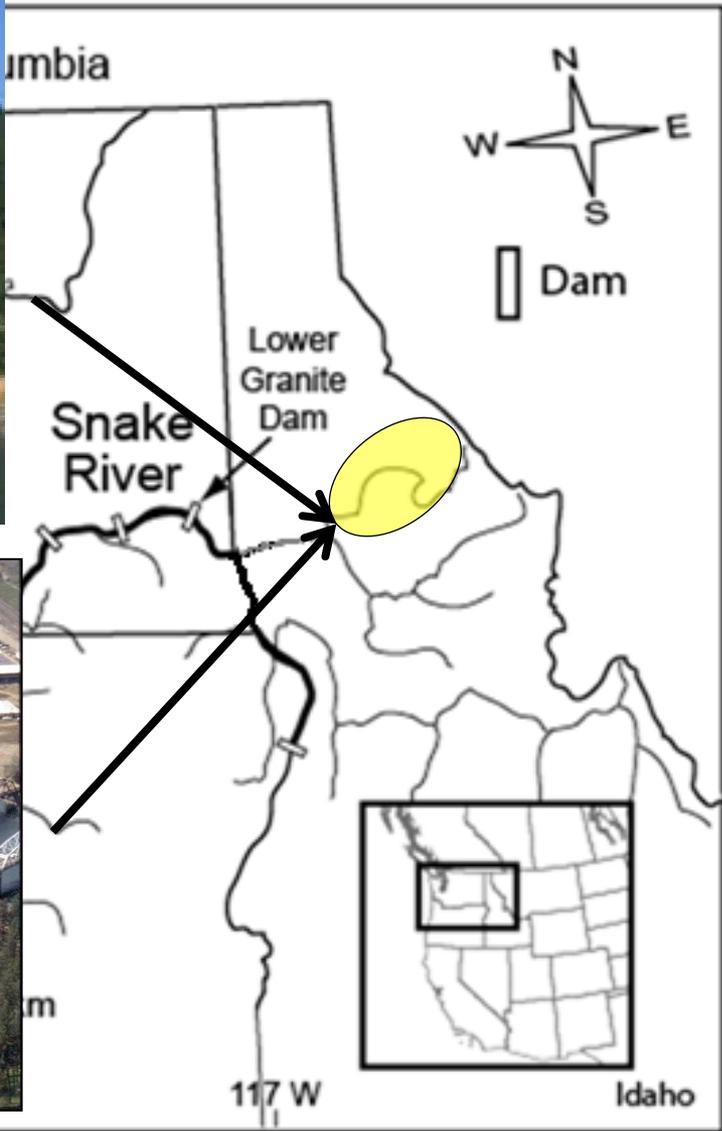


# Selective Spawning: Dworshak NFH B-Run Steelhead



Brett Bowersox, Idaho Department of Fish & Game  
Chris Peery, Idaho Fishery Resource Office, USFWS





Latitude

Longitude

# What are the points of concern?

## Issues with stock:

- Are population characteristics changing?

## Importance of stock:

- Unique Dworshak/North Fork B-Run Population
- Economics of a Popular Fishery

## Brood Management:

- What are viable strategies for maintaining what makes them unique
- Genetic analysis, why are we doing this and does it work

