

# Age at Maturity and Length at Age for South Fork Salmon River and Upper Salmon River Chinook Salmon

**Brian Leth and John Cassinelli**  
**Idaho Department of Fish and Game**



Age and Size at Maturity of Chinook Salmon  
and other Pacific Salmonids

Portland, Oregon  
May 17-19, 2011

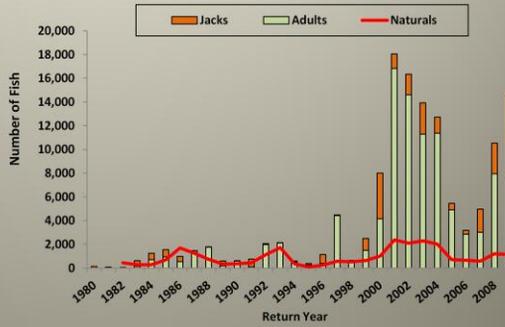


# Introduction- SFSR Summer Chinook

- South Fork Salmon River (SFSR)
  - McCall Fish Hatchery- built in 1980 as part of the LSRCF
  - 1 million smolt program

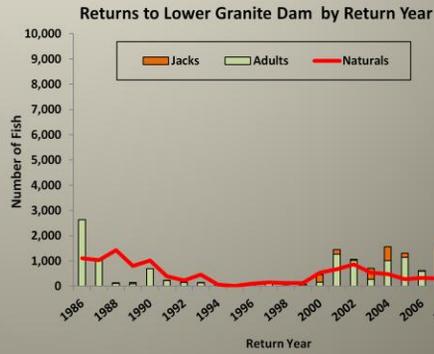
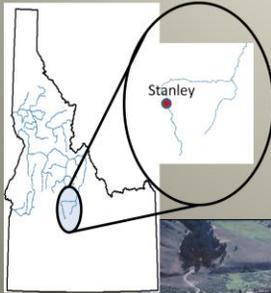


Returns to Lower Granite Dam by Return Year



# Introduction- USR Spring Chinook

- Upper Mainstem Salmon River (USR)
  - Sawtooth Fish Hatchery- completed in 1985 as part of the LSRCP
  - 1.7 million smolt program



# Methods

## Hatchery Origin Fish

### – Age composition

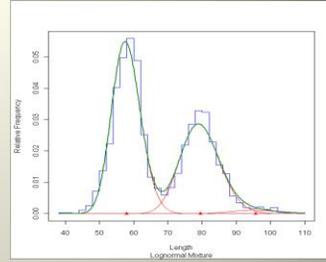
- Sample of known age fish
  - CWT recoveries at hatchery, spawning grounds, and fisheries
  - PIT tags

### • Length Frequency data

### • Mixture analysis

### – Length at Age

- CWT recoveries at hatchery, spawning grounds, and fisheries
- Length Frequency Data
- Mixture analysis



# Methods

- **Natural-Origin Fish**
  - **Age composition**
    - Sample of known age fish
      - Fin Ray analysis
    - Length Frequency data
    - Mixture analysis
  - **Length at Age**
    - Length frequency data- mixture analysis
    - Fin ray or scale analysis

