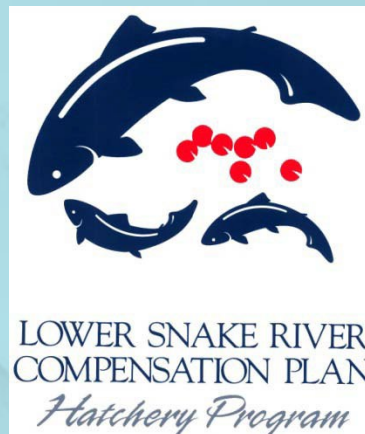


# SPRING CHINOOK SALMON DWORSHAK NATIONAL FISH HATCHERY CLEARWATER RIVER, IDAHO

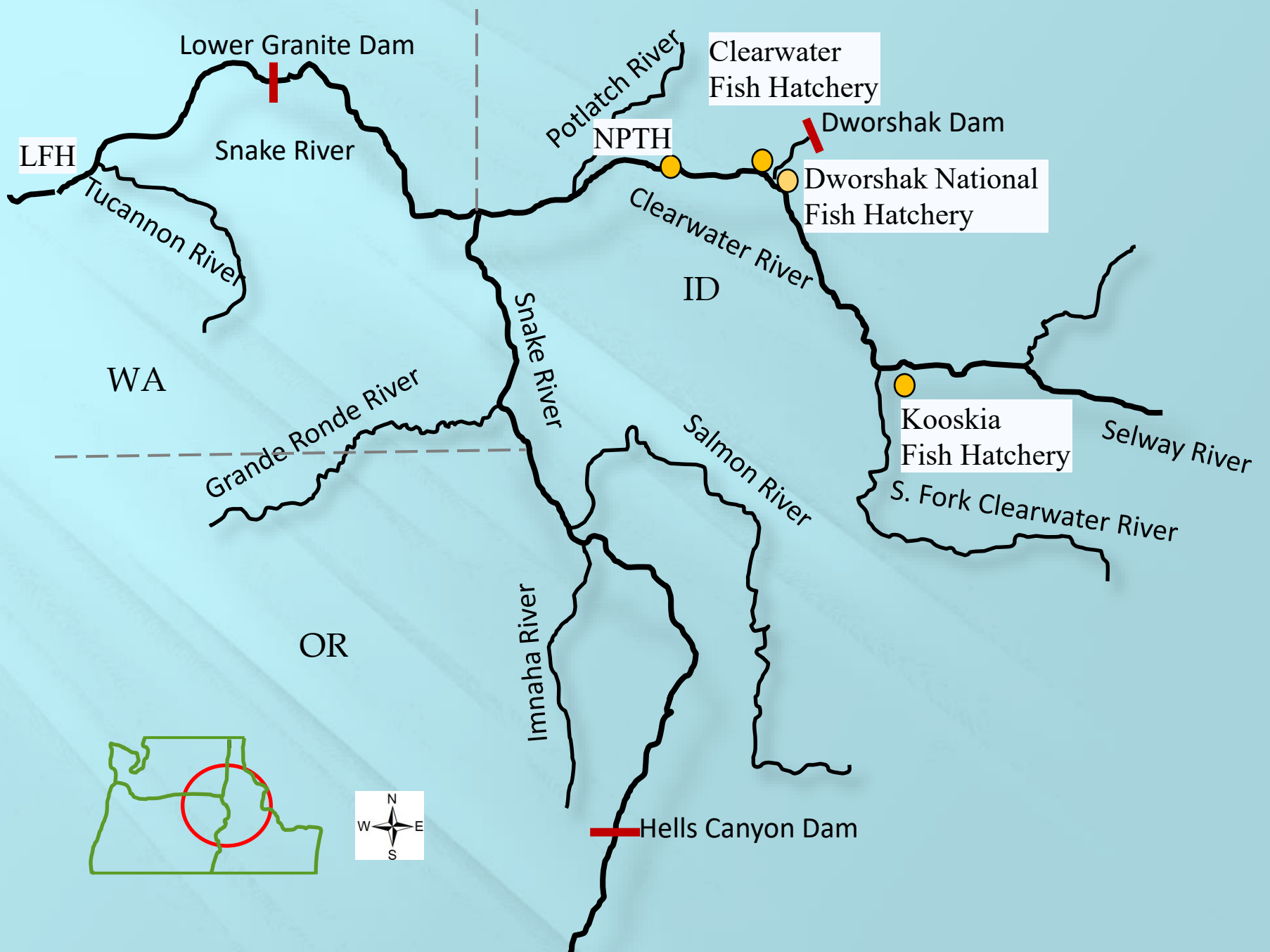
William Young, Frank Mullins,  
John Erhardt, Doug Nemeth

Nez Perce Tribe

U.S. Fish and Wildlife Service







Lower Granite Dam

LFH

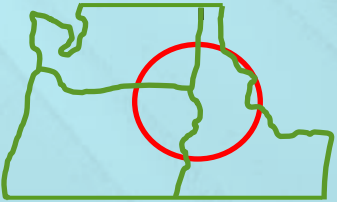
Snake River

Tucannon River

WA

Grande Ronde River

OR



Potlatch River

NPTH

Clearwater  
Fish Hatchery

Dworshak Dam

Dworshak National  
Fish Hatchery

ID

Clearwater River

S Snake River

Salmon River

Kooskia  
Fish Hatchery

Selway River

S. Fork Clearwater River

Hells Canyon Dam

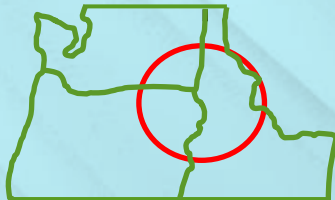
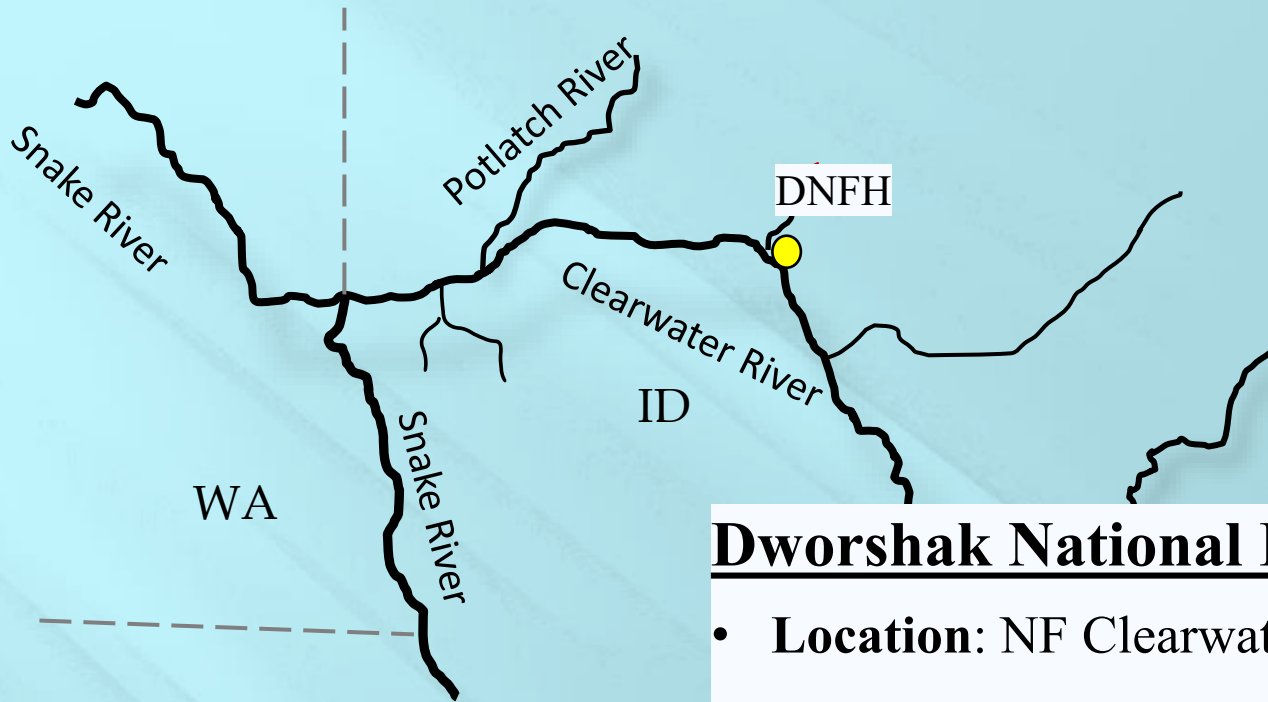


# NPT sole operator: summer 2022





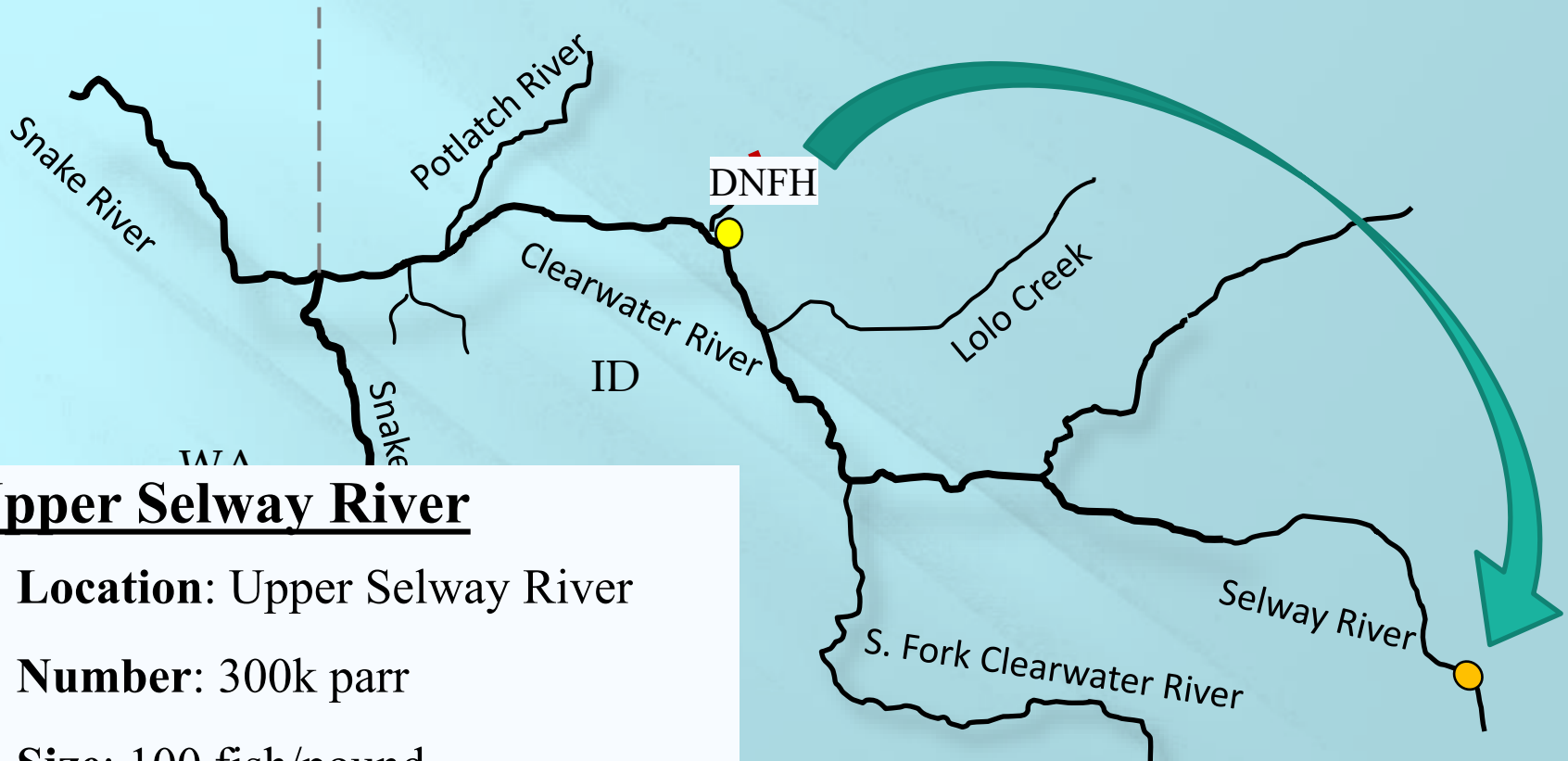
# Juvenile Release Locations



## Dworshak National Fish Hatchery

- **Location:** NF Clearwater River
- **Number:** 1.05 - 1.65 million smolts
- **Size:** 20 fish/pound
- **Marking:** 100% AD
- **Tagging:** 180k CWT; 52k PIT; PBT
- **Release:** Acclimated; Late March to mid-April

