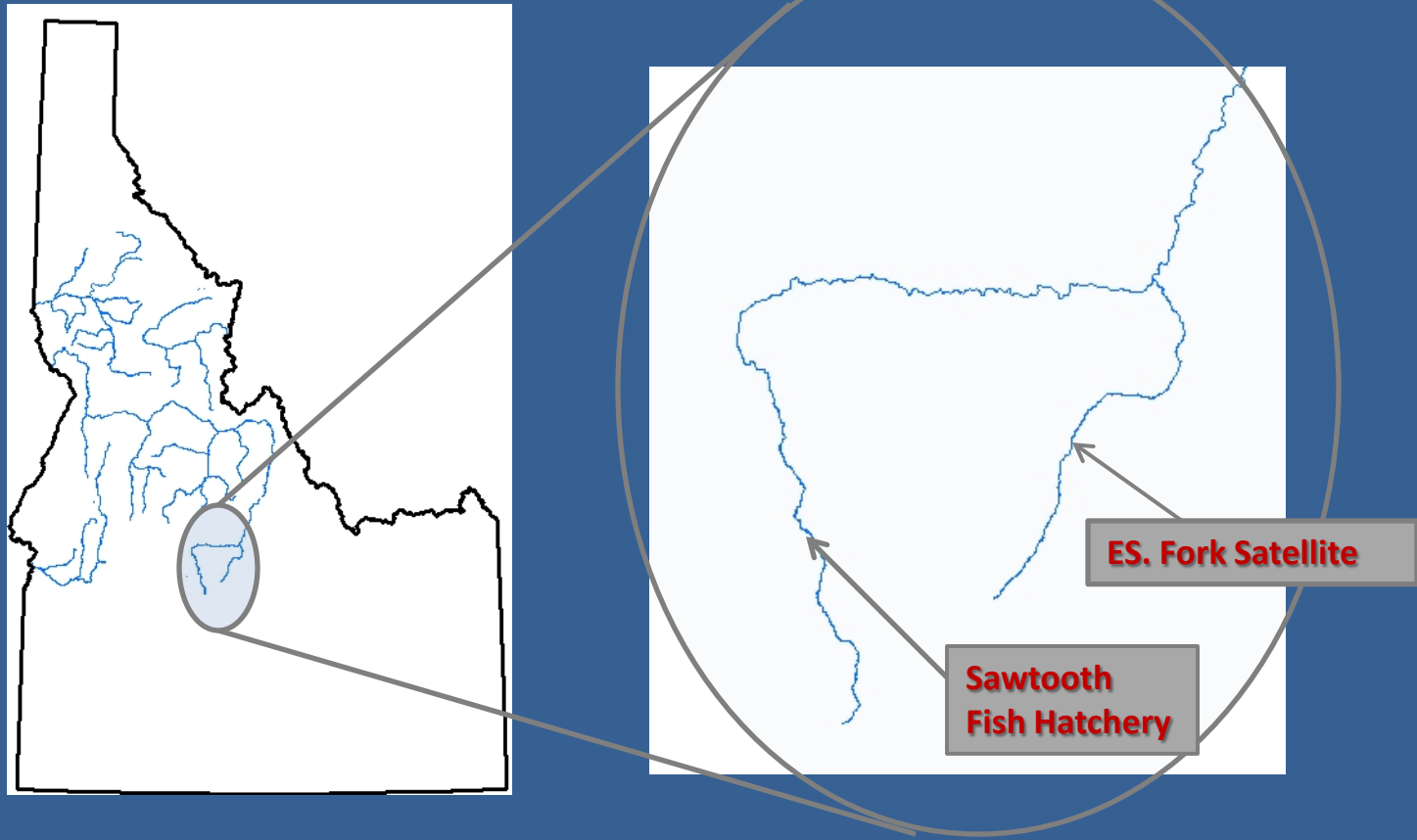


Upper Salmon River Spring Chinook Salmon

John Cassinelli, Brian Leth, Shane Knipper

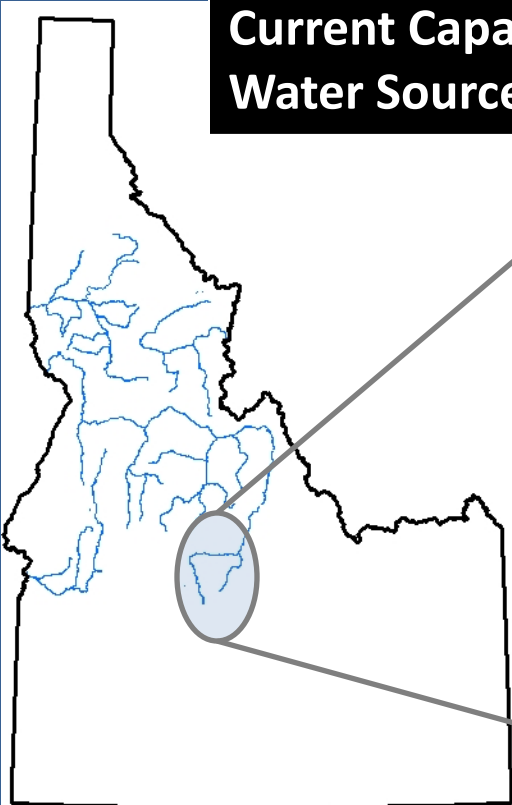


Upper Salmon River Sawtooth Fish Hatchery and Satellite



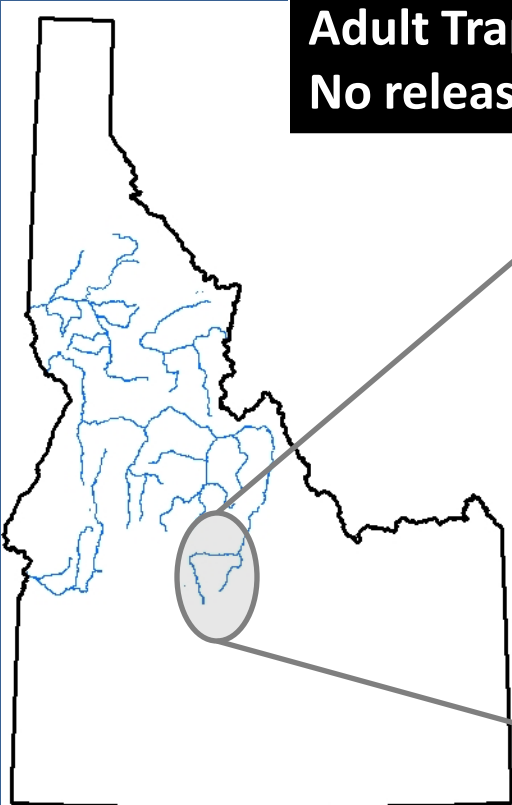
Upper Salmon River Sawtooth Fish Hatchery

Construction completed in 1985
Design Capacity- 2.3 million
Current Capacity- 1.7 million smolts
Water Source- well and river



Upper Salmon River East Fork Satellite

Construction complete in 1984
Adult Trapping and Spawning
No releases since BY1993



Program Background

Goals and Objectives

- **Mitigation Goals**
 - **Adult Return- 19,400 above Lower Granite Dam (77k down river harvest)**
 - **Original Smolt Release Goal- 2.3 million (0.87 SAR- post downriver harvest)**
 - **East Fork Salmon River (700,000),**
 - **Valley Creek (300,000)**
 - **Sawtooth Hatchery (1,300,000)**
 - **Adjusted smolt release target of 1.7 million full term smolts**

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- **M & E Objectives**
 - Monitor production, productivity and life history characteristics of hatchery and natural populations
 - Evaluate broodstock and rearing strategies to increase adult returns

Program Background

Broodstock and Release Strategy

- **Broodstock History/Strategy**
 - Initial brood collected in the USSR 1981-84
 - Releases of Rapid River Chinook in the late 70s
 - De facto integration/supplementation until 1995
 - 1995-2009 segregated brood with supplementation research
 - 2010 implementation of stepping-stone integration

Program Background

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 - 1995-2009 segregated brood with supplementation research
 - 2010 implementation of stepping-stone integration
- **Release Strategy**
 - 1,500,000 full term smolts (+200k for Yankee Fork)
 - Reared on USR water and released directly to USR

Program Background

USR Natural Population Status

- **Natural population listed as threatened in 1992**
 - Hatchery population included in listing in 2005
- **Natural-origin abundance has ranged from 18 - 1,431 (1981-2009)**
- **ICTRT Status assessment- Not Viable**
 - High risk for abundance and productivity
 - Moderate risk for spatial structure and diversity