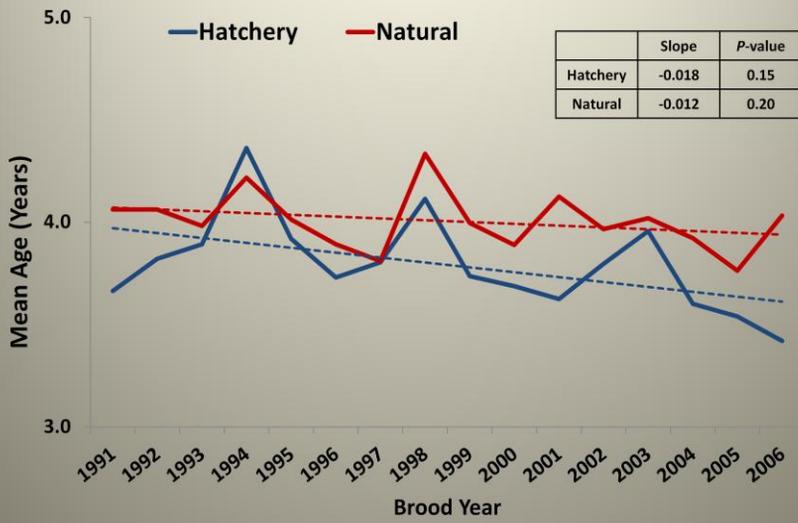


# Metrics

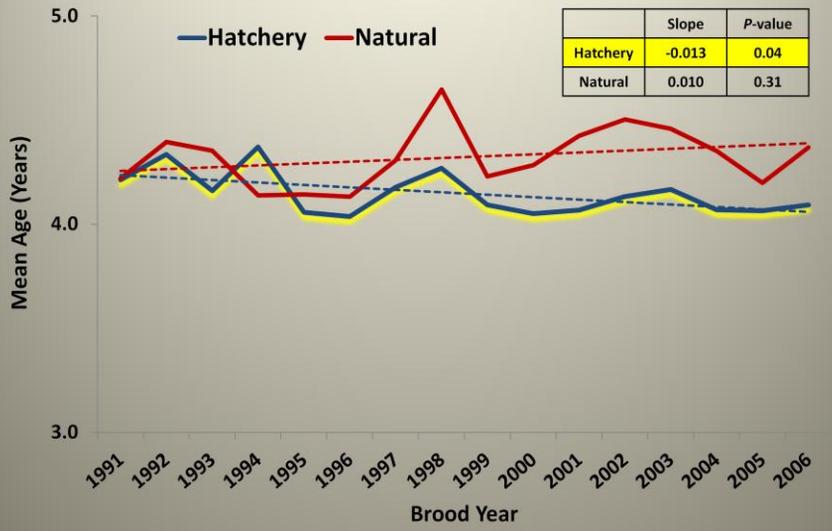
- Mean Age
- Age Composition
- Mean Length
- Length at Age
  
- BY 1991-2005 (and 2006)
- Males, Females, M&F Combined
- Hatchery and natural in USR and SFSR
- Aggregate naturals at Lower Granite (M&F combined)



