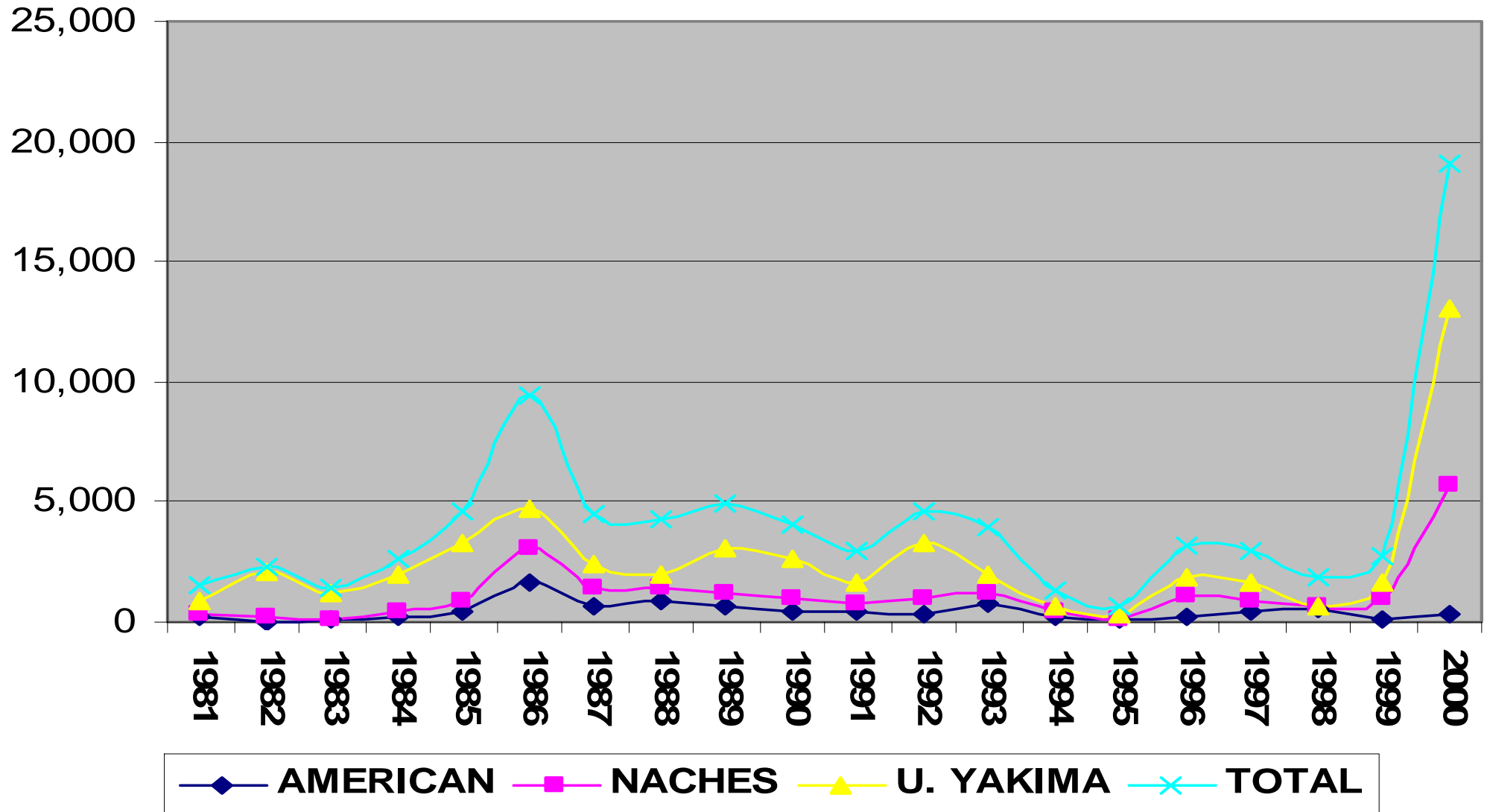


OVERVIEW OF FISHERIES RESEARCH IN THE YAKIMA BASIN

*David Fast, Bill Bosch, Ray Brunson, Craig Busack,
Andy Dittman, Joel Hubble, Mark Johnston,
Curt Knudsen, Don Larsen, Jason Rau,
Steve Schroder, Charles Strom, Todd Pearsons,
Doug Neeley, Bruce Watson*

YAKIMA SPRING CHINOOK RETURNS BY STOCK, 1981 - 2000.



1982

**The Council first encouraged BPA
to “fund the design, construction,
operation, and maintenance of a hatchery
to enhance the fishery
for the Yakama Indian nation as well as
all other harvesters.”
(NPPC 1982)**

YAKIMA/KLICKITAT FISHERIES PROJECT (YKFP)

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

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**

2. Maintain Demographic Traits of Wild Fish

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

3. Maintain Homing and Spawning Site Selection

4. Reproduce Successfully!



MISSION OF FACILITY

- **Collect Broodstock**
- **Enumerate Spawning Escapement**
- **Monitor Characteristics of Escapement (age, length, weight, DNA,)**
- **Enumerate Hatchery Returns (by Treatment, Acclimation Site and Brood Year)**