# Snake River A-Run



# Snake River B-Run

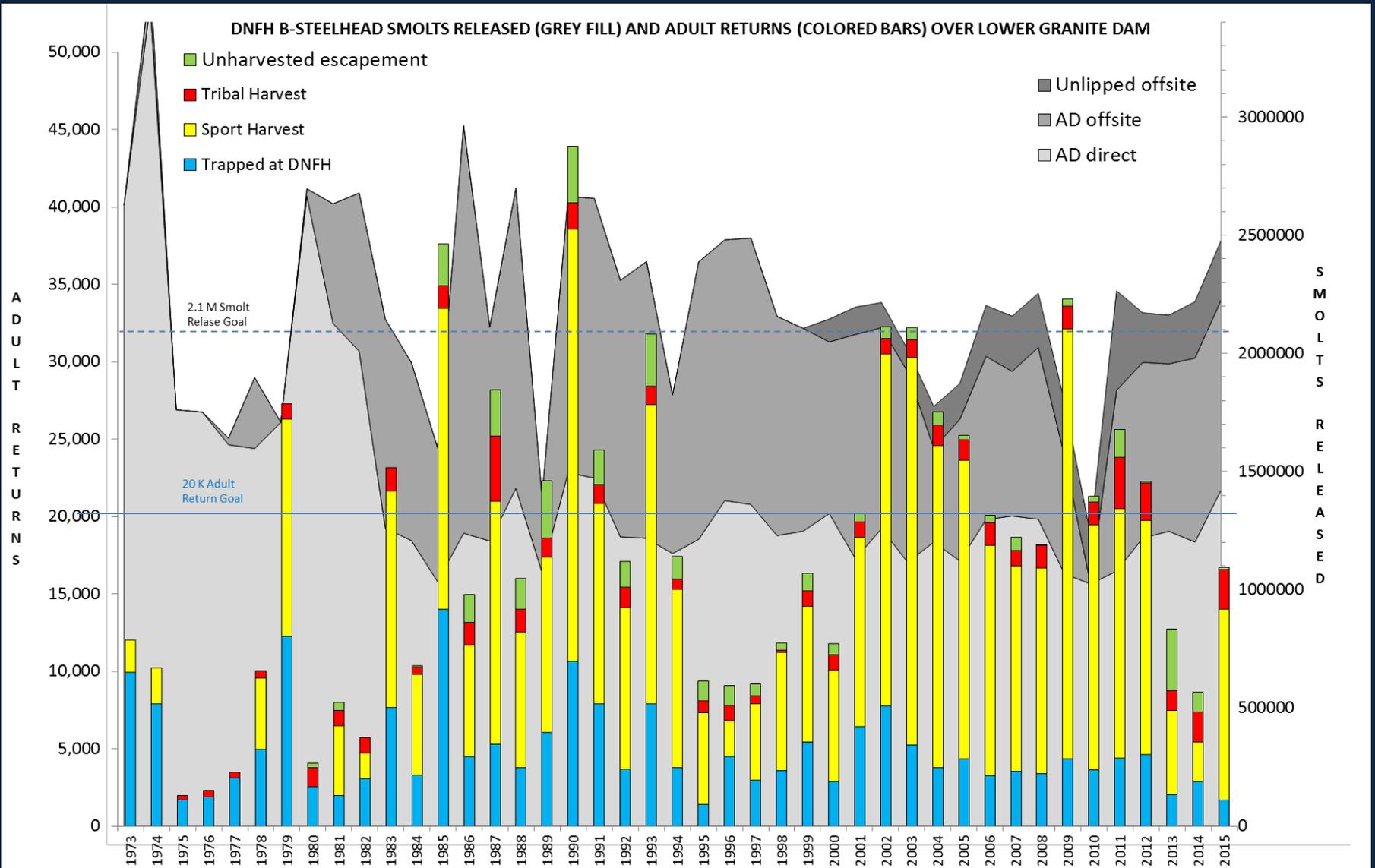


# Importance of Fishery

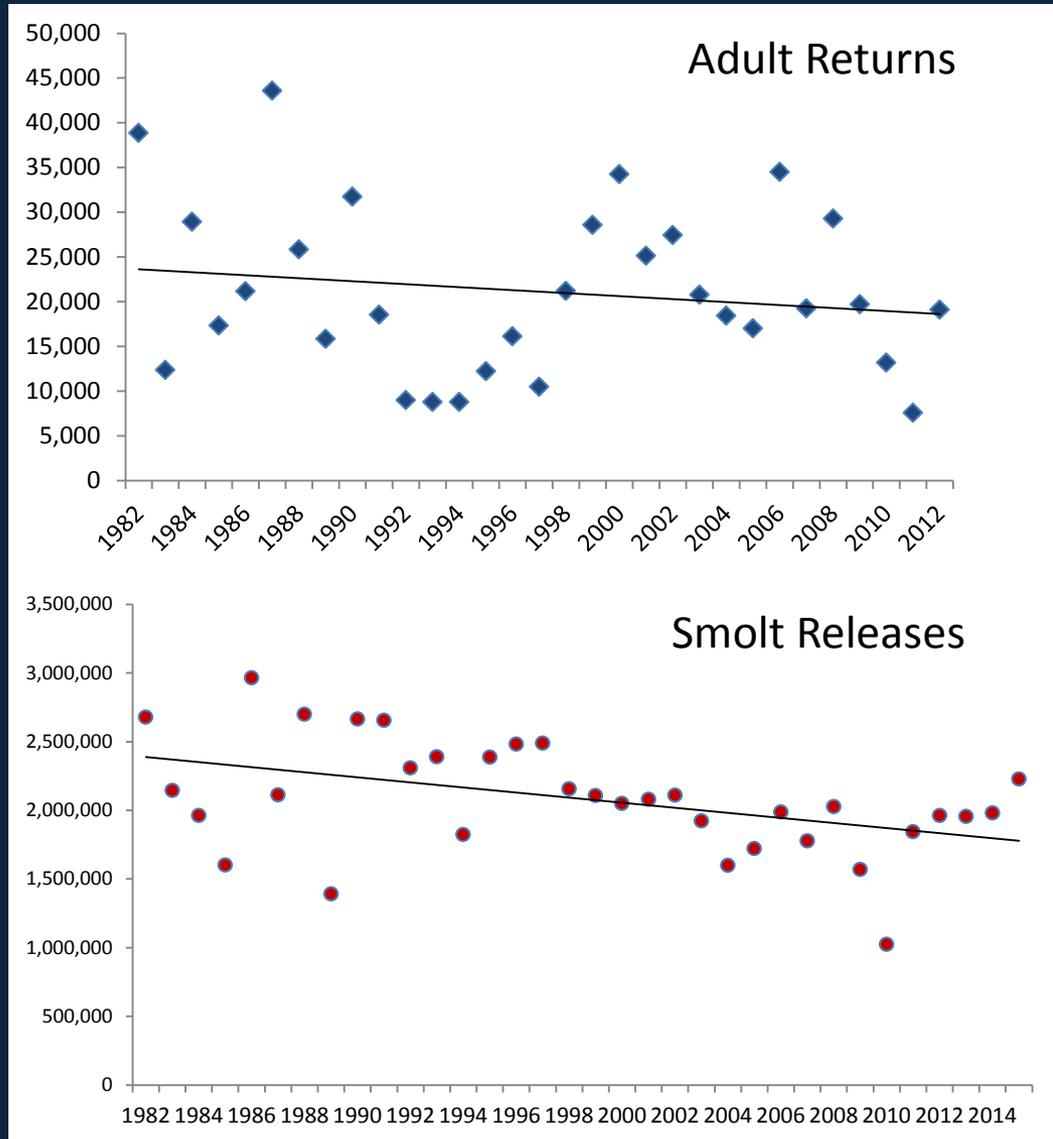