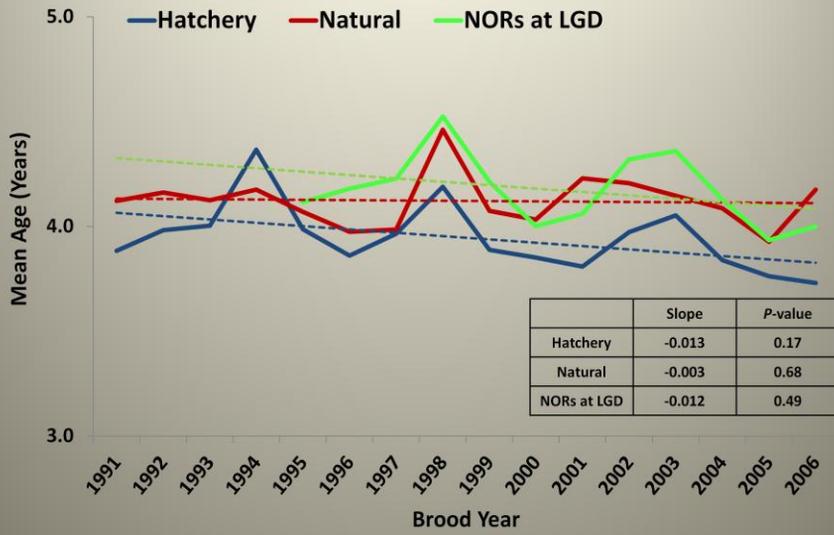
# Mean Age – SFSR Males



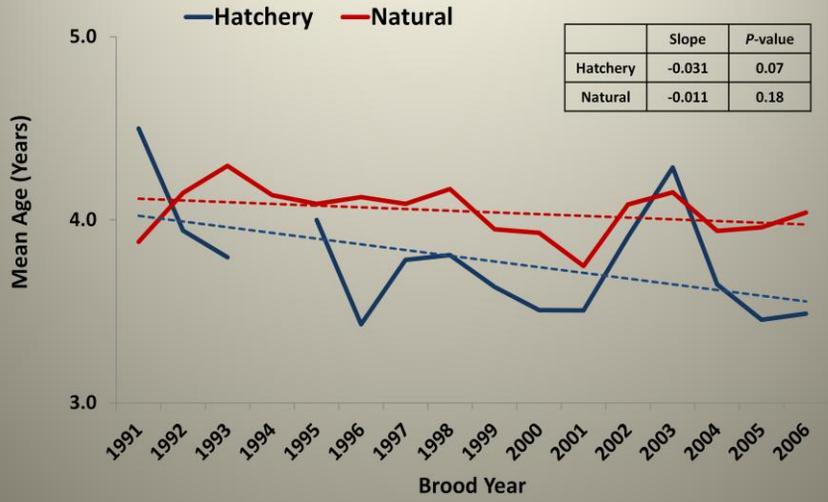
# Mean Age – *SFSR* Females



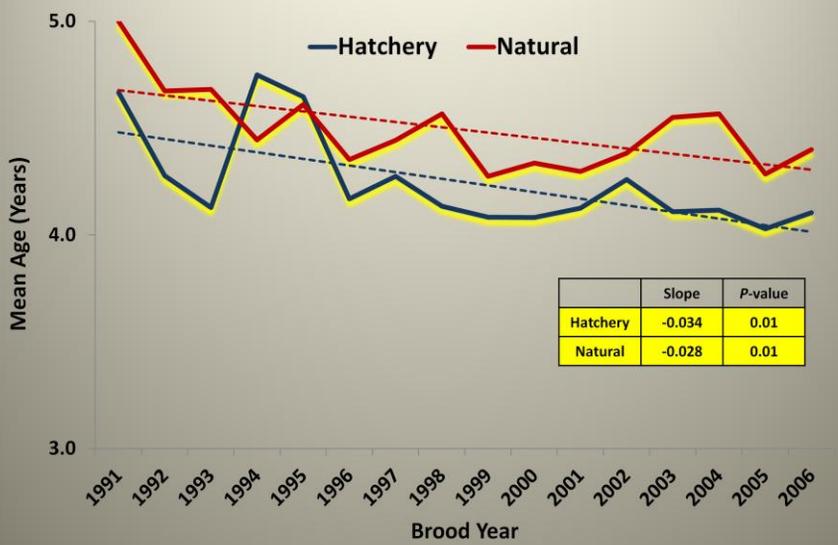
## Mean Age – SFSR Males & Females Combined



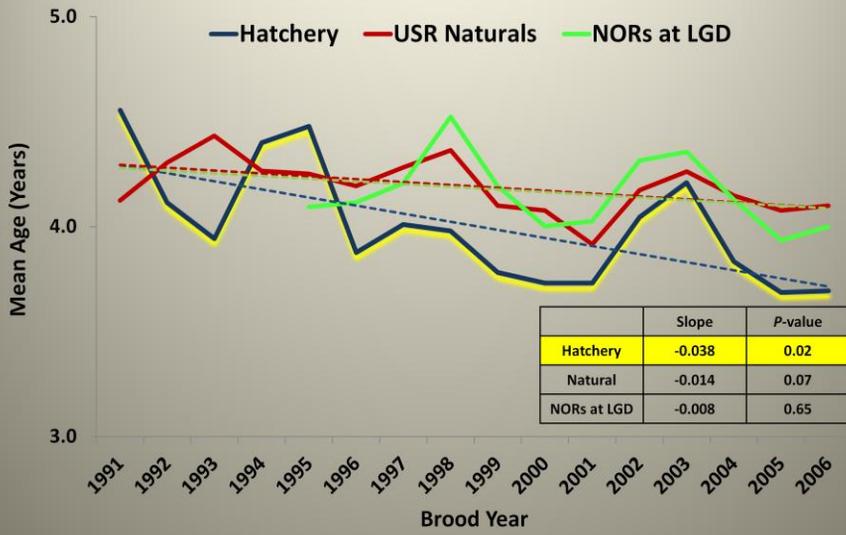
# Mean Age – USR Males



# Mean Age – USR Females



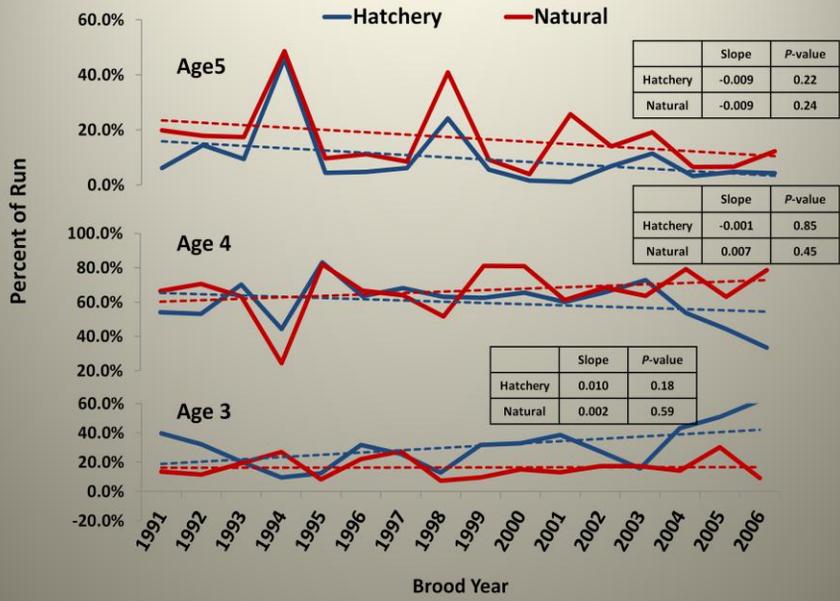
## Mean Age – USR Males & Females Combined