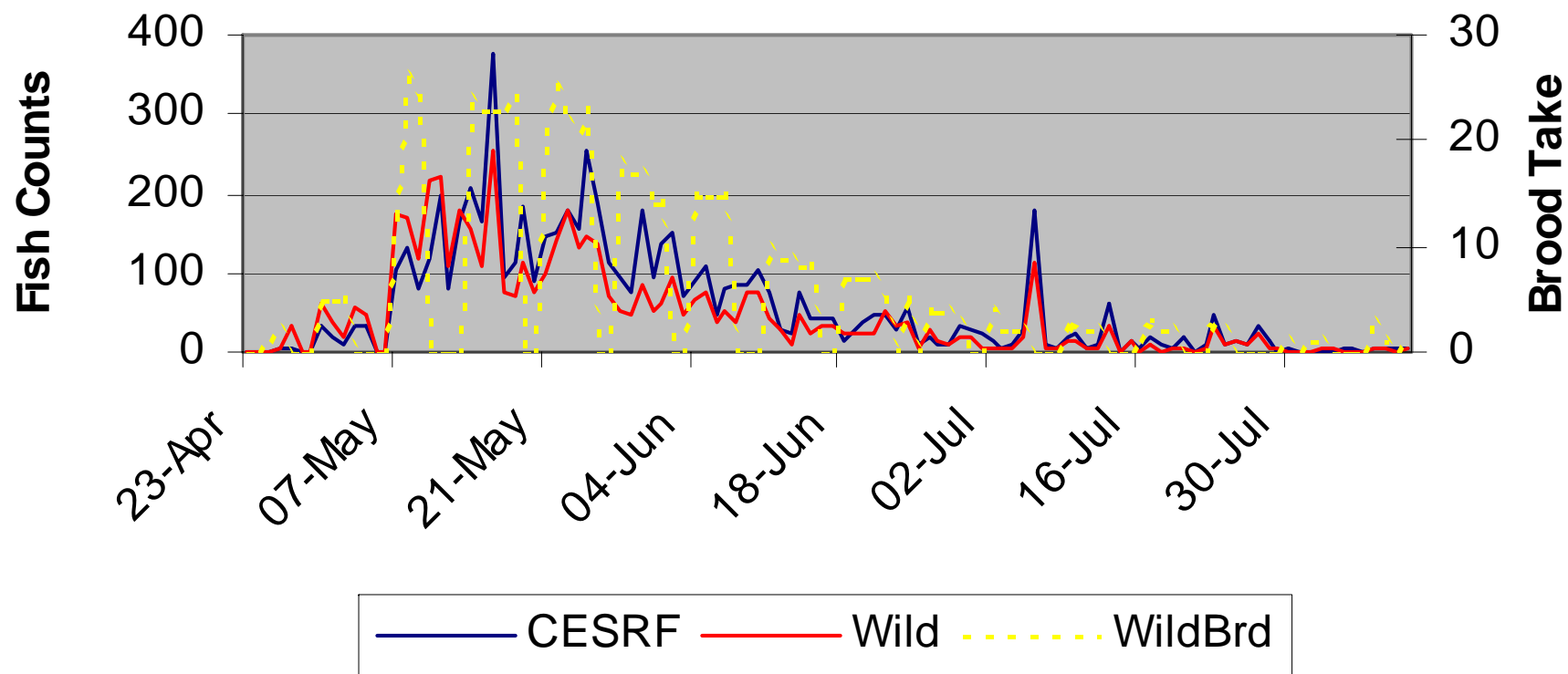




BROODSTOCK COLLECTION GENETIC GUIDELINES

- **COLLECTION THROUGHOUT ADULT
RUN TIMING**
- **RANDOM COLLECTION OF ADULTS**
- **TAKE NO MORE THAN 50% OF ADULTS
INTO HATCHERY (HALF THE ADULTS
SPAWN IN THE WILD)**