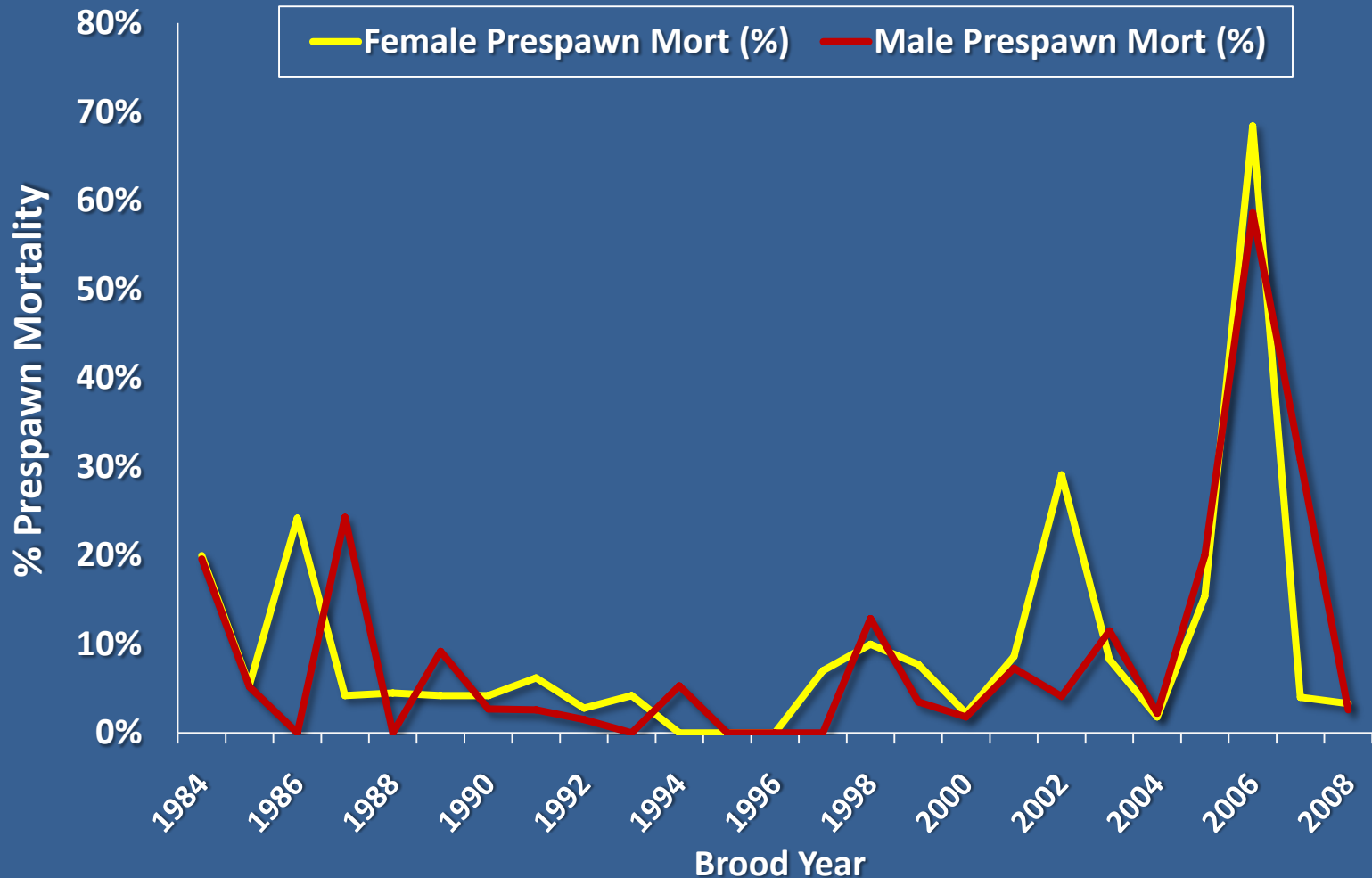
Hatchery Production and Survival Data

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



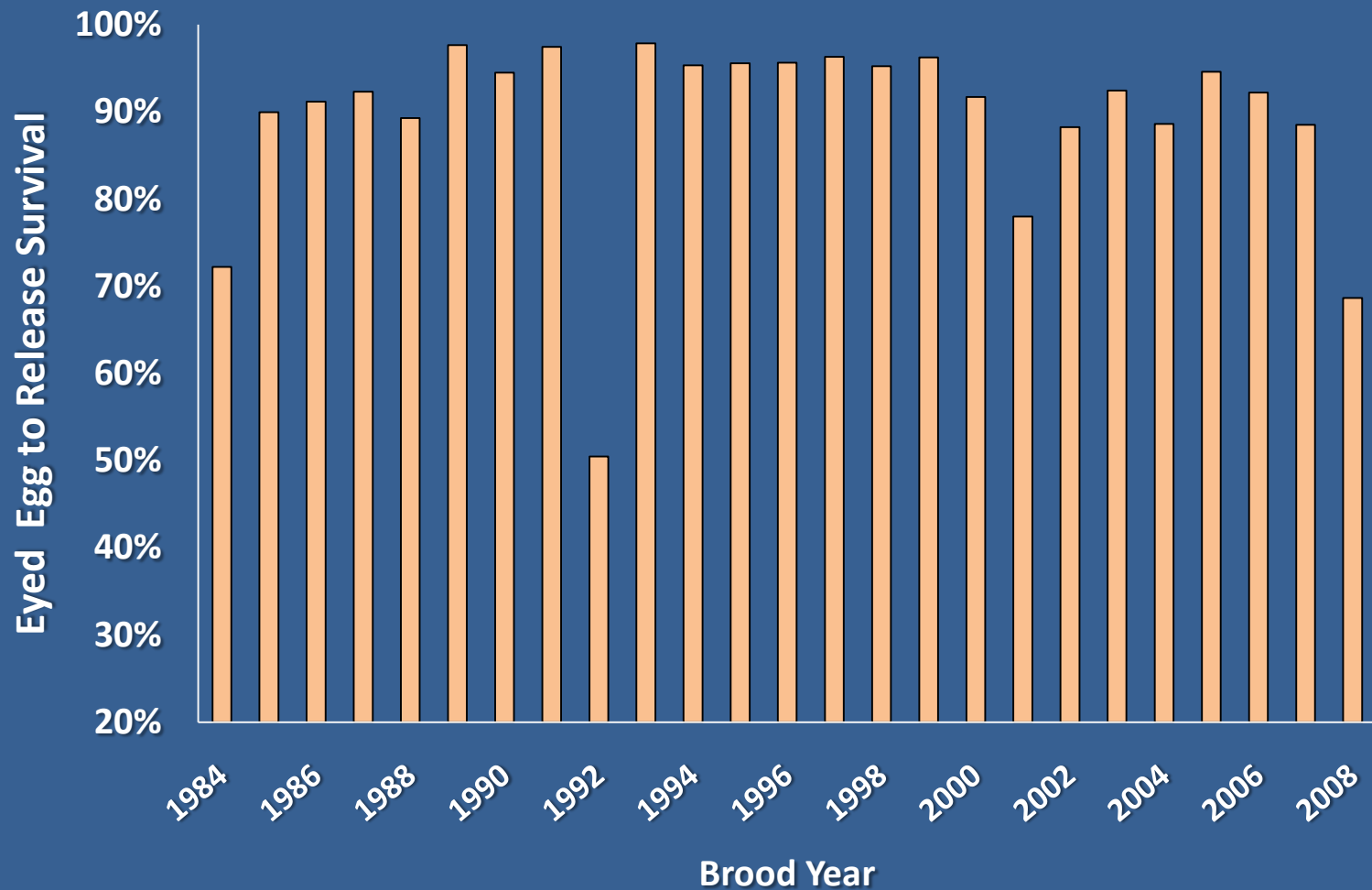
Hatchery Production and Survival Data

Broodstock Performance



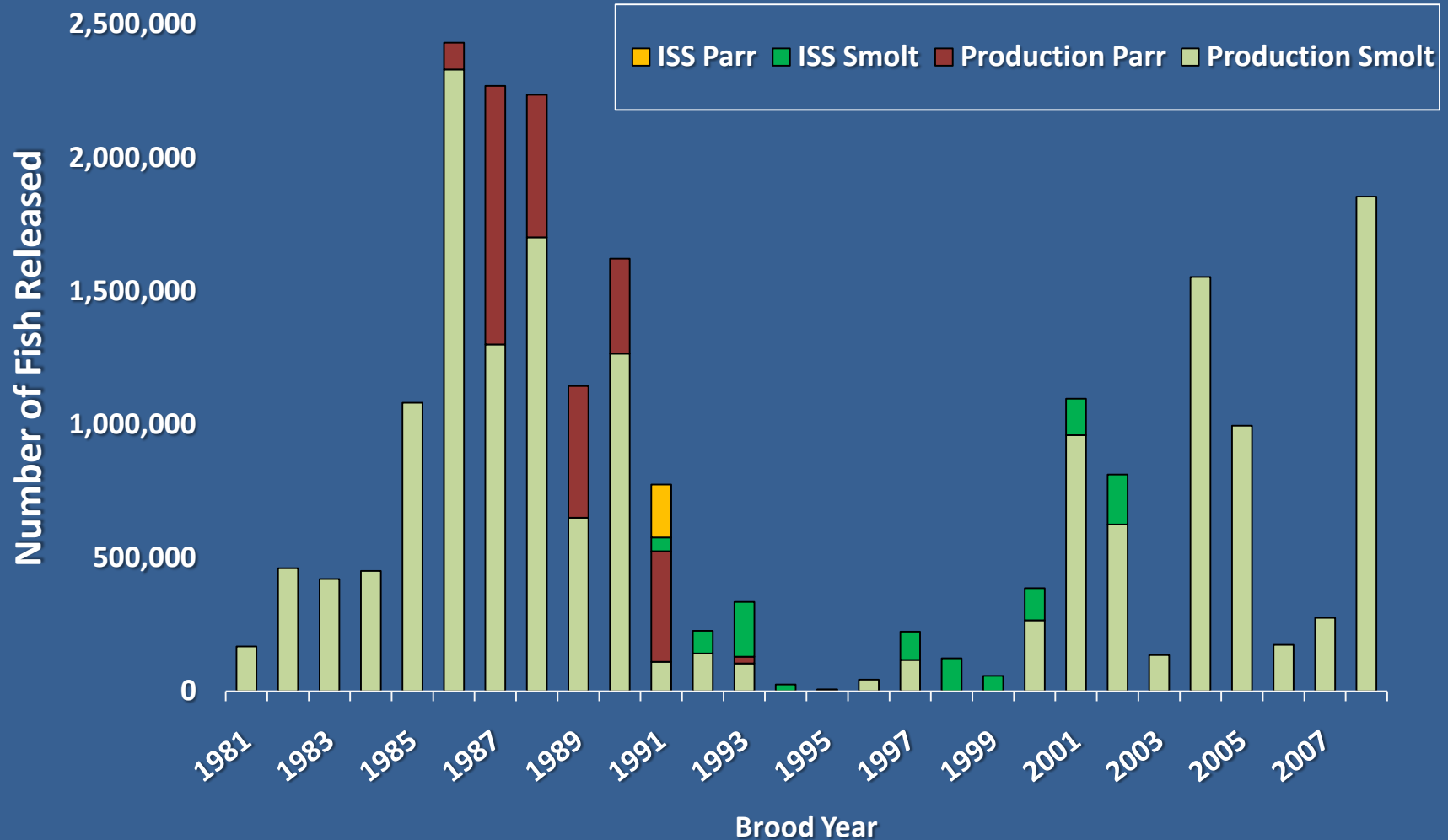
Hatchery Production and Survival Data

In-Hatchery Survival



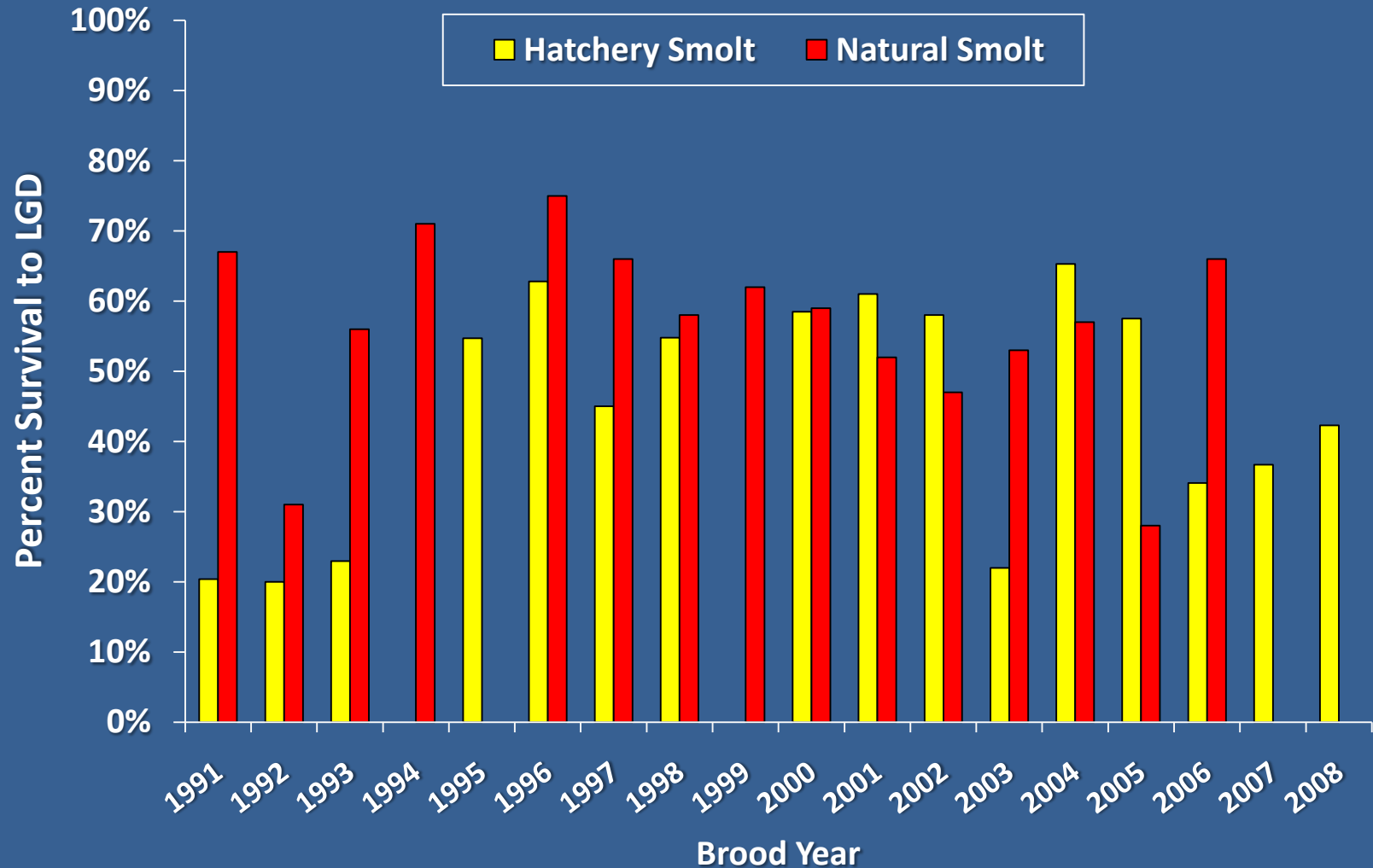