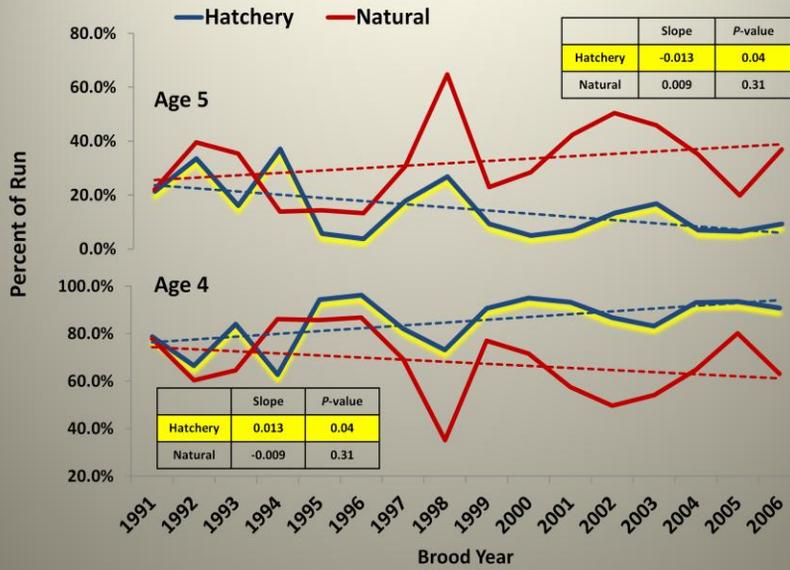
## Summary – Mean Age (BY91-05)

Origin	Gender	SFSR	USR
		slope	slope
Hatchery	Male	—	—
Natural	Male	—	—
Hatchery	Female	—	—
Natural	Female	+	—
Hatchery	M&F Combined	—	—
Natural	M&F Combined	—	—
LGD Aggr/Natural	M&F Combined	—	—

