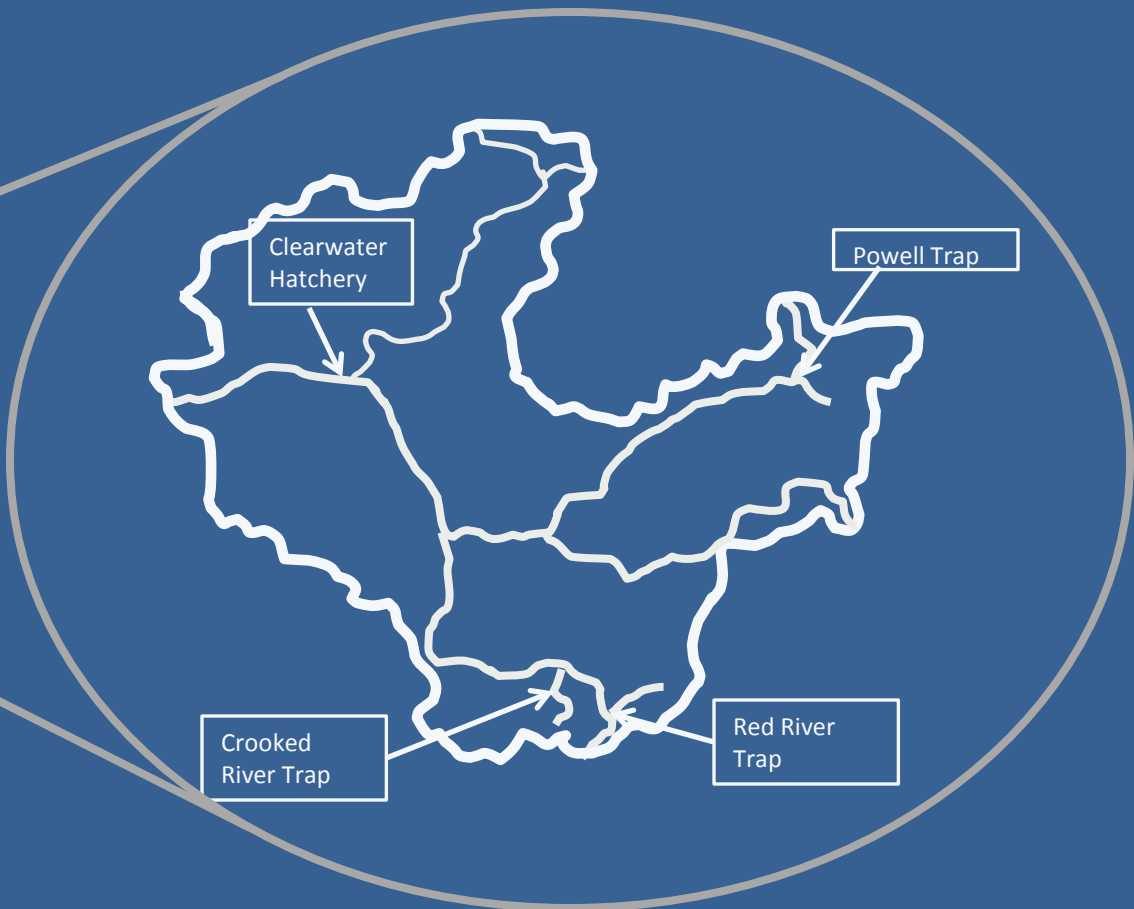
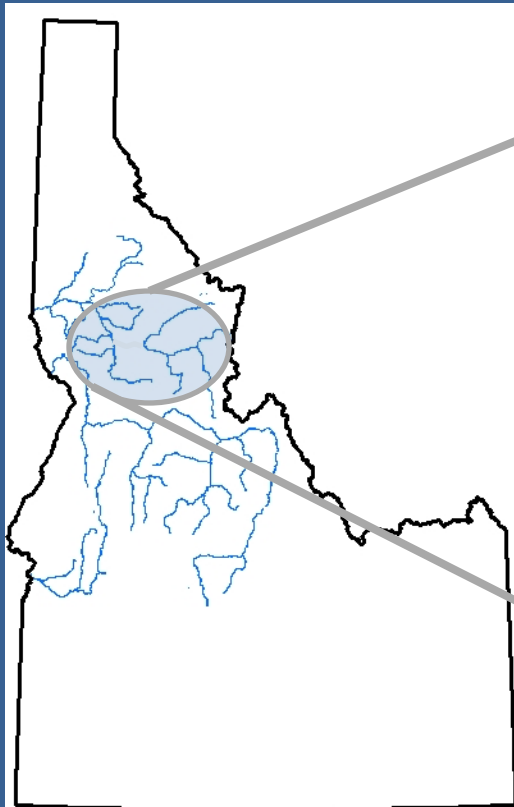


Clearwater River Spring Run Chinook Salmon

Brian Leth, John Cassinelli, Shane Knipper

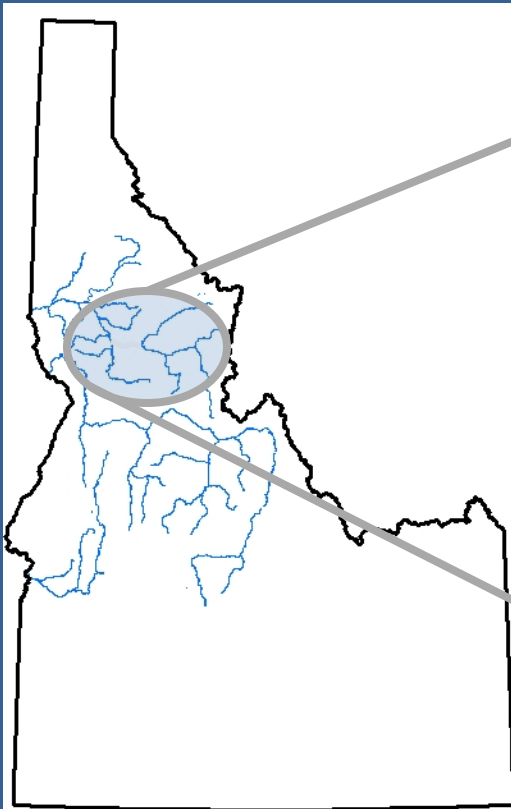


Clearwater Fish Hatchery and Satellites



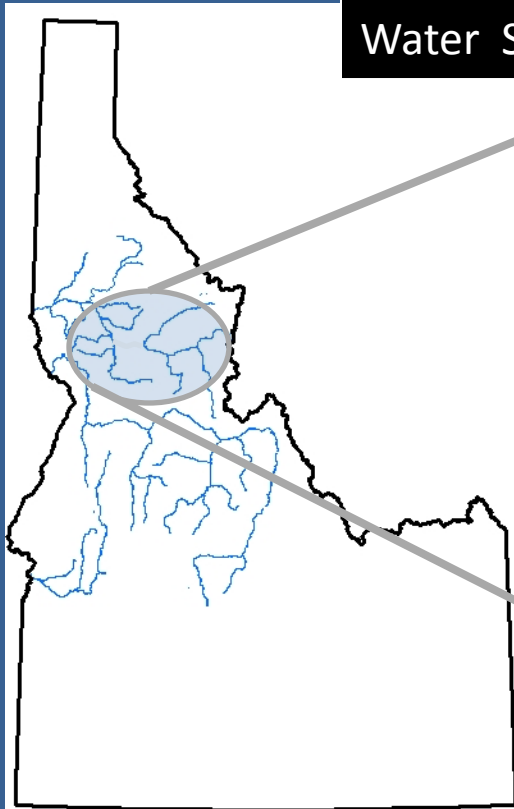
Clearwater Hatchery

Completed 1992- Last LSRCP facility
No Adult trapping
Rear both Chinook and steelhead
Water Source –Dworshak Reservoir



Powell Satellite Facility

Completed 1989
Adult Trapping and Spawning
Acclimation Pond
Water Source –Walton Creek



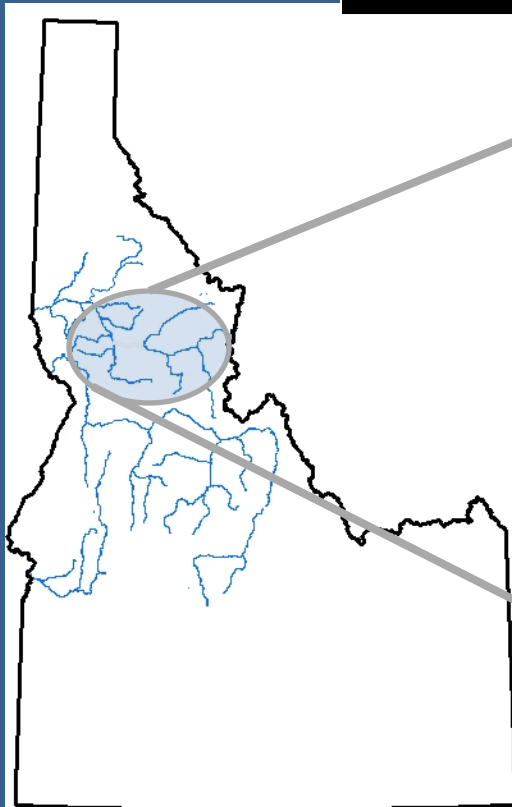
Crooked River Satellite Facility

Completed 1989

Adult Trapping – no holding

Acclimation Raceways 15 km upstream

Water Source – Crooked River

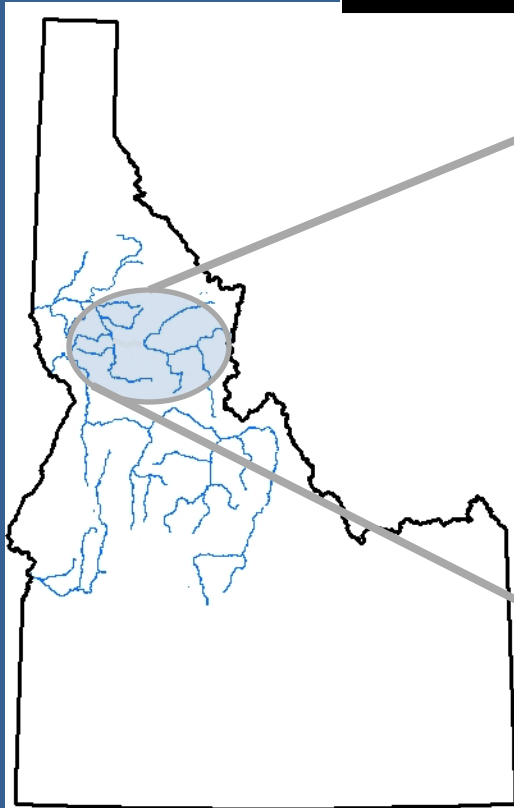


Crooked
River Trap

Red River
Trap

Red River Satellite Facility

Built in 1976, updated in 1986
Adult Trapping /Spawning
Acclimation Pond
Water Source –S.F. Red River



Program Background

Goals and Objectives

- **Mitigation Goals**
 - **Adult Return- 11,900 above Lower Granite (47,600 down river harvest)**
 - **Modeled Smolt Release- 1.4 million (0.87 SAR- post downriver harvest)**
 - **Red River (700,000),**
 - **Crooked River (335,000)**
 - **Powell (335,000)**
 - **Current smolt release of 2.3 million full term smolts and 0.3 million parr**
 - **Includes releases at Clear Creek, and Lower and upper Selway River**

Program Background

Goals and Objectives

- **Mitigation Goals**
 - Adult Return- 11,900 above Lower Granite (47,600 down river harvest)
 - Modeled Smolt Release- 1.4 million (0.87 SAR- post downriver harvest)
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 - Crooked River (335,000)
 - Powell (335,000)
 - Current smolt release target of 2.4 million full term smolts
- **Management Objectives**
 - Restore and maintain natural populations in the Clearwater River
 - Meet LSRCP adult mitigation objectives
 - Restore and maintain recreational and tribal fisheries
 - Minimize impact of hatchery program on the natural population

Program Background

Goals and Objectives

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 - Meet LSRCP adult mitigation objectives
 - Restore and maintain natural populations in the Clearwater River
 - Restore and maintain recreational and tribal fisheries
 - Minimize impact of hatchery program on the natural population
- **M & E Objectives**
 - Monitor production, productivity and life history characteristics of hatchery and natural populations
 - Evaluate broodstock and rearing strategies to increase adult returns
 - Cooperative effort between state, tribal and federal managers.

Program Background

Clearwater River Natural Populations

- **Lewiston Dam 1927 (4 mi us of mouth)- virtual elimination of natural populations**
 - Passage improvements in the 40s and 60s, removed in 1973
- **Reintroduction efforts began in the 50s and ramped up in the 70s (spring Chinook)**
 - Primarily Rapid River stock but included Dworshak, Kooskia, Carson and Cowlitz
- **Natural populations of spring Chinook salmon in the Clearwater River not part of the Snake River spring/summer ESU.**

Program Background

Hatchery Broodstock and Release Strategy

- **Broodstock History/Strategy**
 - Initially Rapid River spring Chinook
 - Since mid-90s maintained S.F. Clearwater and Powell locally adapted stocks
 - Have back filled between these two and have used Rapid River
 - De facto integration/supplementation until 1995 (mass marking began BY91)
 - 1995-2010 segregated brood with supplementation research
 - Since 2002 all broodstock has been segregated
 - Supplementation releases in Selway River

Program Background

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 - Since 2002 broodstock has been segregated
 - Supplementation releases in Selway River
- **Current Release Strategy**
 - 2,300,000 full term smolts and 300,000 parr
 - Reared on Dworshak Reservoir water and released directly or with brief acclimation.