Hatchery Production and Survival Data

Juvenile Releases



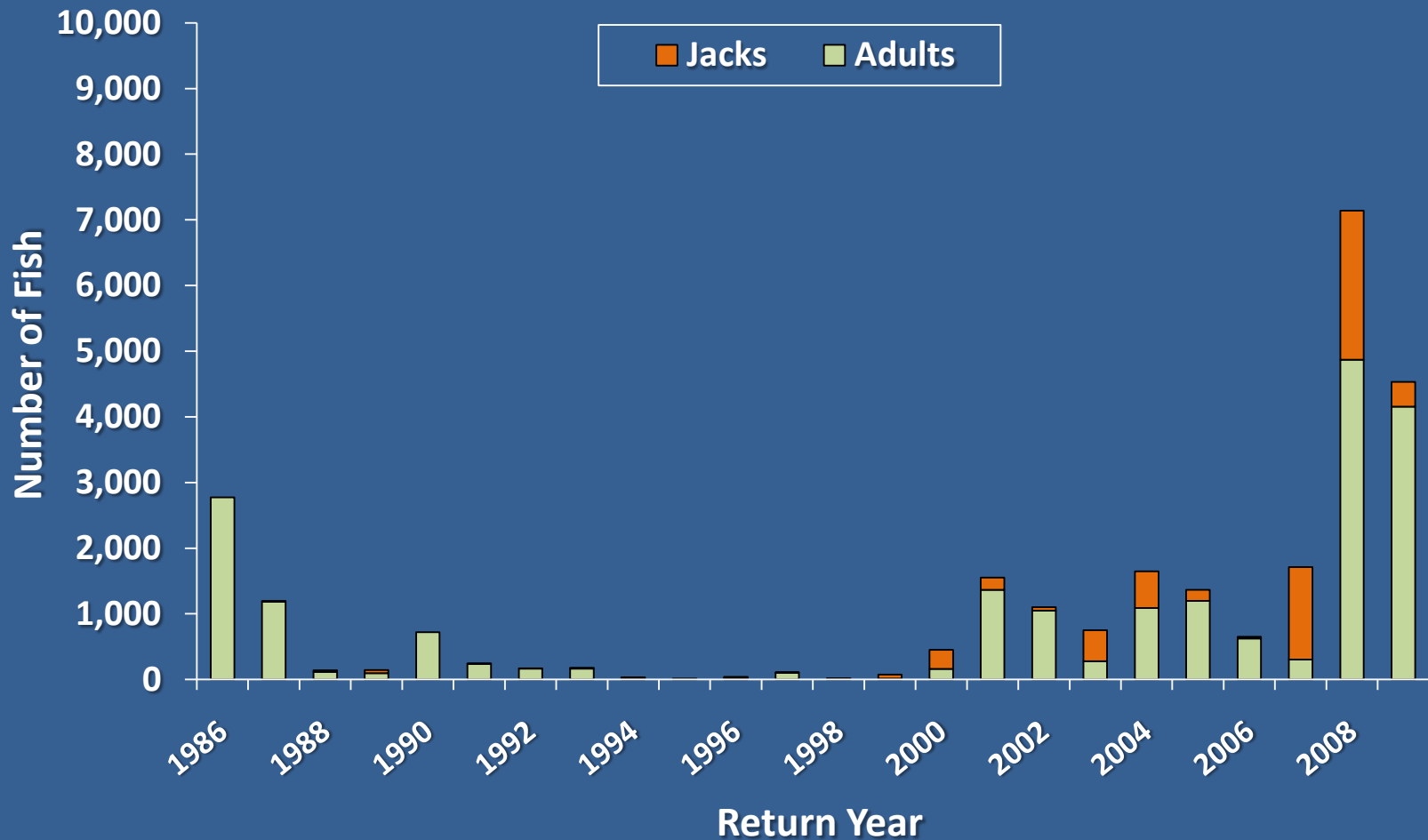
Hatchery Production and Survival Data

Juvenile Survival to LGD



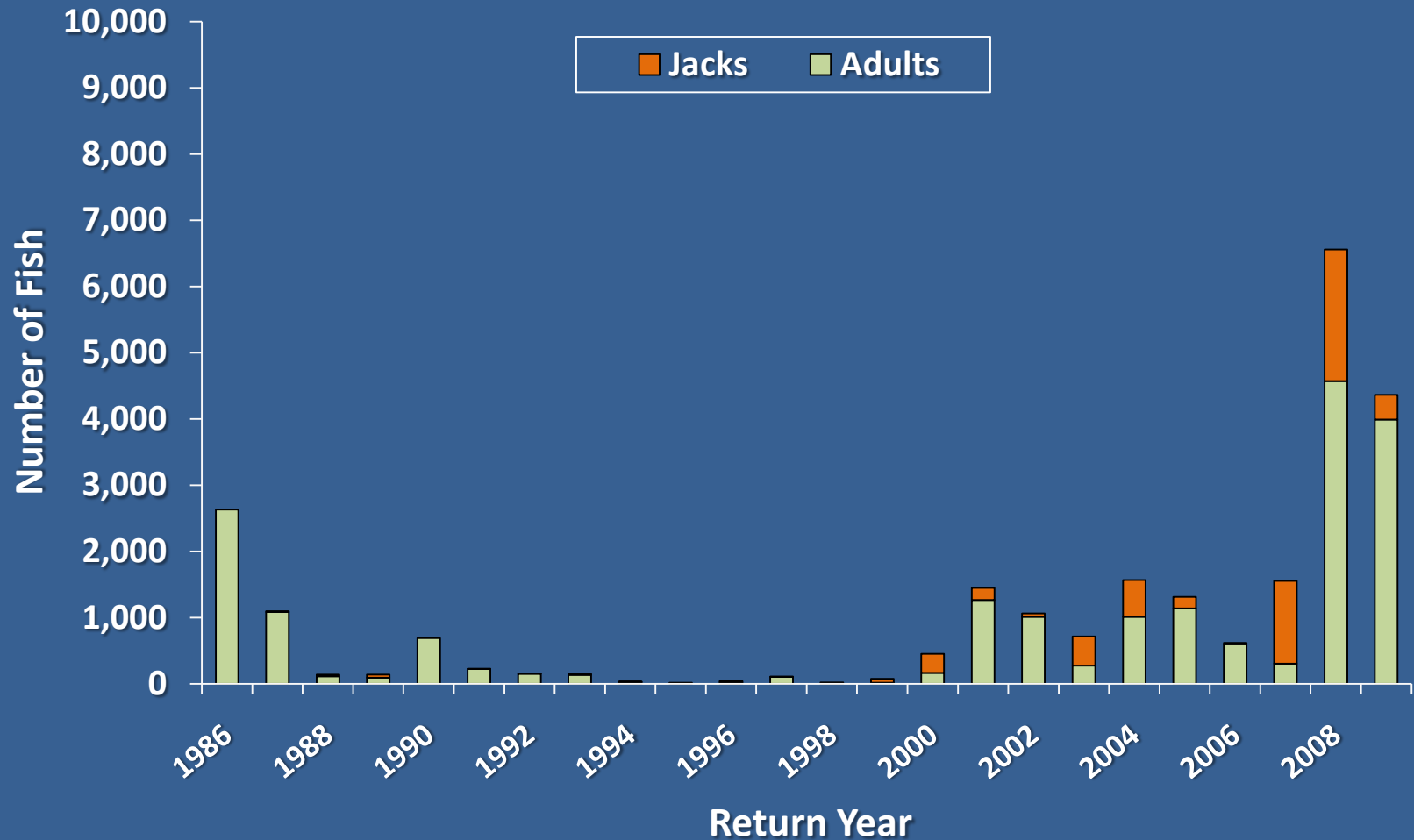
Hatchery Production and Survival Data

Adult Returns-Total Adults Produced to Columbia River Mouth



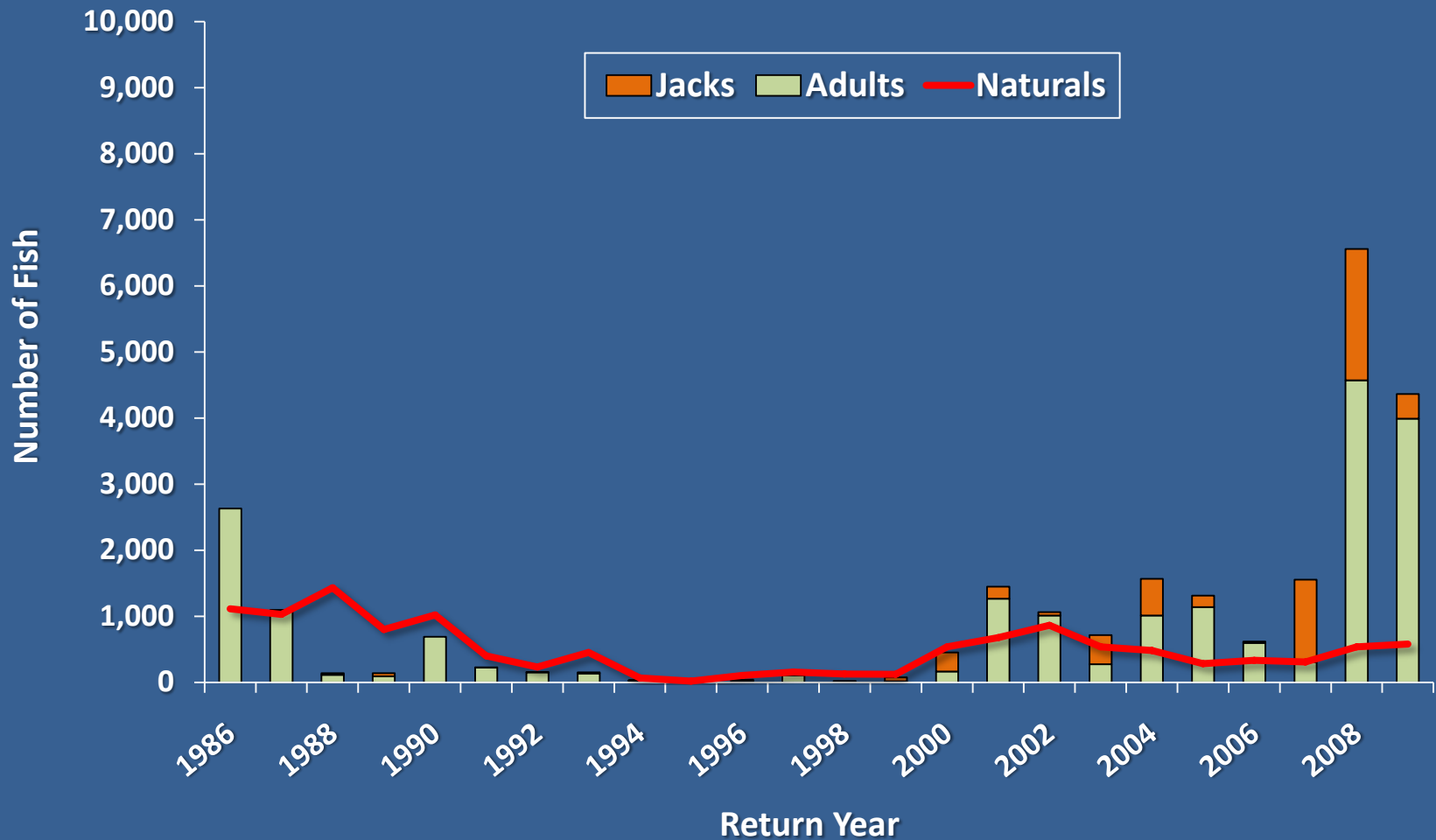
Hatchery Production and Survival Data

