

OVERVIEW OF FISHERIES RESEARCH IN THE YAKIMA BASIN

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Area of Interest within Washington State

- Dams Diversions
- Acclimation Sites
- Cities

Scale: 0 2 4 6 Miles

Compass Rose: N, S, E, W

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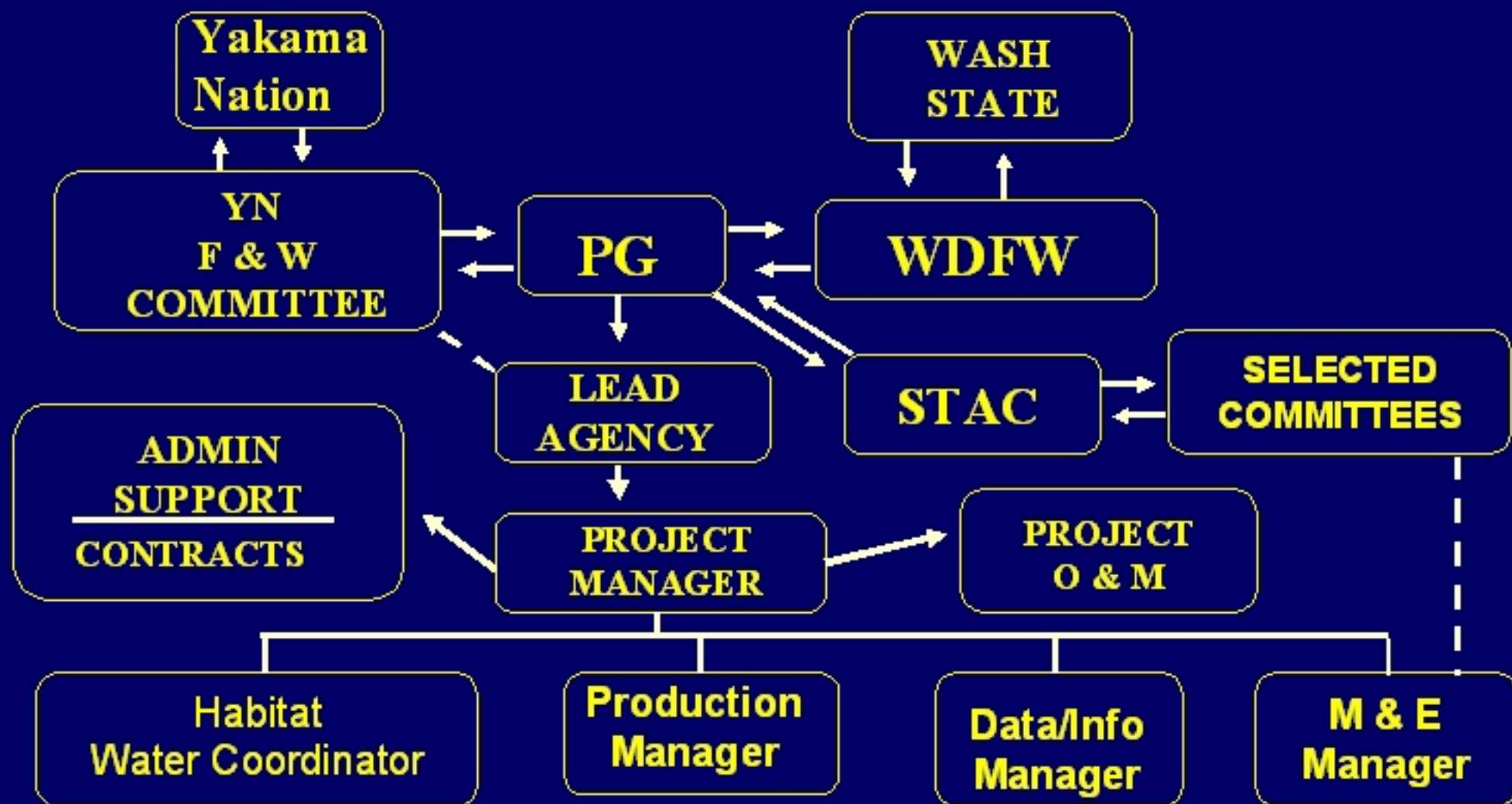
Estimates of Historical Anadromous Fish Runs in the Yakima Subbasin as Compared to Recent Run Size (5-year Average, 1999-2003)

Species/Race	Pre-1900 Run	Recent Average
Fall Chinook	132,000	7,402
Spring Chinook	200,000	12,985
Summer Chinook	68,000	0
Coho	110,000	3,354
Summer Steelhead	80,500	2,528
Sockeye	200,000	0

