2011 ISRP Retrospective

Presented by:

Rich Alldredge

Tom Poe

Pete Bisson

Greg Ruggerone

Eric Loudenslager

Northwest Power and Conservation Council

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ISRP Retrospective Report Council Request

- Increase the visibility of project and program results
- Summarize accomplishments of Fish and Wildlife projects
- Summarize status of major basinwide programmatic issues

ISRP Retrospective

- Mainstem
- Habitat Restoration
- PIT Tag Loss and Mini-jacks
- Artificial Production

Mainstem

- **Hydrosystem Passage RME & Related Life History Projects**
- **Lamprey Projects**
- **Predation and Competition**

Hydrosystem Passage RME - Support Projects

PIT tag monitoring systems development and data storage, management, and analysis support

- Essential projects
- High priority to develop spillway PIT tag detection systems
- Additional analysis needed of PIT tag loss and tag-related mortality.

Hydrosystem Passage RME - Core Projects

Data collection projects tracking hydrosystem fish passage survival

- Provide long-term data series of smolt-to-adult survival.
- Address management questions.
- Essential projects.

Life History, Population Status, and Hydrosystem/Hatchery Uncertainties

One of these long-term studies has provided the majority of data on listed Snake River fall Chinook and results include:

- Earlier emigration timing for ocean–type wild subyearlings.
- Identification of a reservoir-type wild fall Chinook that overwinters in reservoirs.
- Significant increases in redd counts following supplementation but is there competition – hatchery vs wild?
- Possible density dependent factors as stock size rebuilds.

The ISRP sees the value of long-term data sets as essential and this study serves as a model for other supplementation projects.

Lamprey

Few results to date. Critical questions to address:

- Is dam passage (mainstem and/or tributary) the key limiting factor?
- What is the importance of tributary habitat?
- What is relative importance of ocean conditions and toxic contaminants?

Predation/Competition

- Loss estimates provided
- Importance for recovery of listed salmonids uncertain.
- Recommend large scale life cycle modeling, including mortality from all predators.

Habitat Restoration

"…the critical programmatic issue in the RM&E/AP review is whether the collective suite of proposed projects is adequate to monitor and evaluate the effectiveness of our habitat actions in ultimately improving the population characteristics of our key fish species, and to be able to use what we learn to adapt the implementation and management of the program."