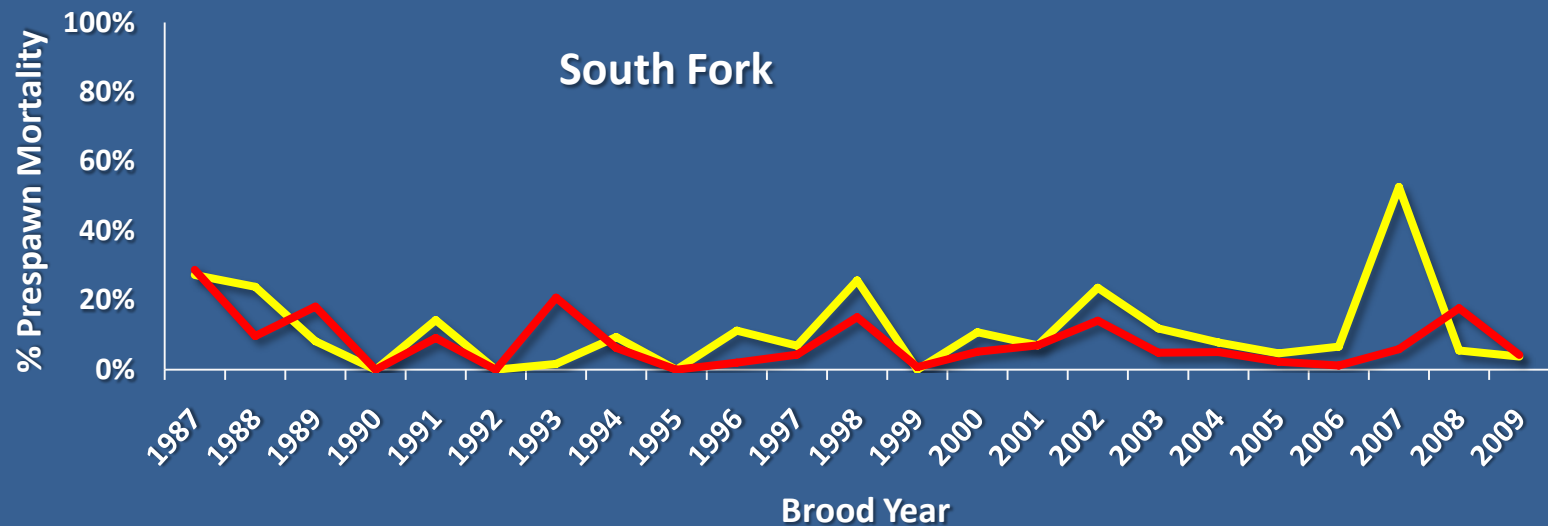
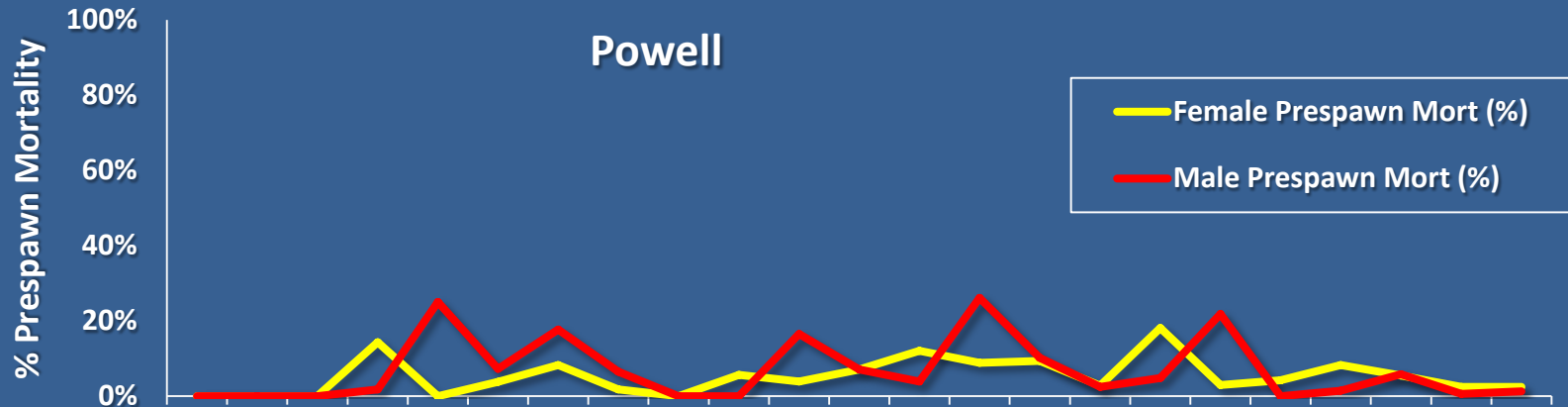
Hatchery Production and Survival Data

- Broodstock Performance
- In-hatchery survival
- Juvenile releases and survival
- Adult production and productivity