# Juvenile Release Locations

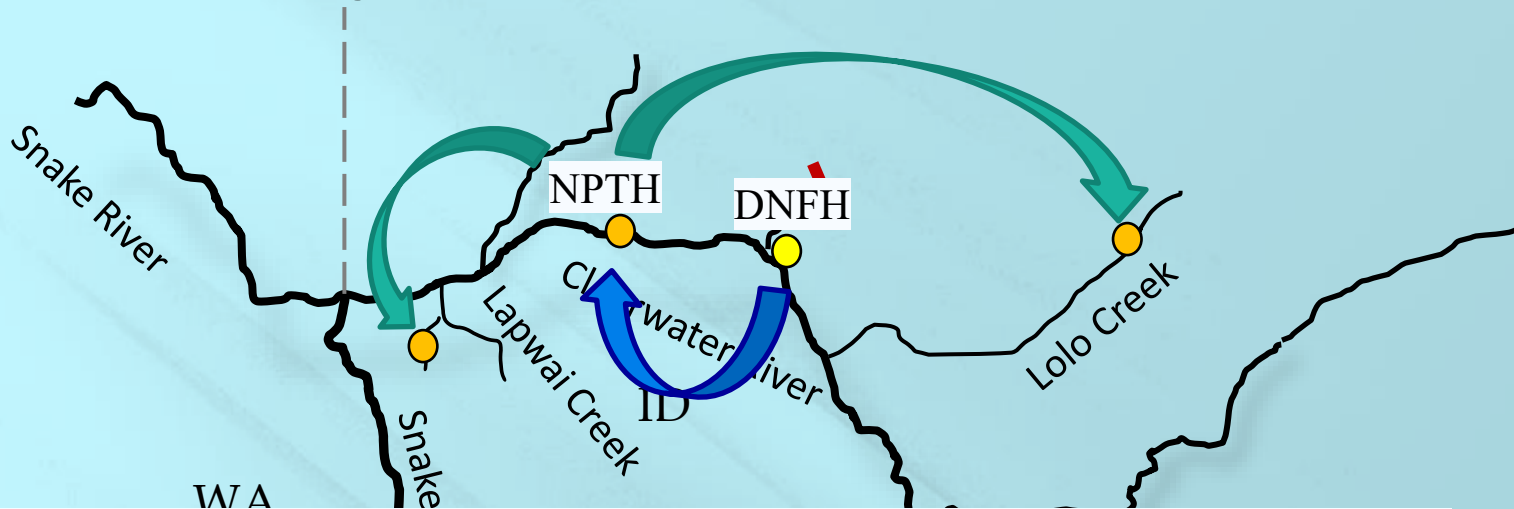


## Upper Selway River

- **Location:** Upper Selway River
- **Number:** 300k parr
- **Size:** 100 fish/pound
- **Marking:** unclipped
- **Tagging:** PBT
- **Release:** Direct; August/September



# Juvenile Release Locations



## Off-station smolt release

- **Rearing:** early – DNFH; final - NPTH
- **Location:** Lolo Creek/NPTH/Lapwai Creek
- **Number:** 200k smolt
- **Size:** 20 fish/pound
- **Marking:** 100% AD clipped
- **Tagging:** 60k CWT; 600 PIT; PBT
- **Release:** Accimated (NPTH)/Direct (Lolo/Lapwai); March/April

# DNFH Program Goals

- 9,135 adults above Lower Granite Dam
  - 0.87% SAR
- Harvest of 36,500 in ocean & Columbia River
  - 4.30% SAS
- Original production goal of 1.4 mil smolts
- Current production goal of 1.65 mil smolts



# Management Objectives

- Mitigate for losses from the construction of the four lower Snake River dams
- Meet program broodstock goals
- Provide sport & NPT fishing opportunities in the Clearwater River
- Minimize impacts to natural populations
- Assist other programs in the Clearwater basin



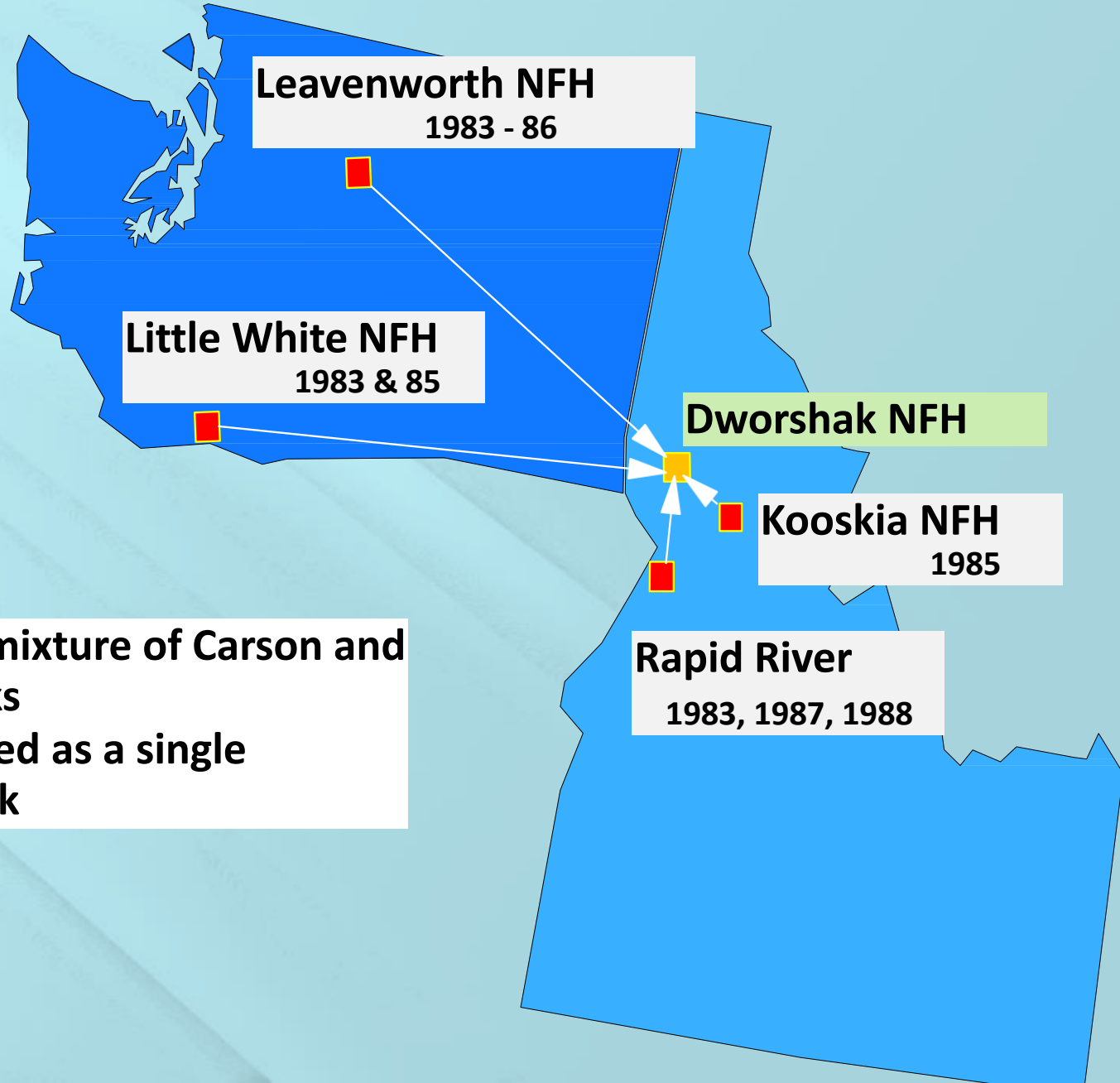
# M&E Objectives

- Evaluate the effectiveness of the program so that it can be managed adaptively
- Determine if the program is meeting its mitigation goals
- Document and communicate programs success at meeting its program and management goals
- Communicate hatchery and R,M & E activities

# Lewiston Dam: 1929 - 1972

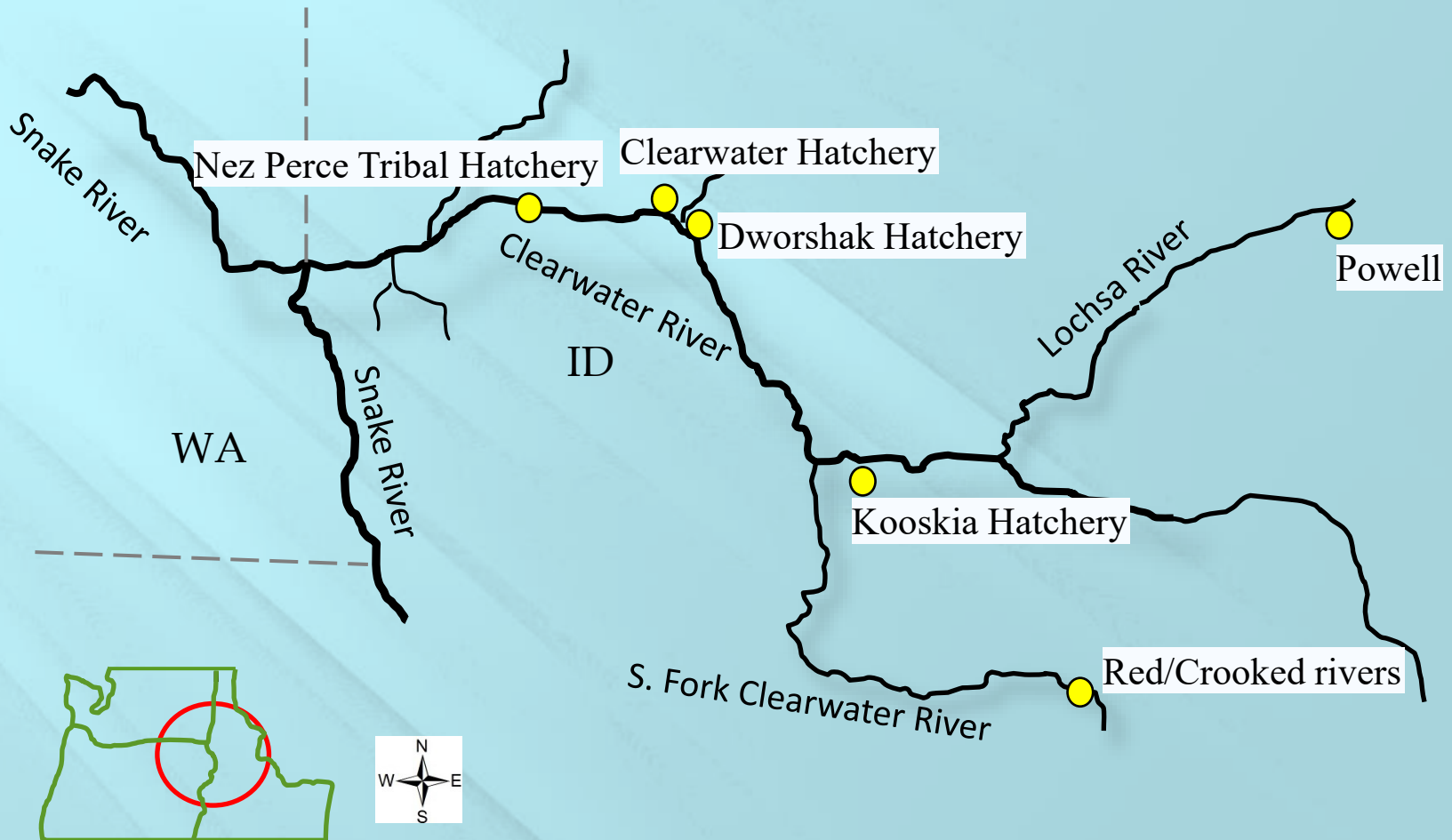


# Brood stock Development

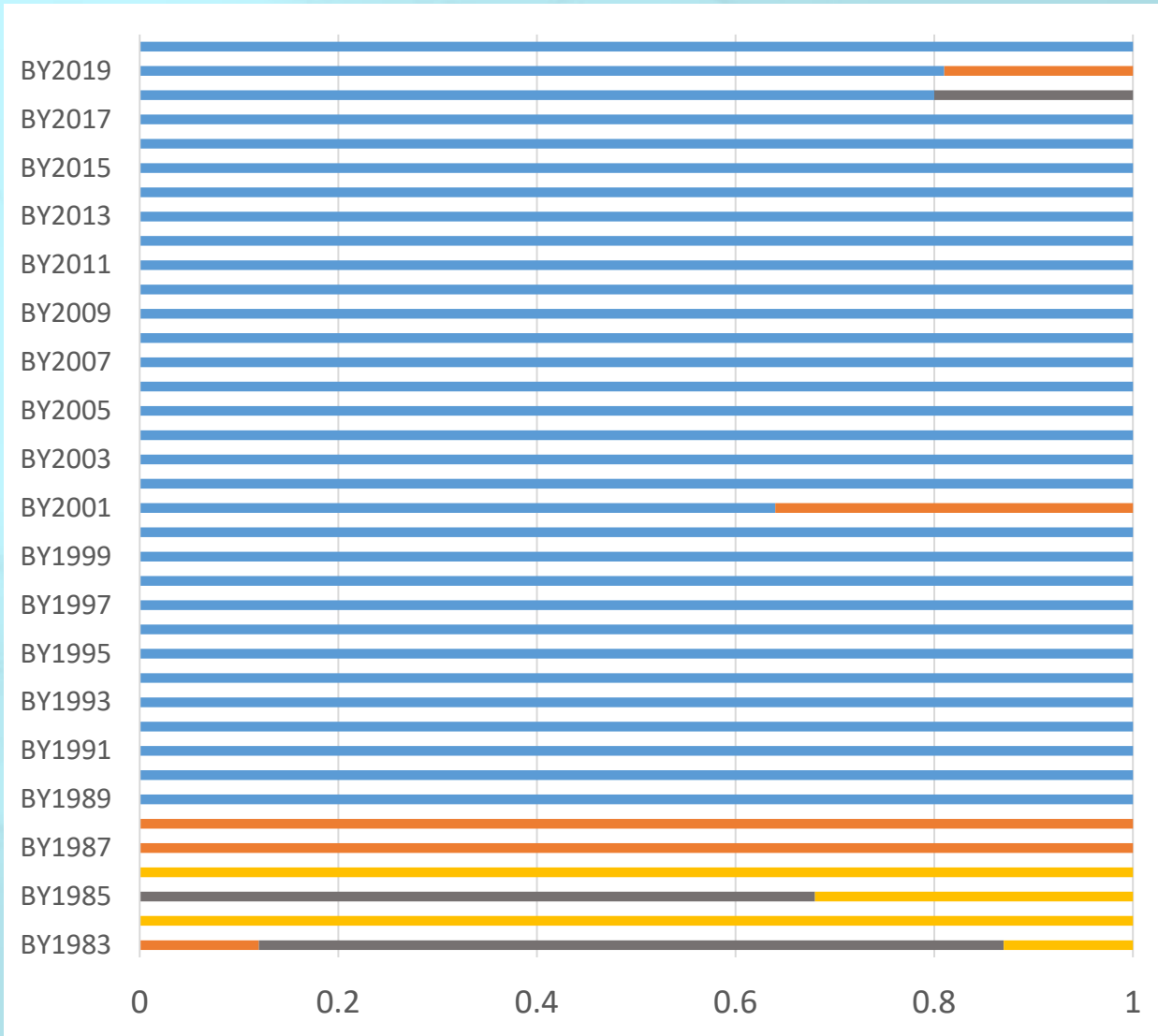


- **Founded with a mixture of Carson and Rapid River stocks**
- **Currently managed as a single 'Clearwater' stock**

