# White Sturgeon & Snake River Flows

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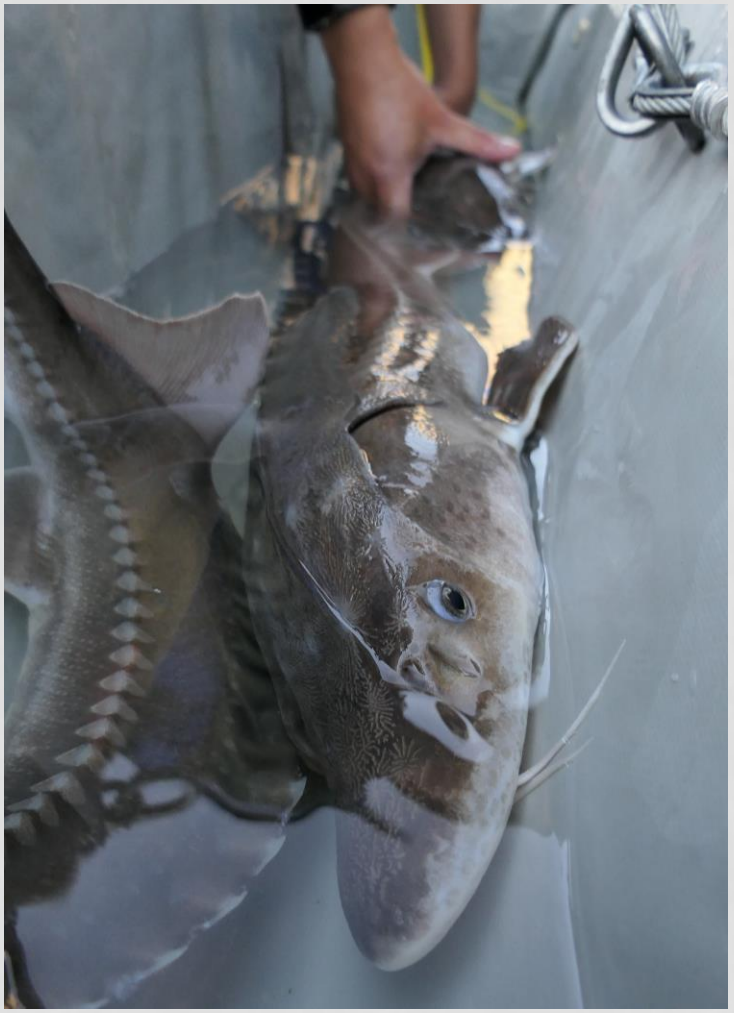
  - IPC - Senior Engineer, Operations Hydrology

# IDFG'S GOALS

- Conserve native species
- Provide recreational fishing opportunity



# DIRECTION

- Operational Plan
  - IFGC guidance
- Monitoring
- Enforcement
- Research
- Population status
- Stocking
- Address limiting factors

Snake River
**White Sturgeon Management Plan**
2023-2032

*Prepared by* IDAHO DEPARTMENT OF FISH AND GAME
July 2023

# WHY?

- Concern for important WS populations
- Cultural
- Economic
- Bureaucratic
- Communicate what WS populations need

