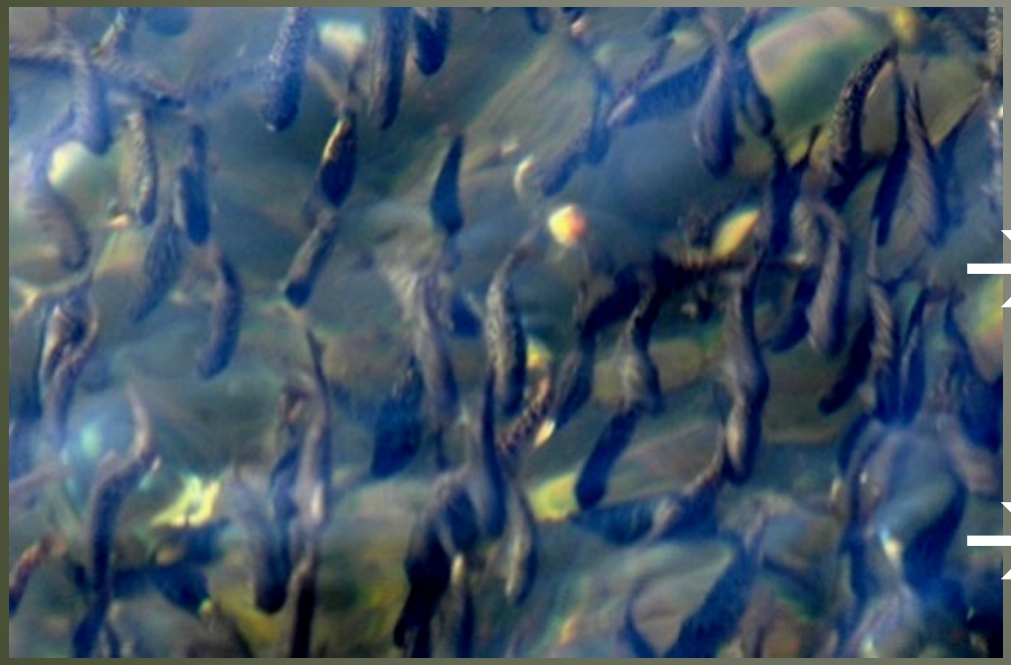
CTUIR Visioning for LSRCP Next 10 Years



LSRCP CHINOOK SYMPOSIUM 12-15-22

GARY JAMES
CTUIR FISHERIES PROGRAM MANAGER

Brief Background of CTUIR Involvement in LSRCP

- Gary James, first CTUIR biologist hired in August 1982
- Lookingglass Hatchery dedication in 1982 attended by CTUIR
- CTUIR began receiving LSRCP funds in 1989
- CTUIR sponsored BPA-funded Upper GRR and Catherine Creek satellite facilities to facilitate in-place in-kind mitigation (1997-2000)
- CTUIR conducts O&M and M&E of satellite facilities and M&E of CHS supplementation in Lookingglass Creek

CTUIR Involvement With Hatchery Intervention

1. **Reintroduction Following Extirpation**

- Salmonids: Umatilla CHS, CHF, & coho; Walla Walla CHS; STS above McKay Dam
- Other Species: Pacific lamprey and freshwater mussel programs ongoing with research at WWCC

2. **Supplementation of Depressed Populations**

- CHS: Grande Ronde, Imnaha & Tucannon
- CHF: Grande Ronde, mainstem Snake and Columbia River
- STS: Umatilla

Note: Gravel-to-gravel satellite facility approach

Why Hatcheries?
What has happened to Columbia Basin habitat?

- Over 1,000 dams have been constructed since the late 1800's.
- There are 13 mainstem Columbia and Snake River dams.
- Only 55% of once-available habitat is still accessible today.

- About 65% of remaining accessible mainstem Columbia and Snake River habitat has been transformed to reservoirs/pools.
- Common tributary limiting factor due to economic development is stream channelization and poor water quantity/quality and lack of natural floodplain function.