Adult Returns-Lower Granite Dam



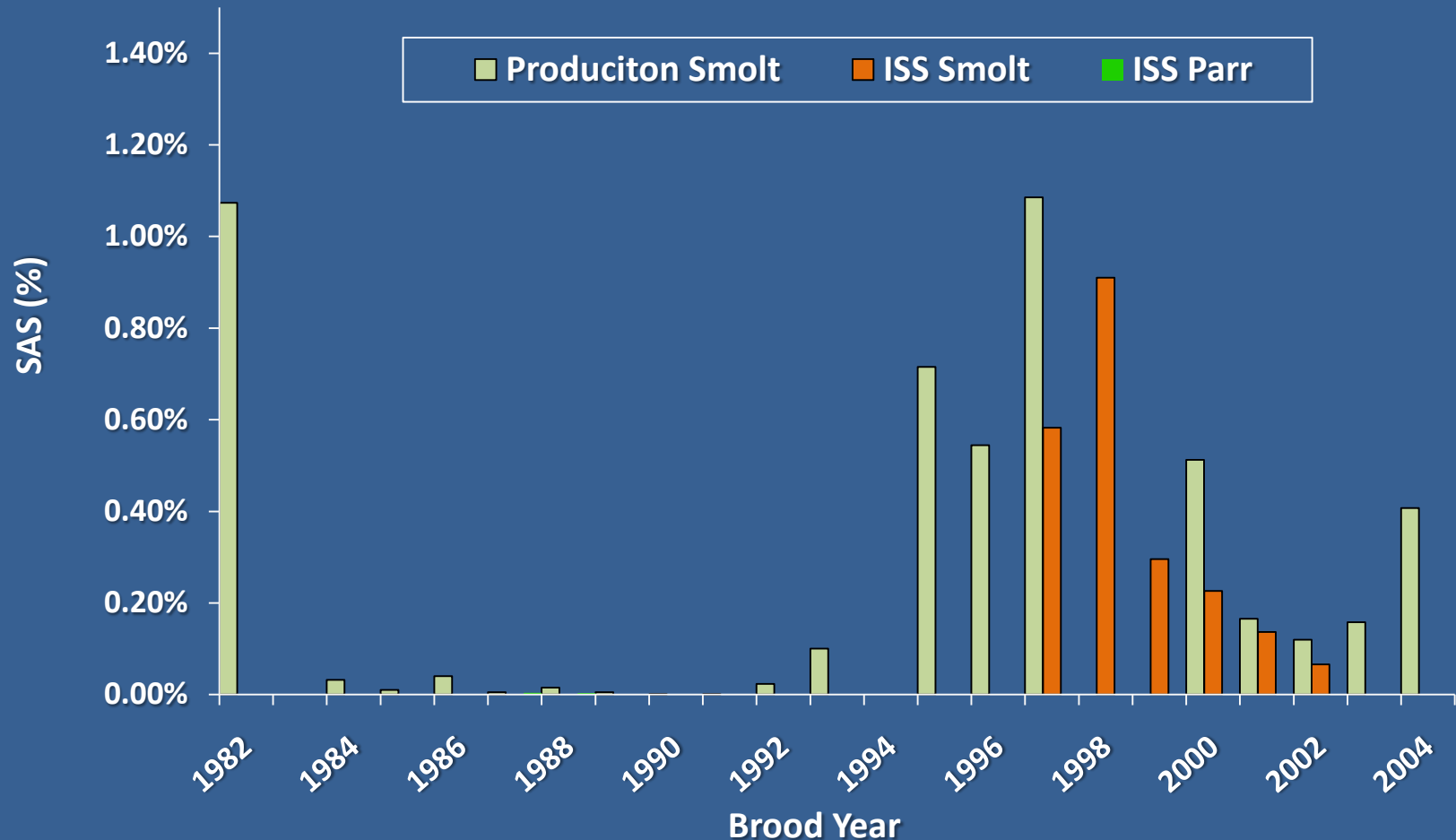
Hatchery Production and Survival Data

Adult Returns-Lower Granite Dam



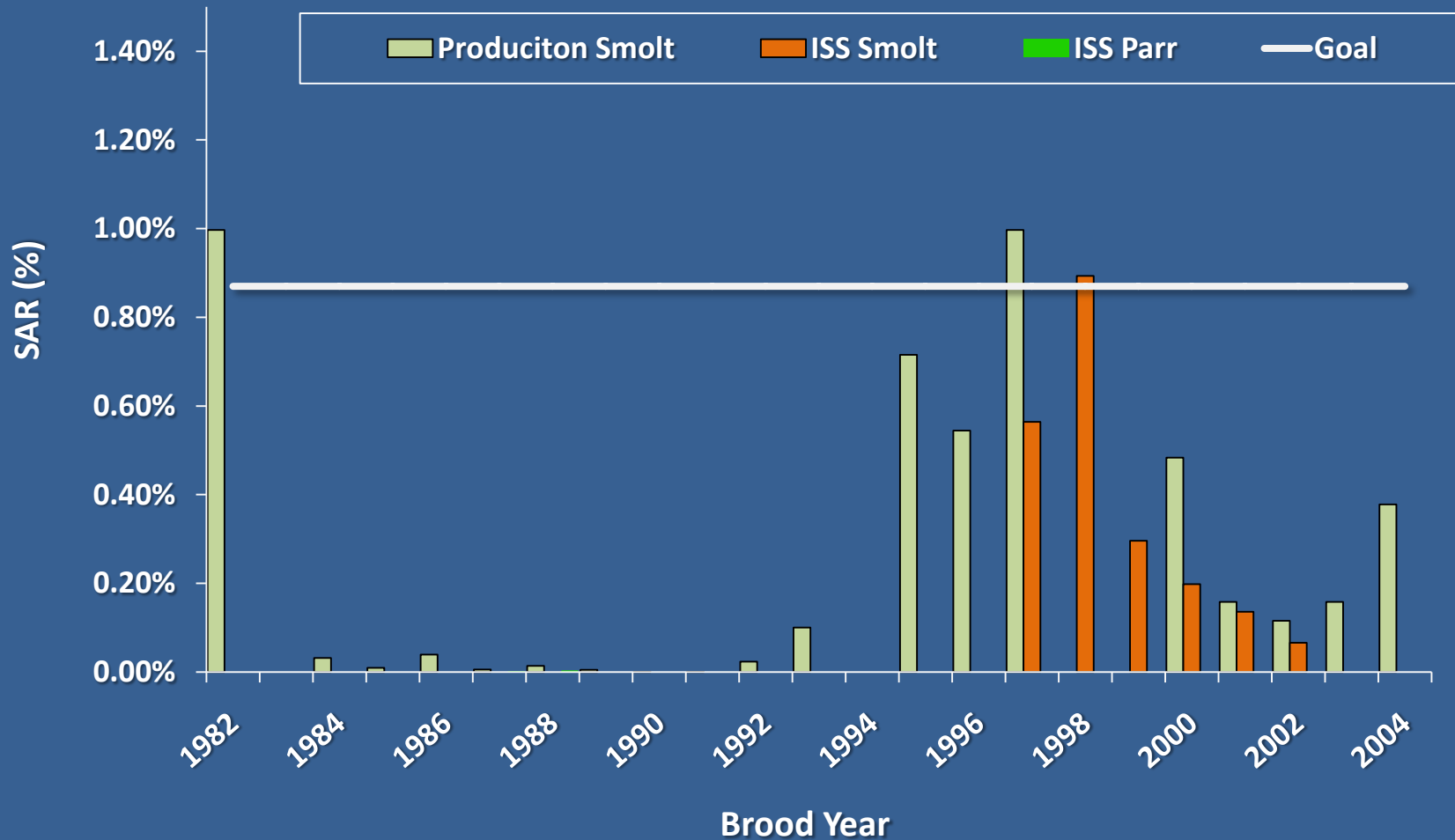
Hatchery Production and Survival Data

Smolt to Adult Survival (SAS) – All Adults



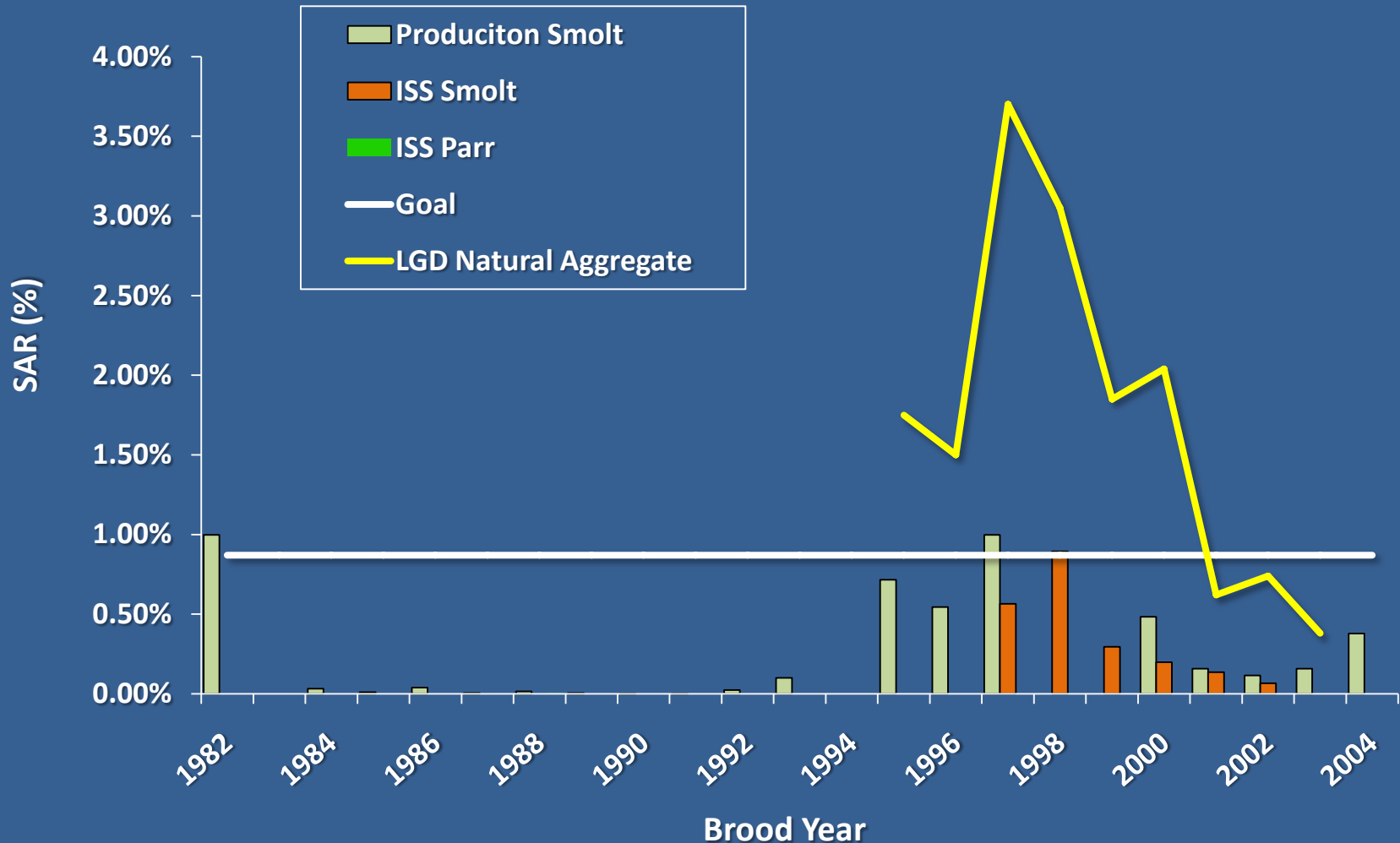
Hatchery Production and Survival Data

Smolt to Adult Return (SAR)