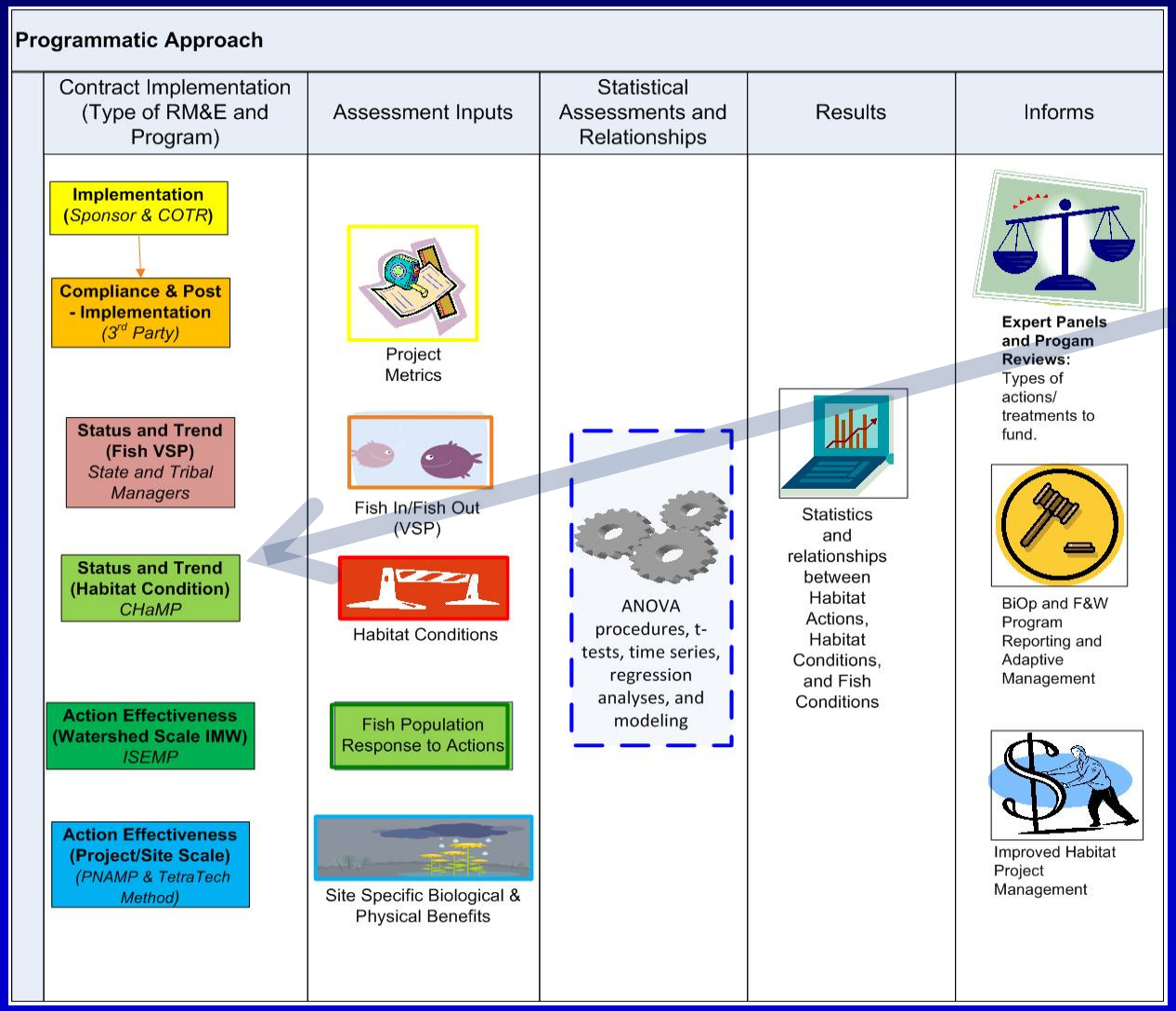
“…in flux or under development”

“…still needs clarity and further definition”

“…reasonable chance of knowing -- in 5, 10, 20 years”

1. Standardizing Habitat Monitoring

Is it feasible to standardize habitat monitoring and if so, is standardization warranted?



Columbia Habitat Monitoring Program (CHaMP)

ISRP 2011-10

Recommendations:

- Habitat effectiveness monitoring is a work in progress
- A single standardized habitat monitoring approach is not achievable or desirable
- Improved standardization of measuring fish response is needed, especially “adults in” and “smolts out”

2. Establishing Realistic Time Frames for Results

How long will it take to measure the effects of habitat actions?

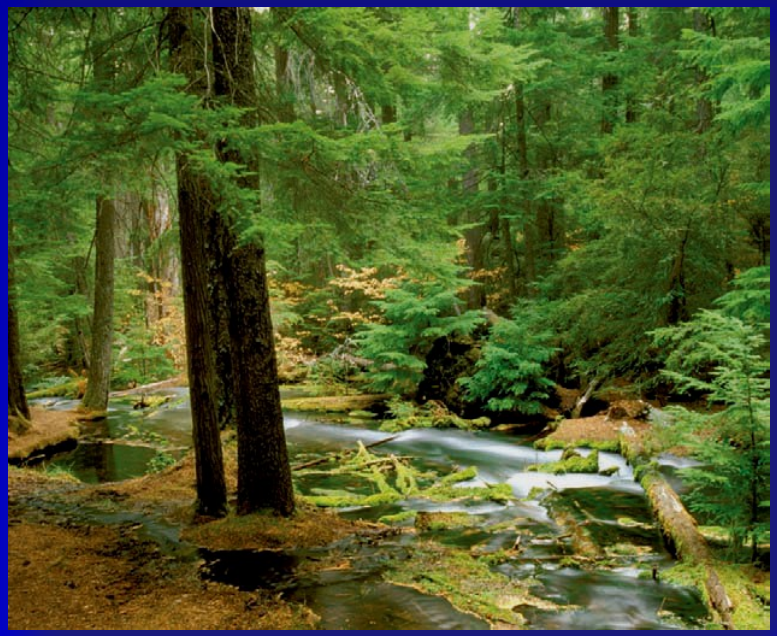
Some improvements will be almost immediate…