YAKIMA/KLICKITAT FISHERIES PROJECT (YKFP)

- ECOSYSTEM MODELING (EDT)**
- SALMON SUPPLEMENTATION AND
REINTRODUCTION PROGRAMS**
- HABITAT ACQUISITION AND
ENHANCEMENT PROGRAMS**

Yakima/Klickitat Fisheries Project Management Structure



Yakima/Klickitat Fisheries Project

Federal Agencies Cooperating

BPA

- Funding
- NEPA
- Review

NPPC

- Review
- Priority
- 5 Yr. Plan

USFWS

- ESA
- Fish Health

USFS

- Habitat

BOR

- Passage
- Water
- Facilities O & M
- Phase II Screens

NOAAFish

- ESA
- Physiology
- Homing

SPECIES ENHANCED IN YKFP

- **ALL STOCKS IN BASIN - TIERED**
- **SPRING CHINOOK INITIAL STOCK 1997**
- **COHO FEASIBILITY PART OF PROGRAM**
- **FALL CHINOOK 1998**
- **STEELHEAD – MODELING, PLANNING,
(and KELT RECONDITIONING)**
- **OTHER STOCKS OF ABOVE SPECIES
REVIEWED FOR POTENTIAL**

YKFP SUPPLEMENTATION AND RESEARCH PROGRAM

Purpose

To test the hypothesis that new supplementation techniques can be used in the Yakima River Basin to increase natural production and to improve harvest opportunities, while maintaining the long-term genetic fitness of the wild and native salmonid populations and keeping adverse ecological interactions within acceptable limits

SUPPLEMENTATION GOAL: IMPROVE NATURAL PRODUCTION

1. Increase Survival

- * Egg to Smolt**
- * Outmigrating Smolts**
- * Returning Adult**

5. Maintain Demographic Traits of Wild Fish

- *Age Composition**
- * Run Timing**
- * Spawning Timing**

3. Maintain Homing and Spawning Site Selection

4. Reproduce Successfully!

IMPROVE NATURAL PRODUCTION

1. Increase Survival

- * Egg to Smolt – Supplementation Culture**
- * Outmigrating Smolts**
 - Precocial Males**
 - Fish Predators**
 - Bird Predators**
- * Returning Adult**
 - Columbia Migration**
 - Harvest**







**SUPPLEMENTATION GOAL:
MAINTAIN THE LONG-TERM GENETIC
FITNESS OF THE SUPPLEMENTED AND
NATIVE POPULATIONS**

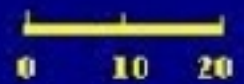
- 1. Monitor Genetic Traits of Fish**
- 2. Develop Research Program to Evaluate Domestication Effects of Hatchery**