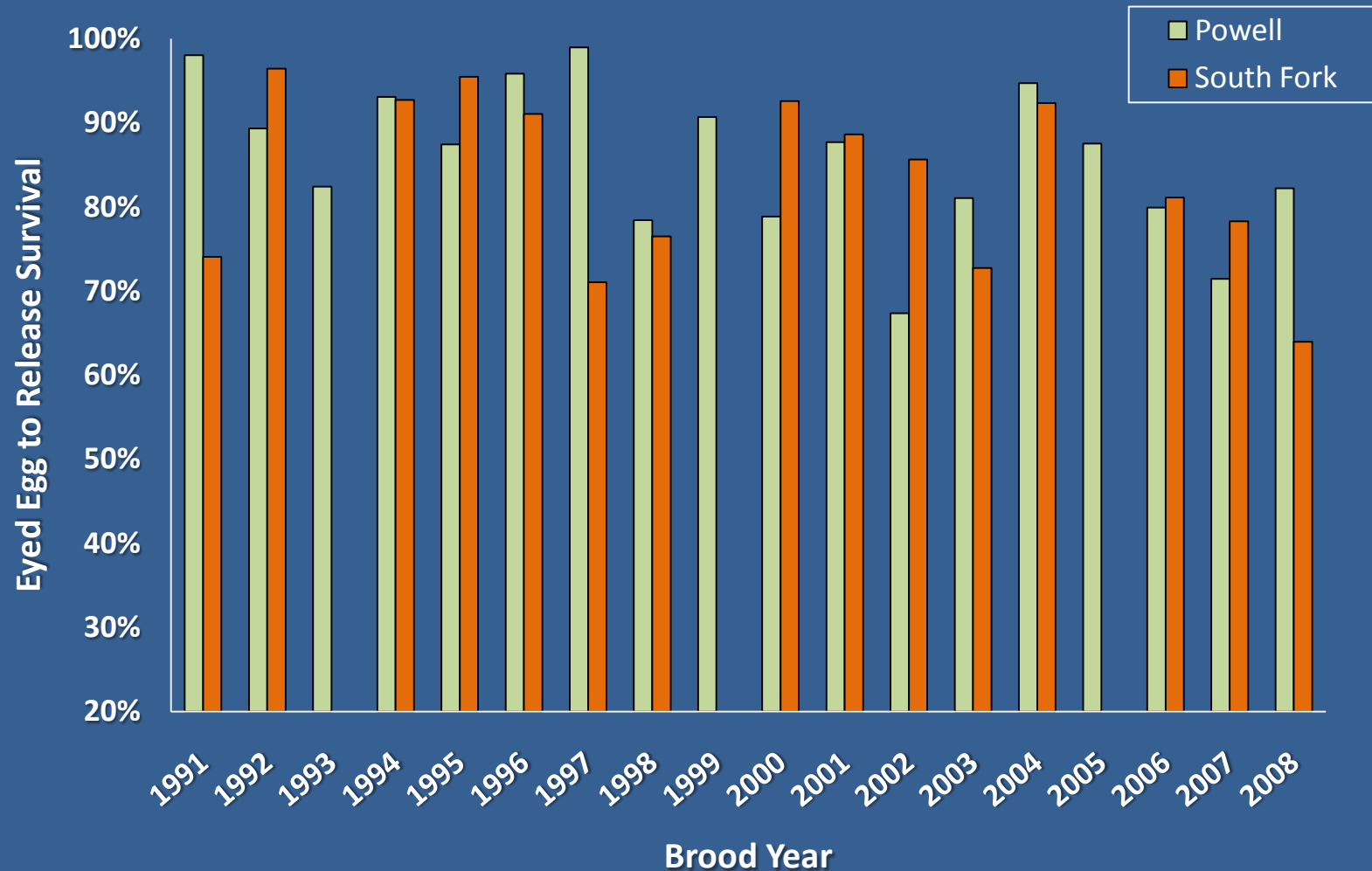
Hatchery Production and Survival Data

Broodstock Performance



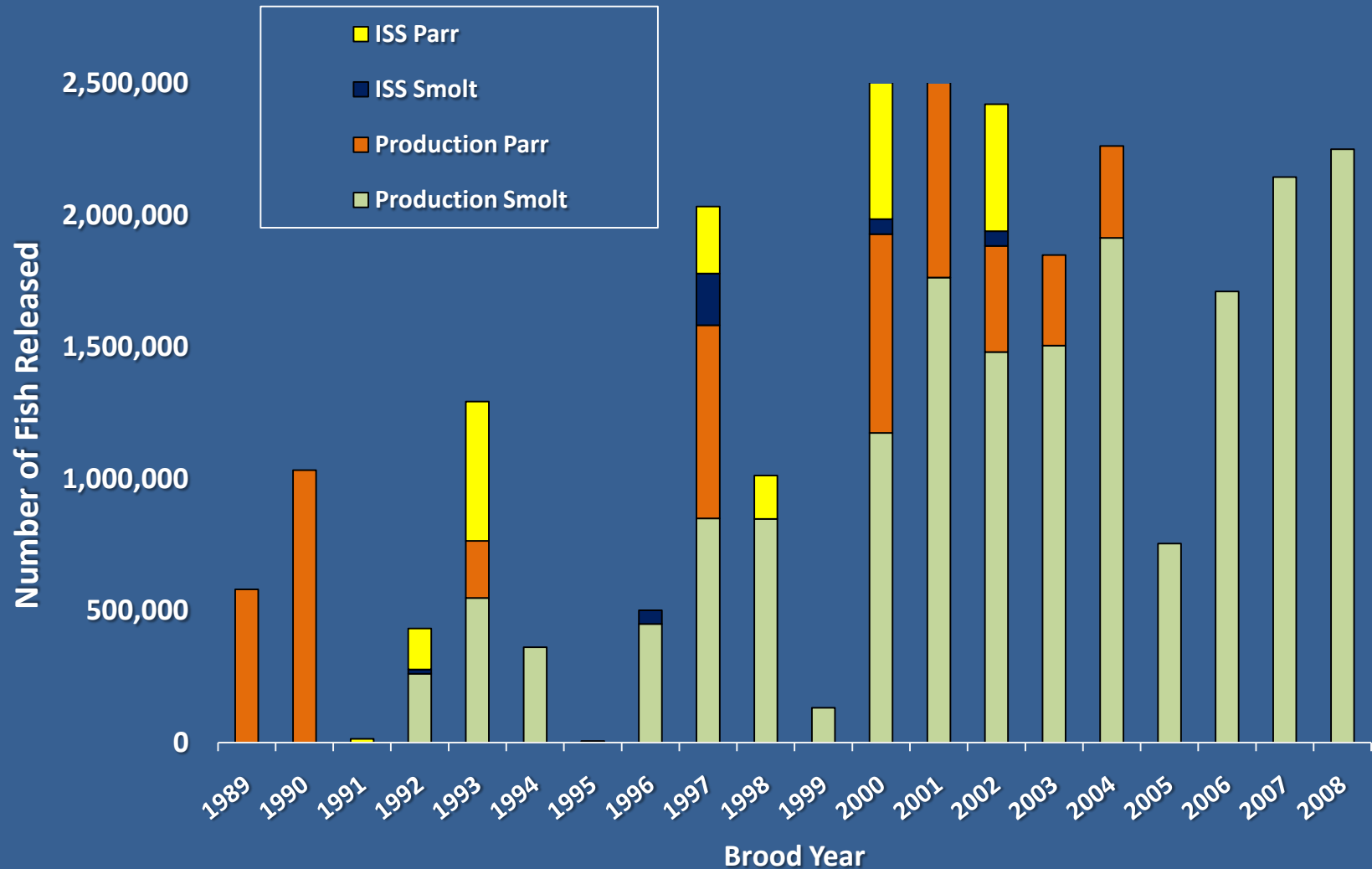
Hatchery Production and Survival Data

In-Hatchery Survival



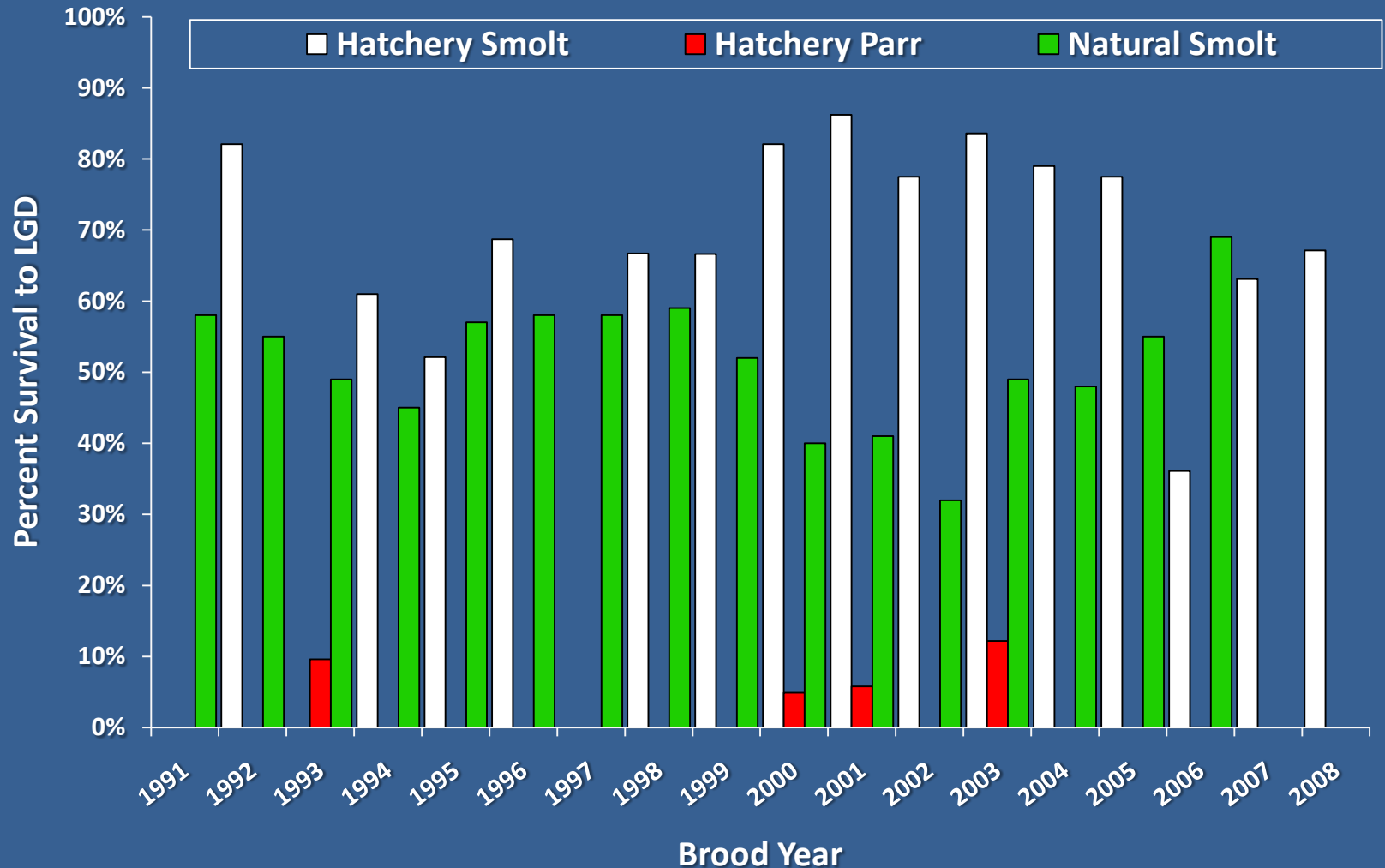
Hatchery Production and Survival Data

Juvenile Releases



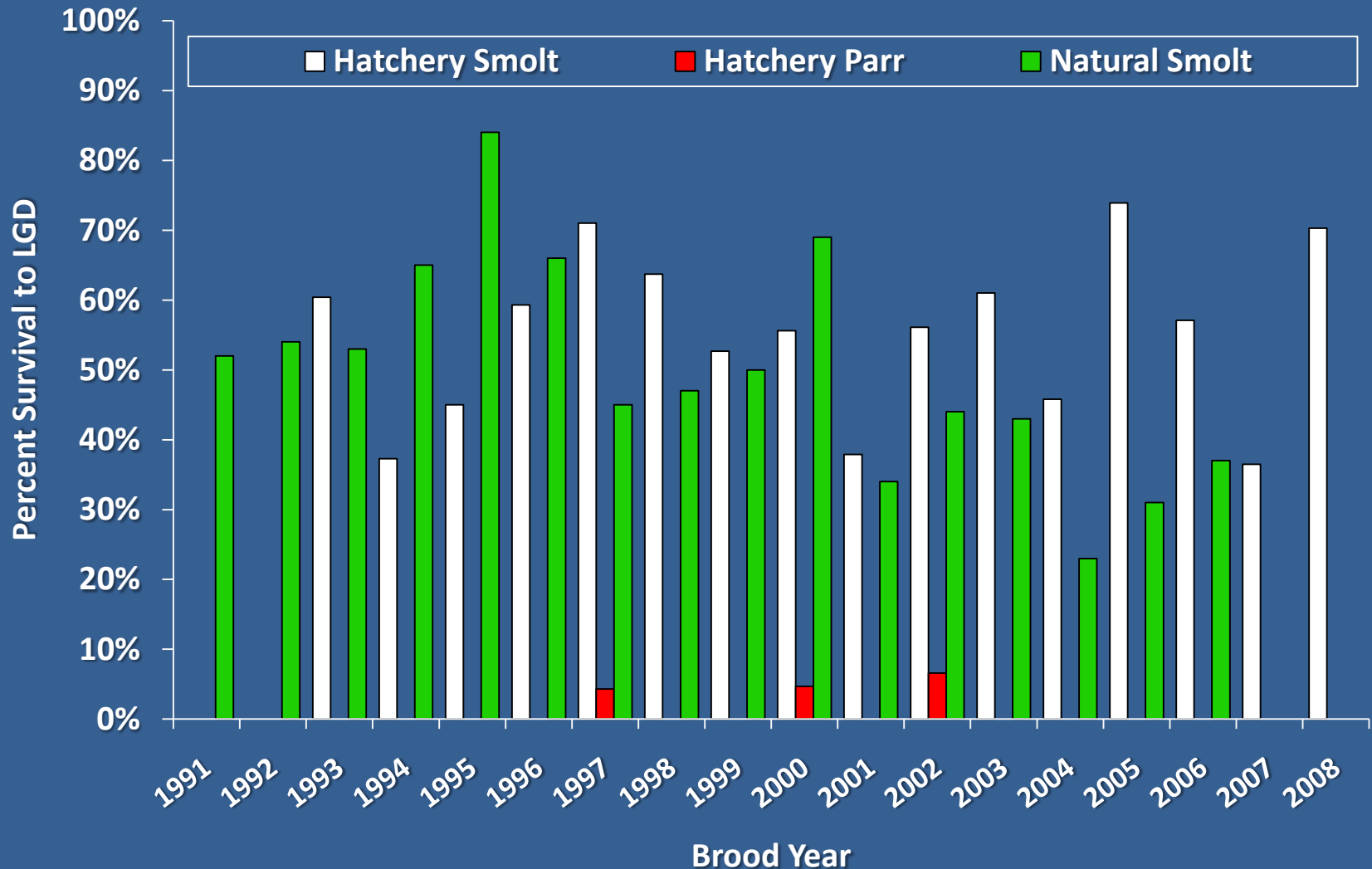
Hatchery Production and Survival Data

Juvenile Survival to LGD (Powell)



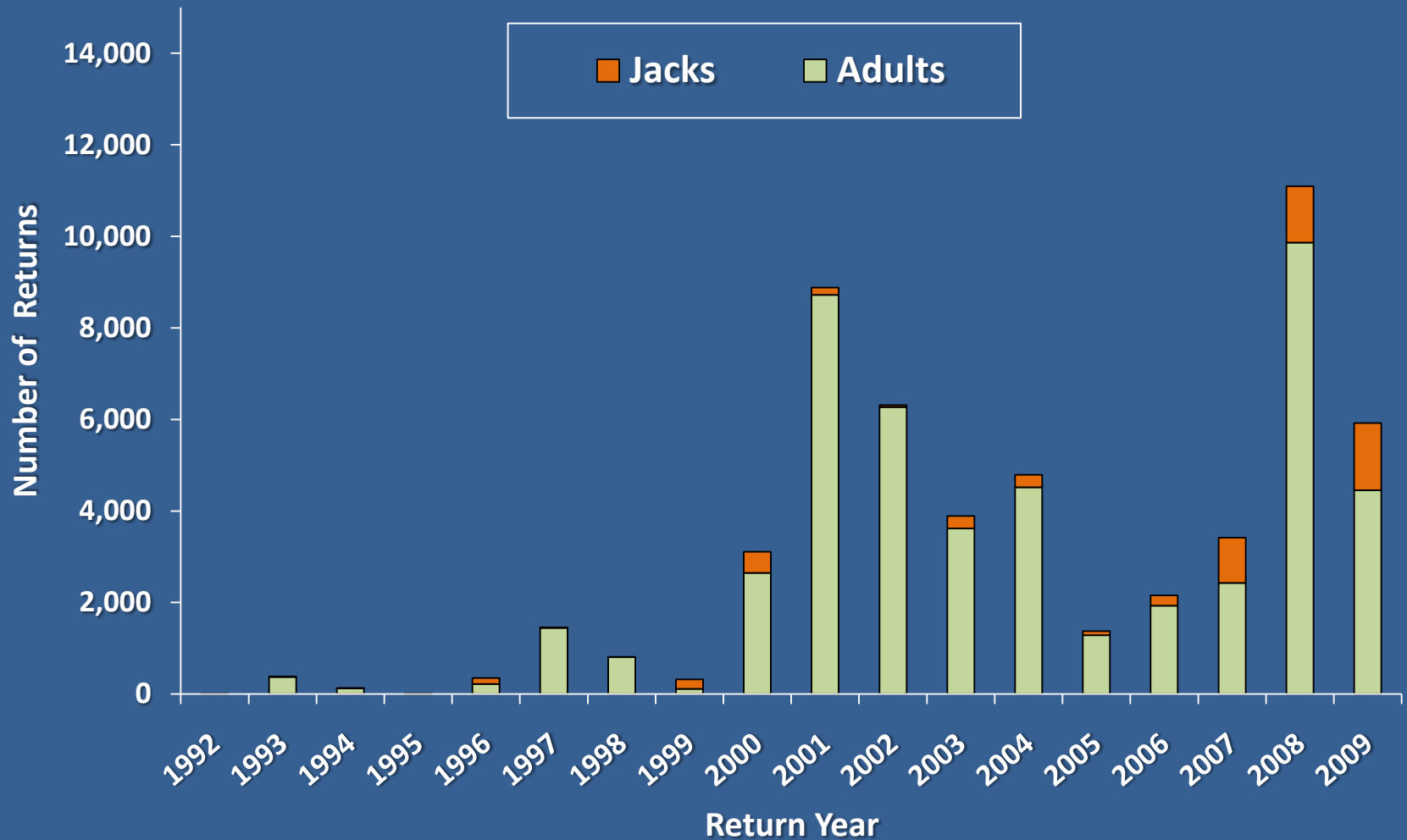
Hatchery Production and Survival Data

Juvenile Survival to LGD (South Fork Clearwater)