Hemlock Dam before removal

After removal

Some will take decades…

Riparian planting, Middle Fork John Day River



Jack Creek, Deschutes National Forest

Determining effectiveness of habitat improvements on fish

- High level of annual variability in abundance
- Limited resources for long-term effectiveness monitoring
- Scarcity of appropriate unenhanced reference sites

Definitive answers to the question “Is it working?” may not be achievable in a 5-20 year window

Recommendation:

Additional dialogue needed between habitat managers, scientists, and policy-makers so that realistic timeframes can be established

Trout Creek above former site of Hemlock Dam

PIT Tag Assumptions

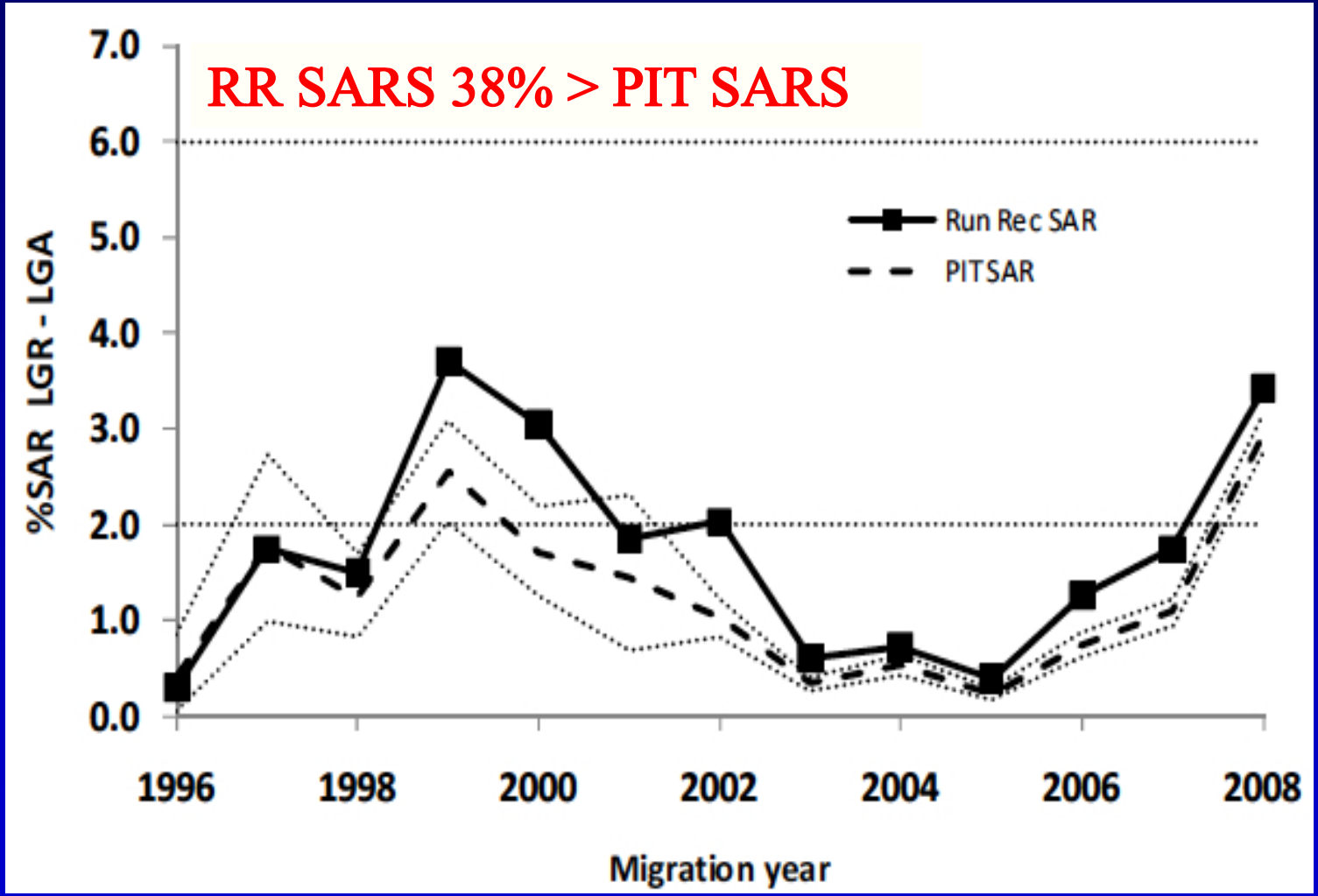
- Tagged fish retain tags.
- Tags do not alter fish growth, behavior or survival.