~ \$24 million in  
angler expenditures



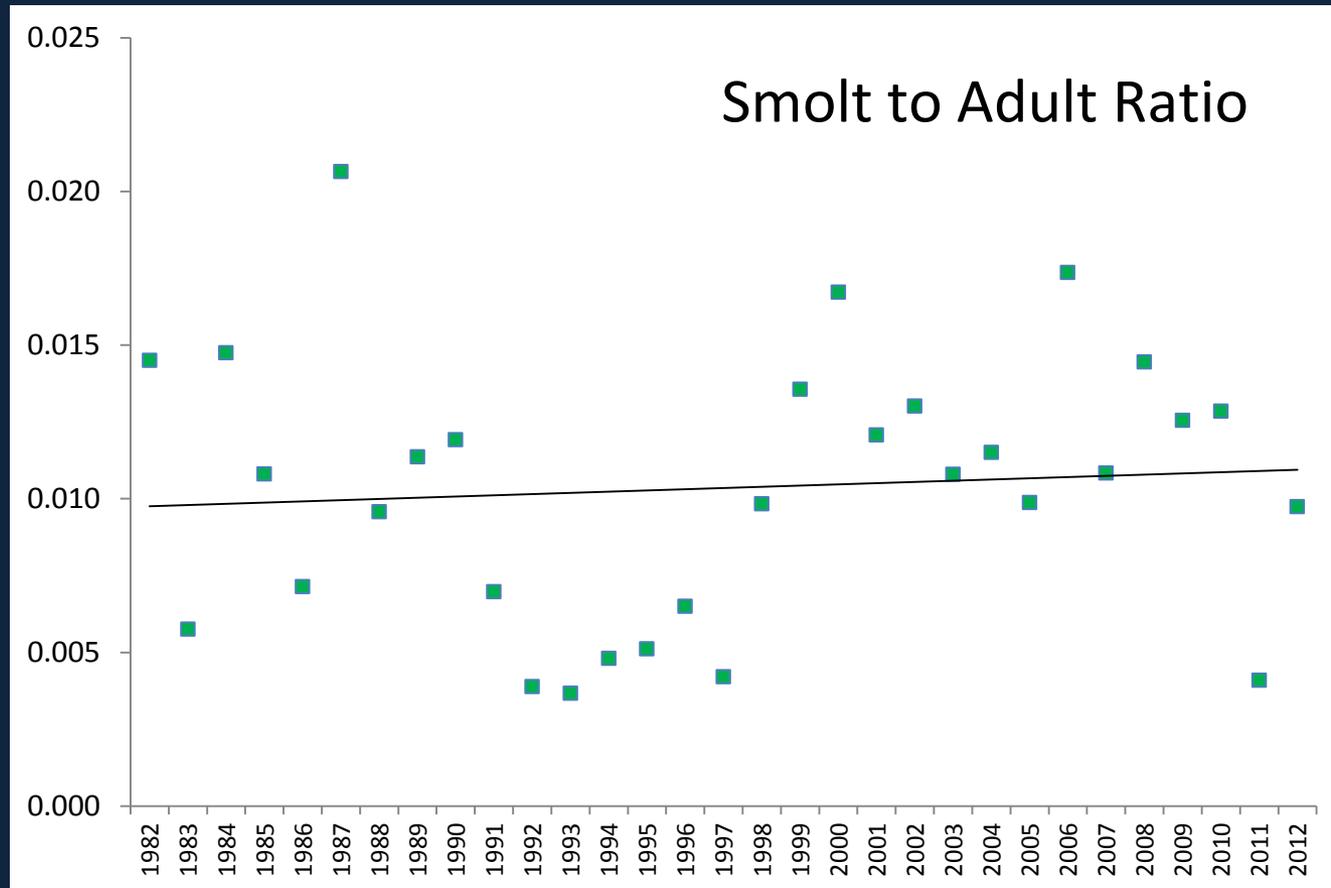
# So what's going on with the hatchery stock?