# Clearwater Stock



# Historical brood stock sources



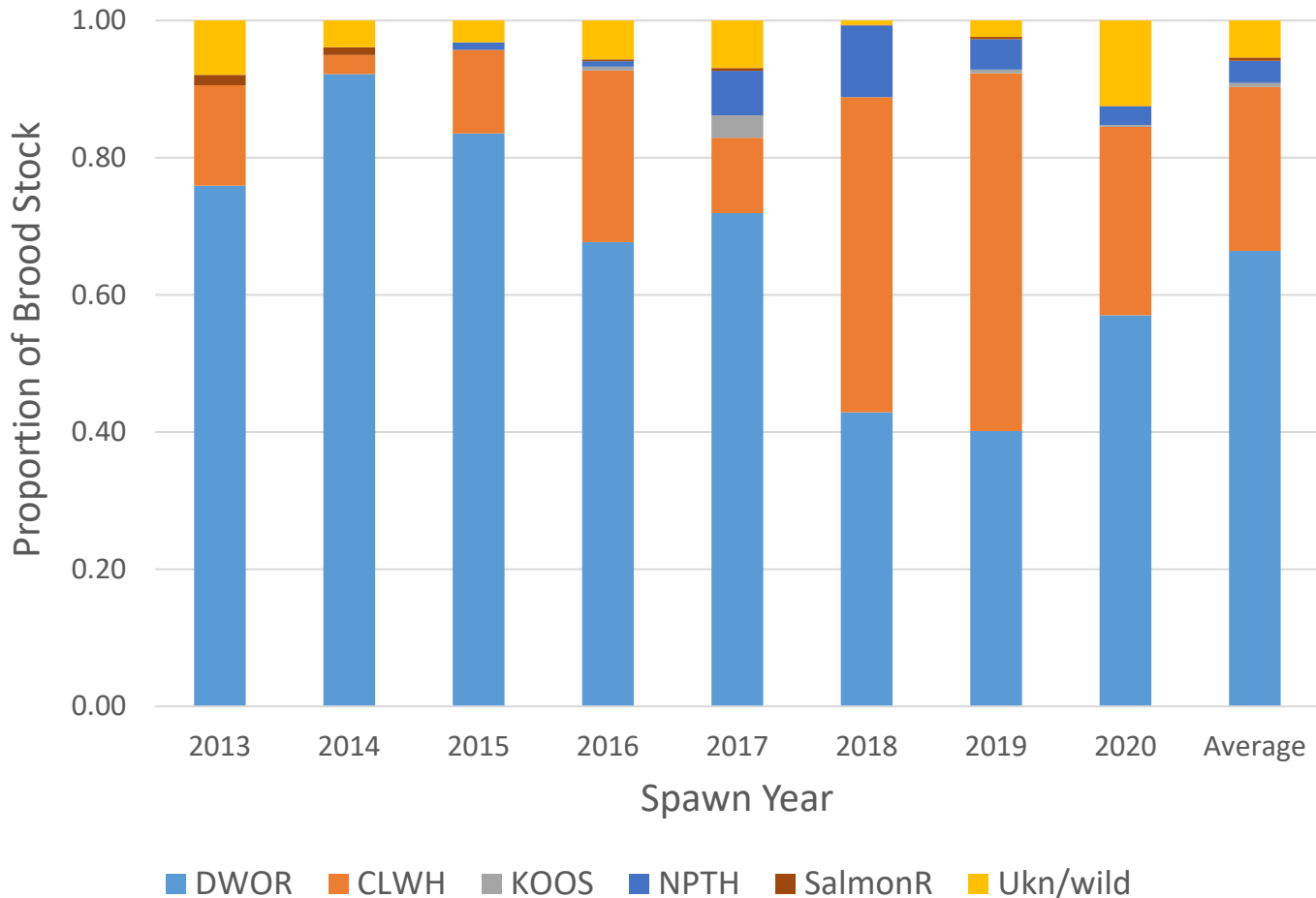
- Clearwater
- Leavenworth
- Little White Salmon
- Rapid River