DOMESTICATION RESEARCH

- Supplementation Line – S
- Wild Control Line – WC
- Hatchery Control Line – HC

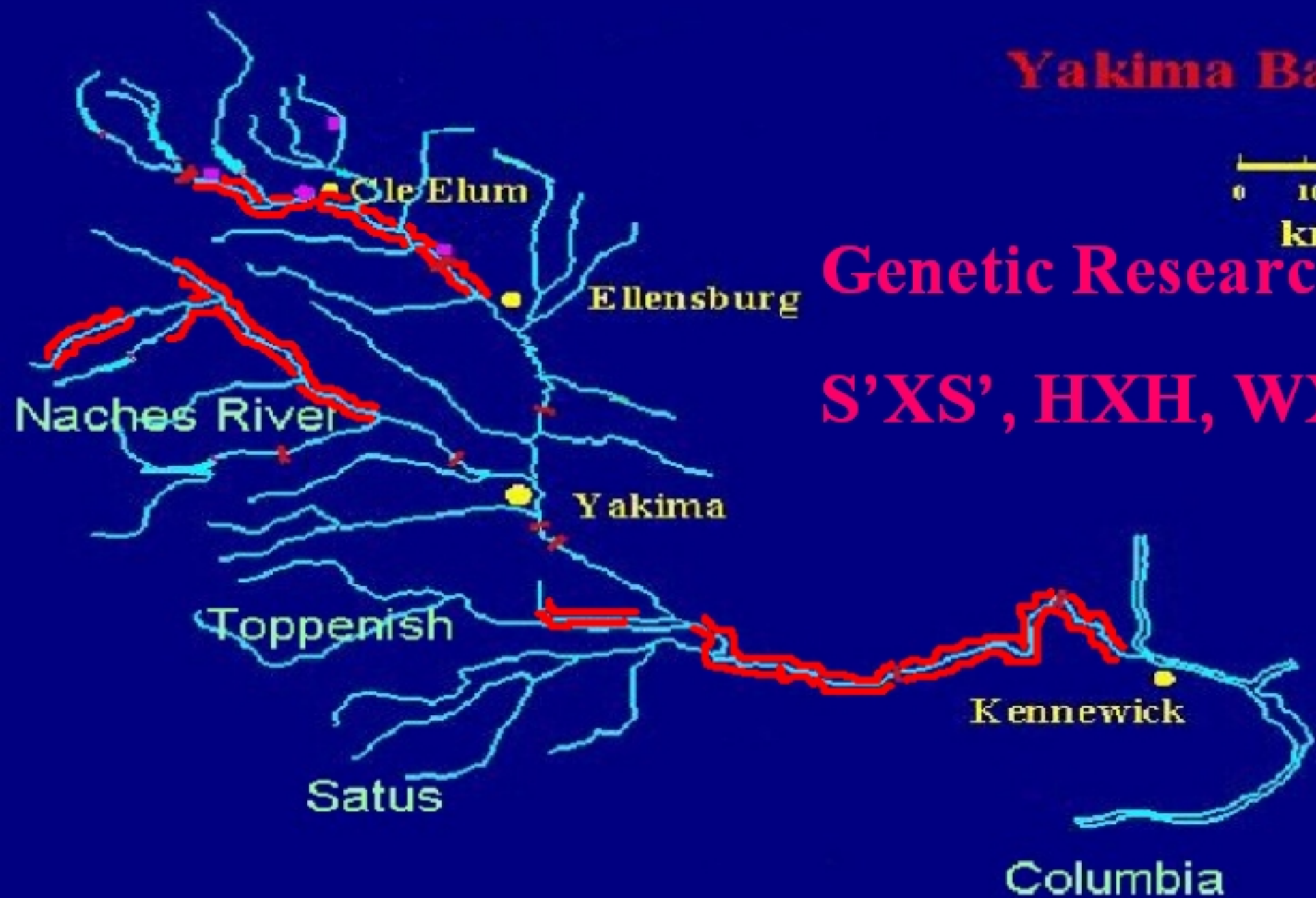
Potential to evaluate the level of domestication that is occurring in the YKFP Supplementation Line (S) and compare to the Hatchery Control Line (HC) of traditional hatcheries as well as an unsupplemented population (W).