Why Hatcheries?
What has happened to Columbia Basin Salmon and Steelhead?

- Spawning populations are often below replacement
- 23 populations have become extinct
- 199 populations are ESA-listed as threatened or endangered
- Jay Hesse, NPT: 42% of nat-origin Snake CHS populations are at or below QET (50 fish); 77% predicted by 2025
- Once productive CTUIR U&A fishing areas in NE Oregon/SE WA are often closed or have very limited harvest opportunity

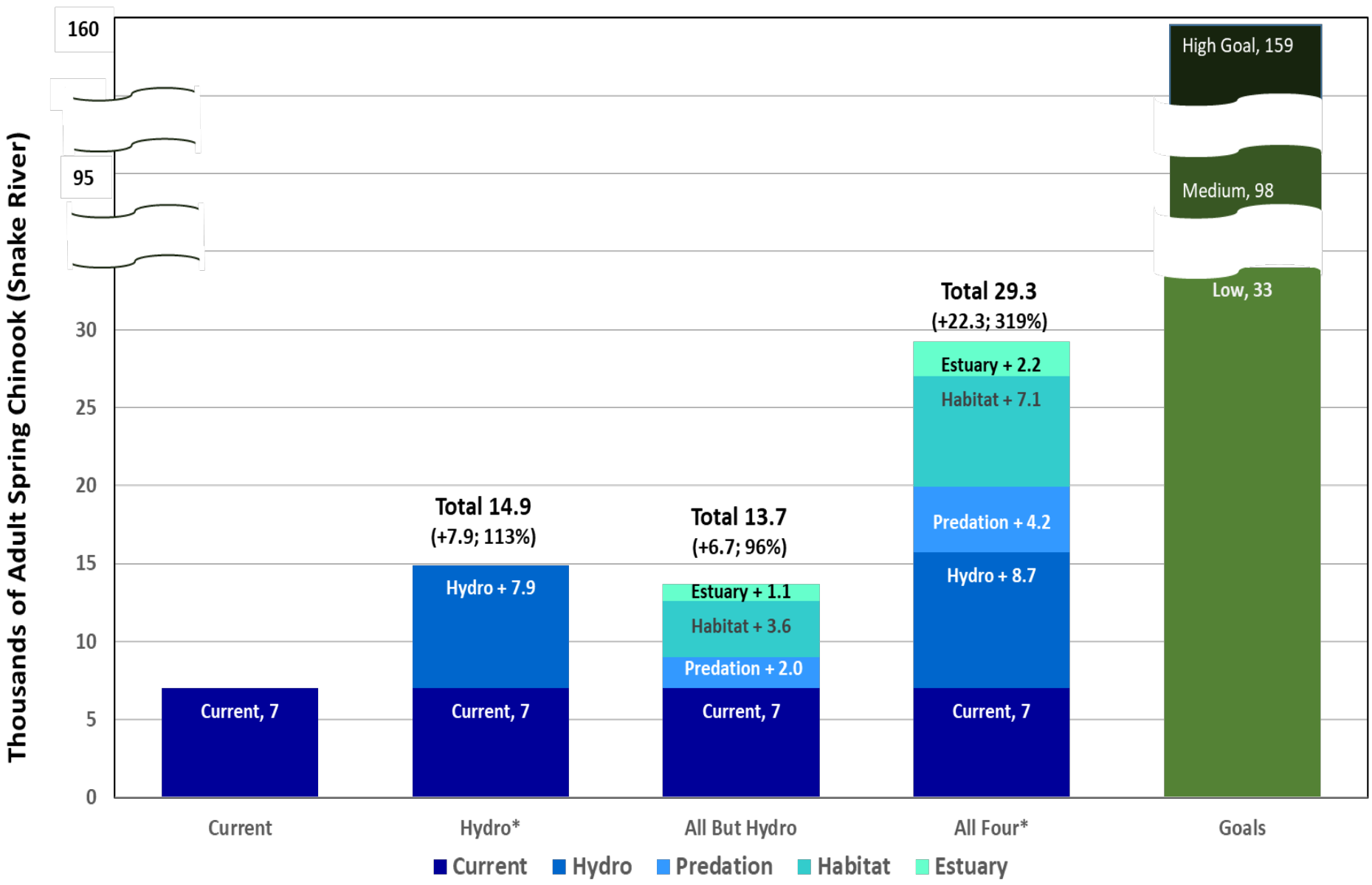
Snake River Spring Chinook Goals
(LSRRCP Hatchery and CBPTF Natural)