Spring Chinook Run Timing at Roza, 2001



Upper Yakima River Basin

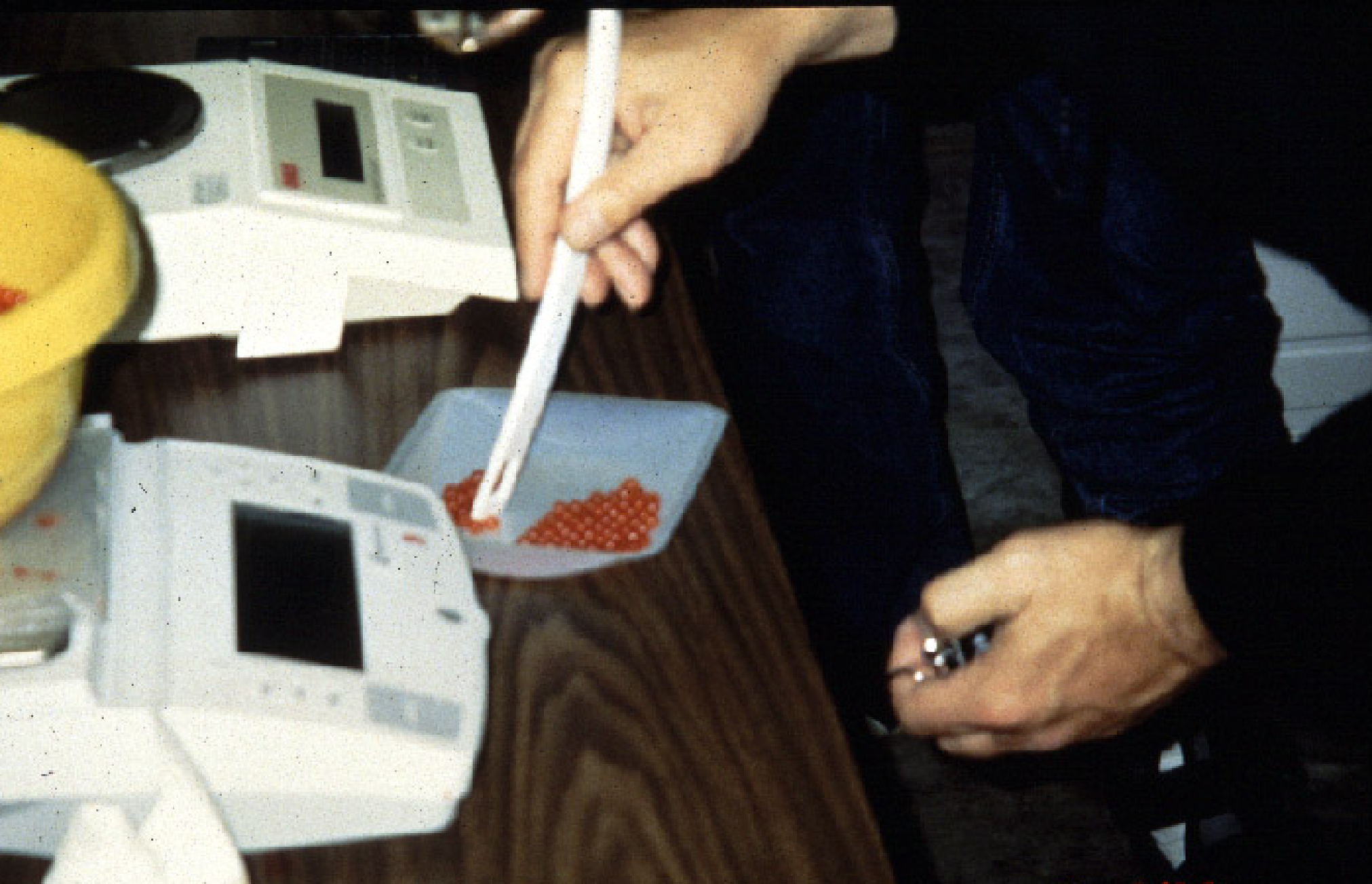








Pf No. FL



Female #1

Female #2

Male #1

Male #2



REARING CRITERIA

- **OPTIMUM CONVENTIONAL TREATMENT-OCT
PRODUCTION VESSEL – 100'X10'X3.5'
LOW DENSITY – 0.75 LB/FT3
45,000 FISH PER VESSEL
TEMPERATURE – <55F**
- **SEMI-NATURAL TREATMENT -SNT –
IDENTICAL TO OCT - PLUS
OVERHEAD COVER,
SUBSTRATE,
INSTREAM COVER,
UNDERWATER FEEDERS**

Research Monitoring Activities

Designed to test the performance of the two treatments of artificially reared fish (OCT vs. SNT), and to compare their performance with naturally reared fish.

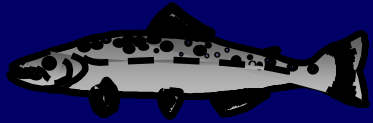




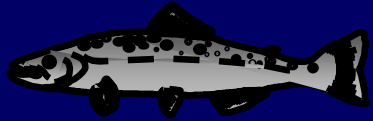


Cle Elum

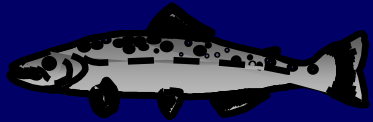
PIT Tagging Operation



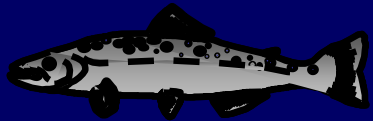
134 KHz (ISO) Tags



**Tagged ~ 5.6% Fish per Raceway
(~ 2,225 per Raceway)**



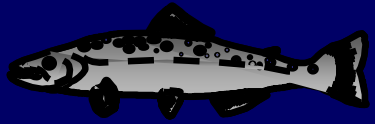
40,000 Fish PIT tagged



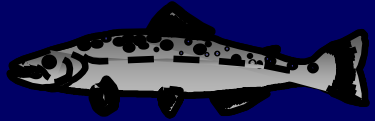
**Selected 40,000 Total Marked to
Rigorously Estimate Smolt-to-Adult
Survival Rates.**



CWT and Elastomer Marking Operation



Raceway Specific Binary Codes



100% Fish Marked

- All Adipose fin clipped
- PIT tagged fish snout tag
- All 18 raceways body CWT & Elastomer