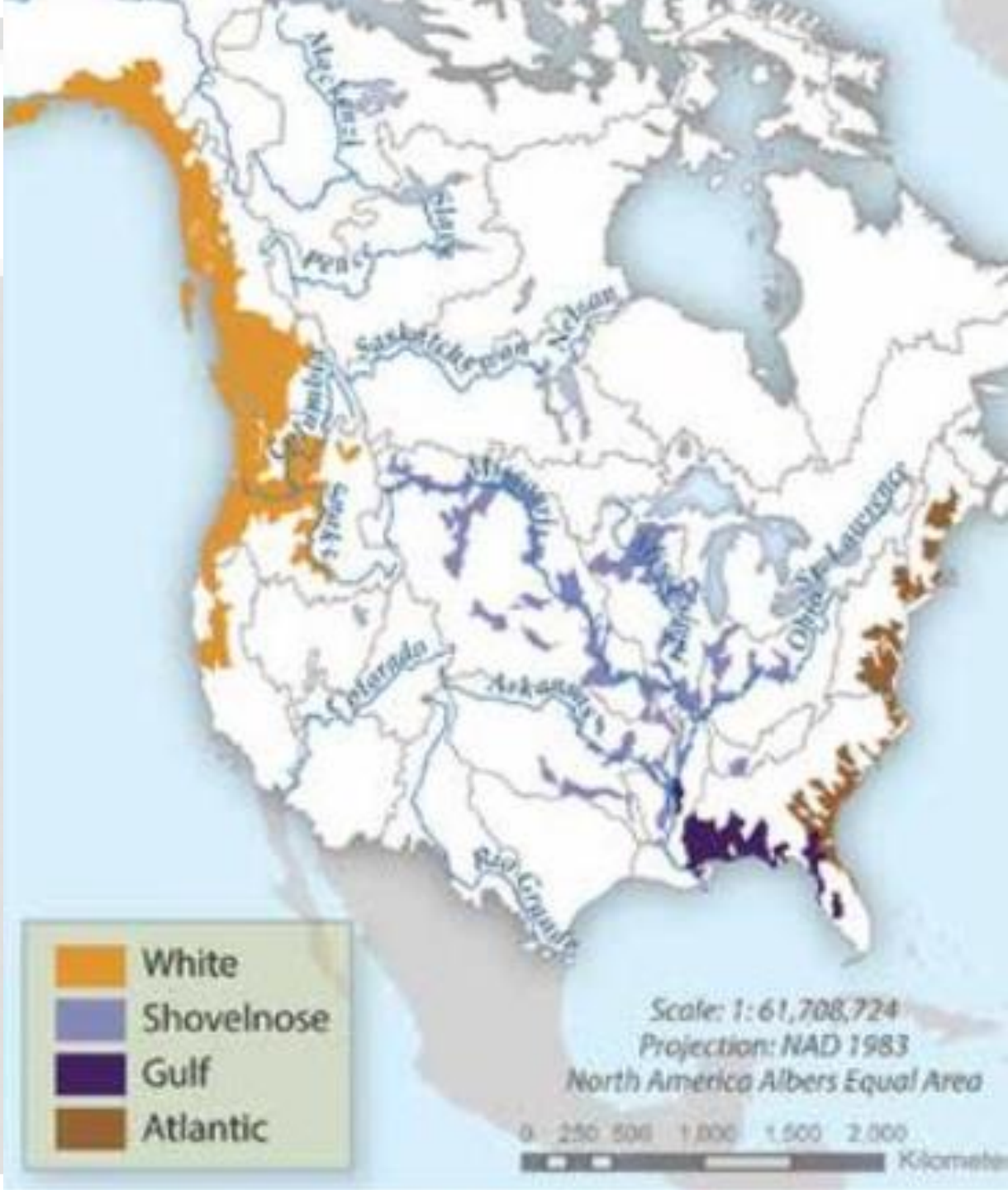
# WS SPECIES OVERVIEW

# ANCIENT

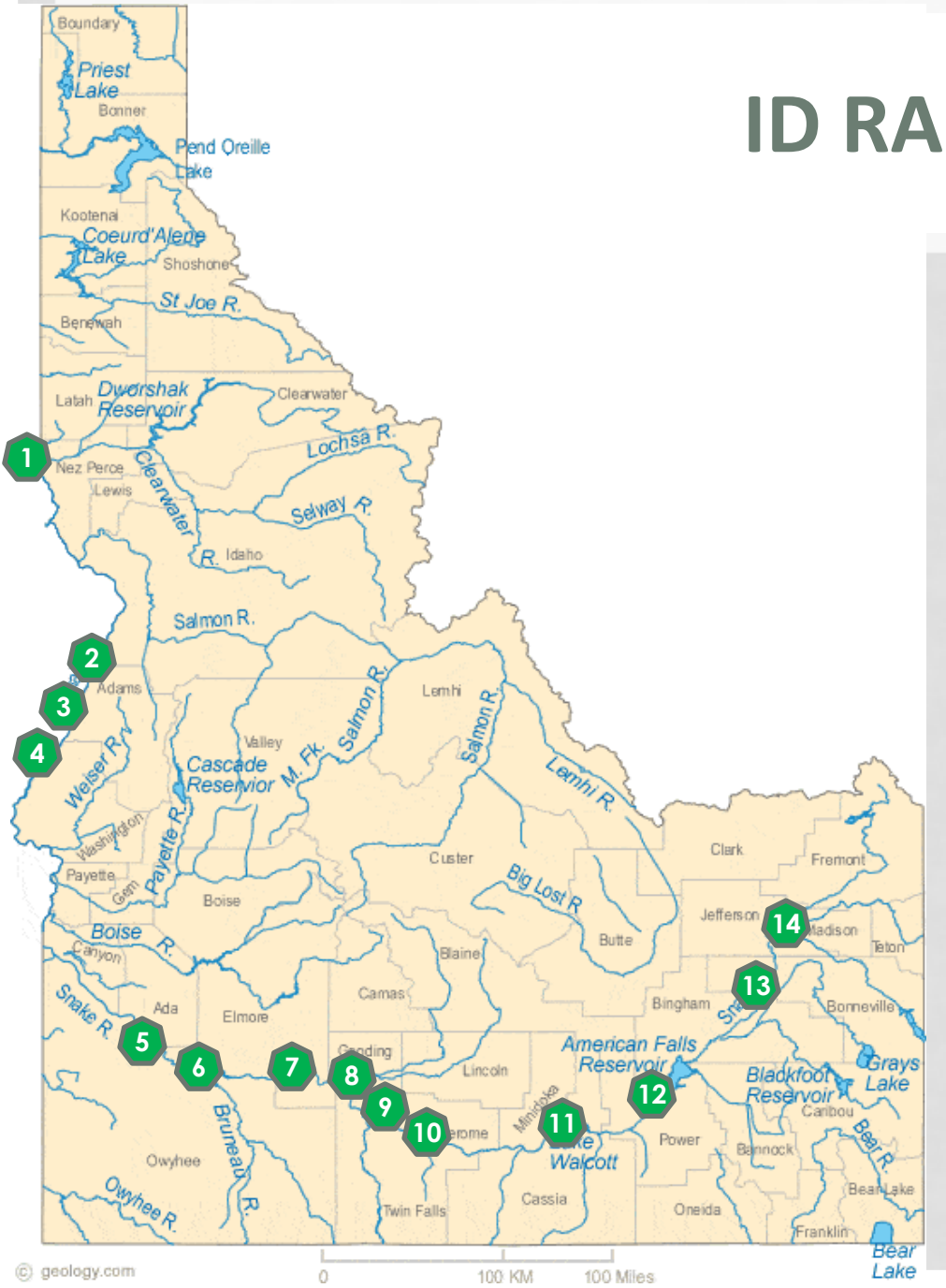
- Up to 300 mya
  - Fossils at least 200 mya
  - Relatively unchanged
- Cartilaginous skeleton
- Unique appearance, organs, & structures

# RANGE

- Columbia
- Fraser
- Sacramento



# ID RANGE




1. Lower Granite (1975)
2. Hells Canyon (1967)
3. Oxbow (1961)
4. Brownlee (1959)
5. Swan Falls (1901)
6. CJ Strike (1952)
7. Bliss (1948)
8. L-Salmon Falls (1910)
9. U-Salmon Falls (1947)
10. Shoshone Falls (Natural)
11. Minidoka (1906)
12. American Falls (1978)
13. Gem State (1988)
14. Idaho Falls (Natural)

# LIFE HISTORY

- Long lived & large
- Late maturing
- Non-annual spawning
- **Specific spawning requirements**
- Adhesive eggs
- Larval drift
- High mortality of eggs and fry
- Low natural mortality of sub-adults & adults

# RANGEWIDE STATUS

- Columbia
  - Mixed
  - High abundance, but declining
  - Poor recruitment
- Fraser
  - Moderate abundance, but declining
  - Poor recruitment
- Sacramento
  - 150k to 33k
  - Poor recruitment
  - Petition for state listing

# ID STATUS

- Abundance ≈ 10,000
- Two important populations
  - Below Hells Canyon
  - Below Bliss
  - Natural recruitment
- Populations increased & peaked by early 2000s
  - Decades after harvest closures
- Little recent recruitment