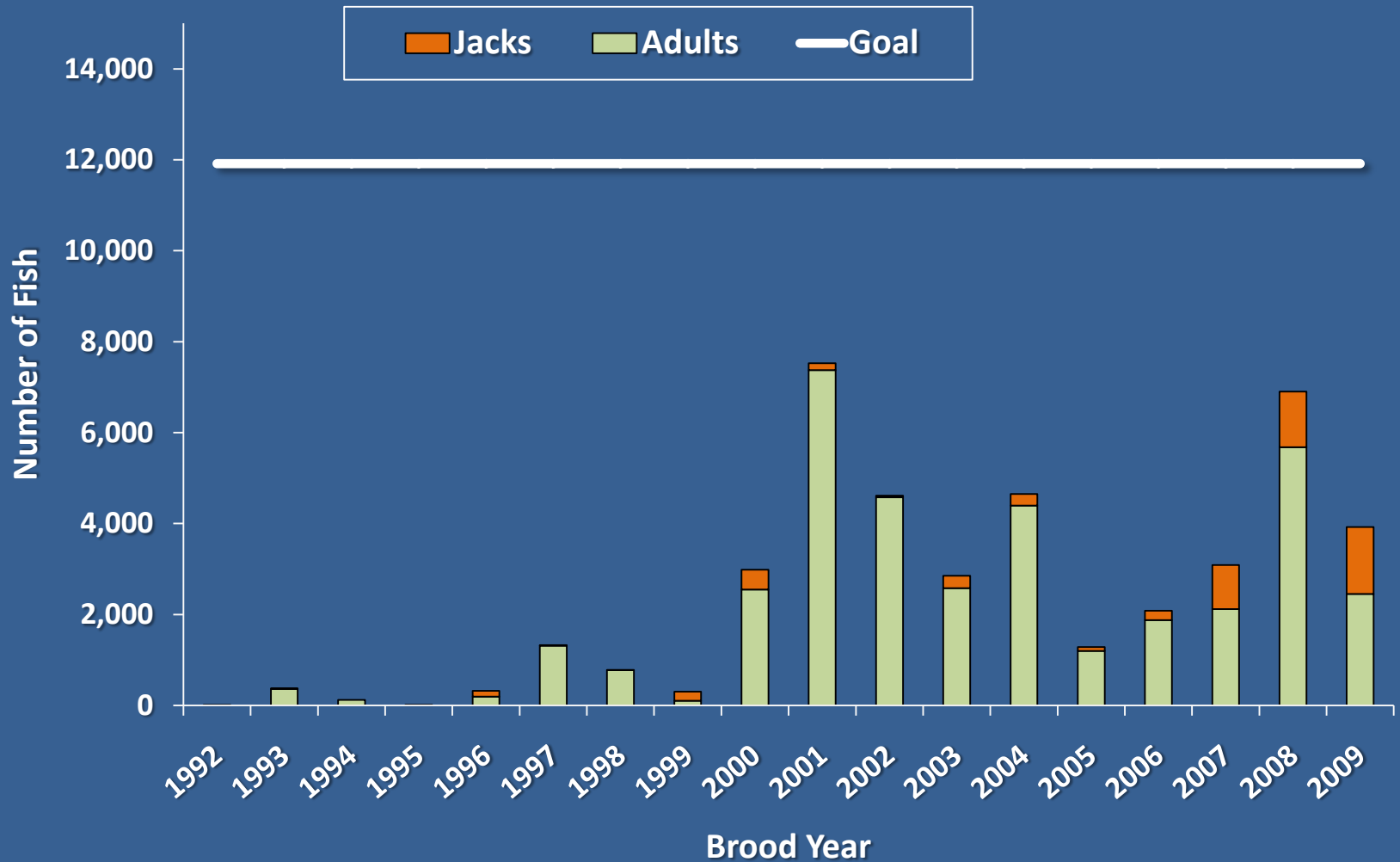
Hatchery Production and Survival Data

Chinook Salmon – Total Adults Produced



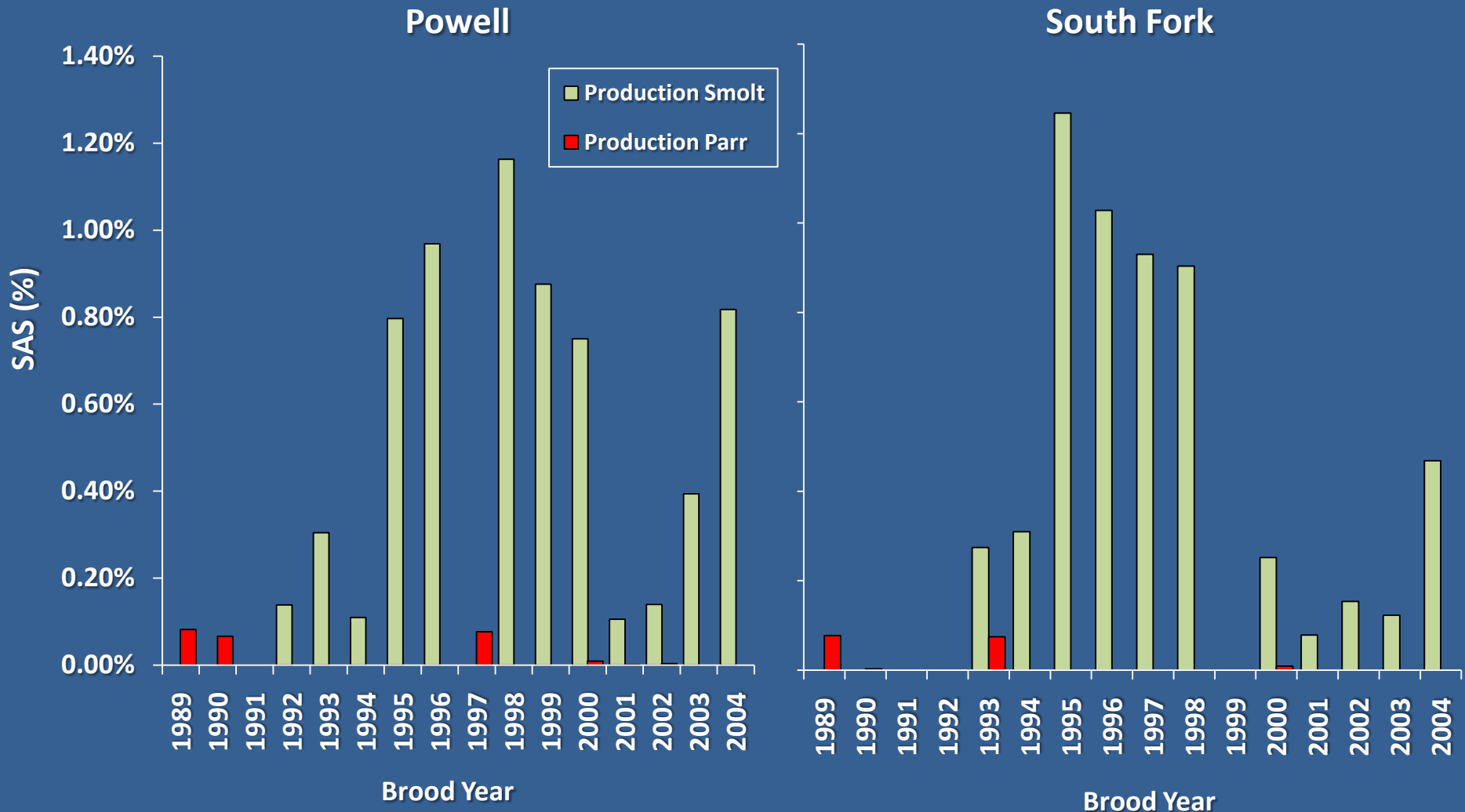
Hatchery Production and Survival Data

Chinook Salmon – Lower Granite Dam



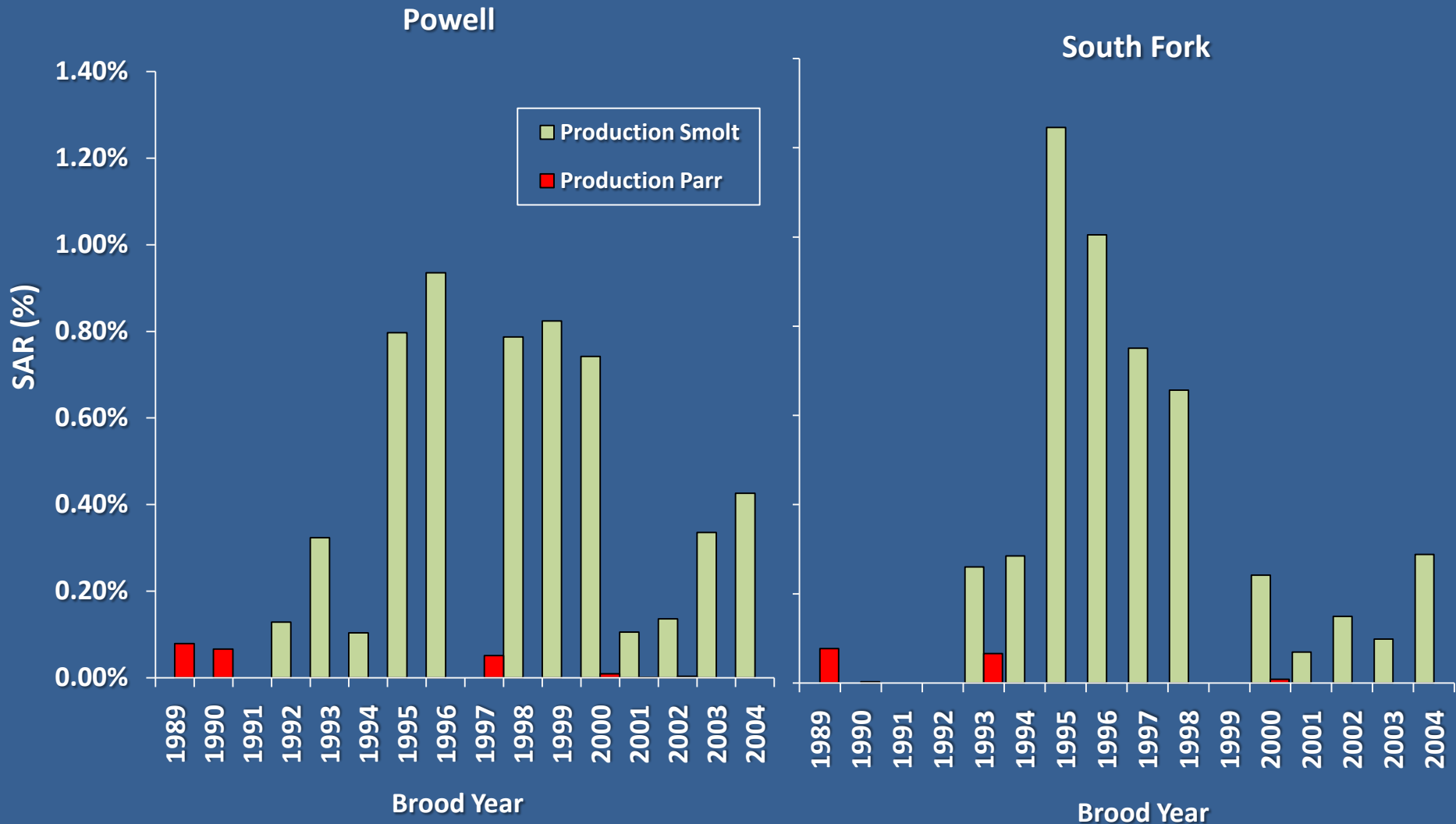
Hatchery Production and Survival Data

Smolt to Adult Survival (SAS)



Hatchery Production and Survival Data

Smolt to Adult Return (SAR)



Life History

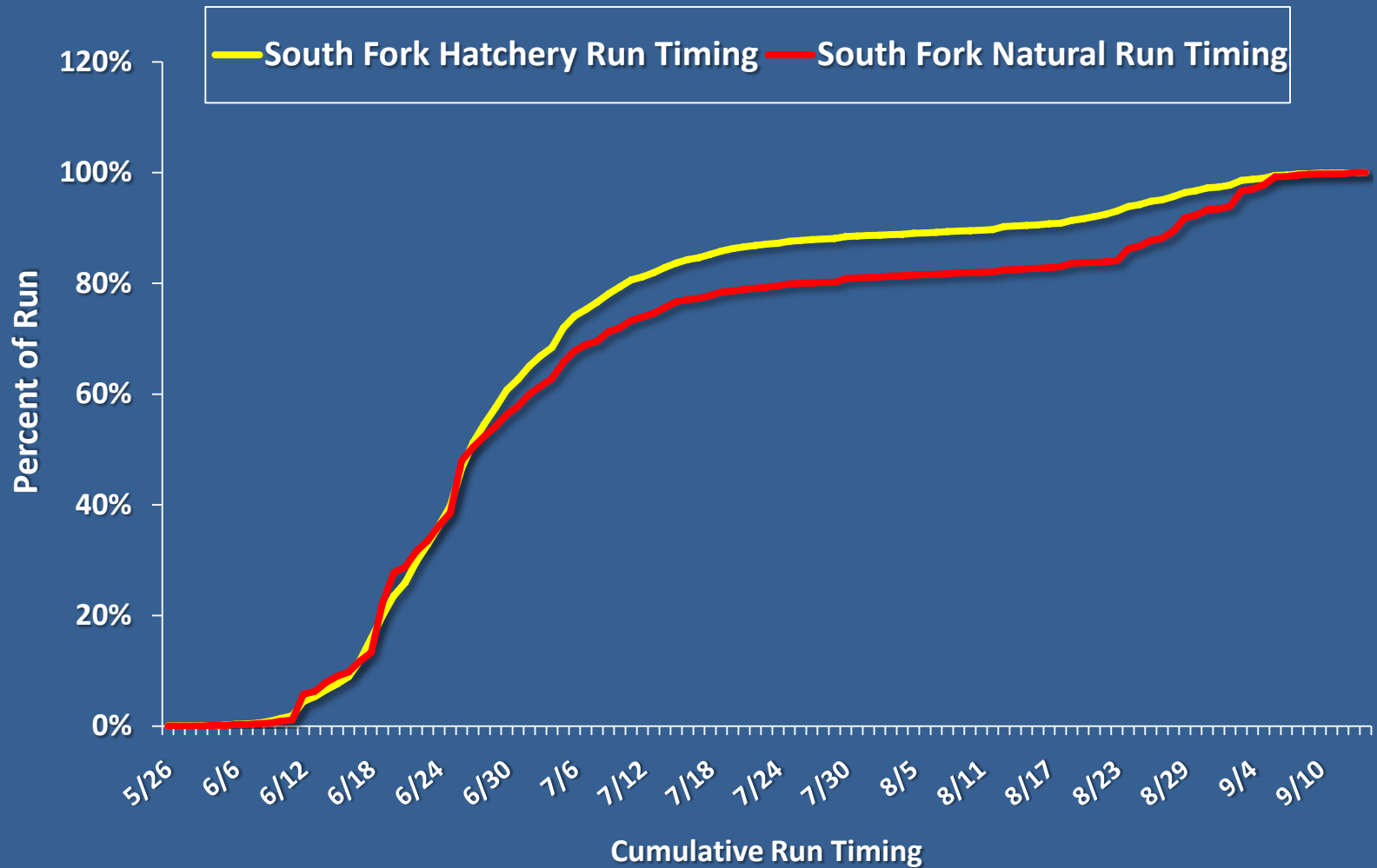
Trends and comparison to natural population