Yakima Basin

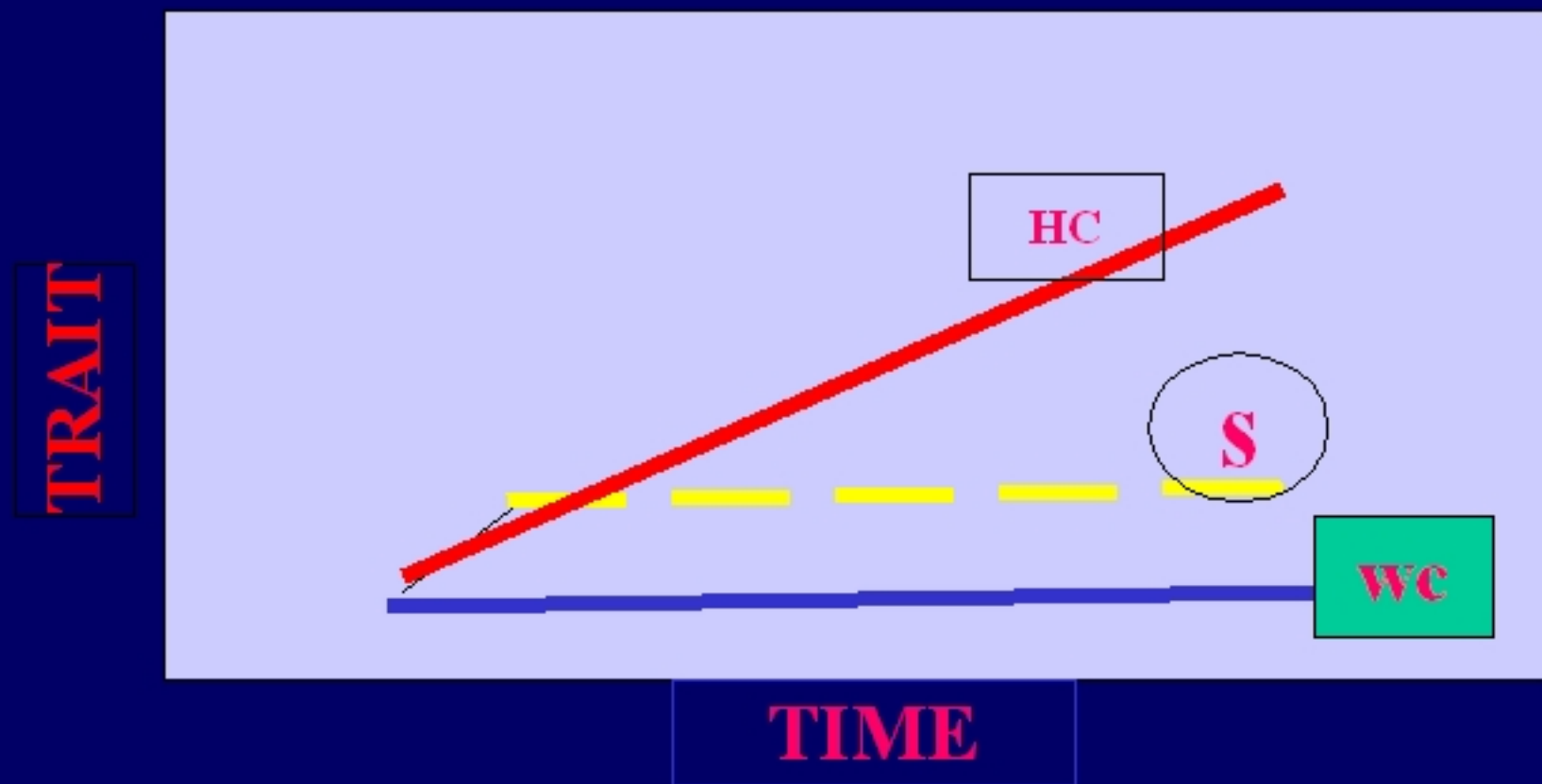


Genetic Research

S'XS', HXH, WXW



DOMESTICATION – HYPOTHETICAL OUTCOMES



ADULT TRAITS MONITORED

- **Adult Recruits**
- **Age Composition**
- **Sex-at-Age**
- **Sex Ratio/Age**
- **Run Timing**
- **Spawn Timing**
- **Fecundity**
- **Egg Size**
- **Reproductive Effort**
- **Fertility**
- **Morphology**
- **Spawning Behavior**
- **Spawning Success**



JUVENILE TRAITS

- **Emergence Timing**
- **Kd at Emergence**
- **Egg-fry Survival**
- **Developmental Abnormalities**
- **Fry-Smolt Survival**
- **Juvenile morphology**
- **Smolt survival**
- **Natural Smolt Survival**
- **Smolt-Adult Survival HC Line**
- **Outmigration Timing**
- **Food Conversion**
- **Length-Weight**
- **Agonistic/Competitive Behavior**
- **Predator Avoidance**
- **Precocialism**