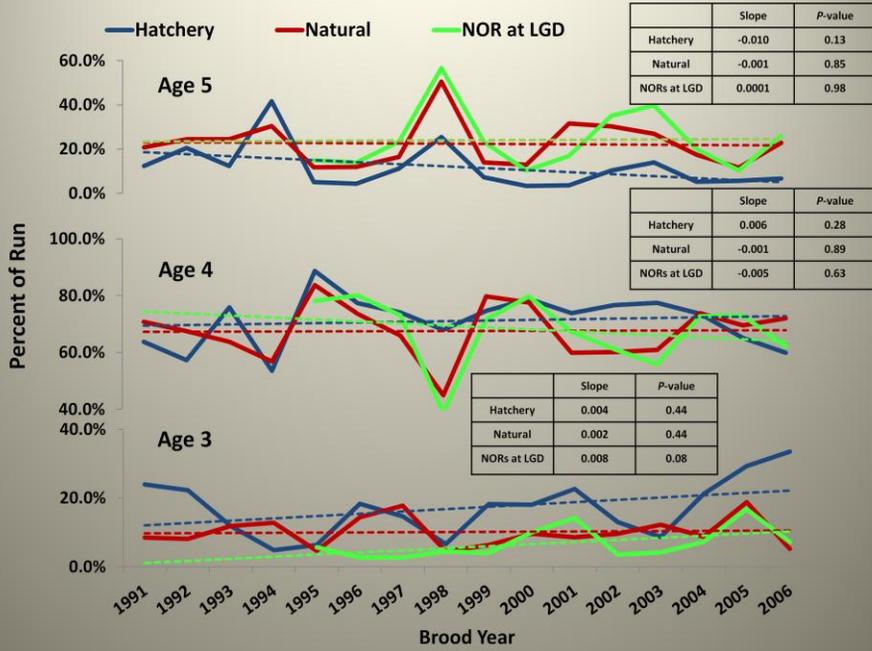
# Age Distribution – **SFSR** Males



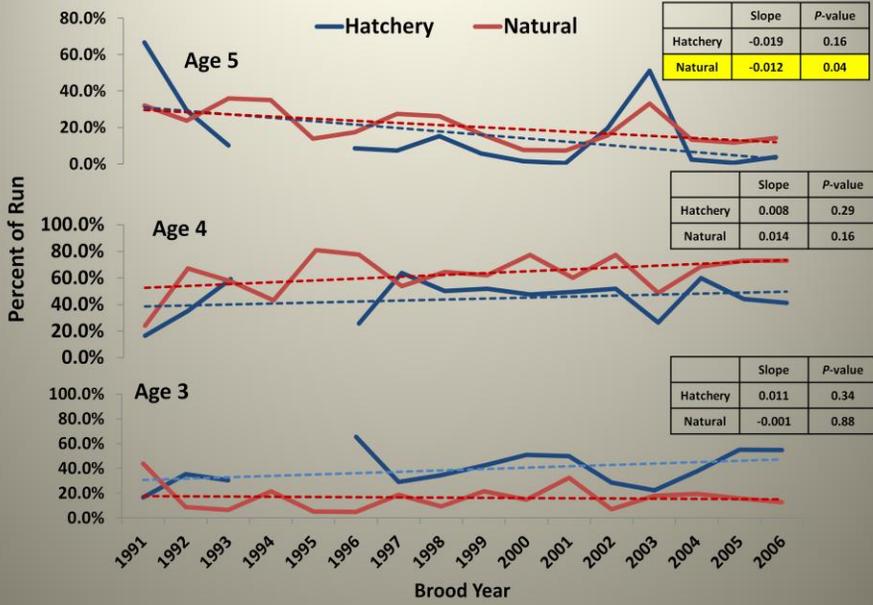
# Age Distribution – SFSR Females



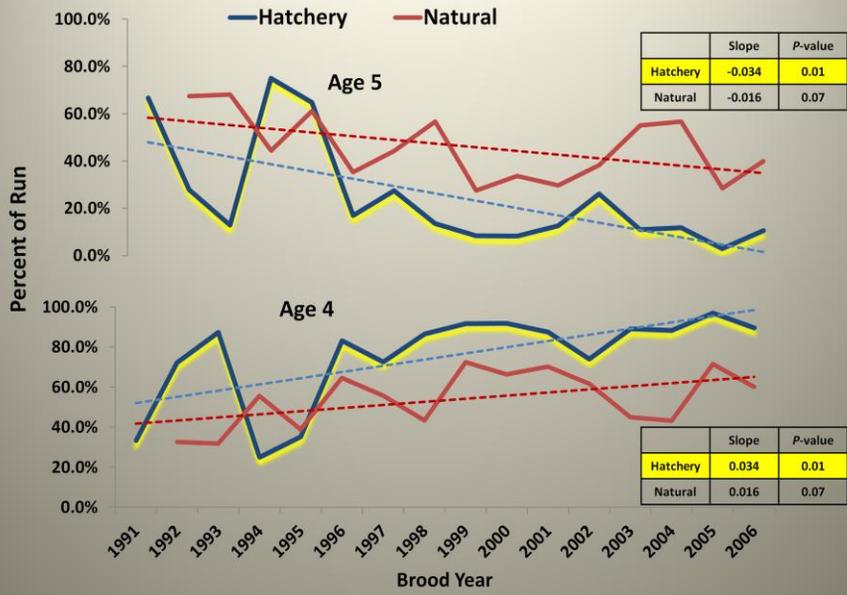
## Age Distribution – *SFSR* Males & Females Combined