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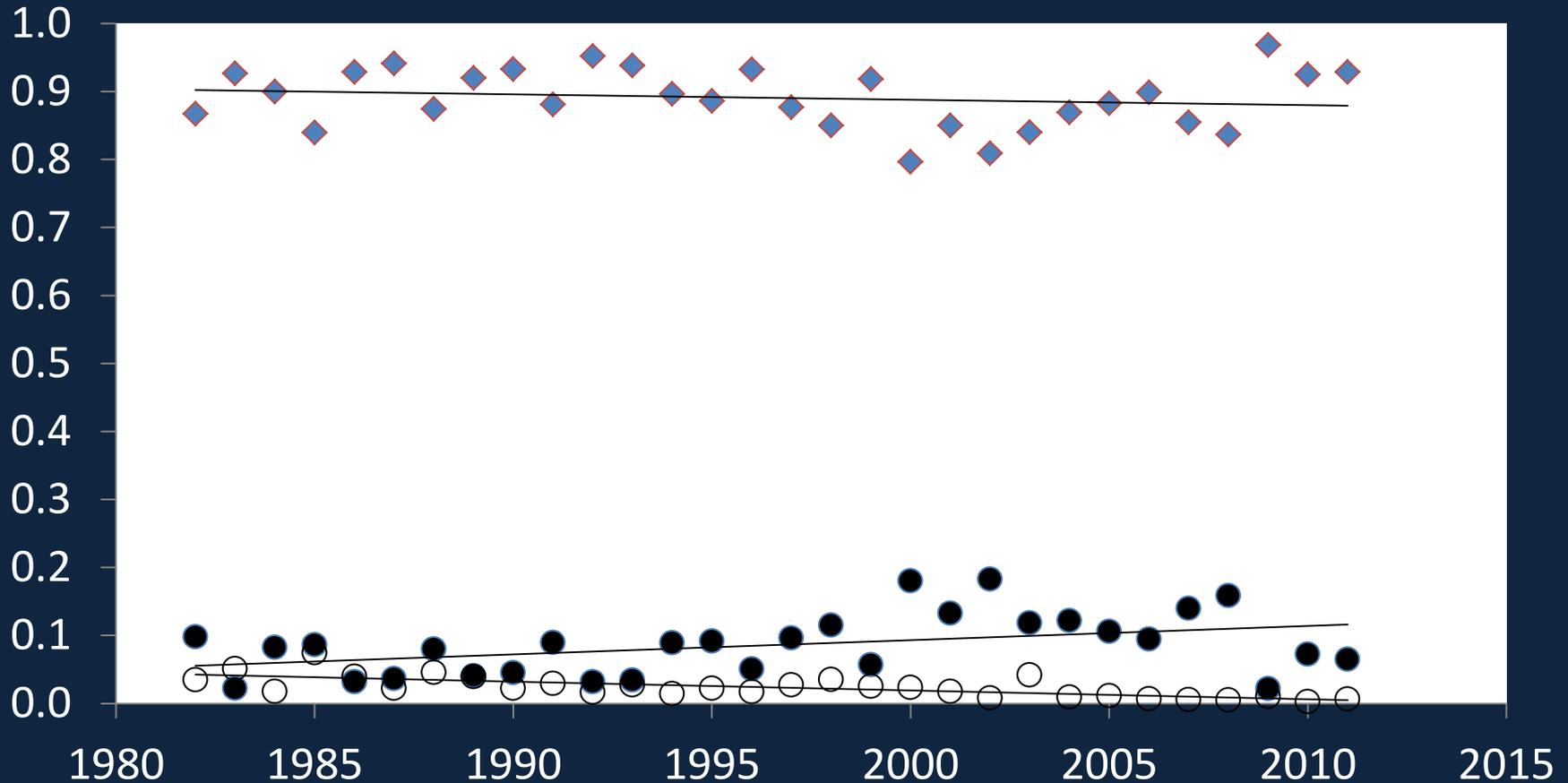
# So what's going on with the hatchery stock?