Hatchery Production and Survival Data

Smolt to Adult Return (SAR)



Life History

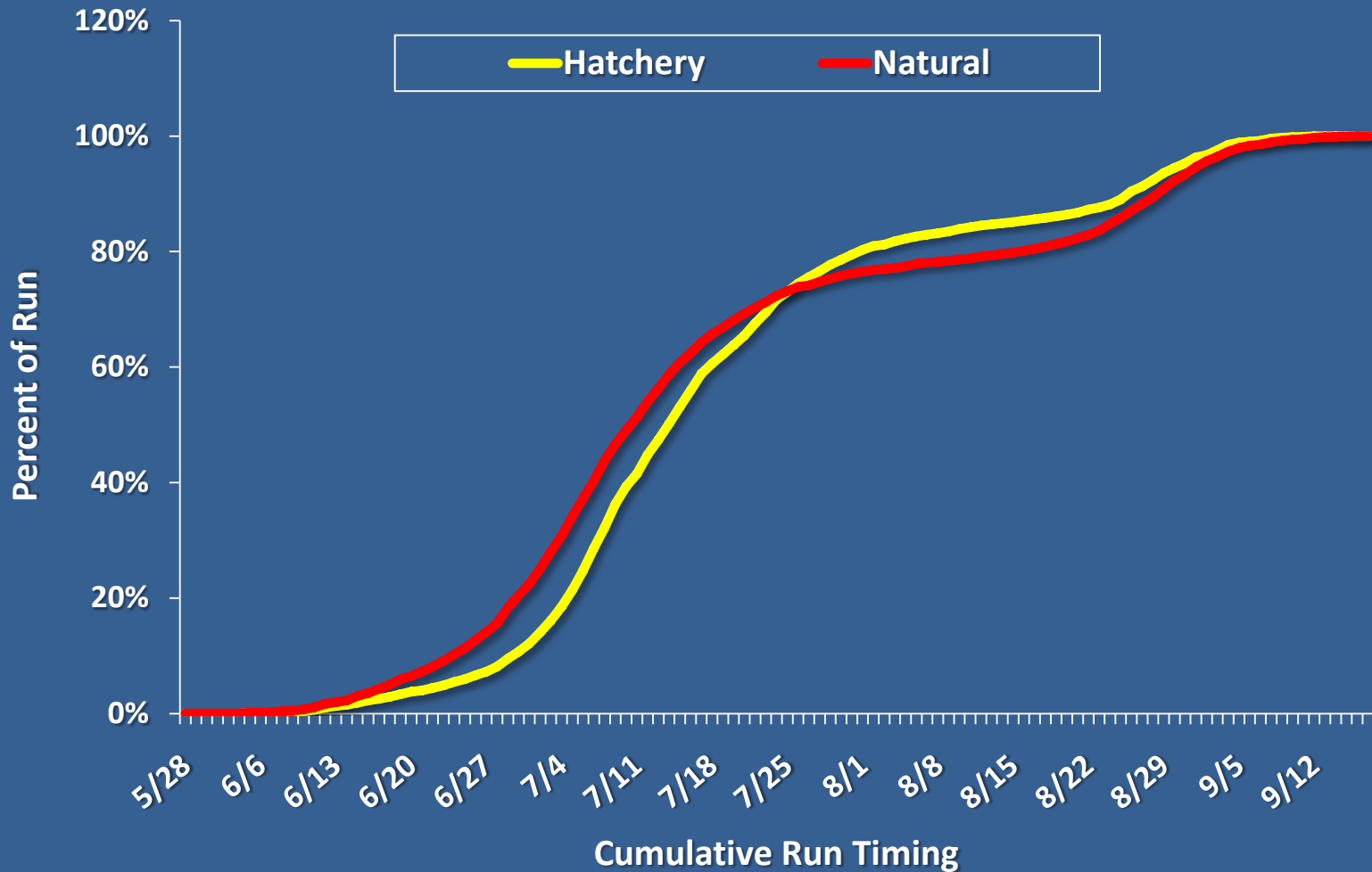
Trends and comparison to natural population