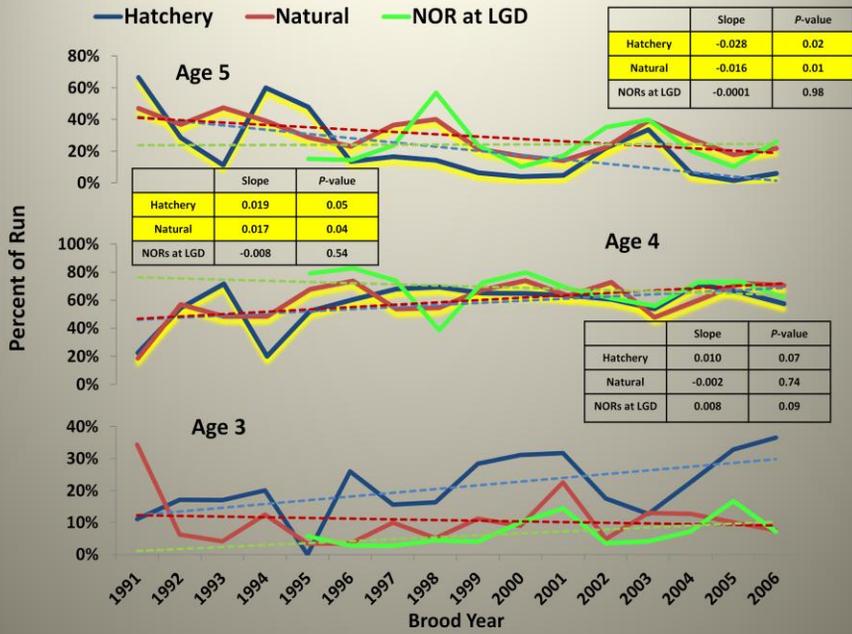
# Age Distribution – USR Males



## Age Distribution – USR Females



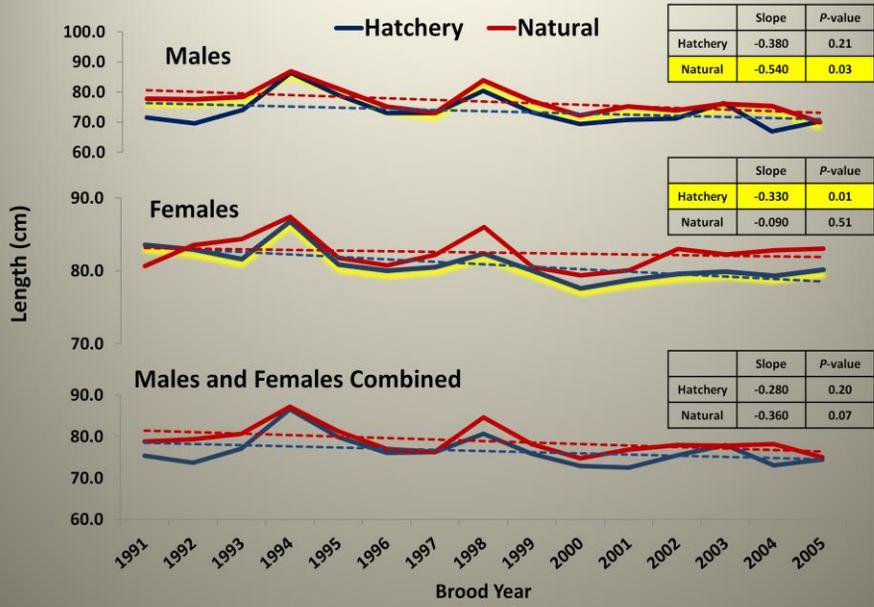
# Age Distribution – USR Males & Females Combined

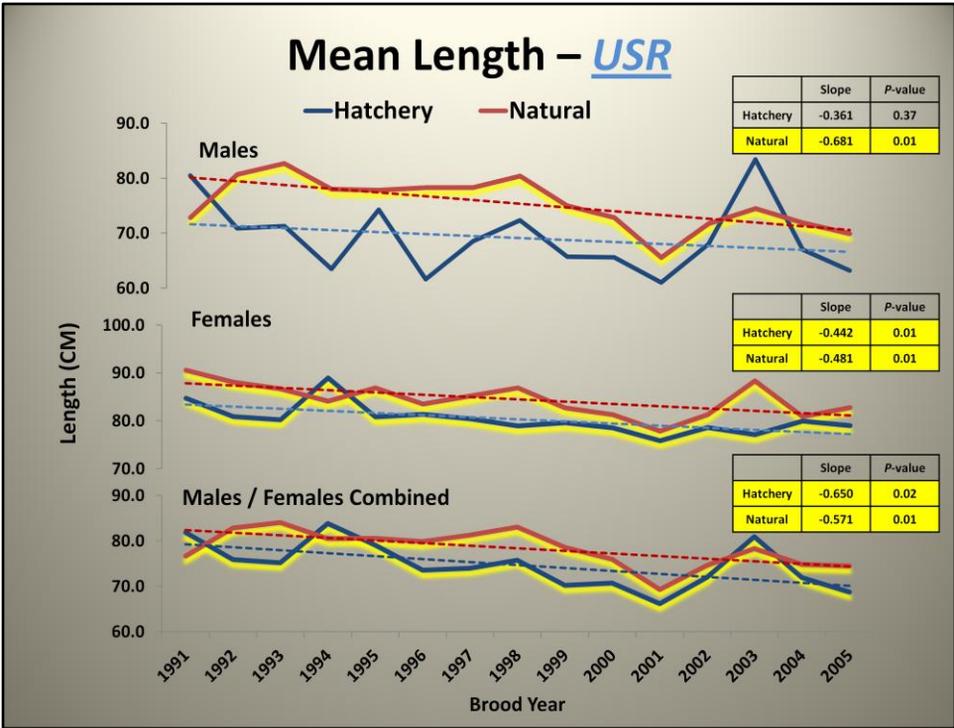


## Summary – Age Distribution (BY91-05)

Sex	Origin	SFSR			USR		
		3	4	5	3	4	5
Male	Hatchery	+	-	-	+	+	-
Male	Natural	+	+	-	-	+	-
Female	Hatchery		+	-		+	-
Female	Natural		-	+		+	-
Combined	Hatchery	+	+	-	+	+	-
Combined	Natural	+	-	-	-	+	-
Combined	LGD	+	-	-	+	-	-