# Dworshak Population

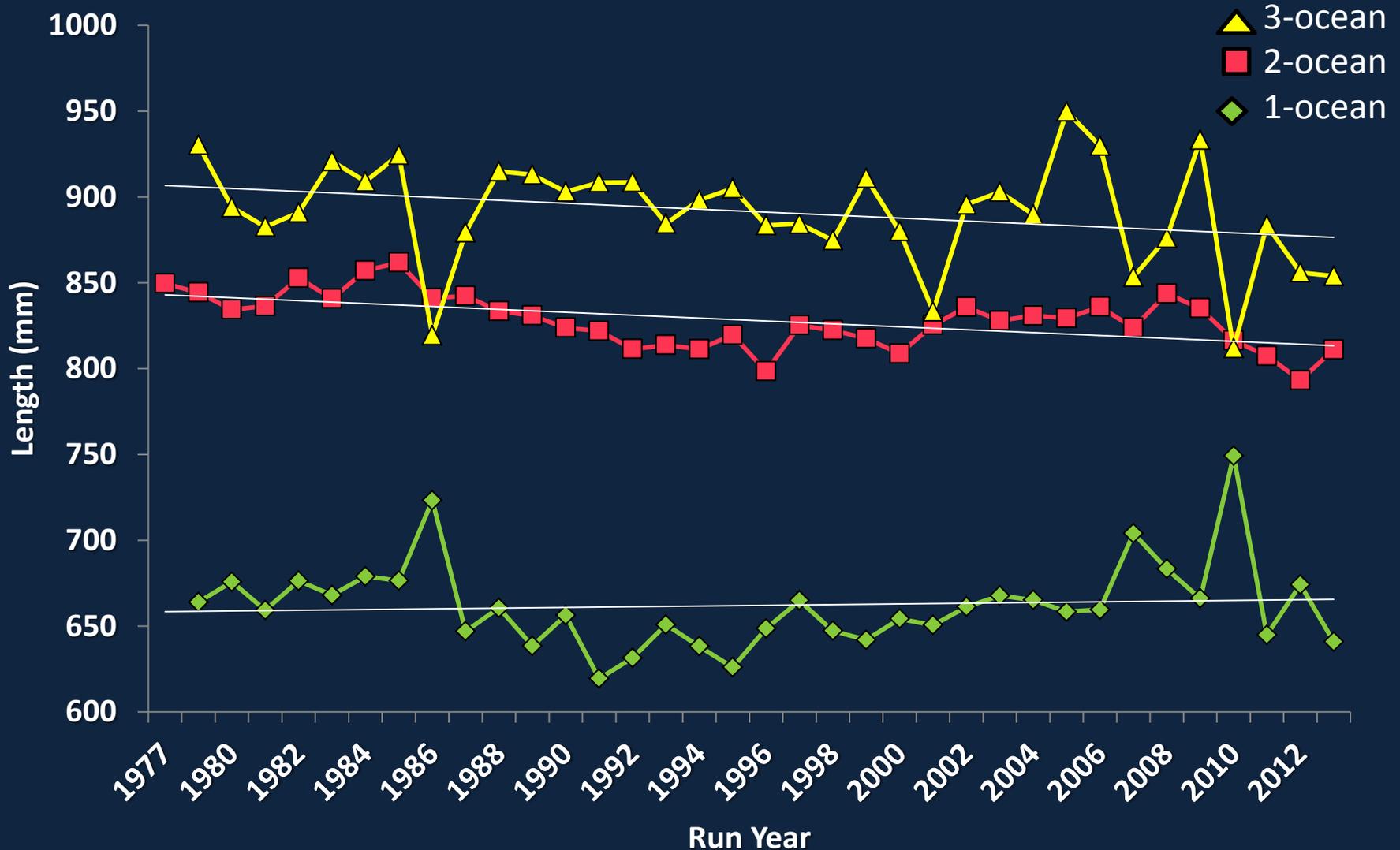
## Age Structure

● 1-Ocean    ◆ 2-Ocean    ○ 3-Ocean



# DWOR Stock

## Length at Ocean age



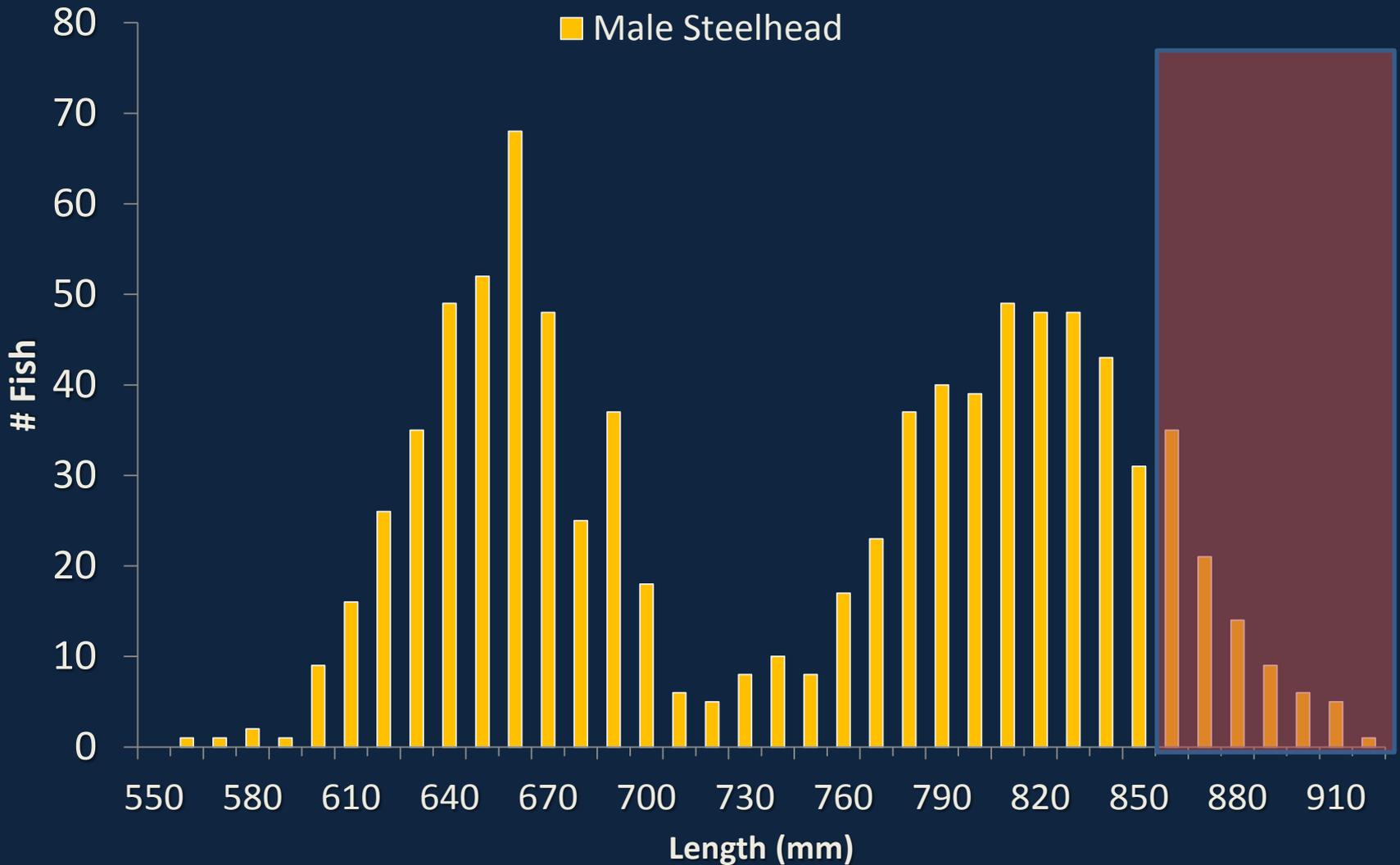
# Broodstock Management Strategies



# Multiple Spawn