LSRCP - Snake River Hatchery CHS Status and Goals

Location	LSRCP Goal	Recent Status	% of Goal
Upper Grande Ronde	1,617	1,106	68%
Catherine Creek	970	658	68%
Snake River	58,700	44,071	75%

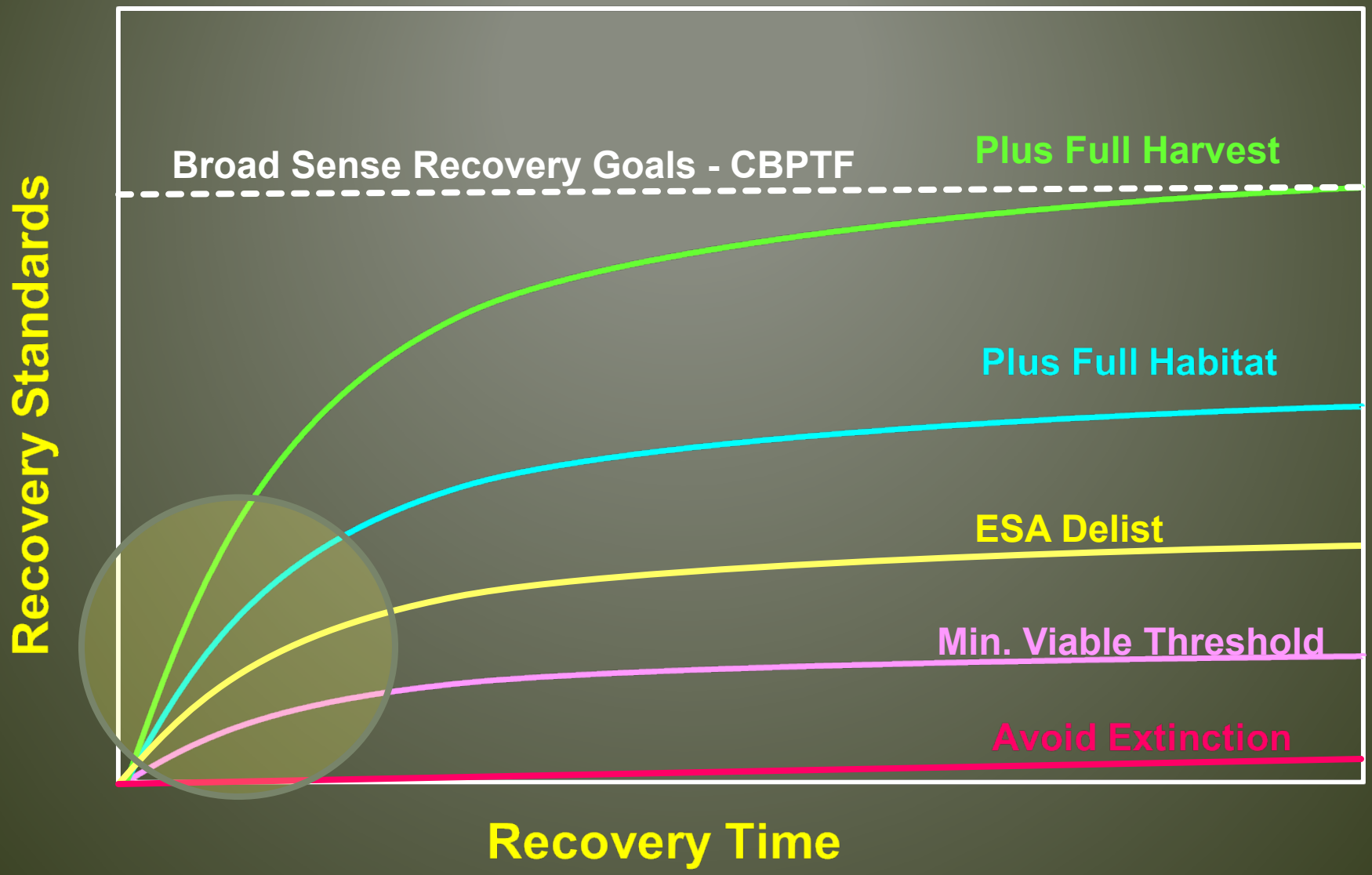
CBPTF - Snake River Natural-Origin CHS Status and Goals

