U.S. Fish & Wildlife Service Anadromous Fish Restoration Program Salmonid Monitoring Needs

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Monitoring Central Valley Chinook Salmon and Steelhead Populations Workshop

Outline

AFRP

AFRP Needs

Existing Monitoring

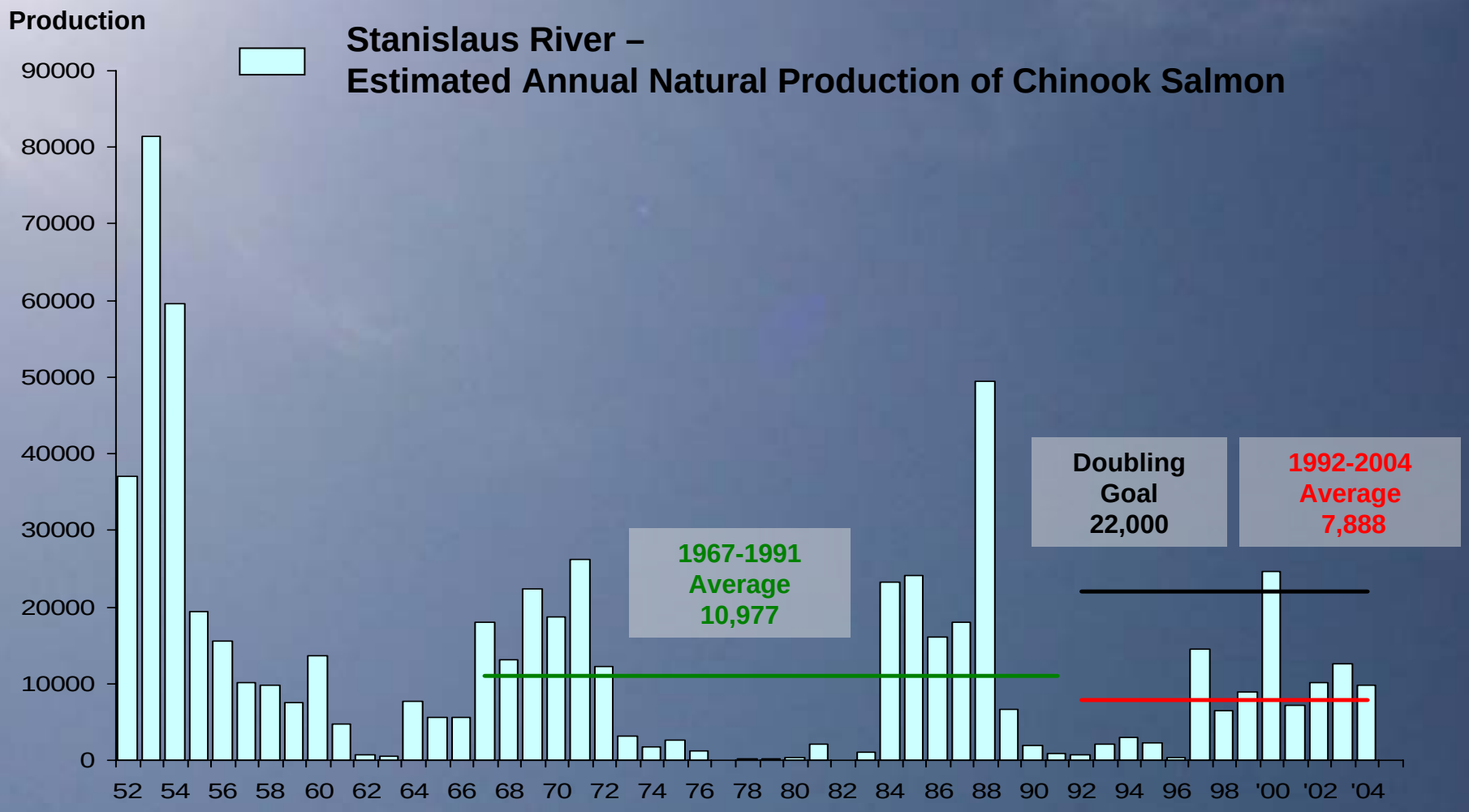
Gaps

Recap

AFRP Goal

Make "all reasonable efforts to at least double natural production of anadromous fish in California's Central Valley streams on a long-term, sustainable basis".