} Brood stock development

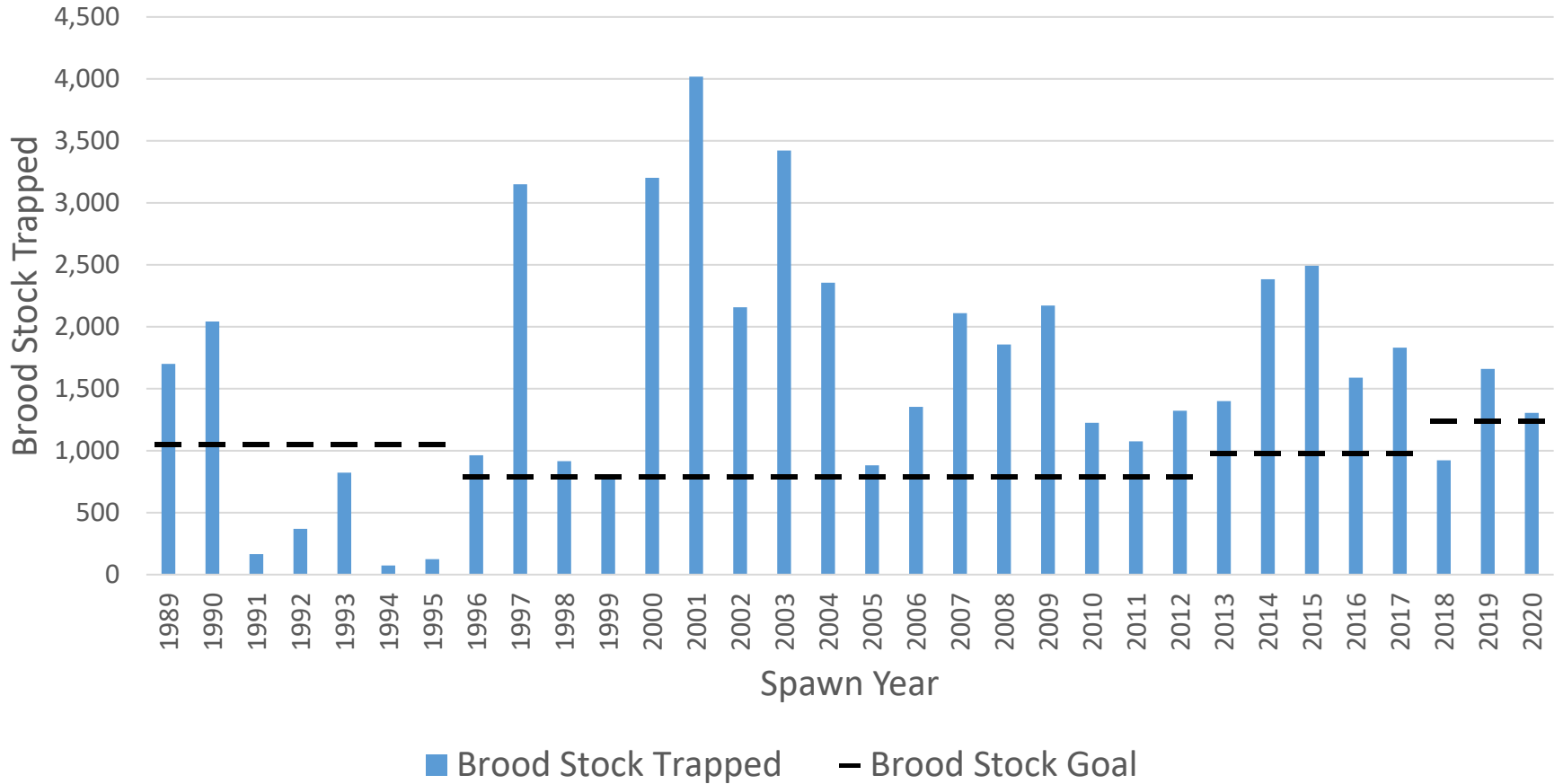


# Brood stock composition

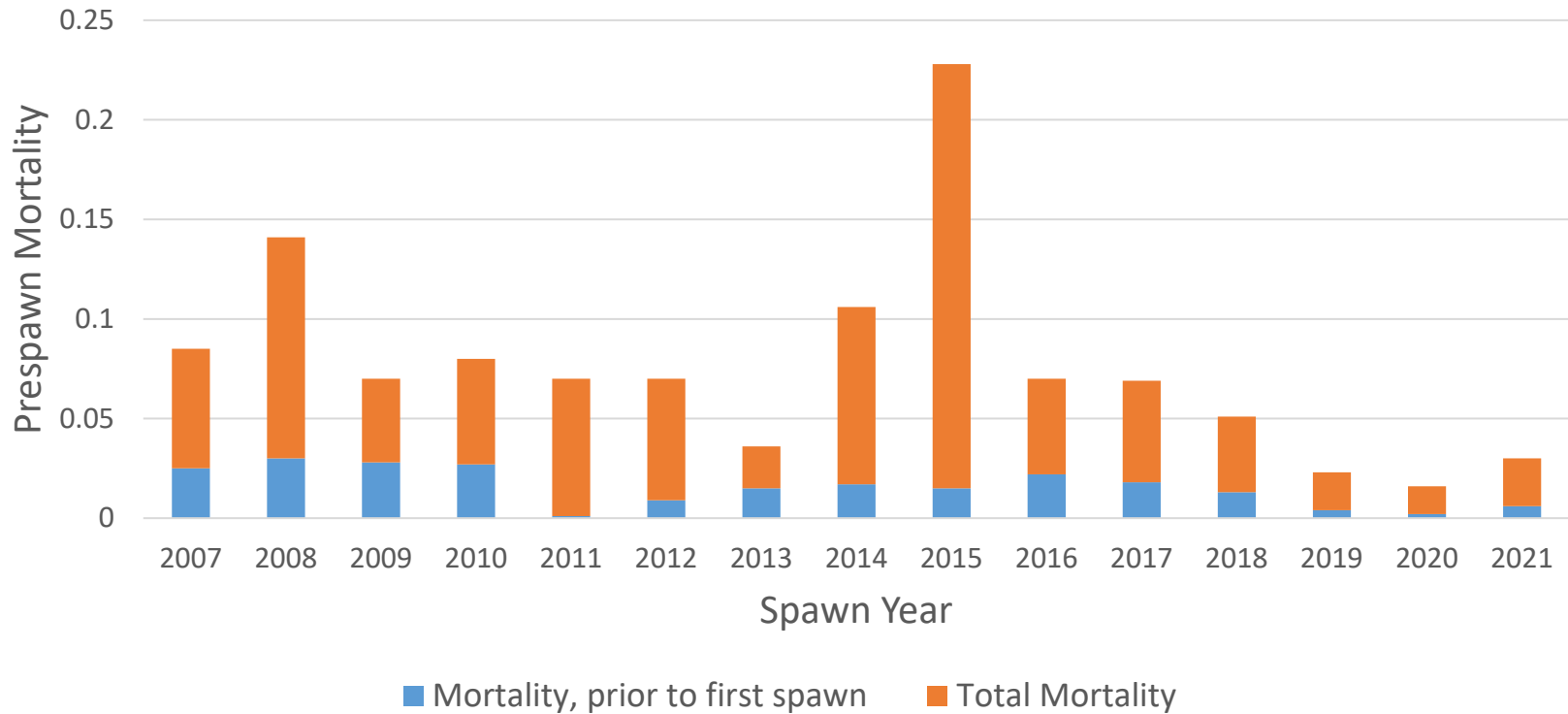
Spring Chinook trapped/spawned at DNFH



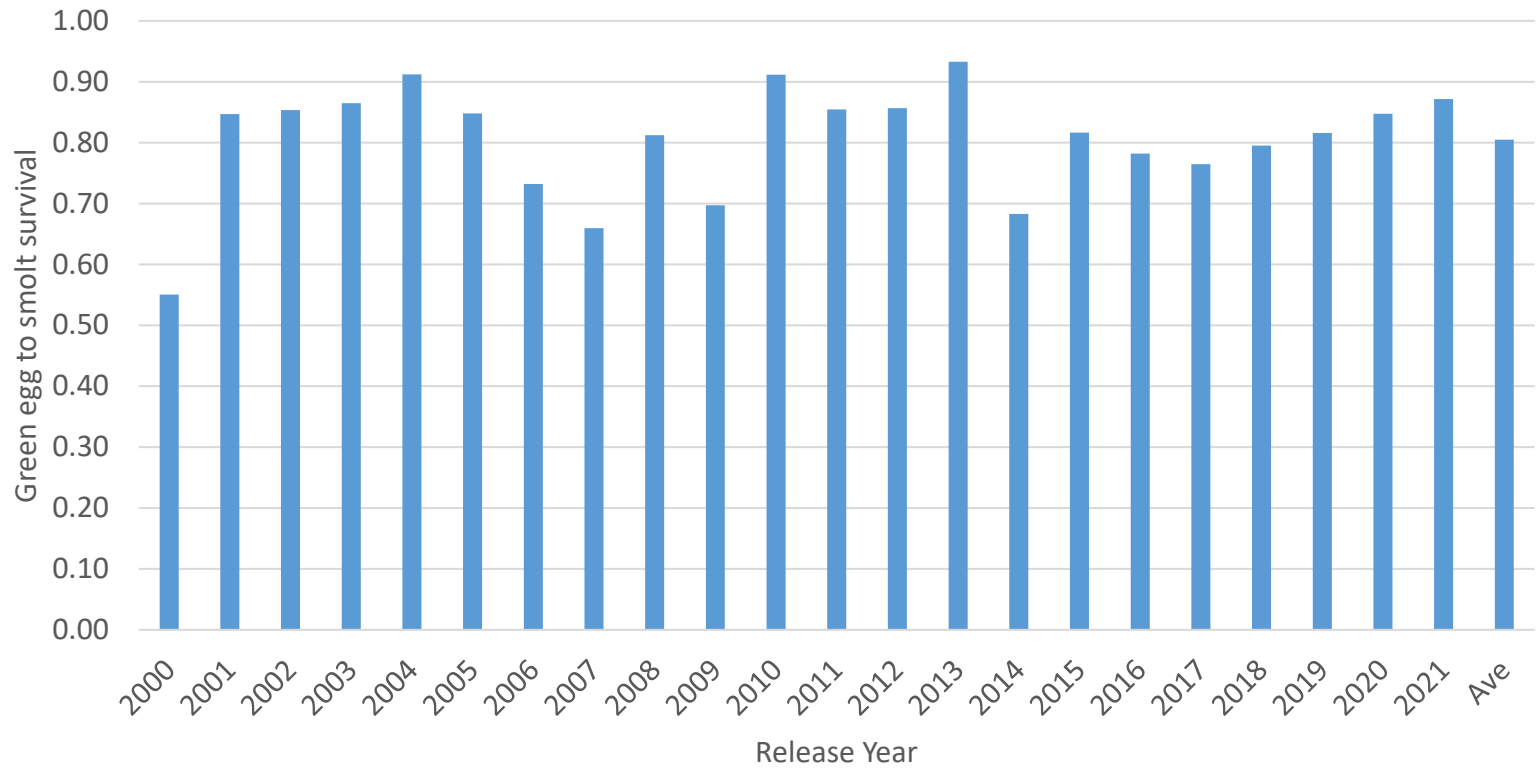
# Brood Stock Collections and Goals



# Brood stock prespawn mortality



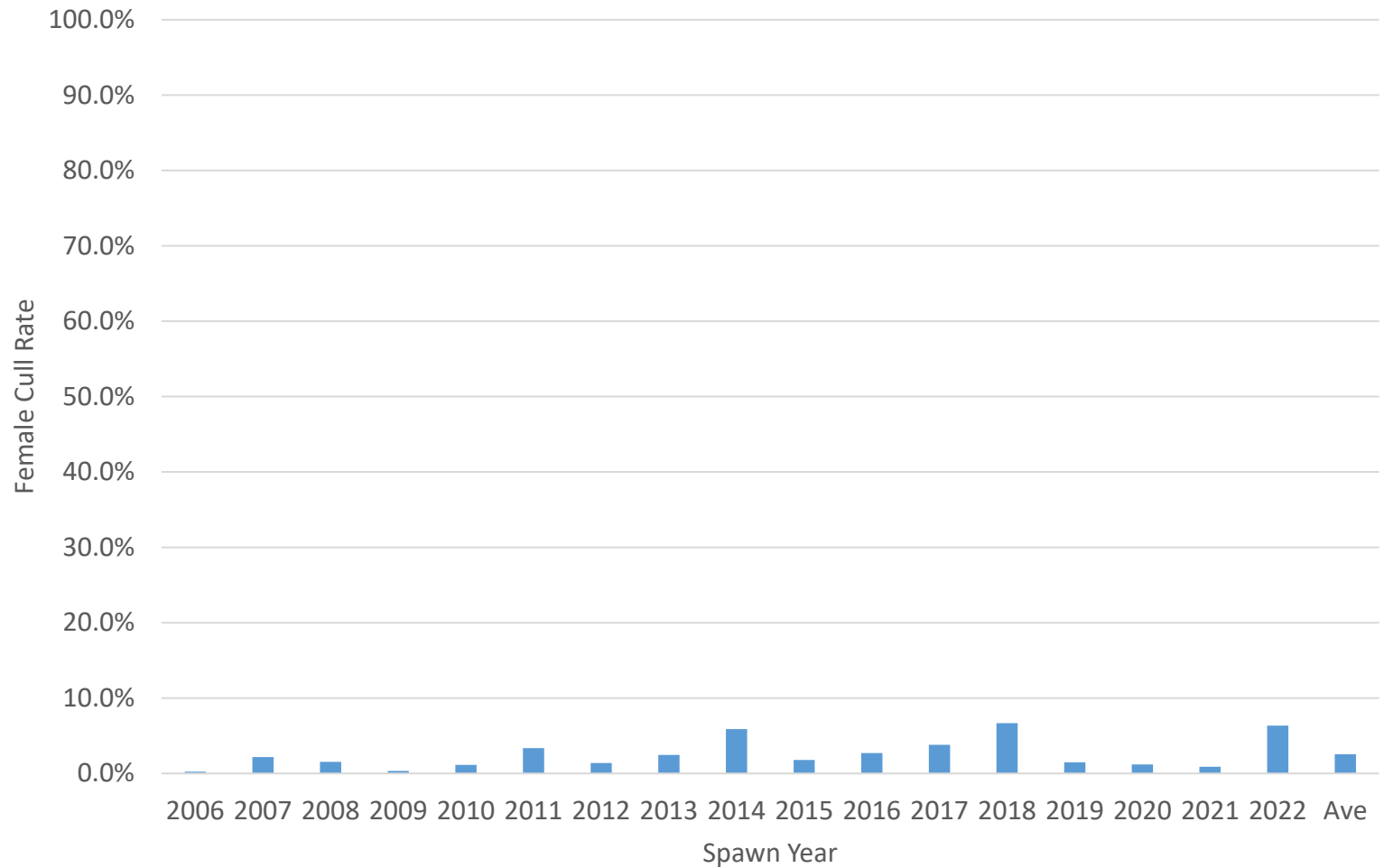
# Egg to Smolt Survival



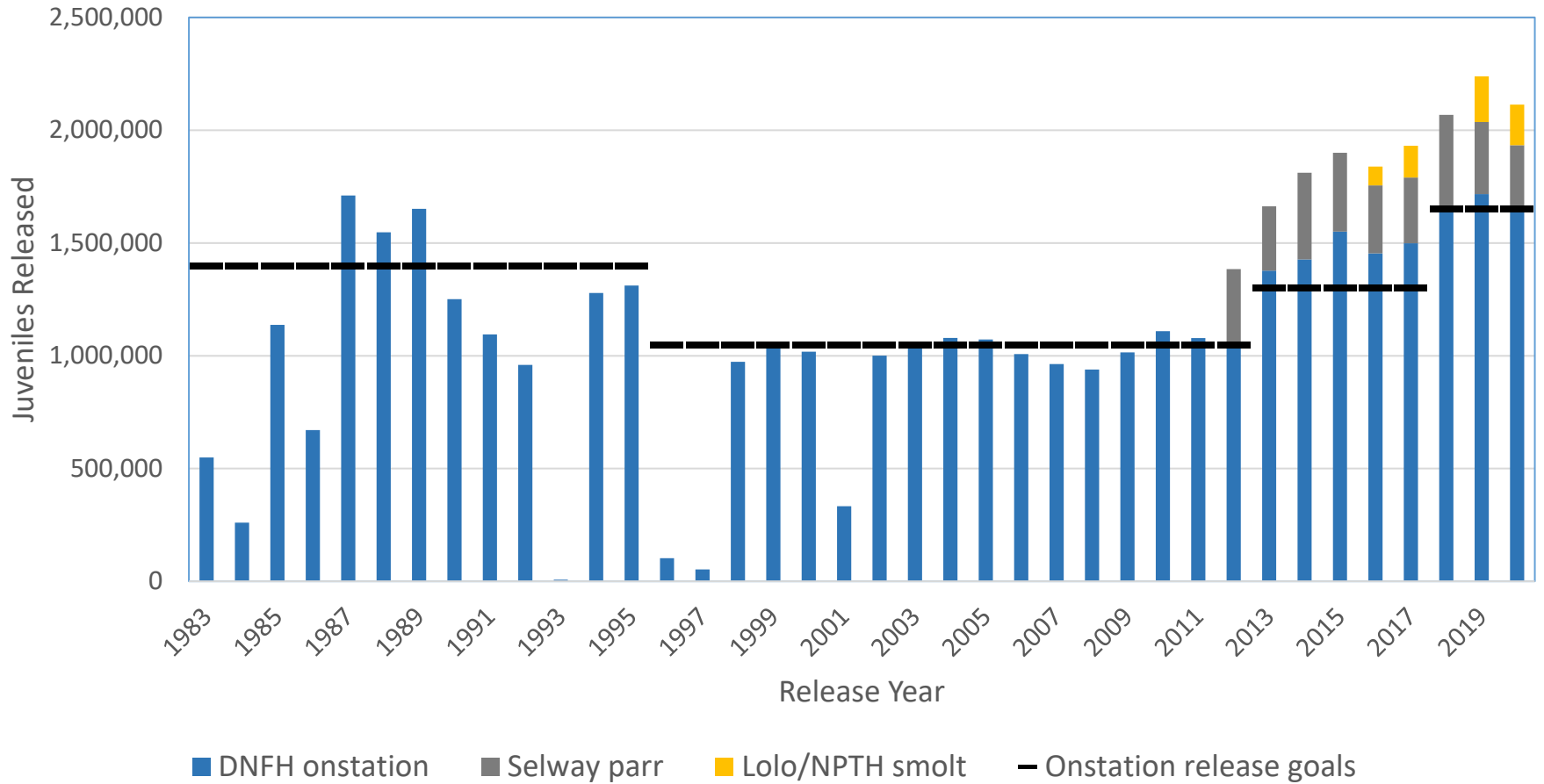
# Fish Health Measures

- BKD controls continue
  - Cull females
    - Visually at spawn
    - post-spawn ELISA
- Do not inject females prior to spawning
- Monitor for IHN in male and female brood stock
- Juvenile monitoring and treatment as warranted