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



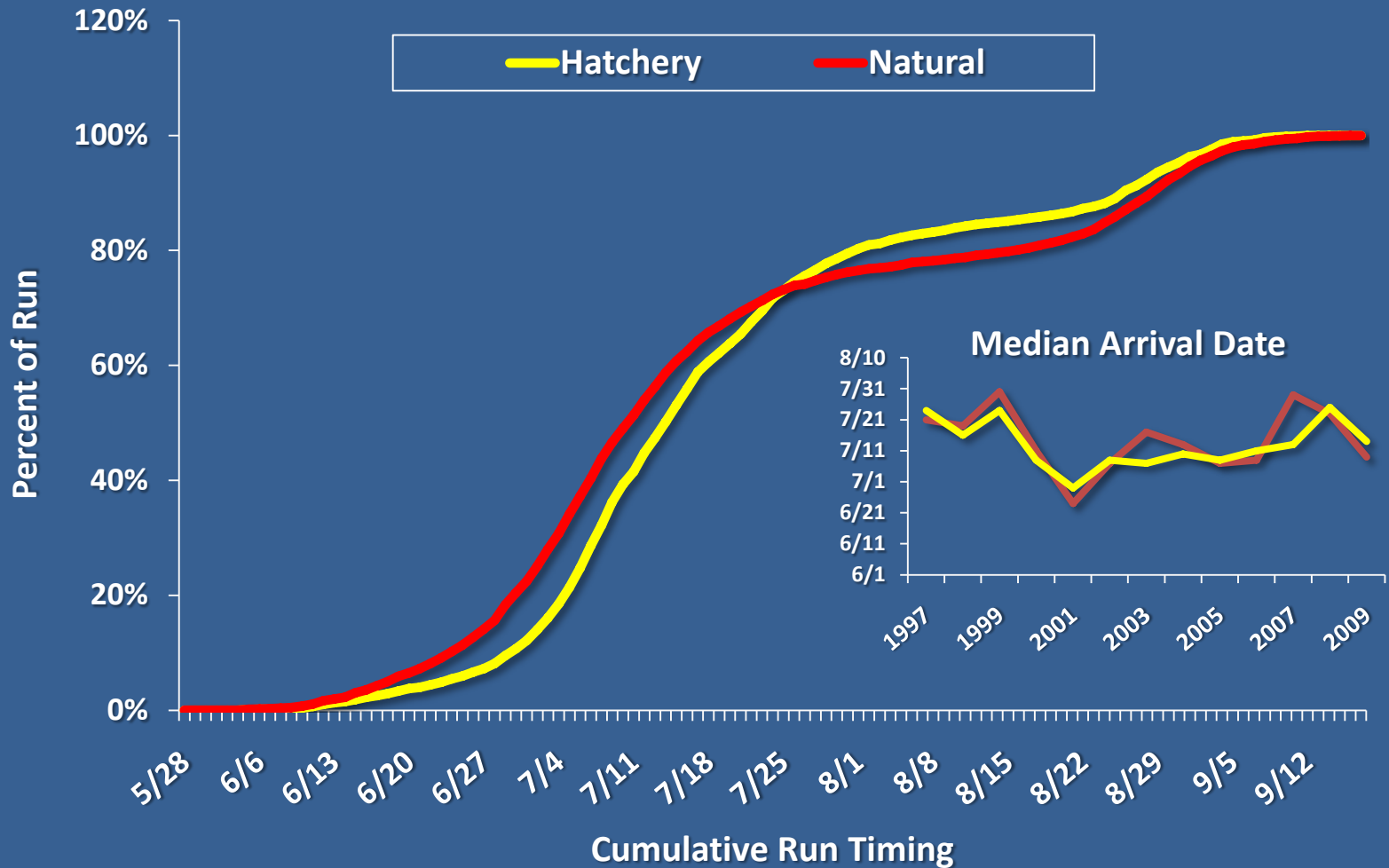
Life History

Adult Run Timing

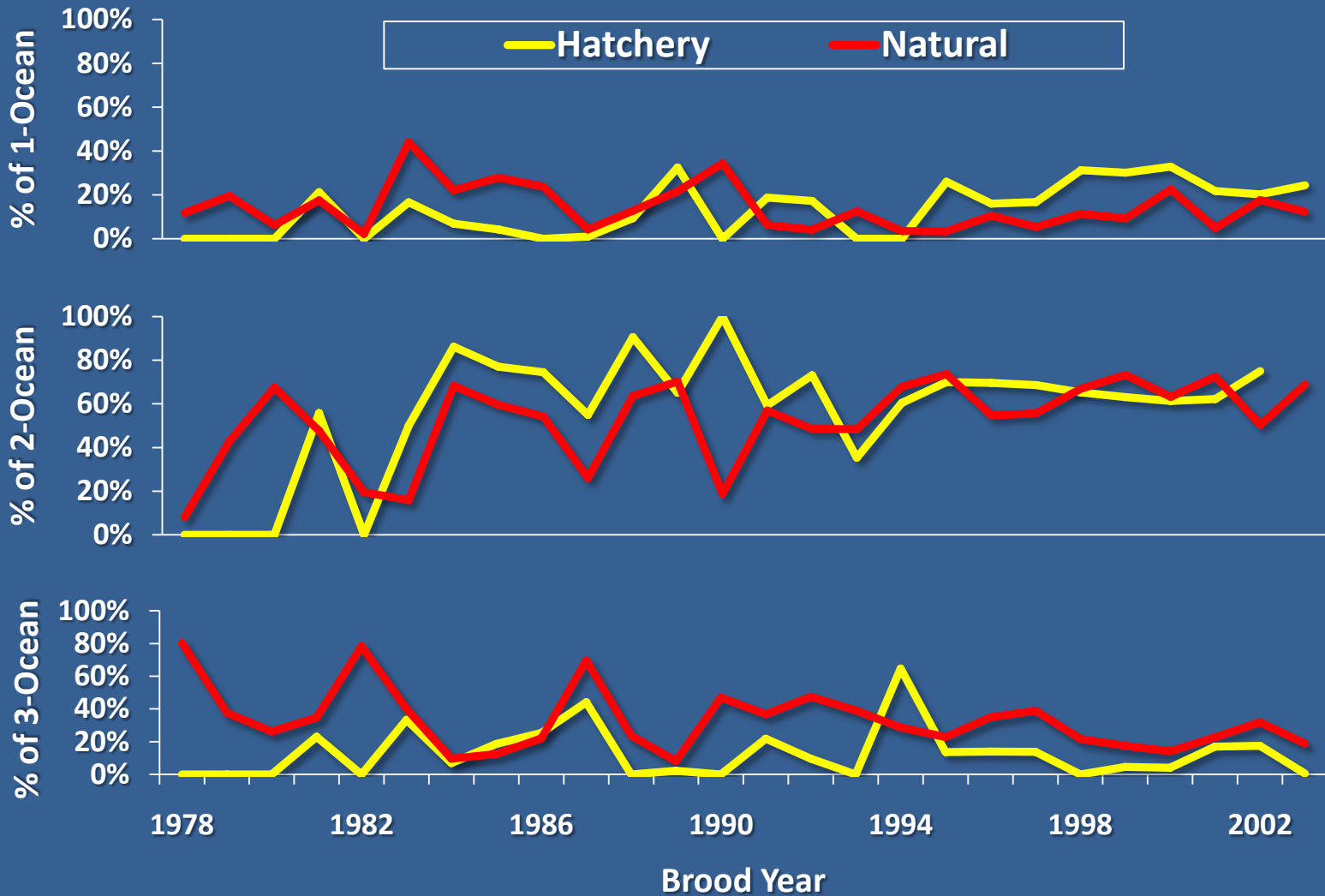


Life History

Adult Run Timing

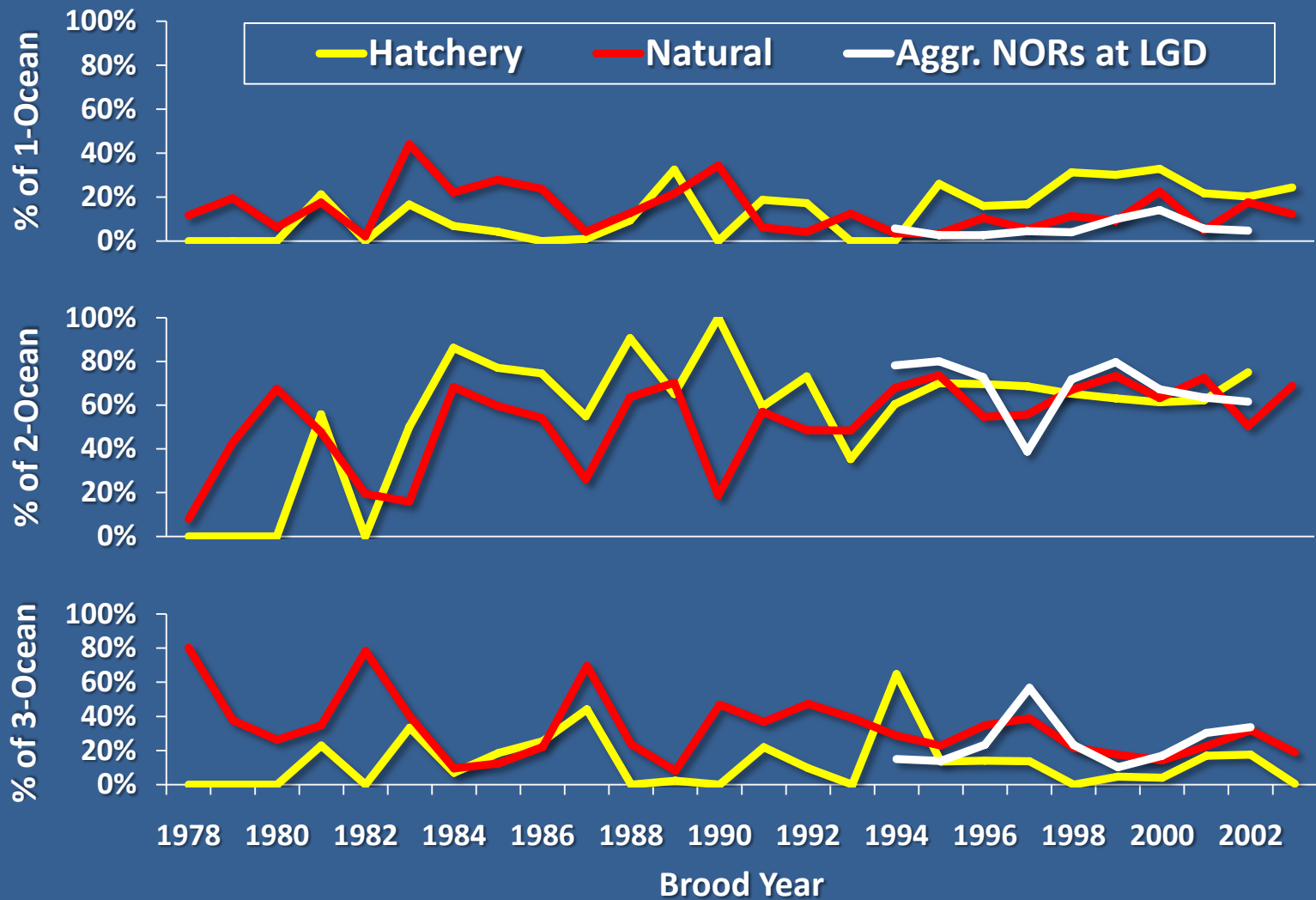


Life History Age Composition



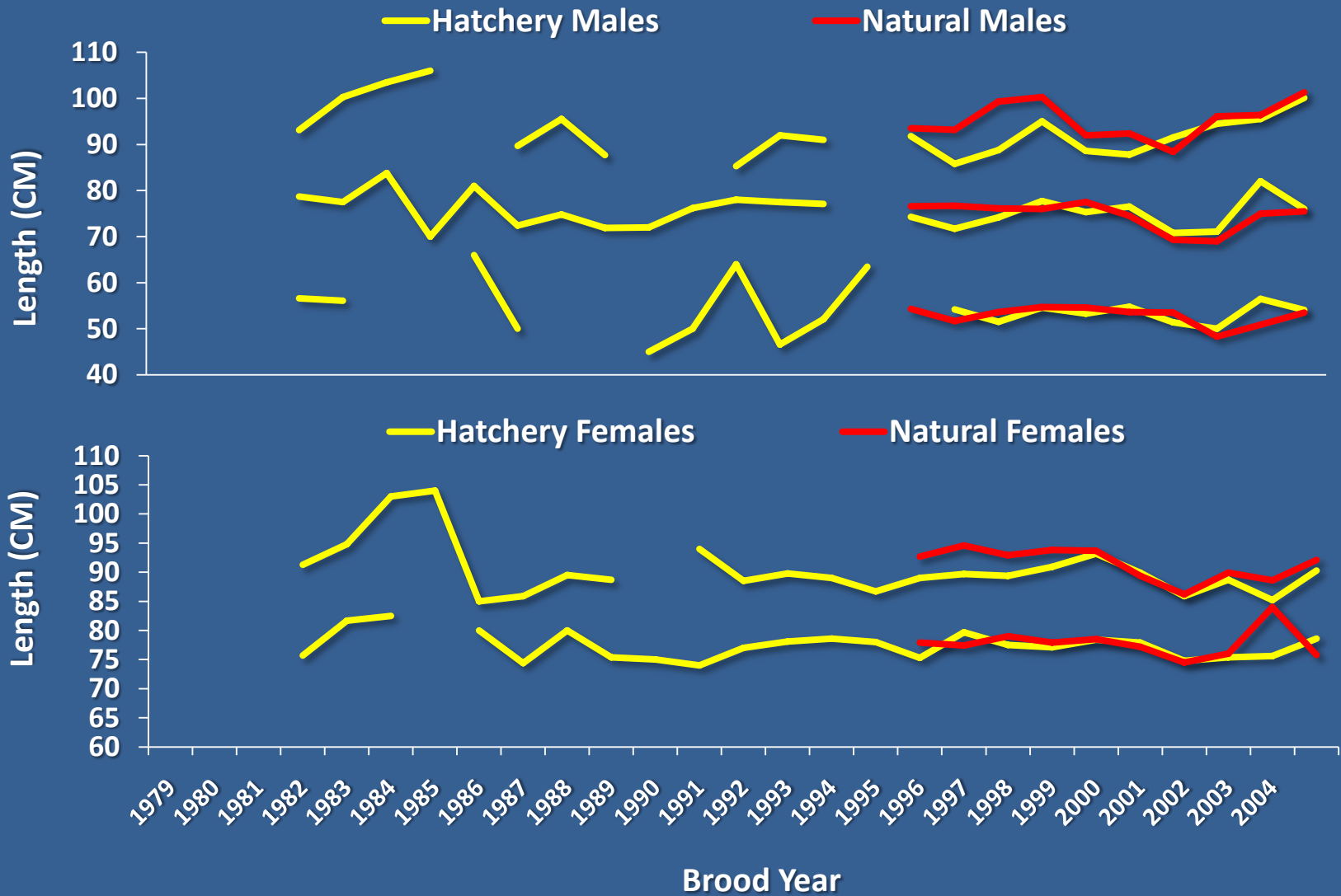
Life History

Age Composition

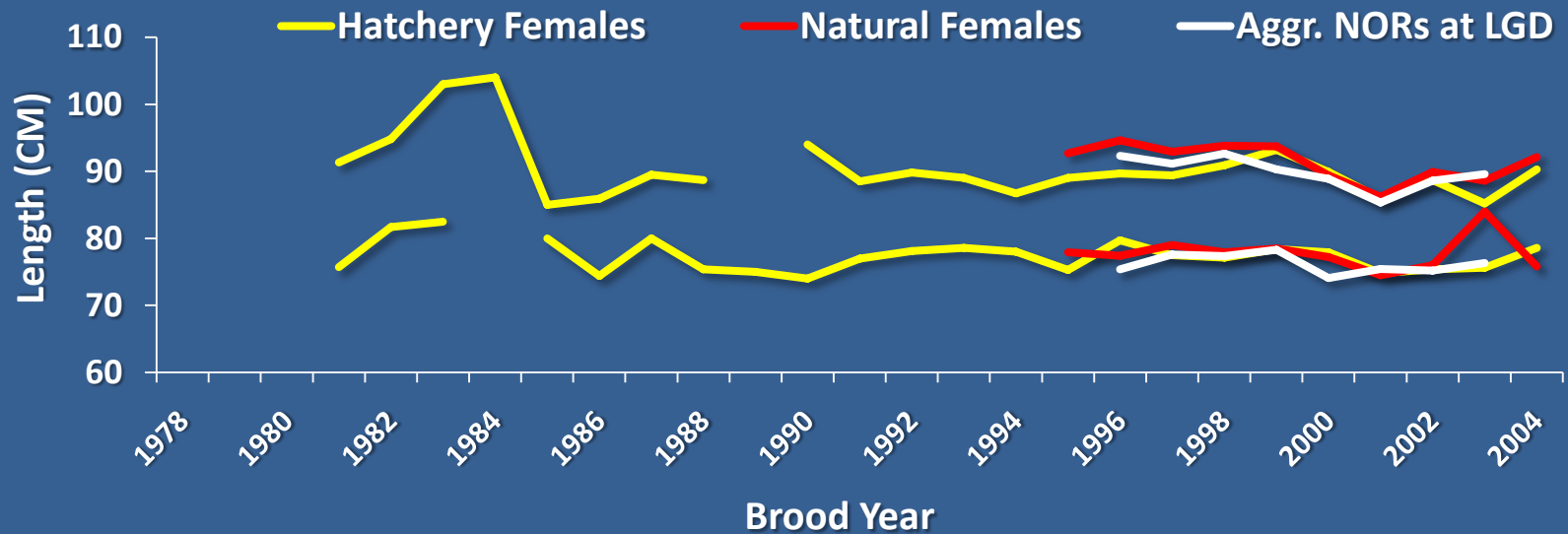
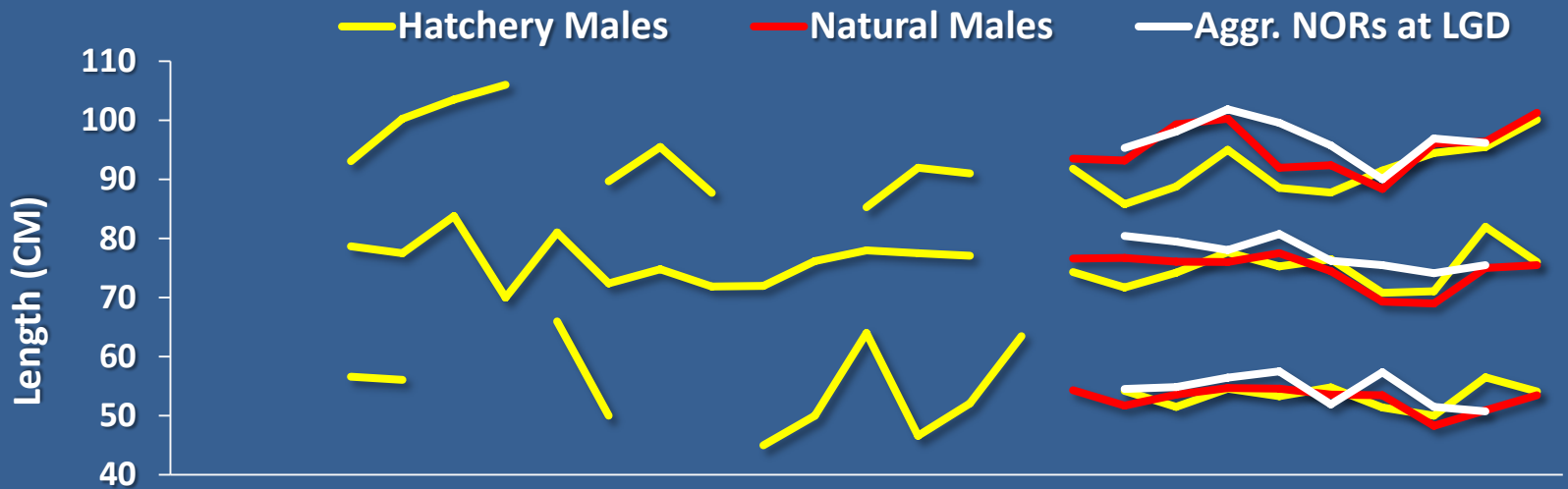