# Mean Length – *SFSR*

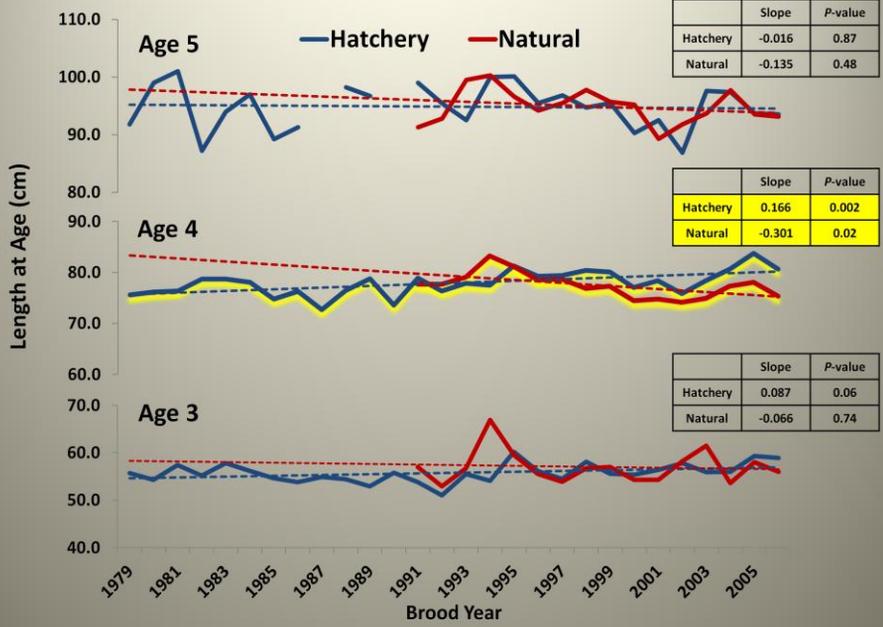




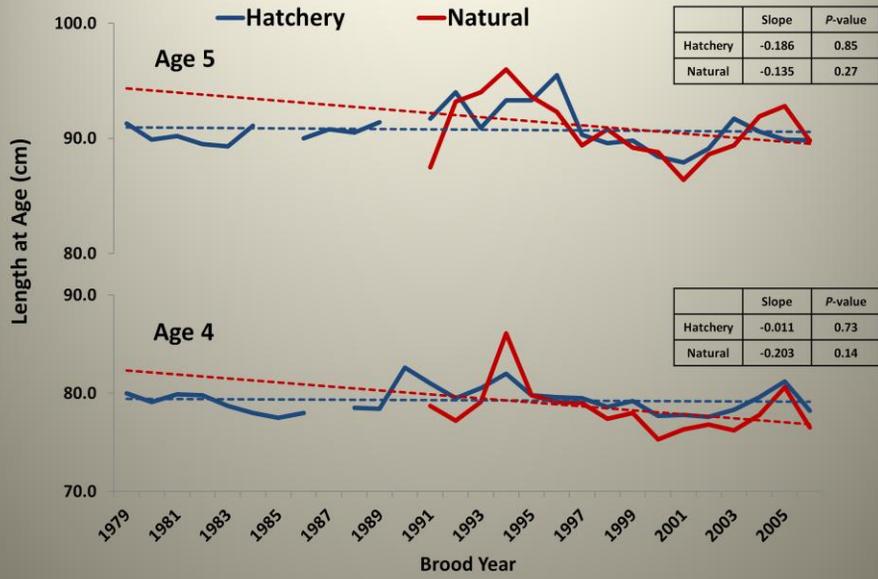
## Summary – Mean Length (BY91-05)