- Run Timing
- Age
- Composition
- Length at Age
- Spawn Timing
- Fecundity



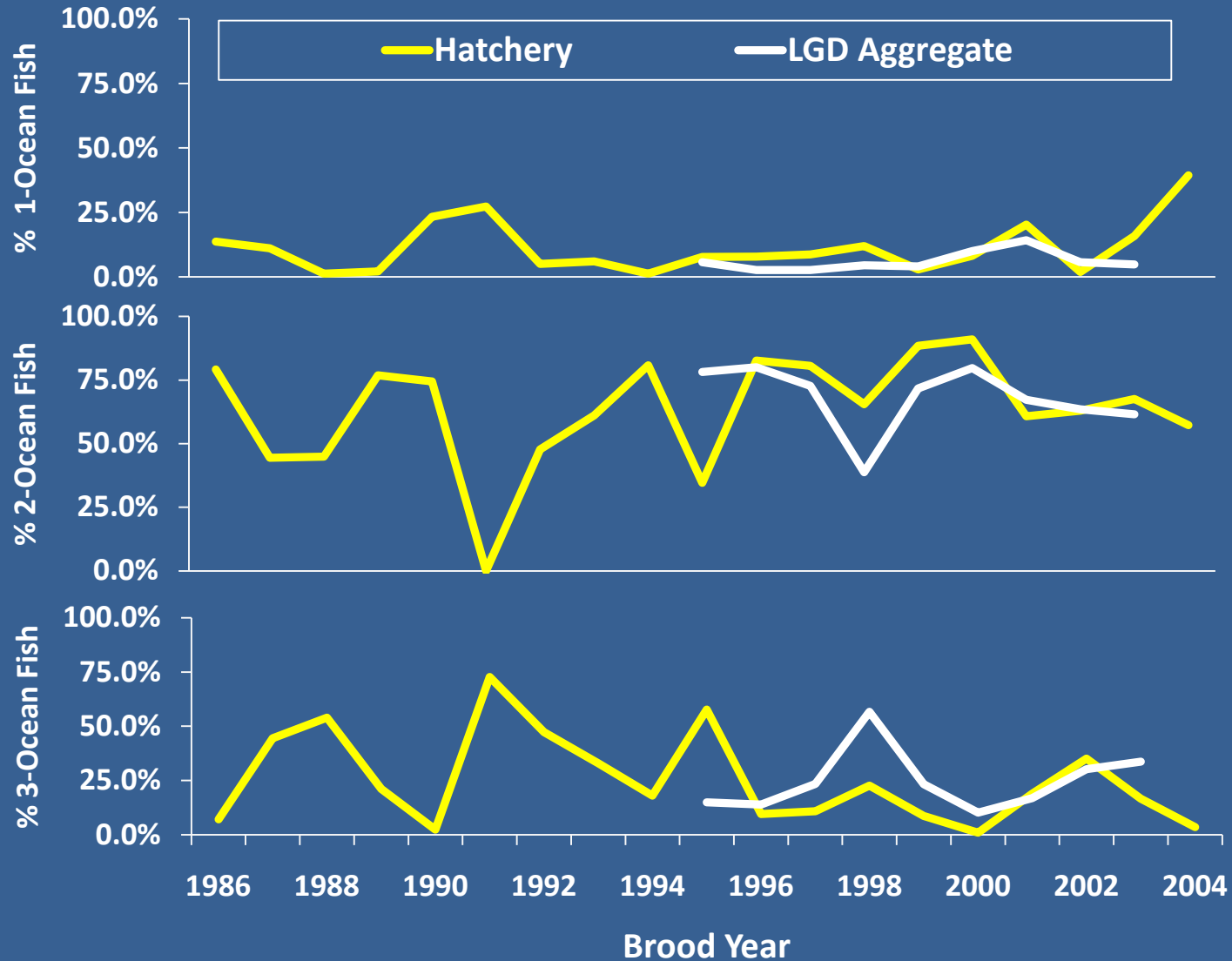
Life History

Adult Run Timing



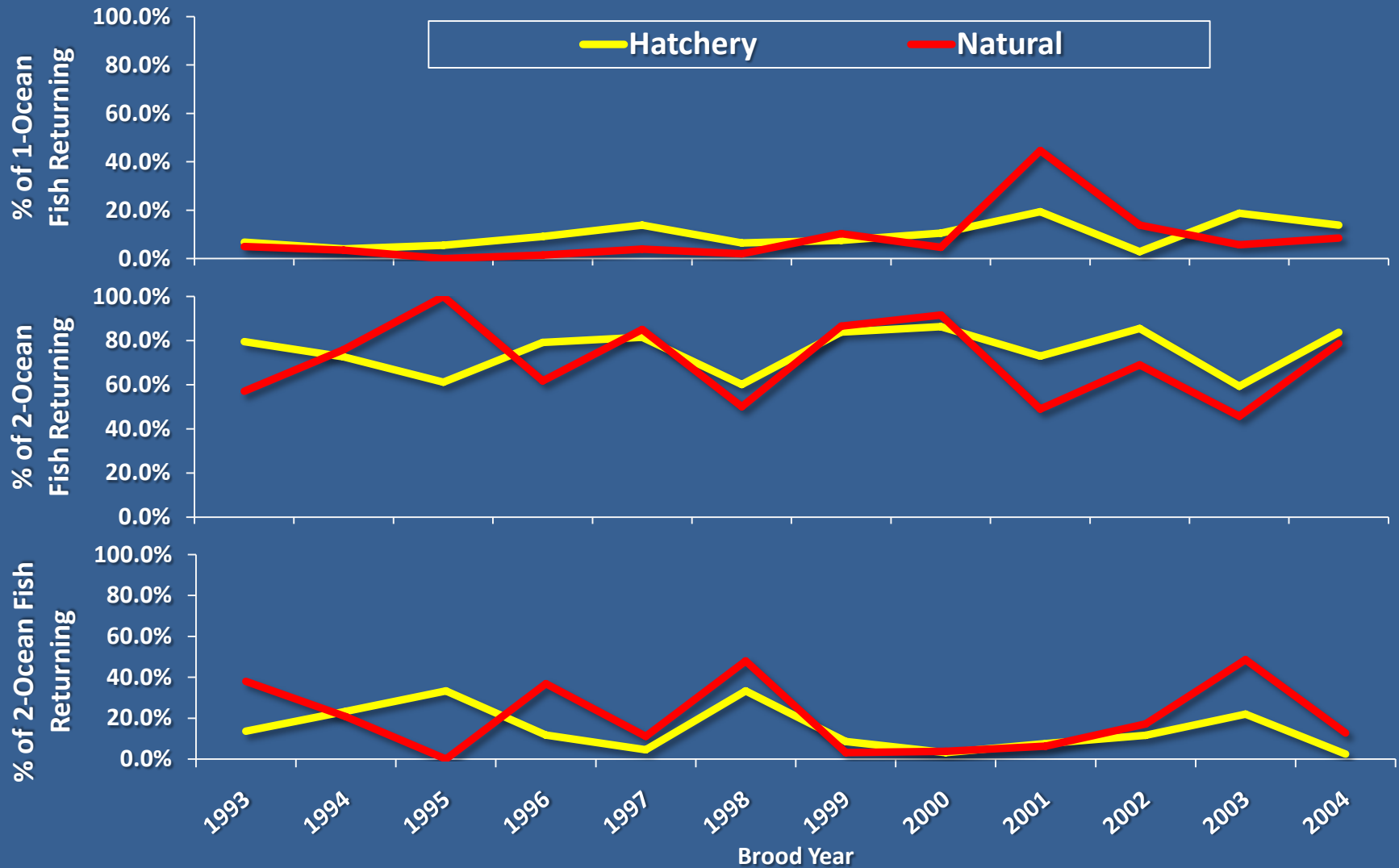
Life History

Age Composition (Powell)



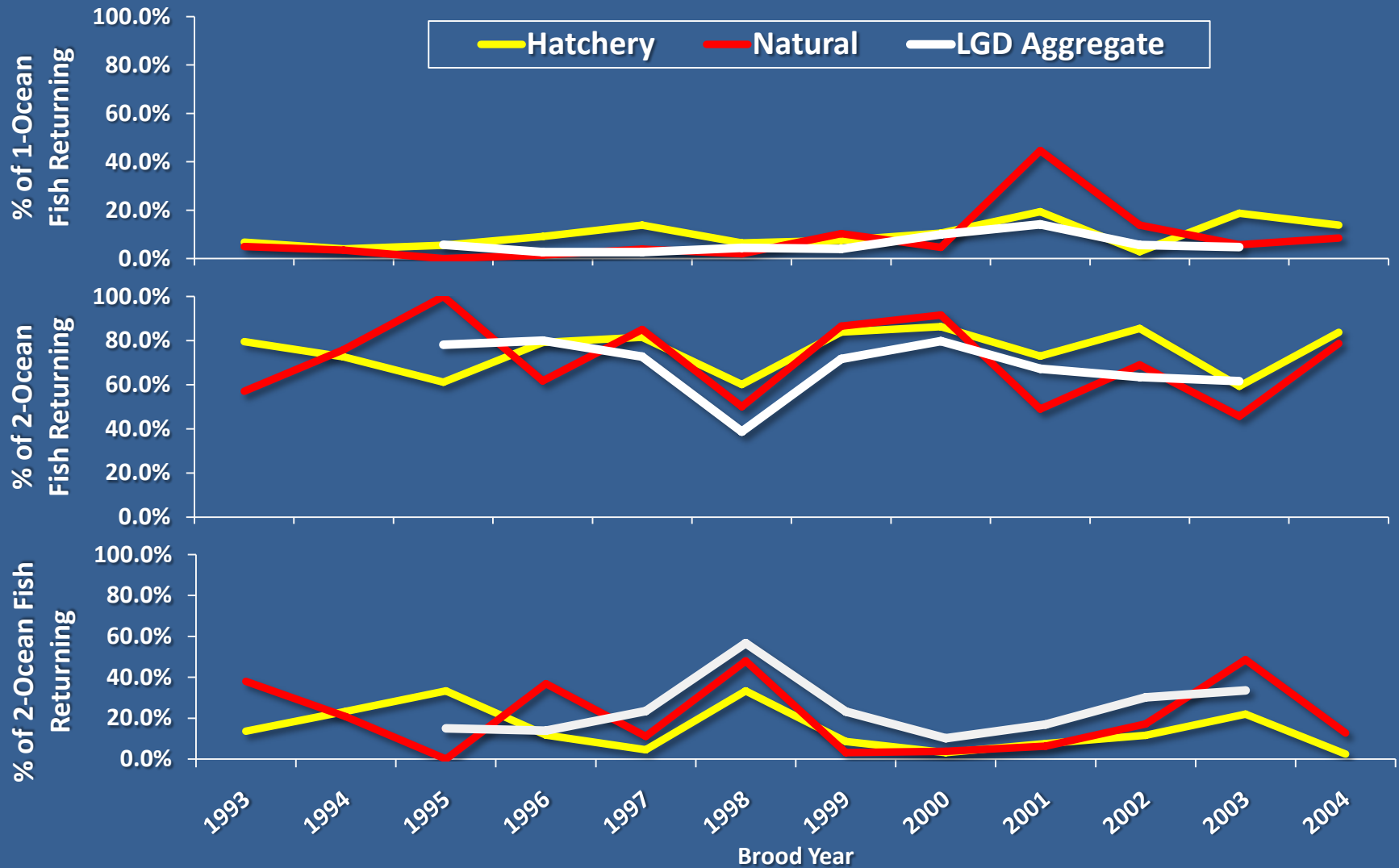
Life History

Age Composition (South Fork Clearwater)



Life History

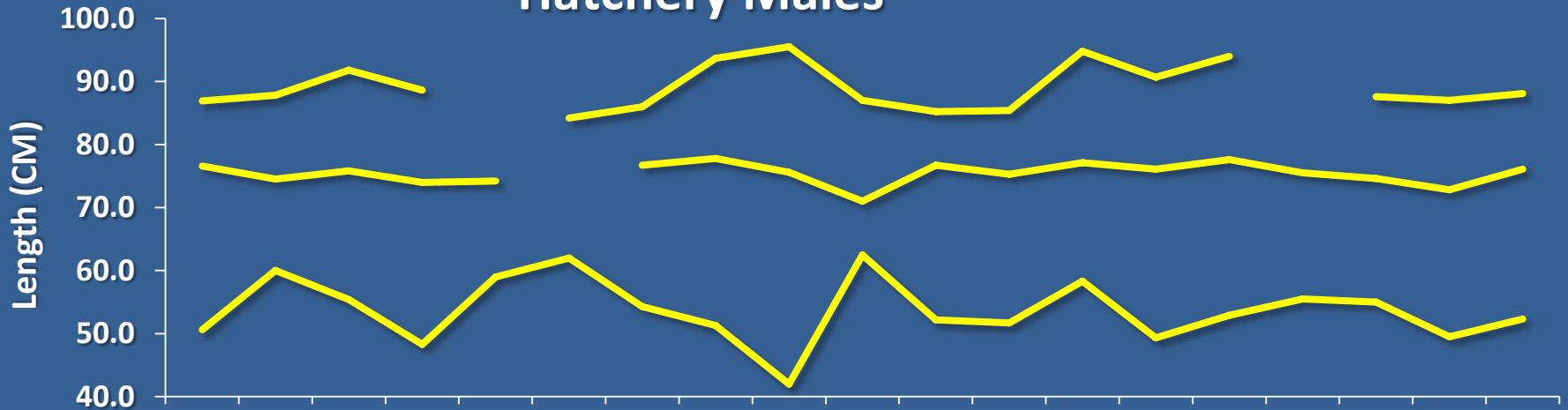
Age Composition (South Fork Clearwater)