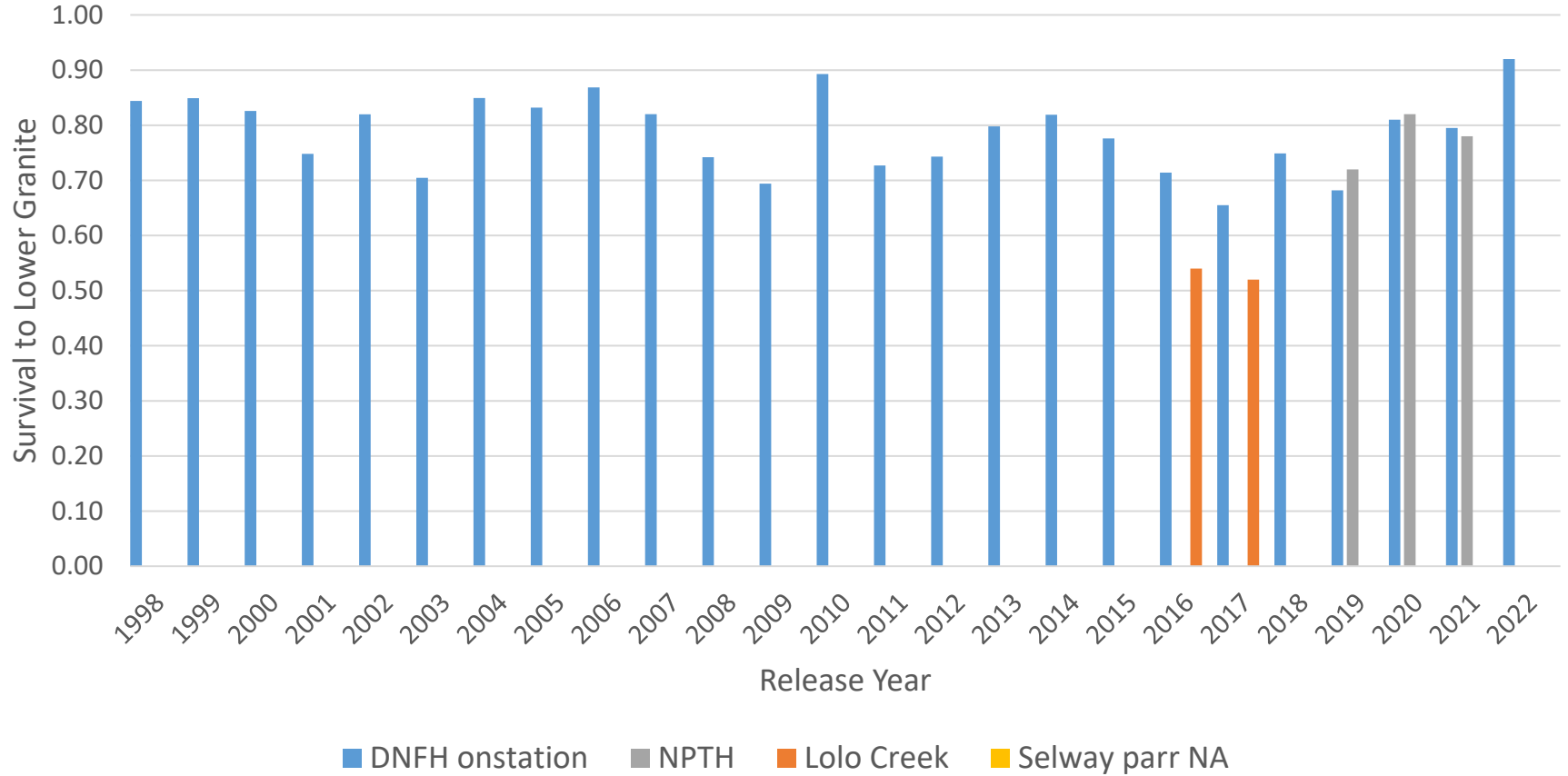
# Female BKD culling



# Dworshak NFH Smolt Releases

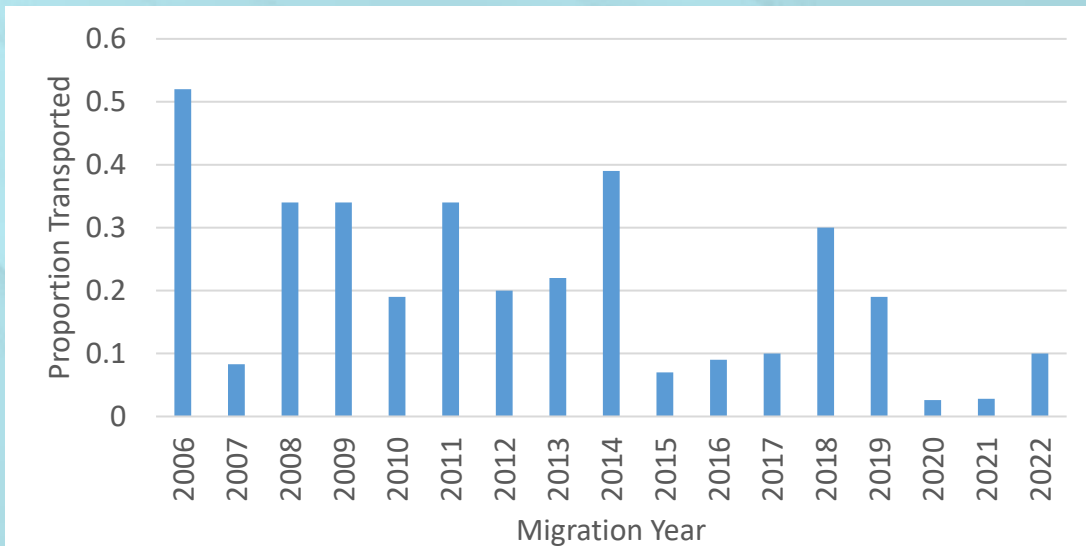
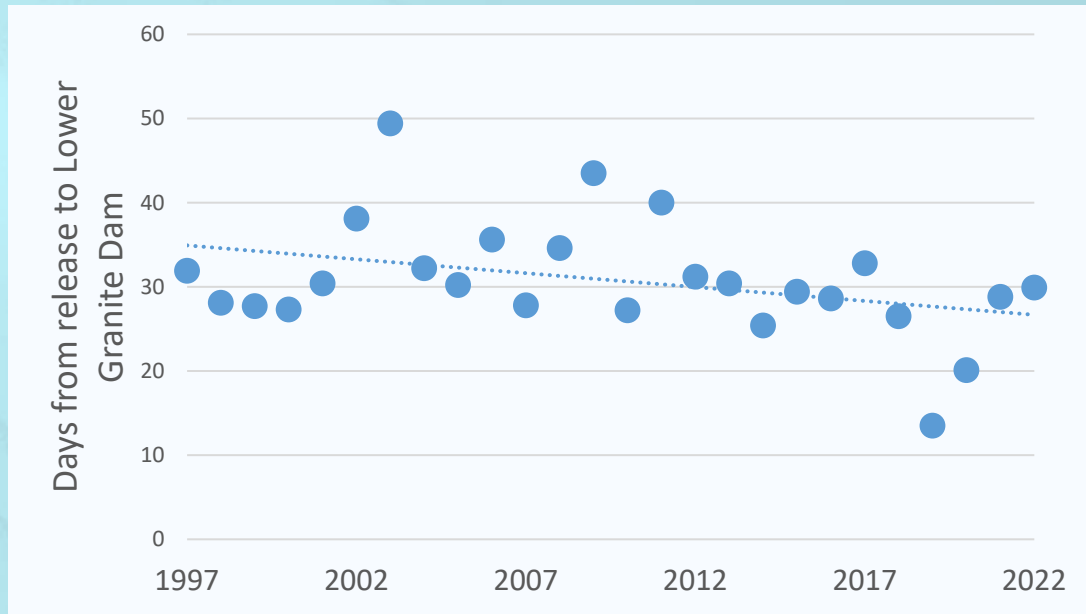


# Juvenile Survival to Lower Granite Dam

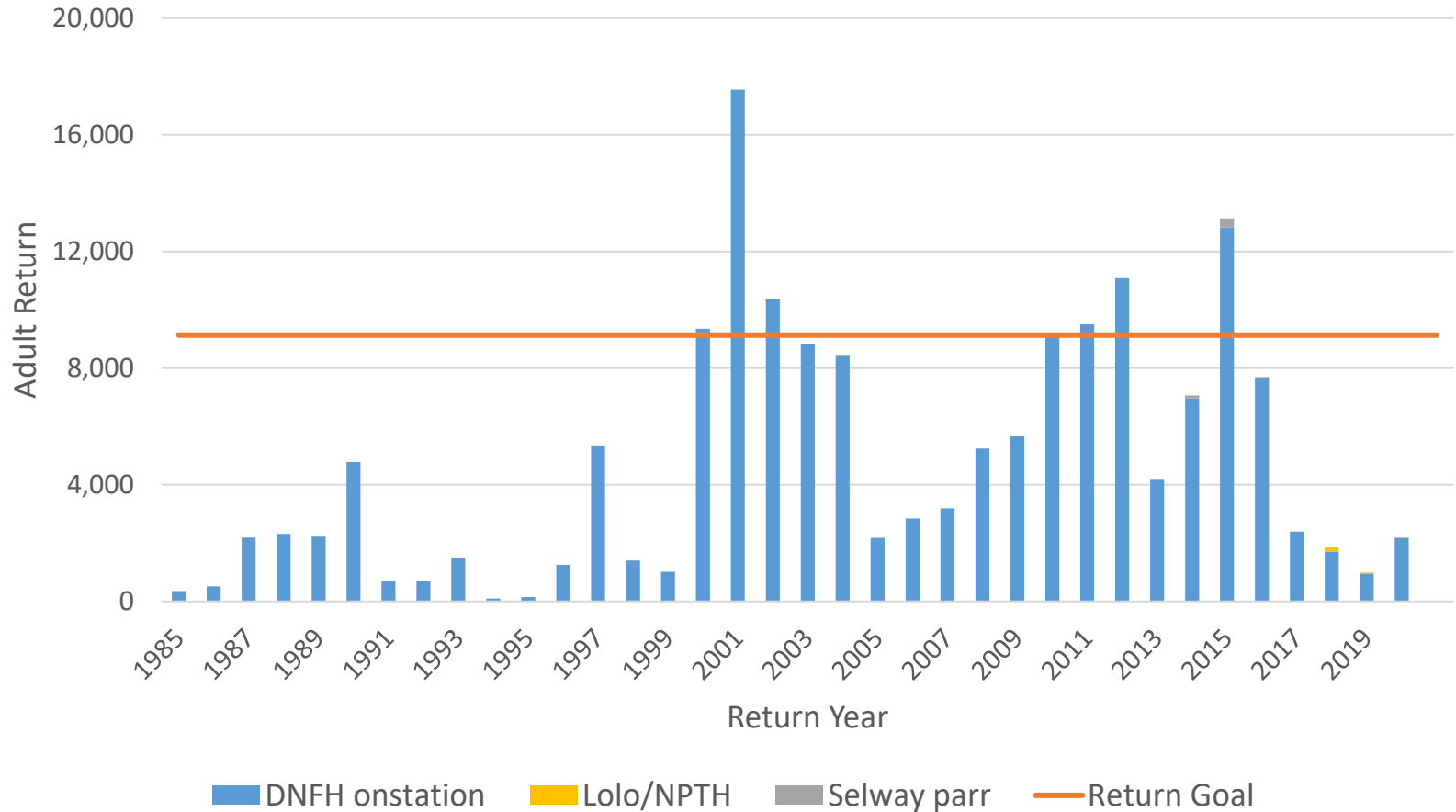




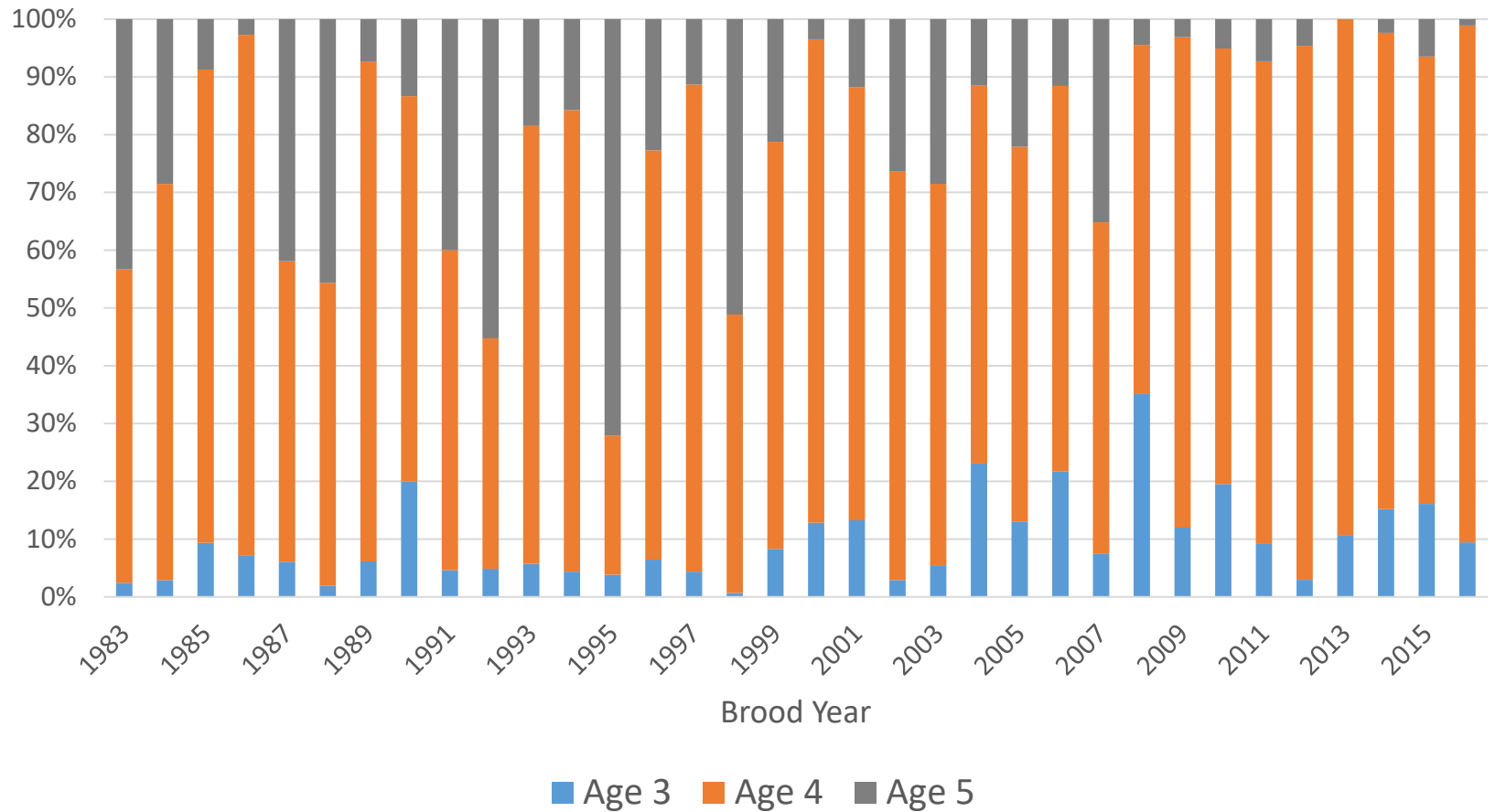
# Travel Time to LGR



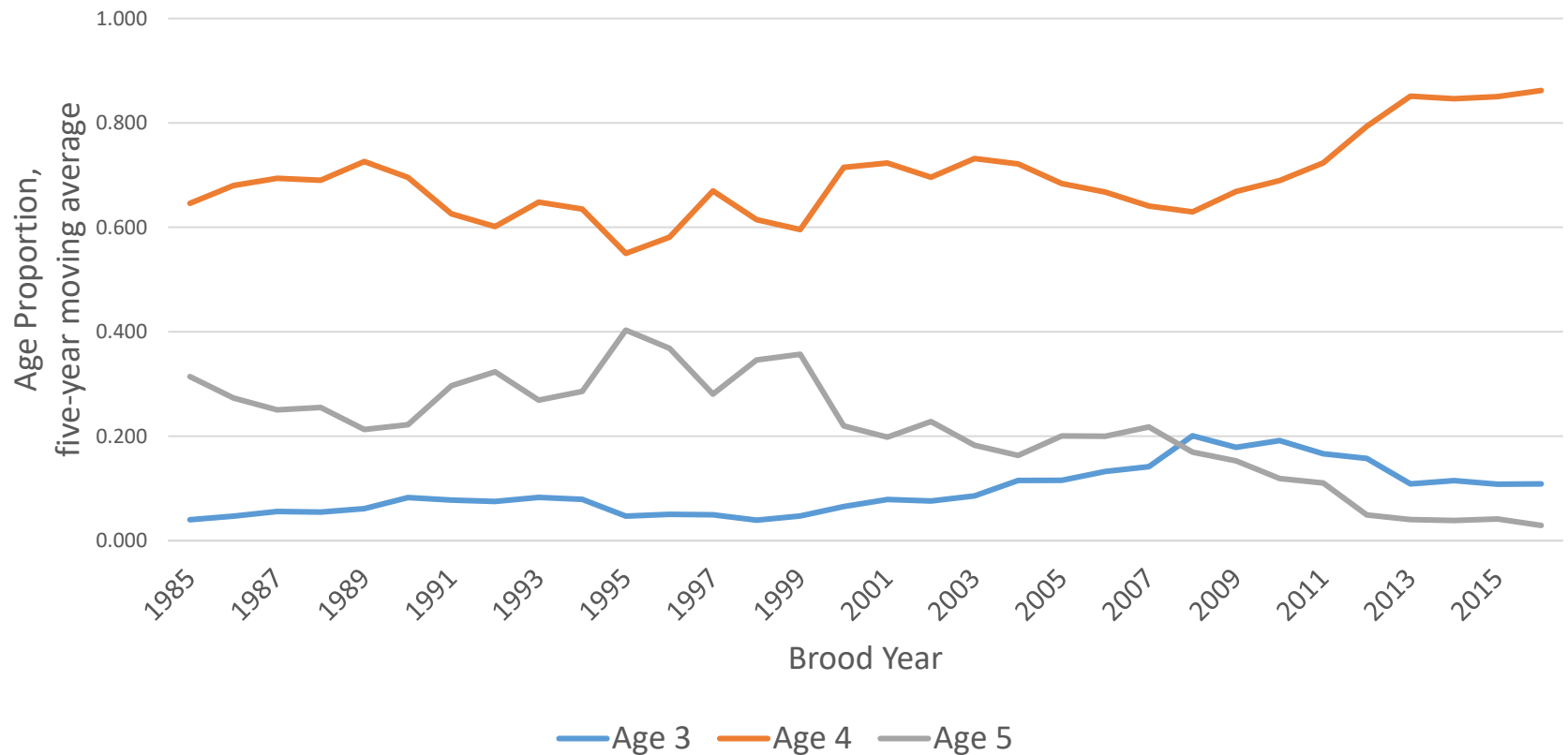
# DNFH Spring Chinook Returns to the Snake River