Upper Yakima River Basin





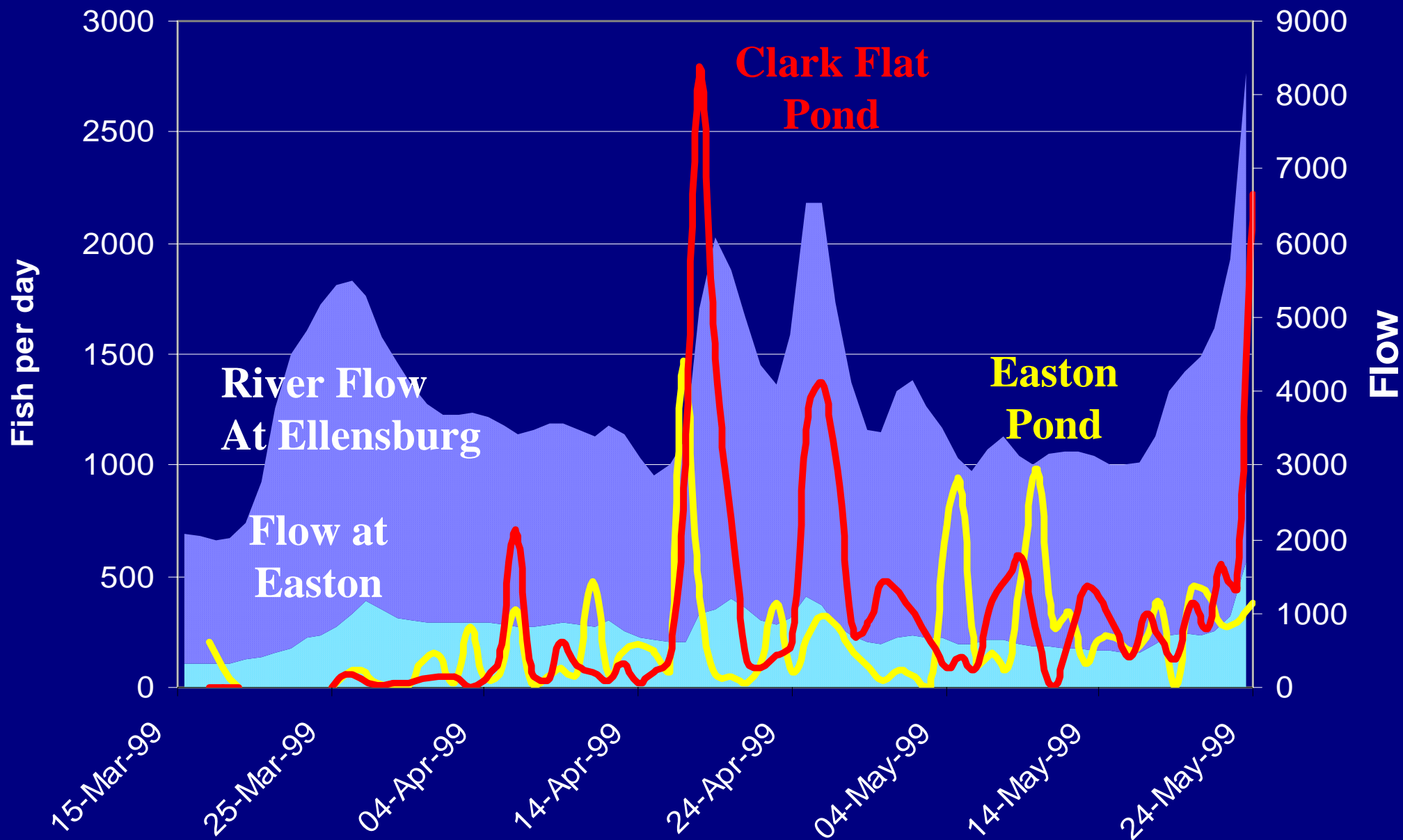




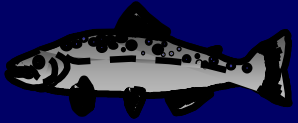
PIT-Tag data transfer

- Fish volitionally leave acclimation raceways, starting March 15 (screens pulled, all ponds).
- PIT-Tag data retrieved from migration channel detection system.
- Data downloaded to PTAGIS system, distributed to YKFP data managers.
- Fish movement posted on YKFP website.

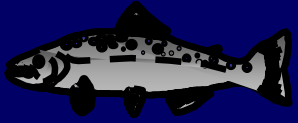
Volitional Releases and River Flows 1999



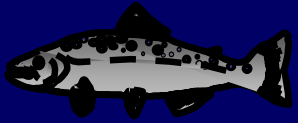
Hatchery Fish Performance will be Measured in Four Areas



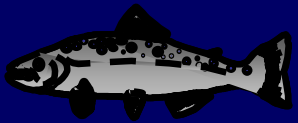
Post-release Survival (smolt release to adult)



Reproductive Success (smolts/spawner)