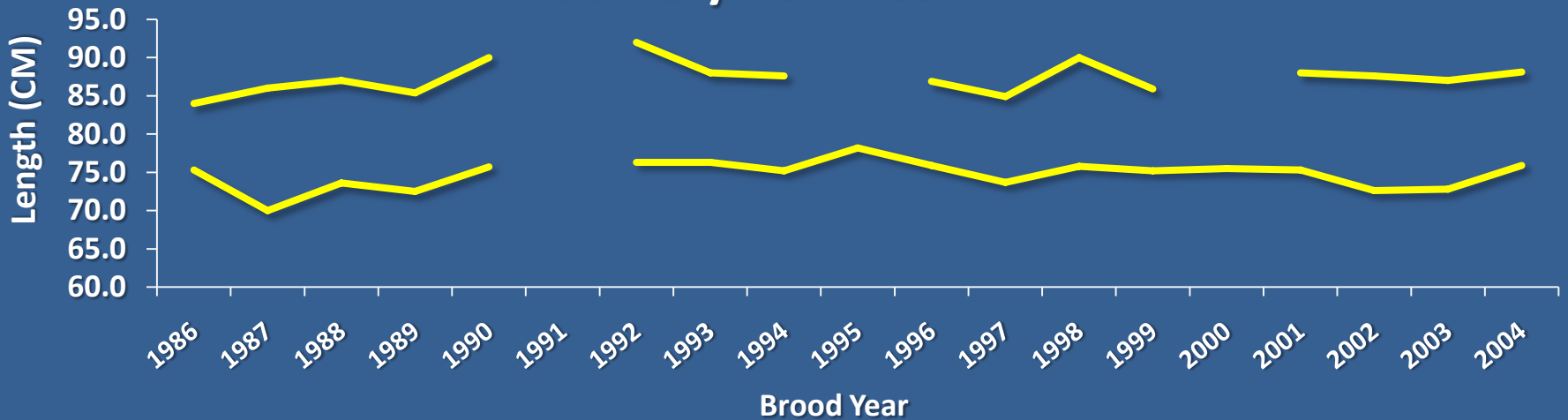
Life History

Length at Age (Powell)

Hatchery Males

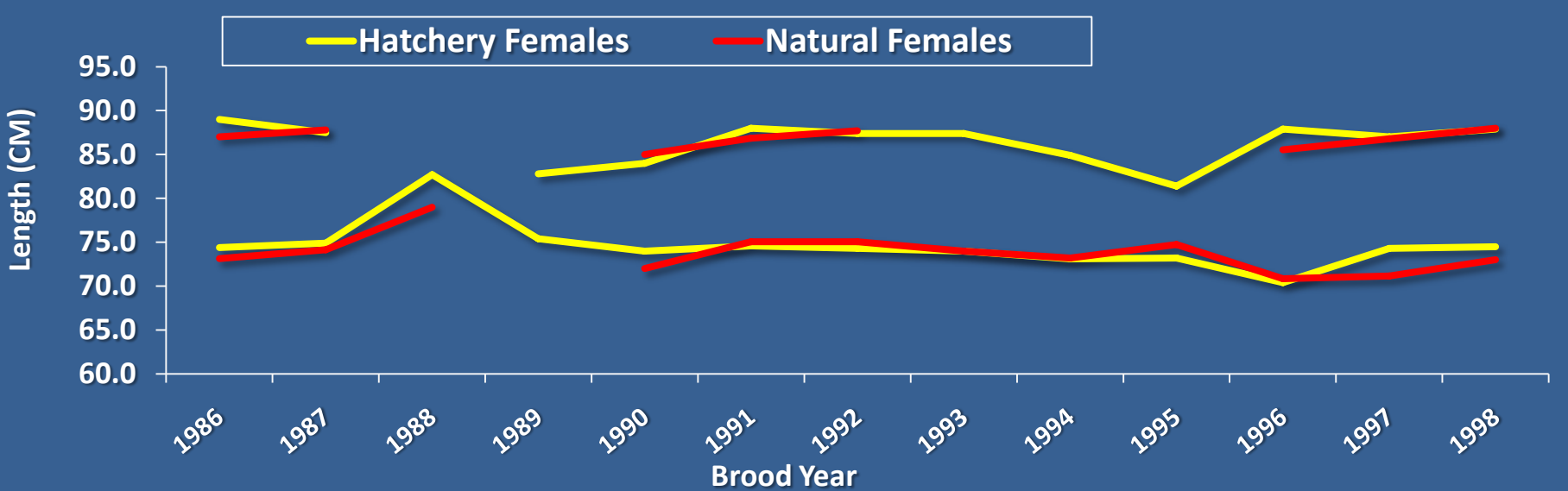
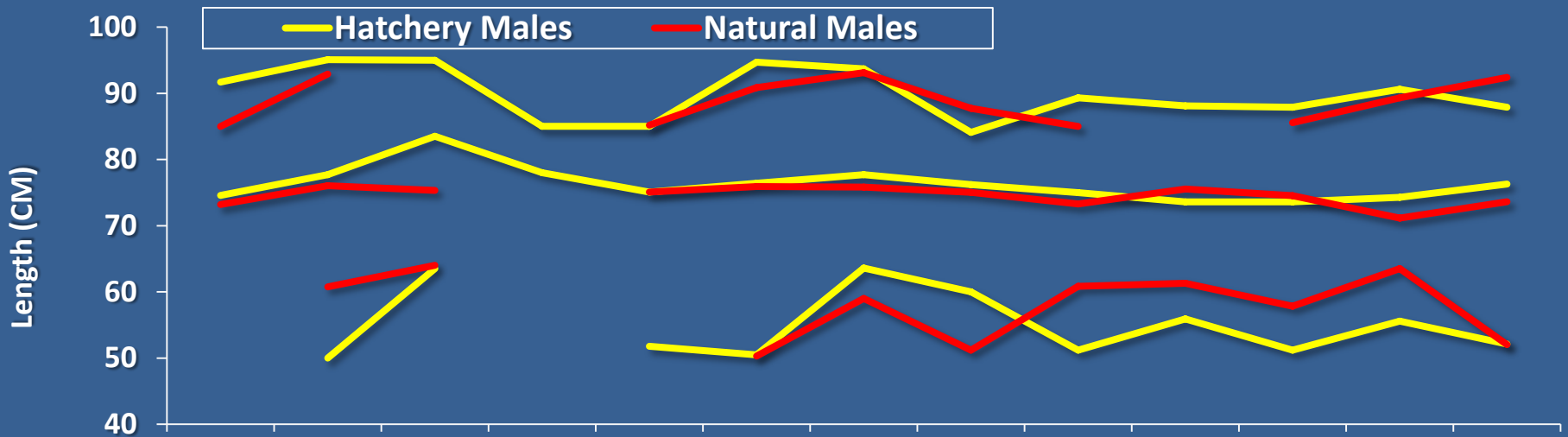


Hatchery Females



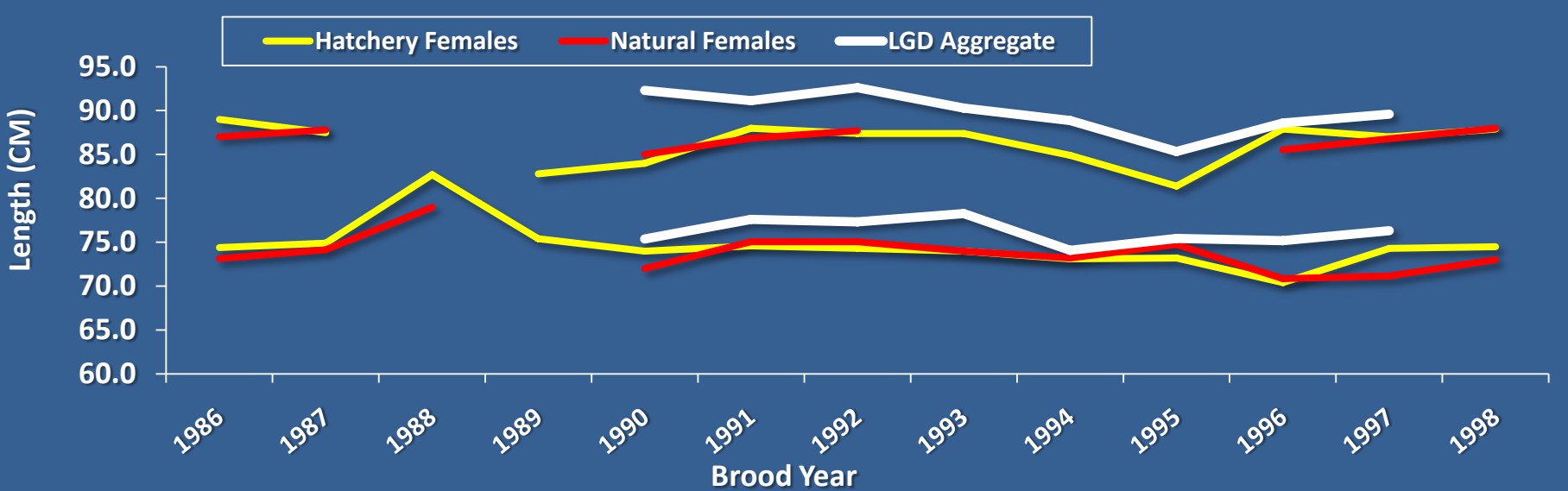
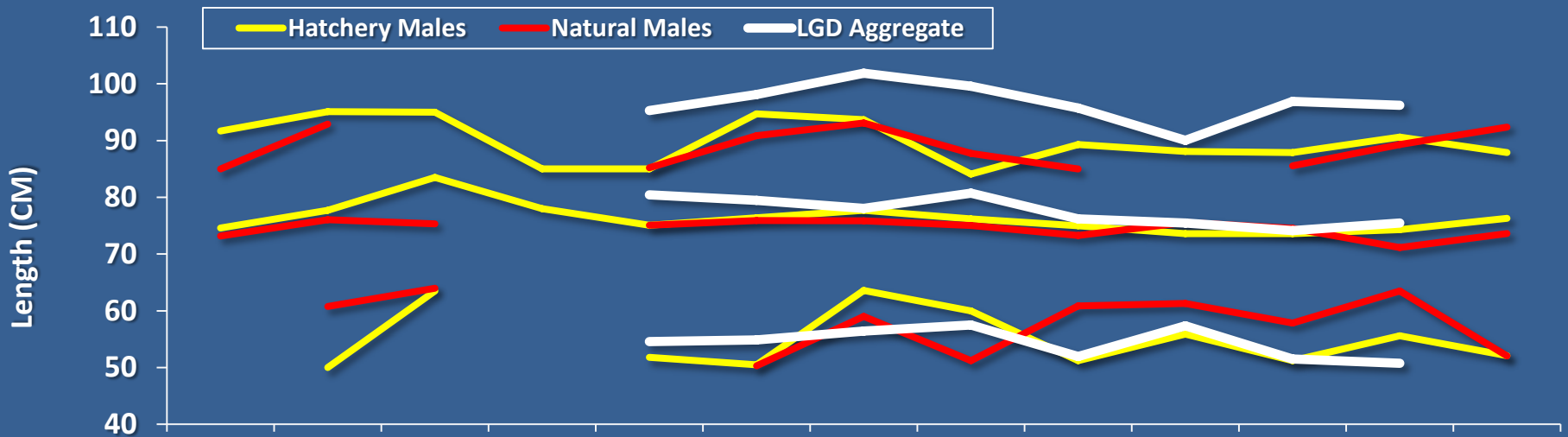
Life History

Length at Age (South Fork Clearwater)