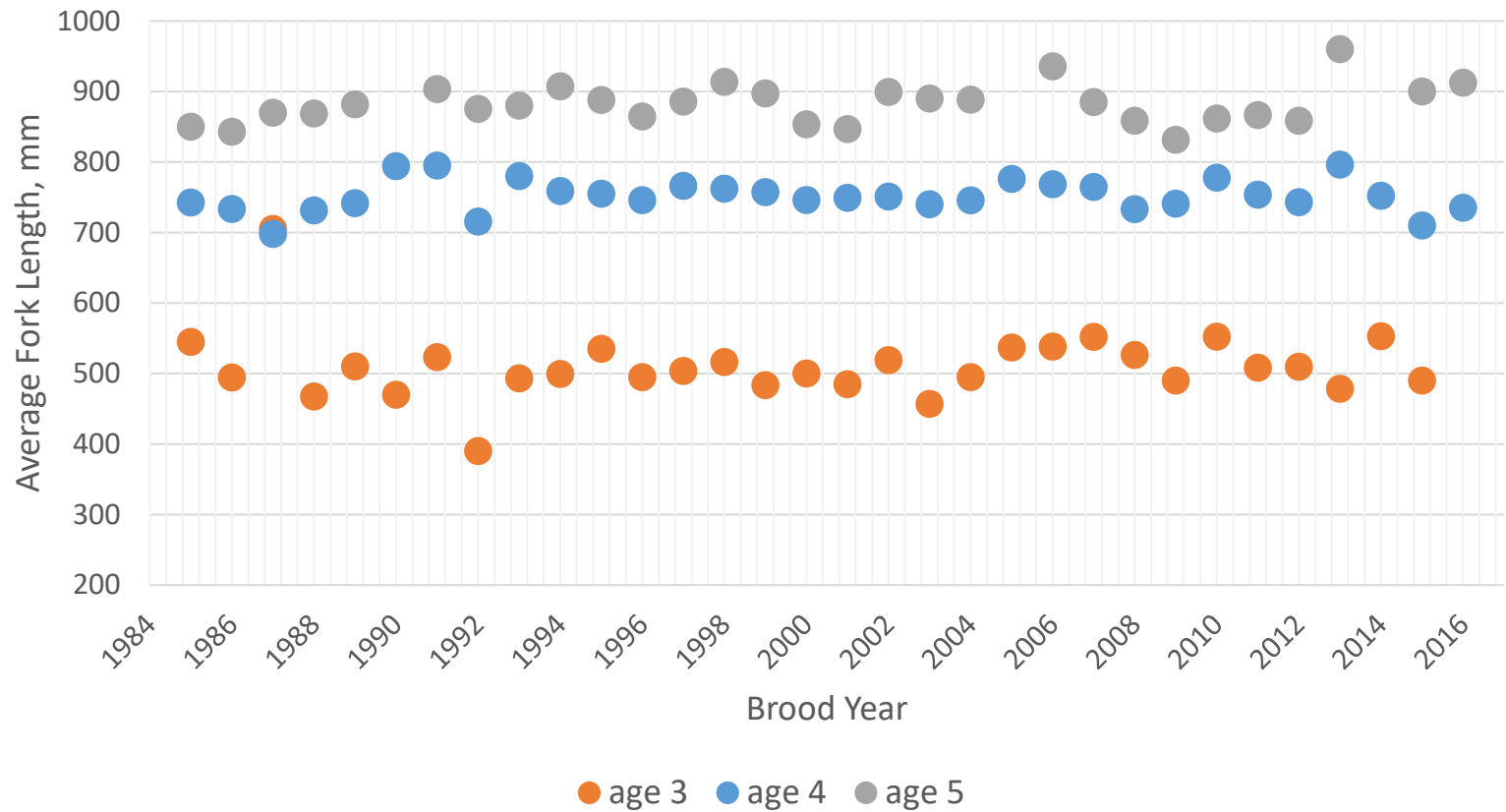
# Adult Age-at-Return



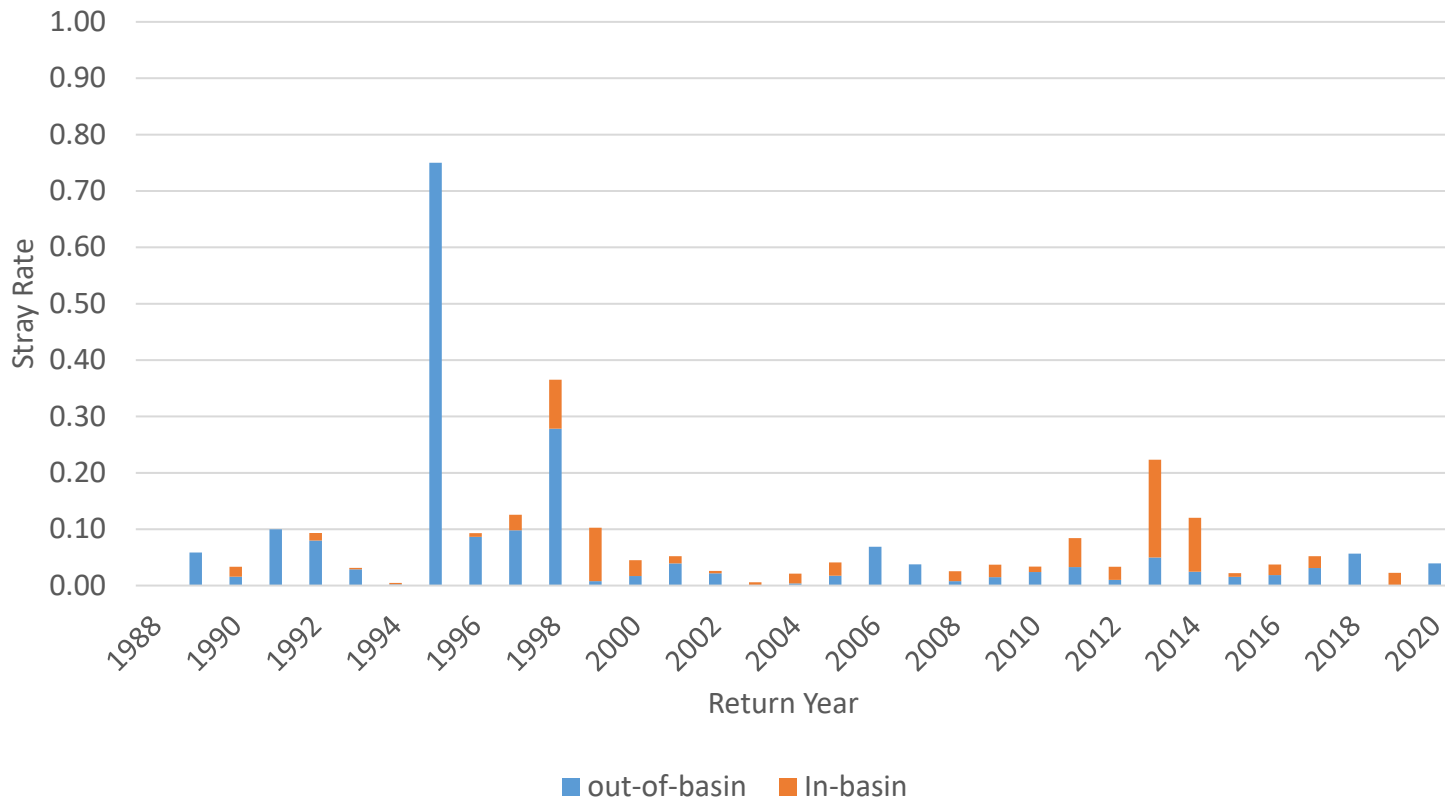
# Trends in Adult Age-at-Return



# Adult Size-at-Return



# Adult Stray Rate



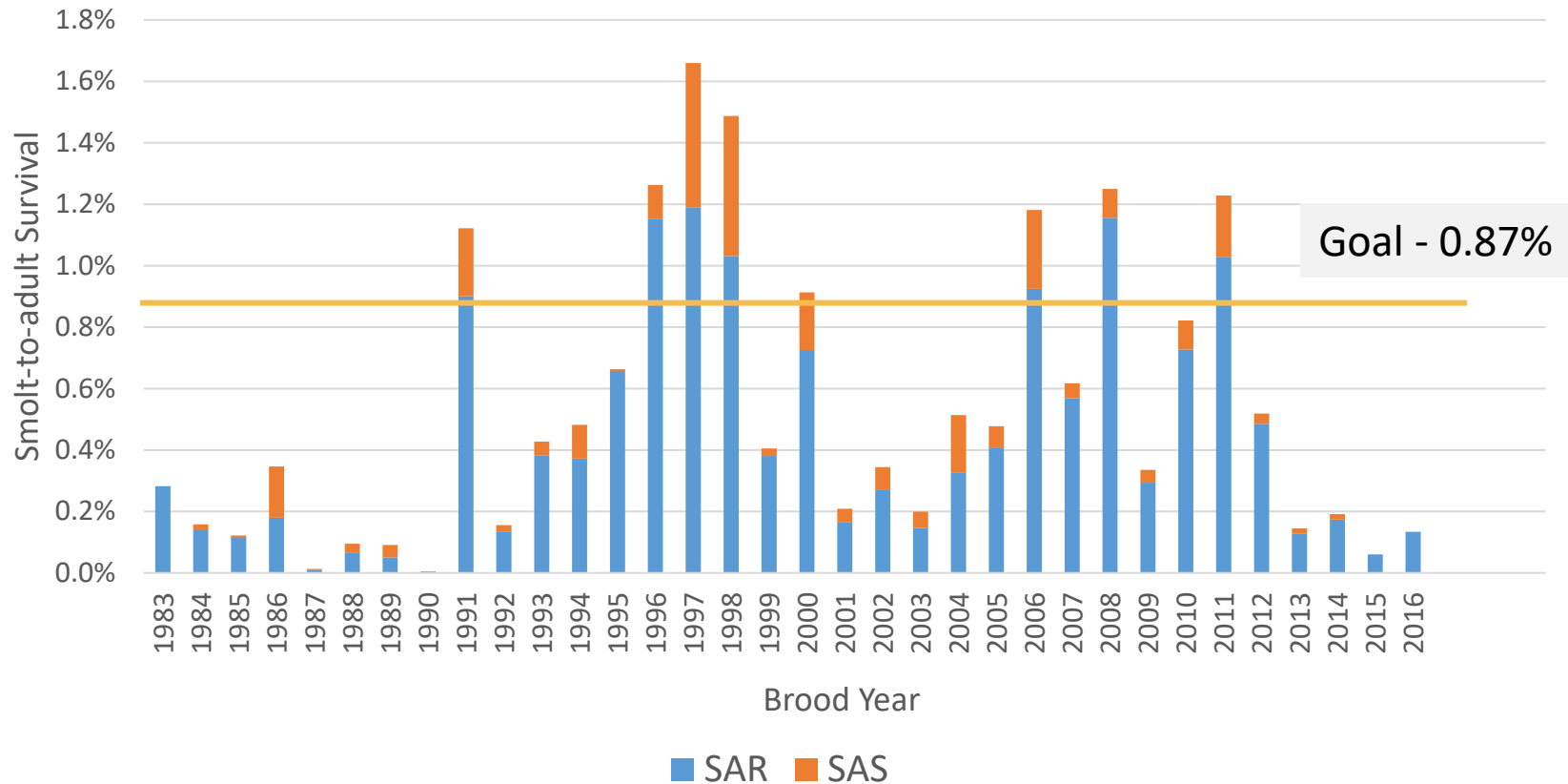
- Out-of-basin: Recoveries at hatcheries, traps and spawning grounds outside the Clearwater River
- In-basin: Recoveries in the Clearwater River basin outside of DNFH