# THREATS

- Harvest
- Insufficient Reach Length
- Altered Hydrographs

# ALTERED HYDROGRAPHS & SPAWNING

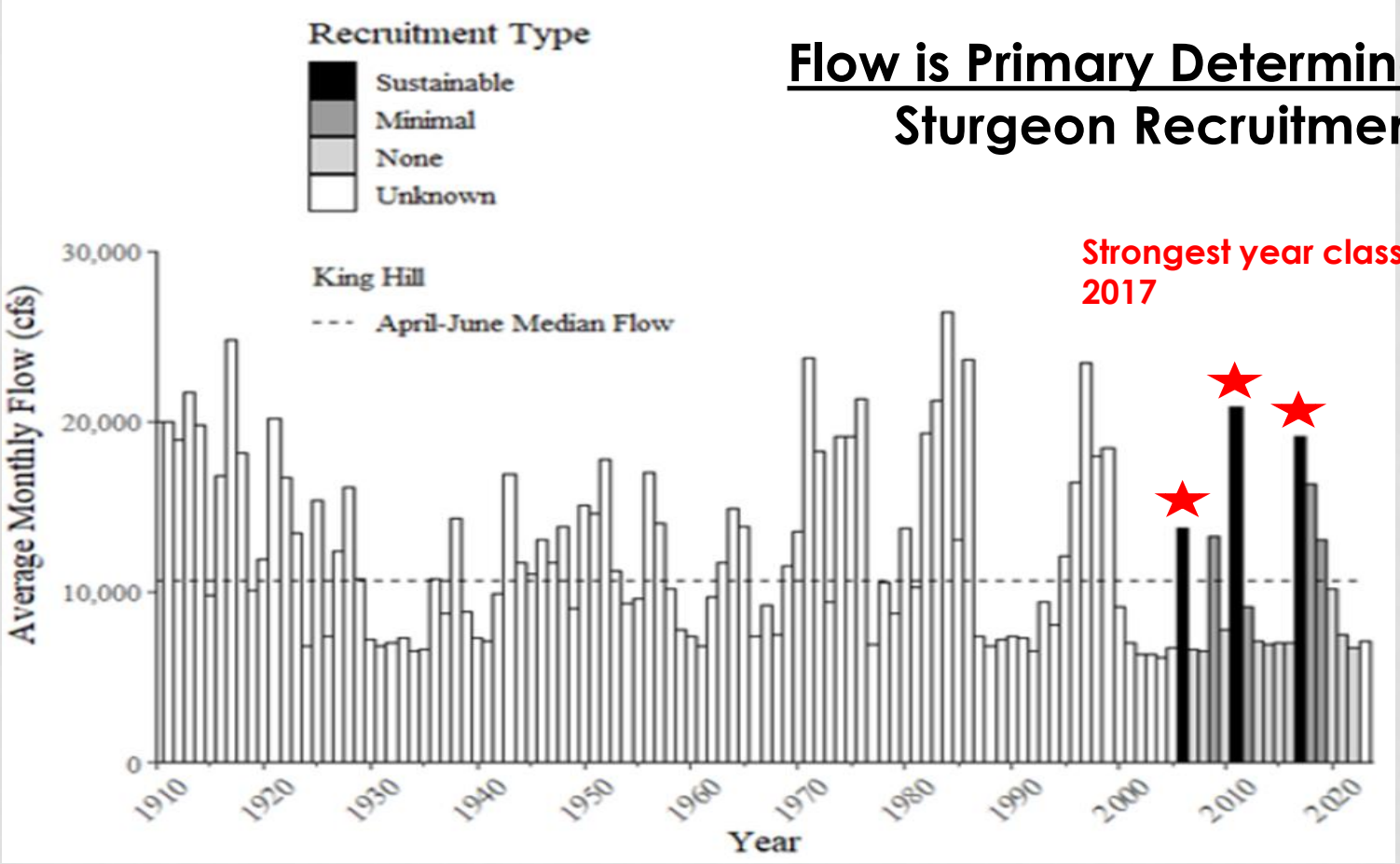
- Alterations
  - Magnitude
  - Timing
  - Temperature
  - Turbidity
- Migration Cue
- Initiate Spawning
- Affects egg & fry survival

# WS RECRUITMENT

# Sturgeon Spawning

- Late April to early June, **Peak spawning in May**
- Spawning temperature range 12-18C (53 – 64F)
- 14-16C (57-61) optimal of egg development
- Broadcast spawning in high velocity areas, rocky substrate, hydraulic complexity
- Flow Benefits: substrate cleaning, egg & larval dispersal, turbidity, reduced predation