Anadromous Production



Calculating Production

Production =

Escapement + Harvest

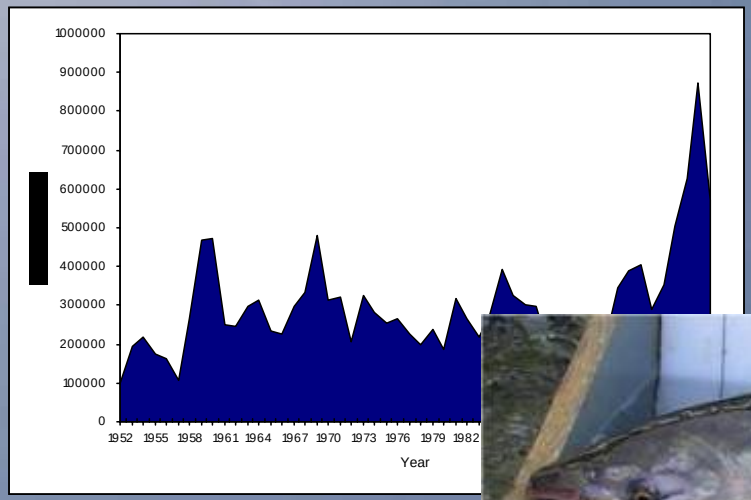
Harvest =

Ocean Harvest + Inland Harvest

Natural Production

Natural Production =

Production - Hatchery Production



Chinookprod

Ocean Harvest

- proportioned over CV

Inland Harvest

- 5% (SJ tribs) to 45% (Feather)

Hatchery Proportions

- 0% (Yuba) to 90% (Battle)