Location	CBPTF Med Goal	Recent Status	% of Goal
Upper Grande Ronde	2,500	70	3%
Catherine Creek	1,875	190	10%
Snake River	98,000	7,000	7%



*Assumes removal of Snake River dams and 50% survival improvement for Columbia River Dams

Trajectory of Fish Recovery Programs

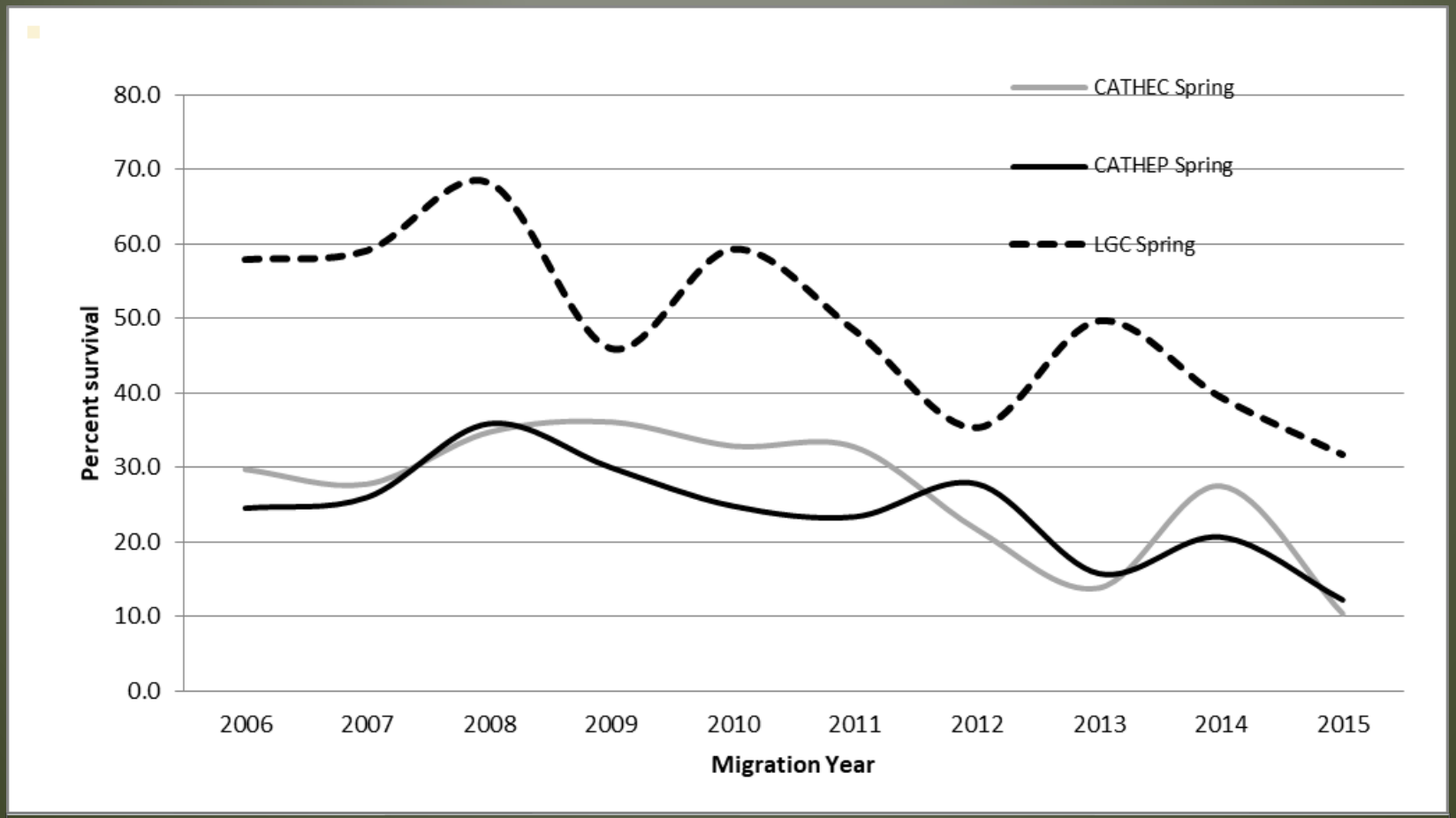


Grande Ronde River State Ditch construction cut off 45 stream miles

Mouth of Walla Walla River – loss of meanders due to channelization

Grande Ronde Degraded Habitat Impacting CHS Juvenile Survival

- Pre-spawning mortality of adults passed above upp GRR weir is ~70%
- Loss of Catherine Cr & Upp GRR juvenile outmigrants through Grande Ronde Valley is 70-90% (Lookingglass Creek survive much better)

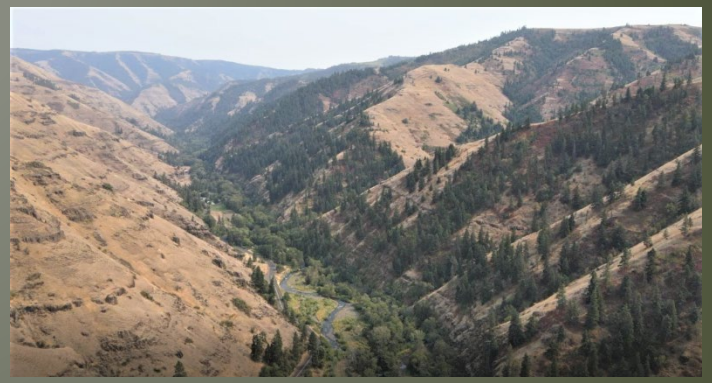