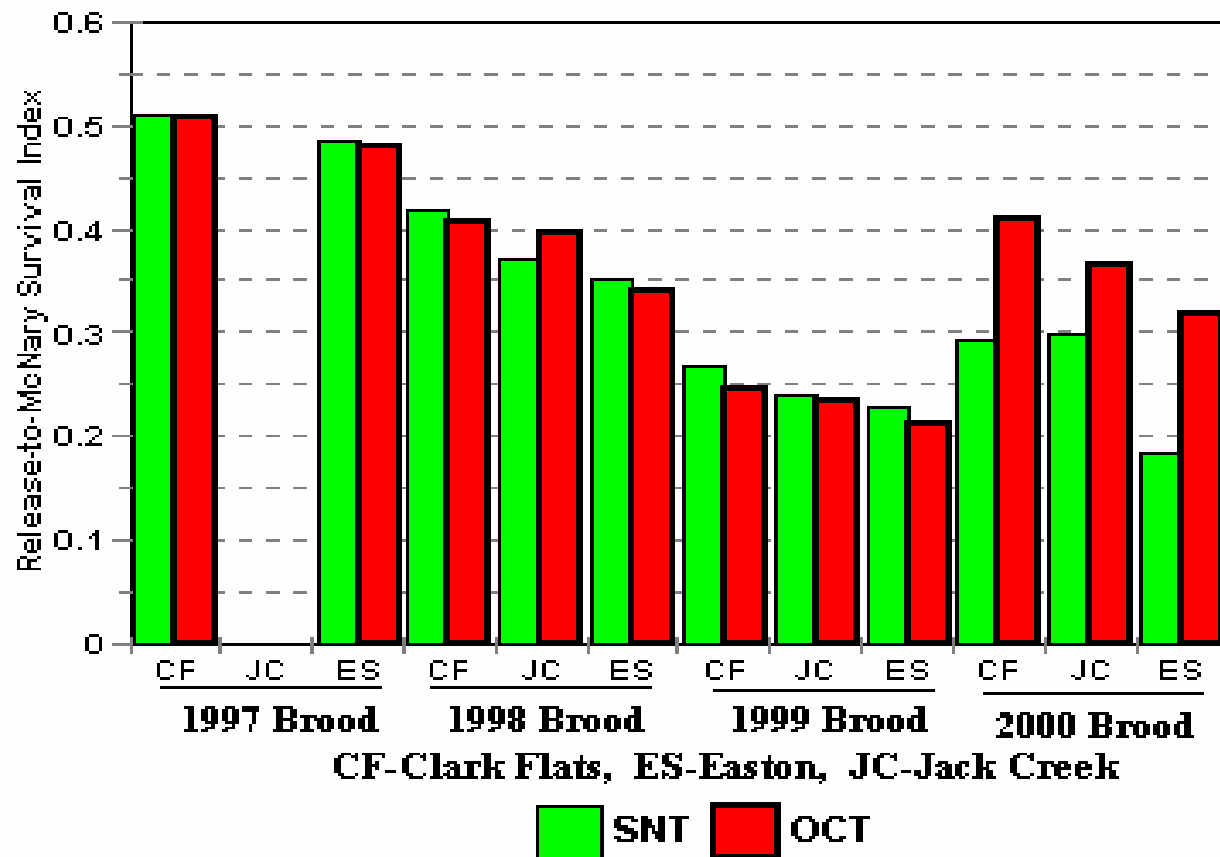


Long Term Fitness (genetic diversity and long term stock productivity)