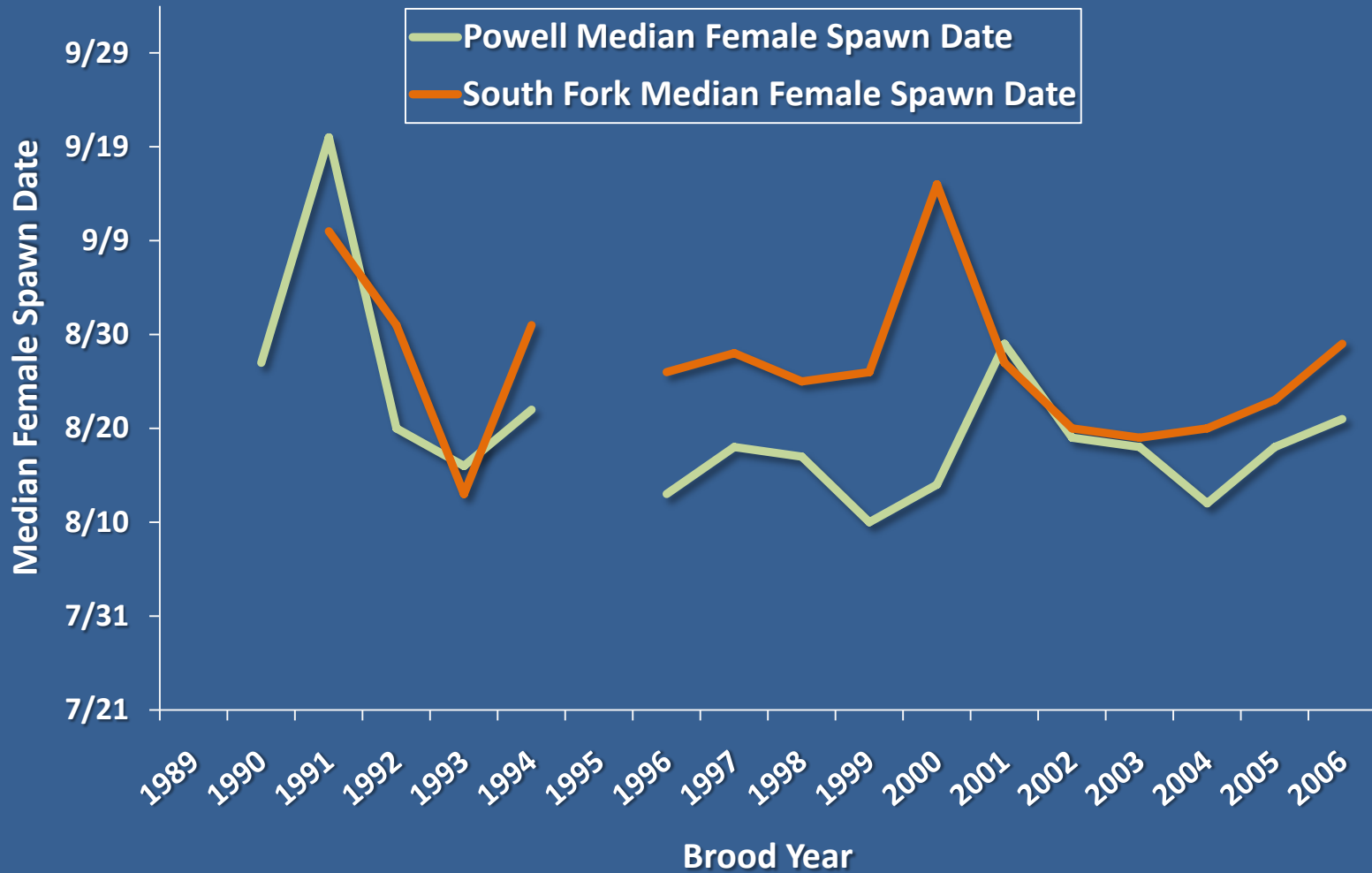
Life History

Length at Age (South Fork Clearwater)