The same pattern is observed for the Upper Grande Ronde stock

Population and Habitat Enhancement Both Needed to Restore Native Aquatic Species

1. **Floodplain Habitat Enhancement - Physical**

- CTUIR First Foods River Vision Mission
- Must address ecological function and floodplain health



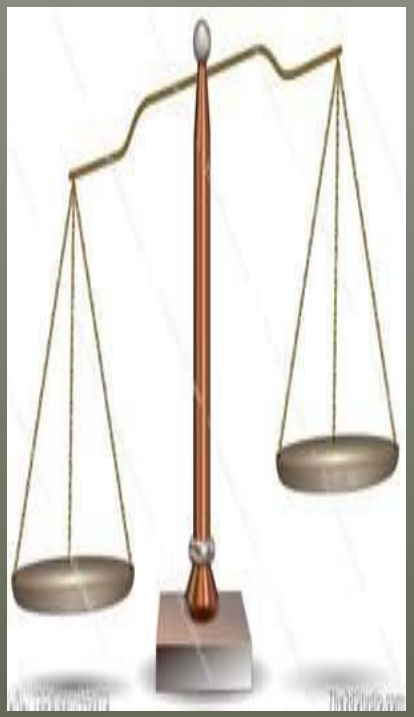
2. **Population Enhancement - Biological**

- Rebuilding may result from habitat improvements
- However, artificial propagation/supplementation is necessary when life cycle mortalities don't allow for natural rebuilding
- Hatchery intervention also likely necessary for providing harvest mitigation prior to rebuilding of natural production

HATCHERY BENEFIT VS. RISK
(RECOVERY TOOL OR IMPACT?)