Life History

Length at Age

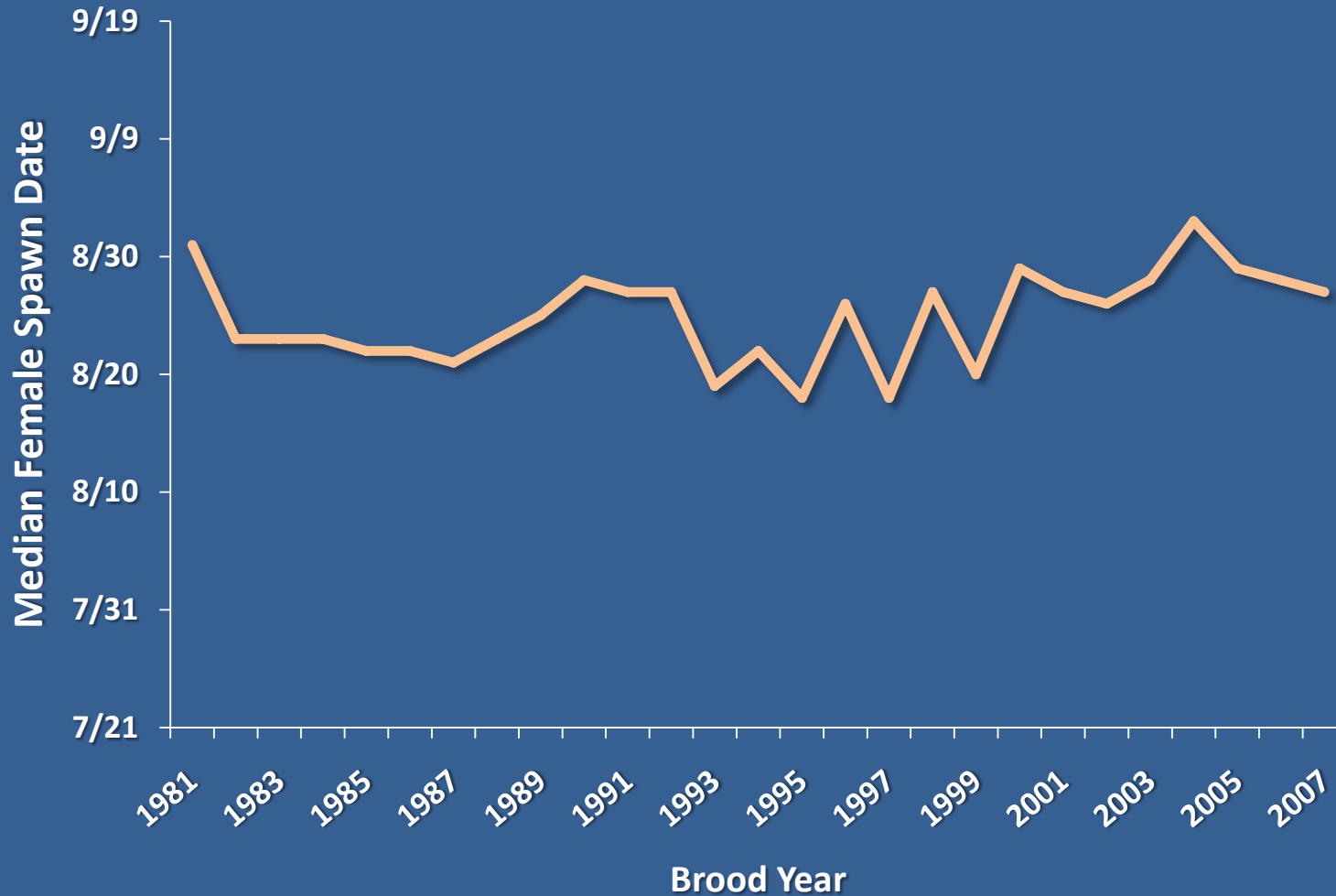


Life History Length at Age

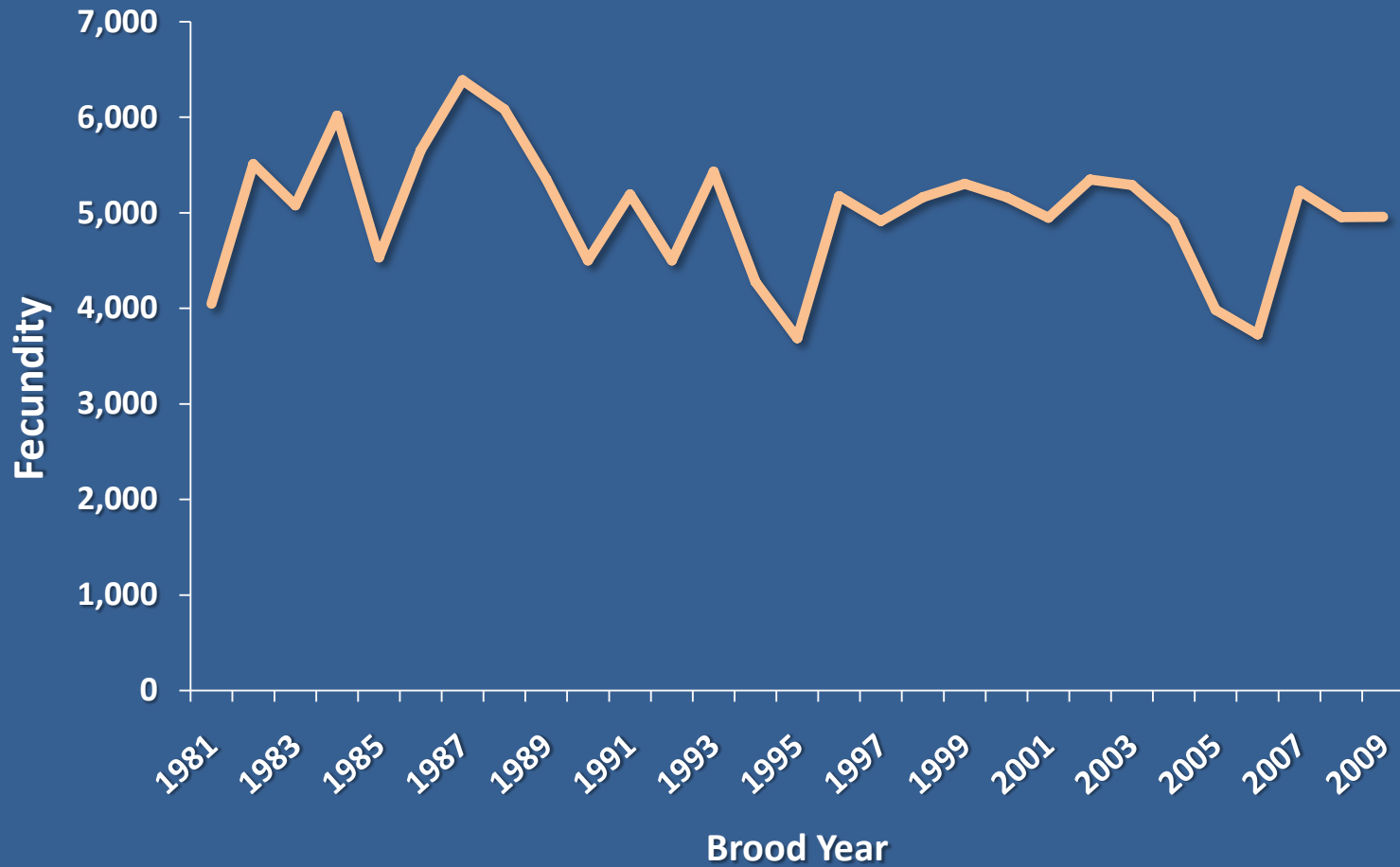


Life History

Spawn Timing



Life History Fecundity

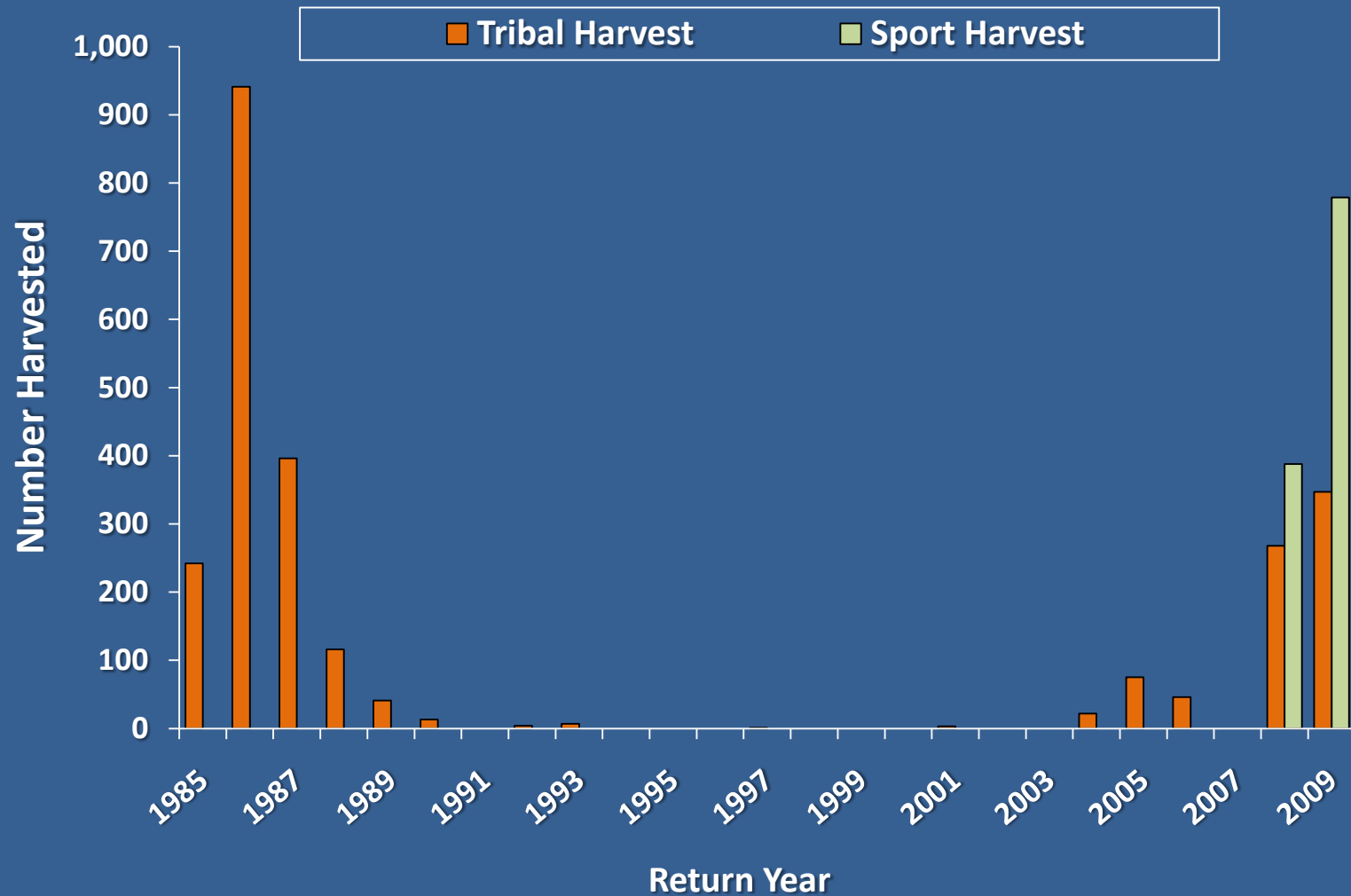


Harvest and Escapement

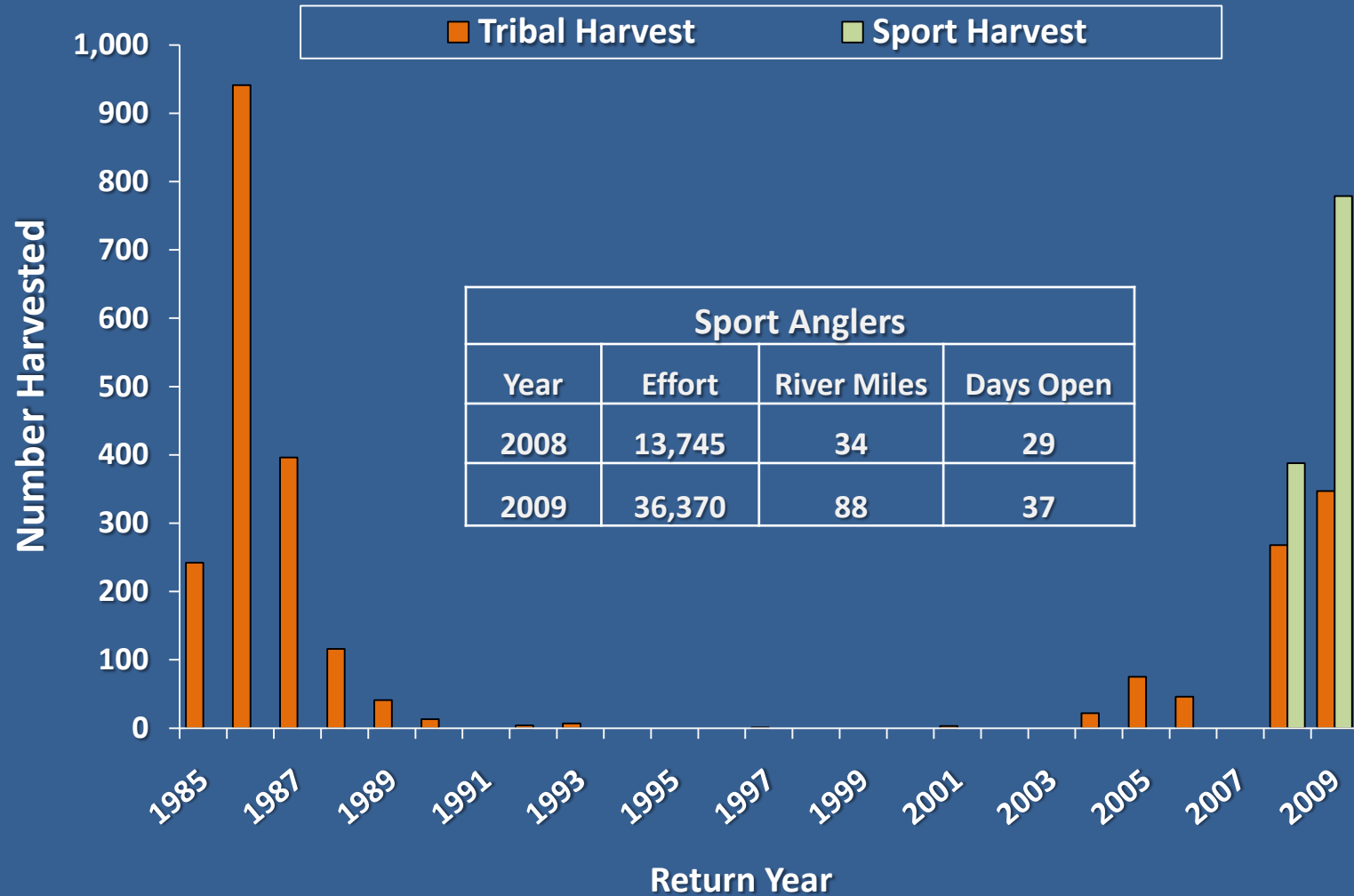
- Catch and Effort
- Harvest Opportunity
- Strays
- Disposition of Escapement



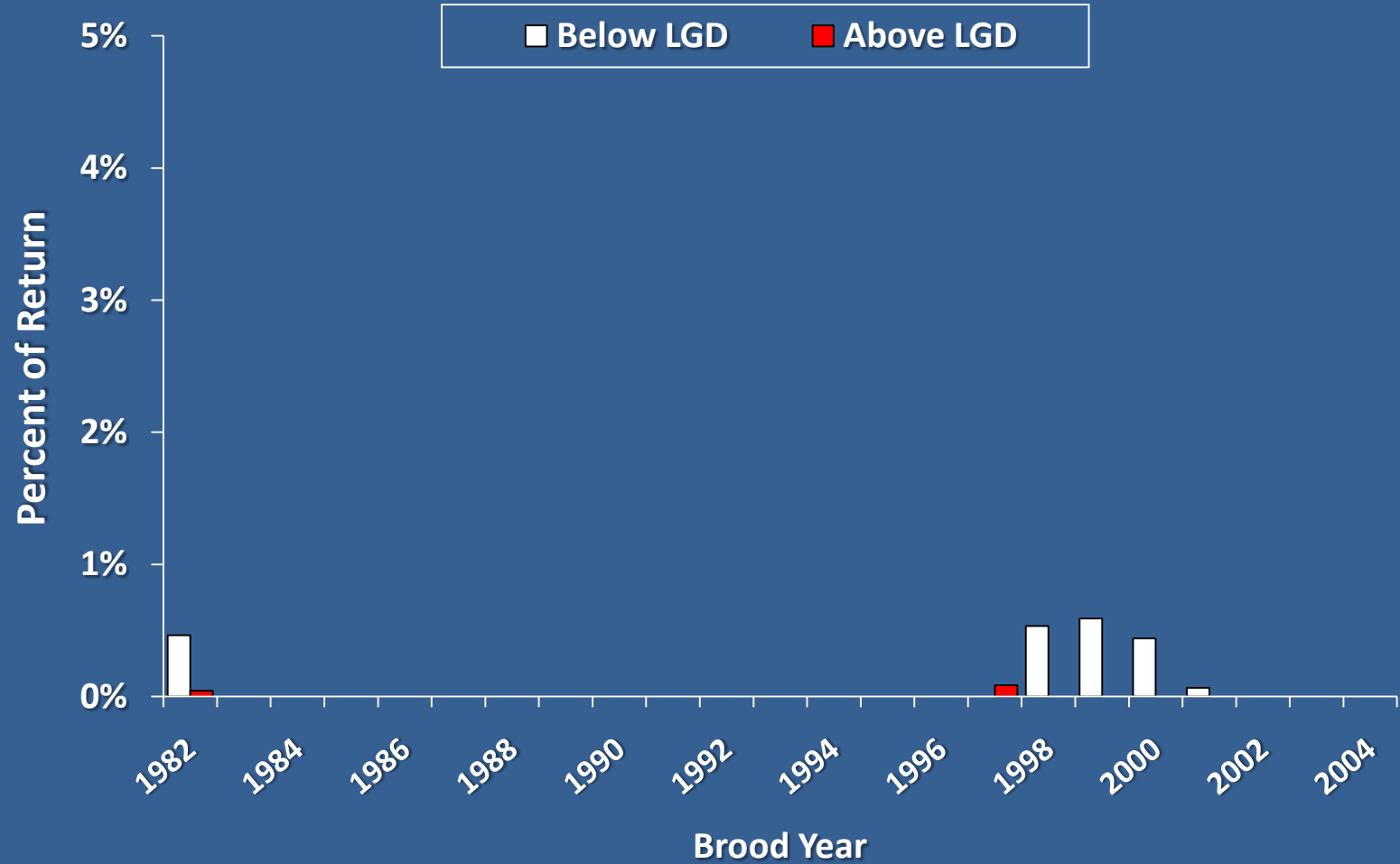
Harvest- by Return Year



Harvest- by Return Year



Strays



Escapement

Disposition of fish at Sawtooth 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

- **Significant outbreaks**
 - BY 2006 broodstock (about 60% loss due to Ich)
 - BY 1992 juveniles (about 50% loss due to bacteria (*Aeromonas* spp.))
- **Ich – is a more recent issue**
 - Adult - 3-7 day per week treatment with formalin based on water temp
 - Juvenile – treat based on observation
- **Whirling disease has been a concern at Sawtooth since mid 1980's**
 - Delay moving fish to outside raceways (larger fish)
 - Limited pathogen-free water

Program Summary

Remember the Management objectives....

- **Restore and maintain natural population in USR**
- **Restore and maintain recreational and tribal fisheries**
- **Meet LSRCP mitigation objectives**
- **Minimize impact of hatchery program on the natural population**

Program Summary

- Restore and Maintain the Natural Population in the USR
 - Integrated Broodstock
 - Supplementation
 - Sliding Scale management

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- Restore and maintain the natural population in the USR
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 - Since 2008 there has been rebuilding of recreational and tribal fisheries
 - Highly dependent on post release survival

Program Summary

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 - Integrated Broodstock
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 - Sliding Scale management
- Restore and Maintain Sport and Tribal Fisheries
 - Since 2008 significant rebuilding of recreational and tribal fisheries
 - Highly dependent on post release survival