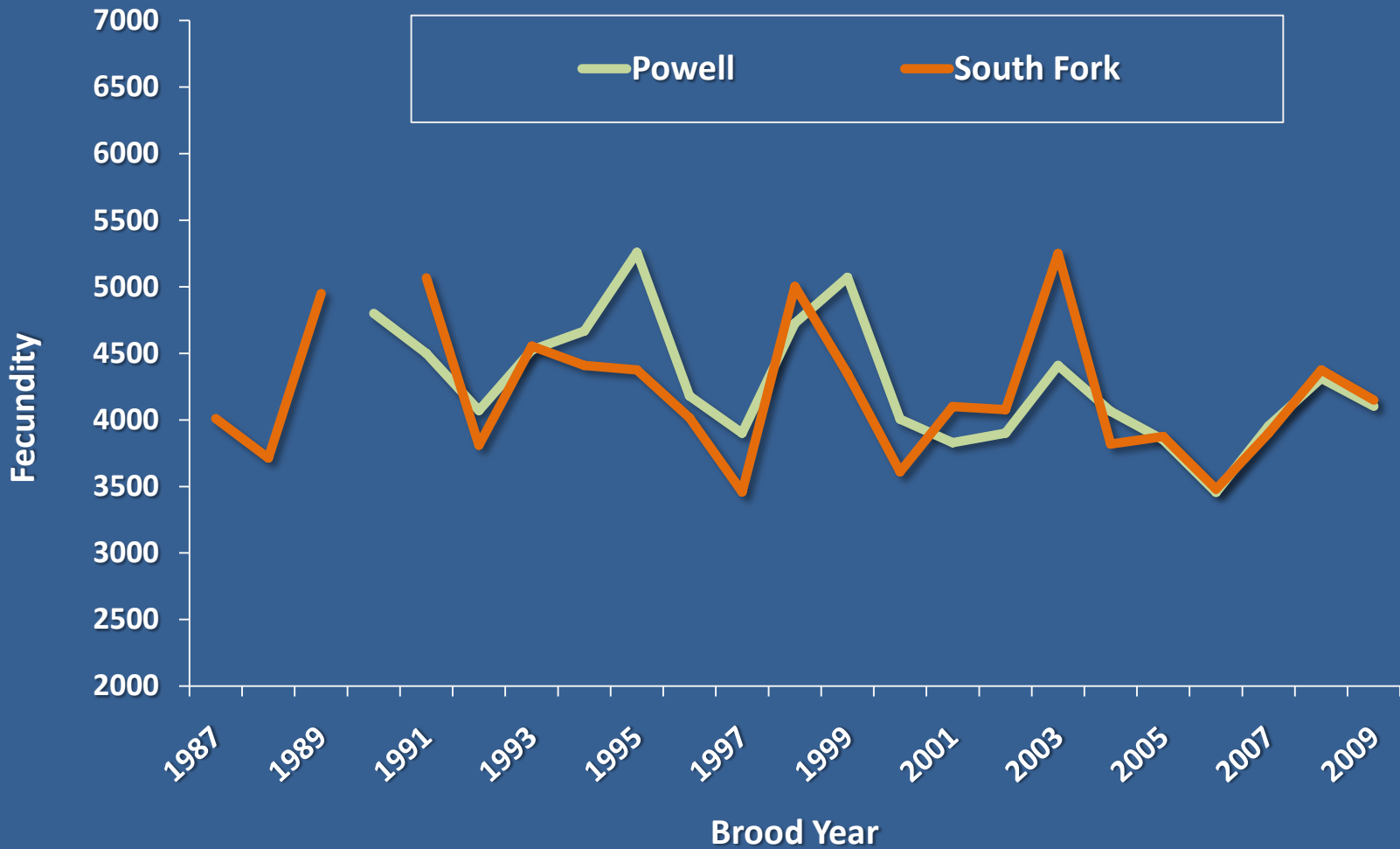
Life History

Spawn Timing



Life History

Fecundity



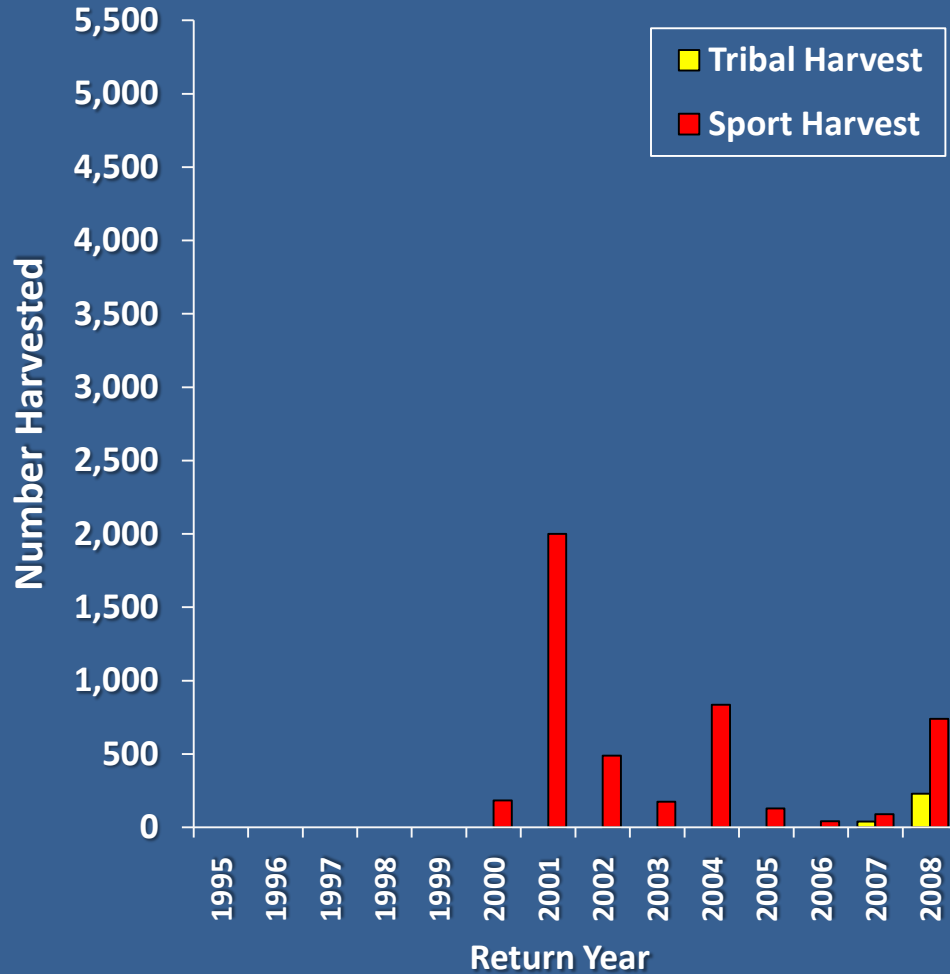
Harvest and Escapement

- Catch and Effort
- Harvest Opportunity
- Strays
- Disposition of Escapement

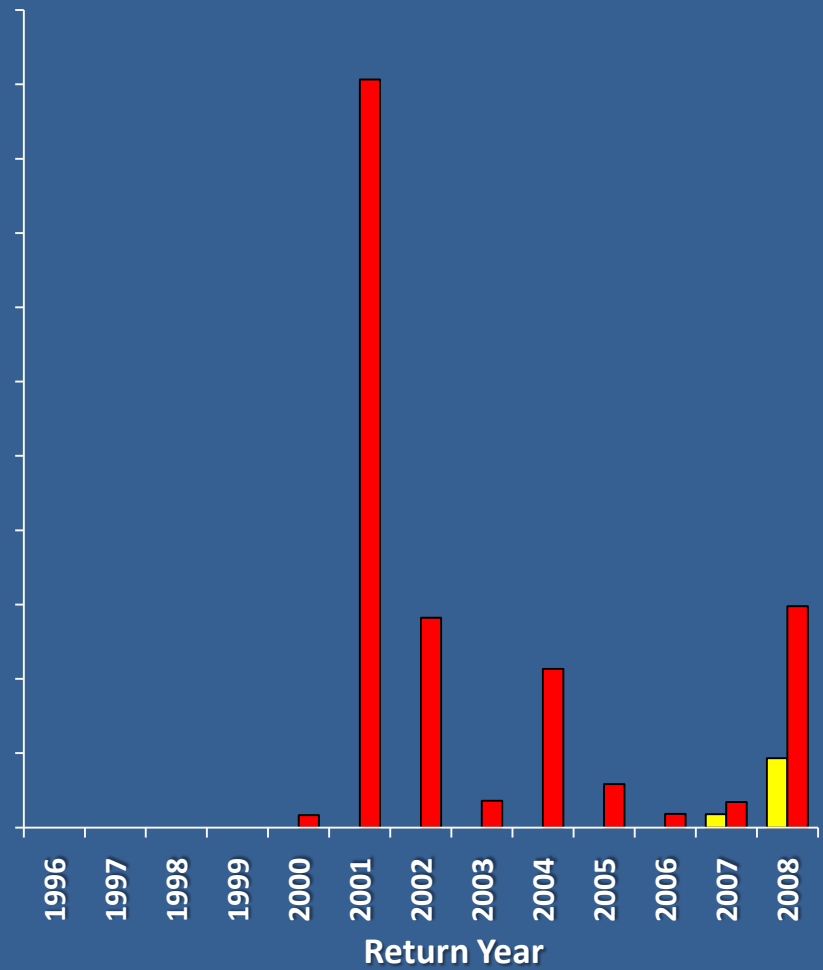


Harvest- by Return Year

Powell

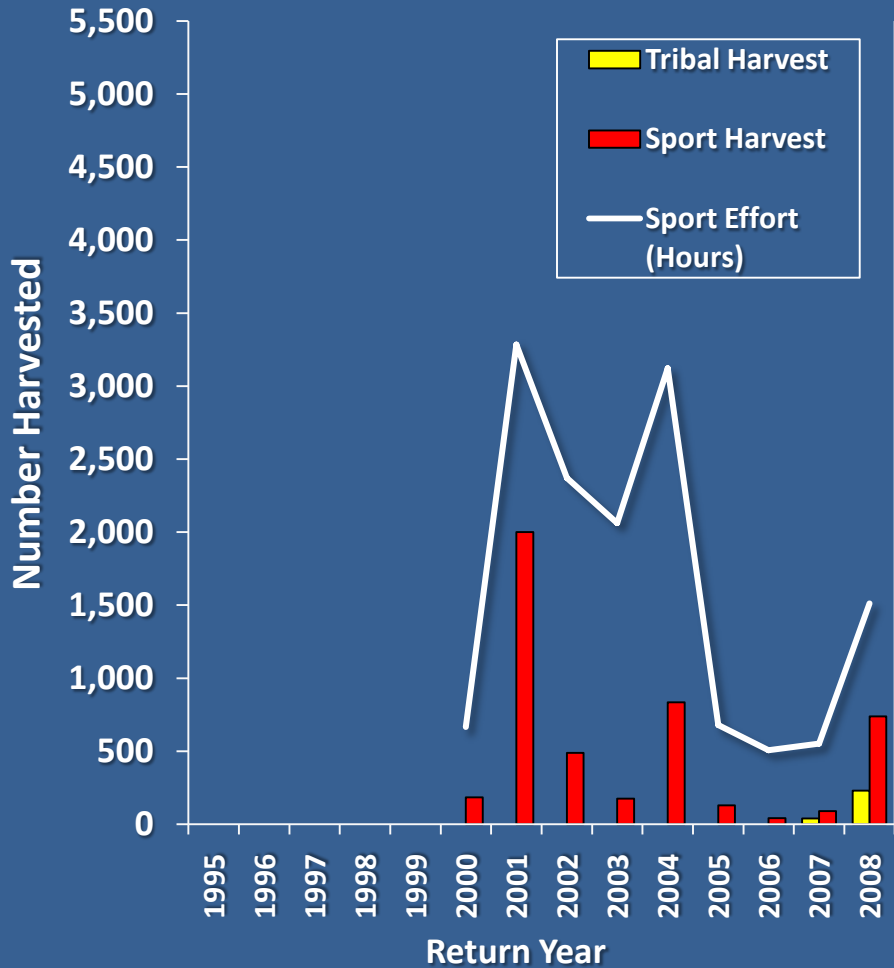


South Fork Clearwater

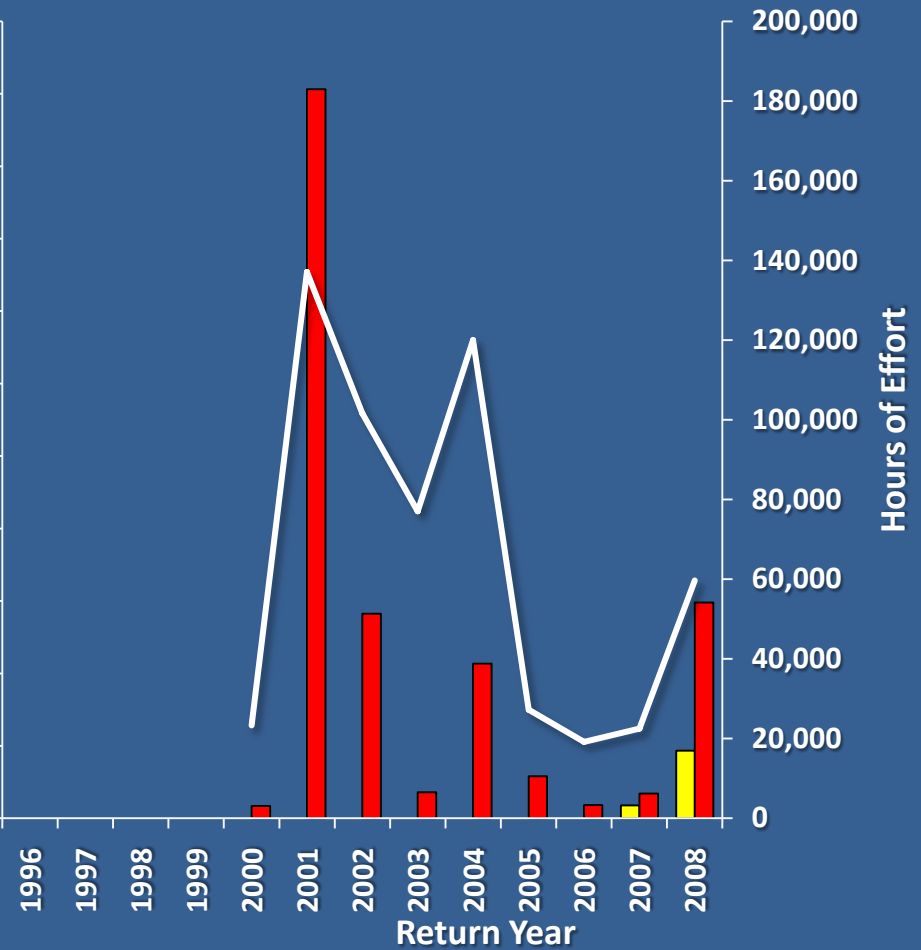


Harvest- by Return Year

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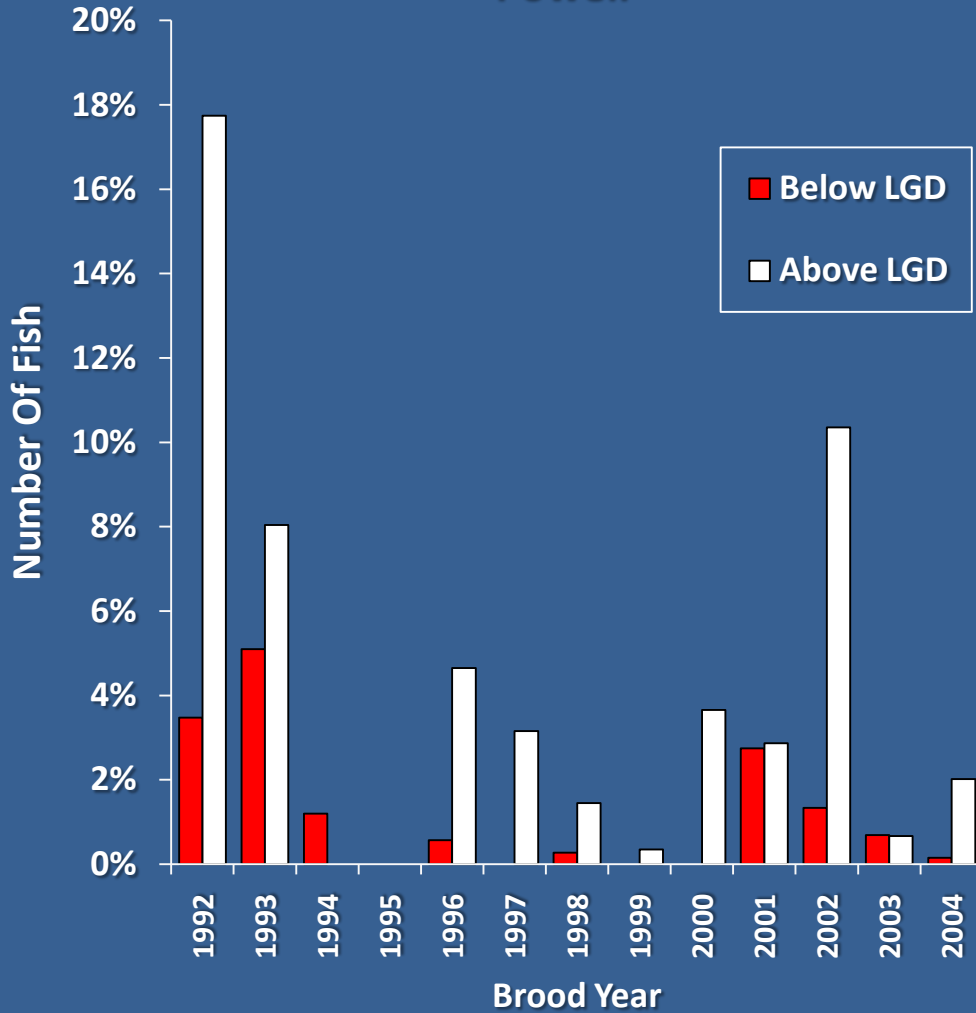


South Fork

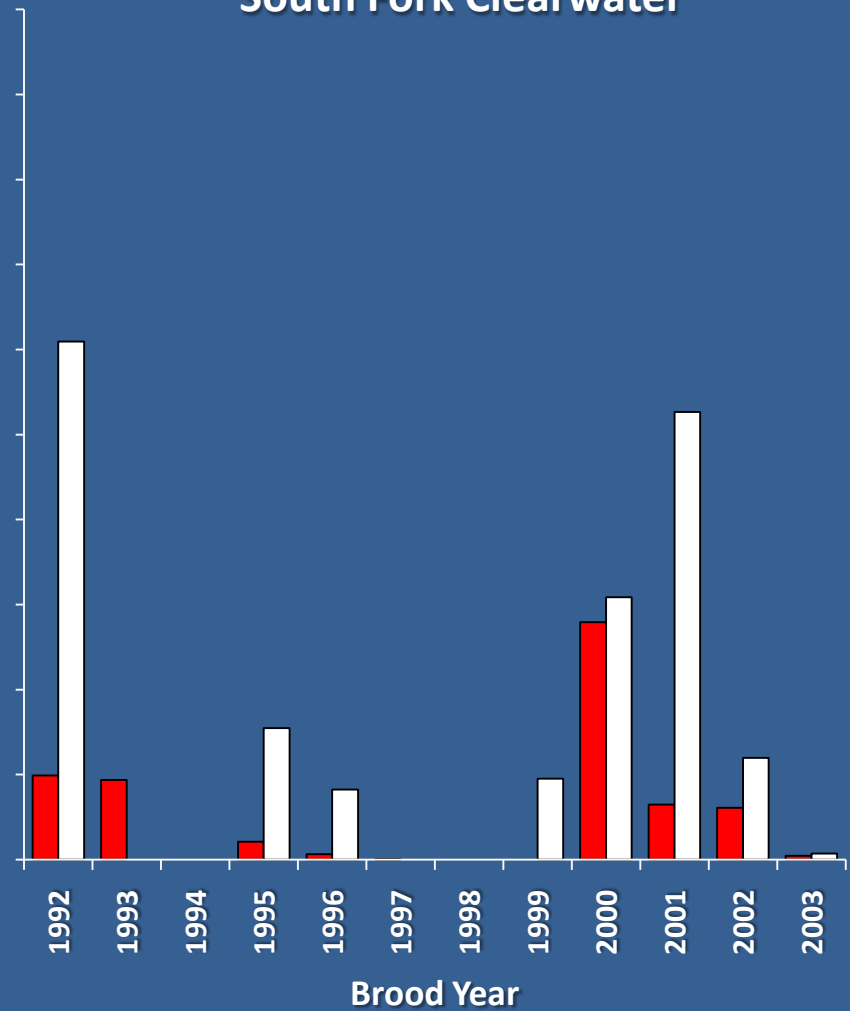


Strays

Powell



South Fork Clearwater



Escapement

Disposition of fish at weir

- **Collaboration between Idaho and tribes to determine beneficial use of escapement**
 - **Broodstock needs and spawning escapement above weir**
 - **Maximize harvest opportunity**
 - **Subsistence use**
 - **Outplants for natural spawning**

Disease / Pathology

- BKD has been an issue in the past but has been significantly reduced
- Minor issues with Ich early on (none since 2000)
- Sunburn- an emerging issue??
- No significant reoccurring disease issues

Program Summary

- Consistent high survival during hatchery culture
- Poor survival of subyearling releases
- Highly variable post-release survival
- Upswing in post release survival since 1996
- Have never met Project Area mitigation goal
- No distinct trends in life history characteristics
- Synchrony between hatchery- and natural-origin fish
- Since 2000 significant rebuilding of recreational and tribal fisheries
- Low observed stray rates
- Disease has not been a significant issue

M&E Outlook

- Continued monitoring of hatchery production and productivity measures

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- PIT Tagging
 - Estimating adult survival
 - Migration timing and inter-dam conversion
 - In-season fisheries management

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- PIT Tagging
 - Estimating adult survival
 - Migration timing and inter-dam conversion
 - In-season fisheries management
- Parental Based Tagging (PBT)
 - Catch contribution
 - Stock Identification
 - Heritability/ Family Effects

M&E Outlook

Natural Population Monitoring

- Continue above/below weir monitoring

M&E Outlook

Natural Population Monitoring

- Continue above/below weir monitoring
- Redd counts/ carcass surveys
- Juvenile Trapping and PIT Tagging
- In-stream PIT arrays
- Representative PIT tagging adults at Lower Granite Dam
- Genetic Stock ID at Lower Granite

Moving Forward

- **The Clearwater Fish Hatchery program will focus on meeting LSRCP mitigation objectives**
 - **Have initiated development of summer run program in SF Clearwater and Selway rivers**
 - **Expand harvest opportunity**
 - **Improved survival ??**
- **Continue to mitigate for lost sport and tribal fishing opportunity**
- **Continued coordination between state and tribal and federal managers**

Questions?



Put it all Together

Smolt to Adult Survival Rate