Species	Mean Tag loss	Citation
Coho salmon	59% ♀ 13% ♂	Prentice et al. 1994
Chinook salmon	18%	Knudsen et al. 2009
Arctic grayling	17%	Buzby and Deegan 1999
Brown trout	20% 56%	Acolas et al. 2007 Dieterman and Hoxmeier 2009
Cutthroat trout	26%	Bateman et al. 2009

Run Reconstruction v. PIT Tag SARS
Snake R Wild Chinook

SARS influenced by both tag loss (18%) & tag-related mortality (10%).

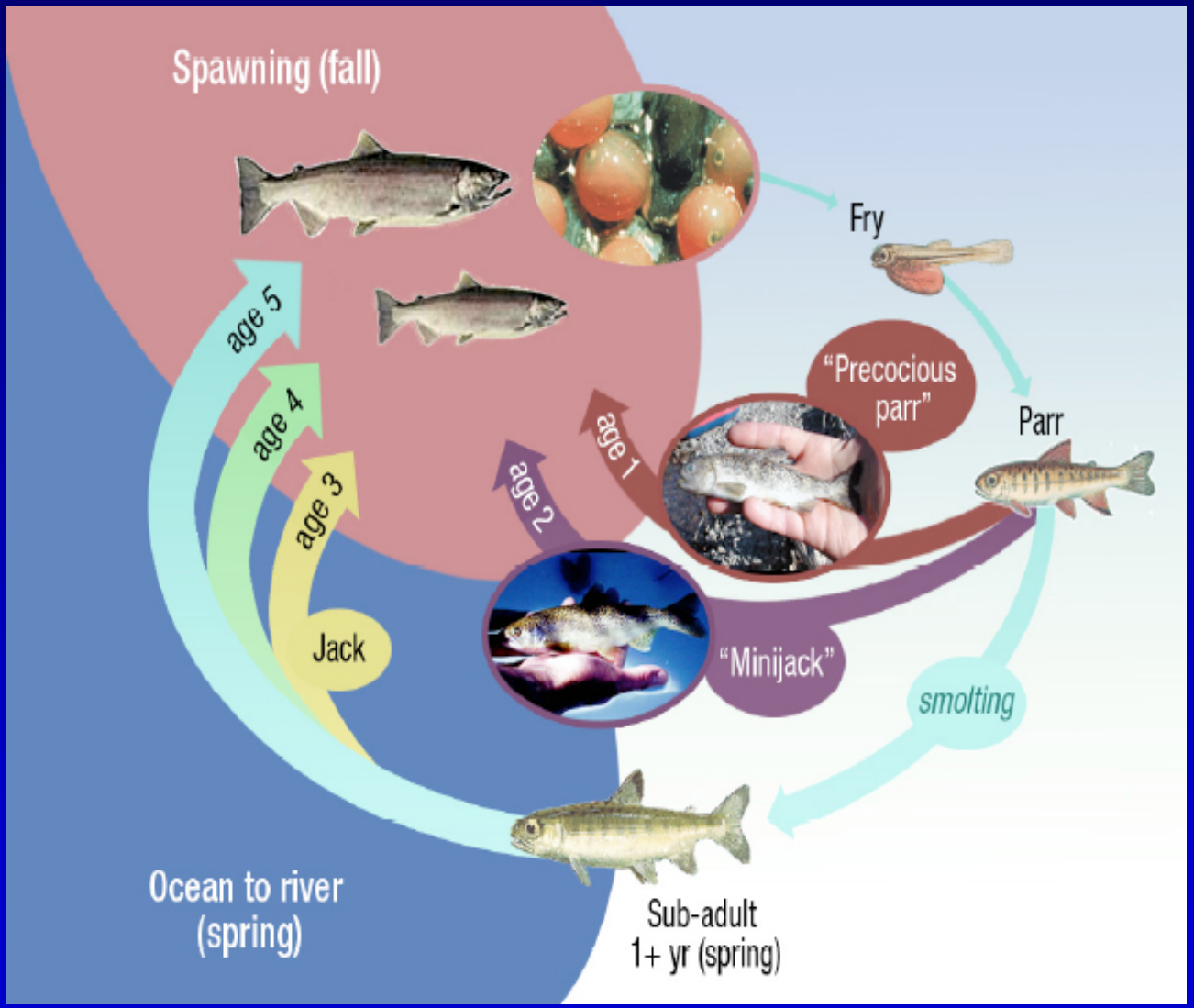
Knudsen et al. 2009



Key Concerns & Recommendations