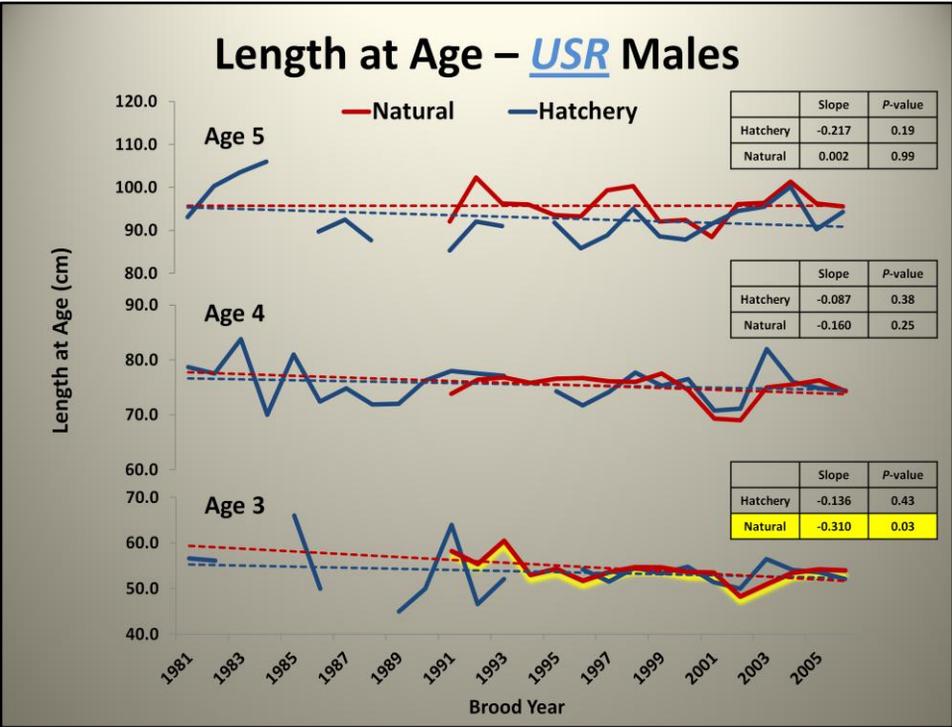
Origin	Gender	SFSR	USR
		slope	slope
Hatchery	Male	—	—
Natural	Male	—	—
Hatchery	Female	—	—
Natural	Female	—	—
Hatchery	M&F Combined	—	—
Natural	M&F Combined	—	—

# Length at Age – *SFSR* Males

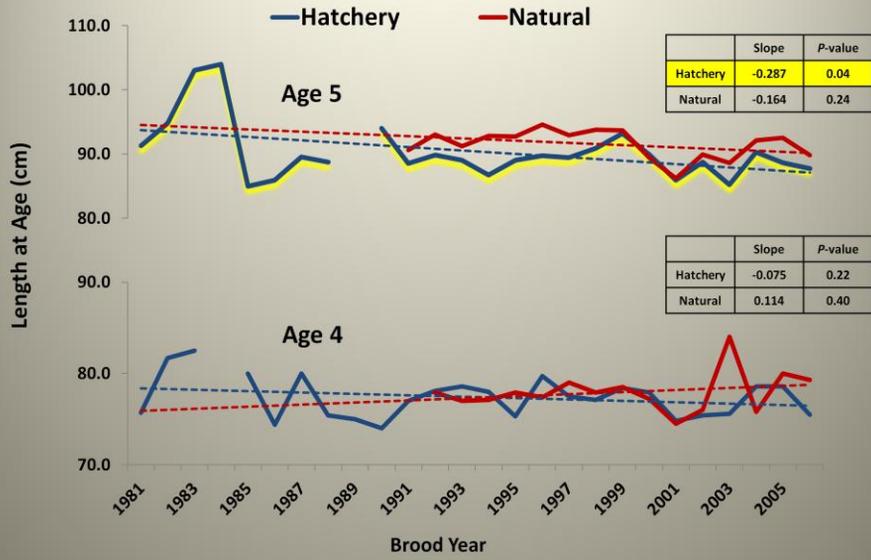


## Length at Age – *SFSR* Females





# Length at Age – USR Females



## Summary – Length at Age (BY91-05)

Sex	Origin	SFSR			USR		
		3	4	5	3	4	5
Male	Hatchery	+	+	-	-	-	-
Male	Natural	-	-	-	-	-	+
Female	Hatchery		-	-		-	-
Female	Natural		-	-		+	-

## Observations

- Both hatchery and natural populations are trending towards younger and smaller individuals at return
  - Hatchery populations changing at a higher rate
- Patterns in age distribution and size at age are similar for hatchery and natural populations
- Natural populations are larger at age than hatchery populations
- Natural populations are older at return than hatchery populations.

## Relationships

- Smolt to adult survival with Age Comp or Length at Age
  - Weak inverse relationship for Age Comp (Age5)
- Length at Age with Age Composition
  - No relationships
- Size at release with Age Comp or Length at Age
  - Inverse relationship with mean age of males

# Acknowledgments

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