- **Meet LSRCP Mitigation Objectives**
 - Consistent high survival during hatchery culture
 - Poor survival of subyearling releases
 - Highly variable post-release survival
 - Upswing in post release survival since mid 1990's
 - Have never met total mitigation goal
 - Have never met project area goal

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 - Have never met total mitigation goal
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- **Minimize Impacts of Hatchery Program on Natural Populations**
 - **Very low observed stray rates**
 - **Synchrony between hatchery- and natural-origin fish**
 - **No apparent trends in life history characteristics**
 - **Broodstock and weir management**

M&E Outlook

Hatchery Program Monitoring

- Continued Monitoring of Hatchery Production and Productivity**

M&E Outlook

Hatchery Program Monitoring

- Continued Monitoring of Hatchery Production and Productivity
- PIT Tagging
 - Estimating adult survival
 - Migration timing and inter-dam conversion
 - In-season fisheries management
 - In-stream PIT Arrays
 - In-ladder array system

M&E Outlook

Hatchery Program Monitoring

- Continued Monitoring of Hatchery Production and Productivity
- PIT Tagging
 - Estimating adult survival
 - Migration timing and inter-dam conversion
 - In-season fisheries management
 - In-stream PIT Arrays
- Parental Based Tagging (PBT)
 - Catch contribution
 - Stock Identification
 - Heritability / Family Effects

M&E Outlook

Natural Population Monitoring

- Continue Above/Below Weir Monitoring
- Fish-In, Fish-Out Monitoring
 - In-stream PIT arrays
 - Juvenile Trapping and PIT Tagging
 - Representative PIT tagging adults at Lower Granite Dam
- GSI at Lower Granite Dam

Moving Forward

- Program will continue to support both harvest and conservation objectives
- Continue to mitigate for lost sport and tribal fishing opportunity
- Expanded coordination between state, tribal and federal managers
- Program direction incorporates current and emerging science
 - HSRG and HRT hatchery reviews
 - Hatchery and Genetic Management Plan (HGMP)

Questions?