Assessing Production

Escapement

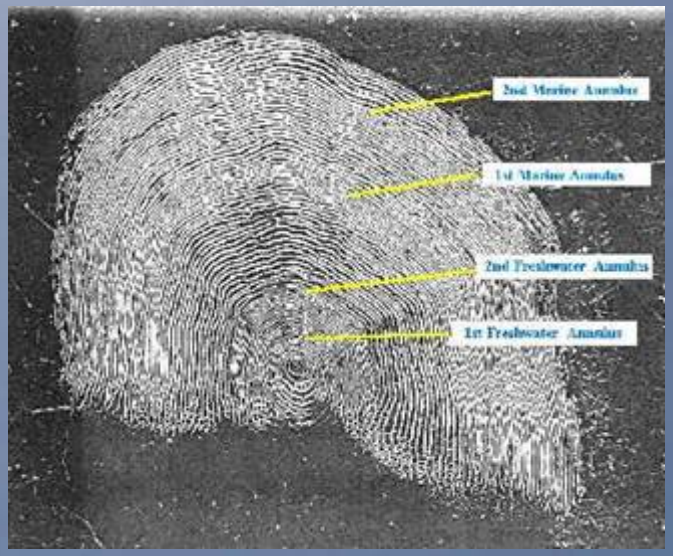
Carcass Surveys

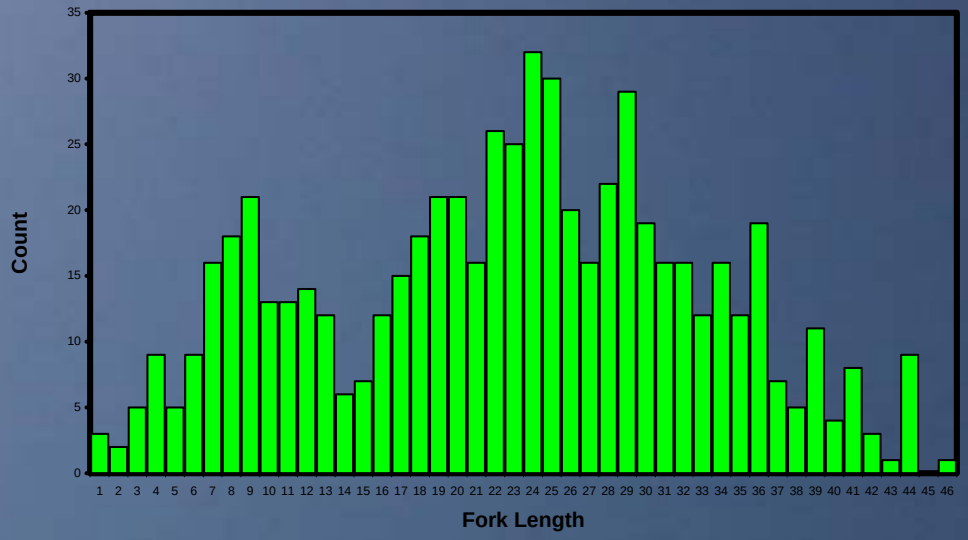
Ladder/Weir Counts

- Video
- Digital Photo
- Infra-red
- Acoustic

Escapement Needs

- Population count or estimate
- Length frequency for age analysis
- Scale or otolith age analysis





Hatchery Proportion

Methods to accurately assess hatchery component of production

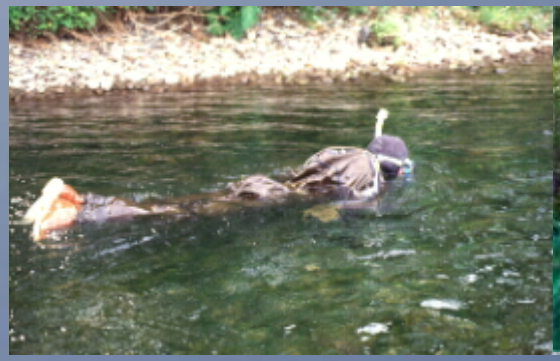
- cwt
- fin-clip all or constant fraction
- thermal marking
- otolith sulfur microchemistry

All require recovery of carcasses or ability to read ad-clips at weir or ladder

Evaluating Restoration

Methods to accurately assess benefits of restoration projects

- short-term versus long-term
- project versus population



Short-term Monitoring

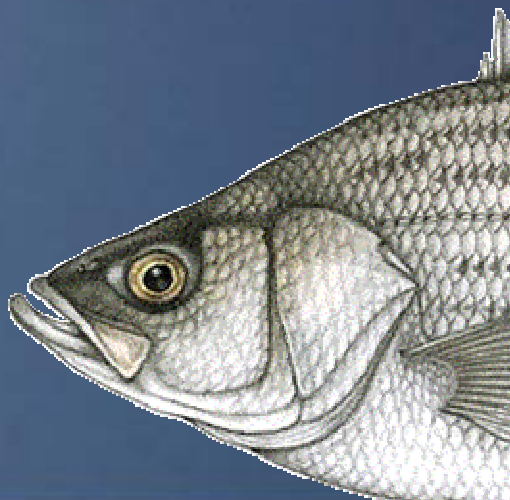
Used to assess specific short-term project results

- Habitat use
  - snorkel survey
  - seining
- Habitat value
  - fluvial studies
  - habitat mapping

Long-term Monitoring

Used to provide a baseline to evaluate restoration efforts

- Juvenile Production
  - rotary screw trapping
  - seines and trawls
- Juvenile Survival
  - rotary screw trapping
  - seines and trawls