- Variability in PIT tag loss and mortality in relation to species, fish size, ecological conditions, and tagging personnel.
- Increasing tag loss with salmon age (Snake R Chinook).
- Need to further evaluate PIT tag loss and tag-related mortality.

Mini Jacks and Precocious Male Salmonids



Larsen et al. 2010

Why are Mini Jacks Important?

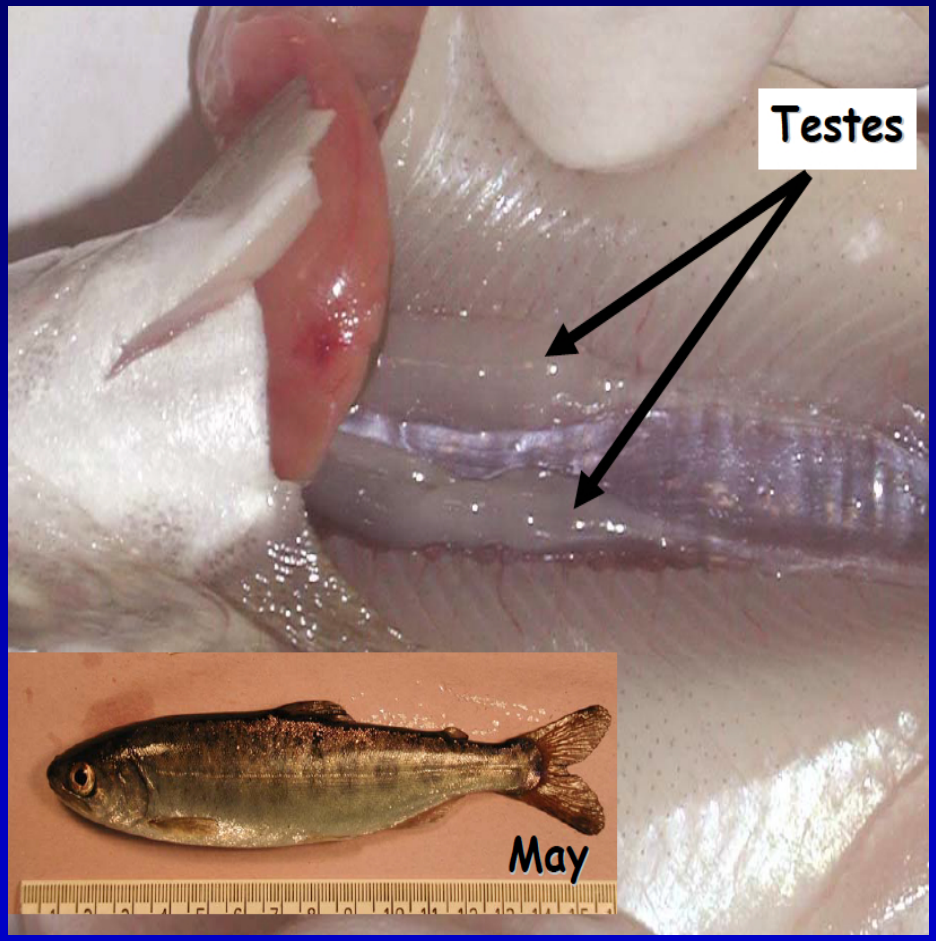
Potentially abundant among spring & summer Chinook at hatcheries (10-52% of males).