# Flow is Primary Determinant of Sturgeon Recruitment



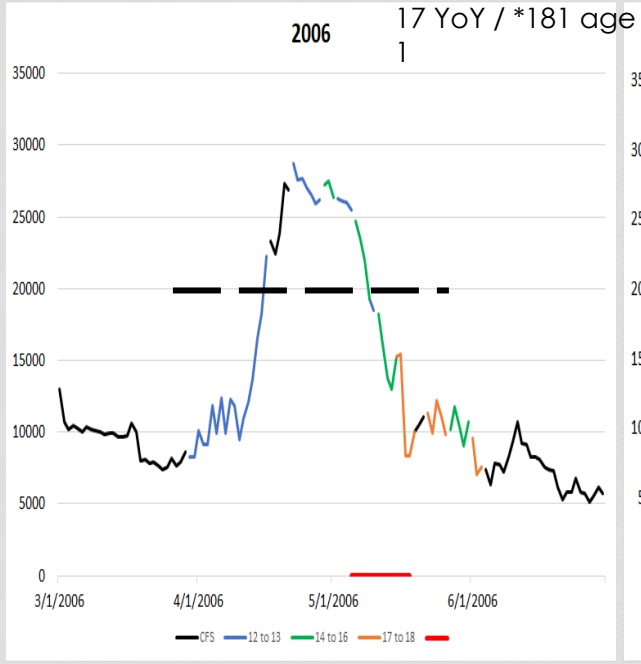

Strongest year classes: 2006, 2011, 2017

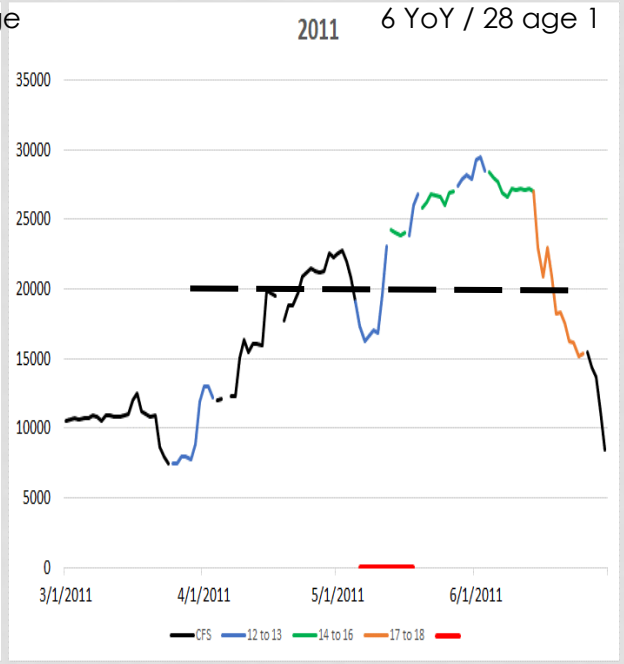
2006
Age-0 Index = 17 (non gill-net)

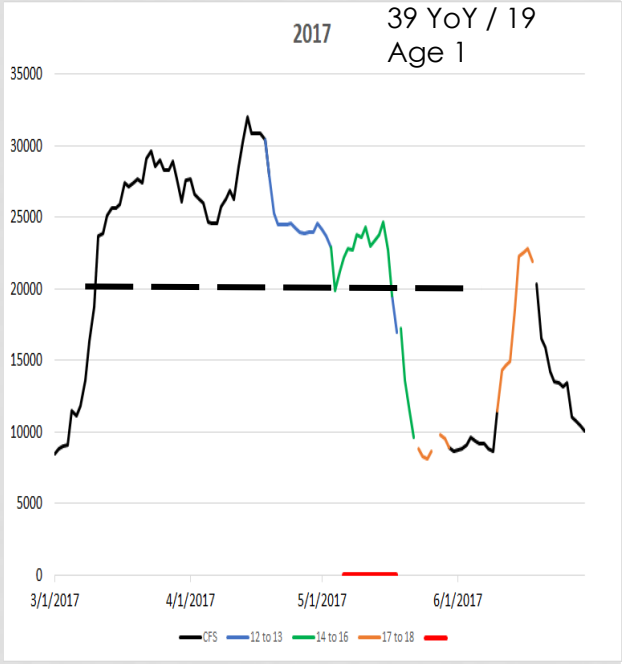
2011
Age-0 Index = 6
Age-1 Abundance = 417 (230-728)