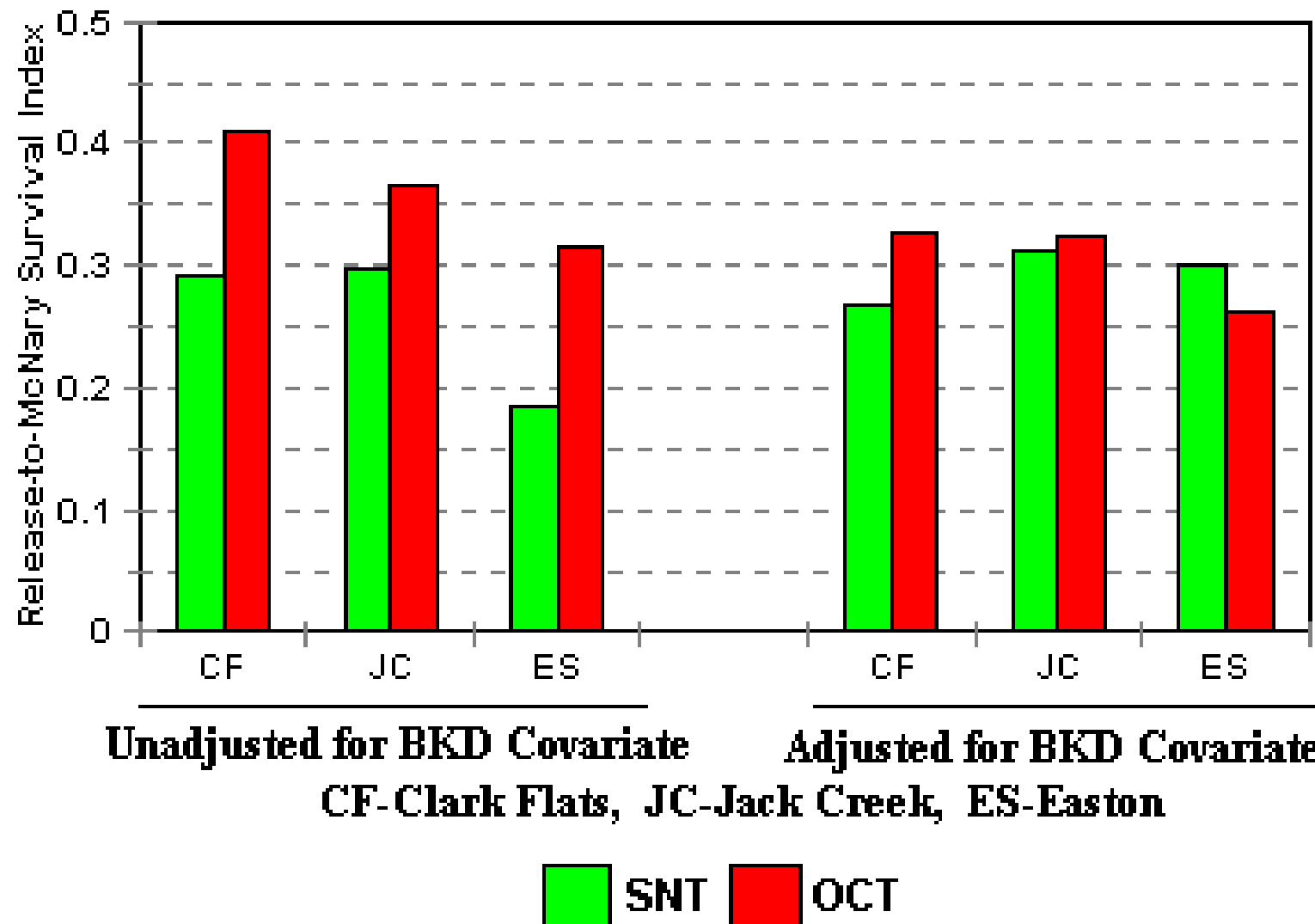


Ecological Interactions (population abundance, and distribution, growth rates, predation and competition)

**Outmigrant SNT and OCT Treatment Release-to-McNary-Dam Survival
Indices within Sites for Brood-Years 1997 through 2000 (1999 through 2002
Outmigrants)**