May significantly reduce SARS (e.g., 25%).

Economic, ecological, and genetic impacts.

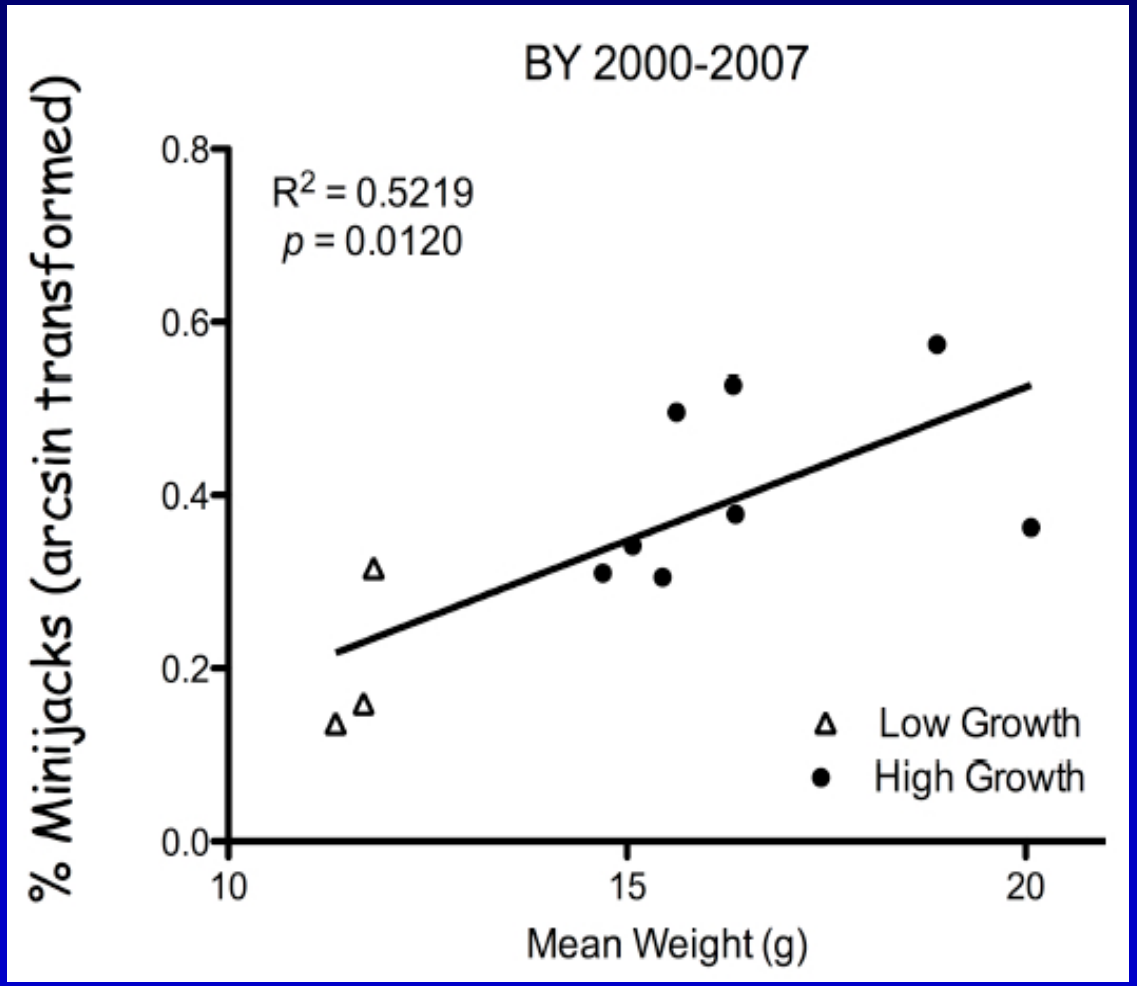
Integrated hatcheries (natural broodstock) may produce more mini-jacks.