Adult Monitoring

	Carcass Survey	Redd Survey	Adult Counts	Ladder or Weir Count
Merced	DFG			
Tuolumne	DFG SF T/MID			
Stanislaus	DFG USBR			FWS
Calaveras	FWS[1]	FWS[1]		
Mokelumne	EBMUD			EBMUD
Cosumnes	FWS[1]	FWS[1]		
American	DFG USBR WF	USBR[2]	USBR[2]	
Yuba	DFG			FWS DFG
Feather	DWR			

1 – includes *O. mykiss*, 2- primarily *O. mykiss*

Juvenile Monitoring

	RST Production[1]	RST Survival[1]	Electro-fishing	Snorkel Survey[1]	Seine
Merced					
Tuolumne	TID/MID SF DFG			TID/MID SF	TID/MID SF
Stanislaus	OID/SSJID	FWS USBR		USBR	
Calaveras	SEWD[2]				
Mokelumne	EBMUD		EBMUD		EBMUD
Cosumnes					
American	USBR DFG WF			FWS	
Yuba	DFG FWS	?			
Feather	DWR		DWR[2]	DWR[3]	DWR[3]

1 - includes *O. mykiss*, 2 – primarily *O. mykiss*, 3 – stranding surveys

Other Monitoring

Disease

Water Quality

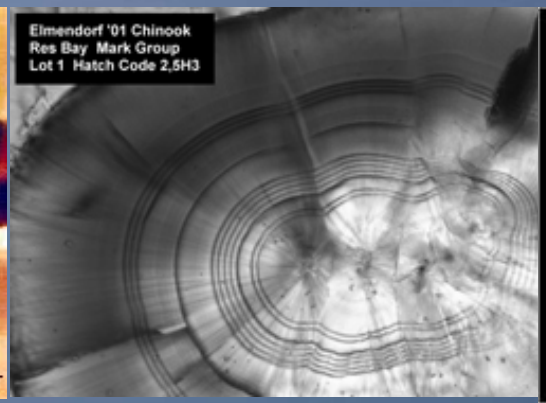
Temperature

Flow

Adult Monitoring Gaps

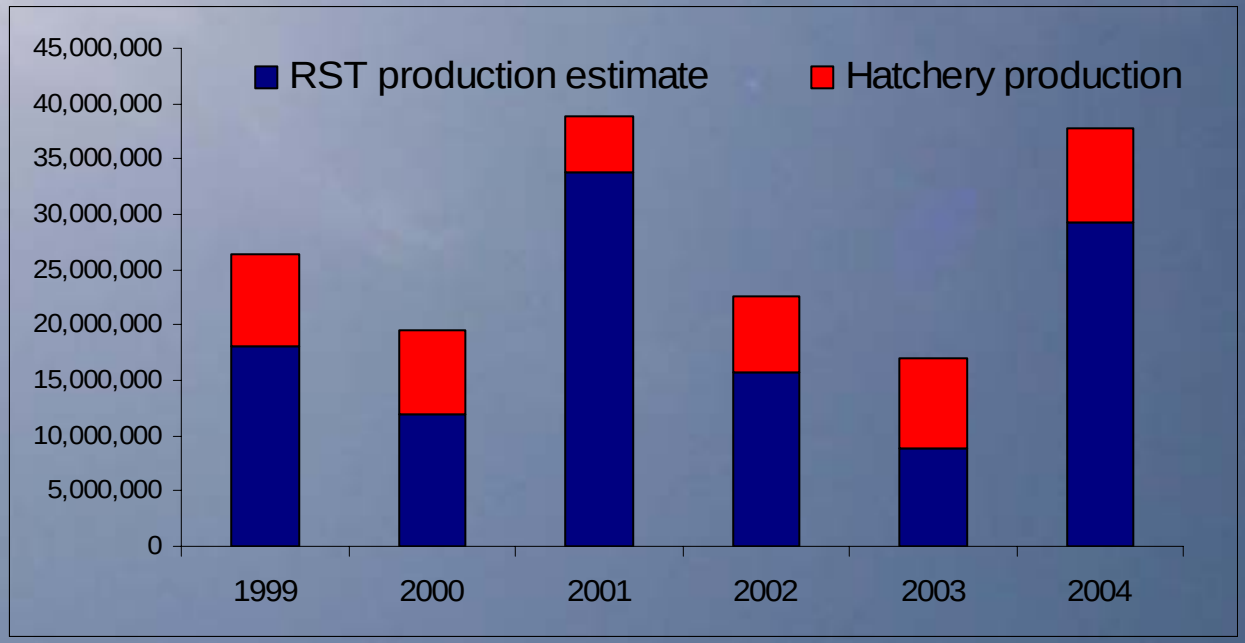
Hatchery Proportion

- better cwt recoveries
- constant or total fractional marking
- thermal marking
- microchemistry sulfur analysis