Benefits:

- Demographic boost to natural spawning population (90% vs 10%)
- Avoid extirpation, ESA listing or possibly delist
- Reestablish fisheries in traditional locations; treaty trust responsibilities



Risk of using tool:

- Reduced genetic diversity
- Ecological impacts (disease and competition)
- Reduced productivity (RRS & RS)

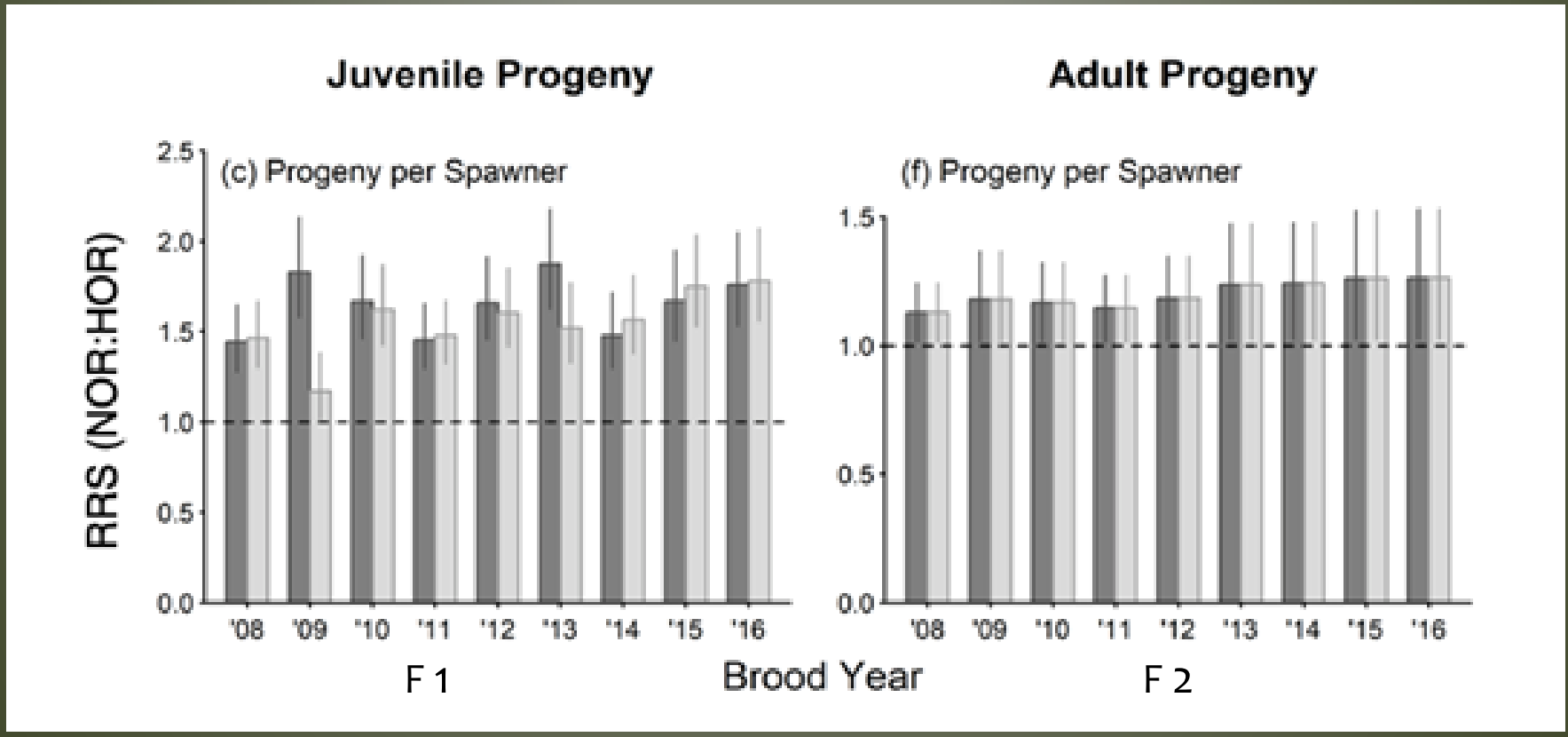
Risk of not using tool:

- Continue deficit returns
- Continue low natural production
- Continue low/no harvest

Seek benefits of using hatchery tool while minimizing risks to wild fish

Lookingglass Creek Relative Reproductive Success

Nuetzel et. Al. *Improved productivity of naturalized spring Chinook salmon following reintroduction from a hatchery stock in Lookingglass Creek, Oregon* (in-press), Canadian Journal of Fisheries and Aquatic Sciences.



This study demonstrates the naturalization of hatchery origin Chinook after spawning in nature.

Efforts to Review and Improve Hatcheries Over Last 30 Yrs

- 1990-1992: Regional Assessment of Supplementation
- 1992-1995: Integrated Hatchery Operations (IHOT)
- 1997-1999: Artificial Production Review (APR)
- 2001: Performance Standards and Indicators (PSI)
- 2002-2005: Artificial Production Review and Evaluation (APRE) and Hatchery and Genetics Management Plan (HGMP)
- 2003-2005: ISAB Review of Salmon & Steelhead Supplementation
- 2006-2007: Ad Hoc Supplementation M&E Workshops
- 2005-2015: Hatchery Scientific Review Group (HSRG)

Recommendations/Considerations Moving Forward

Apply regional hatchery science but also respond to site/program specific fish survival needs:

1. **Expedite increased fish survival across all life stages**
   - CBPTF → Columbia Basin Collaborative (CBC)
   - More aggressive all-H efforts to achieve CBPTF goals
2. **Revisit LSRCP Goals**
   - Adjust for increased or under-acknowledged habitat mortalities
   - More in sync with CBPTF goals?
   - More integration for supplementation of natural production
3. **Improved Infrastructure and Technologies**
   - Capital facility upgrades
   - Improved operations and fish survival

Applying New Technologies at Hatcheries

1. **Circular Raceways**

- Improved fish fitness (continuous exercising)
- Fish evenly more distributed (reduces densities)
- Circular motion produces self-cleaning effect

2. **Other Recent Technologies**

- Recirculating Aquaculture System (RAS) – water conservation
- Improved Ultra-Violate light water treatment systems
- Improved monitoring and SCADA systems (Supervisory Control and Data Acquisition)
- Use of barge array at Walla Walla River mouth to monitor smolt outmigration

Recommendations Moving Forward (continued)

4. **Increased Hatchery Production**
   - New or expanded or substituted production
   - Increased broodstock holding and juvenile rearing = increased or more flexible use of space
   - Additional production for blocked areas
5. **Address Adult Mortality**
   - Less handling at weirs to increase survival of passed fish or
   - Hold more fish in hatchery prior to release for spawning
6. **Expedite floodplain restoration**
   - More attention to key habitat fish mortality factors
   - Implement near term priorities and plan long term needs (eg. GR Valley restoration; Vey Meadows)

Defining Hatchery Program Success

- For Tribes, maintaining or increasing harvest opportunities in all usual and accustomed treaty fishing areas.
- Increasing spawners and rebuilding natural production to counter the effects of habitat impacts.
- Accomplish above using "best hatchery management technologies and practices".
- Improve fish survival at all life stages (multiple H programs)
- Lack of success = continued population declines, inability to effectively use the hatchery tool, inability to delist, more extinctions and limited ability to exercise treaty fishing right.


QUESTIONS?