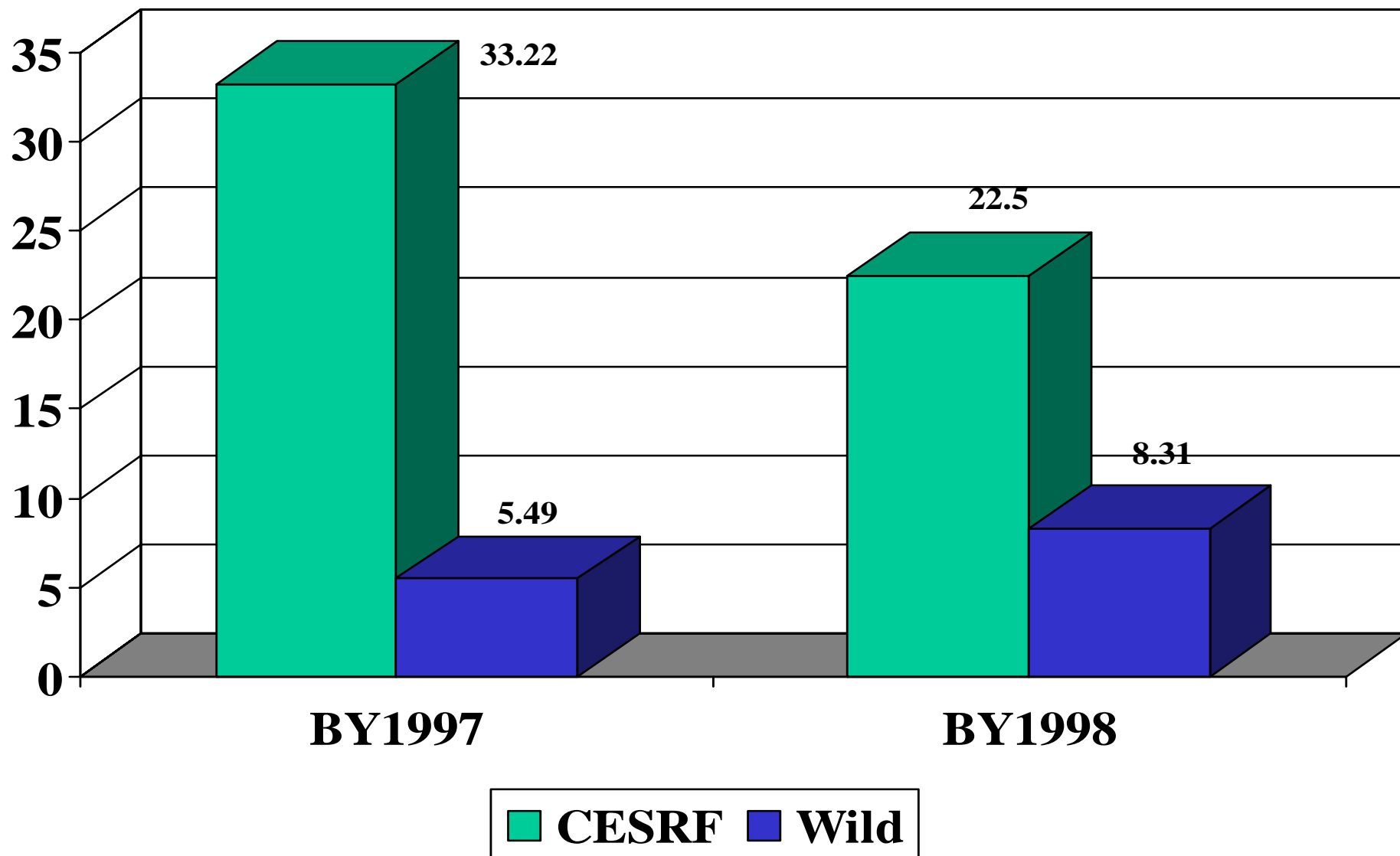


2000 Brood Survival Incices Unadjusted and Adjusted for BKD Covariate



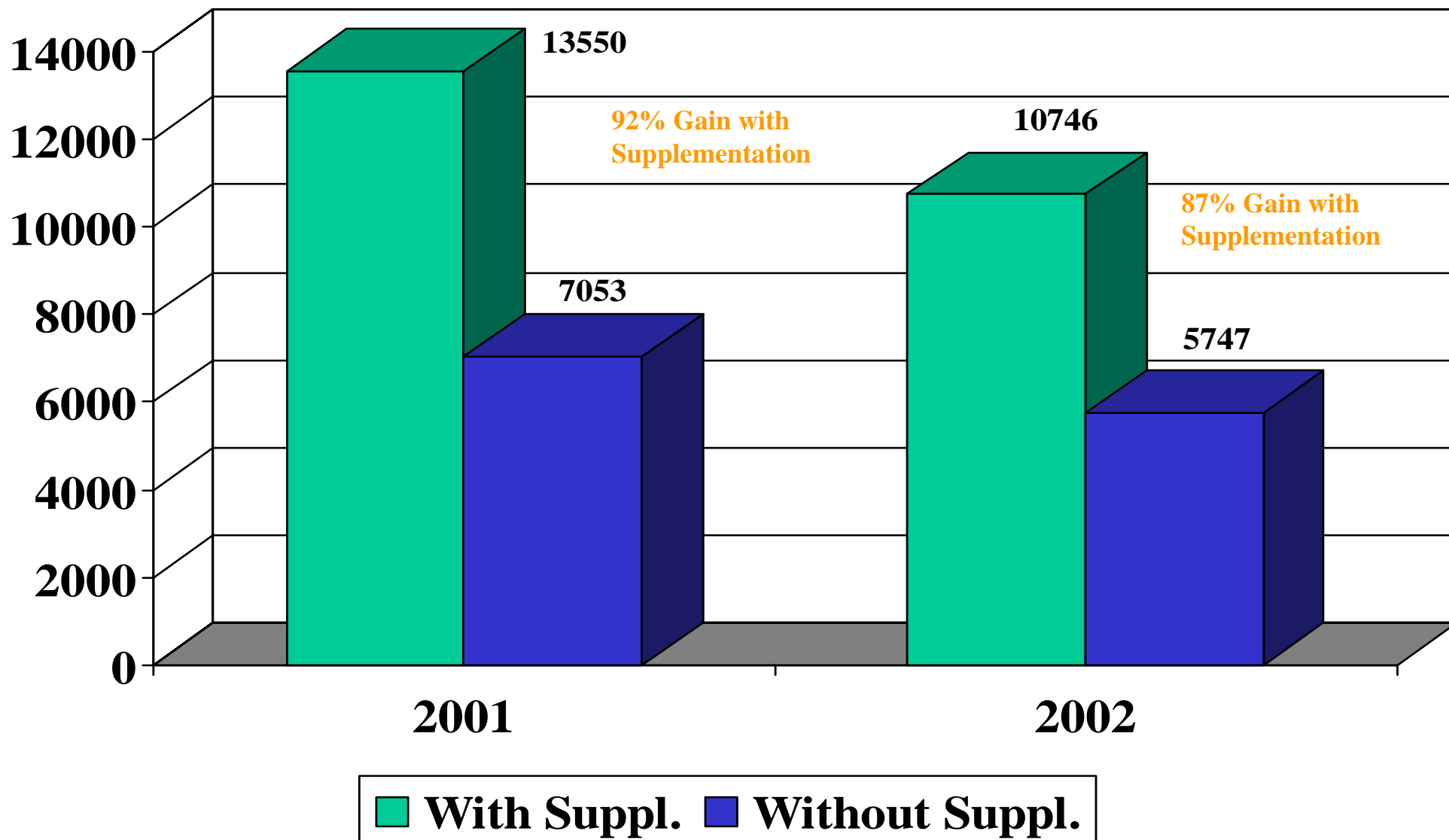


Upper Yakima Spring Chinook Return-per-Spawner rates



Upper Yakima Spring Chinook

Age 4 Returns with and without Supplementation



YKFP

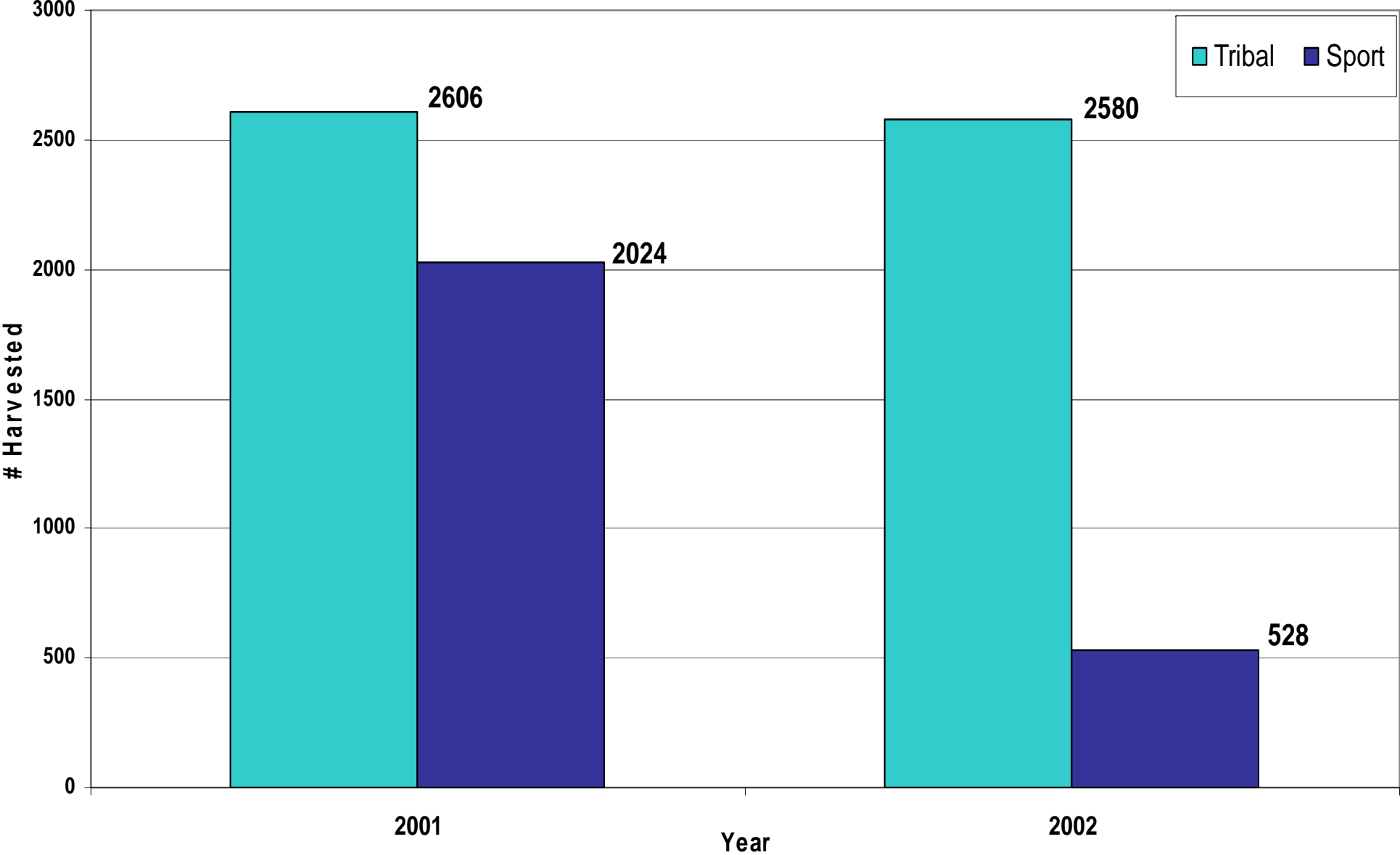
Spring Chinook Supplementation Project