IMPROVE NATURAL PRODUCTION

3. Maintain Homing and Site Selection

- * Homing to Acclimation Sites**
- * Redd Characterization and Selection**

4. Reproductive Success

- * Laboratory**
- * Spawning Channel**

HOMING FIDELITY -Upper Yakima Acclimation Sites





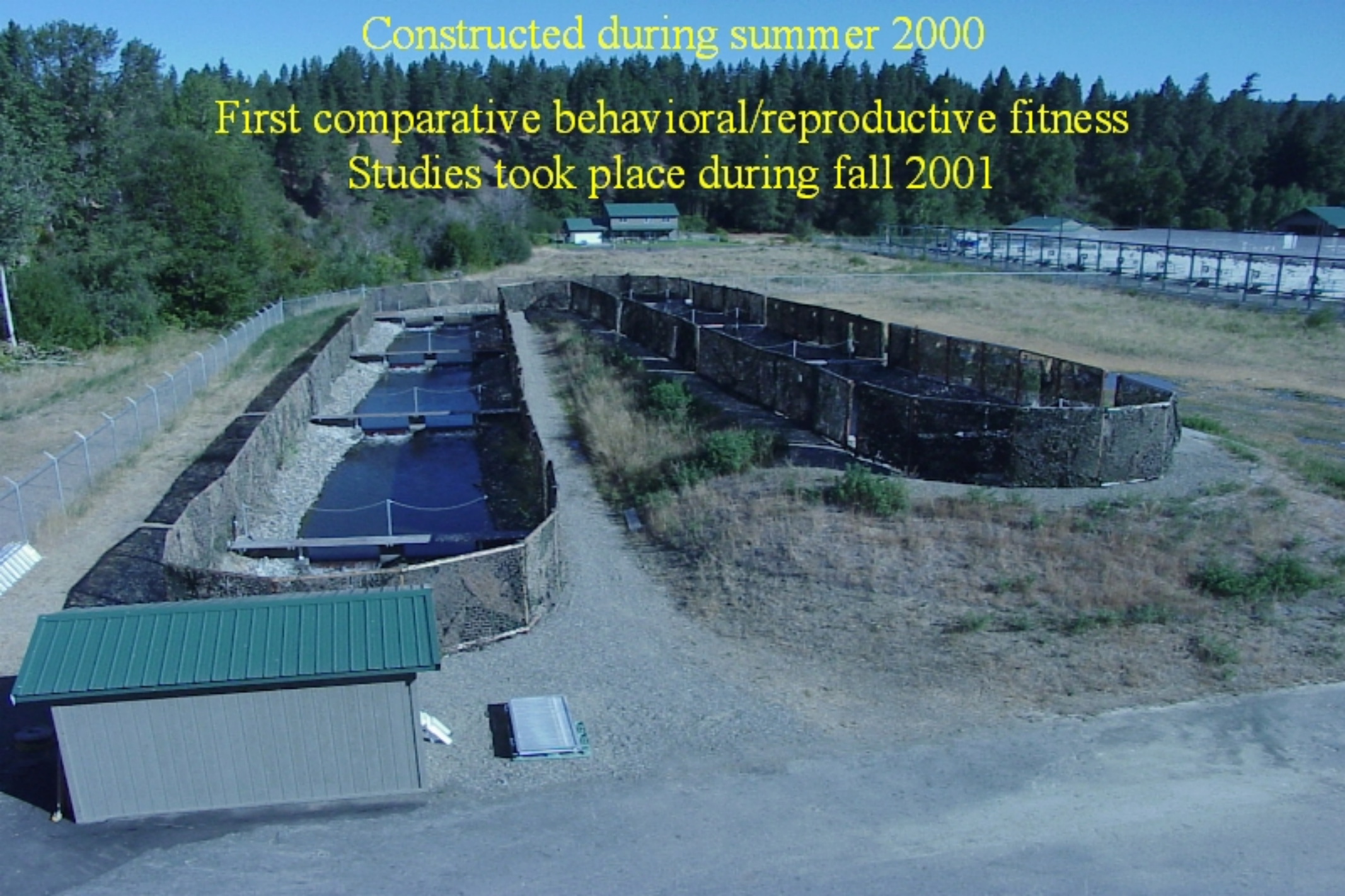


Factors Affecting Reproductive Success



Constructed during summer 2000

First comparative behavioral/reproductive fitness
Studies took place during fall 2001



Spawning Channel

Measuring
Reproductive
Success



Microsatellite
Pedigree
Analysis



Thursday June 16 – Fish Science

- **Spring Chinook (Cont) – Precocious Males**
- **Ecological Interactions**
- **Fish and Bird Predation**
- **Coho Salmon**
- **Fall Chinook**
- **Steelhead**
- **Bull Trout**
- **Sockeye**

Northern Pike Minnow Predation and Movement

Presented by
Michael Berger, Joe Jay Pinkham
Linda Lamebull

Yakama Nation



Monitoring and Evaluation of Avian Predation on Juvenile Salmonids on the Yakima River, Washington



Ann E. Stephenson
Yakima Klickitat Fisheries Project
Yakama Nation Fisheries

YKFP Coho Program

- **Program Goal** - Re-establish self-sustaining naturally spawning population of coho salmon in Yakima River

Phase I: 1999-2003 Completed (Yes, it is possible to re-establish an extinct stock of Coho Salmon)

- **Feasibility**

Phase II: 2006-2010 (Can escapement goals be obtained using an established, fully developed Yakima Basin Coho Stock and, can re-establishment occur in tributaries)

Fall Chinook Supplementation





OTHER RESEARCH PROGRAMS:

- 1. Steelhead Kelt Reconditioning**
- 2. Bull Trout Evaluations**
- 3. Habitat Protection and Enhancement**
- 4. Dam Passage**

Kelt Pictures Before and After





HABITAT ENHANCEMENT BAD CULVERT



Cle Elum Dam Passage Study Outfall of Flume into River