2017
Age-0 Index = 39
Age-0 Abundance = 830 (431-1746)

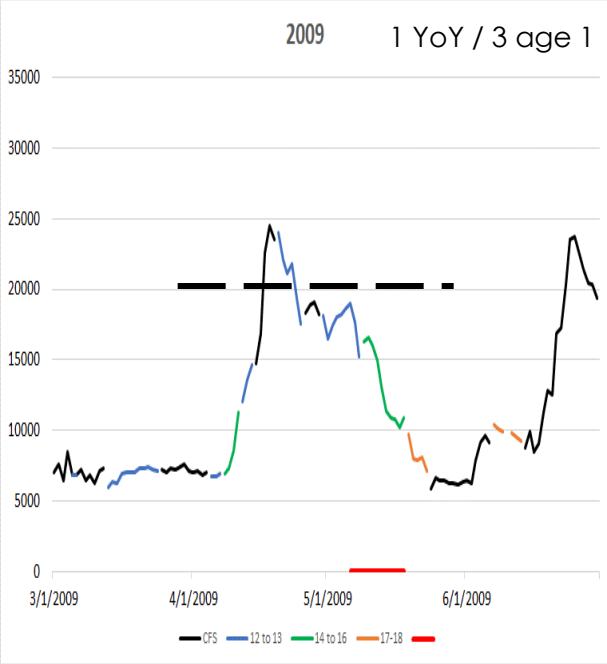
# High Flow Recruitment

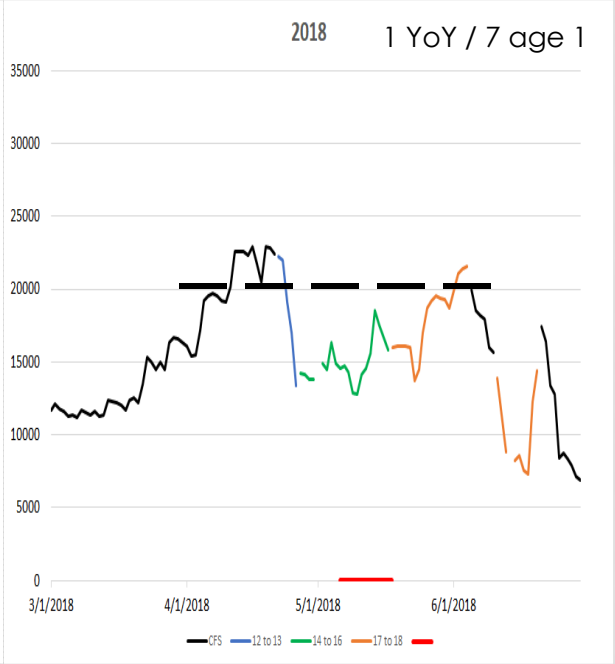


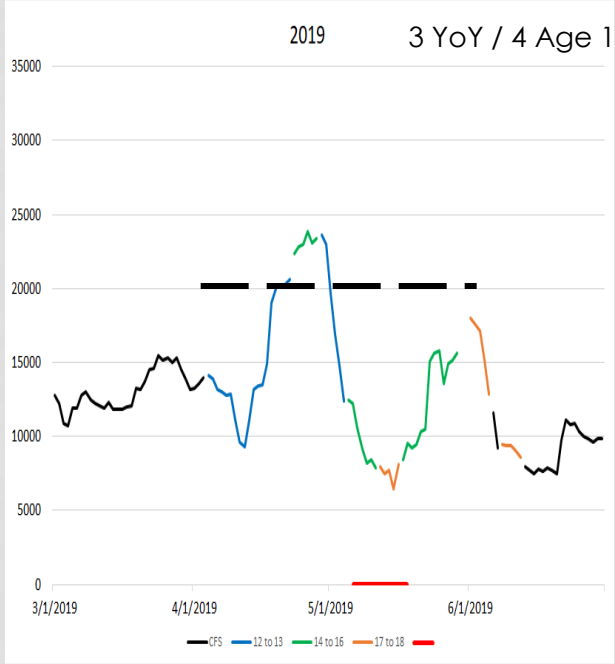



# Some Recruitment….Not population sustaining

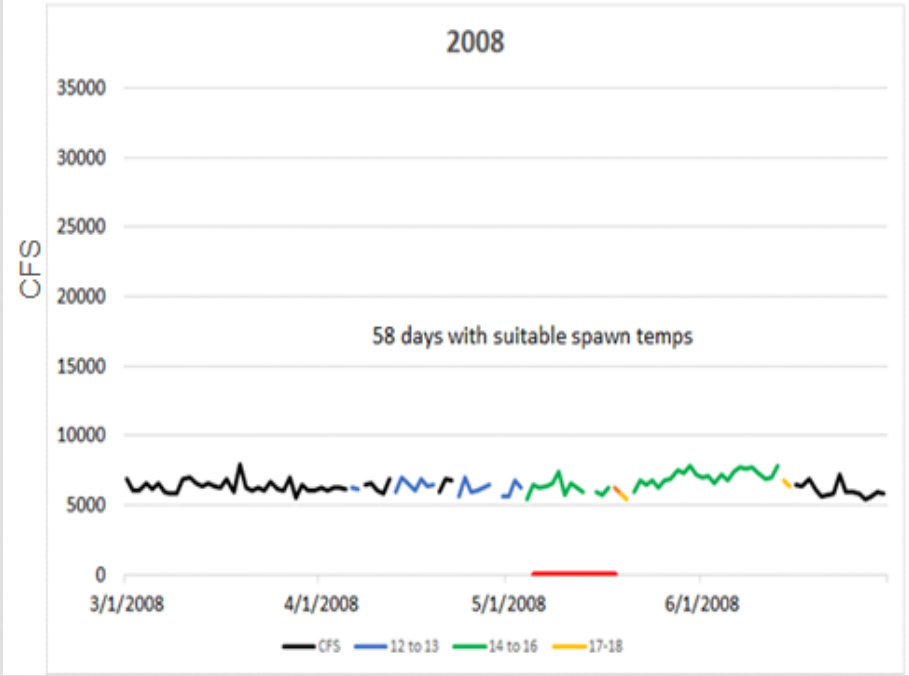


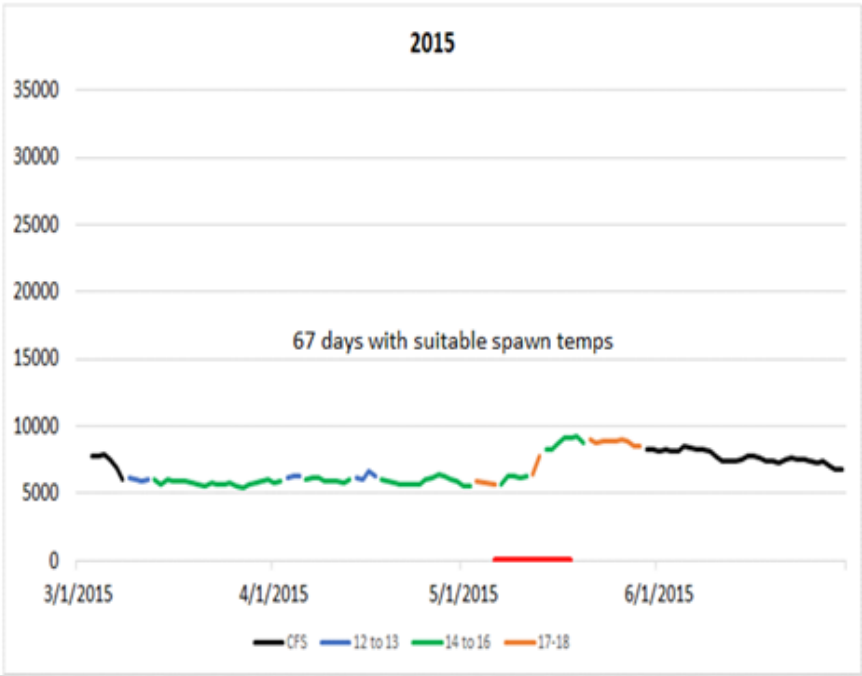