Mini-jack rates in hatcheries are 10-20 times higher than in wild.



Growth Affects Mini-Jack Rate

NOAA Fisheries is looking at a variety of factors affecting mini-jacks, including season of rapid growth & genetics.



Larsen et al. 2010

Artificial Production

Research Topics

- Relative Reproductive Success
- Gamete Preservation
- Hatchery Reform
- Kelt Reconditioning
- Sockeye Salmon

Relative Reproductive Success

Steelhead

Non-local “domestic” stocks <<<

1ST Generation Local =

2nd Generation Local <

Multi-Generation Local <<

Genetic Effect (H_{WW} versus H_{NN})

Carry-over Effect (N_{HH} versus N_{NN}

Relative Reproductive Success

Spring Chinook

Wenatchee River

1st Generation Local = 50%

Females – Correlated w Location

Males – Significant Post Correlation

Catherine Creek – Grande Ronde R.

Parr 103%

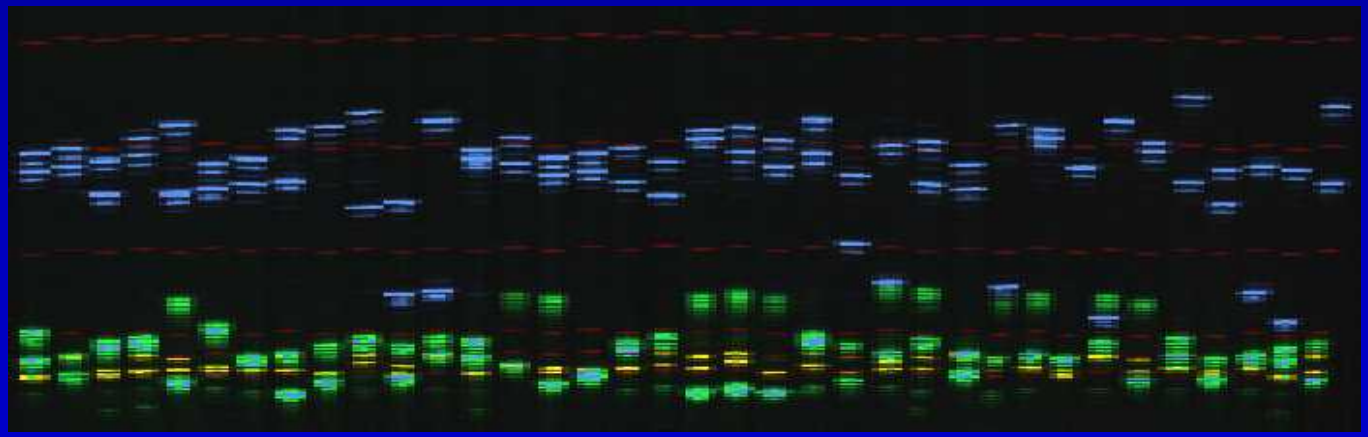
Migrants 100%

Returning Adults 77%

Relative Reproductive Success

ISRP Conclusions

- Replication, Gaps, Study Longevity
- Coordination and Integration of Projects
- Environmental Correlates and Mechanisms Research