**Enhanced the tribal subsistence
And ceremonial fisheries**

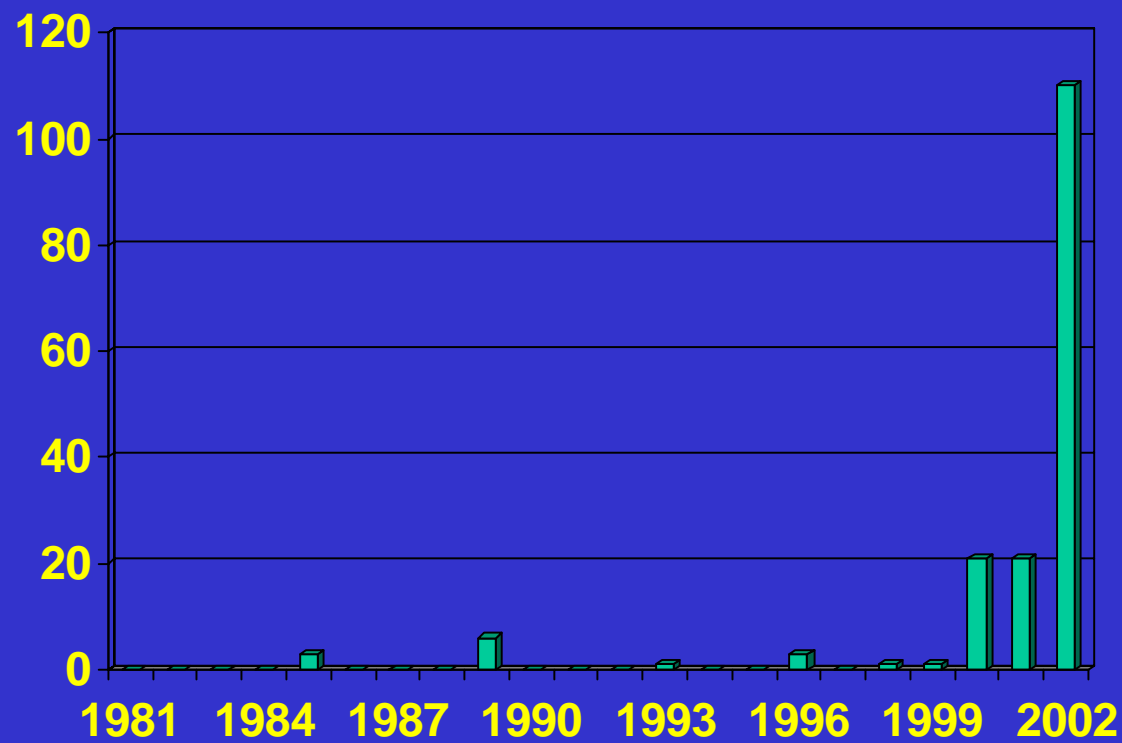
&

**Initiated the first sport fisheries
In over 50 years**

Yakima R. Spring Chinook Harvest



Teanaway R. Spring Chinook Redd Counts, 1981 - 2002



Constructed during summer 2000
First comparative behavioral/reproductive fitness
Studies took place during fall 2001