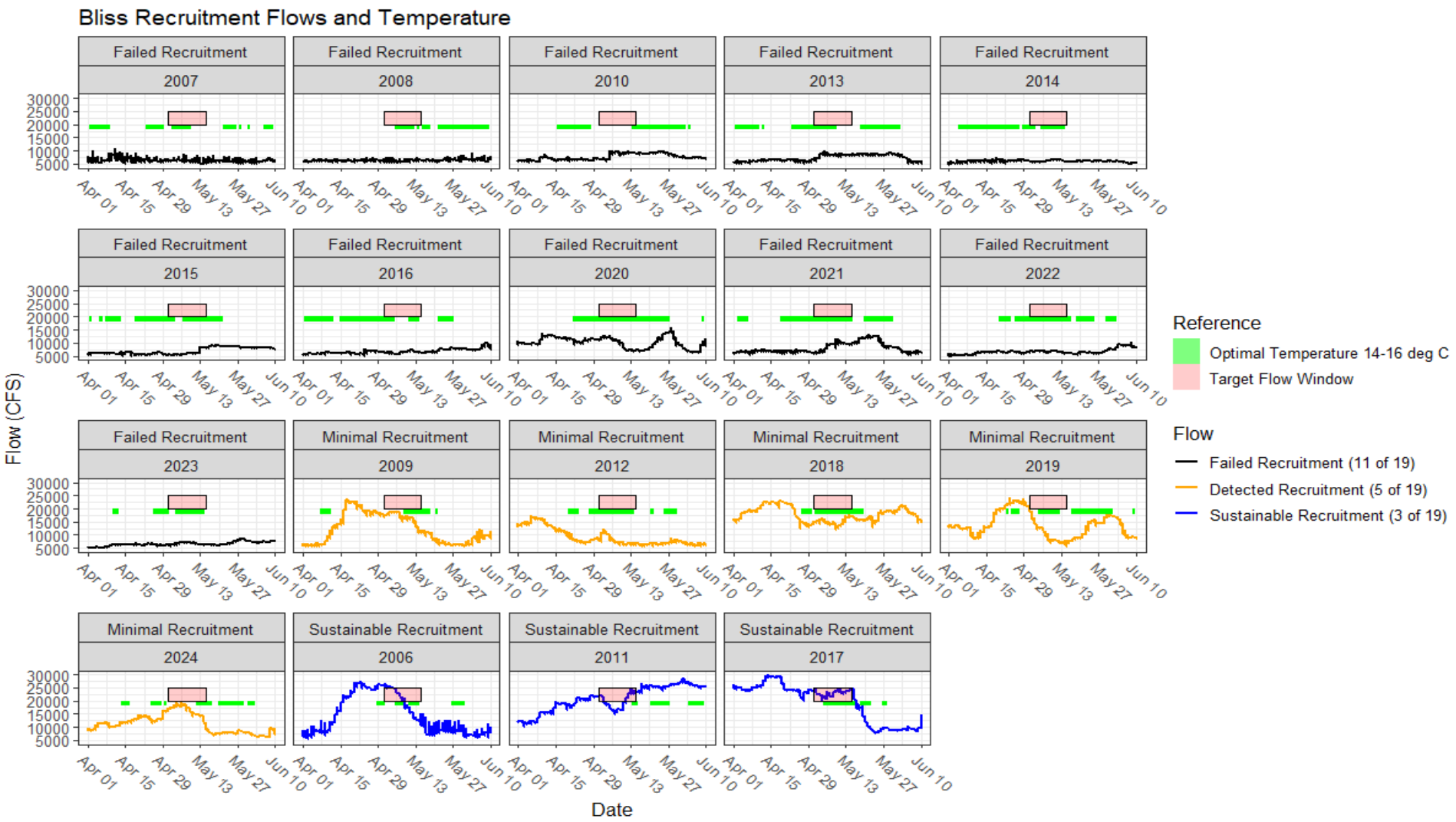



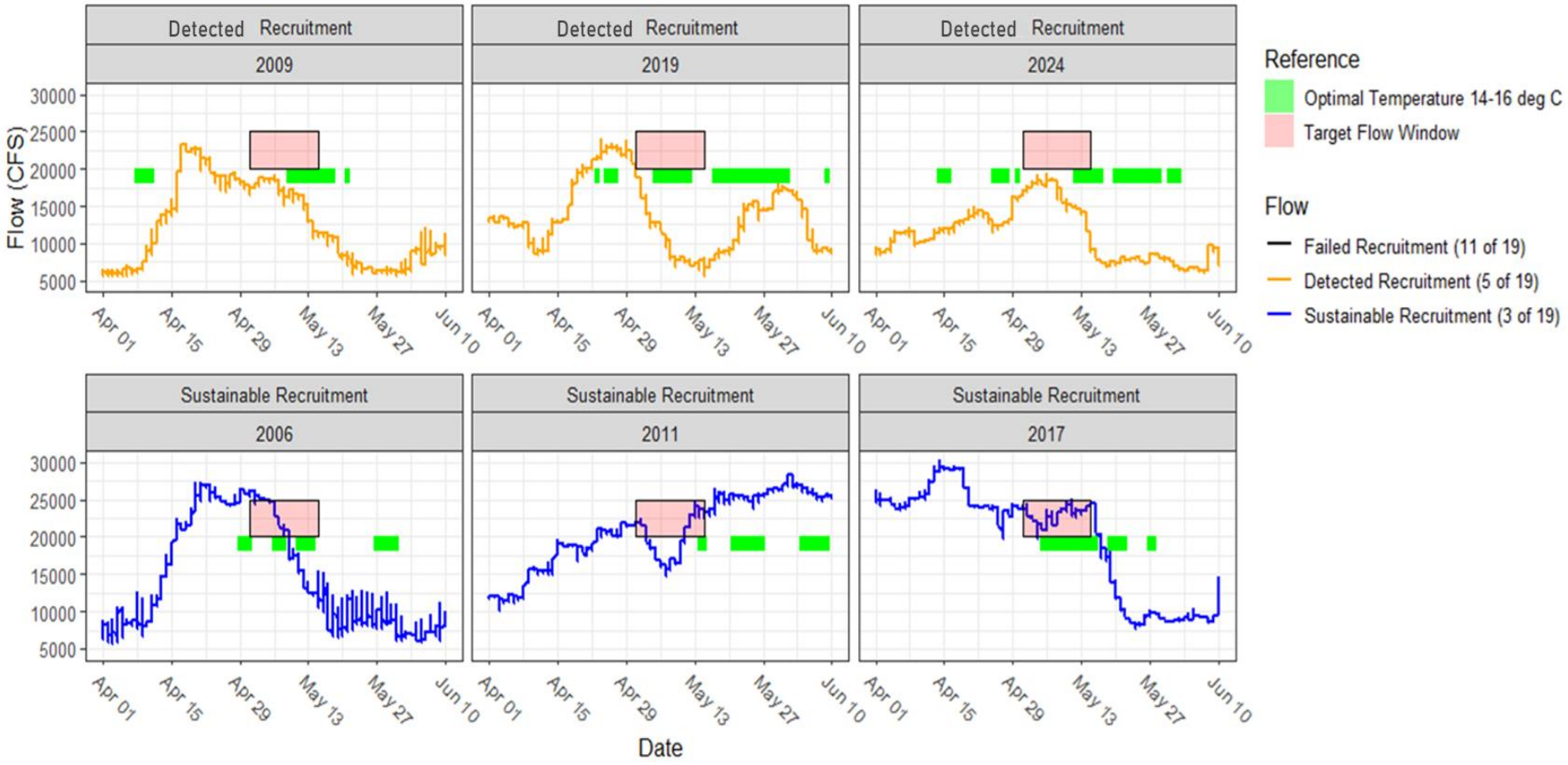
# Recruitment failure flows

## Below average – dry years




Bliss Recruitment Flows and Temperature
Failed Recruitment
2007
2008
2010
2013
2014
2015
2016
2020
2021
2022
2023
Minimal Recruitment
2009
2012
2018
2019
2024
Sustainable Recruitment
2006
2011
2017
30000
25000
20000
15000
10000
5000
Apr 01
