac; Bottom left: Doug Olson, Don Campton, Susan Gutenberger, Larry Telles, Larry Marchant

Not pictured: Chris Pasley, Bryan Kenworthy, Barry Berejikian, Bruce Stewart, Herb Pollard, Ron Hardy