Hatchery Example

Feather River Fall-run 1999-2004



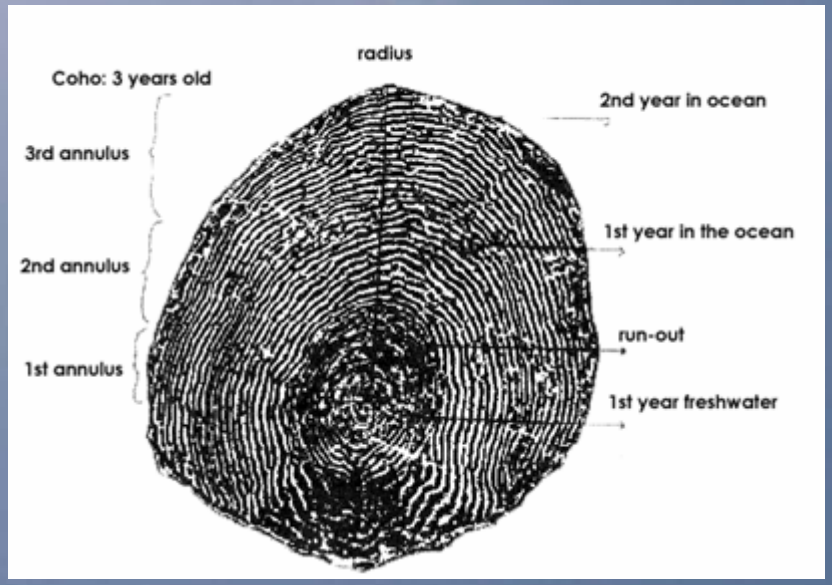
Hatchery production proportion 13 – 48%

Chinookprod Proportion – 40%

Adult Monitoring Gaps

Age Distribution

- scale or otolith analysis
- length frequency



Inland Harvest

Expand Creel Census

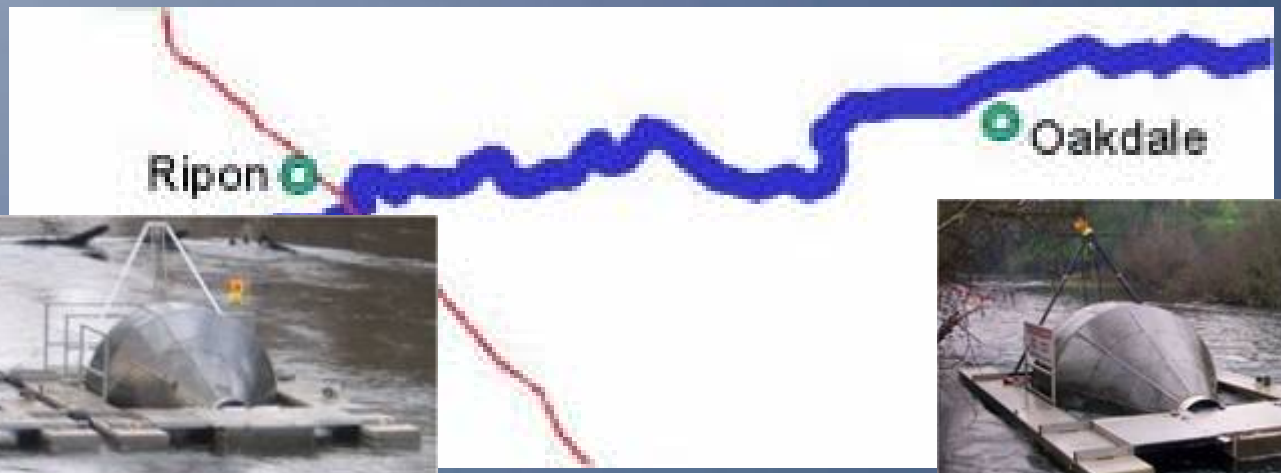