Apr 15
Apr 29
May 13
May 27
Jun 10
Flow (CFS)
Date
Reference
Optimal Temperature 14-16 deg C
Target Flow Window
Flow
Failed Recruitment (11 of 19)
Detected Recruitment (5 of 19)
Sustainable Recruitment (3 of 19)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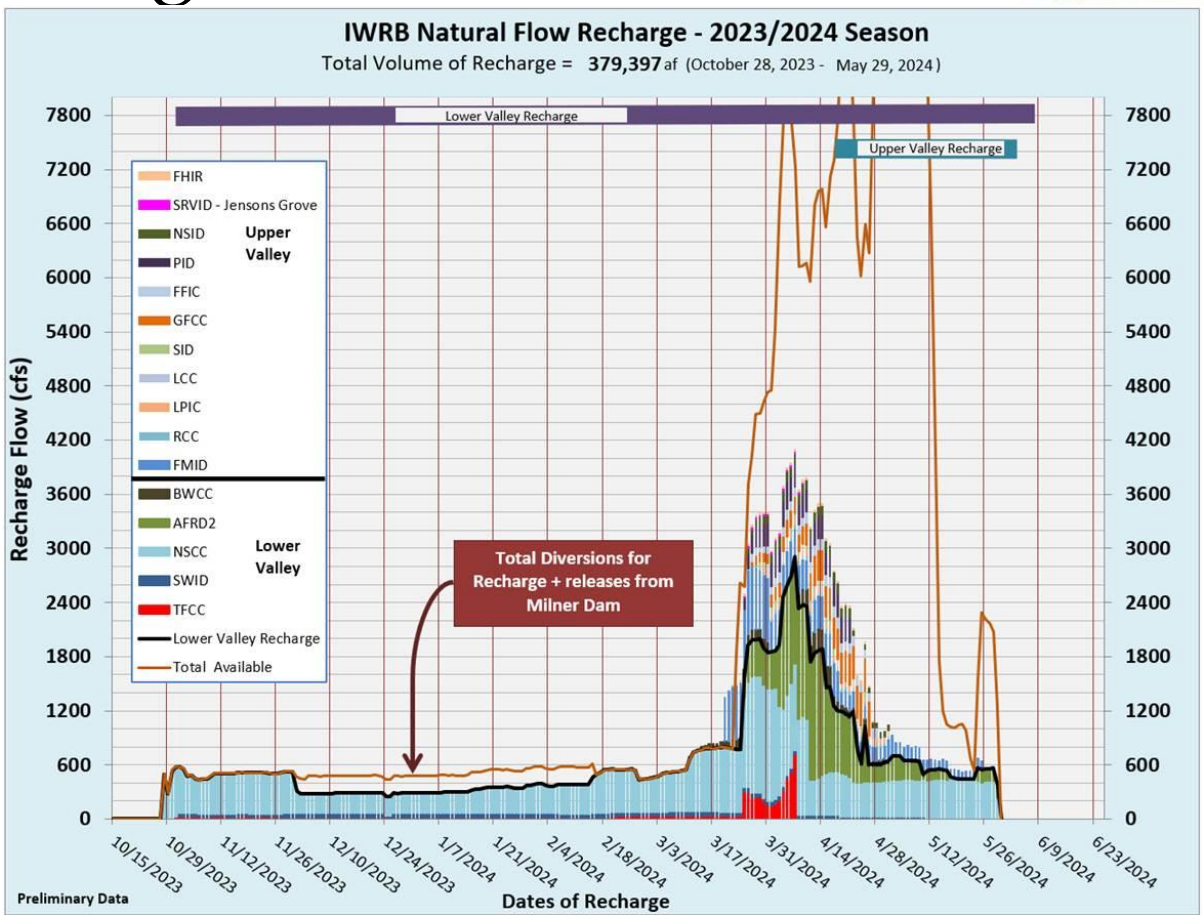
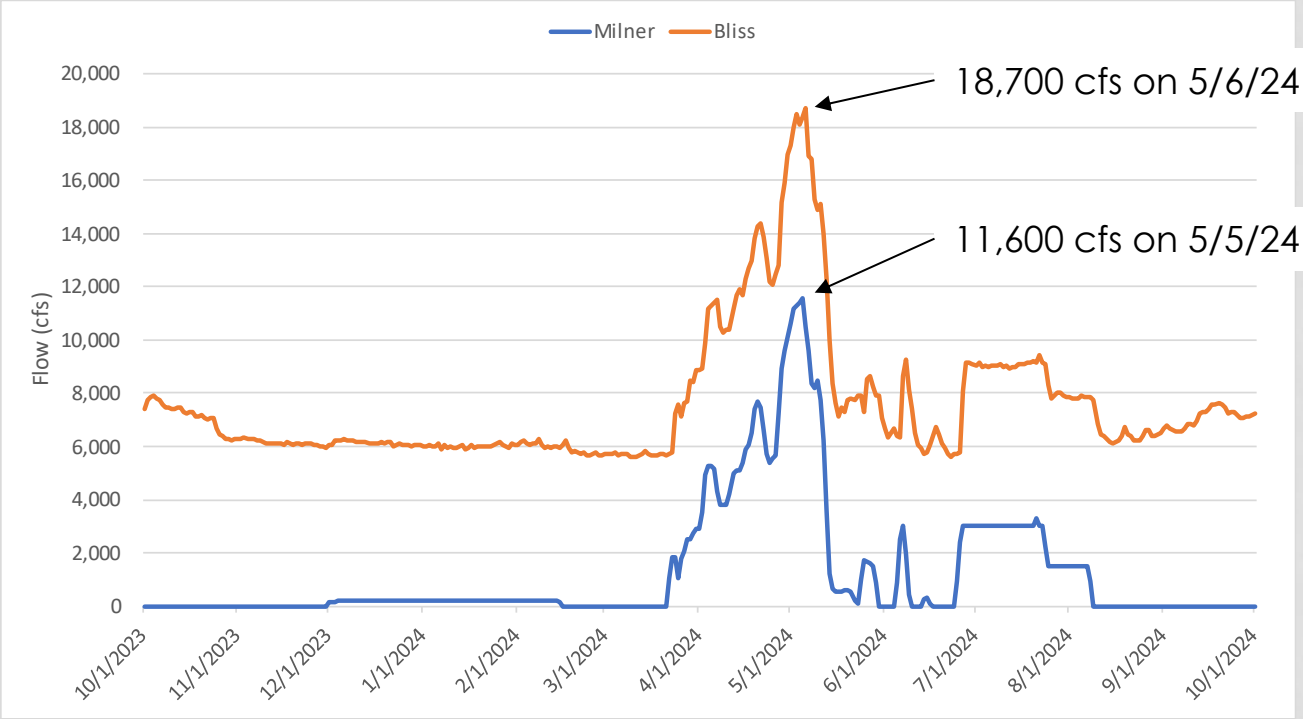
# 2024 Recharge