# Dworshak Spring Chinook Adult Survival

## Smolt-to-Adult Return (SAR) Goal

1998-2016 = 0.48%

2007-2016 = 0.48%

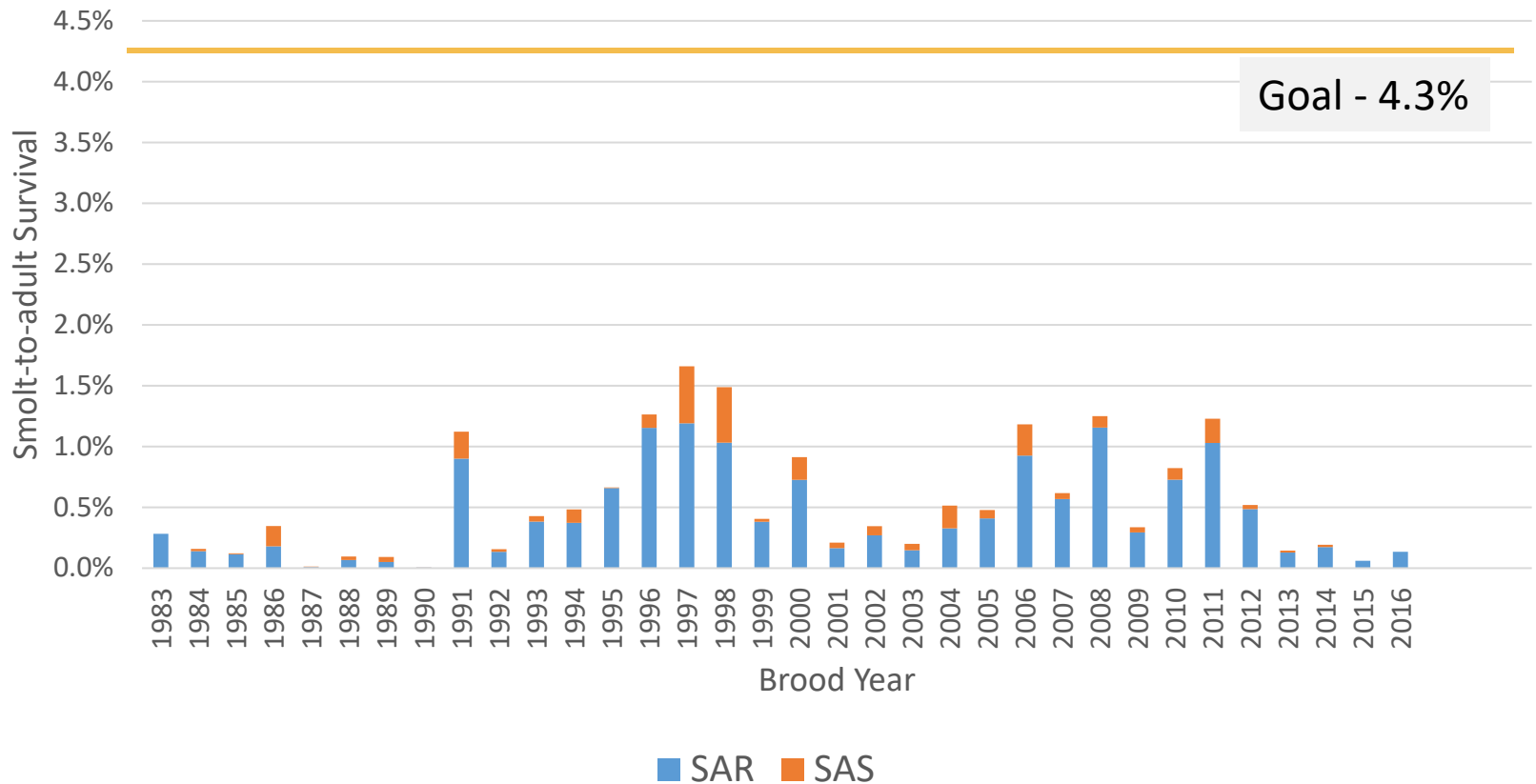


# DNFH Spring Chinook Adult Survival

## Smolt-to-Adult Survival (SAS) Goal

1998-2016 = 0.58%

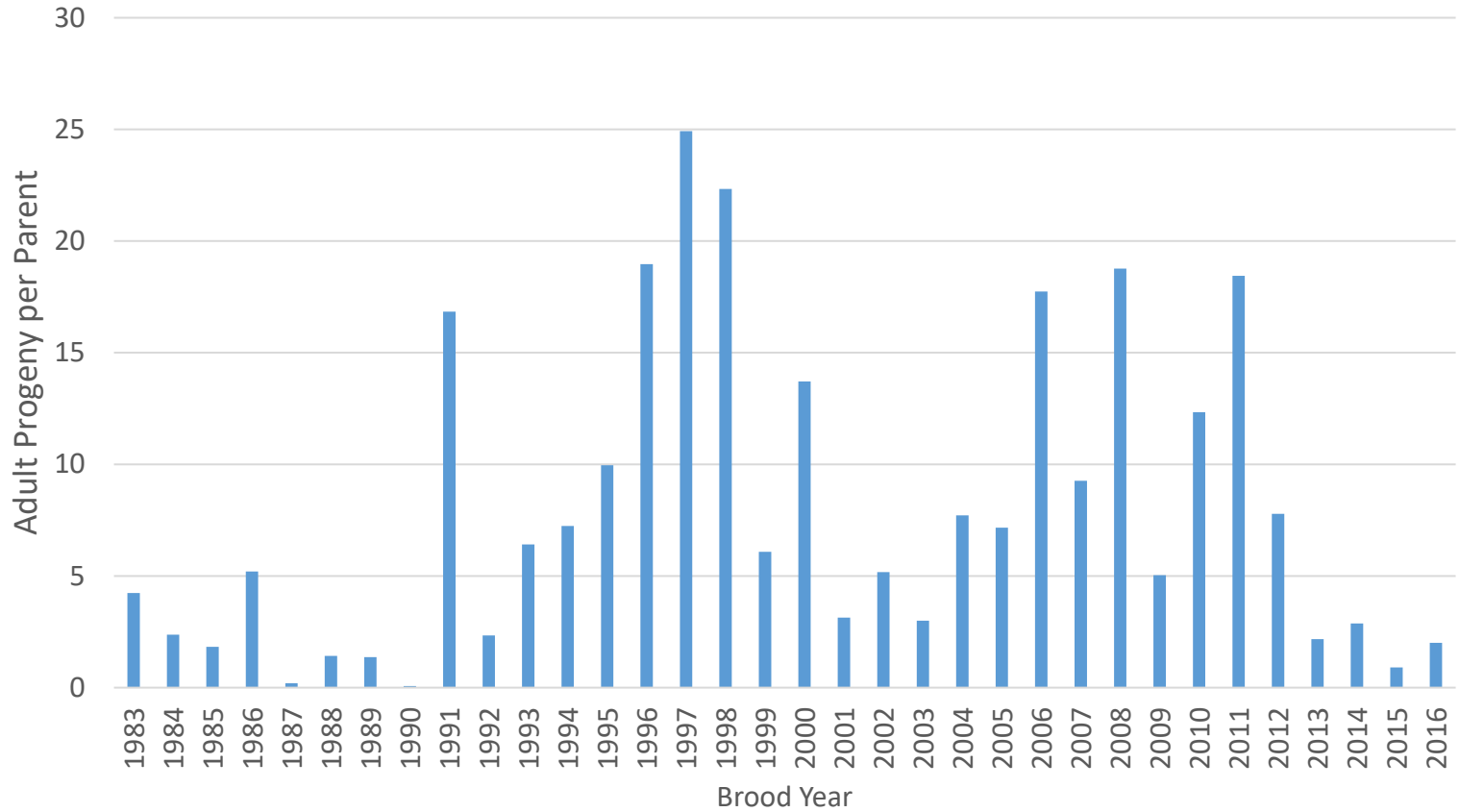
2007-2016 = 0.53%



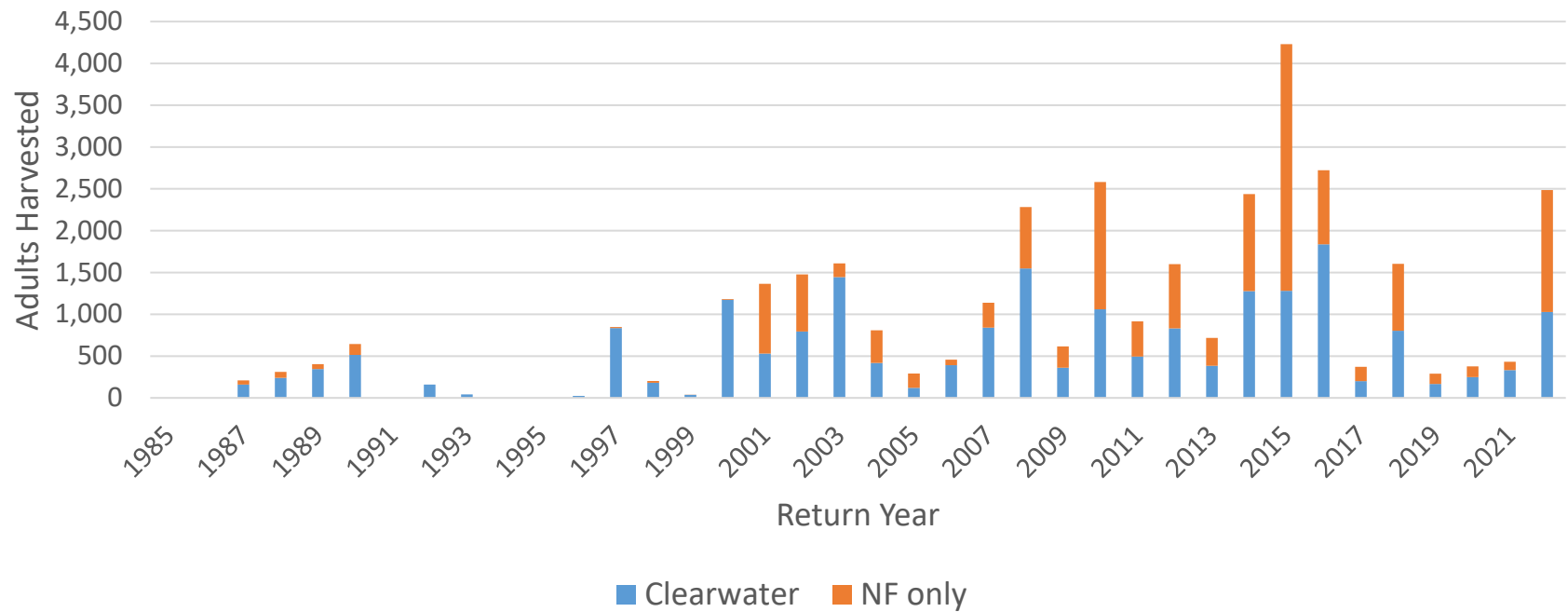


# Dworshak Spring Chinook

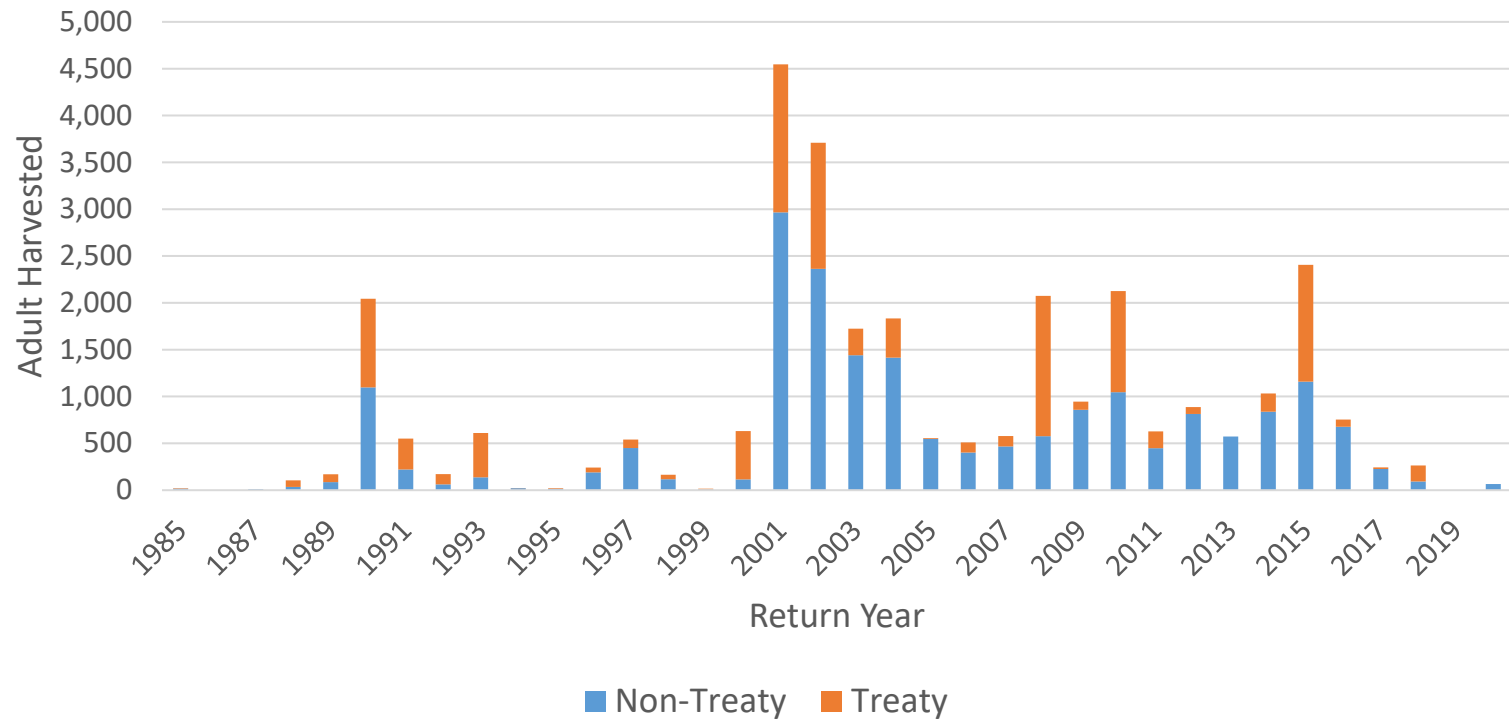
## Recruits per spawner



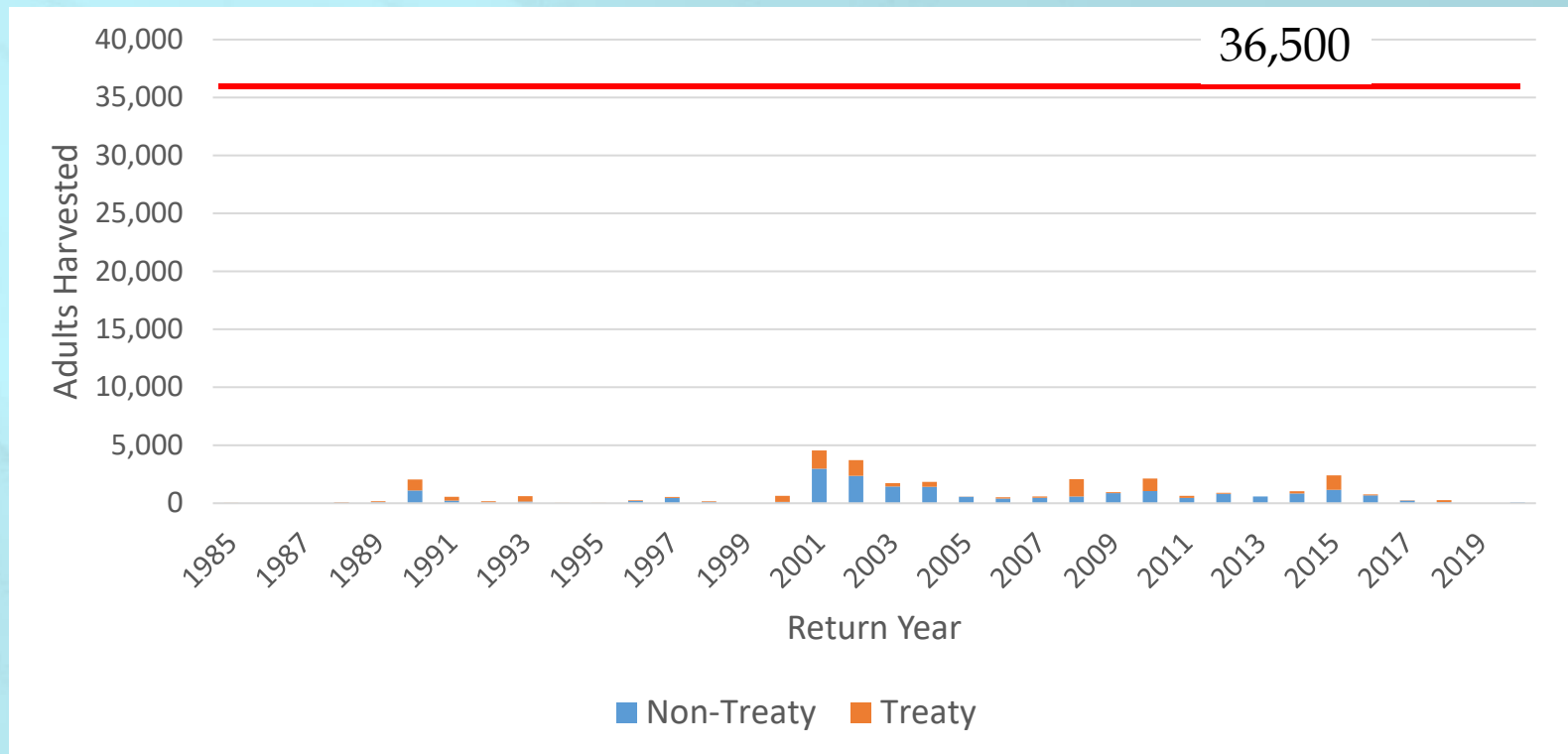
# Dworshak Spring Chinook Salmon Harvest Clearwater River NPT



# Dworshak Spring Chinook Salmon Harvest outside the Snake River



# Dworshak Spring Chinook Salmon Harvest outside the Snake River

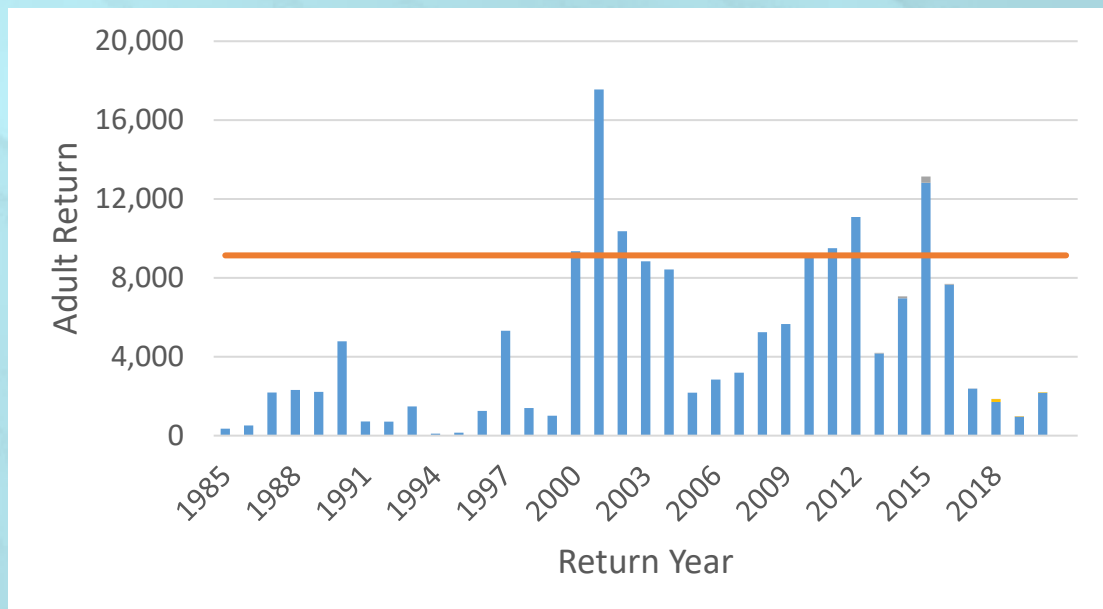


## ❖ HGMP/HRT Recommendations

- Increase Clearwater basin coordination
  - Continued weekly comanager calls since 2009
  - Clearwater AOP process
  - End-of-the-season wrap-up meeting and document posting
- Continued BKD controls
  - Female ELISA culling
- Water supply
  - Not addressed, significant cost
- Locally-adapted brood
  - Clearwater spring Chinook managed as a single stock
  - Limited use of out-of-basin brood when necessary

## ❖ Maximize adult returns – increase juvenile production

- BY2010 – 1.05 to 1.35
- Density Study
- Juvenile production increase above US v OR levels
- Conversion of Selway parr to smolt release – 1.35 to 1.65