Crosses For Males



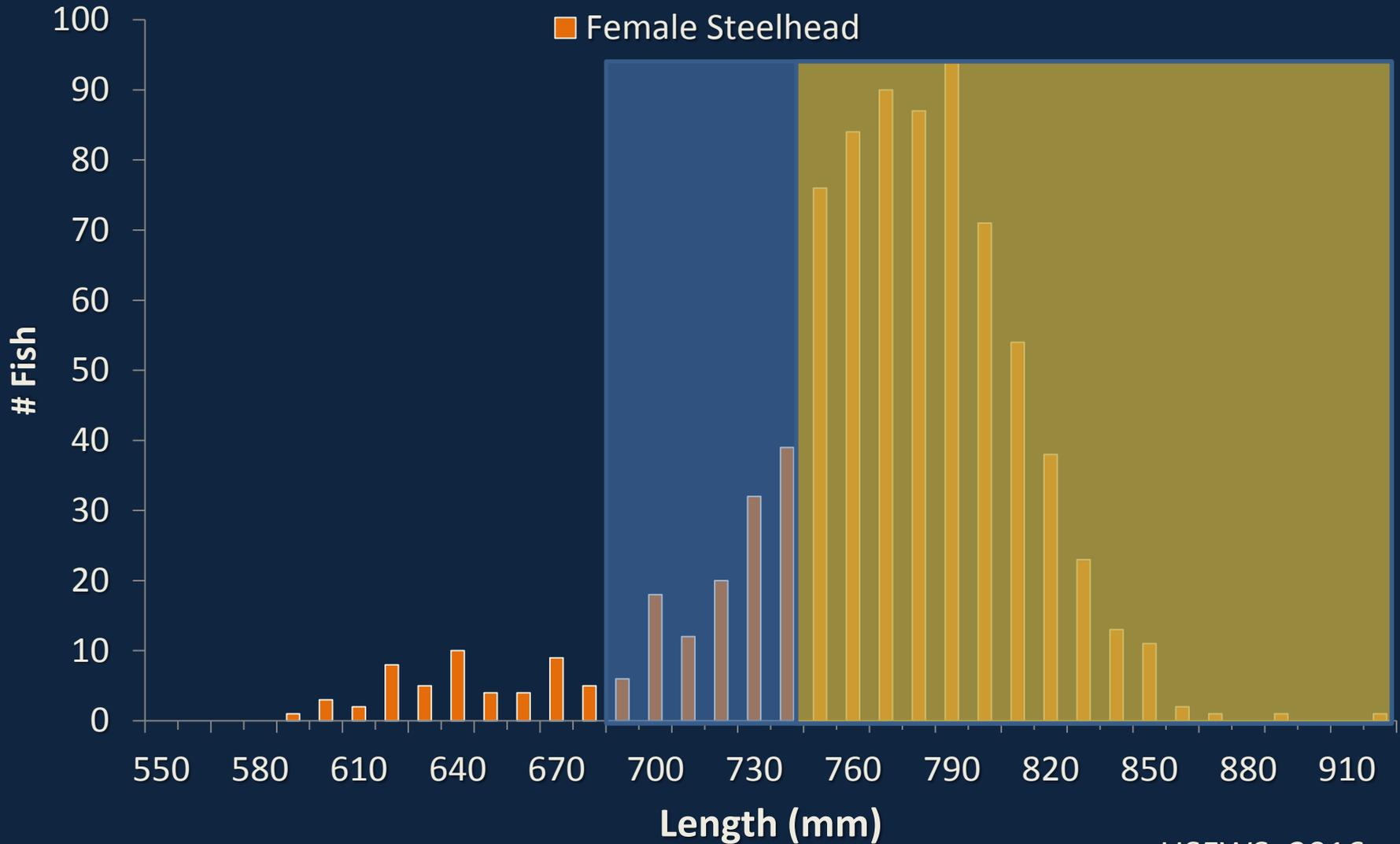
# Outlook for 2016



# Minimum Size Criteria for Females



# Minimum Size Criteria



Why could this make a difference?  
And  
How will we know?

# Selection

Three conditions must be met for selection to occur in a population:

Variation: Individuals in the population must differ with respect to the trait in question.

Heritability: The variation found in the population must (at least partially) be heritable, e.g. transmitted from parent to offspring.