# Snake River Flows



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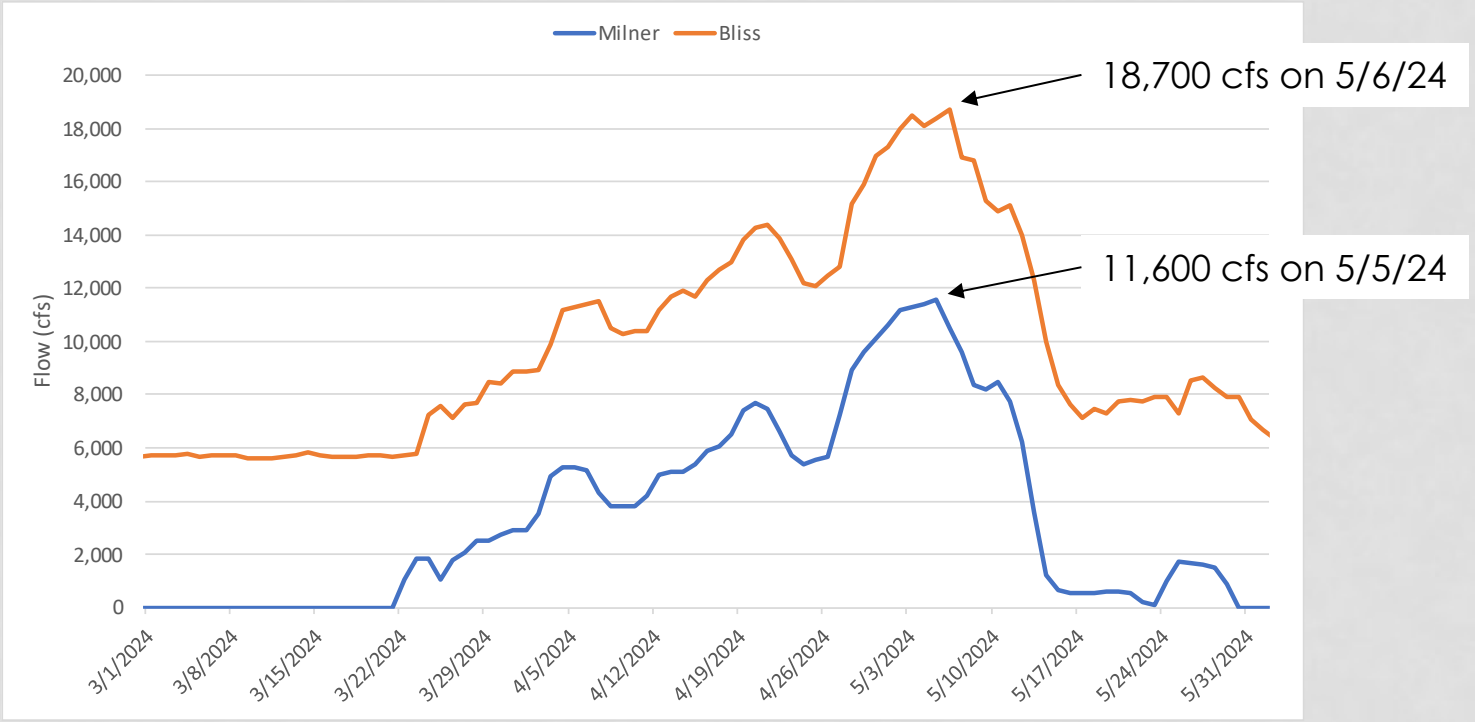
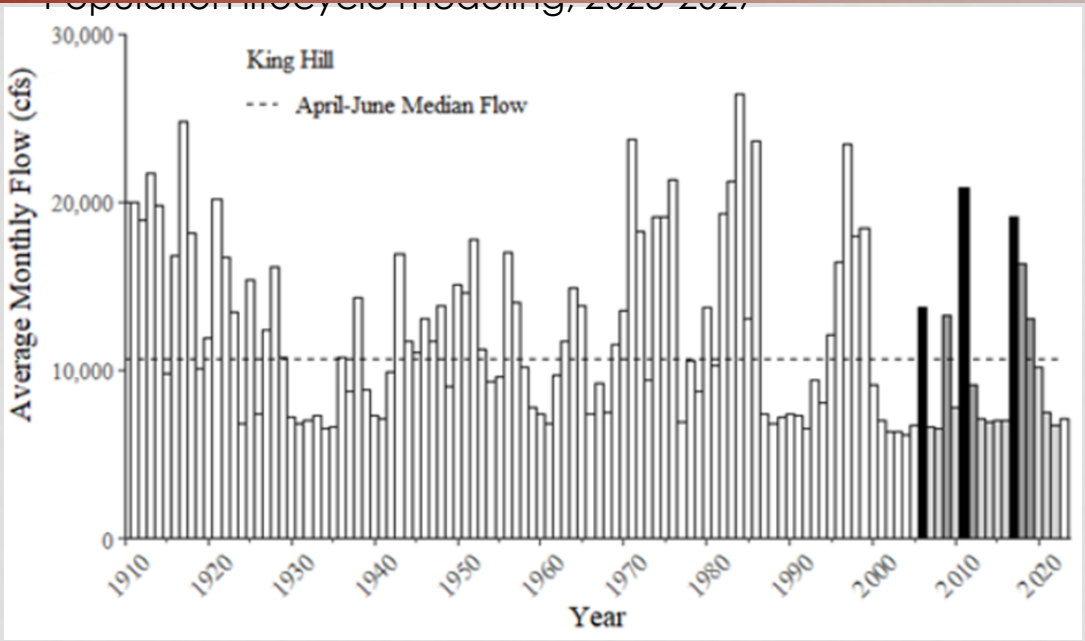


# How infrequent is Too infrequent?

When environmental conditions (e.g., high spring flows) that trigger successful recruitment become too rare……

- population abundance decline
- erosion of genetic diversity

Population lifecycle modeling, 2025-2027





Questions?