## ❖ Maximize juvenile performance

- Night smolt release
  - Initiated in release year 2020 (BY2018)



## ❖ Maximize juvenile performance

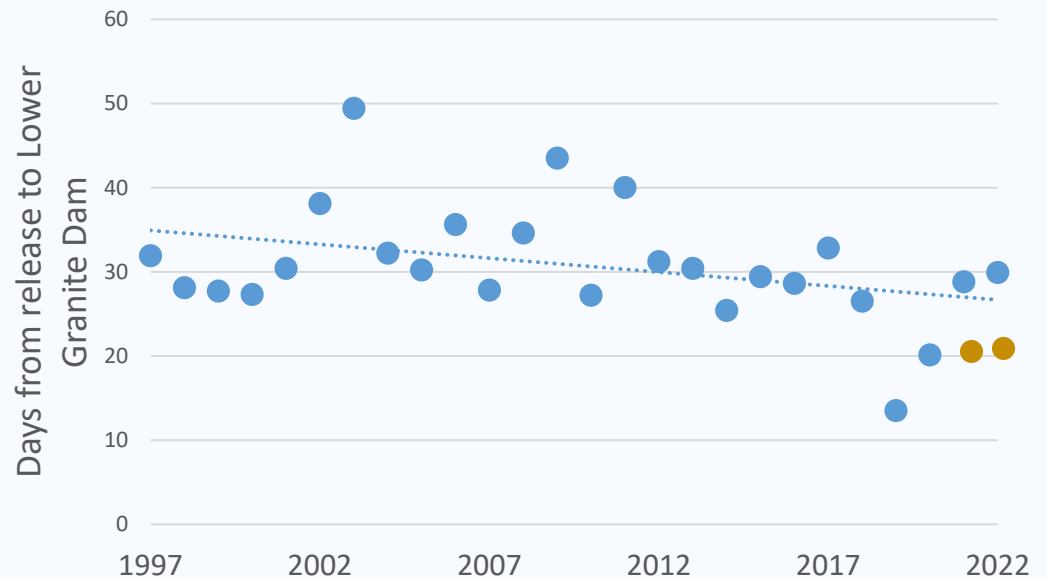
### ➤ Release timing study

- Initiated in release year 2021 (BY2019)
- Split release, 'normal' time and 2 weeks later
- Includes CFH and NPTH to evaluate across hatcheries

## Survival to LGR

Release time	2021	2022
Early	76.9%	88.7%
Late	81.9%	95.2%

## Travel time to LGR





## ❖ Optimize hatchery management

- Use of Brood stock calculator to determine annual brood needs.
- Use five-year averages for production metrics;
  - smolt release goal, prespawn mortality, BKD cull rate, fecundity, egg to smolt survival

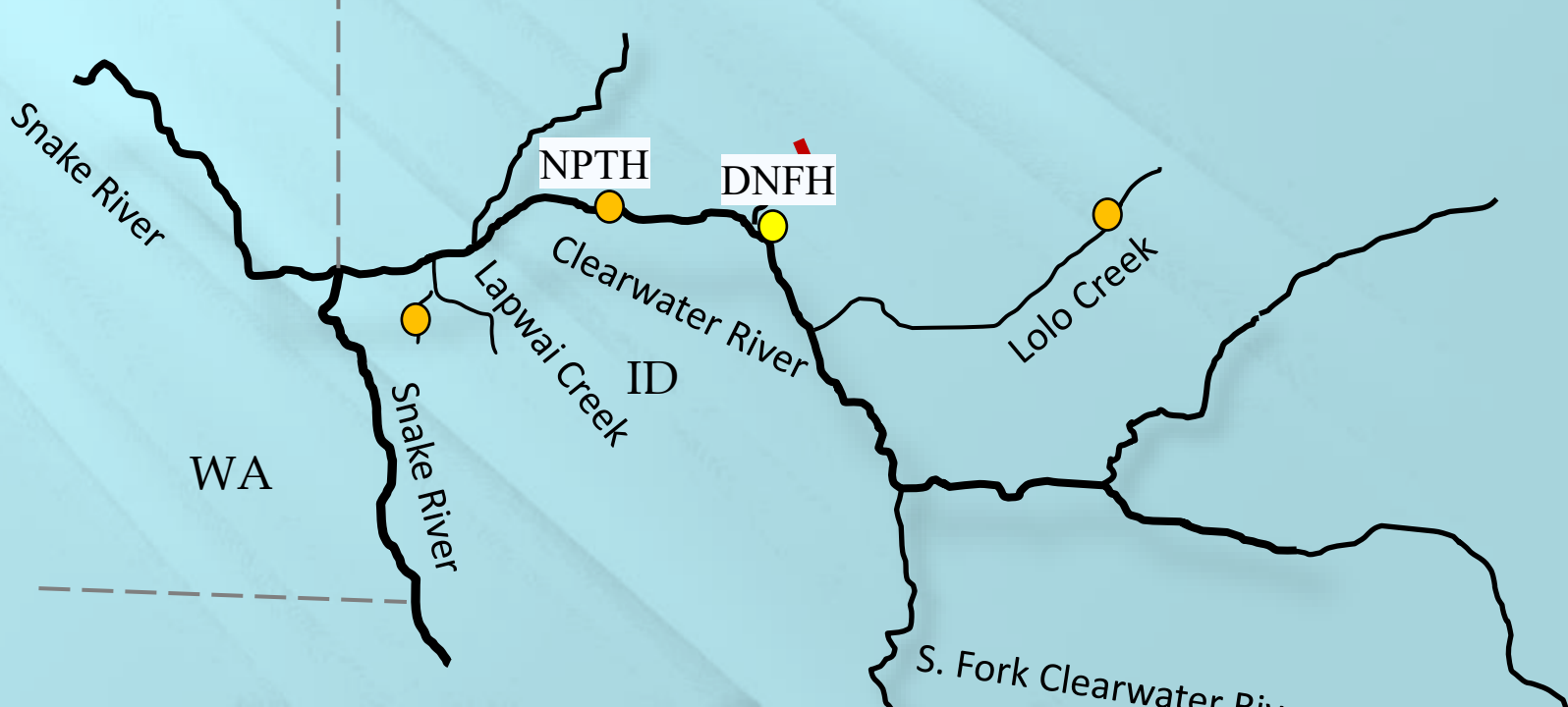
## ❖ Optimize hatchery management

### ➤ Parentage-based tagging

- Initiated in BY2009
- Important for abundance, harvest estimates, composition
- Critically important for hatchery investigations – Density, release timing, etc.

## ❖ Maximize adult returns and harvest

- Move Lolo Creek release to Lapwai Creek
  - Expect improved juvenile survival
  - Expect increased adult returns
  - Exclusive NPT fishery in Lapwai Creek



# Conclusions

- LSRCP mitigation goals have not been met
- Adult returns and harvest continue to be under goals
- In-hatchery juvenile and adult metrics are meeting objectives
- We continue to apply adaptive management to all aspects of hatchery production