Juvenile Monitoring Gaps

In-river Survival Estimates

- paired rotary screw traps

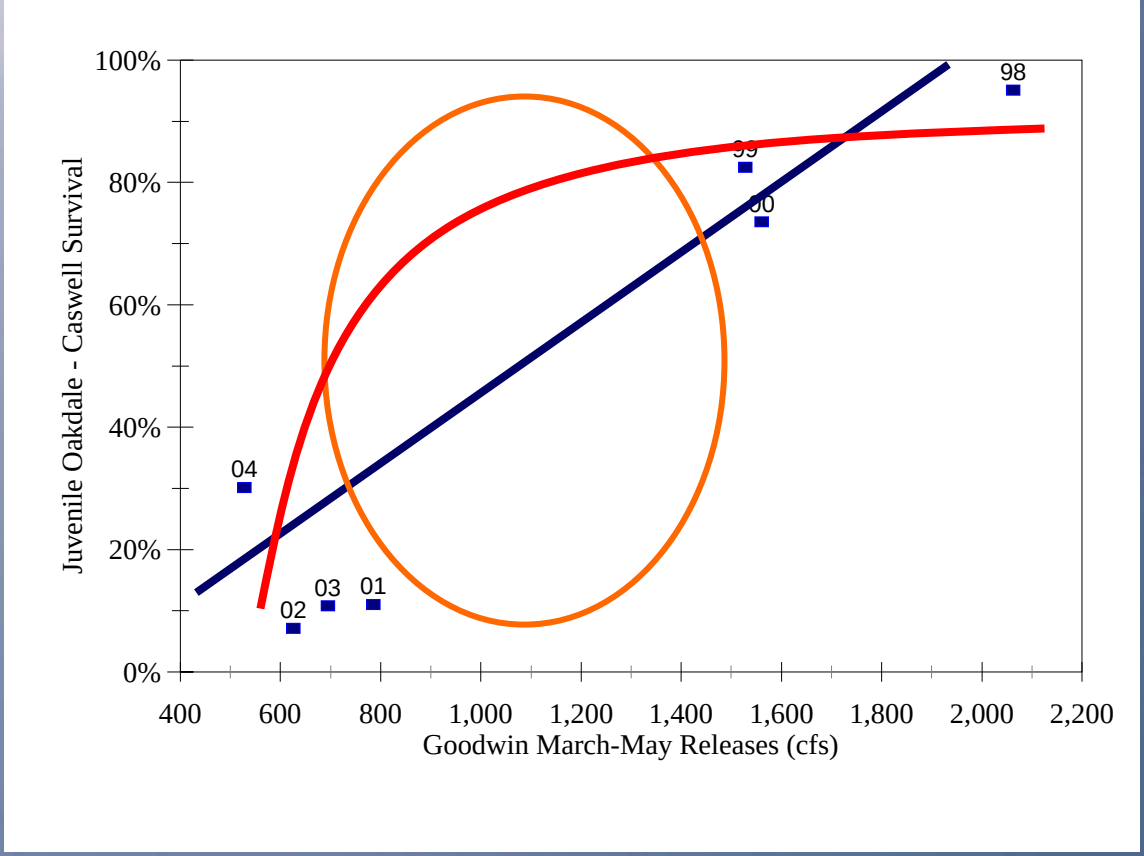
Data Quality

- improved efficiency test procedures



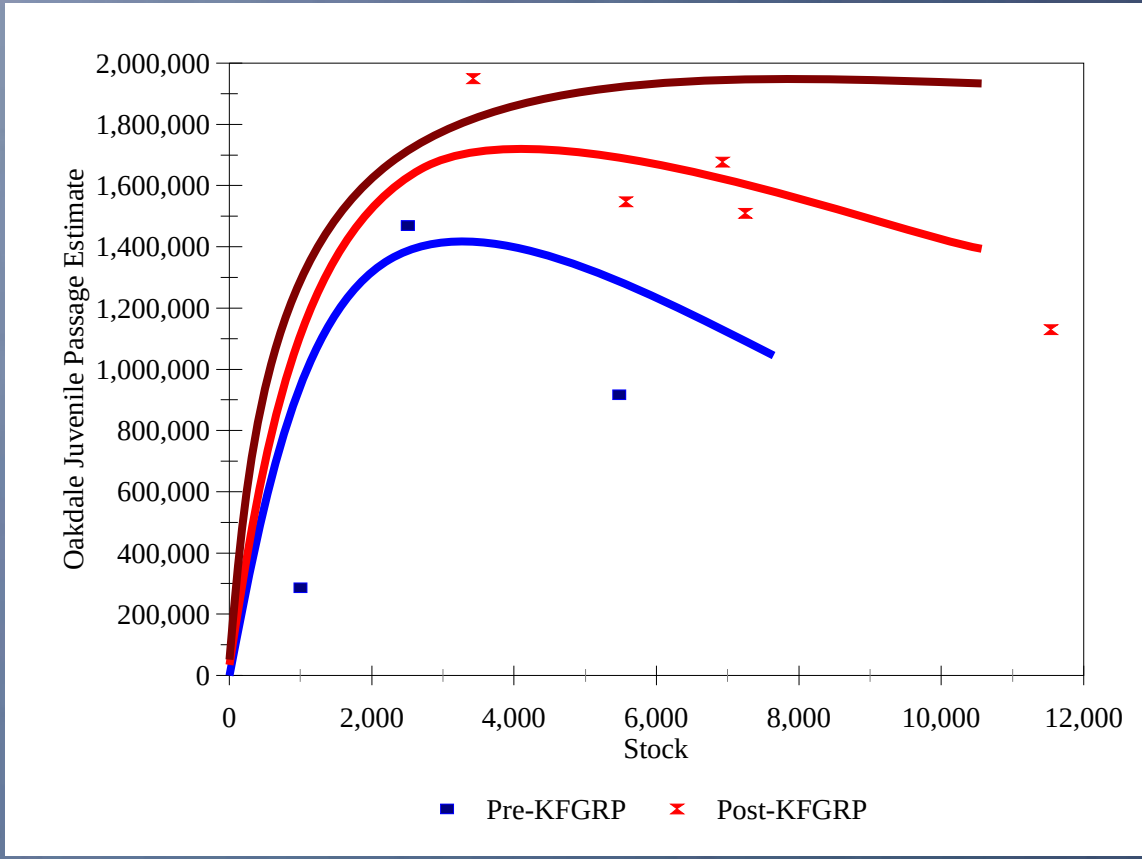
Dual RST Survival Estimates

Demonstrate Flow-Survival Relationship



RST Production Estimates

Demonstrate Restoration Progress



Data Dissemination Gaps

Central Online Repository

Better Standardized Reporting

More Descriptive Methods

Describe Caveats

CODED-WIRE TAG DATABASE

Interagency Ecological Program

COOPERATIVE ECOLOGICAL INVESTIGATIONS SINCE 1970

AFRP Monitoring Needs

Escapement

Hatchery Proportion of Production

Baseline Juvenile Monitoring

Data Dissemination