FWP Hatchery Monitoring and Evaluation

ISAB and ISRP APR Metrics

Same Metrics used in LSRCP

1. Performance in Hatchery
2. Performance Post-release
3. Impacts on Natural Populations

Fish and Wildlife Program Production Initiatives

Performance in the hatchery

- Performance indicators and quantitative objectives?
- Adequately measured, reported, and analyzed?
- Able to achieve project goals?

Recommendations: Conform to Council APR Indicators
Clearly defined standard and report on whether achieved
Update a table of performance annually
Establish comparisons across programs

Fish and Wildlife Program Production Initiatives

Performance Post Release

- Performance indicators and quantitative objectives?
- Adequately measured, reported, and analyzed?
- Able to achieve project goals?

Conclusions: Hatchery smolt survival and migration difficult to interpret
Adult SAR and harvest inconsistently measured and reported
Substantial full life-cycle advantage
Harvest opportunities increased, but objectives not met

FWP Hatchery Monitoring and Evaluation

Impacts on Natural Populations

- Performance indicators and quantitative objectives?
- Adequately measured, reported, and analyzed?
- Able to achieve project goals?

Conclusions: No effective indicators for ecological or genetic impacts
Supplementation evaluation incomplete

Fish and Wildlife Program Production Initiatives

Supplementation Evaluation

Performance Metrics
- Natural Origin Adult Abundance
- Intrinsic Productivity

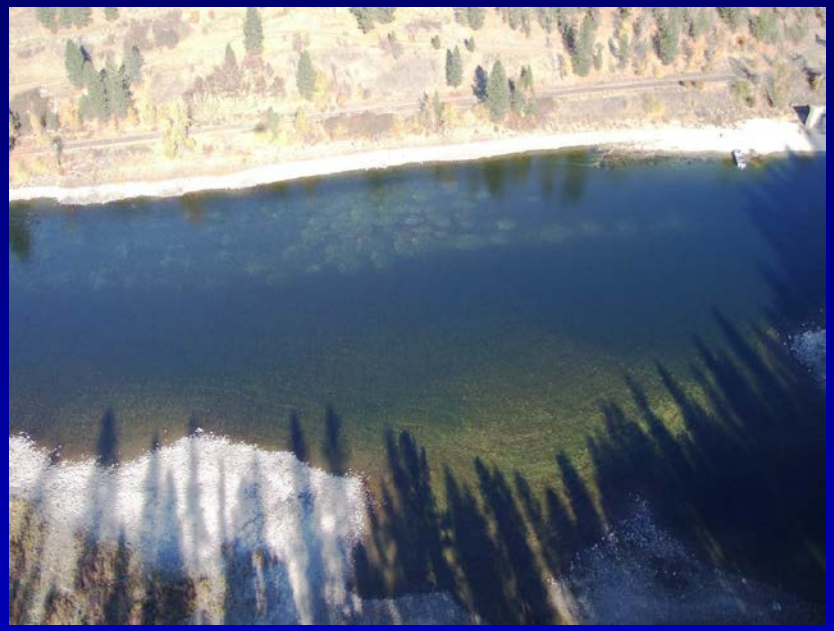
Evaluation
- Treatment x Reference Stream
- Before-After-Control-Impact (BACI)

Natural spawning by Hatchery-Origin adults is the treatment in a supplemented stream, not the response variable

Fish and Wildlife Program Production Initiatives

Supplementation Results

- Imnaha spring Chinook BACI
- Umatilla summer steelhead BACI
- Density Dependence



Conclusions

- Evaluation of abundance and productivity required
- Absence of empirical evidence to assign a conservation benefit
- Long-term use of sliding scale is risk to population viability
- Investigate causes of density dependence