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
What is Hatchery Reform?

“What 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
3 Guiding Principles

1. Well-Defined Goals
   stated in terms of Benefits and Purposes

2. Scientific Defensibility (Measured Benefits > Risks)

3. Decision Making based on Monitoring & Evaluation
Federal Hatcheries Reviewed

24 federal hatcheries / 53 programs reviewed
~ 750 Recommendations

www.fws.gov/pacific/fisheries/hatcheryreview
Implementation Tracking of Recommendations: 2010

- Completed: 27%
- Ongoing: 49%
- Not Initiated: 18%
- Substituted Alternate Action: 5%
- No Longer Applicable: 1%

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- **No Longer Applicable?:** Reduce Fall Chinook Production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

Graphic by S. Pastor
Challenge (Risk): Spawning Ground Recoveries

see also Smith and Engle (2011)

Data from S. Pastor CRiS
Snake River: Hagerman National Fish Hatchery

• **On-Going Challenge:**
  Declining Water Supply and Impact to Steelhead Hatchery Production
# Recirculating Aquaculture System

![Image](image_url)

<table>
<thead>
<tr>
<th>Target 4.5 fpp</th>
<th>RAS 3-30’ x 6’ Circular Tanks</th>
<th>Rectangular 100’ Sections x 4</th>
</tr>
</thead>
<tbody>
<tr>
<td># FISH</td>
<td>90,000</td>
<td>90,000</td>
</tr>
<tr>
<td>LBS</td>
<td>19998</td>
<td>19998</td>
</tr>
<tr>
<td>FLOW(GPM)</td>
<td>700/1400 (w/Recirc)</td>
<td>1481 x 4 = 5924</td>
</tr>
<tr>
<td>FRESH WATER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VOLUME cuft</td>
<td>11655</td>
<td>12000</td>
</tr>
<tr>
<td>DENSITY lbs/ft³ / (Kg/m³)</td>
<td>1.7/(27.5)</td>
<td>1.66/(26.9)</td>
</tr>
<tr>
<td>LBS/GPM</td>
<td>28.6</td>
<td>3.4</td>
</tr>
</tbody>
</table>

(Peery, Eaton, Turik 2014)
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.).
On-Going Challenge: Pacific Lamprey Passage

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
On-Going Challenge: Climate Change and Extreme Weather

• Hatchery Vulnerability Assessments led by Abernathy Fish Technology Center

• Warm Springs 2015
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
Implementation of Hatchery Reform is Strategic Hatchery Management

Adapted from USFWS Strategic Habitat Conservation Model

Goal and Objective
Setting for Populations

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