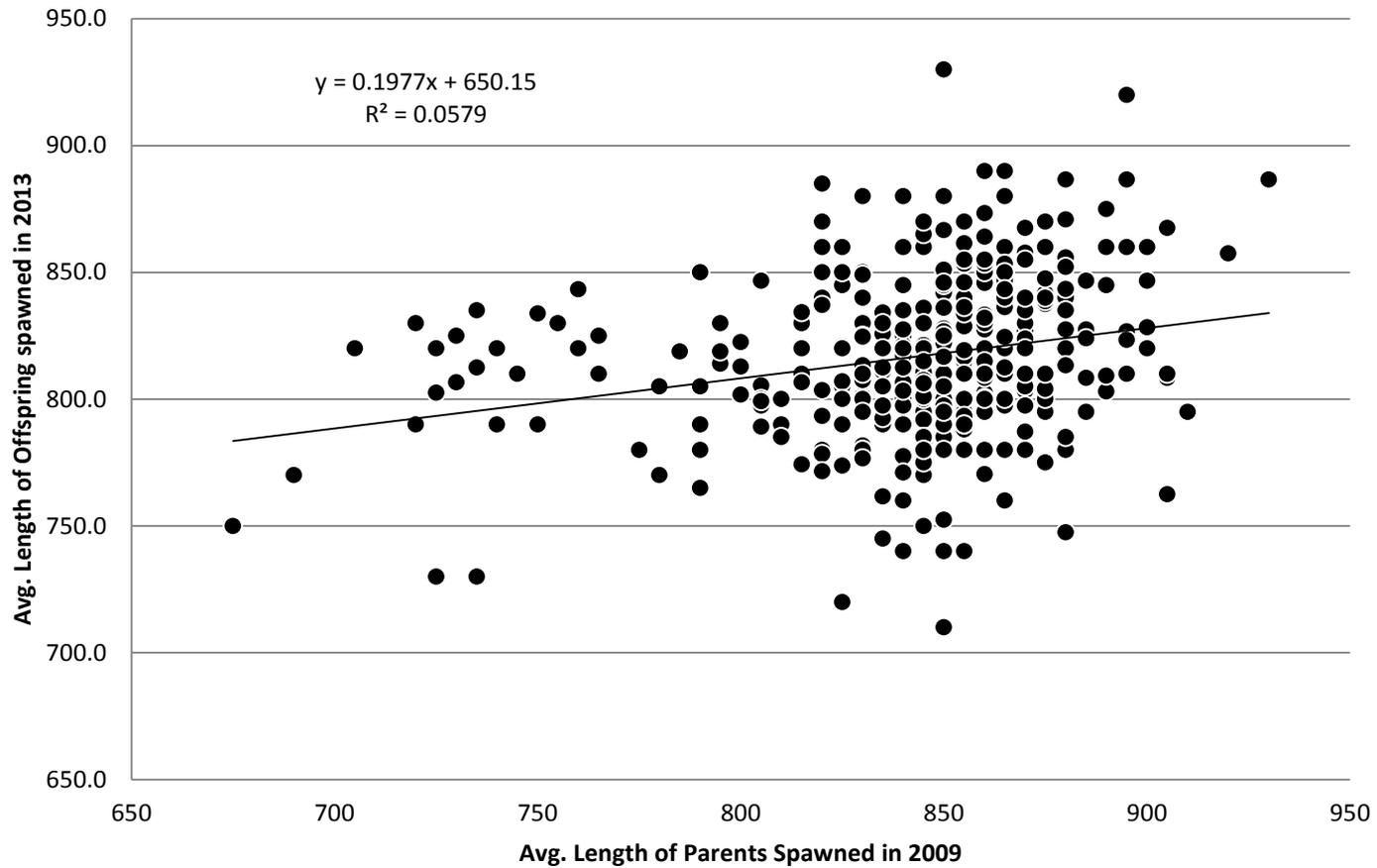
Differential Mortality: Finally, individuals must have a probability of survival that is a function of the value of the trait in question. If all individuals, regardless of their trait value, had an equal probability of survival and fecundity, no predictable change in the mean value of the population would occur.

# Heritability

- Heritability is the proportion of variance in a particular trait, that is due to genetic variation among individuals in the population
- A simple way to estimate the heritability of a trait is to plot the offspring's traits against the average of their parents

# Heritability in Steelhead

## Heritability of Fork Length



# Summary

- **Clearwater River B-Run Steelhead are unique**
- **It is the responsibility of USFWS to maintain the population integrity**
- **The Age Structure and Size-At-Age are changing – a basin-wide trend**
- **Broodstock selection may help maintain age and size structure for this population**
- **Close monitoring is needed to assure is effective and not causing un-intended consequences.**