Acclimation Enhances Postrelease Performance and Reduces Potential Interaction Between Hatchery and Natural Fall Chinook Salmon

Stuart Rosenberger
Acclimation Enhances Postrelease Performance of Hatchery Fall Chinook Salmon Subyearlings while Reducing the Potential for Interaction with Natural Fish

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Snake River Fall Chinook

- Listed as Threatened under ESA 1992
Nez Perce Tribe Fall Chinook Acclimation Program (FCAP)

- Releases Began in 1997
- Pittsburg Landing (Snake R.)
- Captain John Rapids (Snake R.)
- Big Canyon (Clearwater R.)
Acclimation

Benefits may include.....

• Reduction of transportation stress
• Introduction of natural prey items
• Introduction to natural thermal patterns

Potential Outcomes

• Increase Juvenile Survival
• Increase Adult Homing to Release Sites
• Increase SAR’s
Approximate Latitude 45-47° Longitude 116-118°
Double Shifting

• Capacity at Acclimation Facilities
• Lower Flows
• Higher Temperatures

• May reduce survival
Study Design

- 5 yr Study
- Acclimated (3 weeks) vs. Direct Release
- Phase 1; Juvenile Performance
- Phase 2; Adult Returns
Captain John Rapids

Courtesy of NPT
Lyons Ferry Hatchery (1984)
Fish Culture

Consistency

- Rearing Containers
- Feed
- Flow and Density Indices
- Disease Monitoring (Elisa)
- Tagging Practices
- Size at Release
- ???????
## Juvenile Releases

<table>
<thead>
<tr>
<th>Year</th>
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# Juvenile Performance

Release to Lower Monumental Dam

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Survival
Release to LMN

% Survival

2008  2009  2010

Acclimated  Direct
Adult SAR’s
Release to Lower Granite Dam

SAR

- Acclimated
- Direct

2005 2006 2008 2009 2010 5yr Average
What About the Natural Fish?

- Would it be possible to reduce impacts on natural populations with changes in hatchery release strategies?
## Natural Fish Tagging

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Niche Overlap

Potential for:

• Aggressive/Non-aggressive Interaction
• Competition
• Disease Transfer
• ????
Niche Overlap

% Overlap

Daily Passage %

06/01/10  06/11/10  06/21/10  07/01/10  07/11/10  07/21/10  07/31/10
Niche Overlap
(2008)

Daily Passage %

24%

45%

ACC
NAT

DIR
NAT

0%
10%
2%
4%
6%
8%
10%

05/20/08 05/31/08 06/01/08 06/19/08 06/23/08 07/09/08 07/19/08 07/23/08
05/20/08 05/31/08 06/01/08 06/19/08 06/23/08 07/09/08 07/19/08 07/23/08
Niche Overlap
(2009)

Daily Passage %

0% 3% 6% 9% 12% 15%

05/20/09 05/30/09 06/09/09 06/19/09 06/29/09 07/09/09 07/19/09 07/29/09

ACC NAT

18% 33%

0% 3% 6% 9% 12% 15%

05/20/09 05/30/09 06/09/09 06/19/09 06/29/09 07/09/09 07/19/09 07/29/09

DIR NAT

33%
Niche Overlap
(2010)

Daily Passage %

06/01/10  06/11/10  06/21/10  07/01/10  07/11/10  07/21/10  07/31/10

ACC
NAT

DIR
NAT

28%

45%
Outcomes

• Acclimation increased rate of seaward movement
• Acclimation increased juvenile survival
• Acclimation decreased potential interaction with natural counterparts
• Acclimation increased SARs (preliminary)
Questions?